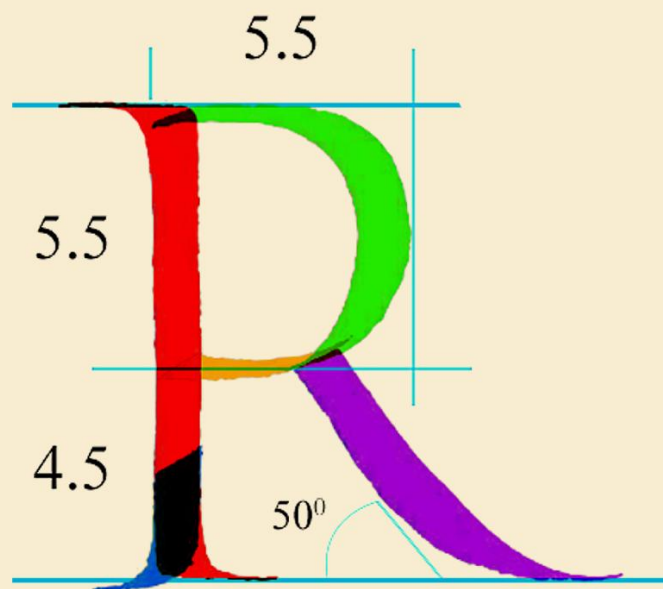


ROMAN CALLIGRAPHY

BASIC LETTER STRUCTURE



THE ROMAN LETTERS

Combined with its seniority in the history of writing and further development from the first centuries AD onward, the Roman lettering style is still commonly used in the Latin alphabet to this day. Despite several variations and adaptations over times, it is still able to preserve the simplicity and sophistication.

Then, it would be a miss if we do not mention about the Trajan alphabet, a standard throughout history, when it comes to Roman lettering. The Trajan alphabet was named after an inscription on the Trajan's Column in Rome, Italy. It is the majuscule typeface (no lowercase letters) typically used for stone-carving to save current important information.



The Trajan alphabet on Trajan's Column in

With the art of lettering in general and calligraphy in particular, Trajan is not only commonly used but also becomes a standard for developing other scripts.

In this humble document, I will analyze the Roman Calligraphy through the Trajan alphabet, based on direct analysis of the inscription on the Trajan's Column. By using Trajan for practicing Roman lettering, we can adjust and develop different writing styles as long as other Roman scripts.

ABOUT THE SIMILARITY OF SHAPES

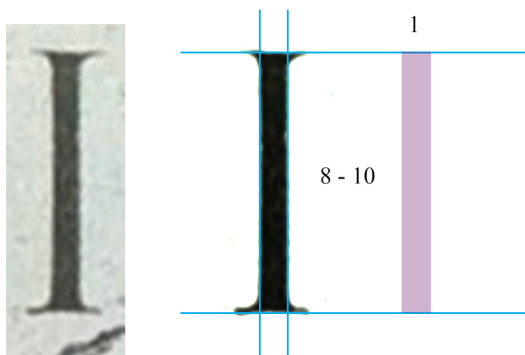
Letters in the Trajan alphabet are divided into groups of similar shapes or W/H (width/height) ratios. For example, B, P, and R are 3 letters that have similar shape. Same with C, D, Q and G - those are formed based on the shape of the letter O.



Here comes the example of the similarity among B, P and R. Basically, those letters consist of a vertical stroke and a curve at the top. The factor of uniqueness of each letter lies in their final stroke.

ABOUT THE HEIGHT OF LETTERS

Although the height of Roman letters can be customized according to the writer's will, it depends on the thickness of the main stroke. Therefore, the main stroke's thickness is used to estimate the height of letters.

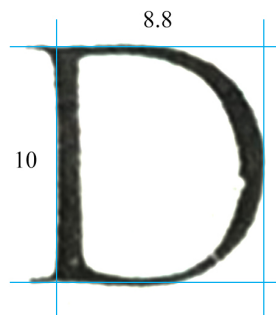
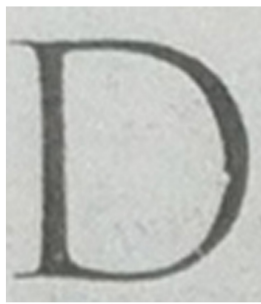


As illustrated, the letter I in Trajan alphabet is used as a standard for the vertical stroke. Assumed that the stroke height is 1 unit, its thickness will be around 0.89. Therefore, a relative height should be round 8 - 10 times compared to the stroke thickness.

ABOUT THE WIDTH OF LETTERS

The height of letter depends on the thickness of its vertical stroke which is also used to measure the width. Therefore, the thickness of the vertical stroke will be chosen as one unit (the unit depends on the thickness of each nib).

If your nib is 3.0 mm wide, the height of the letter should be around 24mm - 30mm, or same with Trajan letter proportion - 27mm. For example, the letter D has a W/H ratio approximately 9:10 (in this case, the height is within 10 times compared with the the vertical stroke thickness).



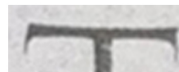
As analyzed, if the height of the letter D is 10 units, the width will be about 8.8 - 9. Within this document, for easier calculation, 10 units will be used as the standard height.

ABOUT THE STRUCTURE OF STROKES IN LETTER

In general, all letters in the Roman alphabet consist of some certain basic strokes. Understanding these rules under geometric aspect will better our practice in similar groups of letters.



The 1-unit-thick vertical stroke is used in many letters.



The horizontal straight strokes in E, F, L, T, etc. The thickness is approximately 1/3 or 1/2 unit.



The diagonal strokes in A, N, W, etc. with 1-unit thickness.



The O-shape strokes are, in fact, ovals or enclosed circles.



The strokes combining straight and partial O-shape strokes can be found in letters D, R, etc.



The cursive strokes exclusively used for the letter S is the connection of two ovals.

TRAJAN ALPHABET PROPORTIONS

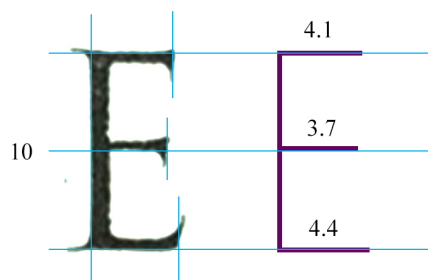
In the next section, we will learn about the Trajan alphabet proportion and structure through the use of equally thin strokes. By drawing thin lines first, we can feel the shape and proportions better, which will smooth out the way of using Trajan in calligraphy.

Group of letters

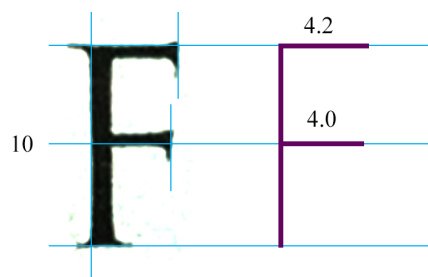
As mentioned in the previous sections, letters in the Trajan alphabet are divided into groups of similar shapes. In each group, I will analyze the proportion based on the original Trajan alphabet.

Group 1: E, F, L, I, T, H

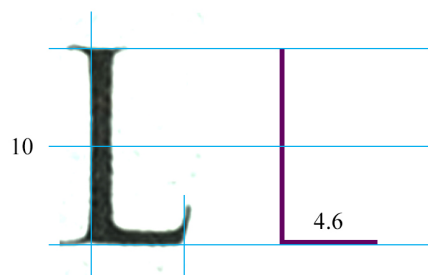
The first group consists of letters with only vertical or horizontal straight strokes such as E, F, L, I, H and T. Within these letters, E, F and L are considered to have much closer similarity.



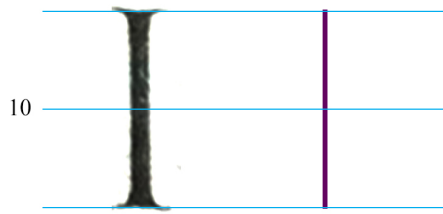
In average, 3 horizontal strokes of the letter E will be 4.1, 3.7 and 4.4 in length respectively. Generally, these strokes are not equal: the shortest is in the middle while the longest lies at the bottom.



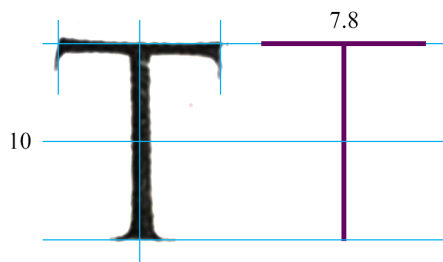
The top horizontal stroke of the letter F is 4.2 units long while the bottom is 4.0 units long. In general, these strokes are in the same length with the top and middle horizontal strokes of the letter E.



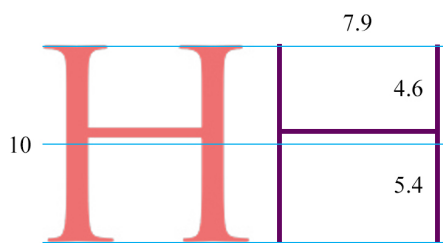
The horizontal straight stroke at the bottom of the letter L is 4.6 units long, similar to that of the letter E.



The letter I is simply a vertical straight stroke within 10-unit height.



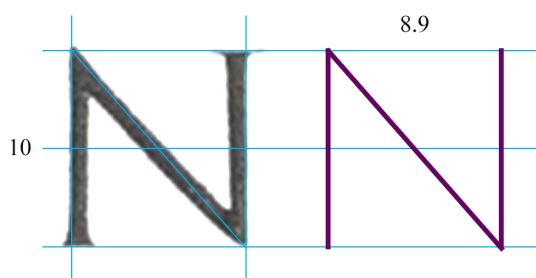
The letter T consists of one horizontal stroke on top and one vertical stroke in the center. The length of the horizontal stroke is 7.8 units.



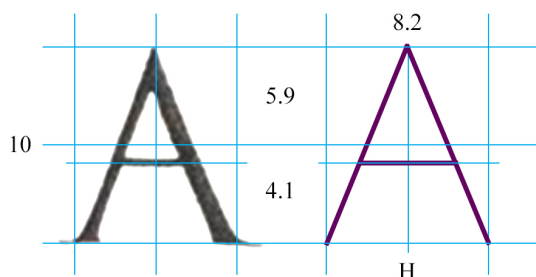
In fact, the alphabet carved on the Trajan's Column does not include the letter H. However, according to the analysis of other Roman alphabets in the same period of time, along with its common use at present, the width of the H is assumed to be 7.9 units. It is similar to the width of the letter T. The cross stroke divides its height into two parts: 4.6 and 5.4 units downwards.

Group 2: N, A, V, M, W, X, Y, K, Z

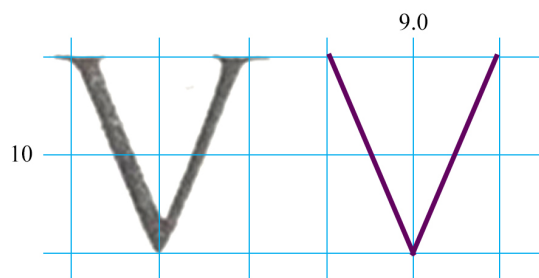
The second group consists of letters with diagonal strokes such as letters A, N, V, etc. These strokes have different tilt angles depending on specific letter.



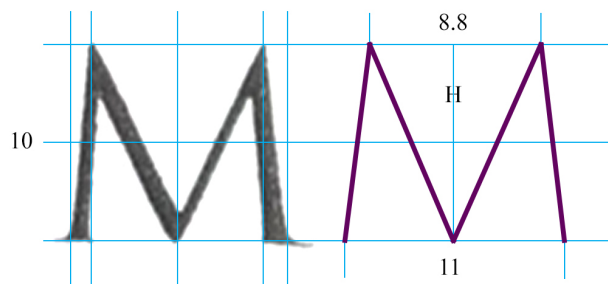
The letter N consists of 2 vertical strokes on both sides connected by a diagonal cross line. Its width is 8.9 units.



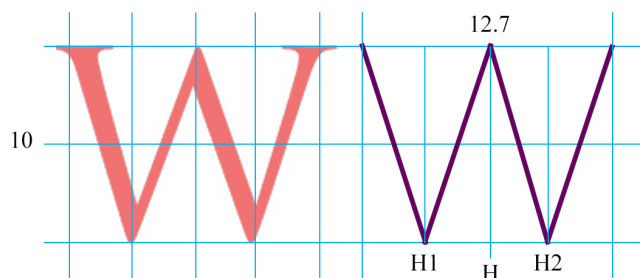
The two diagonal strokes of the letter A form an isosceles triangle with 8.2-unit width. However, there are other A with the width of 7.8 units. Therefore, in average, the A width should be approximately 8. The cross stroke divides its height into 2 parts: the 5.9 and 4.1 units downward.



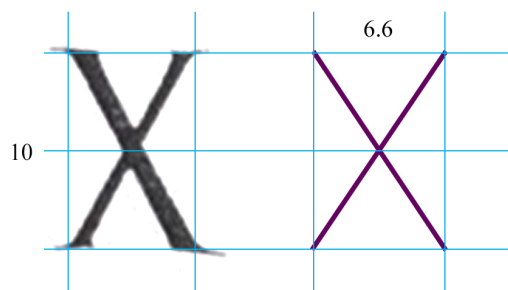
The letter V is made of 2 diagonal strokes that form an isosceles triangle. It is common sense that it is an inverted shape of the letter A. However, according to the result after measuring most of the letter Vs written in Trajan, its width is about 8.7 - 9.0 units - wider than the letter A.



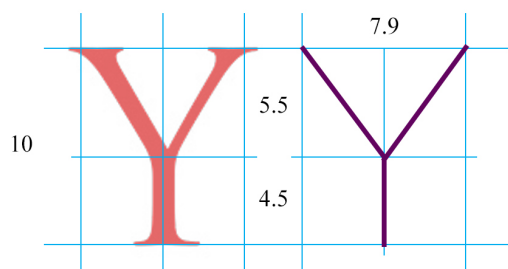
Based on almost all versions of the Trajan alphabet, the letter M has a trapezoidal shape with a small base of 8.8 units and a large base of 11 units. Its two inferior strokes are similar to the V-shape and crosses each other at the center point.



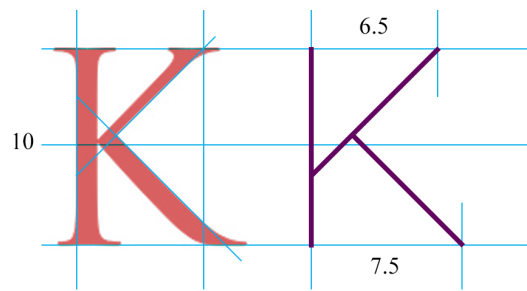
Similar to H, the letter W does not appear in the original Trajan alphabet. However, according to common usage in the later periods, it was considered to be a combination of 2 V. Each inferior V has its width shrunken to fit the total 12.7-unit width.



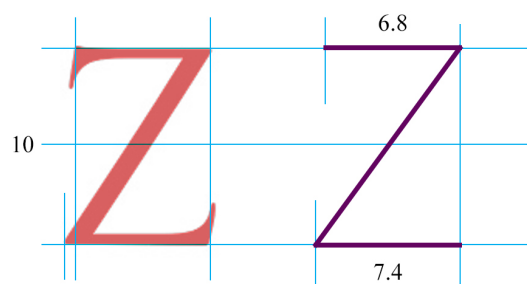
The letter X contains 2 diagonal lines crossing each other at the center. The overall width of the letter X in the Trajan alphabet is about 6.6 units.



Y is the third letter that is not included in the Trajan alphabet. Similarly, according to the common usage and overall analysis, the letter Y has a width of about 7.9 units. Its upper part consists of 2 strokes forming the V-shape of 5.5-units height. Below drawn a vertical stroke in the middle.



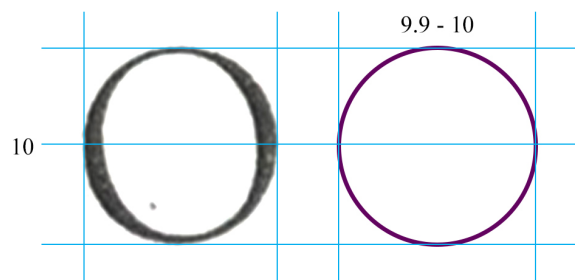
According to common use, the letter K has only one vertical stroke on the left and two inferior diagonal strokes in the other side. Its upper diagonal stroke creates a width of 6.5 units while the lower one goes with 7.5. These strokes create an angle of 45° compared to the horizontal line.



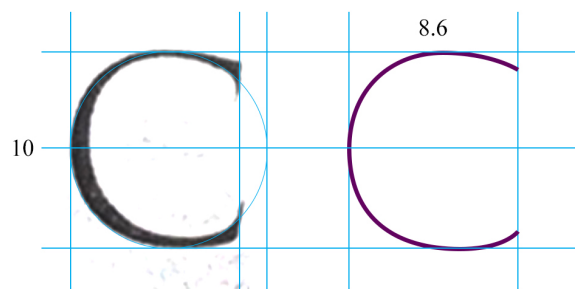
The 5th letter that is not originally in the Trajan alphabet is Z. It is a combination of two upper and lower horizontal strokes and one diagonal stroke. The above width of which is about 6.8 units and the lower width is about 7.4 units. Both horizontal strokes end with the same vertical line on the right.

Group 3: O, C, G, D, Q

Group 3 includes the letters within the O-shape, which means that most of the strokes are curved lines of a circle or oval.



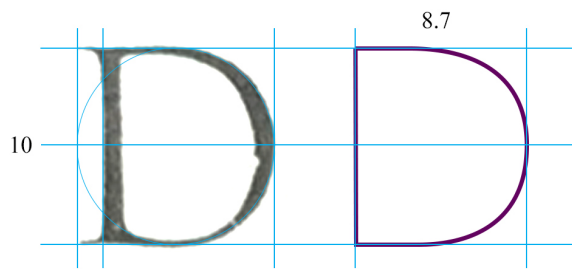
The letter O is about 9.9 units wide, approximately 10. It has the shape of an enclosed circle.



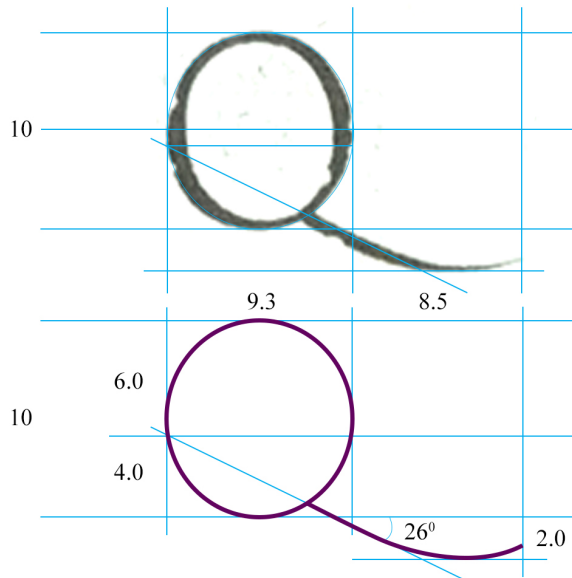
The letter C is the left part of the letter O and has a width of about 8.6 units.



The letter G in the Trajan alphabet has a similar shape to the letter C and is 8.7 units wide. On the right, there is the vertical line connecting the lower and upper strokes. It starts from the middle of the letter height.



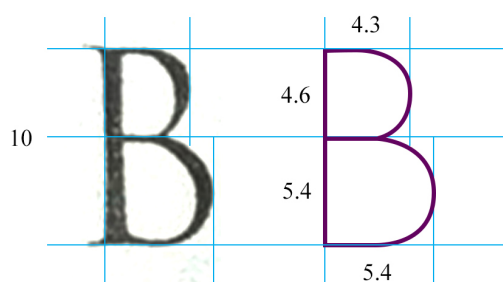
In contrast to C and G, the letter D is in the opposite curved part of the letter O. The vertical strokes bridge the upper and lower stroke and its width is approximately 8.7 units.



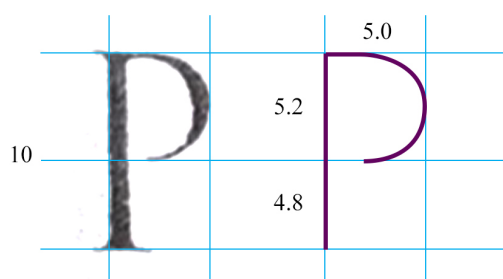
The letter Q can be considered to be an oval with a width of about 9.3 units. The letter Q has a distinctive "tail" dividing the height of the letter into two parts: 6.0 units above and 4.0 units below. Starting from the intersection of the division and the left edge, drawing a slanting line 26° compared to the horizontal line, we have the direction of the "tail". The extended stroke makes the Q wider to 8.5 units, and the trail are 2.0 units under the baseline.

Group 4: B, P, R, U, J

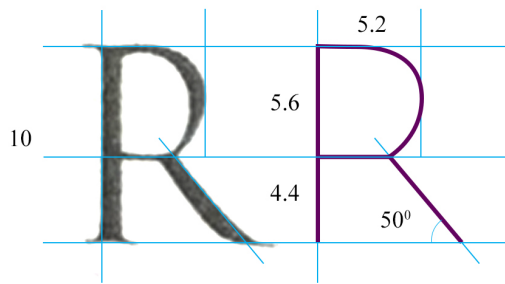
Letters in group 4 contain both curved and straight strokes. In addition, B, P, R belong to a more closely similar group.



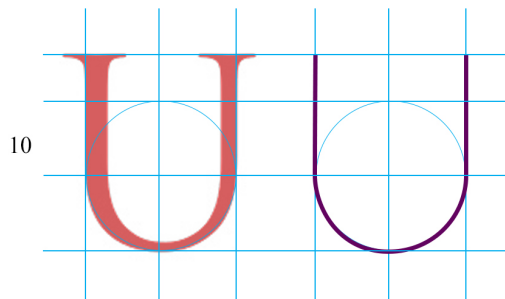
The letter B has 1 vertical line on the left and 2 curves on the right which divide the height of the letter B into 2 parts: 4.6 units above and 5.4 units below. The upper curve is in 4.3 units width and the lower one is 5.4 units.



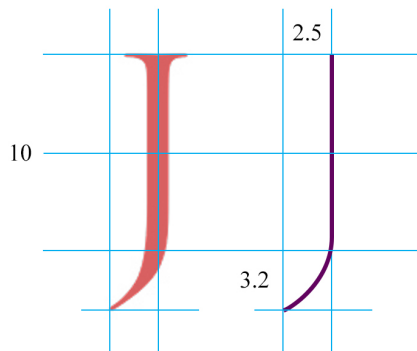
The letter P is similar to the shape of the letter B. The difference is that it does not have the lower curve. Moreover, the curved part of the letter P creates a width of 5.0 units. The curve is in 5.2 units height and the curve's end is not connected to the vertical stroke.



The curved part of the R creates a width of about 5.2 units, the height of the curved line is about 5.6 units and is connected by a horizontal line. From the connection point, the R-stroke is drawn in the direction of approximately 50° from the horizontal line.



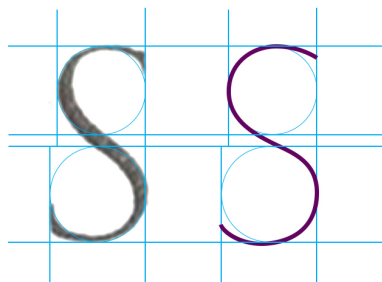
U is the 6th letter not in the Trajan alphabet. It consists of 2 vertical lines on both sides connected by the bottom half-circle. The width of the text is about 7.7 units, equal to the diameter of a circle.



The last letter that does not appear in the Trajan alphabet is J, with its tail of 3.2 units under the baseline. The trailing stroke is a curve to the left and in about 2.5 units width.

Group 5: S

Group 5 contains only one unique letter with special shape - the letter S.



The letter S is within 2 circles. The smaller and upper one has a 4.5-unit diameter while that of the other is 5.0. These 2 circles have the same right side. The curve of the letter S is the connection of the two described circles.

General note: Although commonly used in current Latin script, in the original Trajan alphabet, there are 6 un-included letters: H, W, Y, K, Z, U and J. We can refer to some existing Trajan scripts that has been harmoniously redesigned based on the original. Let's take the Carol Twombly's Trajan alphabet that was designed for Adobe in 1989 as an example. This information is generally analyzed and can be customized to the senses of each individual.

SIMPLIFY LETTER PROPORTIONS

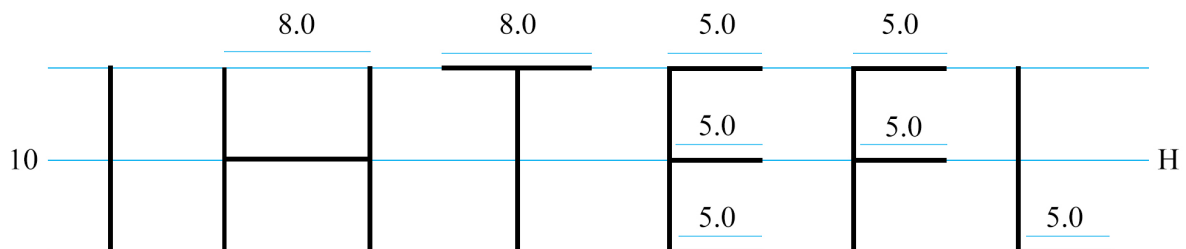
In previous sections, letter proportions in the Trajan alphabet were analyzed with relatively detailed data. However, in writing and lettering, it is not necessary to follow those rigid rules since understanding the correlation among letters is far more important. Therefore, now let's simplify the letter proportions with simpler metrics.

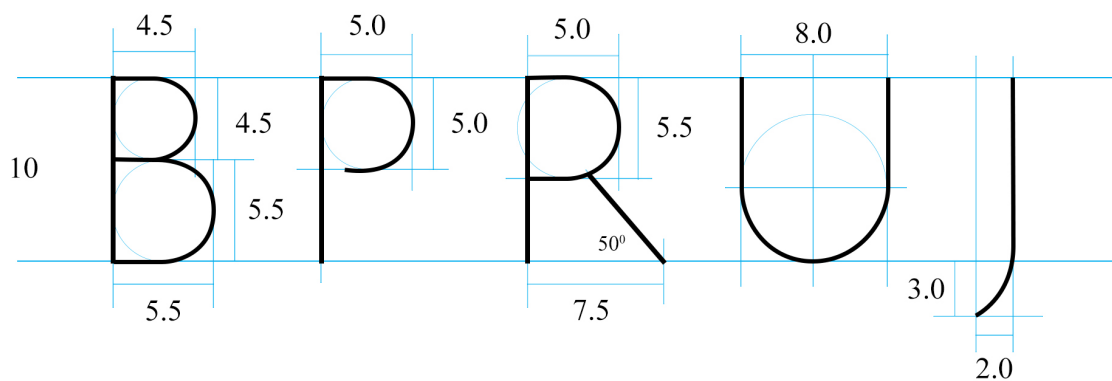
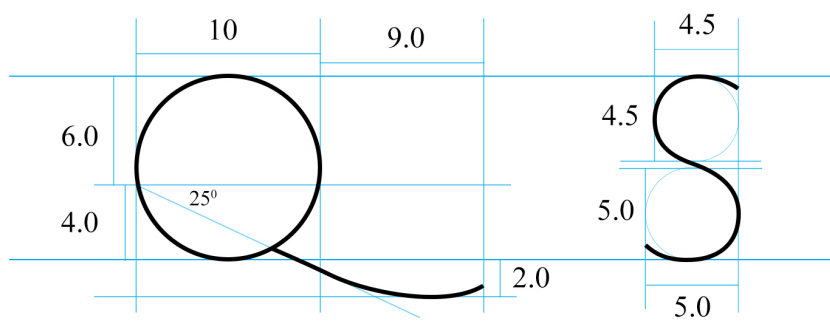
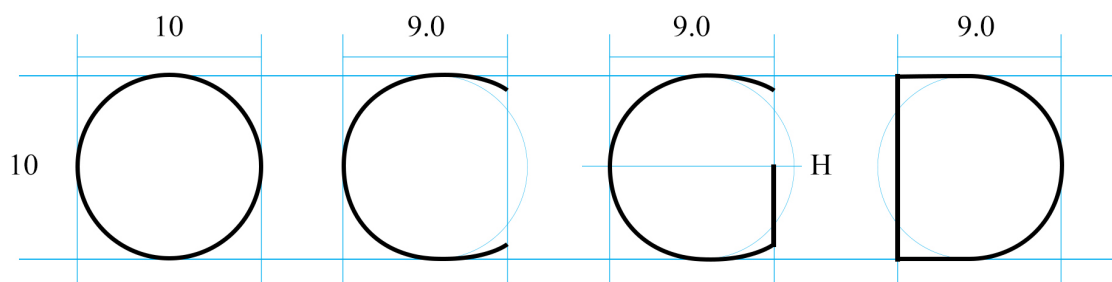
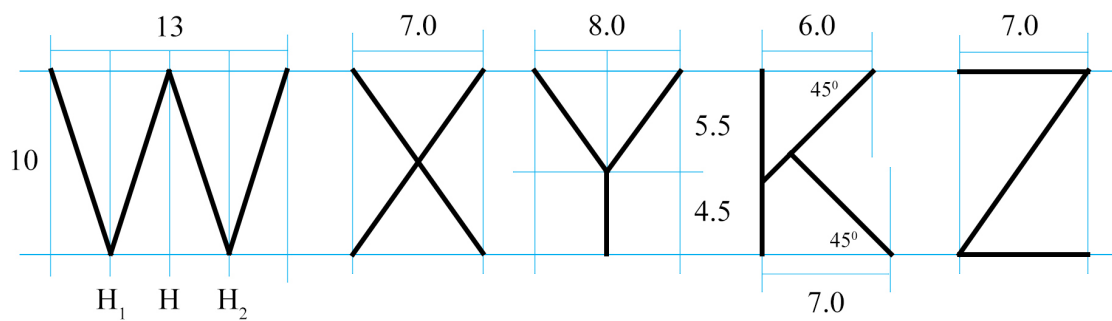
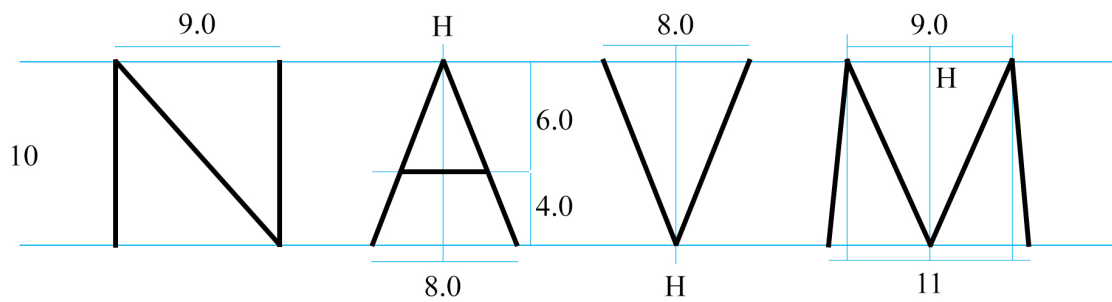


The Trajan alphabet with red-highlighted letters that do not appear in the Trajan's original version.

The simplified Trajan alphabets

There is a simplified Trajan letterform with grouping letters as in previous sections to help people observe the correlation among letters in groups easier.





ROMAN CALLIGRAPHY

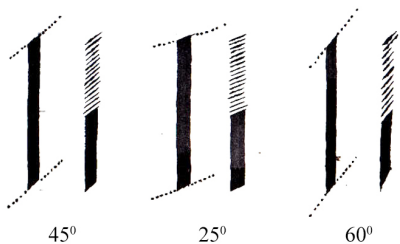
Now here comes the main content about Roman Calligraphy which is based on the knowledge of the previous section. This section is divided into 2 parts: Basic Roman Calligraphy (simpler and more basic, focusing on shape of letters) and Roman Calligraphy (more advanced, focusing on writing techniques).

THE BASIC ROMAN

In this section, we will briefly discuss some fundamental elements in Calligraphy and apply basic techniques to lettering.

The pen angle

The Roman Calligraphy is written by a broad nib or a flat brush. When the nib is placed on the paper, its direction against the horizontal line is called the pen tilt. For Roman Calligraphy in particular, the pen tilt is within 25°.



On the left, there are some illustrations of pen tilt. Same vertical stroke but once change pen tilt, the thickness of the stroke will be different.



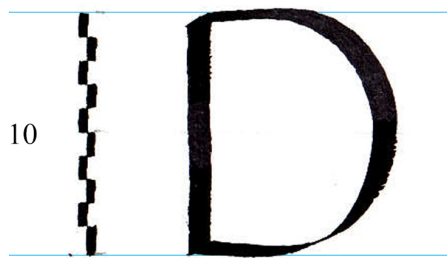
Above are examples of the pen tilt in Roman letters, including straight, diagonal and cursive strokes. Please note that in lettering, no matter what direction you may take, the pen tilt should remain the same.



Another example of a cursive stroke appearing in the S and a complete Roman-style B.

The height of letters

The height of letters in Calligraphy is determined by the width of the nib. In other words, each nib size specifies a different font height when it comes to the same ratio. The height of letters is determined by placing the pen in parallel with the horizontal line and drawing adjacent squares from top to bottom. As mentioned in the structure of the letter shape, the height of Roman letters is 10 units. We will use that ratio in this calligraphy section so that the height of Roman letters will take about 10 strokes.



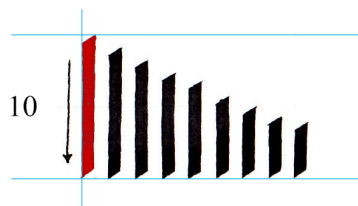
On the left is an illustration of how to determine the height of letters. At the same time, I will illustrate a basic D as an example of how to use letter within 10-stroke height.



Please note that the height of letters can be customized to the writer's will. This image depicts Roman letters written in the height of 8 and 5 strokes. The correlation between the height and width should be visually balanced and harmonized when changing the height of letters.

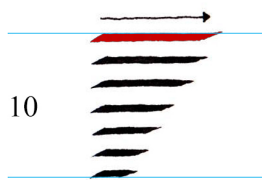
Basic Strokes

Basic strokes are factors that determine the overall balance and harmony. A good practice of basic strokes helps us observe the correlation among letters easier. Basic strokes can be slightly changed for specific letters, but the techniques are generally remained the same.



Practice the vertical straight strokes within different height levels.

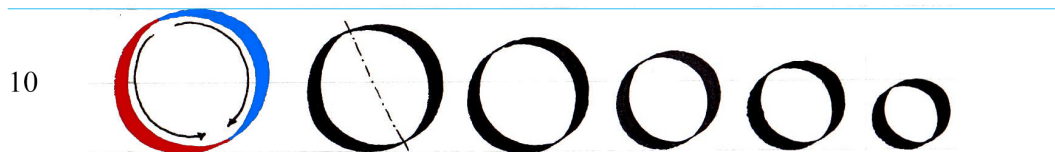
Vertical straight strokes: Vertical straight strokes are those written from top to bottom, parallel to the vertical line and perpendicular to the baseline. Pen tilt remains at 25°.



Horizontal straight strokes: By remaining the pen tilt, drawing from the left to the right and following the horizontal line, we will form a basic horizontal straight stroke that is commonly used in several letters.



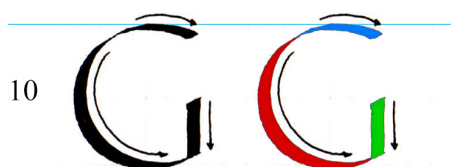
Diagonal strokes: There are 2 common directions for diagonal strokes. Depending on what direction the writer takes, the thickness will be different. These strokes are usually drawn with an angle of 60° from the baseline.



Cursive strokes: Curves are mostly contained in O-shape letters, which is written in 2 strokes (as illustrated). The intersection of these two strokes will form an inclined axis of 25° from the vertical line.



Wavy strokes: Wavy strokes are used for the letter S. The height of which is lower than that of the whole word, so that its foot and head strokes can be written at the top and bottom.



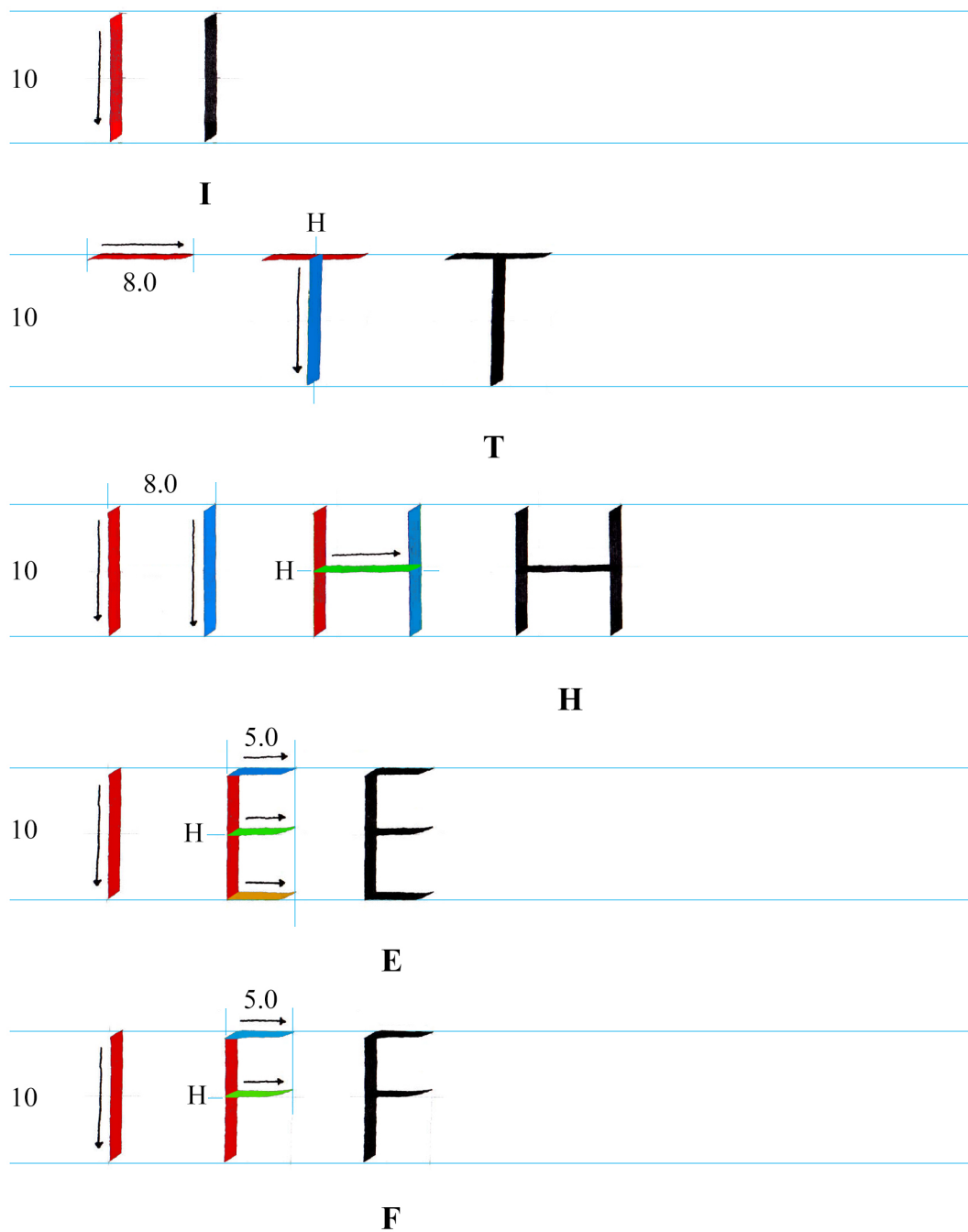
The letter G illustrated on the left is formed by 3 strokes. The first one is a left-part of the letter O; the top is a curve that also belongs to the O and a vertical stroke on the right.

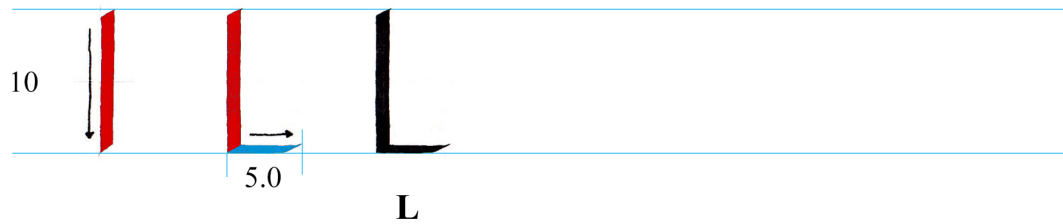
Note: When lettering with broad nibs, the two sides of the nib should be placed completely on the paper to ensure that the stroke is best formed (without defocusing at the edge). Remain the pen tilt when it comes to basic strokes.

THE BASIC ROMAN ALPHABET

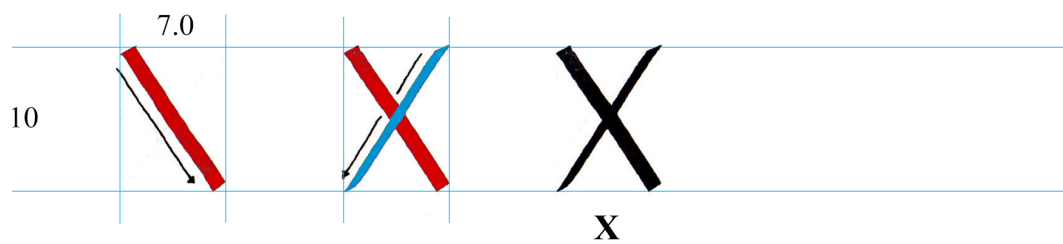
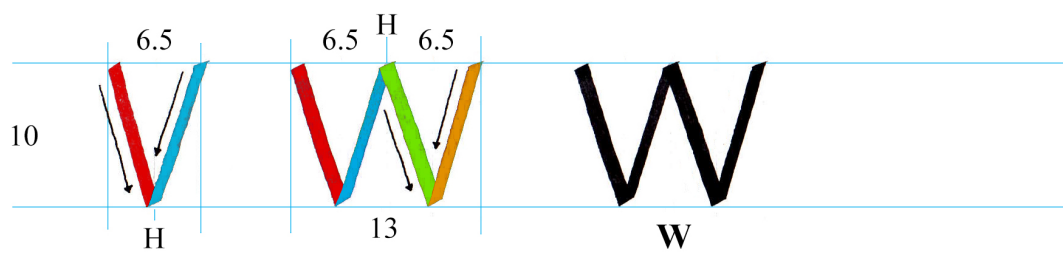
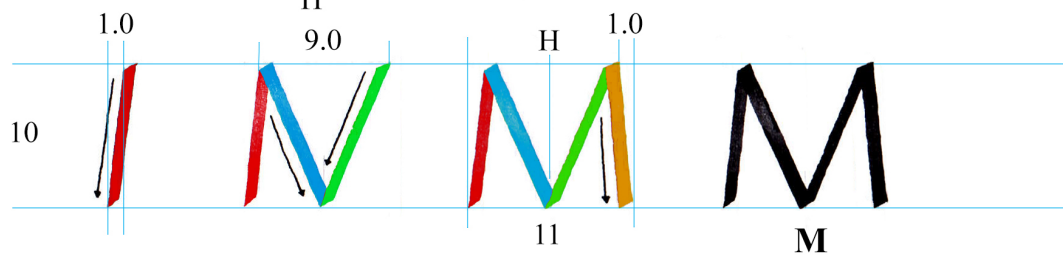
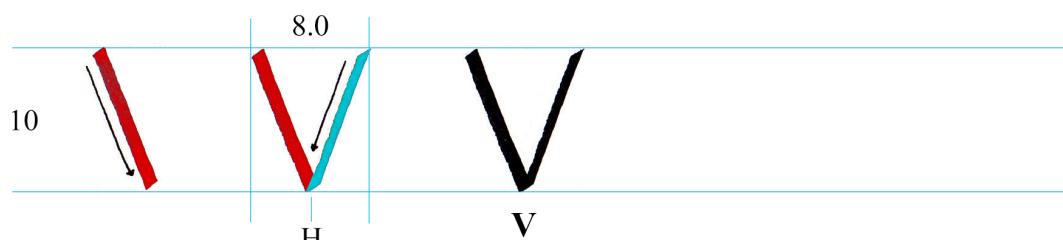
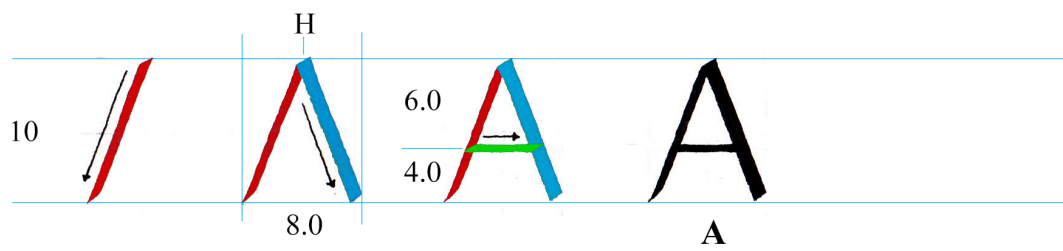
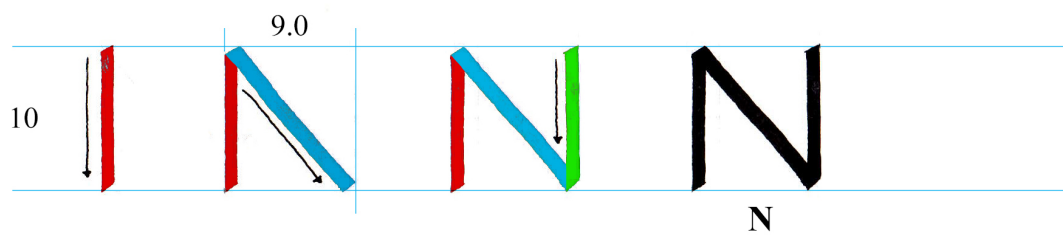
After mastering basic strokes, we will learn how to apply these strokes into lettering. For basic Roman style, letters are drawn based on the simple ratios (the figures were simplified in the previous section) and divided into groups of similar shapes.

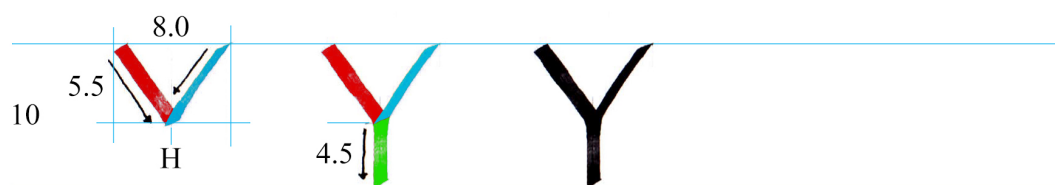
Group 1: I, T, H, E, F, L



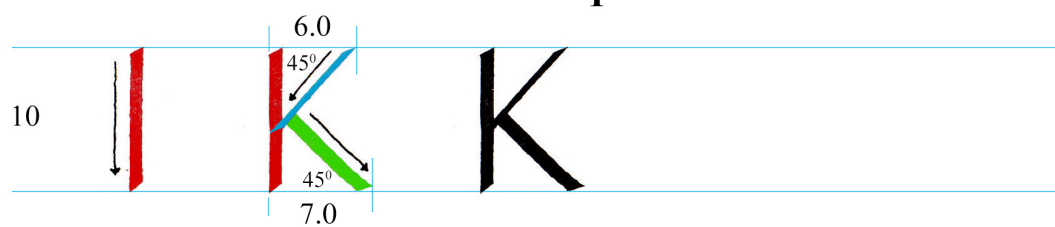


Group 2: N, A, V, M, W, X, Y, K, Z

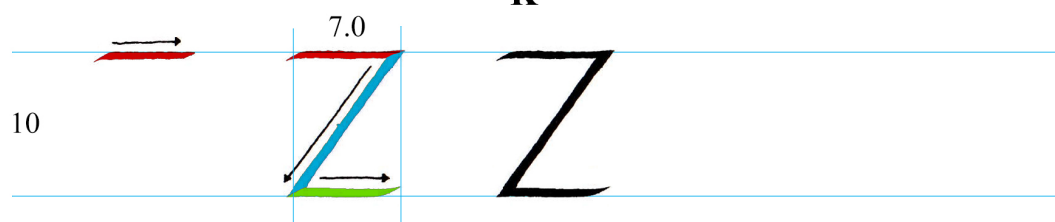




Y

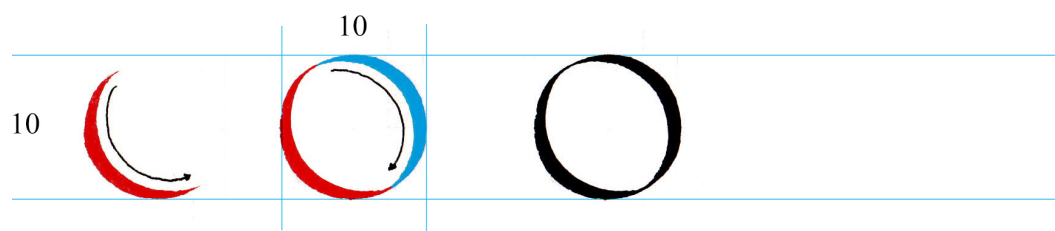


K

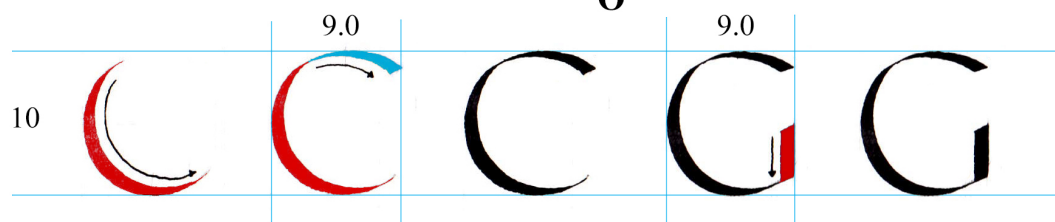


Z

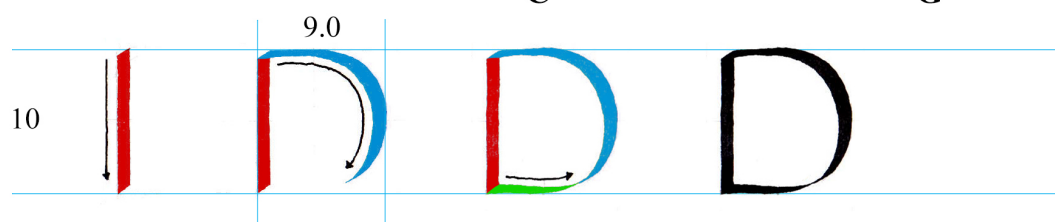
Group 3: O, C, G, D, Q



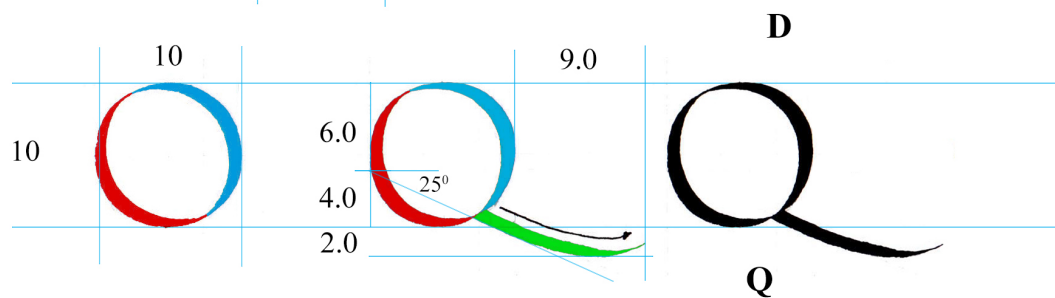
O



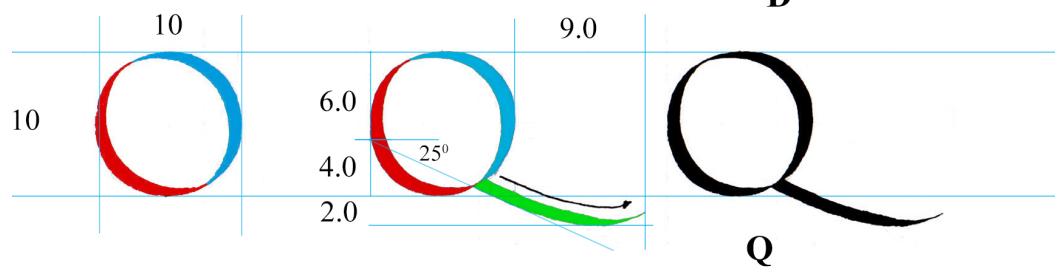
C



G

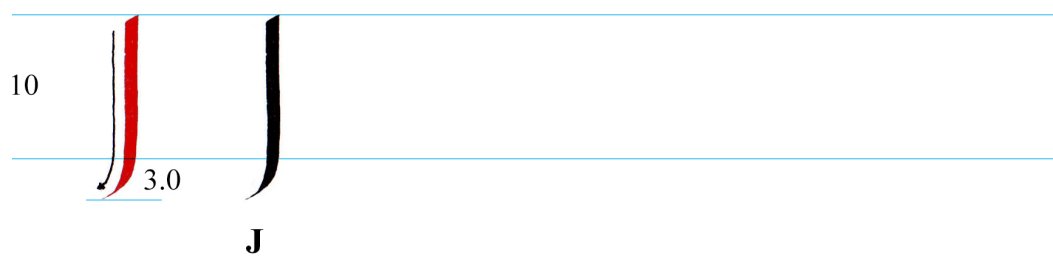
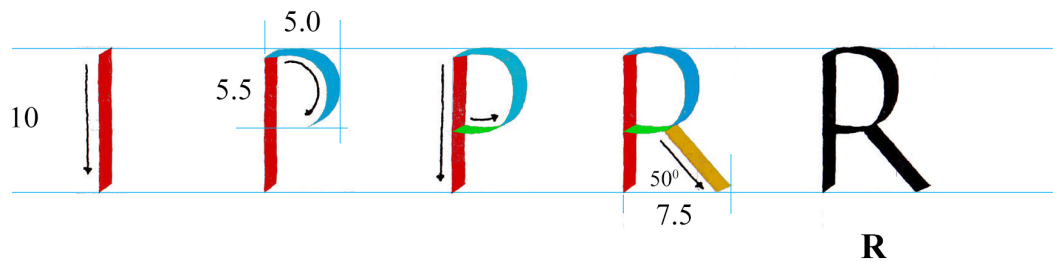
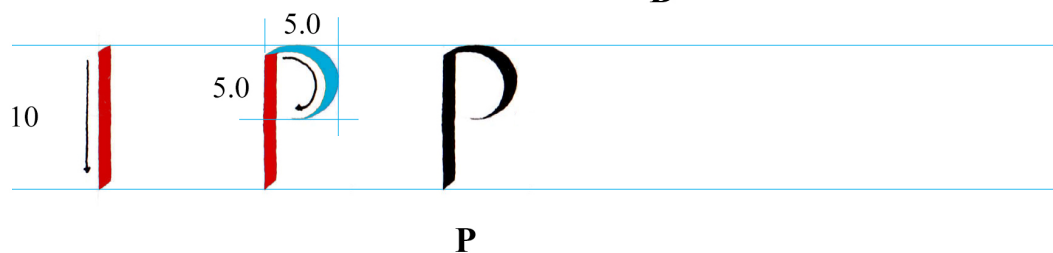
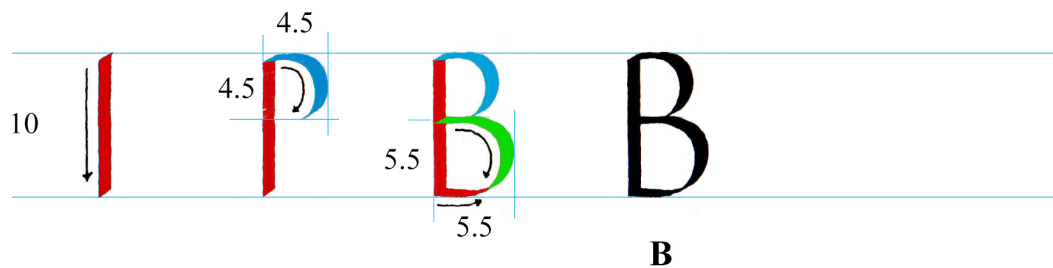


D

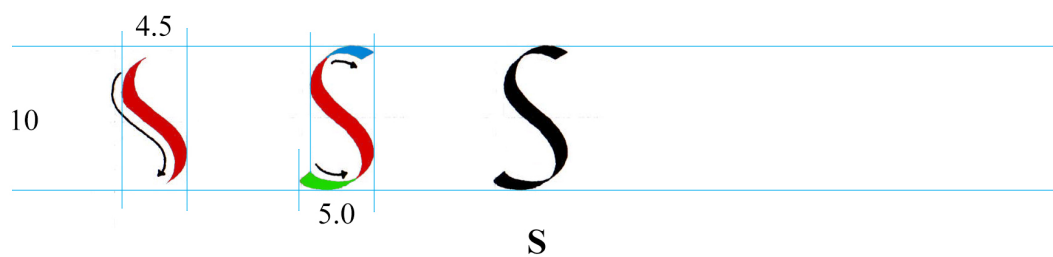


Q

Group 4: B, P, R, U, J



Group 5: S



BASIC TRAJAN ALPHABET

A B C D E

F G H I J K

L M N O P

Q R S T U

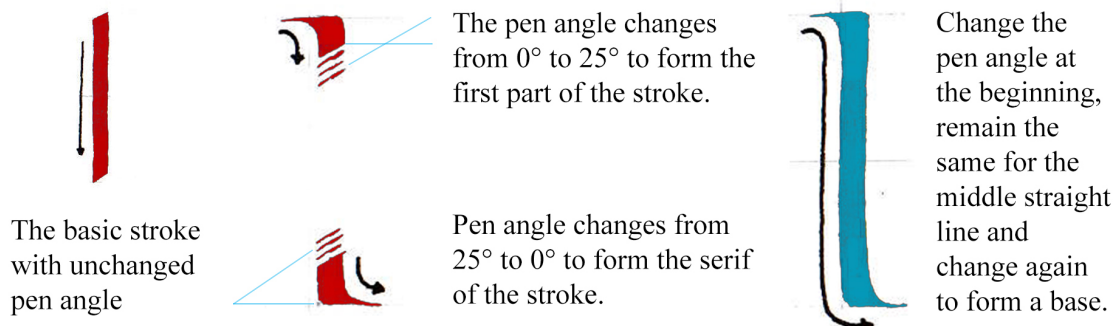
V W X Y Z

TRAJAN CALLIGRAPHY ALPHABET

Moving to the next section, we will practice lettering in Trajan style, also known as the Roman serif, with more advanced techniques. In the Trajan alphabet, we will not use the rounding ratio with relatively large error as in the basic Roman section. However, at the same time, it should not be too rigidly exact as when analyzed. Instead, we will round letter proportions in more details to show the correlation among specific strokes.

The vertical straight stroke

As discussed in previous sections, basic strokes in Calligraphy are crucial factors. In Trajan Calligraphy, basic strokes have one more important factor - the change of the pen angle. For basic calligraphy typefaces in general, the normal pen angle will remain the same. However, when it comes to more advanced typefaces like the Trajan, pen angle will change while moving to create strokes.

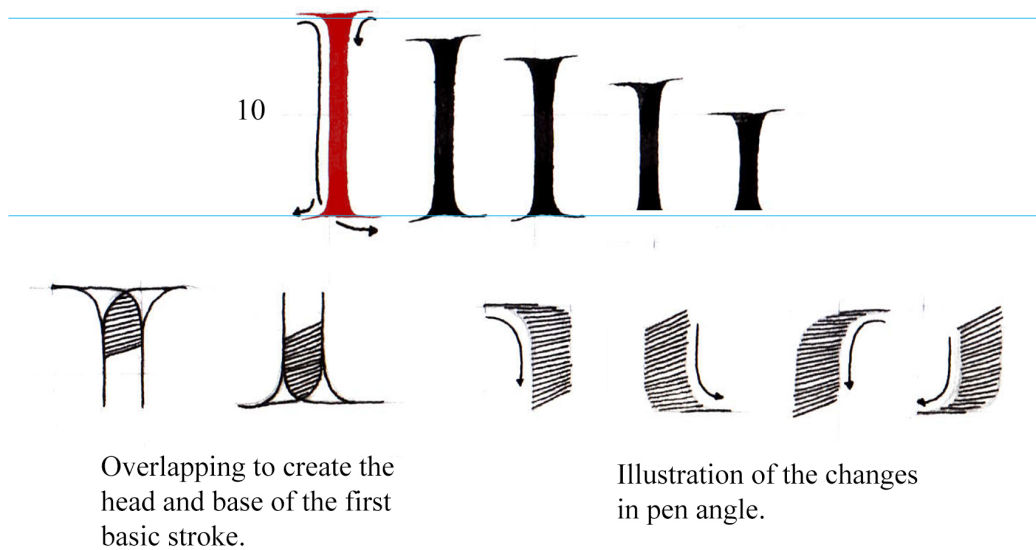
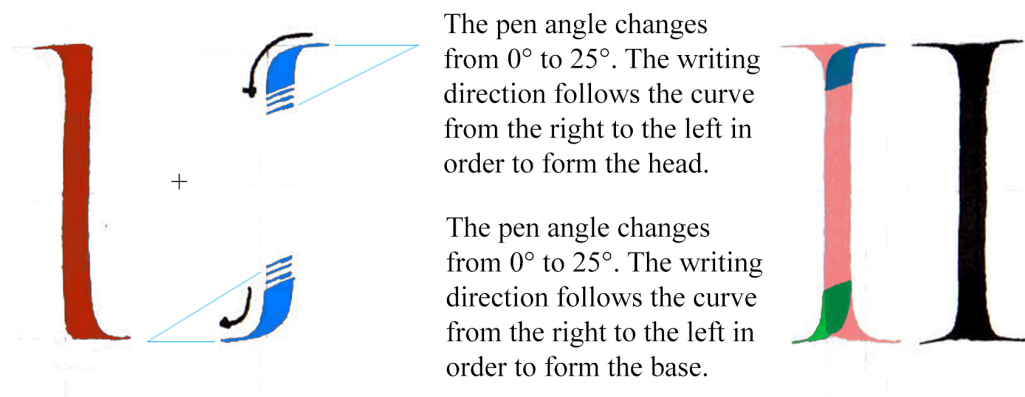


Remember the pen angle changing technique: Keep the body of the pen straight and nearly perpendicular to the paper for better the stroke control. The stroke still moves while changing the pen tilt (keep writing while changing the pen tilt). Move it smoothly and relax your wrist.



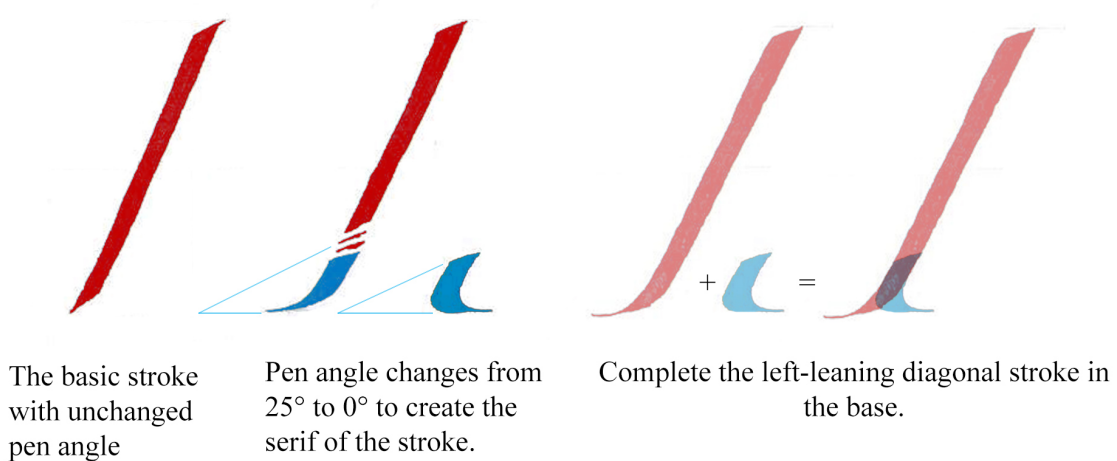
Practice with different height levels.

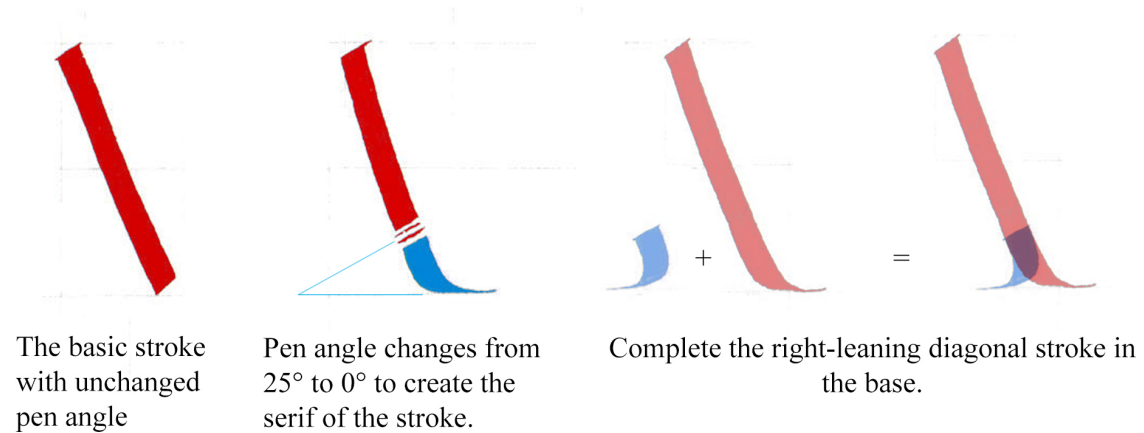
After practicing the first basic stroke, let's combine it with two other strokes to complete the shape of the letter I.



Diagonal strokes

The next basic stroke is similar to the diagonal strokes in V, W, A, etc. In order to create the base, we will use the pen angle changing technique mentioned above.





Besides the oblique formed by two strokes, there is also another type worth practising - the diagonal stroke that has the base created by one single stroke. Although the pen angle is also changed, this stroke creates a wider curvature.

Horizontal straight strokes

Horizontal straight strokes are within T, H, L, E, F, etc. and a part of the S base. Depending on specific letters, horizontal strokes change their pen angle to different angles.



The first horizontal stroke starts with the pen angle of 25° and ends with 90°.



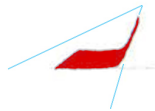
The pen angle is changed.



Finish the first horizontal straight stroke for letters like T, C, etc.



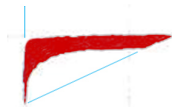
The second horizontal straight stroke starts with the pen angle of 25°. In the end, the pen angle changes to approximately 80° with the pen pointing up.



The pen angle is changed.



Finish the second horizontal straight stroke used for letters like E, L, etc.



+



=



The third horizontal straight stroke starts with the 80° or 90° pen angle, then change to 25°. This stroke is often combined with the first horizontal stroke to create a T-shaped head.



The fourth horizontal straight stroke starts with the 90° pen angle, similar to the third horizontal stroke, but its writing direction is opposite to create the S-foot section.



Curving strokes

For the Trajan alphabet, the curvature is the same as the O-shape stroke in basic Roman alphabet.

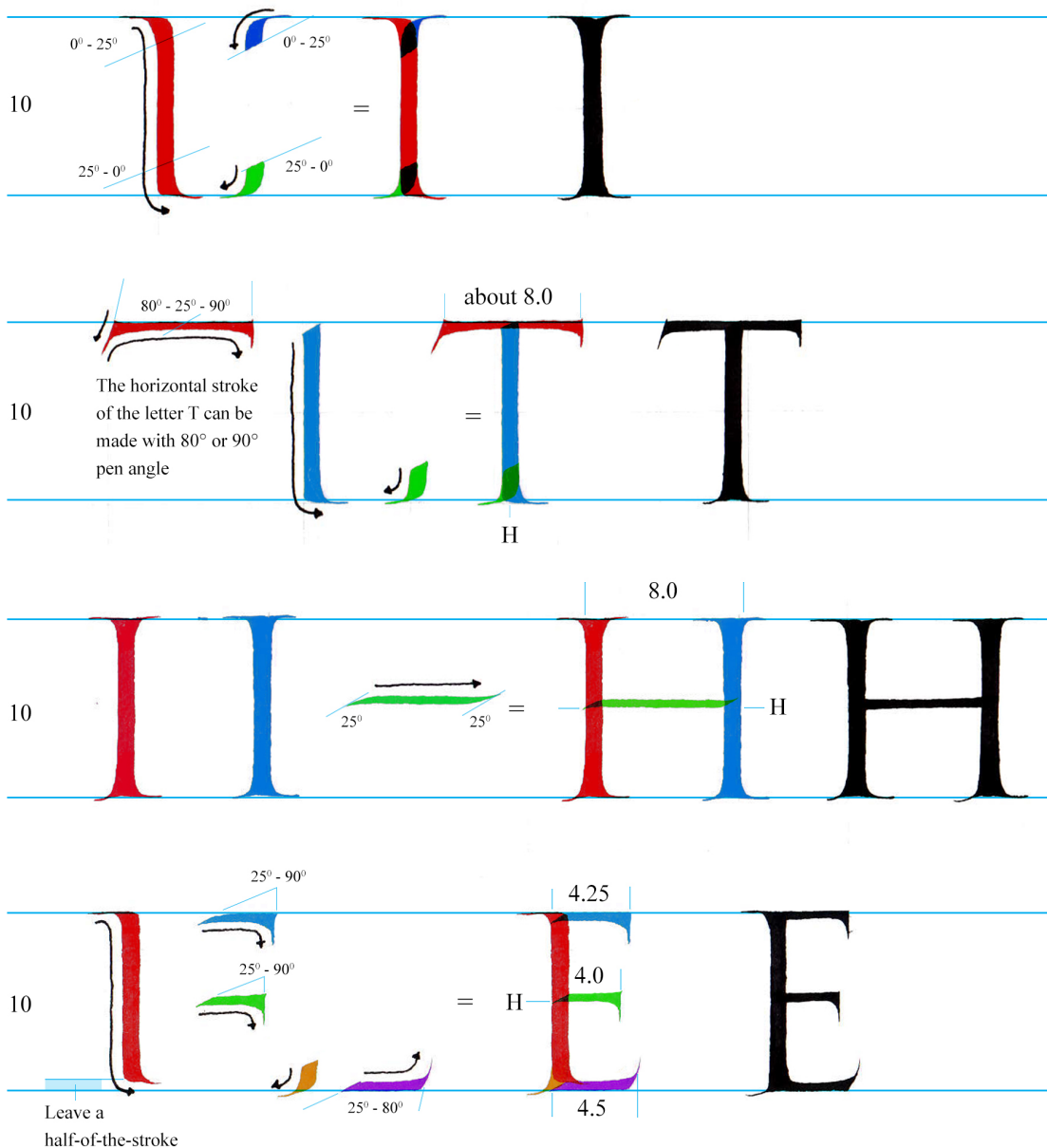
THE ALPHABET

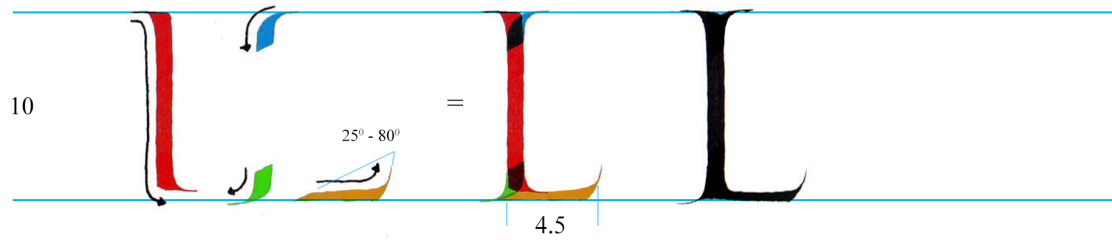
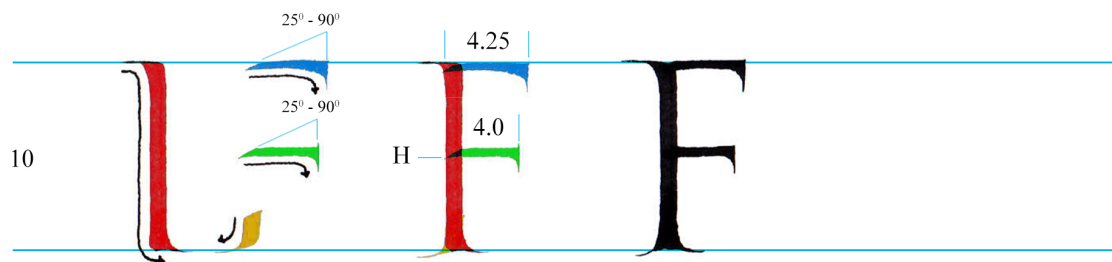
When you have finished drawing basic strokes and learning about the changing pen angle technique, let's have a look on Trajan Calligraphy in details. This time, it comes with a full description of letter proportions as well as the overlap of individual strokes. The Trajan alphabet will also be divided into groups of similar shape.

Note

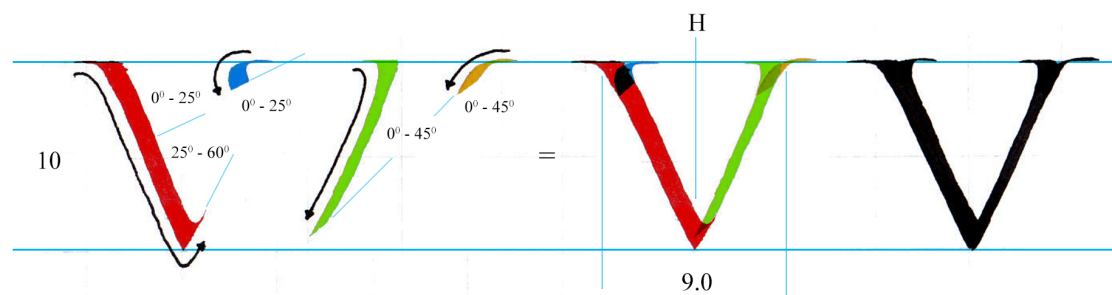
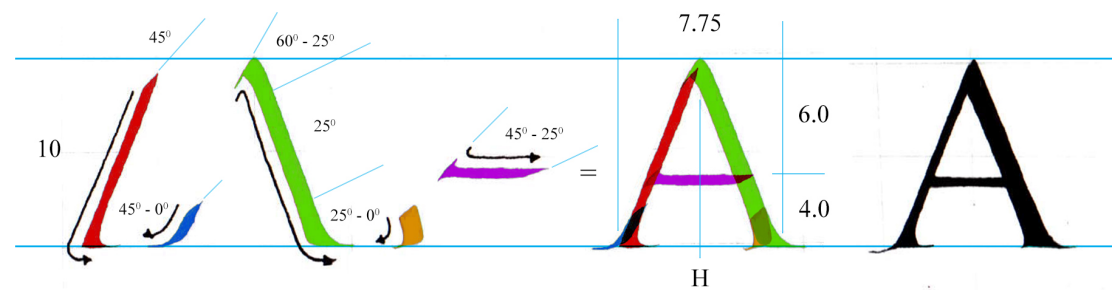
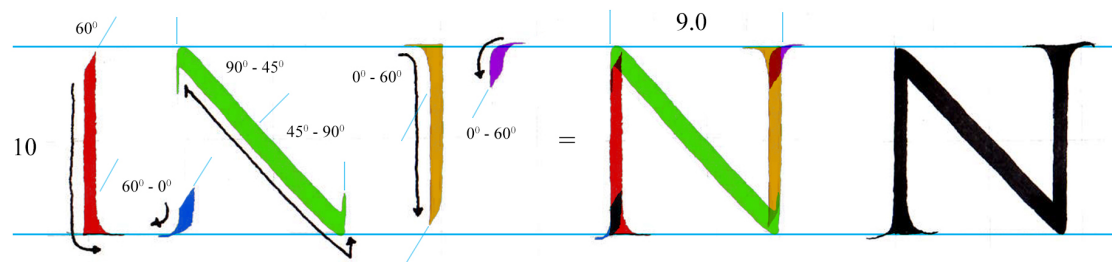
<u>The strokes order</u>	<u>Pen angle</u>	<u>The letter proportions</u>	<u>The direction</u>
 1 2 3 4 5 6	Example: $25^{\circ} - 70^{\circ}$ Pen angle is changed from 25° to 70°	Example: 9.75 Stroke with 9.75 length	

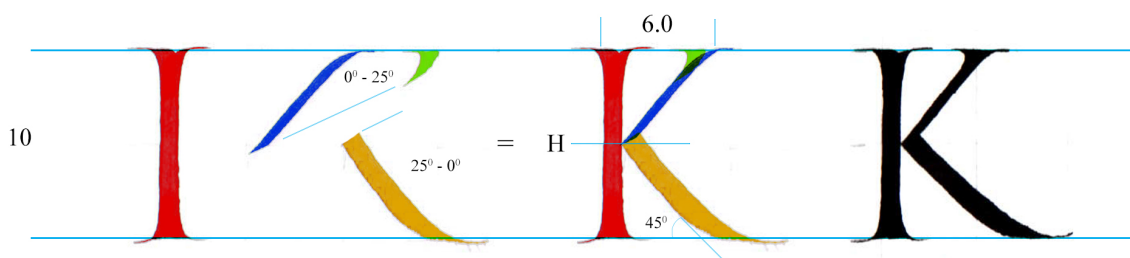
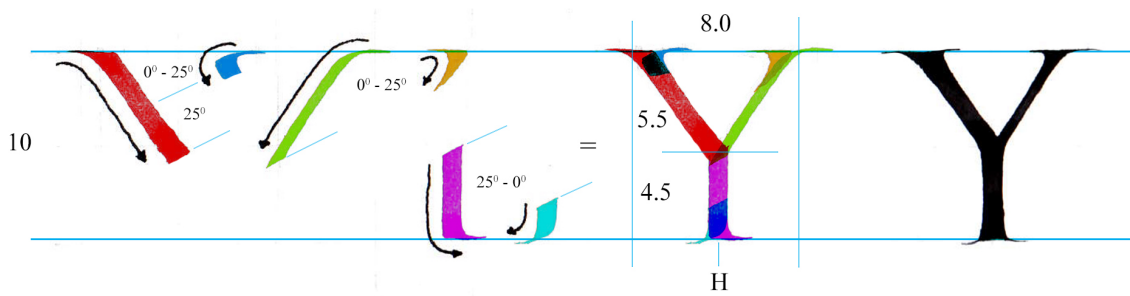
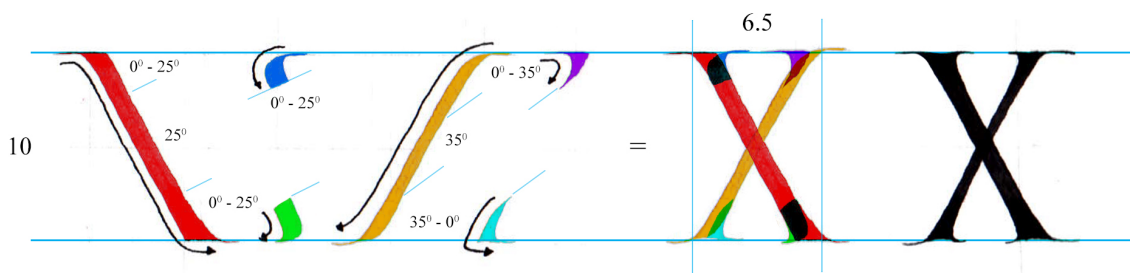
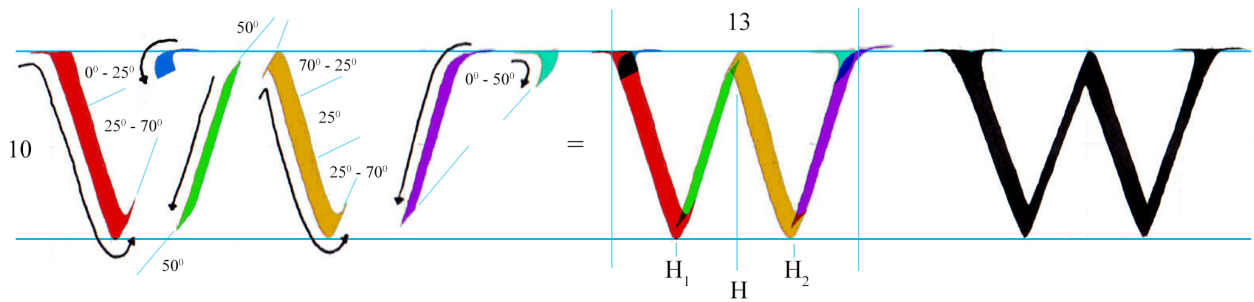
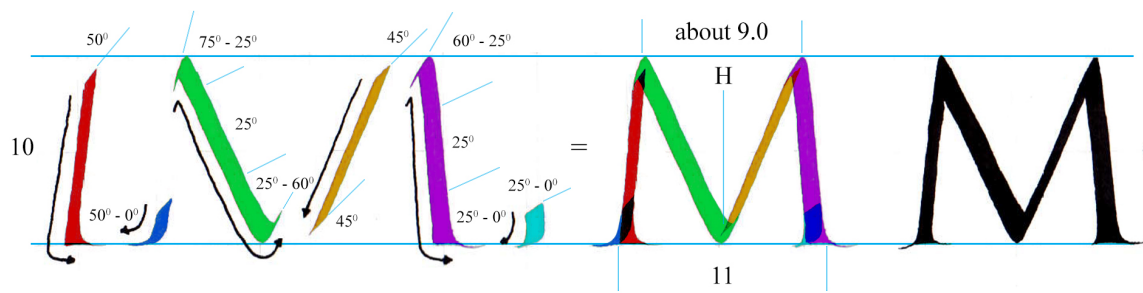
Group 1: I, T, H, E, F, L

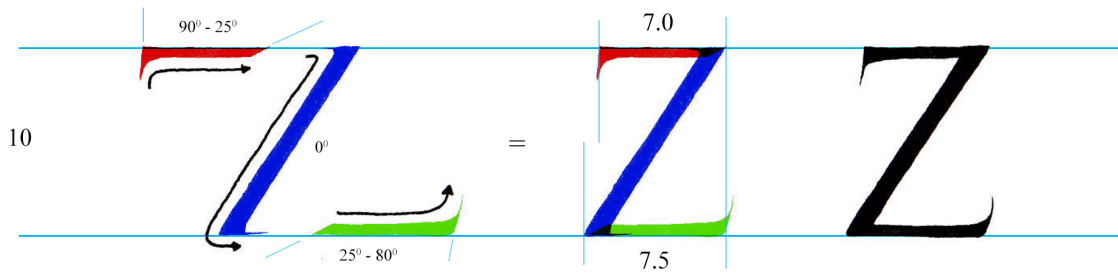




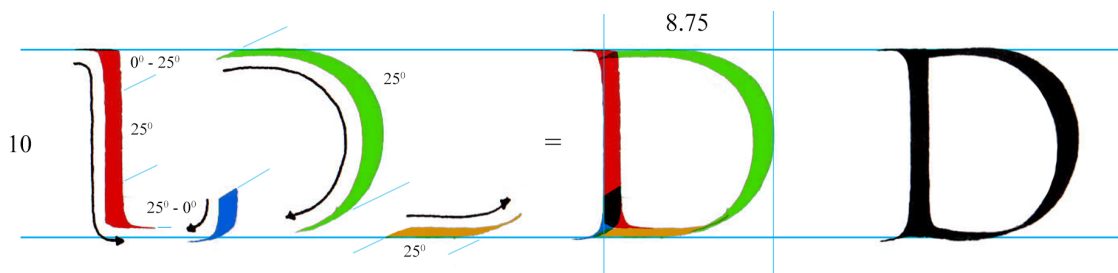
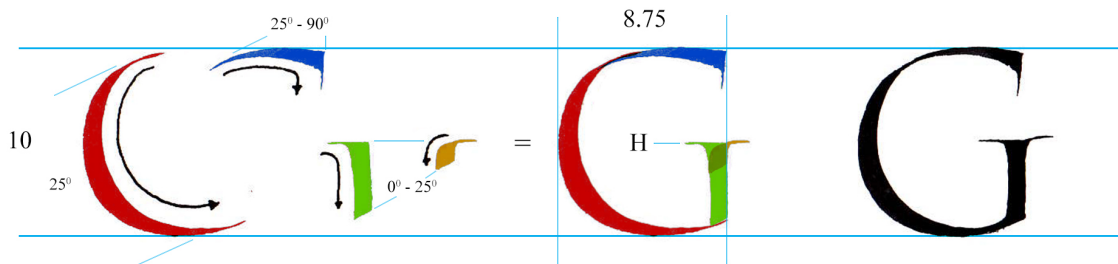
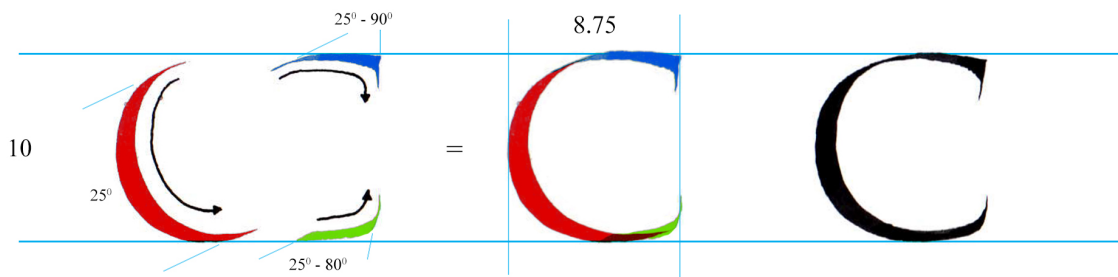
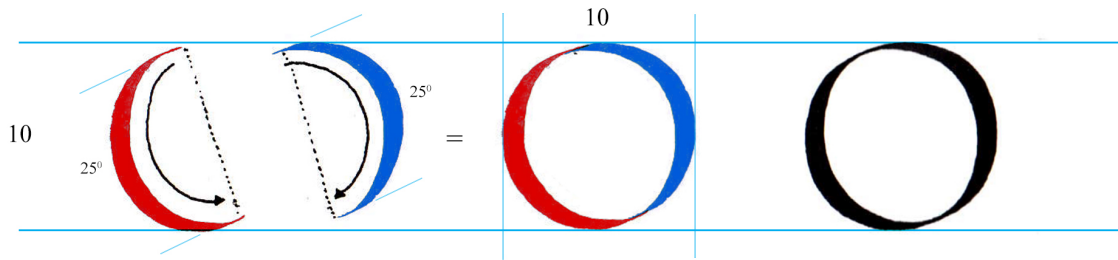
Group 2: N, A, V, M, W, X, Y, K, Z

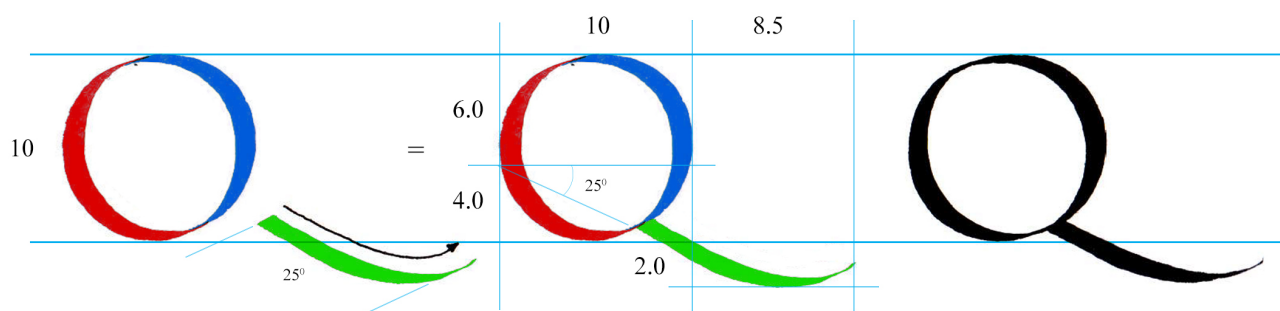




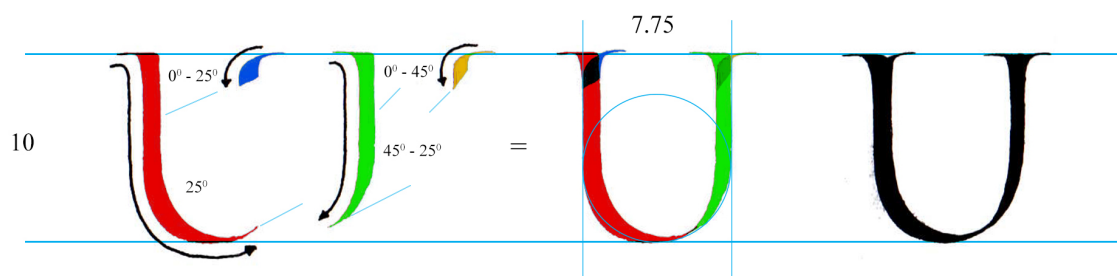
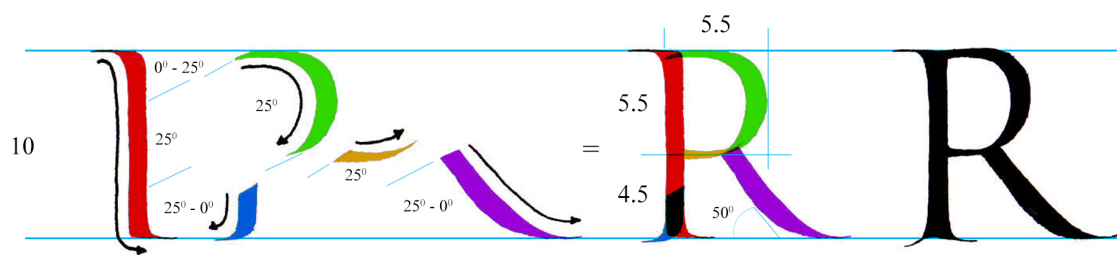
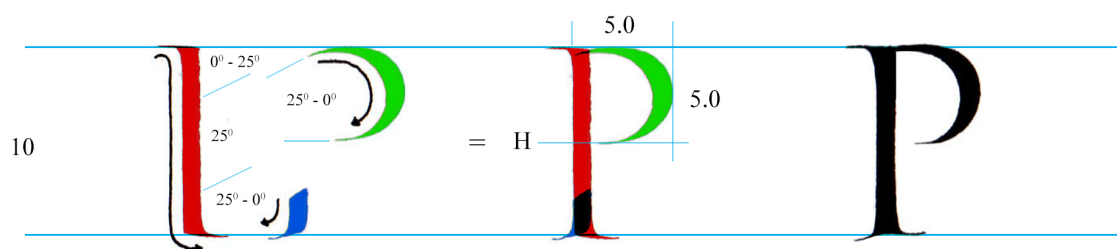
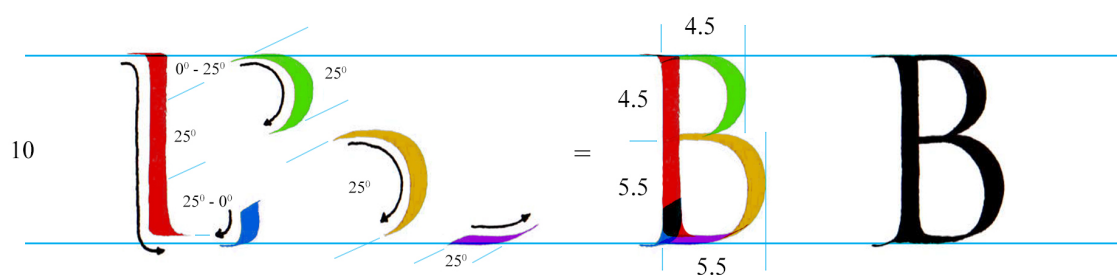


Group 3: O, C, G, D, Q



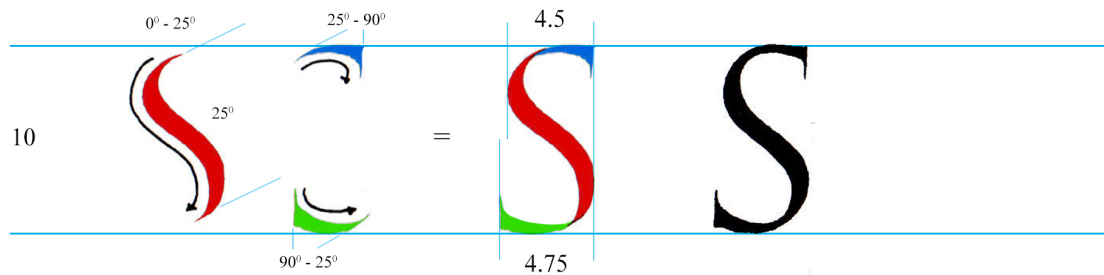


Group 4: B, P, R, U, J



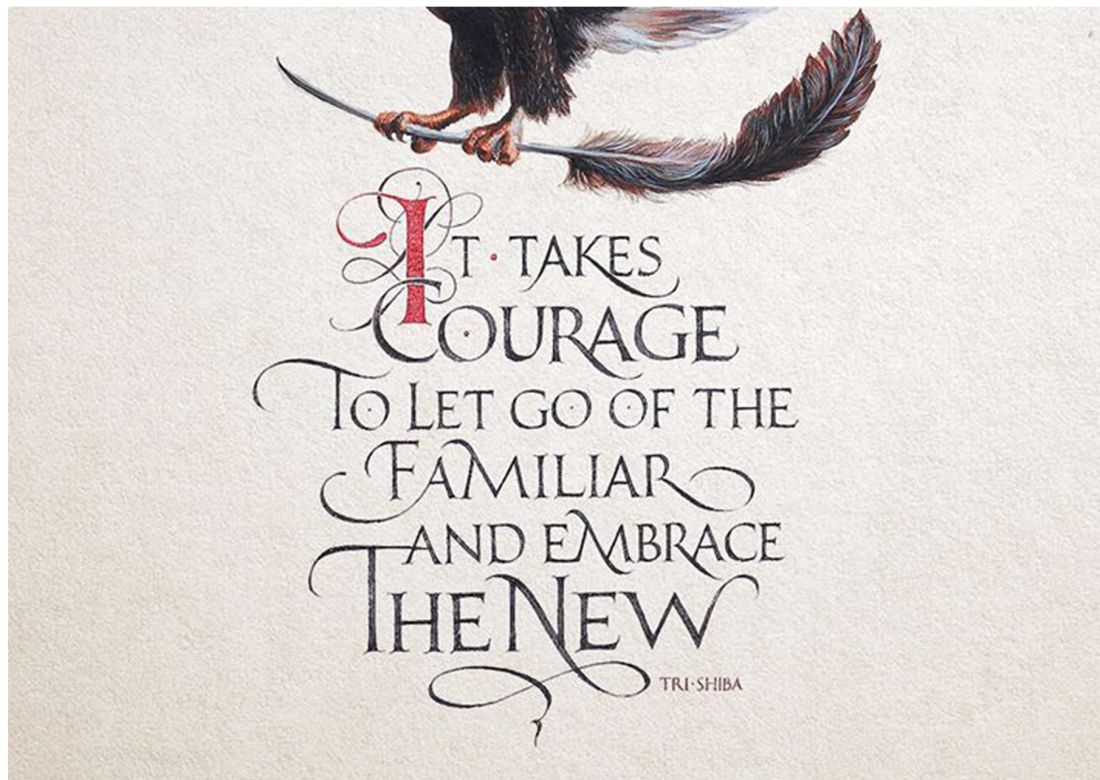


Group 5: S



Notes

Letter proportion rules in Calligraphy does not need to be exactly followed. However, at the beginning, the most accurate proportion can help us build the habit of forming letters. Then, we will be able to change the proportions as we please while still preserve the visual harmony and balance of the letter.



COMPLETE TRAJAN ALPHABET

A B C D E

F G H I J

K L M N

O P Q R S

T U V W

X Y Z

A B C D E

F G H I J

K L M N

O P Q R S

T U V W

X Y Z