EMPOWERING THE BURN TO DESIGN: A Creative Journey from 2D to 3D

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Class Code: MA3502-P

Learn how to unlock your hidden ideas that burn inside. In this class, you will learn how Autodesk® SketchBook® Pro and Autodesk® Alias® Automotive can facilitate fast creative techniques, helping you create the punchy sketch and 3D visual to inspire, captivate, and stimulate your audience. Starting with 2D, the class will demonstrate the interface simplicity and natural workflow that is evident in SketchBook Pro. It will highlight the quality of the line weight and natural feel of the tools. Continuing to 3D, the class will touch on the translation of a sketch into Alias StudioTools and the use of quick visualization tools in Alias to output an image for retouching in SketchBook Pro. This case study will take attendees through the initial ideation phase of a design from rough sketch to a tighter presentable rendition. The workflow between SketchBook Pro and Alias will be highlighted.

Learning Objectives
At the end of this class, you will be able to:

- Understand creative ideation techniques
- Create impactful fast volume sketches
- Have a basic understanding of Autodesk Sketchbook Pro and Autodesk Alias Automotive
- Create an impactful 3D Visual

About the Speaker
Peter Blades originally from the UK, graduated Coventry University with a Masters of Design in Transportation design in 2001 and went on to complete his specialized training at the Royal College of Art in London gaining a Master of Arts in Vehicle Design. During his earlier years of training Peter gained experience at Jaguar Cars Ltd, Land Rover, Ford Motor Company and Ove Arup Design Research.

In late 2003 Peter arrived in the USA to begin his career in Automotive Design at GM Design and went on to work for KIA Motors America in California. Peter has an enthusiastic outlook that not only looks at the automotive field as the design outlet for his focus, but turns his attention and design skills to the limitless ideas that plague him. From product design to far reaching future vehicle design, he uses Sketchbook Pro and Alias software to bring his ideas to fruition.

Peter has contributed to the teaching programs at both the College of Creative Studies in Detroit and Cleveland Institute of Art in Ohio. Currently Peter is a visiting lecturer at Art Center College of Design in Pasadena California supplying his skills to the teaching of visual communication and drawing on to presentation style. The passion and enthusiasm that Peter brings is very evident when he shares in his philosophy of ‘how to think sideways’, the tools provided by Autodesk such as Sketchbook Pro and Alias enable this faster and with the most rewarding outcome.

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CONTENT:

- This handout will elaborate and highlight particular useful interface Tools with SketchBook Pro and Alias Automotive providing screen snapshots as useful ‘Look to’ instructions for after class reference.

- The topics of today’s class in the presentation will work in tandem with the handout so you can follow along, and after the class the handout will hopefully trigger your memory.

- Also interwoven into the handout, will be some of my philosophies if you will, which will elaborate on the creative journey I talk about. Philosophy alert when you see this image:

PRESENTATION OF 3 PARTS:

PART 1: 2D - HOW TO UNLOCK YOUR HIDDEN IDEAS

This will explore how I collect, select and compile imagery which begins my ideation technique.

I will then demonstrate using Sketchbook Pro, my fast and simple approach to create volume and design ideation sketches which read well and are attractive to look at.

At this time I will highlight the interface tools I use the most, and the wonderful simplicity of Sketchbook Pro, such as:

- Navigation, Color and Organization
- Pencil, Brush, Airbrush
- Color lock Mode
- Canvas Symmetry
- Ellipse and Ruler Tools
- Scaling and Moving
PART 2: 3D – SKETCHING WITH CURVES

This will explore how I have begun to use Alias Automotive as a creative design tool and not see it as a separate stage of my design process, but an integral part of realizing my ideas.

I will talk about my change in mindset towards Alias as a dominantly creative right brain thinker, highlighting how to sketch with curves, learning to treasure a design while also being happy to trash elements as you go along.

At this time I will highlight the basics of the interface, and show the tools I predominantly use to enable my sketch modeling, there will be snap shots of their icons and function attributes included in this section.

PART 3: 2D – CREATING AN IMPACTFUL 3D VISUAL

This section will explore the basics of how to set up a model in Alias Automotive within a simple environment with assigned surface shaders and default lighting.

This portion is to enable the exporting of an image from Alias Automotive which can be used to present as a finished proposal or even a work in progress design visual for presentation.
PART 1: 2D - HOW TO UNLOCK YOUR HIDDEN IDEAS

Creative Ideation Techniques:

Image collection and compilation is my first exercise when beginning a design project. Often starting a design is the hardest part. This makes beginning easier but certain questions should be asked of one’s self when selecting the images and inspiration:

- **What** do I like about an image?
- **Why** do I like the image?
- **Does** the image hold enough information?

The image or subject matter must fulfill certain specific criteria to fulfill you as the designer/creator; if it’s the wrong subject matter then problems arise later down the track (lose momentum and passion). The process can also be iterative and work in tandem with sketching which is why I have included this part of my process in this presentation.

Often I start sketching as I have an idea; in turn this makes me think of a subject or a material, a finish/texture or even a color. The important exercise is to build a library of imagery as you go about your design life, in doing so you begin a collection of imagery you can turn too. Often you work on many projects or programs at once and to be fast and effective I find this method inspiring for me and when presented it gives foundation and clarity to your design intent and a clear story for the client to believe in.

From this subject matter I develop Keywords which help define and clarify the message of my design idea.
Setting up Your Wacom:

This is key to making life easy – less reach to the keyboard means less strain on you.

Wacom tablet properties found in Window Control panel:

**NOTES:**
Now that we have set up the Wacom tablet lets open sketchbook Pro and take a look at the interface.

Autodesk Alias Automotive Suite comes with a version of Sketchbook Pro, this is what I use, however newer tools and additions are available in the latest version of Sketchbook Pro 6

**Autodesk® SketchBook® Pro**

On opening Sketch Book Pro your faced with a blank canvas and a few interface details let’s look at this briefly.

From here I am going to show the main tools that I use and not all the details of the interface, but ones that will get you started and using the software fast, it’s very intuitive.
EMPOWERING THE BURN TO DESIGN

- ellipse and ruler guides
- symmetry tools
- undo/redo
- marquee selection
- move scale rotate
- free hand / straight line
- toggle layers
- copic color palette

Image editing Tools

Click on pencil reveals Brushes

Click on colored circle reveals color palette
Further exploration will show brush options including the new Copic marker brush options and other preloaded brushes for textures and finishing, in automotive design and industrial design I find the default Brush – Airbrush and Pencil brushes the ones I come back to as a staple.

DOODLES:
Make your Gradient:

The first step I take is to set up a gradient layer, you can do this in Sketchbook pro by painting one – I tend to use an alternative software and save the canvas as a PSD file, then open it within Sketchbook Pro.

Notice in the layer box on the right of the image, layer 2 says multiply (ringed in red), this is a duplicate of the layer beneath allowing me to darken the gradient; I can also play with the opacity. See images on the next page.
So the multiply feature allows me to add a layer that acts as if translucent. This can be used as a painting layer and is useful when working quickly to block in shadows and darker shades.

**NOTE:** White will not work on a multiplied layer.

So this is now where I begin to sketch: **THE LINE WORK**
When designing in Sketchbook pro, I am really able to let the pen move freely, by this I mean that the discovery of the design is easier because the interface is so simple and intuitive. I always carry a hardcopy sketchbook around with me everywhere; it is the simplest interface available to us to quickly and efficiently get our ideas down.

Sketchbook Pro has enabled me to embrace digital sketching without the often stalling interface that lies between me and the idea. I need to forget about self and find the design, if I have to keep separating from the sketch development, I find my efficiency and creativity can suffer.

FAST VOLUME COMMUNICATION

I go lighter on the background gradient and begin to add tones to depict the form, when I do this I am really only thinking about light and dark, and therefore shadow:

I continue to add further layers of shadow and lighter levels of hue within this monochromatic color palette.
At this stage I have to apply some white for contrast. Note the Color palette has a custom swatch; this is good practice for speed and consistency in a fast workflow.

**Tools used and the order:**

1. Pencil at varying line weight – High quality feel in Sketchbook Pro
2. Brush tool can be used at full opacity as I have here or for a more painting effect at varying opacity levels
3. Airbrush helps to depict the volume and often the highlights and gradient shadows

**During** the whole process I am constantly accessing the Erasers for a varying soft and hard finish to the sketch
To give a feeling of depth I have added to the background gradient I first created, it suggests a depth to the environment that the flying submersible resides in. I have also added a layer and applied one accent color – Orange – which reflects the inspiration images first collaged. To create a vibrancy to the accent color I have made another layer and applied the **Screen** effect, opposite to the **Multiply** effect the **Screen** effect creates a vibrant translucent property over a darkening property.
The final touch to this iterative sketch page of ideas is the Bubble effect I have created by customizing a brush in Sketchbook Pro.

By playing with the variables of the brush properties I can adjust the brush to quickly produce the desired effect of representational bubbles, creating motion, emphasizing perspective and placing the designed vehicles on the page and in an environment.

**SUMMARY of PART 1: 2D**

You should now:

- Understand creative ideation techniques (page 4)
- Create impactful fast volume sketches (pages 8-13)
- Have a basic understanding of Autodesk Sketchbook Pro Interface and a few Tools:
  - Line weight
  - Color Blocking and Light source
  - Highlighting
  - Multiply and Screen
Here are a few Extras: Ellipse and ruler tool:

A powerful tool, the ellipse guide allows you to create any number of perspectives through squish, scale and rotate control handles located at 4 points around the tool.
The ruler tool has two control points click and drag these to locate your ruler line in a fast and efficient manner. The yellow block of color in the same image is highlighting the symmetry tool. Click this on and it drastically speeds up front and rear views, while also giving you live proportion adjustment as you sketch.

Cut and proportion your sketch with the marquee tool - correct the perspective using the tools:

**Squish – Scale – Rotate - Move**

**Mirror Canvas:** You can work fast and effectively by mirroring the canvas so as to recreate a ‘fresh –eye’ effect.
The Lock transparency tool enables you to change the color or add to the locked layer only where you have painted. Here I have added a tonal gradation using the airbrush, darkening the light blue of the main image.
PART 2: 3D – SKETCHING WITH CURVES

Using Autodesk® Alias® Automotive as a Designer

THE INTERFACE

On opening the Alias Automotive Interface we are faced with the complete opposite of SketchBook Pro, and not surprisingly, this software is extraordinary in its power to make ideas become real. It is with this tool and learning to take small bites over time that you realize that anything is possible.

What I am showing above are some basic elements of the interface which are important, I have hidden certain options such as shelves, and for this class concentrating on simplifying your options. Alias Automotive interface is fully customizable to the user and their individual workflow.

A user’s workflow becomes evident over time; because this is the case I am keeping to the standard palette layout and marking menus. What I tend to do, is monitor what I use and add and subtract tools that I do or don’t use, this all occurs over time.
I too am learning this software and see using this software not as a destination but truly as a journey. Simply by the **burn inside to design** I have battled to understand and become familiar with the program. I am predominantly an artist and not akin to great mathematics, for me learning to work with Alias Automotive is a necessary must and now a pleasure.

**HOTKEYS:**

**F5 - PLAN VIEW** These hotkeys are standard. Use these to navigate to sketch curves.

**F6 - SIDE VIEW**

**F8 - PERSPECTIVE**

I have a few routines which I run through on opening Alias Automotive:

Set draw precision to its maximum setting – (see adjacent diagram)

I also set the diagnostic shading tolerance level to 0.002 (previous diagram)

I have picked up these details from digital sculptors I have worked with in industry.
MARKING MENUS

Marking menus are an integral part of moving freely within the Alias interface, these are fully customizable also. Again I have stayed with the default menu that comes with the software.

My only addition has been to the ACTION menu – where I have added the **Align_G2 tool**.

There is much more to the interface of Alias Automotive, but for this creative journey we need to move into the translation of sketch to 3D. In your own time and journey the interface will reveal itself.
CURVES ARE THE SECRET

So I have done some rough sketches in SketchBook Pro, and now I begin talking about modeling the design. The normal process for a designer should be to fully resolve the sketch and propose a worked out design. There are times when this is done, but to really integrate Alias Automotive into a designing workflow, I believe now is the time to explore if the sketch works or has depth to go further.

**NOTE:** I never stop sketching throughout the process, 2D and 3D work in tandem

So I begin to Sketch curves – I start in the side view

THE CURVES:

These are the only curves I use and I begin with the simplest and add curve construction math as I need it:

**Start with:** 2 DEGREE if I need Tangency to another curve I make it a 3 DEGREE using the curve construction editor, if I need Curvature I make it a 5 DEGREE.*

*Note: Curvature Continuity is covered with the align tool on page 26
I work the curves in the side view first, and then move to the plan view and pull cv's to give the desired acceleration. This is a continually iterative process where I am assessing the proportion and attenuation of the line, the crown and the curves relation to each other in space, as I would a sketch.

The plan view at first the curves have no shape. At this point moving into the perspective window is a must.
At this stage I think it's important to explain why curves are the secret. To develop good surface the curves must be light in construction and the CV's be in good locations along the curve line, in all views.

As a designer change is inevitable, building good curves enables easier editing and fewer steps when making proportional changes.

Stick to the **RULE OF PSD**:

**PROPORTION** – Get this right with your curves – learn to look, look again and look again!

**SURFACE** – Next begin to build surface – but note you will need to change your curves as you assess the design and the surfaces you start to build.
**DETAIL** – Only when you are completely content with the design in **Proportion** and **Surface** do you begin detailing and filleting.

It seems simple right? – It is! – But it takes discipline.

**CURVE EDIT TOOLS**

Here are a few of the tools I use most as I sketch the model in Alias Automotive:

**Curve Section Tool:**
Curve Stretch Tool:

The curve stretch tool enables you to retain the character of a curve to a certain extent, use it to make curves touch when distances are small. If you stretch a curve over a long distance the character becomes compromised. Try to use the Scale and Extend tool first if a large distance needs to be covered.
Extend Tool

This tool is found under the **Object Edit Tab** in the Tool Palette, it can be used for both curves and surfaces. Use this to help develop your curves as you sketch your design in 3D.
Align Tool

The Align tool is accessed through my marking menu but can be found under the **Object Edit Tab.** This tool can be used for both surfaces and curves.

CONTINUITY is simply explained by the diagram above, it can be explained more deeply by better modelers than I; however I am predominantly right brain so I keep it simple.

If I desire a curve with a simple radius character I use Tangent. However if I need ‘LEAD-IN’ (the lack of elbow shape or a mechanical nature to the curve) I use Curvature.

**Tangent control** requires one CV leaving you one to play with (if a 3 DEGREE CURVE)

**Curvature control** requires 2 CV’s leaving you none to play with (if a 3 DEGREE CURVE) Therefore with curvature control we add CV’s making the curve a 5 DEGREE CURVE giving us 2 CV’s to play with.

I hope this helps, experience the tool and it becomes clear.
Predominantly I use Move – Scale and Rotate the most with the sketching of my design in curves. It is through these actions that you control the CV’s and the objects in space.

The pivot point is always the go to before you make an action, know where it is and decide if it is in the correct location for the character of the change you desire.
Below is a series of snap shots that show the development of the model from curves to surfaces:
Through looking at these snapshots you can start to see the level of sketch curves I reached as I started to throw some rough surface onto the construction.

As the surfaces are built I am adjusting the curves and the math construction of them so as to achieve the surface dynamic I’m after. This is subjective and requires a lot of looking and design judgments.
**Treasuring a Part of Your Model**

A good friend of mine often remarks on this belief:

“In learning Alias you must find a part of the design you really like or want to see, treasure it, love it and build it so every surface begins to work together. It will lead you on to greater things”

(Julien Montousse - Director/Chief Designer COD – Clear Oxygen Design)

On this model of the Fighter SUB the tail has been that part for me. The long tail rudders, the mechanical Gyro pivots and the main drive Prop housed in a section that’s similar to a motorcycle back tire has been this element of the model that I have treasured.
BASIC SURFACING

This is a very heavy topic to try and cover in a 90 Minute presentation and a few pages document, so rather than instruct on how to model the design, I present in the next few pages some of my favorite surface tools that I like to use:

SQUARE – BI-RAIL – SKIN

SQUARE TOOL

Needing four sides* a square surface is just that. It is my preferred surface as you can easily control each edge of the surface and its relationship to another surface, whether it need to relax another surface next to it, or create a dynamic transition the square surface holds a logical way of being constructed, similar to a patch work construction.

*FOUR TOUCHING CURVES OR FOUR TOUCHING SURFACE CORNERS

NOTE: When creating any surface, HISTORY of how the surface was created is retained*
**BI-RAIL / MONO-RAIL**

Needing one or two rails which you can select within the option box and a generation curve, a railed surface acts the same as a square surface, providing history and the availability to adjust the continuity on each edge. However you can create surface with less than 4 curves such as a mono-rail, which only requires one rail and one generation curve.

Again the curves must be touching for the surface to build without gaps.

**SURFACE HISTORY**

When creating any surface, HISTORY of how the surface was created is retained, this is useful with regards to editing and adjusting surface continuity with other surfaces. However it is ok to loose surface history if you choose to edit the surface manually, though this manual CV and Hull controlling of a surface can lead to time consuming adventures.
SKIN ‘TO WIN’

Using the skin surface tool is a really quick method to look at the volume you have created with your sketched curves. It is important to be able to trash surfaces and not hold onto them as precious during the modeling stage, this understanding of being able to trash a surface because it isn't correct or isn't building correctly is important. It enables growth in modeling skill while also keeping you moving forward.

If you have good curves you will inevitably get good surface. Spend time on curve construction.
Query Edit Tool

This tool resides in the standard marking menus on the third mouse button. This is a very quick action which enables you to call up the HISTORY of an object whether a surface or curve if the HISTORY hasn’t been lost or deleted (Green if there is still History).

The Tool resides in the Object Edit Menu in the palette.
SUMMARY of PART 2: 3D

You should now:

- Understand some of the basic elements of the Alias Automotive interface (pages 17-19)
- Understand how to use curves in Alias automotive to begin to translate your 2D sketch into a 3D curve representation (pages 20-27)
- Have a basic understanding of Alias Curve editing tools and Surface creation tools (pages 20-34)

LOTS OF SKETCHES:
PART 3: 2D – CREATING AN IMPACTFUL 3D VISUAL

So you have your sketch model, it's by no means complete but it's good enough to set up with shaders and in a basic environment.

The first step is to begin to assign material shaders to the surfaces built around your sketch curves.

This helps with the development of the design through material graphic break up and consideration for finish properties, all part of the development of a vehicle design.
In the below image the Model has been hardware shaded and the surfaces are all set to the default shader, it is from here we start selecting each surface and assigning a shader material.

Above the shader box floats in the screen to the left of the model, it is with this interface I assign the shaders to the surfaces. Within the Visualize tab to the right of the model we can select our choice of material shader from the provided shader balls Alias Automotive has integrated into the software.
How to Hardware Shade

The **Hardware shade** set up interface box is found at the top of the screen menu bar under the **WindowDisplay** tab, click on the small box to the right of the word this will open the options.

It is from this interface we can edit the background, turn on the groundplane effect and choose the light source requirements.
It is possible to toggle the hardware shade on and off using the marking menu on the third mouse button.
Creating a Simple Gradient Background

By creating a simple gradient background, it places the model into the world of 3D space without distracting the attention of the onlooker away from its properties.

turn these on (as shown)

slide to vary ramp gradient
Creating a Reflective Ground Plane or Ground shadow

Giving the illusion a design is floating or seated firmly on the ground, helps the design sit within the 3D space.

Adjust sliders to find desired result
Assigning Shaders

The model now sits in an environment good enough for snap shots; however the materials and shaders need to be applied.

I usually begin assigning the shaders during the modeling process, exploring material graphic break up and surface finishes, from high gloss to satin to matt reflectivity. This is all part of the creative process.

Once all the shaders are allocated to the surfaces we are ready to create a view that can be exported.
Lighting – Default setting or All Lights

A full topic of understanding which deserves a class of its own is to do with lighting, for now and usually on fast design projects the default light setting will be fine. However do explore lights and setting their parameters to create truly stunning imagery.
Setting up a Shot / Camera Properties

Setting up the image and the dynamic of the shot, depends very much on the type of product it is. In the case of this design I want to create a sense of scale. To portray this I adjust settings within the camera lens editor tab in Alias Automotive. This allows the opportunity to exaggerate the perspective, leading to dramatic shots.

45.00 is the camera angle of view. I try shots between 45.00 and no more than 80.00
Exporting an Image for Editing

Exporting an image at a higher resolution than the monitor requires a few steps, however once you know the steps, it becomes familiar.

Within the File tab on the menu bar there is an export tab giving you a few options, even one for exporting the screen, please ignore this and go straight to the current window tab below it and click the small box to its right. This opens up an option box allowing the adjustment of your outputted image in a more customizable fashion (Page 48)
The final stage - This process of quickly and easily producing a 3D visual can be used during the design journey; to resolve design issues by sketching on the image in Sketchbook Pro to find a surface transition solution.
Of course it is possible to output a better quality image with more time and better lighting, this all takes time, and as mentioned during the presentation, time is often the one element that’s hard to come by.

**SUMMARY of PART 3: 2D**

You should now:

- Know how to Hardware shade the model (pages 37-40)
- Understand How to create a simple gradient background and ground plane for the model (Pages 41-42)
- Understand how to find the Alias Automotive shader Library and assign your selections to surfaces (pages 37-39,43)
- Have a basic understanding of how to set up a dramatic image using the camera properties box in Alias Automotive (pages 44-46)
- And finally be able to export a high resolution image from Alias Automotive to Autodesk Sketchbook Pro for additional rendering or design resolving sketches (pages 47-48)
Autodesk® Showcase®

The software that will really enhance a 3D model is Autodesk® Showcase®, a powerful rendering and short animation program specifically set up to showcase 3D Digital models and work in tandem with Alias Automotive among other Autodesk Software’s.

NOTE: More to be added – A final Image with Sketchbook Pro touch-up