

# Vector Drawing



Ill right, all right, I know that most of you probably bought this book to learn how to draw vector letters, so I won't delay. The first and most important tip I can give you is to learn to love the pen tool: It's the foundation of all vector-based software.

No matter how many crazy effects they bake into Illustrator, the pen tool is the only thing you really need to master and is the single most important tool for vector drawing. It takes time to learn how to use it well and to teach your brain to think of it as just another mark-making device—not dissimilar to a real pen or pencil—and once you have, vector drawing will feel natural. When you're drawing with a pencil on paper, you're not thinking about the point where the pencil touches the paper, you're thinking about the path the pencil is about to take. Even though you're plotting vector points one at a time, the more you do it, the more you start to think of not the point you're currently plotting, but how it will affect the next point and the one after that. Most people never learn how to properly plot anchor points or begin by manipulating basic geometric shapes rather than drawing from scratch, but I'll teach you some best practices that will make your curves smoother and your process more efficient.

## Draw, Rinse, Repeat

My vector-drawing process is not dissimilar to the process I use for sketching—I build up the drawing in components, beginning with a skeletal stroke to define the letterforms. If the sketch is very tight or entirely shape-driven (as is often the case with logotypes) I can trace the outline of the sketch directly, but usually I just use the sketch as a guide, especially if I'm drawing a script or if the thins of the letterforms can be defined by a single stroke.

Everything starts with a pencil sketch. Since this was a pro-bono project, I didn't do a large number of pencil sketch explorations. I had a pretty clear idea of what I wanted the logo to look like from the start (a brush script that mimicked nail polish.)

The vector skeleton is created from a single stroke in Adobe Illustrator. I can perfect spacing, swashes, and letterform shapes before further developing the mark.

I spent a lot of time messing around with the skeleton on this one, and realized that some of my original swash choices weren't quite right (the swash running through the *l* would impair legibility, possibly making the *l* look like a *t*). After correcting the skeleton, I redrew the logotype as shape.

Only after the letterforms are perfected do I play with color or additional ornaments (in this case, the highlights added to make it feel more like nail polish). While color is important, it's secondary to the design of the actual letterforms.



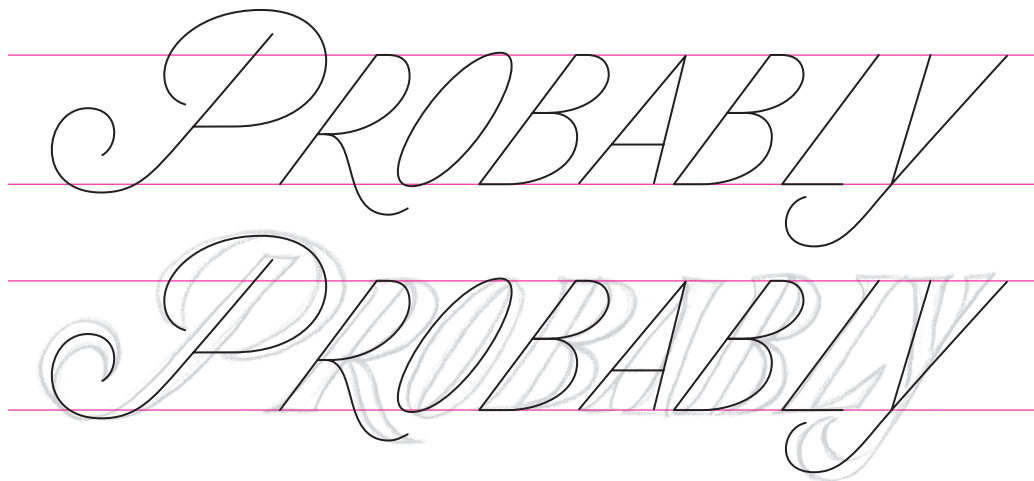
## **Step 1: Setting Up Guides**

I drop my sketch onto its own layer in Illustrator, turning the opacity down to 15 percent or so (dark enough that I can still see it clearly but light enough so that it doesn't distract me). I create a layer for guides and start drawing them on that layer as .25-point strokes in a bold color like magenta, defining the baselines, cap heights, and x-heights of letters. I draw strokes as guides (rather than the default Illustrator dragged-from-the-rulers guides) because I often work with all sorts of baselines in the same composition—straight, angled, arched, circular—and it's easier to customize them if they're hand-drawn. I lock both my sketch and guide layers and create a new layer for artwork.

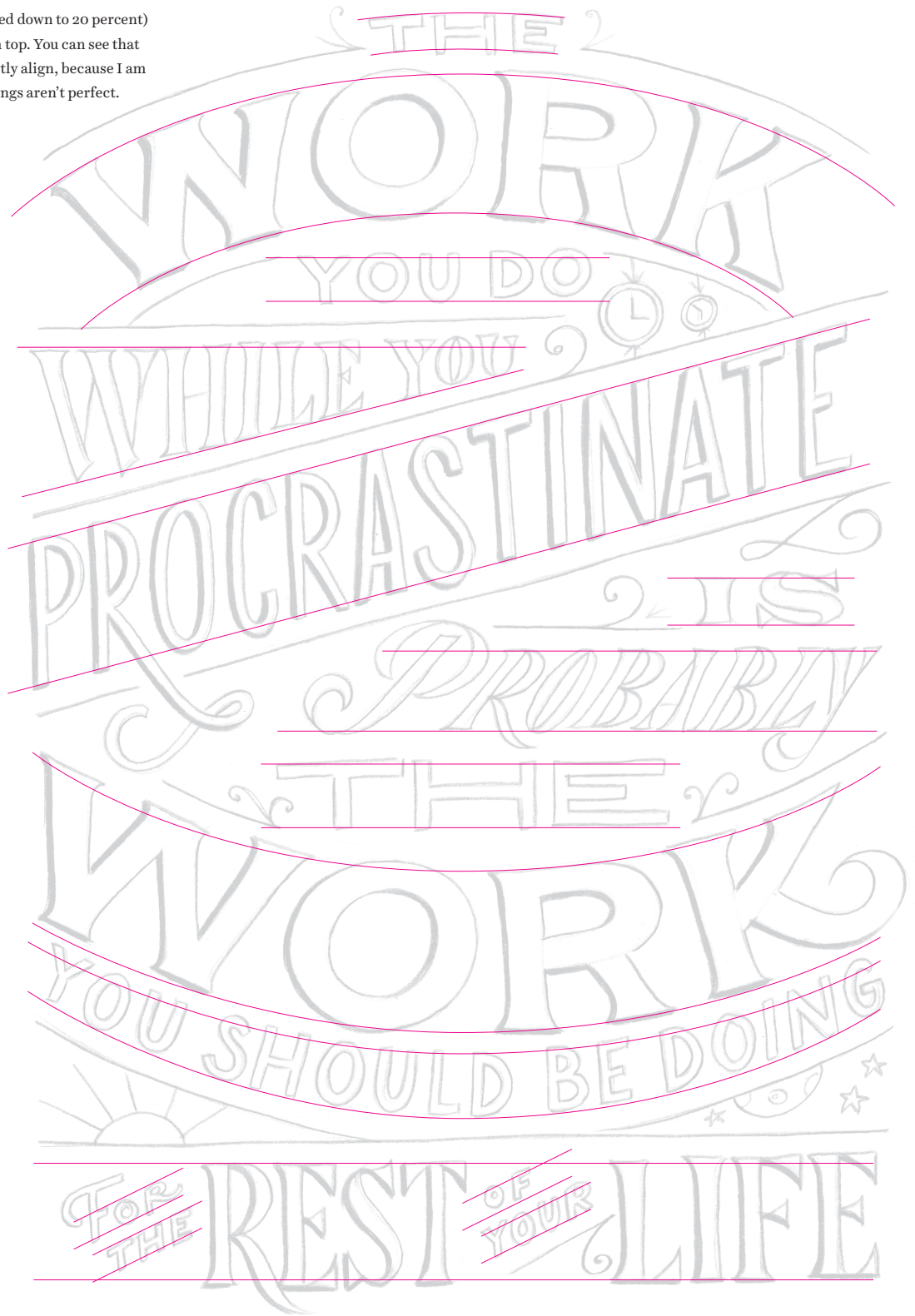
## **Step 2: The Skeleton**

Next I'll draw the skeleton as a single stroke, using my sketch as a guide. The reason why I build from a skeleton up yet again is because by doing so I can make changes and edits to the lettering that weren't easily spotted in the sketch—I'll correct spacing issues between letters, adjust connections, and make sure all my letterforms are on a consistent angle (if italicized) and have a consistent baseline and x-height (or cap height). Once the skeleton is drawn and a minimum stroke width is selected, I usually turn off my sketch, working with just the skeleton and guides from there on out. I will periodically reference my sketch after this point but am not usually tracing it directly. In the example below, you can see how the sketch is used as a basic guide for the vector skeleton, but that I'm correcting letter angles and spacing as I go, so the end result does not perfectly align with the sketch.

There is a logic to how I plot anchor points that I have learned through personal experience and by attending the Type@Cooper program at Cooper Union. Studying under type designers definitely changed the way I approach my work and improved my vector drawing skills tremendously. I find that if I adhere to these rules, I work so much more efficiently and am so much happier with the final result than if I choose to ignore them. When Erik, my studiomate, and I do workshops at our studio, this is what people come for and what they ooh and aah over—super-nerdy vector tips.



The sketch (opacity turned down to 20 percent) with vector guidelines on top. You can see that the sketch doesn't perfectly align, because I am not a robot and my drawings aren't perfect.



# Proper Point Placement

## Basic Point Plotting

Anchor points are the building blocks of vector artwork and are used to define the edge of a letterform when drawing in Illustrator or font design software. They define each shift in angle, be it sharp or curved. For boxier forms, it's easy to see where the points should be placed, but for curved forms, it can seem a bit tricky. The goal is to have just enough points to define the shape—problems occur when there are too few or too many anchor points. Below are some tips on point placement and illustrations showing good and bad point placement.

## Plotting Points on Curved Forms

### Find the Extrema

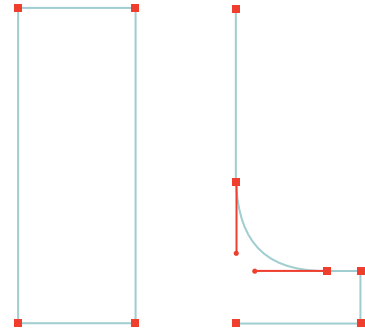
A perfect circle consists of four anchor points with symmetrical Bézier handles.<sup>1</sup> There are anchor points at the northernmost, southernmost, easternmost, and westernmost parts of the shape. These points are the curve extrema, and type designers (and savvy letterers) plot their anchor points on the extrema of curves whenever possible. Even if you draw a circle with the shape tool in Illustrator, you'll find that the program plots points this way.

Even on italicized letters, the points are plotted on the extrema, not on the “top” and “bottom” of the letter, as you may have guessed. To find the extrema on any letterform with curves, draw a box around the exterior of the letter and another around any interior counters (the negative space inside the letterform) and look at where the edges of the letter shapes touch the boxes—those are the extrema.

I tend to plot just the north and south anchor points first on curves (especially when drawing scripts), adding east and west points as needed after. This allows me to very quickly draw the basic shapes of my letters—they look super-funky until I sit down and start futzing with the handles to perfect my shapes.

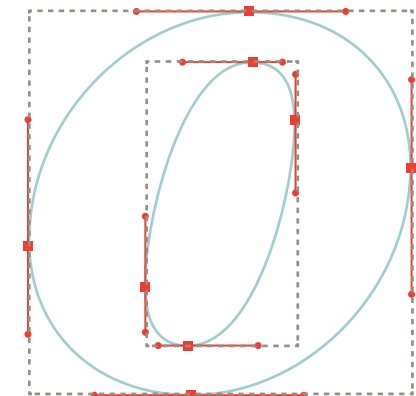
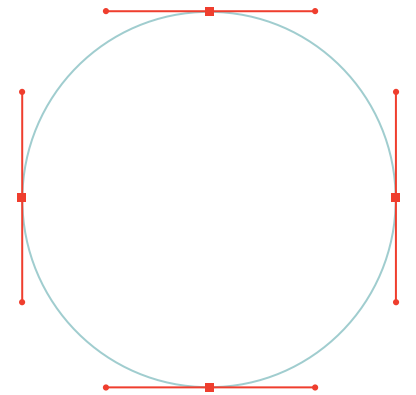
### Pretty Handles

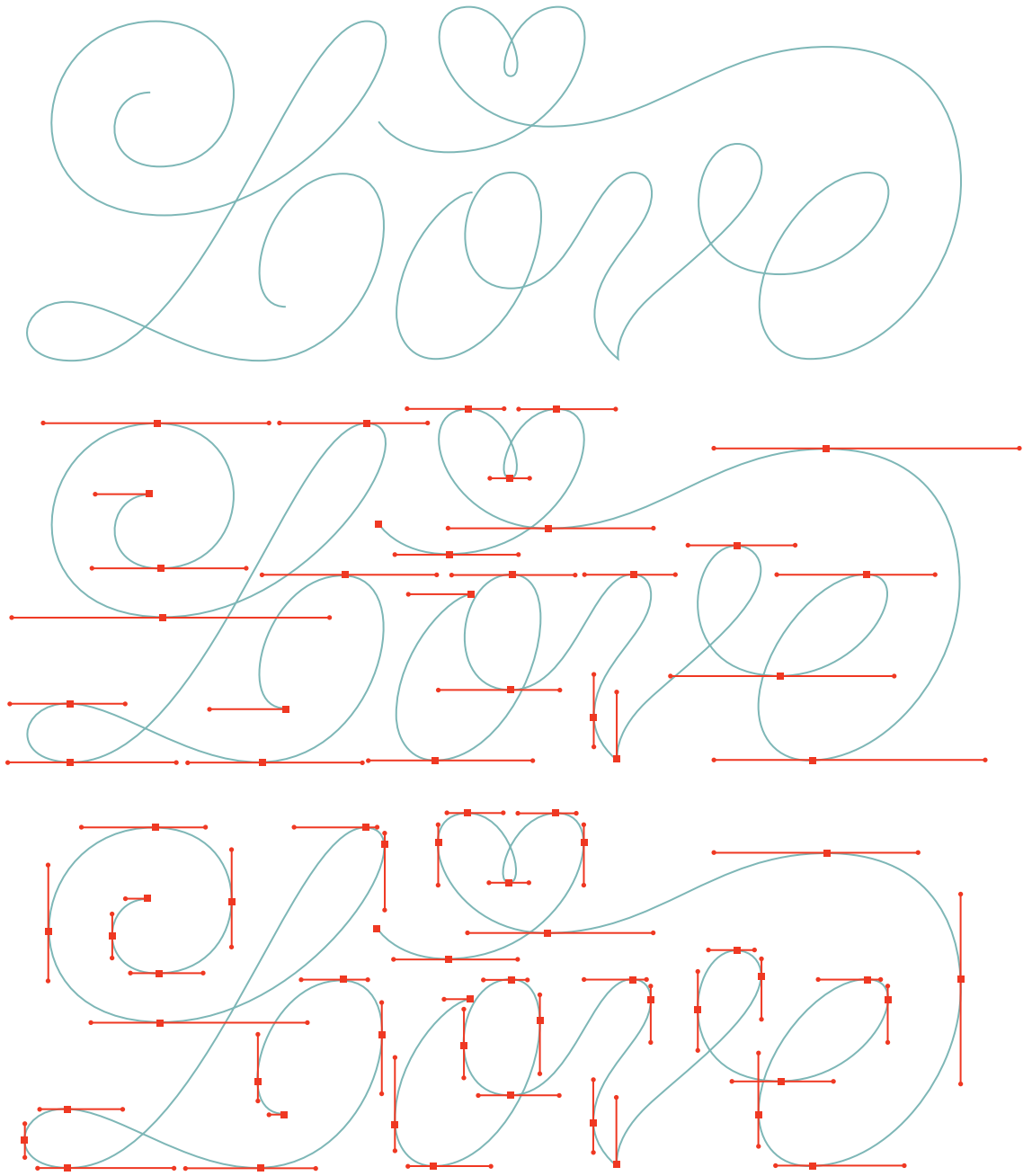
As you draw anchor points on the extrema of the shape and drag out each anchor point's Bézier handles to create the curve, hold down Shift. This will ensure that the handle is perfectly vertical (they'll be vertical on east and west



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**Bézier handles:** In vector-drawing programs, anchor points on Bézier curves can be further controlled by manipulating their attached handlebars.





anchor points) or perfectly horizontal (on north and south anchor points). There are a few reasons why type designers plot anchor points and deal with Bézier handles this way, but the reason why you should adopt this method is that doing so makes it a heck of a lot easier to adjust your drawing later. When you make adjustments to a curve, you can adjust it one handle at a time, holding down the Shift key as you move an individual handle closer or farther away from the anchor point it's attached to. By holding down the Shift key, you ensure that only the anchor point and handle you're currently adjusting is affected, which allows for complete precision and much swifter editing.

## Rounded Corner Shapes

When working with rounded rectangle shapes (such as those you might find on a bracketed serif), remember that you want an anchor point at the entrance and exit of each curve. Look at how Illustrator plots points on the shape tool's rounded rectangle—there are always two points to every corner, not one, and if you think of each rounded corner as a quadrant of a circle, the points are plotted perfectly on the extrema.

These rounded rectangle shapes are seen often in letterforms—any time a curved part of a letter begins to straighten out, you'll need appropriate anchor points for the curve and a point where the curve begins to flatten to a straight.

When you're working with the angled strokes of certain letterforms, like *A*, *M*, *N*, *V*, *W*, *Y*, or *Z*, you'll sometimes encounter straights merging into curves in a way that does not allow you to plot points on the extrema. In cases like these, just remember that if there is a curve, have an anchor point with Bézier handles at the entrance and exits of the curve. On an *A* with a bracketed serif, the Bézier handles of anchor point #1 follow the angle of the downstroke, while the Bézier handles of anchor point #2 can be perfectly horizontal.

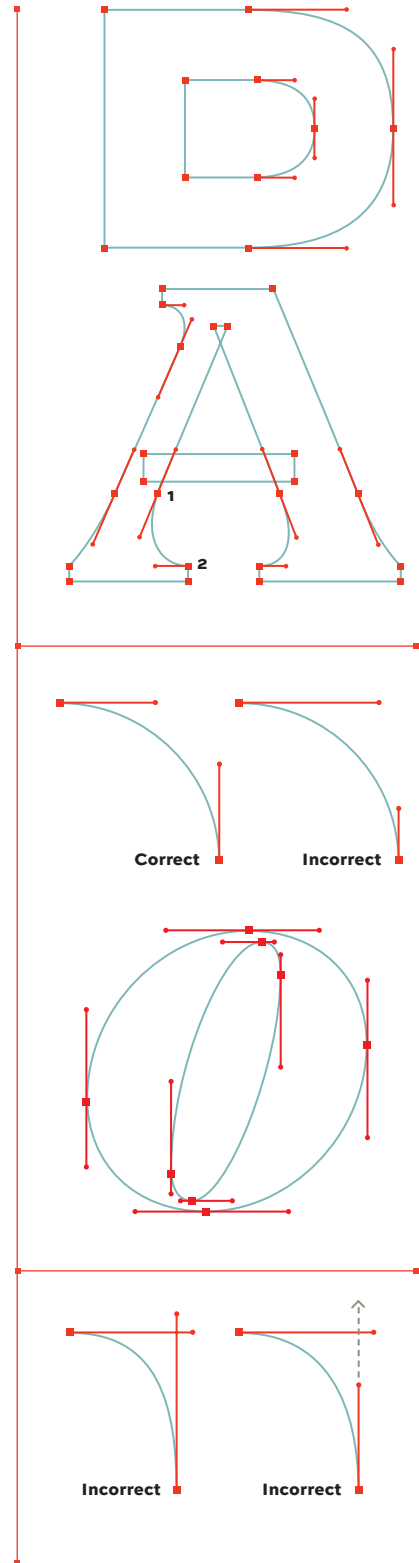
## Let the Handles Share the Work

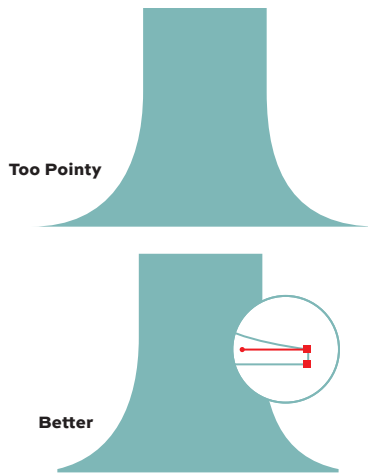
When you're finessing curves, it's important to make sure that each curve is defined by two Bézier handles, and that one handle isn't doing way more work than the other. Usually when I have a bit of stubborn lumpiness in a curve (or some undesirable flatness), it's because one of the handles isn't pulling its weight.

I don't shoot for perfect mathematical symmetry, because I like for my work to look as if it was made by a human and not a robot, but I try to get it as close as possible by eyeing it. On a perfect circle, the handles will be all the same length, but on other shapes you'll see a different kind of logic emerge. On an italicized *O*, for example, you can see that the handles of the inner counter aren't symmetrical but that certain handles relate to one another.

## Never Cross the Streams

A very important rule worth following is to never let the Bézier handles of a curve cross each other (or even imply that a future cross will occur). If you need to tighten a curve and find that your handles have become so long that they cross over each other, move your points and shorten your handles so that this doesn't occur. You'll notice right away that if you adhere to this rule, your curves will be far less funky.





## Other Vector Lettering Tips

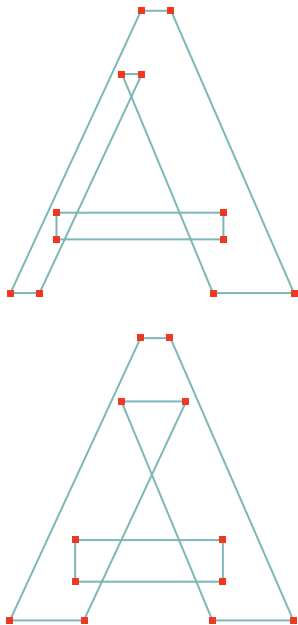
### Square Off Sharp Points

There's a weird optical illusion that can happen when a serif or swash comes to too sharp a point—it looks almost as if there is a thin hairline coming off of it. If you terminate your sharp points with a small flat table top, it eliminates this problem and also makes it a lot easier to add strokes and effects to the letterforms later. This is not saying that all pointed swashes and serifs must terminate this way. Use your best judgment about whether table-topping your points is necessary.

### Create Overlaps to Ease Editing

This is best explained through a visual example. If I were drawing a capital *A*, in the inner apex (the highest pointy point), I would have not one anchor point, but two, used in a very different way than the previous table-topping example: One anchor point is plotted at the terminus of each of the angles, forming a small triangle in the way they overlap each other.

Drawing this way is super handy, because you can make adjustments to the weight of one side of the letter without affecting the other. In the case of this *A*, maybe I want to transform it from a low-contrast to a high-contrast letterform. If I just had one point in that inner apex, there would be a lot of adjusting to do after moving the points around, but with it set up as overlapping strokes, it's quick and easy.





### **Step 3: The Body**

There are a few ways that I add weight to letterforms. The most precise way is to draw shapes on top of the strokes, making sure that the connections between the shapes and strokes are as smooth as possible. I enjoy working this way because it gives me the most control.

When I'm working on a script, in particular a low-contrast script, I can use the width tool in Illustrator, which lets you add width variance to a stroke. This tool is fantastic but has a few shortcomings and can at times be a bit buggy. Sometimes it's best to go about things the long way because the results are more predictable.



Shapes (shown in red) overlap strokes (shown in blue). Final artwork shown small to the right. Before sending files to the client, all strokes are outlined and all shapes merged. Always make sure you save a “working” version of your vector artwork (strokes and overlaps still present) incase there are last minute changes.



I can reuse sections of my letterforms if it makes sense, but I usually end up making a lot of customizations and adjustments as I go. As a letterer, you're creating custom artwork. Repeating letterforms may seem like a smart idea sometimes and certainly makes your process faster, but I can't tell you how many times clients have told me that my artwork looks “too much like a font” when I repeat letterforms too much. It's infuriating feedback (since fonts are artwork, too!), but I understand that they want the word or phrase to be really special—to feel unique and impossible to achieve through typesetting.

I always begin by making sure the letterforms are under way before adding in any ornamentation. The sketch is turned off at this point, but I may reference it from time to time.

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## **Step 4: The Clothes**

I tend to draw serifs, swashes, and the like as separate components (separate shapes on top of the shape of the letterform itself), which allows me to reuse parts or manipulate the serif or swash separately from the letter. As you've probably realized, my process is very additive. I start with something small and simple and build on top of it until the artwork is finalized. It's kind of like building a house: You need to build a solid foundation and frame before you lay down floors or put up walls (and you certainly need all of the above before you add custom light fixtures and doorknobs).

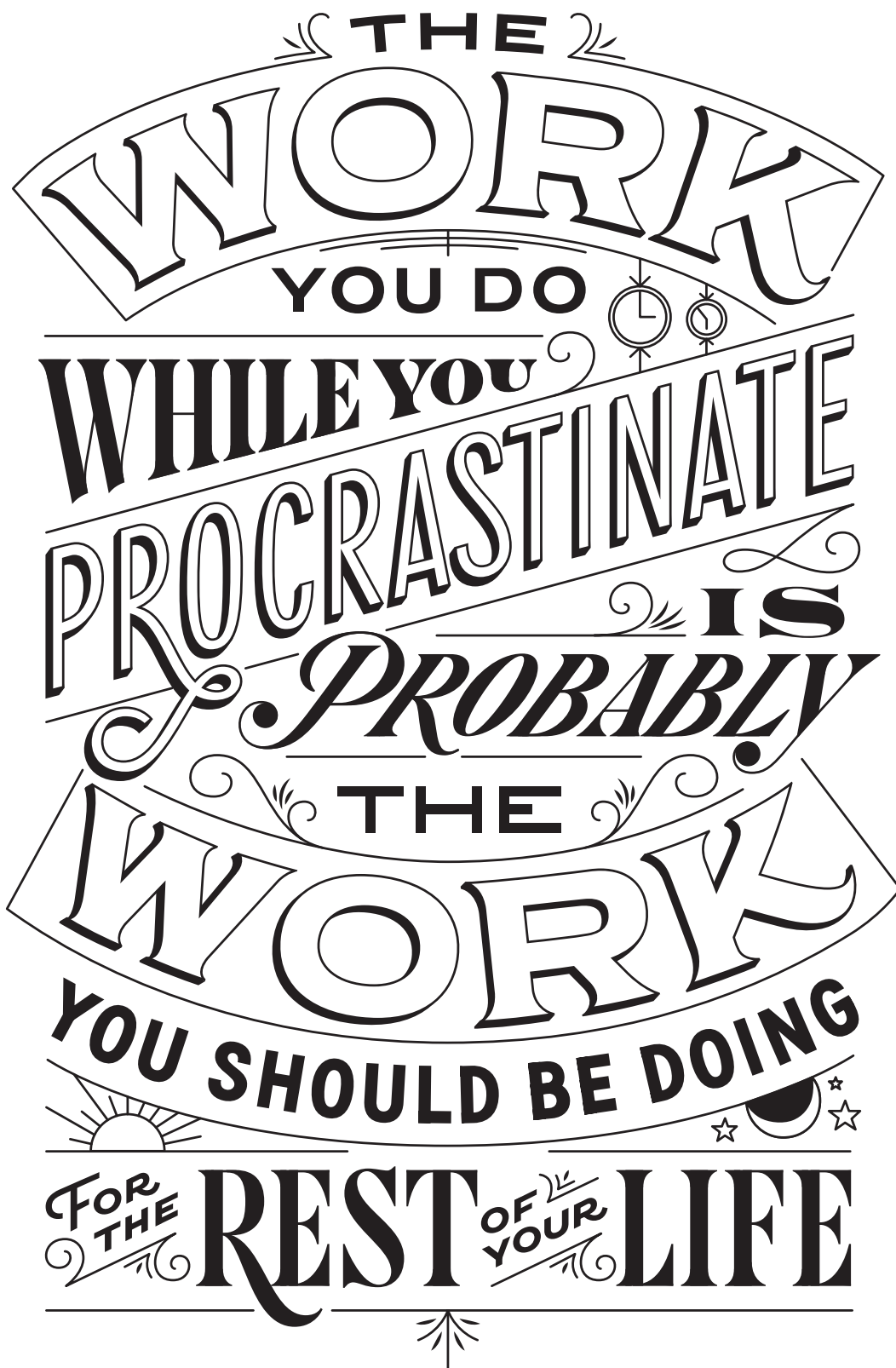
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### **Step 4.5: Draw It Again (Optional)**

When I work on certain kinds of projects (like logos), a more severe level of perfection is required. My artwork, at this point, is made of a number of components (the skeleton or hairline strokes, the weight shapes I've created, and the serifs, swashes, spurs, etc.), and I try to make the connections of those components as smooth as humanly possible. Though a serif is drawn as a separate shape on top of the stem of a letter, I try to make their point of connection invisible. Sometimes, to be sure that the connections are as perfect as can be, I'll redraw the entire lettering piece, tracing around the contour of what I have created already and treating it almost like a "refined sketch" instead of final artwork.

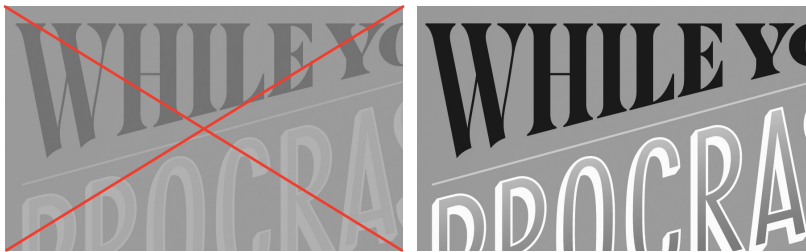
Another, faster, way to do this is to convert any strokes to shapes and then, using the pathfinder tool, merge all your shapes together. The only issue with using this method is that there will likely be extra anchor points or funky handles that happen when you automate the merge in Illustrator, meaning additional editing will be required that sometimes takes longer than redrawing it from scratch. When true perfection is sought, drawing it again, point by point, is best. Plus, we all need the practice!

When it comes to adding drop shades or shadows to the letters, I first merge all of the separate components (the base letterform shapes and serifs) together using the Unite tool in the Pathfinder palette. It's smart to save an unmerged version of your letters as well. You can add a drop shade by either using the Extrude/Bevel effect in Illustrator, or do it manually (which is how I prefer to do it) by duplicating the letters and placing the copy behind the original letters, using anchor points to create the extrusion.



## Step 5: Adding Color

When the design of the lettering is finalized and I've added just the right amount of decorative nonsense (be it interior ornamentation, drop shades, borders, calligraphic ornaments, etc.), I consider color. Sometimes I'll work with placeholder colors while developing a lettering piece, but I do most of the color experimentation after the artwork is finalized. When choosing colors, I always make sure there is enough contrast between the lightest and darkest values in the design so that even if it's printed poorly, the lettering is still legible. One of the best ways to see if your design would survive crappy printing is to create a test print with your laser printer. If the design still looks great printed in only black ink and doesn't turn into a grayscale muddy mess, you (and your clients) win.



### Using Global Color Swatches

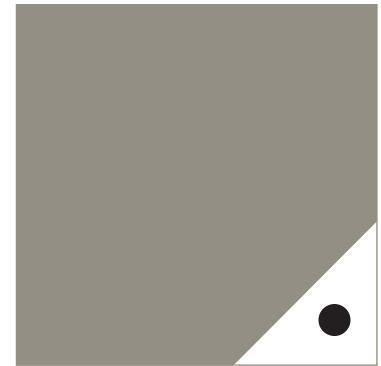
One tip that I learned while working for Headcase is to set up global color swatches at the beginning of a project. Global color swatches (in Illustrator) behave like spot colors (allowing you to create hues of that color, like you can with Pantone colors) but are still CMYK or RGB process colors. You can tell a global swatch apart from a normal or spot swatch because it has a small white triangle in the corner but no dot within that triangle.

The reason why global color swatches are spectacular is because you can change the color of the swatch itself (by double clicking it and adjusting the CMYK or RGB breakdown) and it will globally change any shape or stroke that uses that swatch. This means no more “select same fill” “select same stroke” blah blah blah. You can make color adjustments incredibly fast and try out color options easily.

When I set up global swatches for an editorial job or any lettering assignment that prints with CMYK inks (and not foil or a limited number of spot colors), I create a white swatch, light gray swatch, medium gray swatch, dark gray swatch, and black swatch. These are placeholder colors that represent the range of values I hope to represent in my color selection later. I love working with limited color palettes when possible and always feel that it brings sophistication to work.



### Normal Color Swatches



### Spot Color Swatches

It's very important to note that accidentally using spot colors in a file that is intended to print with CMYK inks (cyan, magenta, yellow, and black—the standard four color printing set up), can be a very pricey mistake. Each spot color creates a new color plate, rather than utilizing CMYK inks. This book utilizes a spot color—metallic silver—on top of the standard CMYK.



### Global Color Swatches

Global swatches behave like spot colors, allowing you to easily create tints or make global color changes, but work with standard CMYK printing.

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