RE4UHD SAR EAR Tool Tutorial

Tools by Son of Perisa

Tutorial by Mr.Curious

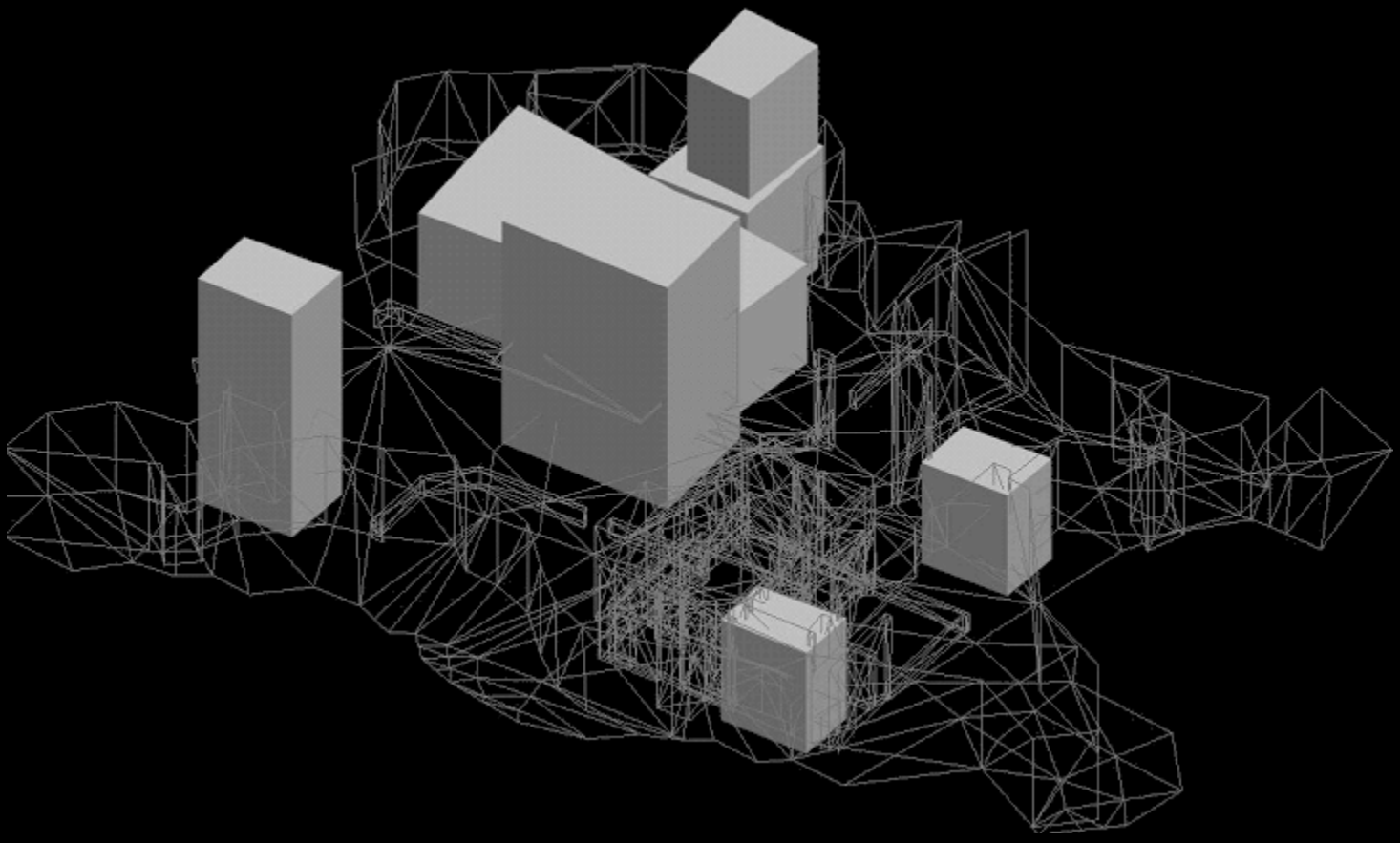

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TABLE OF CONTENTS

SAR & EAR FILES DESCRIPTION

The SAR & EAR are both files that are contained within the UDAS archives in the stage folders. Each of these files serve the function of activating/deactivating lights (SAR) and effects (EAR) using TriggeZones.The tools for these files can handle both kinds of files as they are quite similar in structure and function. Let's look at a brief description of each file type:

SAR

While we are not sure exactly how the SAR file exactly works we do know that it is the file that controls where certain lights are triggered (only up to two lights). While we can use the CAM to deactivate entire lighting Groups, the SAR file can turn off individual lights within a Lighting Group.

EAR

Essentially the EAR file contains TriggeZones to activate/deactivate effects within certain Effect Groups in the EFF file. Unlike the SAR file, the EAR file does not contain as many limitations as to how many effects can be activated/deactivated.

FILE EXTRACTION

To extract an EAR or SAR file simply place the file in the same folder as the **RE4UHD_SAR_EAR_Tool.exe** and **.bat f**iles. Double click on the **SAR_EAR_Extract.bat** file. Once this is complete you will see that a new folder has been generated (depending on which file type is used). Inside this new working directory are a **.txt** file and **.obj** files. We are now able to edit the parameters in the **.txt** file and/or edit the TriggeZones using the **.obj** file. For more information on this part of the process please read the '**Understanding the extracted OBJ files**' section of the '**Universal Concepts**' guide.

It should also be understood (as with all Son of Persia tools), that the amount of sub-object layers in the **.obj** file must match the values in the **EventCount** offset of the extracted **.txt** files. If we are to remove or add entries, these must match.

WORKING WITH THE SAR FILE

PREREQUISITES TO WORKING WITH SAR

Before we get into how to use the SAR file, users should already have a basic comprehension of the concepts illustrated in the LIT Tool Tutorial, as the SAR file deals directly with lights. There will vocabulary and terminology that we learn about in the LIT Tool Tutorial that is essential reading before dealing with the SAR file.

SAR FUNCTIONS EXPLAINED

As mentioned earlier in the LIT Tool tutorial, the **SAR** file is used in conjunction with the **LIT** file to activate up to two individual lights. While it is not really necessary to use this functionality it can often give us a little more control over the lights, or add an extra dimension of reality to our lighting scenarios. We can create some really beautiful shadow effects using the SAR if we are experienced enough and patient.

It should be noted that the **SAR** file only reduces the intensity (or activation) of two lights that reach player & enemies. What this does is generates the illusion that the characters have entered a shadowed area (for example, when we enter a cabin or we come close to a wall that generates a big shadow on the floor. Take a tour in the main village area (r101) and you'll notice it easily.

For example, I used the **SAR** file to deactivate a light that was used for lighting Leon. I would set the TriggerZone of the **SAR** file entry so that when Leon walked close to a certain wall the light would go out so it appeared that he was walking into a shaded area. This kind of flexibility can give us wonderful looking results, but there is often more work involved.

As noted above, SAR entries only affect the player & enemies, but **not the stage models**. The SAR entry only affects two lights at the same time and they are **always the same for all LIT groups**. So, if we are planning to use the SAR file we must make sure that the lights we want to be activated/deactivated are **ALWAYS** in the same order in all the Lighting Groups of out LIT file. If we are only using one Lighting Group then we do not have to worry about this. So far we have only experimented using the SAR-EAR tool using **Type 5** lights, so we are unsure what the results will be with Type 2 and other Light Types.

SAR FILE PARAMETERS

Once we have an extracted SAR file we can open the extracted **.txt** file with a text editor to see the contents. Let's have a look at an example of an extracted SAR file:

EventType = 0
EventCount = 1 (amount of entries in the file)

Event 0

Index = 0x1 ---- ID OF THE EVENT
Offset[1] = 0x1
Offset[2] = 0x13 ----LIGHT 1 (**0x13** = **19th** light in the LIT file.It will deactivate/tone down **light 19** for ALL LIT groups)
Offset[3] = 0x1 ----- LIGHT 2 (**0x1** = 2nd light in the LIT file. It will deactivate/tone down **light 2** for ALL LIT groups)
Offset[4] = 0x1
Offset[5] = 0x1
TriggerZoneHeightBoundary1 = 2000.000000
TriggerZoneHeightBoundary2 = 10563.557617
UnknownValue = 2000.000000
TriggerZoneCorner0_X = 73956.796875
TriggerZoneCorner0_Y = -1662.605469
TriggerZoneCorner1_X = 81356.281250
TriggerZoneCorner1_Y = 1099.443359
TriggerZoneCorner2_X = 84325.484375
TriggerZoneCorner2_Y = -7005.798828
TriggerZoneCorner3_X = 77198.578125

TriggerZoneCorner3_Y = -9760.255859
Offset[52..55] = 0x0
Offset[56..59] = 0x20 ----- INTENSITY OF THE LIGHT MASK | **0x0** = LIGHT TOTALLY DEACTIVATED

SAR:
Offset[2] = 0xXX
Offset[3] = 0xYY

0xXX = light number for player
0xYY = light number for enemies

Example, you have **Type 5** Light which is some atmospheric light that reaches both the player and the enemies. Let's say this light is the **4th** light in the group, so the number reference for that light is "3" (the 4th if we take "0" into consideration

If you want that light to be deactivated partially or totally inside a TriggerZone, you'll have to set:
Offset[2] = 0x3
Offset[3] = 0x3

Sometimes, the atmospheric **Type 5** lights have different settings for both, player and characters, and you have two different **Type 5** lights (a reason for this could be the developers wanted Leon or the enemies to be more brighter/light coming from a different angle/color/etc in certain areas, for playability reasons).

Only Leon
Category = 7
Type 5
SubType = 0
ModelReach = 0x1

Only enemies
Category = 7
Type 5
SubType = 0
ModelReach = 0x2

Example: If the first light (Leon light) is first position inside the LIT group, its number ID is "0". and if the second light (enemies) is in 5th position, it's number ID is "4".
So, the right SAR lines will be:

Offset[2] = 0x0
Offset[3] = 0x4

Offset[56..59] = 0xZZ
0x0 = the light is completely deactivated
0xFF = the light is completely on (the SAR entry doesn't generate any effect)

WORKING WITH THE EAR FILE

WHY USE EAR?

There are certain reasons why we need to use EAR, as sometimes we don't want all of them running all the time. The effects were probably designed to be toggled to conserve CPU usage so that effects are only 'on' when the player is within a certain visible range of the effect. The other reason for this is because there are often times that we only want an effect to be seen in certain areas of a room (like having rain only visible on the exterior of buildings). The EAR file can really come in handy if we want to be able to toggle effects in certain areas, and with some custom effects this can be really fun and exciting.

UNDERSTANDING THE EAR FILE'S ROLE WITH EFFECTS

One thing we must understand while editing the **EAR** file is how it works in tandem with the **EFF** files. This relationship is very important because the EAR file can be setup to control which Effect Group folders get activated/deactivated. Simply put, each Effect Group folder can be linked to an entry in the room's EAR file. This allows for toggling effects with EAR TriggerZones.

Before diving into the functions of the EAR file, u**sers should have a solid understanding of how effects are organized with the Tables. You can read about that in the EFF Tool Tutorial** HERE.

To avoid redundancy in these tutorials, I will request users to please read the **HOW THE EAR & EFF FILES WORK TOGETHER** section of the EFF Tool Tutorial for more detailed information about how EFF and EAR files are linked.

The only other information that needs to be shared here is that the EAR file uses TriggerZones to activate/deactivate the groups, so be sure to follow all the same principles of working with TriggerZones, and working with **.txt** & **.obj** files as outlined in the **Universal Concepts Guide**.

This concludes the SAR - EAR Tool Tutorial

Happy Modding!

Mr.Curious
12 - 2018 (edited 2-2023)

BACK TO TOP

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