

## BEST PRACTICES COURSE – WEEK 20 Managing Attributes, Project Preferences, Work Environment – Part 7-A – Work Environment: User Preferences, Schemes and Profiles

Welcome everyone to the ArchiCAD Best Practices training lesson. Today we'll be focusing on the topic of Work Environment settings and preferences. So the Work Environment is something that is set up in ArchiCAD for your workstation. It is local to that station, so it's not attached to a project. We talked last time about the difference between PP, which is when you set them, they live in the project. If you send someone else the project or open it on another machine, it retains how you want dimensions and things like that are handled. [0:00:41]

The Work Environment on the other hand are your personal preferences based on let's say your personal taste or what you find best as well as maybe what you have customized for your workstation. In some cases, you might have different preferences for a desktop versus a laptop or a faster machine versus a slower machine. There are some options that can optimize the way ArchiCAD works given different hardware capabilities. [0:01:13]

Now the basic structure of Work Environment has not changed much over the years. There have been a few enhancements, buttons and options added. I am going to focus in ArchiCAD 17. If you are in an earlier version, you may find that some of these options either are missing or perhaps the default has changed. In general, Graphisoft didn't change the options, they either added to them or decided in some cases to change the default maybe based on user feedback. [0:01:46]

Alright, so let's look at Work Environment as a whole and what it encompasses. You will see there is a sub-menu under the Options, Work Environment here. It has many different choices. When we open up the first choice, Work Environment here, we see all of those choices, plus a few more. For example, Palette Schemes is something that you can adjust or control from within here, but there's no actual menu command to go there. I don't quite know why Graphisoft doesn't do that, but basically most of these you can go directly to and then a few you have to open up any part of the Work Environment and then you can visit. [0:02:22]

Now what is a profile? A profile is basically a set of preferences that are made up of sub-preferences that they call "Schemes". So if I open this up wider so we can read it, you can see that the standard profile for ArchiCAD 17, at least in the U.S. here, has a setting for "Standard User Prefs". So that is the user preference schemes. Each one of these groups has a scheme recording it. That allows you to possibly save a scheme that relates to a particular part of your preferences, for example, shortcuts. Or the way you like your toolboxes to be done. [0:03:05]



Each one of these has a scheme that you can record. Then all of those schemes can be saved within a larger profile. To really understand what this means, we can start looking at some of the details and see how they are put together. But before we do that, just say that Graphisoft provides a standard profile out of the box for ArchiCAD. If you look at it, at least in the U.S. and I think in international versions, they provide alternate ones for different purposes. For example, we are very familiar with the menu structure for the standard profile. If I go to the Visualization profile, you will notice that it has some changes to the palettes. They leave the commands alone. [0:03:51]

At one point, they would actually change the entire command structure. These are the palette schemes here. Let's look at the visualization ones. So when I activate this, I say "Apply", it tells me that it's going to put all of these into effect, and if I did have any custom changes, they will be in this case retained as custom settings, because you can make tweaks to things and it will remember them as custom until you give them a name. Now I am going to say "Apply" and we'll see what happens. I say OK, you see that the window is reconfigured a little bit. [0:04:30]

When we are doing 'Visualization', it's saying that essentially we may not need the navigator. We just want to have more work space here. You will notice up at the top there is a new palette or toolbox of 3D commands. These are shortcuts to certain common 3D things. So this is an example of how Graphisoft set up at least a couple of differences. They closed the Navigator, and they put in this other toolbox with tools. If I go back to the Work Environment command and change it to the 'Layout" profile - if I apply it, you can't just click OK, you have to click Apply and confirm it, and then you can click OK. Now you will see that it has the toolbox or palette that is called 'Toolbox' which is set up different than the toolbox that goes vertically. [0:05:26]

So it's just a different layout for it. And the Navigator is over on the left side. They have some differences here for when you are working on layouts. Not a lot of differences, but you can see it has changed. Now I will go back to the Work Environment and change it back to the Standard Profile, Apply, and OK. And now we will be back to something more familiar. Now let's take a look at some of the details of what these things control. So if I go back in here, in the User Preference Schemes, there are some preferences that relate to the way that ArchiCAD works with you. [0:06:14]

I won't have time to go into every single command in detail, so I will just mention the ones that I use that I think are important and that you may want to change. This one is an interesting one. I never change it, but if you are a little bit slower, maybe you are an older architect, and just when you are going to put in some numbers or information into a dialog box you find that ArchiCAD jumps ahead of you and all of the sudden it changes what you are doing because it thinks that you are done because you are pausing for a second, you may want to increase the number of seconds here. [0:06:52]

Then it will wait a little longer. If you type in "1" in the U.S., and you wait a little bit, it will change it to 1'0". Maybe you were going to say "1 1/2"" or something like that and it didn't give you enough time. So



you could change this if you find that it's coming up more quickly. Now this option here of "Hide Lock Layers and Popup Palettes" I actually recommend and set it up in MasterTemplate to take advantage of it. This is worth spending a couple of minutes to explain. This is one of the few that I am actually going to out from the Work Environment and demonstrate. [0:07:31]

Now when we don't have "Lock Layers and Popup" palette hidden, then if I go to let's say the Beam tool and I go here and say, "What layer do I want to put it on?" Well, obviously all the layers are turned on right now except for the 'Demo' layer. So I could be on any one. Or if I go to the Object tool, it could be any one of these. We are right now in a view probably based on the Drafting View Map or the Drafting View which means everything is turned on. The rough equivalent in MasterTemplate would be the Preliminary Design View when most of the layers are visible. [0:08:09]

Now if I go to "CD Floor Plans" and double click on it, we don't see any change here. But now you see some of the layers are hidden because on the Construction Document Floor Plan, we don't want to put things on the Furniture layer or rather we don't want to show movable furniture. We don't want to show things that are not for printing or plotting, things like that. So if I go to the Object tool and say, "Which layer am I going to put it on?" I am seeing all of these layers show up. It gets a little bit confusing and there is a long list. It's a little bit hard to manage. [0:08:45]

One option that I recommend has some drawbacks, but overall, I think it's a good idea is to lock layers that are hidden. So the ones that are turned off with the eyeball, I am going to go and sort by this. I click on the top of the column that is for visibility, the eyeball, and you can see it now sorts it. Now I can go and select all of these below here that are hidden and lock them. Now this is just a temporary thing, but I can also update the currently highlighted layer combination. Now if I go back to Drafting, all of these are visible and unlocked. But if I go back to floor plan, we can see how it remembers that. [0:09:33]

So now that I have done that here, if I go to the Object tool, you will see that it's showing the ones that are available. And the ones that are hidden it actually skips over. So that is not too bad, but it's still a long list. That preference that I just was showing you under the Work Environment for dialog boxes and palettes of locking the layers in the popup palettes, if I turn that on, now this list is much shorter. What is the advantage here? I am in the floor plan, and I don't want to use the Furniture layer. Well the furniture layer isn't even showing. [0:10:09]

I don't want to put things on the site layer, because the floor plan doesn't show site information, at least typically. If I go to something - do we have - I guess we don't have a reflected ceiling plan view in the view map set up, but let's just go create a new view and say I'd like to have a view for the reflected ceiling plan. We will call this "RCP" for Reflected Ceiling Plan". And I will also change the Model View Options. So I am changing the layers and Model View Options and giving it a name. [0:10:45]



Now if I have that active, you can see the list is longer here again because I haven't locked it. Let me go and fix that at least for the reflected ceiling plan. I will say that on this plan, all of these layers should be inaccessible; we shouldn't accidentally put things on a layer that is going to be turned off if we were working on the ceiling plan. I say "Update". And now, if I am in the ceiling plan, it will be a short list and will make it easy for me to pick the right layer for objects or lines or dimensions or other things. And this list here includes things like ceiling and roof, whereas if I go to the one for the floor plan, this does not have the ceiling. It does have roof I guess, because roofs could be shown on a floor plan. But basically, it has a different set of layers. [0:11:43]

So that is that particular preference under the Work Environment, Dialog Boxes and Palettes, Hide Locked Layers and Popup Palettes. So the one drawback is that if you have things disorganized and you set this up, then you may have elements on the wrong layers and it becomes harder to move them around from layer to layer because the layers that are locked can't be accessed. So if you are in the process of re-organizing layers or elements on layers, cleaning up a project, then you may want to unlock all layers, but of course have some of them hidden. [0:12:23]

So perhaps you have something showing on the ceiling plan and it shouldn't be showing, it should be showing on something else, and you realize it's on the wrong layer, the ceiling layer, and it should be on the electrical layer or something, then you would be able to select elements that are like that that are out of place and switch them to one of the layers that are hidden, but they won't be locked. So that's the one drawback, but I think it's an interesting thing to try out. [0:12:48]

Now these are some things here in terms of dialog boxes and panels that have to do with screen space. If you have a large screen, this may not be an issue. If you have a small screen, you may want to choose whether the dialog box should automatically move up if it can't accommodate more panels and close panels if it can't accommodate more panels. So let's just see that that does. If I open up the Wall tool, you can see there are all of these panels here. When I open up one here at the bottom, you will see how it opened this one but closed one of the other ones. [0:13:20]

Now if I don't have that set, say this one here or both of these - they have slightly different effects. But if I now open one of these, well it's still actually doing pretty much the same thing. What happened there? I thought that would affect how this is. That's interesting. It's not following that. So I am not quite sure if these have an effect. Here is an interesting one for the Pet Palette, which is that you can have it follow the cursor or jump to the preferred position. In older ArchiCAD versions, it would always follow the cursor, and in fact it was called the "Pet Palette" because it would follow along like it was on a bit of a leash. [0:14:14]

So right now, if I draw some walls and select them and go to the corner here, the Pet Palette sits there and will jump to a preferred position. If I move down to here, then after I do any work you see it will jump to that position. It will go to whatever position was the last one you moved it to. On the other



hand, if we go in here and say "follow the cursor", then there are some options for how close it will follow along. And this is how it used to be in earlier ArchiCAD versions. So as I move this around, you can see how it follows almost like it's on a leash. [0:14:55]

The idea was to keep it nearby so you could grab it. You wouldn't have to go elsewhere onscreen. But a lot of people found that annoying, so they put in the other preference and made it the default. But still, sometimes that may be very useful. Particularly if you have a large screen, you may find that jumping the Pet Palette off to the side is a nuisance. So you may want to play around with that. [0:15:22]

The Position of Text Formatting Palette, all of these are quick little things that we can take a look at - I'm not sure how time will work out with going through every single one of these here. These ones do require some demonstration to understand what they are about. If I go to the Text tool and I say I want to do some paragraph text and type, you can see how this Text palette is sitting right above here. I can go in and potentially change the formatting of bold heading, main text. So if I go in here and highlight this, this is available for me to work with and change. [0:16:14]

Now if I prefer, I could go and have this jump to a preferred position. Then as I do this text, you can see it's just going to sit somewhere, and I can be putting in some text, and it's up here. So these are trivial things. It's your preference, and you can play around with them. I say trivial, because it really doesn't affect your work, except for whether you find ArchiCAD a joy to work with or annoying. And you may find by making little tweaks like this, it becomes just more the way you prefer it. [0:16:56]

Now this one is interesting: 'Keep ArchiCAD palettes visible, even when another application is in front'. Right now, this is turned off. If I go and click in my email, you see how all of a sudden onscreen, the palettes disappear. And when I go back to ArchiCAD, they come in. for screen recording of things, I have found that it's actually better to have this turned on, because now I can click on something like email, and look how my menus changed. It became gray here on the Mac. This means that this is not the front most application here, but the palettes still stayed the same, so I could actually refer to notes and things and not have the palettes disappear. [0:17:39]

So that is what that's about there. "Show User Photos and Lists", I haven't even looked at what this is. I am guessing that this has to do with Teamwork and you might have photos of your team members, I am not sure. Let's go briefly through here. "Selection and Element Information" relates to the color of the elements that you see onscreen. So if you have ever said, "Oh, that's a garish color," or "That's not clear enough, it doesn't highlight it," or it isn't easy to see, you can play around with this. Now I think that the delay here is something that you might want to change if you find it comes up too quickly or too slowly. This may be something that you would want to adjust. [0:18:35]

And we will look at the transparency and the shaded open GL view to see what that does. So these are two things I will demonstrate here. If I hover over this, it took about half a second to come up. Now if



you are just moving around and you don't want that, and it's just continually coming up in that half second, it may be too short for you. You may want to lengthen it. On the other hand, if you are really fast-moving, you may want to shorten it a little bit. [0:19:08]

Now the transparency - let's put in a window and a cabinet in here and take a 3D view - so you can see that we are seeing through the window with transparency. If we go to the Work Environment here, the "Transparency and Shaded Open GL View", this is a shaded Open GL view. If I make it more opaque, I am not seeing a whole lot of difference there. That's what I assumed that was about. So I am not quite sure what that relates to. We will move on. [0:19:58]

So generally, you can play around with these things and set them perhaps to make your preferences here. "Short Info" would mean that when I hover over this, it just says it's a wall here. Whereas if I have that set for "Normal Length Info", then when I hover over it, you can see there's more information. It's your preference. Now as we go through this, and I keep going through it, we will go a little bit quicker because I can't possibly go through every little preference here. I want to show you the most important ones and talk about how the schemes are set up and how you can record these, once you have tweaked them, for later use on another machine or if you reinstall or migrate ArchiCAD. [0:20:56]

I think that the Tracker Value here is interesting. "On Demand" is the default and what I normally use, but always is an interesting one to do. So if I leave it alone and go here, as I click, you can see how the tracker comes up and when I am not actually editing or drawing, it's not there. But if I go to "Show it always", then you can see it's giving me feedback wherever I am. This sometimes may be good. You may want to turn that on temporarily to do it. Now what is it measuring from? When I start, normally this is moving the Edit Origin to the last point that I clicked. So I can see how far I've moved. But before I do it, where is it measuring from? [0:21:52]

It's measuring from the User Origin. Now the User Origin is the Project Origin, or if you click on this User Origin button and place it somewhere, now we are getting feedback based on this even though I haven't started to draw. So you can use this as a quick way of measuring things. You can just hover over a point and see distances and offsets from whatever point you have there. So that may be a useful thing for you. Of course, you can always use the Measure tool, but with the Measure tool you have to turn it on and off. And when you are doing this, if I keep clicking, it's going to keep on calculating. It's not going to start drawing. [0:22:33]

When Measure if off, I can get this feedback and then perhaps start to draw by clicking. So that may be a shortcut that you prefer to use. Now this moving the measurement origin around, of course you can go up to the X but you can also use the keyboard shortcut. On Mac it's holding down Shift and Option and then going to any point that ArchiCAD recognizes as a corner or node. You can see how the X just appears there. And now it's measuring. On Windows it would be Shift+Alt. [0:23:12]



So you hold down those keys. You don't click, you just hover over a corner point and that will move the origin there as a shortcut. So we will go here and I will put this back to the default here. If you are doing some complex things in terms of elevation of elements, you can make the tracker show Z value. Normally you just see it in the Info box, but sometimes you may want to show the Z. I believe that shows in 3D anyway, but on plan it normally wouldn't do it. If you find that it's too small a font, you can uncheck that, and now you can see this is a bit bigger of a font. So that might be a convenience for those of us with eyes that are not quite as sharp as they used to be. [0:24:00]

Various things can be turned on and off and experimented with. Now I have spent some time in the section on coordinate input in the course for explaining some of these options here for how coordinates are measured, so I am not going to demonstrate that. I think that is probably around week 14, somewhere in there, that these would be discussed. These are all things that you can customize to your needs and possibly change on the fly while you are working. Sometimes you may want to change it for a particular period of time. [0:24:46]

"Mouse Constraints and Methods", this basically is what ArchiCAD pays attention to when you use the Shift key. For those of you who maybe got started in ArchiCAD in recent years and are using the guidelines to snap, you may not know there is there is the Shift key method. I will demonstrate that briefly and show how these turn on and off. So if I go and make this a single wall here, this is a guideline, and I can snap to that. But if I want to line something up with this one here, I could drag down and create a guideline and snap to this. So that would be a way to do it. But another way that we can do something similar is to hold down the Shift key which locks the angle to whatever I am on. [0:25:44]

Then I can go snap directly. So that's a little bit quicker. If you are not used to using that, basically you go on some angle that ArchiCAD recognizes, press the Shift key, and it will lock to that and allow you to snap in relationship to it. I do also go through some of this in that coordinates section 14. Now the Shift key will look at the main axes, and if you do have a rotated grid, the axes that are on that rotation. And you can choose whether to have angles. So this one doesn't actually - the 45 - we could say that we wanted to do some other angle here, like 30. But we don't have a guideline. We can use the Shift key and you can see how it snaps to 30. [0:26:37]

So I can type in any value that I want and perhaps part of our building is on that odd angle, whatever that is. And the Shift key will allow us to lock to that. That is another way of doing it if you don't want to use the rotating the grid there. So again, these I have discussed many of these things in the section for coordinates. Here you can see it's going to snap to the instant guideline. Those are those dashed orange lines that you see. And the lasting guidelines as well, which are the ones that you either stroked over in ArchiCAD 14 and earlier or you click on the orange ball to make them stay and they become a more solid guideline for the duration of your exercise. [0:27:27]



The "Cursor Snap Range" used to be something critical; now I don't ever play with it. And in fact, I am not quite sure how effective it is. But if I were to try to demonstrate it, it's how close you need to get before it sees a checkmark. So let me do something odd. I will make it 20px. Well, it looks like the maximum is 9px. I am pretty far off that wall, but it snapped to it. So I don't have to be very close to it, just close enough to get the checkmark. You can see how it jumps. Normally that would be a smaller value like 5. This point is not close enough; I would have to get quite close. That looks not as surprising that it's jumping. [0:28:17]

Now when would you possibly want to adjust that? Well you can see there is a snap point here and here. It's easy enough to jump between them now, but if I zoomed out a little bit, it's hard to tell which one is which. It's hard to define it. So we may want to go sometimes to say make this smaller like 2px or something like that. Now it will only snap when I am right on top of that point. So I have to get right on top of that. If you have found that it's hard to snap to the right thing, zooming in helps, but this is something that you may want to change. And remember this is a setting that you set once and it will stay until you change it. It means that if you like it, you can just make one change and for the next few days, weeks, or months, ArchiCAD will follow that preference. [0:29:12]

I never switch this here, the line drawing things, but if some people prefer to press and hold and let go to draw a wall or a line, you can do that. In the classic style, normally it's click and release, move your mouse over, and then click again. Now the "Use the wheel for pan and Alt+Wheel for zoom" or the reverse. So this is something that I am used to. I don't know why you would switch it, but I suppose technically you could. This is interesting in terms of what it's panning to. With "Wheel for zoom," f I roll this in and out, that's the wheel. If I hold down the Option key, you can see now it's moving it up or down, so I can actually pan by rolling the mouse. [0:30:06]

And on a mouse like I have, where I have the magic mouse on the Mac, I can go left or right using that option by holding down the Option key. So that is something that I often forget, and maybe I would guess a lot of people aren't aware that holding down the Alt or Option key will give you another type of navigation. In 3D, I actually use this all the time. If I press down the mouse wheel, I can pan. If I use the Shift key and the mouse wheel, it will orbit. And I can just let go and I am back in editing mode. [0:30:47]

I haven't experimented with the Shift and mouse wheel - no, it doesn't affect it in 3D. So that preference only affects the plan. We are going to go down here - we've gone through this, guidelines. So you could say that you wanted to have more guidelines. You want to snap to every 30° or 15°, it could get a bit annoying, but in some cases that may be useful for certain types of drawings. So if we were to make it every 15°, we will see a guideline here, and another and another. So the guidelines are the dashed lines. The mouse constraints are handled by the Shift key. And the Shift key does look for guidelines, but the guidelines have their own separate settings for how frequently they come up. [0:31:50]



You can also have something relative to a rotated grid here. And you can choose how the colors work. Here is a note: "Using the 'Force Guide Line Display' command (shortcut: "Q") will: okay, this is a little tip, and I forgot this was around. So if you type in the letter "Q" - not Command+Q or Ctrl+Q which would quit ArchiCAD, but just the letter Q - you can instantly display multi-choice Guide Lines at point statuses without needing the mouse button. Create or activate a Guide Line without needing to click the handle. And with the cursor over a handle, grab the handle and drag to offset a Guide Line without needing to click the handle. [0:32:35]

That is interesting. So that's really a nice tip. I had totally forgotten about that. So if I wanted to line something up with this point, I can hover over it and press Q and then you can see how it's proposing different Guide Lines here. And I can click on that Guide Line and now it will give me that to snap to. So the letter Q will bring up some options there. You might want to play around with some of those options. Now I see a question from Ken Brooks about fonts. So let's look at that later. But one that is relative to this immediate topic is "Magic Mouse sucks for CAD. I am going to have to get a regular mouse." [0:33:21]

Actually, I found that I got used to the Magic Mouse and now I won't go back. I prefer it. Now for those of you who aren't Mac users, Magic Mouse is a mouse that Apple sells. It's a wireless mouse, which is cool. There are wireless mice for Windows, but it has just a smooth surface with no buttons visible on it and no wheel. However, if I press on what would be the left mouse button area, it will pick that up. As long as we have set up in our system preferences for the mouse that we want to have a secondary click available, then it will also pay attention to that. In other words, so we can get left and right or the context menu. [0:34:12]

Now the mouse wheel here also will work by rolling it. I don't think they show - oh, here is the scroll direction. You can see how it's moving in and out. So you can zoom in and out that way. The one thing that is missing from Apple's built in tools is the ability to press the center button, which is used for panning. So if you don't have this free add-on called "Magic Prefs" here, then you can't do the panning. But by downloading "Magic Prefs", which is a free tool, you can set up one simple preference. I have one thing that I have added, and that is that if I press down in the middle part of the mouse, anywhere in that area, it will interpret it as a middle click. So that is how I am able to use this just like any other mouse. And it's very comfortable and ergonomic. But this is the one little thing that it's missing when it comes out of the box from Apple. [0:35:20]

So hopefully that helps Ken as well as anybody else here. Now there is a comment from Rick, "It eats batteries." I use rechargeable batteries. It takes 2 AA batteries. I have a set of four, and I have two in the charger and two in the mouse. When the mouse is running low or runs out, I just swap them and that works nicely.



"Magic Mouse seems to be always jumpy to zoom in with the tiniest finger movements." There are probably some sensitivity things that you can do. I have not had a problem with that. Alright, so that's a little side diversion, but definitely relates to this preference here for the mouse constraints, methods and the wheel. And we are looking at Guide Lines as well. Okay, moving on down through the Work Environment. I guess we are making some good progress here, but there are a lot of little things that you can control, and I haven't gotten to the whole idea of Schemes yet. [0:36:30]

So we will go through these relatively quickly. When you are going to 3D, and the window comes up, the question is, "What is going to happen?" Is it going to bring up this last view of the 3D window or is it going to rebuild from the model? That usually happens. So let's just see what this button does here. If I go to 3D now, you can see there's an extra wall. And if that wall stretches and I go back to 3D, you can see how it stretched. Now if I go to the preferences for imaging, and I say, "Don't rebuild it", then if I go to the floor plan and take this and delete it, and go to 3D, you can see it's still there. [0:37:22]

Now why would you ever want to do that? Why would you ever want to say, "Don't rebuild it yet." Well, sometimes you have a really complex model. And going to 3D takes a little bit of time. You may want to, for some special types of projects or use, say that you want to go to 3D and see what was last in the model and not have it update until I do "Rebuild". And if I zoom in or out, it still is keeping that there. So it's not rebuilding by zooming, I have to go to the Rebuild command, which does have a keyboard shortcut. [0:37:58]

So Command+Option+R, and there would be some equivalent on Windows. And you can see how it's updated. So I have never needed it, given my work where I am essentially just teaching people how to use ArchiCAD. I don't deal with super-large projects. But I can see that this might be useful in a complex project where if every time you go to 3D, it takes 5 or 20 seconds to come up. "3D Settings change brings 3D window to the front." Basically, if you change some of the settings such as shadows or without shadows or some other settings like moving the sun around, if this is checked, making any change will bring the 3D window to the front. [0:38:44]

The idea is that you have changed the setting for 3D; probably you would want to look at the result. When it's unchecked, it means it just remembers it and the next time you go to 3D, it will bring it up. That is what the default is right now - unless you tell it to go to 3D, it won't go to 3D automatically. Now this one is very useful and important to understand. "Keep zoomed detail on rebuild." So what does that mean? If I am zoomed in on here, and I go and drag a copy of the window over here and go back to 3D - I have to remember I turned off that rebuild. Let's go to - you have to be careful here. Let's auto-rebuild this. [0:39:36]

Now we can see as soon as I zoom in or out it does the rebuild. But let's say if I have this in an axo view - and let's take this to an axonometric view - and I zoom in and make a change here and then go back to 3D, I am still looking in this zoomed in view. Generally this works nicely, but the old preference was if



you were in an axo viewand switch to an axo view it would zoom out to show the whole thing. If I say, "Don't keep that there," then, when I go to 3D - actually, let's see. If I go and move things so it's going to have to rebuild, let's see. I am going to 3D. [0:40:47]

So here it's rebuilt the model and it jumped out to show the whole thing. That was something that Graphisoft had as a preference before. I think it's probably less useful, because you can always Fit in Window to do that and I would rather just go back and forth between the plan and 3D and have it stay zoomed in on whatever I am looking at here. And the same thing with the section window. If you were to make a change in the plan or another view that affects what you see in the section, when you bring up the section or an elevation and you happen to be zoomed in, should it stay zoomed in or not? So it's the same thing. [0:41:32]

If you are looking at a particular area and you have made a change, it will stay where you were looking. Otherwise, it will jump out. So both of these are similar concepts. One is in the elevation and the other in 3D. And again, these were things that were added into ArchiCAD at a certain point because people complained that it was always jumping out to show me the whole thing, I don't like that. I would never turn them off, but you might consider that. [0:42:01]

Now here is something interesting. We have "Show progress window" and "Interrupt with error messages" and "Write report". So if you ever noticed that if I go to 3D, up in the corner - well this is so quick here that it didn't - you have seen progress things saying it's calculating or loading something, so there's usually a progress window up in the corner. You can turn that off and on if you don't want to show it. You can hide that. I don't mind it, but perhaps you are meeting with a client and you just want to not have distraction, you could turn that off. [0:42:45]

Now "Interrupt with error messages," if you have some errors in the model - for example, some library parts are missing or some other errors that come up when you go to 3D - in general, it's good to deal with them or fix them. But sometimes you are opening up an old project or something has gone wrong and you just want to keep working. And every time you go to 3D it brings up one or several or many error messages saying something has gone wrong. If that gets in your way and you don't have time or don't want to focus on cleaning it up, you can turn off "Interrupt with error messages" and then it won't keep giving you errors, expecting you to click OK for each one of them. So you can turn that off. [0:43:32]

"Write Report" is something that keeps track of what happens when you go to 3D. If you don't have an error it won't come up, but if you do have any type of error, it will bring it up. Now what does a report have? If I go to 3D, and then bring up under the Window menu the Palettes - where is it? They've moved this. Maybe it's under File, Info, Session Report. So they moved it. It used to be under the Window menu. If I bring this up, you can see that it's showing some information about the model. Right now it just has four walls and two objects and things like that. [0:44:29]



And it tells me how long things have taken to generate a perspective or other types of news. And it keeps track of every time it goes to 3D. Generally that's when it's going to write something in the report. Now, if you have errors, that's very useful because you can study the report to see what were the issues that came up. And alternatively, if you have a complex model and you want to get more detail on why it's taking so long to generate, you may want to get a larger report here. And we say OK. [0:45:08]

Now if we go to 3D, if I go back and forth to 3D or rotate around here, now let's go to that session report and we should see - I am not sure if we are seeing more information here or not. But I would think if you asked for it, it would give you some more things in terms of the errors. So the main time that I play around with that is when I want more information here. And sometimes I want to look at the error messages or hide all of these things and make it as clean as possible. So these things depend upon what you need. [0:46:02]

Elements to be calculated; Show Alert; List all. I am not quite sure what this has to do with it. I think when you are doing certain types of calculations, if nothing is going to be seen it may show you an alert saying that it can't show you the report or calculate it because there are no elements that need that filter. I am not quite sure, so we will leave that alone. [0:46:30]

Moving on through some of the other preferences here, there are locations for some of the files that are created by ArchiCAD. And you can look at the log of Publisher. So what is Publisher? Publisher is the section in the Navigator on the far right that allows you to print, plot, save translated files like DWG or PDF in bulk. So you can take multiple sheets or multiple views and export them or print them and essentially publish them. And there is a log file that is keeping track, and you put it wherever it's convenient. [0:47:08]

I never look at it, but if you were wondering if something happened properly, you may want to double check the log file. There are some things in terms of Project Reviewer which is the section related to sharing your project for markup or review purposes. I guess you can customize the name. This is your name or your company name rather than the project. Remember, this is the Work Environment and it affects multiple projects. [0:47:43]

Okay, there are more options here. A lot of miscellaneous things. Let me see if I can quickly go through them. "Update auto rebuild model viewpoints continuously". If you have a small or medium project this is probably good to leave on. It means that when I move a window over in a 3D view or section it will automatically readjust the view. It will fix the view. But there are times with large projects where getting a nice, clean, updated view takes time. If you turn that off then you can do some editing and moving things around without it taking the time to figure out what's in front, what's hiding things, what you have just changed. [0:48:35]



It will be a little bit more funky onscreen, but it will be an instant response. Otherwise you may find that in a large project that some editing operations, particularly in a section or in 3D, take a while. So if you turn it off then you can control when you update it. This one is one that I have always been annoyed that it's creating a boundary in the Detail Worksheet window. This is where you control it. Let's just see where that is. So if I were to create a detail, let's say we were to call out a detail here. We open this detail up; you will notice that it has this boundary poly line. [0:49:19]

I could delete it, but let's just see. I will go back to the floor plan and we turn off that preference to have a boundary. And now if I do another detail here, it has no boundary around it. So if you have never used a boundary, if you don't like the boundary to be drawn, then just turn that preference off. It will save you the step of deleting that poly line that it creates. [0:49:55]

"Save navigator preview data with project files". I don't actually look at the preview data, but that's because of my workflow which is more explaining things to people and doing little pieces of projects. But if I go to an elevation here, not that there's anything to see at this point, but if I bring up the Project Preview, here is a preview of this elevation. And we could potentially drag that preview in here. Now if I go to the north elevation, that's a little different. Let me pop in a window. So now if I go back to that north elevation, is it going to have that preview with more detail? [0:50:53]

So this preview, I don't frequently use. But if the building has a very distinct shape, which elevation would you want to look at? If I go now to that elevation, I will choose "Redraw Preview" here. There you can see the preview is there. So this information, which can get rather detailed, is useful when you highlight these things. So if I have a bunch of sections or detail drawings, the preview can help me to see more than just a name. So I can say, "Oh, that's the one that I want." And then you can open that up. So that preview data is useful for picking which one to open. [0:51:48]

Of course, you can also use this to zoom in or out or reposition your view. This is something that not everybody realizes is a very convenient thing in a complex project to do that. In fact, on the floor plan here we can zoom in on an area just by dragging this around here. So that is the Navigator Preview. It's opened or closed just by this little button here, the second from the left. Click it and it goes away; click it and it comes back. Now this data could get very detailed. It doesn't have all the lines of the plan, but it does have the main ones. [0:52:25]

It is probably just the reference lines of the walls and the outlines of library parts and things like that. But that data can be stored within the project file here. That means that when you open the project file it will all be there for you to use. On the other hand, that will save you time when you are jumping around from detail to detail or section to section. So that's good, but it will add to your file size. My guess is it's probably worth doing if you are using this preview actively to turn that on. [0:53:08]



"Assign new element ID to each new element". You will notice it says "Window 01" because I dragged a copy of that. But let's go to the Window tool, and if I click that's "Window 04" and "Window 05", etc. so it takes whatever the ending is. So if I say that I want to put in "Window 12" and I go up here, that's going to be 12, 13, etc. So that's a nice thing, although generally you are going to want to assign the element IDs later to suit your needs, either grouping them based on similar elements and have all the windows that are the same type and size have the same number or number them going around the building clockwise or counterclockwise or some other rationale. [0:54:12]

So this is a convenience and is nice, but since you are generally going to put things in not in the order that they are going to be notated at the end, it's a little less critical. "ArchiCAD sounds". If you started using ArchiCAD back in the 90s, you may recall that doing certain operations would have a little choochoo train sound or other sounds that you can turn on for nostalgia's sake. I think I have almost forgotten that they existed, but they were sort of cute. If you were in Teamwork, normally when you are sharing a file, people can send you a message saying, "Hey, I'd like to work on this area that you seem to have reserved." Or, "Hey, I'm going out to lunch." [0:55:01]

If you don't want to be disturbed on your screen, you can turn that off and they will accumulate in a list. "Do not launch an instance of ArchiCAD when placing a view onto a layout". So what does that mean? When we are placing a view from another project onto a layout, ArchiCAD will automatically open the other file in the background and place it on there. Now when would you do that? Say you are having a site plan and you have three buildings on it and you are going to be putting views of the buildings or some other data from the individual files, so you are linking in the project files. [0:55:56]

When you hotlink in those project files, it brings in the 3D model. But if you want to bring in actual drawings from those external files, you can use the Organizer part of the Navigator to bring in layout sheets or views from another project into your current project. If you do that, you can choose whether it's going to open up a new instance of ArchiCAD to do it or not. Frankly, I haven't played around with this for a while, but this may be useful for optimizing the response time for doing that. [0:56:30]

This is an interesting one. When you are placing model views onto layouts, "Adjust each drawing frame to show only zoomed area of model view." So when this is checked, I will go and say I'd like to create a new custom view here, and I call it "Custom View of First Floor". It has the zooming that says that it's the current zoom rather than everything that is in the window. Then if I create this and go to place this here and drag that new view in here, you can see the view was cropped automatically to the window that I was in. [0:57:25]

It's generally useful if you are creating a new view and you do want it to be cropped. It will give you a preliminary crop, because we might want to go back to this and tweak it. Maybe you want a little more information up to there because you want to get the bubble in there or whatever it is. You can tweak it, and at least it gets you in the ballpark. If we turn that preference off here, and then we go to save - if I



delete this view and drag it in again, you see it brought in the entire view here, it didn't have the crop. Generally that's pretty useful, but occasionally that may be something you don't want to have turned off. [0:58:21]

"When opening view or layout from a menu or by double clicking in the Navigator, do you want to open it in an existing window or in a new window?" So here is what that means. If I go to the east elevation, I am in a window that says "East Elevation". If I go to north elevation, notice that the east elevation window is no longer there. It's just whatever was the last elevation that I chose. So basically, we have a floor plan 3D, we have one elevation, one detail, and one layout. On the other hand, if we change the preferences to open in a new window it doesn't affect the floor plan. You can't have the first floor and third floor in two separate windows unfortunately; it would be nice. But now if I go and open the east elevation, you will see that both east and north are available. [0:59:20]

Why would you want to do that? If you particularly want to look at the model from different positions, then you may want to resize these and put them side by side. By the way, I am adjusting the position or the size of the windows here on my Mac. This is the same way you would do it on Windows. You would basically grab it from any corner or edge. If you are on an older version of the Mac OS of ArchiCAD, it may be ArchiCAD 10, 12 or 14, and you are on the Mac, you have to go to the bottom right to resize it. In recent versions, you can resize it from any side, which is much more sensible. It's one of those things that I thought Windows had it right and Mac refused to do it until a couple of years ago. [1:00:18]

Okay, but this is where we can see multiple views in different elevations. If you have the project preference here to open in an existing window, then it will have fewer windows. It means that your window menu is less cluttered when you use existing windows, but this one will give you more options. I have seen sometimes people send me a file and this window list is long. It has 10-20 different windows all remembered. And one issue with having many of these is it's hard to find which one you were last looking at, because maybe you have six sections listed and which one is it that I am trying to find, as opposed to just the last section that I was working on is the only one that is there. [1:01:13]

The other thing is that if you save a file and reopen it later, it will open up every single one of these views, which means sometimes that it will take a while to open the file before you can do anything. If you have it simple with only a few views it will come up more quickly. That can be an issue particularly if you have a lot of sections and elevations that take time to generate. It will generate all of those including the 3D window views before it lets you do any work. So this is a way to keep it simpler here. That is what I generally prefer, but I'm not working in production. Having the ability to put elevations and sections next to each other - you can do things with virtual trace that will give you some views next to each other, but to have multiple windows and look at these, this is the only way to do it. [1:02:17]

Now a little shortcut here, not related to our preferences but under the Window menu - let me go back to the floor plan here - there is an option to close all background windows. So what does this do? It will



close every other window other than the floor plan. So I do that and you can see it's now just the floor plan. So that is a quick way of closing those windows to make this list shorter. And you can go and bring up the 3D view and now it has the 3D window. Let me bring up one elevation, and now you can see that's in the list. So it's like starting fresh by closing that. [1:02:58]

Sometimes I will do that just as a routine thing when I am going to save the project and close it, because I know that the next time I open it I don't want it to open all of those windows that I was last working on. I want to start fresh. So that is a useful thing to know about.

So I see a question from Robert Stensland related to surfaces. That is a rather different question. I know Robert if you look at the section of my training that covers Element Attributes, Surfaces, you will see some information there. But it sounds like you are probably already familiar with the basic tools of matching with the internal engine. And I don't quite know why you have that setting where the material appears to be mirrored, but there is a setting in Lightworks where you can mirror it on different axes. [1:04:01]

You may want to check some of the detail settings in Lightworks. Now I think probably most of you know that ArchiCAD 18 is about to shift next month and it will have a totally different rendering engine, so the Lightworks things that we have been working with will be obsolete because we are going to have a new rendering engine. Frankly, I don't know if they are going to keep Lightworks as an alternate or if they will remove it. So we will have to see. [1:04:28]

Ken Brooks had a question about fonts. Just a quick answer to that. It says, "How does one add a new font type like 'Avant Garde' in ArchiCAD?"

Basically, if it's in your system, if you see it in MS Word or a word processor, it should show up in ArchiCAD. It basically uses the system fonts. Generally to install a new font in your system, you can Google it and find out online, but there's generally a fonts folder or directory, and you can find that and drag the font file into it. Or in some cases, you can right click in the font folder and there will be an option that says,

"Add a font". Then you can browse for the font file. Basically ArchiCAD will use whatever fonts are within your current environment. [1:05:24]

We have been going through this a while, and I realize there is a lot here. We've gone through about half of this list. I can't say it gets quicker, there are going to be a lot of things to cover as we move forward. So we've been going over an hour. What I am going to do is finish out this top section of user schemes and show you a little bit about how you can save a scheme and import and export it. Then in our next session next week, we will go on through the rest of these here and hopefully cover the rest of that. [1:06:01]



"Advanced Redraw Options" - "More options" here. "Launch new instance of ArchiCAD when opening a project from the recent list or by dragging onto a running ArchiCAD." Okay, this is something that has changed in recent years in terms of ArchiCAD's capabilities. I think it is important to understand. On the Mac, for years it was difficult to set up ArchiCAD to open up more than one project file. If you said you want to open another file and keep this one open, it didn't allow you to do that. The only workaround in old versions of ArchiCAD - and I'm not sure when this changed, maybe it was version 10 - was to actually duplicate the application and have two copies of ArchiCAD installed and literally open a different one. [1:06:54]

Just like opening Photoshop and Illustrator and Dreamweaver, there were three different applications open. In Windows, on the other hand, if you just double clicked on an ArchiCAD file, it would open up a new instance of ArchiCAD. So for years we had that difference. In Windows, you could have two or three sessions without a problem. Now if we say "Open" a file or "New" file, there is an option that says, "Launch a new instance of ArchiCAD?" so then you can have a second, third, or possibly more. That means that you can compare files, copy and paste things from one to another. You can have one file open and be working on it, and a phone call comes in from a client and you can open their project keeping the original one open, etc. [01:07:44]

That is all available through "Launch a new instance of ArchiCAD". This preference says, "When opening a project from the recent list" - so you know how under the File menu, there is "Open"; there will be a list of recent files down below. You want it to automatically open another session of ArchiCAD and keep this one open. Generally I haven't preferred to do that, because I would rather find the file and click the check box to launch a new instance, but I can see that could be very convenient. And the way you would work with it is if you wanted to switch files, you could close the file and then open the recent file. Whereas if you want to keep both open, then you just go to the recent one and it will open a new session of ArchiCAD. [1:08:43]

Dragging a file onto a running ArchiCAD - so in the dock here or in your folder where you have the ArchiCAD application, if you drag an ArchiCAD file onto it, should it essentially close the current one and reopen the new file or should it launch a new instance. So if you turn that on, it's probably a good idea, but occasionally I've seen people get confused saying, "I don't know. I've got all of these ACs open. I just opened another file, but I didn't realize the old one was still there." So if you are able to manage that, great. This may be a time-saver. [1:09:28]

So we have a few more things about performance before we finish up today's session. "Advanced Redraw Options". What is this? When we are looking on the floor plan and we pan or zoom around, are we seeing the entire model or simplified versions? Now as computers have gotten faster in particular with Open GL and display acceleration, this has become much less necessary. But if you had a really complex project with lots of line work and detail, you may find that moving around, panning or zooming, gets slow and sluggish and jerky. So you could force it to use less information. [1:10:16]

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So right now in this default, if I pan, as I slide this over, everything looks like it's sliding under glass. But if I change this to simplified model and pan, this one still looks the same. Actually, you can see that some things didn't come up until I let go. That may be part of that control. But let's look at the one that is "Structural contours only". When I am zooming in and out, it's showing less information here. I am trying to see. Yes, if you zoom in, you can see how this wall is showing less. And when I stop it fills that in. so that's the outline of the walls, but not the fill until I let go. [1:11:19]

So the main time you would use that is if you are finding that moving around onscreen is sluggish. "Antialiasing" is a term for smoothing. Generally you want to leave these on unless you have some problems with your monitor or your display card. I never play around with it. Basically, this controls how ArchiCAD smoothes things. In "redraw", it says, "Advanced level users". In most cases the default values are recommended. You can potentially turn on acceleration for your video card for some cases. And you can potentially change the amount of memory that is set for the redraw here. This is talking about advanced level. If you feel you are advanced, feel free to experiment. [1:12:19]

Mainly this will deal with really complex projects that are having some issues or you have some special hardware that you want to take advantage of. Okay, moving onto "Onscreen Options" here. We have some colors that you can choose. The colors, for example, of the master items on the layouts here. If I go to a layout sheet here, you can see that all of this is in red; that is the title block. This is where you can control that if you preferred to make the master items blue or gray or something like that. Then you can see that changes. [1:13:03]

So it's really your choice there. So we have various things that you can try. Now the "Ghost Bounding Boxes", that's one of the things that ArchiCAD - when they released this, I don't know when it was - they added the ability to preview what you are going to place before you place it. And they were very proud of it, but a lot of people complained that it was annoying. So they turned it off but gave you the option to turn it on and off. So what does that mean? If I go to the floor plan and then to the Object tool, right now I can't see what I am going to place. But when I click, I placed it. With this option turned on here, then as I move my cursor around you can see there's this thing following along. [1:13:58]

Frankly, it probably is more annoying than helpful, but you may find that it's useful. So feel free to turn that on or off there. "Display editing plane during editing operations only". So what does this have to do with the editing plane? It's the 3D surface that helps you to see where you are drawing. Now let's see what this means. If I go to 3D and start to draw a wall, you can see it's being placed right next to the building in the place that you would expect. But I can't really tell where I am doing it. And if you think about it, this point here could have actually been underneath the building rather than in front of it. [1:14:43]

It helps sometimes to turn on the editing plane display. And now you can see there's a little bit of a preview here that helps me to see where I am hovering over. This editing plane could get in the way.



There are different settings for that which we can look at, but right now the main preference we are talking about is is this going to go on and off only when we are editing. So now I say OK and it's gone. But when I click, I get that feedback. It even gets bigger or retracts to try to not cover up things. So it is an interesting option. I haven't played around much with it. [1:15:33]

"Automatic pen color visibility adjustment for model views" - if you were to put a different background color, like black, if you were saying that you prefer to work with a black background like AutoCAD, then I guess it will change the way that dark pens will automatically switch to a lighter version so that you can see them there. Mainly this would be useful if you are bringing something in from AutoCAD or if you just prefer working with a black background. [1:16:12]

We already did "Master items on layouts" and "Highlight inverted elements". I am not quite sure what this is, so I am not going to go into it. "Special snap point feedback graphics". So these are all colors, just play around with them if you like. "Marker elements onscreen only part solid and green". Okay, this is interesting. Right now, if I draw a section here, you can see that it's drawing the section line and a little guide for how far the section is looking. Perhaps I don't want to see the next building over if there is a next building. [1:16:55]

This is controlled by the View menu, Onscreen View Options, Marker Range. If I turn that off, you can see it disappears. Also notice that the call outs that I made for these detail drawings earlier, we are not seeing the square box, we are only seeing what is going to print. So these onscreen view marker ranges give us options so we can select and edit the bounding box or the extent of some of the markers. And what color are they? Right now they are a dull green color here. We could potentially go to this and change this here. We could also make it some sort of dotted line if we prefer. Now we can see just a tiny hairline dot here. [1:17:58]

If we zoom in, it's hard to see. If I go out a little bit, you can see that it's there as a dot. So maybe that wouldn't be a very effective one, but we might potentially want to switch it. Instead of it being solid, we can make it a hidden line, dashed effect. Now you can see it doesn't look like a solid line, it kind of shows that it's implied area. So that might be a good one to use if you wanted to tweak it. Teamwork, we are going to be looking at Teamwork in a separate section of the course. When you share a file, you are going to reserve certain elements to say that you are working on this particular part of the building. And you can highlight elements if you wish with colors to see maybe what elements are free for working on. [1:18:51]

Maybe you want to work on one of these three bathrooms, and maybe someone else is working on one of them. So you can see whether it's free or not without having to try and select it. So it gives you some visual feedback about that. Or if you are requesting things - if you say, "I sent in a request, but Joe hasn't responded," okay - so you can see what you haven't gotten yet. It's requested, but you haven't gotten it reserved. There is a section here for energy evaluation model. So what is what? That is Eco Designer,



which is supplied with ArchiCAD 16 and 17. It allows you to color code, in a 3D view, different sections of your model. [1:19:36]

So you can tweak that if you wish to see if you have designated the energy usage of things properly. What is external vs. internal, what is below grade vs. above grade, things like that. That affects your energy analysis dramatically, so they provide colors here. And I guess "Reset colors" would put it back to the defaults if you play around with it. So we are at an hour and 25 minutes here. And what I realize is we've just gone through this and I have mentioned the idea of a scheme. So I am going to show you a little bit just to finish up how you save out a scheme and how you bring it in, then I will start our next session looking at schemes again and then going onto the rest. [1:20:28]

So what is a scheme? It's a group of preferences. I have made a couple tweaks to this. You can see it says "Custom". So whatever changes I've made here, I could store this as a name. I could say "Eric's Prefs" here or "Eric's User Prefs". I can give it whatever name I want here, and it's now a list. If I go back to this I can apply it or I can go back to here and apply it. So I can switch back and forth. In an office, potentially you might want to make certain preferences available on other machines. Maybe you are the boss and you want to have your preferred preferences available when you go sit down at somebody's machine. [1:21:11]

Or you may want to transfer your preferences to a laptop. So how do you do that? You export them. When you click on the "Export", it will create a file in a location. You can browse and choose any location that you want. That will create a file here in that location, and later I can go and import that file. You can see it found it. If I import it, it will probably give me a duplicate. You can see it time stamped when it created it and when I imported it. These happen to be duplicates, so I will just delete this here. [1:21:53]

But that is how you would do it. You would export it and it would create either a file or a folder that has information about all of these items. Essentially it's a text file I believe with the ending ".xml". It has all of the preferences available for transport. So to bring it to your laptop or another machine - maybe you have an office and you want everybody to have the same preferences. You could export the preference for this section. If we go to the Work Environment Profile, you can see I can change the standard profile to use - let's see, this is all locked. [1:22:37]

If I create a new profile, I can change - for any particular profile - which one it's going to be. So again, this is an overall preference setting. It refers to individual schemes, which are either standard or ones that you set up. If you have made any changes and you haven't stored them, they will be called "Custom". So generally what we want to do is name the settings that we have so that we have them with a reference rather than using "Custom". [1:23:08]

But if we do have this profile, just say OK, it's in the list here. And I can export it again to a certain location and later import it. So this allows me to take the entire set of preferences over to another



machine; say, desktop to laptop or vice versa. Now the question sometimes comes up, "I have some preferences, and I am going from ArchiCAD 17 to 18 or ArchiCAD 12 to 17, can I bring in my preferences from the old ArchiCAD." It may be possible to do it. You may be able to import and old profile, but you have to be careful because for example, there are things about how the commands are set up here, like what commands are available. [1:23:58]

If you import the old scheme for the commands, it may not have some of the new commands. You may be missing some commands that have been added into the last version or several versions. I have gotten support questions asking, "Hey Eric, you say that you should change such and such, but I can't find that menu command. I can't see where you change it." So then we have to go and say, "Alright. You need to go and apply the standard commands, rather than your imported one that came from an earlier version of ArchiCAD." [1:24:34]

While you probably can import preferences from earlier versions, you have to be careful particularly in relationship to commands. That's where people get tripped up. But maybe in some of these other things as well. So let's see. We are at the hour and a half mark. I see a comment from Steve Nichol saying - this is from a while ago about Lightworks - "I didn't like Lightworks anyway." Okay, so let's see if there are any closing questions. As often is the case, there is so much to explain. I hope I hit the right balance between telling you the minutiae and telling you the important things. That's always a bit hard with this type of area. Let me know what you thought. I am grateful for your interest and your time and attention. Please add your comments and questions on the page down below this recorded video. This has been Eric Bobrow, thanks for watching.

[END OF AUDIO 1:25:44]