Caeciliae

A Free Gregorian Chant Font

***Note:** This document describes a tool that is still in development. Many of Caeciliae's features, keys, styles, and metrics will be adjusted and changed before an official release.*

Introduction 2
- Features 2
- Requirements 3

Tutorial: Crux fidélis 4
- Drawing the clef 4
- Inserting empty staff lines 5
- Inserting neumatic elements 6
- Podatus and clivis 6
- Decorator marks 7
- Manual neumes 8
- Staff divisions 8
- Other common elements 9
- Ending the line 10
- Expanding our repertoire with lines 10
- Liquescents 11
- Additional glyphs 12

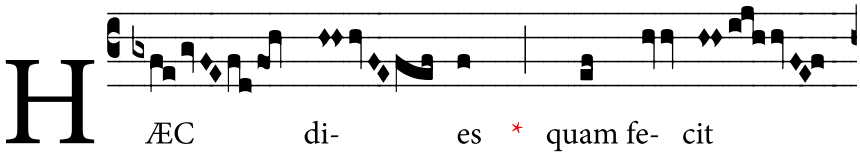
Reference 12

Appendix: Samples Antiphons 13

Caeciliae

Introduction

Caeciliae is a font designed to assist in the notation of "modern" (square note) notation of Gregorian chant. It does not have characters for writing the text of the chant, but rather contains many glyphs that can be combined to create the music line of the chant. Here is an example of what Caeciliae looks like in use:[1]



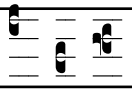
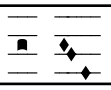
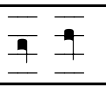
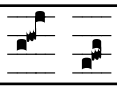
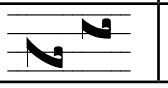
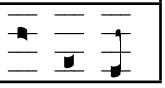
Response after the reading for Laudes on Easter Sunday. Source: *Antiphonale Monasticum* I (2005) 221.

Features

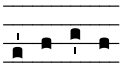
Caeciliae was not designed to store neumes, but rather to provide all the elements that make up common neumes. Thus, Caeciliae contains many glyphs to be used. Here are a few examples (some of these are actually composites made out of several glyphs—this is explained below):

1 Caeciliae was designed for use on printed paper. Sometimes artifacts will be noticed when viewing Caeciliae on a computer screen: small variations in line widths, misalignment of neume elements, etc. This is due to small rounding errors in word processing application that must try to render the glyphs in Caeciliae. If some of the glyphs in this document are not exactly aligned, it is probably simply due to viewing it on a computer screen.

Hopefully this problem can be mitigated in the future by better hinting in the font, but if you need precise conversion to bitmap image formats, there are simple techniques to eliminate rounding errors before rasterizing the glyphs. See Caeciliae's website (http://www.marello.org/caeciliae) for more information.

Clefs	Punctum	Virga	Podatus/Pes	Quilisma	Porrectus	Liquescent
						

Also: flats (and naturals), hollow notes, custodes, oriscus, etc. Caeciliae also contains other glyphs that might be useful:

- Punctum mora, which can be added to nearly every element, e.g.:
- Horizontal episema, e.g.:
- Vertical episema (ictus): e.g.: 

Requirements

Caeciliae is designed using OpenType, which is a font specification that allows for more advanced font features and "intelligence." Caeciliae leverages OpenType technology to allow the user to quickly enter complex Gregorian chant notation using common Western computer keyboard layouts.

Unfortunately the support for OpenType features utilized by Caeciliae for easily inputing the glyphs is limited to only a few applications designed for desktop publishing. Although the full range of glyphs contained in Caeciliae are accessible through most word processing applications that support Unicode, some might find it too cumbersome to use such applications to notate anything significant. At the time of this writing, desktop publishing applications from Adobe (InDesign, Photoshop, Illustrator) of version CS2 and above support all of the fea-

tures contained in Caeciliae. Windows Vista contains a framework for the necessary support for the OpenType features used in Caeciliae, but unfortunately few applications yet take advantage of this.[2]

Microsoft Word 2007 seems to support the ligatures that Caeciliae uses to facilitate input (though their support of ligatures is not official, so it is not clear how long this will work). However, Word does not handle spacing (kerning) of the characters according to defined OpenType specifications.[3]

Tutorial: Crux fidélis

Caeciliae is not difficult to use, but it is a bit awkward to describe how it works. The easiest way is to simply do it. This short tutorial should help demonstrate the basic use of Caeciliae. We will start by looking at how to create the staff of the first phrases of *Crux fidélis*, a relatively simple piece of chant.

Drawing the clef

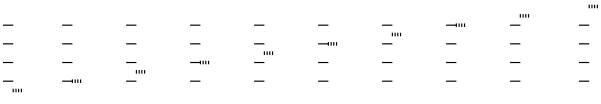
Type 'd'. You will see a Do-clef symbol that looks like this: . This is the default Do symbol, but because *Crux fidélis* is in mode I, we want to put the Do clef on the top most line. How do we do that?

2 Ironically, Notepad in Windows Vista currently has better support for OpenType than most other sohpisticated Word processing applications (including Microsoft Word 2007!). Unfortunately Notepad does not have the important ability to layout text like desktop publishing applications do.

3 Although Microsoft Word supports kerning, it seems that it does not correctly apply kerning rules for ligatures, even when it employs the ligatures correctly. Word will apparently use the glyph widths of the constitutive chraacters rather than the single width of the ligature glyph itself. If anybody knows more about this issue, this author would be interested.

Delete the clef you just entered, and type ‘7’. You should see a dotted line that looks like this: ( ). Then type ‘d’. The dotted line will be replaced by a Do clef that looks like this: . Notice that the Do clef is centered on the dotted line that appeared when we typed ‘7’. What just happened?

When 0-9 precede other characters, Caeciliae uses them to determine at what height you want the neume elements to be inserted. So you could also type ‘5’ ( ) then ‘d’ and you will see the Do clef look like this: . The keys 0-9 correspond to spaces and lines on the staff:[4]



If you inserted other clefs, delete them so we are just left with the one we need, ‘7d’, . Be sure to delete stray numbers you may have inserted in the process or your clef might show on a different line.

Inserting empty staff lines

Now we need to put a few empty staff lines to give us some space after the clef. Type ‘=’ once or twice to insert some empty staff lines. Typing ‘-’ will insert staff lines of half the size. (There are also other keys that will insert staff lines with different widths. This allows finer control over spacing between neumatic elements. See the reference below.)

4 For symbols below 0, use ‘A’ and ‘B’; for symbols above 9, use ‘Z’.

Inserting neumatic elements

Now we want to start writing the neumes of the piece. Inserting punctums works in the same way as the clef. We notice that the first neume of *Crux fidélis* falls on the lowermost staff line, which corresponds to 1 in Caeciliae's height system. Press '1' () followed by 'p'. You should see . Insert some empty staff lines by typing '=', , a few times. The next neume in *Crux fidélis* falls on the space between the lowest lines, which corresponds to 2 in Caeciliae. Type '2p' , followed by some empty staff lines.

Podatus and clivis

Now we need to insert a podatus for the syllabal 'dé' in fidélis. Because a podatus has a lower note and an upper note, we type in two height indicators, followed by 'P' (uppercase!). In the podatus we need here, the lower note is at height 4, and the upper is at height 5. Type '4' followed immediately by '5'. You will see two dotted lines that looks like this: . Then type 'P', and you will see a podatus that starts at 4 and ends at 5: . The podatus can be used at other heights just as easily. For example, '36P' ( ), '15P' (), '68P' (), etc.

The clivis follows the same pattern as the podatus. Just enter the upper height first, followed by the lower height, and then type 'C'. In the case we see here, we would type 54C: .

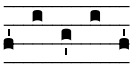
The next few notes of the piece should now be easy to enter. Try it out yourself. Stop when you reach the clivis with the horizontal episem. (If you get stuck, try this: 5p==7p==76C).

Decorator marks

Caeciliae has the capacity to decorate neume elements with various symbols. This includes the horizontal empisema, the vertical episema (ictus), the puntum mora, etc. Before we discuss how to get a clivis with a horizontal episema, let's look at how to get decorators on a simpler symbol, the punctum.

Type '5p': . To add a punctum mora, simply type a period. You should then have: . Caeciliae tries to anticipate where you want the punctum mora placed by looking at the height of the preceding glyph. In this example, the height of the punctum was 5, so Caeciliae placed the mora at the same height. If we type in '3p.' or '6p.', we will see the following, respectively: and .

To insert a horizontal episema, the same principal applies, but you use an 'h' or 'H' instead of a period. An 'h' will place a horizontal episema below the neume element (thus, lowercase 'h'), and an 'H' will place a horizontal episema above the neume element (thus, uppercase 'H'). For example: '3ph': ; '3pH': ; etc.

The ictus works exactly the same using 'i' (below) and 'I' (above); 3pI==6p==4pi==6p==3pI: 

These decorators can always be forced to certain positions by immediately preceding them with a height indicator of their own. This can be useful when you prefer a decorator to appear in a different location other than the default. For example, in certain cases you might prefer to mark as . To accomplish this simply type in '1p0.' which will force the mora to the zero position. This technique is also necessary if you want to place the mora on a podatus. The first mora after a podatus will use the second height specified, but after that you must

manually indicate the height of the lower mora: (=23P.2.=). This method can be useful on a clivis too:

(54C.5.=).

This brings us to the next neume in our example. How do we enter ?

Manual neumes

The horizontal episema will not span the clivis automatically. In this case we must insert the clivis element by element.

Type in '5c' on the staff. 'c' creates only the first glyph of a single-step clivis. Then type 'H'. Now we should have . Then type in '4p': . Now we must extend the horizontal episema over the second element of the clivis, but if we just type 'H', it will put it lower than we want (it will look like , 5cH4pH). Instead, we can simple precede the second 'H' by a height indicator of 5 to force it to line up with the higher horizontal episema. Our final string should read 5cH4p5H, which looks like: . See below for instructions on how to create a manual clivis that spans more than one height.

Staff divisions

Inserting the various staff divisions is easy. A '+' creates a quarter bar (), a ';' creates a half bar (), a '|' creates a full bar () and two '|' together ('||') create a double bar division (). That concludes the first phrase of *Crux*

fidélis and now you should be able to do the large majority of the rest of the piece if you wish. Now we will look at other elements in Caeciliae that will allow us to notate most any Gregorian chant.

Other common elements

There are many other common elements that are easy to input:

- *Virga.* The virga is bound to the 'v' key. Thus 4v creates and 7v creates .
- *Punctum inclinatum.* Puntum inclinatum are bound to the 'n' key. The spacing for the punctum inclinatum is a bit more important. It looks better to place space after the virga element, and between inclinatum that span more than one height. For example, (5v-4n3n) looks better than (5v4n3n), and (4n3n-1n) probably looks better than (4n3n1n).
- *Quilisma.* The quilisma is bound to the 'q' key: (3p4q5p).
- *Upper podatus.* Sometimes you will only want the upper portion of the podatus. This can be done by simply using one height indicator with 'P' instead of two (which would create a full podatus). For example, this can be useful for creating a podatus quilismaticus: (1p2q3P).
- *Porrectus.* The porrectus is input in the same way a clivis is: first the upper height, then the lower height, and finally by typing 'r'. A porrectus usual coexists with other elements: (4p53r4P).
- *Fa clef* ('f'; only valid at heights 5 and 7): (5f==).
- *Flats and naturals* ('b' and 'a', respectively; these only work in the heights between the lines of course): (=6b-5p6p5p=), (6b-6v-5n4n3ni-6a-6p).

Ending the line

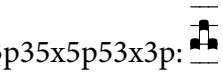
Other Gregorian chant fonts are designed with characters that have consistent widths throughout. For aesthetic reasons, Caeciliae avoids this method. This means that characters and spacing can more closely approximate the the fluidity of 'moveable type' chant notation techniques. However, this also presents a problem of its own: how can we end up with consistent line lengths if the character widths are not consistent?

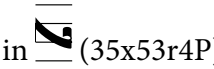
Using the tab features of your desktop publishing application makes it simple to create consistent line lengths. Create a right justified tab where you want the line to end. Specify a 'leader' for this tab as the '/' character. (In Caeciliae, the '/' character is a specially designed character that includes staff lines that overlap to the right and left.) This will create solid staff lines from the last glyph to the tab stop.

Finally, if your line needs a custos, you can insert it using 'u': (=8u =3u =2u). Sometimes the custos or end of line may need to be preceded by a '/' in order to eliminate spaces between staff lines, depending on how your word processor handles tabs and leaders.

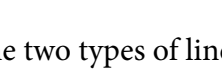
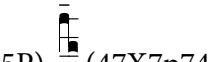
Expanding our repertoire with lines

Caeciliae includes two types of vertical lines used for composing more sophisticated neumes. Lines are not intended to exist on their own, but are meant to exist next to neighboring neume elements.

The first type of lines are connecting lines. These lines are intended to connect two elements at different heights. They are entered using two height indicators followed by an 'x'. For example, to create a torcullus you could enter 3p35x5p53x3p:  (note that lines can be specified from the bottom or the top).

Connecting lines are great when there are glyph elements at both ends, but unfortunately they are not ideal when they are hanging down without an element combining at the lower end. For example, the line hanging off the porrectus in  (35x53r4P) is not aesthetically pleasing because it joins to the staff line. It would be more appropriate to have it represented as (35X53r4P). This is exactly what decorative lines do.

Decorative lines are designed to be used with an element connected only at the upper end. The hang down a little more (also depending on whether they end at a space or a line). Decorative lines function exactly the same as connecting lines, but they are entered using 'X' instead of 'x'.

Using the two types of lines above, we can create many more neumes:  (2p3q35x5P), (2p25x53r35x5P),  (47X7p74x7p), etc. Using decorative lines judiciously can create for very natural looking neumes.

Liquescents

Entering liquescents requires only a few more keys. 'L' and 'l' serve to create descending liquescents, and 'K' and 'k' create ascending liquescents. (Like the episemas, the case of the letters helps to remember what placement

the element will take: ‘L’ and ‘K’ are the upper elements of the liquescent, and ‘l’ and ‘k’ are the lower elements.)

For example: (4L3l), (6k7K), (1k15x5K), (57X7L75x5l), etc.

Additional glyphs

There are other glyphs included in Caeciliae:

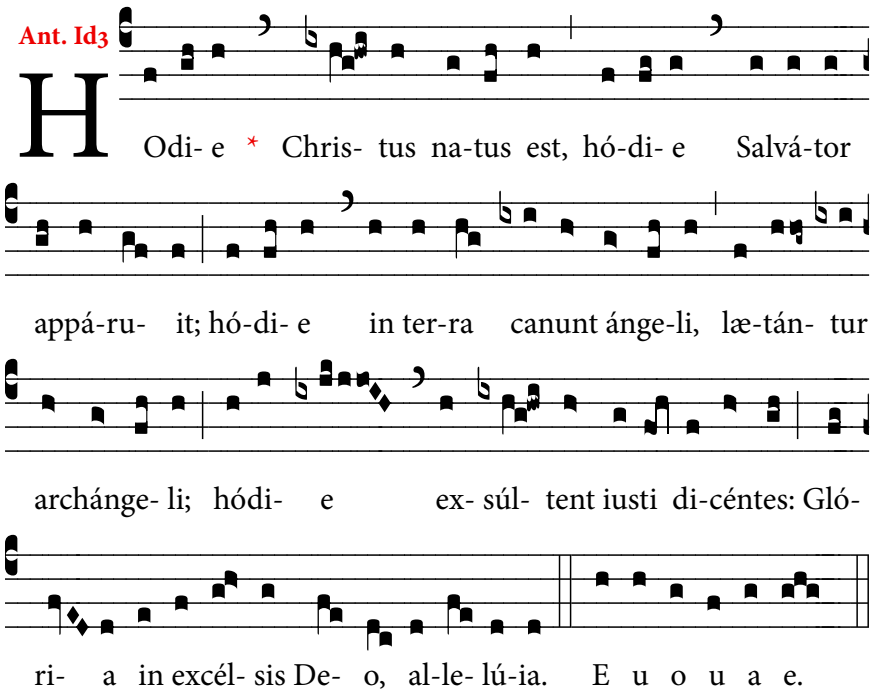
- Hollow notes (‘w’): (=5w=).
- Strophicus (‘s’): (=5s-5s-5s=).
- “Comma” (‘,’): (=,=).
- Quarter-note and eighth-note rests for instructional purposes (to be implemented).

Reference

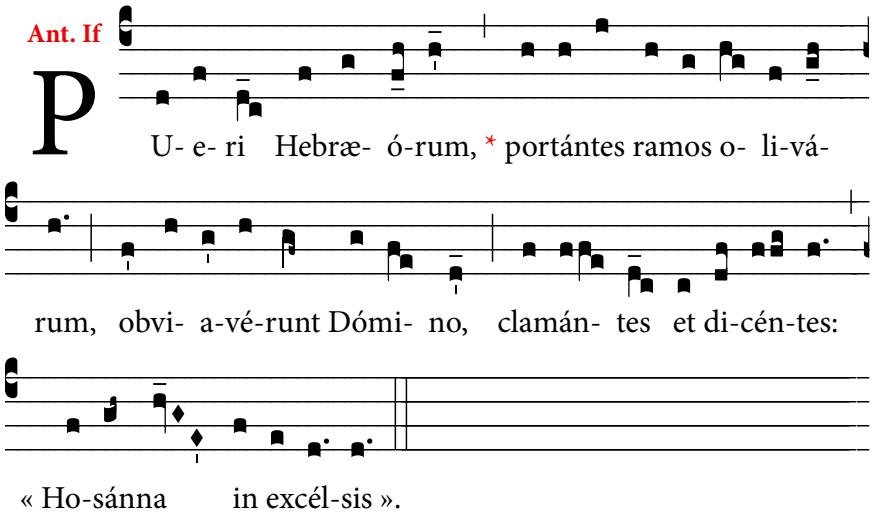
To be written!

Appendix: Samples Antiphons

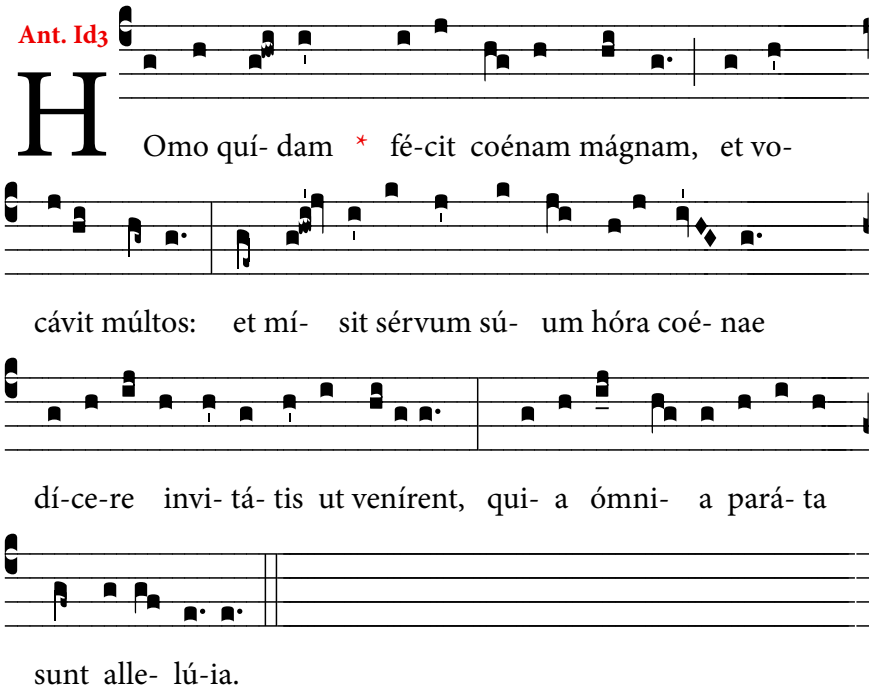
Below you will find samples of some preliminary work with Caeciliae. Enjoy!



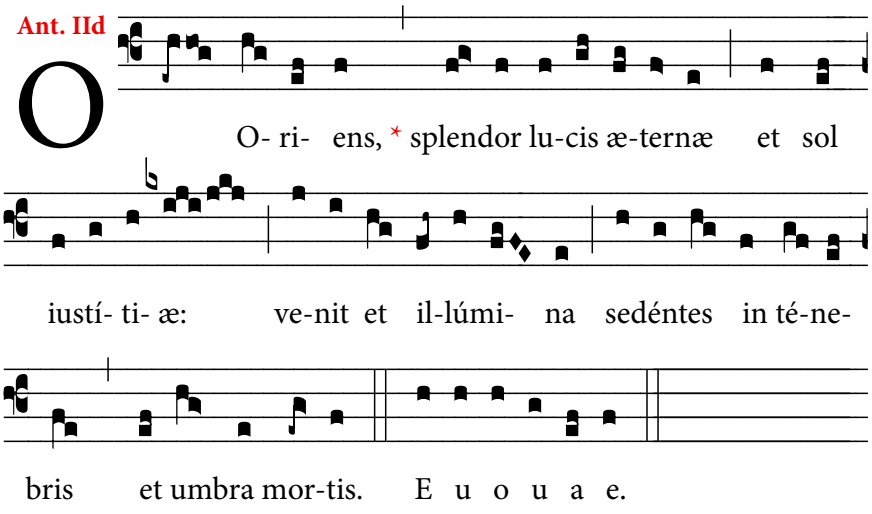
Antiphon for the Magnificat at Vespers II on Christmas Day. Source: *Antiphonale Monasticum* I (2005) 67.



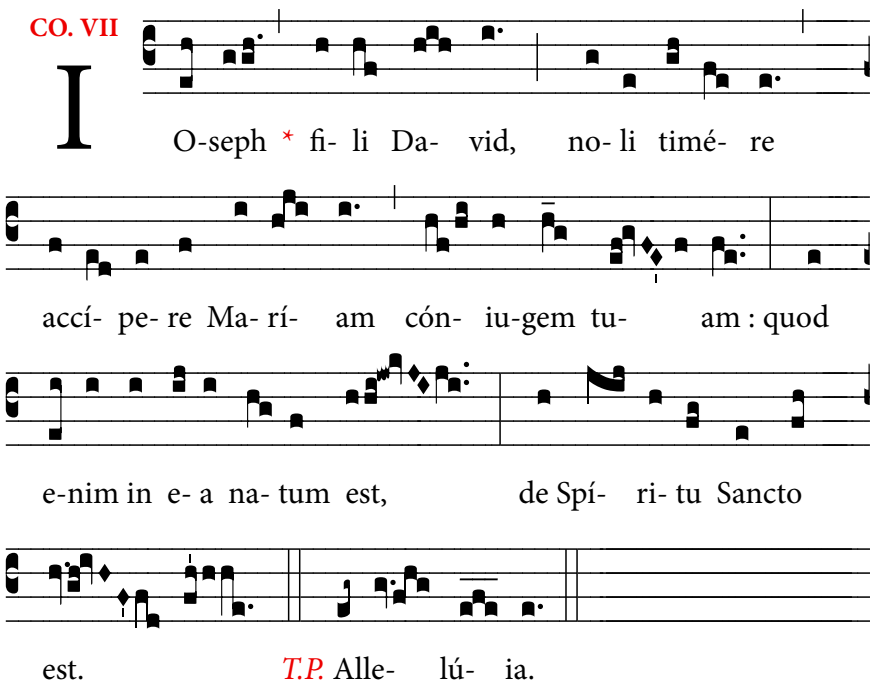
Antiphon for the procession on Palm Sunday. Source: *Graduale Romanum* (1974) 138.



Antiphon for the Magnificat at Vespers II on Christmas Day. Source: *Liber Usualis* (1934) 1101-2.



Antiphon for the Magnificat at Vespers II on December 21. Source: *Antiphonale Monasticum* I (2005) 51.



Communion antiphon from the feast of St. Joseph, March 19. Source: *Graduale Romanum* 552-3.