

Background to the TTT's

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Last updated: 2025-04-12

[This document is part of the [Learner's Maya Glyph Guide](#).]

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A. Introduction

One very productive way to learn Classic Maya is by learning to read inscriptions. For inscriptions on monuments, this is almost always done based on published drawings of the inscriptions. For inscriptions on ceramic vessels this is done based on either published drawings or the famous Kerr “rollouts”.

Beginners and intermediate students are probably better off tackling relatively intact inscriptions – those with little loss of the original glyphic text by wear and tear, erosion, or breakage.

Learning to read Maya glyphs in this way can be done by the time-honoured three-step method of “doing a TTT” (=Transliteration, Transcription, and Translation) of the inscription. In the first step (T--), the reader determines which actual glyphs are present. In the second step (-T-), the reader determines how those glyphs write the Classic Maya words which the creators of the inscription intended. In the third step (--T), the reader determines what those Classic Maya words were intended to express, in a modern language (e.g., English, Spanish, etc).

While this is an adequate “conceptual model” for the entire process, the three steps are not, of course, “hermetically sealed off” from one another, nor do they occur in strict succession. Having an idea of which Classic Maya words are possible (or likely) influences which glyphs the reader “sees” in the transliteration step; having an idea of what the text intends to say influences which Classic Maya words are deemed to be present in the transcription step; having an idea of the structure of the formulaic phrases so common in Classic Maya inscriptions influences what is “read” at each step. In other words, thought processes typical of any one step influence the thought processes of another step, in a complex interplay between all the steps simultaneously.

B. The TTT’s on the LMGG site

As an aid to students of Maya epigraphy, selected TTT’s from the CMGG are available on this website (the LMGG). These inscriptions have been selected based partly on their importance, but much more on their good state of preservation and ease in reading. We believe that it’s beneficial for learners to first attempt their own TTT and then consult the corresponding LMGG TTT, to see to what extent the former matches or differs from the latter.

It should be emphasized that the TTT’s offered here are not considered to be “definitive answers”. On the contrary, they are rather just the result of my own process of doing a TTT. As I tackled each inscription, I ran into puzzling, complex, or subtle issues. I then googled for academic papers, dissertations, and *informés* which might help me solve these issues (<https://scholar.google.com> is particularly helpful if one desires to see only academic publications). When I found useful information, I recorded it in footnotes (actually “end notes”) – sometimes by directly quoting the words of the epigraphers, at other times by summarizing what they had written. If there were conflicting or alternative readings or different opinions on how to translate the text, I tried to record the alternatives, sometimes expressing my personal opinion as to which alternative might be preferred (along with the reasons for my preference). However, it must be borne in mind that these academic works were found through the very informal process of googling and clicking on promising links – I never did a complete and thorough literature search. And of the hits I decided to use, I didn’t necessarily read the complete work either. Instead, I only read and absorbed the parts which were relevant to answering the question I had. These then are the limitations in my consultation of academic sources.

I recorded where I got this information from, in order to provide an adequate citation of the source. As with elsewhere on this website, public URLs are provided for these cited sources when available, allowing the user to get more context if desired. When attribution of an idea is made in an end note, the reference is to where I got the idea from, not necessarily to the first originator of the idea. This also holds for attributions in “personal communications”.

Information which begins its life in an end note of a TTT might eventually become a new entry or part of an existing entry of the CMGG. This is when information which initially seemed to apply only to a specific glyph-block of an inscription later turns out to have a wider applicability, i.e., is relevant to other inscriptions as well.

One further aspect of studying inscriptions is recorded in the end notes of a TTT: calendrical calculations. In end notes pertaining to calendrical calculations, I record some or all of the following:

- Whether the ISIG's LC matches the CR given.
- Whether the patron infixed in the ISIG matches the expected patron, based on the Haab month of the ISIG's LC's CR.
- Whether the Glyph-G (Glyph-G₁ to Glyph-G₉), when given in the SS of an inscription, matches the one expected, based on the ISIG's LC.
- Whether subtracting the DN associated with an 819-day cycle station (when present) results in a CR of the 819-day cycle station which matches that given in the inscription.
- Whether the coefficient of Glyph-DE matches the one expected from the ISIG's LC.
- Whether Glyph-X (if present in the SS) matches the combination of Glyph-C and the coefficient of Glyph-C in the SS.
- Whether the coefficient of Glyph-A matches the one expected from the ISIG's LC.
- Whether a given CR plus (or minus) the following DN results in the next CR, along with (where possible) additional calculation of the LC corresponding to every CR in an inscription. If the value given in the inscription doesn't match the calculated value, then I discuss what can be done by "tweaking" the values, in order to achieve a match. Such tweaks include changing the coefficients of the DN or of the Tzolk'in (day name) or Haab (month name) slightly – the smaller the change, the more desirable. Swapping the coefficients of the **K'IN** and **WINAL** in a DN is a tweak that sometimes helps. Alternatively, a DN sometimes needs to be calculated relative to the LC of some other CR than the immediately preceding one, or relative to the ISIG's LC. All such proposed changes are of course recorded in the end note.

Another important aspect of the end notes (and the introductory notes and actual TTT itself, for that matter) is the existence of the so-called "red bits". Despite efforts to get clarity, there may be issues which remain unresolved. In such cases, the text describing the issue is shown in red. When I have a chance to consult experienced epigraphers on the issue, then this can result in a resolution of the issue. Such a resolution is then recorded in the end note and that information shown in purple. This shows that it was once an issue but has now been satisfactorily resolved (with a record of who resolved it, if appropriate). If the issue remains persistently unresolved, then it is changed from red to brown, to show that this is a long-term problem (= don't keep bothering epigraphers, "nobody knows"). In Maya epigraphy, bolding is used for the transliterations of logograms/syllabograms and italics are used for transcriptions. These two traditional methods of expressing emphasis are hence not available to me: how would one express emphasizing a logogram/syllabogram or a phrase in Classic Maya? For this reason, blue is used to express emphasis and to draw the reader's (and my own) attention to important points. This colour-coding convention was already present in the CMGG entries and has been carried through to the TTT's as well. (This however applies only to the PDF form – colour has been suppressed in the HTML form to reduce distraction.)

Ideally, I would have preferred to upload each of my TTT's only after all the red bits had been looked into and resolved (changed to purple) or known to be a long-term problem (changed to brown). However, this proved to be impractical. It was the same as with the initial release of this website: I could have waited until all doubts had been resolved before going live. But that might be *years* into the future. I was persuaded by friends to go live anyway, marking the "red bits" as being "ongoing uncertainty" (on my part). This re-emphasizes the fact that the TTT's presented here are in no way finished, polished pieces of analysis. They're just "as good as I've been able to get them, up to now". This is the reason that many of the TTT's still have a few (sometimes many) "red bits".

Separate from all of the above, I noticed another subtle issue in doing TTT's: I was often so focussed on the *details* of each glyph (or word or phrase) that I missed the "overall structure" – the "big picture" of what the inscription was trying to say. For example, many monumental inscriptions served the purpose of glorifying the ruler who commissioned the monument (and in so doing, helped to justify his rule or strengthen his political position). But this might be done in two rather different ways. In one approach, the events of an inscription might span many centuries, perhaps even going back several millennia, to mythical times. A series of events in that long history – involving many different rulers – is recounted, ending with just one or two events pertaining to the contemporary ruler (with the monument having been commissioned by that ruler himself). In contrast, the events of another inscription might span just *one* lifetime, recounting the birth, parentage, marriage, accession, and death of one ruler (the monument having been commissioned by that ruler's *successor* – perhaps to commemorate the anniversary of his predecessor's death). These are two rather different types of inscription and, on completing the TTT's of each, I might actually be able to read and "know" what each said. But still, somehow, I'd miss the "big picture": I wouldn't quite realize how different the two inscriptions actually were. It was a classic case of "not seeing the wood for the trees". Alternatively, one could say that I understood an inscription at a "micro" level, without understanding it at a "macro" level.

To address this, I started to add "introductory notes" to each TTT. In these notes, I attempted to record "what the inscription was about". As time passed, I also added "unusual features" (what made this inscription different from others); how a particular inscription relates to other inscriptions from the same site or building as this one was found in; important aspects of the iconography associated with the monument; perhaps provenience or subsequent history (where relevant). I even started recording important aspects of the sources I'd consulted, which drawings I'd used, etc. None of this, however, was done in a structured manner, according to a fixed set of criteria. It's just, rather "organically", what I happened to come across which struck me as interesting and worth recording, each time I tackled a new inscription.

The one area I *did* strive to always cover is an overview of the content of the inscription, labelled as the "Summary".

In longer inscriptions on monuments, events are often not recounted in chronological order. When writing a summary, it's hard to know whether this should be "rationalized" and the account rewritten as a narrative in chronological order. This would capture the content of the inscription in a way which is more easily understood *from a modern Western viewpoint*. But doing so seems, in some ways, to be distorting the intentions of the original text, as the Classic

Maya obviously chose the particular order they did for reasons which made sense to them (e.g., recounting the most important event first, and then giving some “historical background” to that event). That particular information is lost if the narrative is restructured into chronological order in the summary.

I never reached a single, “streamlined” solution to this problem, for all inscriptions. Some summaries take one approach, others the other, based on what I thought appropriate for that inscription. If an account really jumped around in time, I “rationalized” it into chronological order in the summary. However, if there were only occasional references to past events in an otherwise chronological order, or if a section opened with “current” events and then transitioned to mythical ones, I preserved that original order in the summary.

Despite all these issues and the historically rather ad hoc nature of my approach to TTT’s, the result is a fairly standard “framework”, consisting of:

- Introductory Notes, for the overview and summary – the “big picture”.
- The TTT itself, for the glyphic text.
- The End Notes, for the “subtle details”.

It’s my hope (and belief) that such a structure will be beneficial for other learners of Classic Maya.

C. Why no “middle T” (why T-T only) ?

In reading an inscription, the standard methodology consists of doing all three T’s – Transliteration, Transcription, Translation. I fully support that approach, and I believe that it’s not only helpful but also *essential*, in a rigorous academic approach to understanding Classic Maya inscriptions. However, my ultimate (and more limited) goal in doing TTT’s was/is to “become proficient in reading Classic Maya glyphs” and to “understand *the content* of existing inscriptions”. Everything else was (or should be) subsidiary to this goal. And I found in practice that I didn’t really need the middle step. Once I had determined which glyphs were present, I could see, “on-the-fly”, which Classic Maya words were being written (sometimes in conjunction with looking at the drawing), and I could also immediately begin translating into English. The transliteration (T--) step was obviously needed (I had to have something concrete to write end notes about), and the translation (--T) step was also obviously needed – *it was in essence the goal and end result of the TTT process* (and I had to have something to read through, to write the summary). But I found that I could dispense with the transcription (-T-) step.

So, in the interest of increasing the speed at which I could do TTT’s (and hence master Maya glyphs), I omitted the transcription step; i.e., my TTT’s are actually just T-T’s. This saved a lot of time, space, and (potentially) *another whole set of end notes*. Even with just two of the steps, transliteration and translation, I sometimes already had difficulty deciding whether to attach an end note to the transliteration or the translation. Omitting the transcription step saved me from another set of difficult decisions about whether to write end notes discussing the transliteration-to-transcription or the transcription-to-translation step, and also where to attach them.

I would also like to point out that, in my experience as a member of various amateur Classic Maya reading groups since 2020, most participants also omit the transcription step and go from transliteration directly to translation (when reading inscriptions as a group activity, or by themselves, at home). The only situation where a complete transcription step is done seems to be in academic publications. Admittedly, my experience is rather limited, but if that's an accurate reflection of the reality in the practice of reading Classic Maya inscriptions, then this perhaps also partly justifies my decision to skip the transcription step in my TTT's.

I haven't, however, completely banished the transcription step from my TTT's. Where it's important to see or discuss a particular transcription or alternative transcriptions (with implications for the translation), the transcription is present in the end note pertaining to that part of the glyphic text, for example: **jo-ch'a-ja u-K'AHK'** → *johch'aj uk'ahk'* = "it was drilled, the fire of ..." or **K'AL.<ja:yi>** → *k'ahlajiiy* → *k'ahljiiy* = "(since) it was presented" (to show the inserted *-h-* in the passive and the dropping of the middle vowel in trisyllabic words arising from derivation, respectively).

D. The structure of the TTT table

As the transcription step is omitted, there are only two main columns on the right, in the TTT table: the transliteration and the translation. On the far left, there's an additional column for the glyph-block labels. Between the glyph-block labels and the transliteration is (optionally) a column giving the MHD codes of the glyphs in the glyph-block.

The various columns are described below.

D1. Glyph-block labels

- These are given in the usual A1, B1, A2, B2, ... system of glyph-block labelling, i.e., letters for the columns and numbers for the rows.
- As a general rule, there's one table row per glyph-block.
 - For complex glyph-blocks, the glyph-block may be split vertically, to give an Xa-row (left half of glyph-block) and an Xb-row (right half of glyph-block), i.e., <Xa.Xb>. Occasionally, the split may be horizontal rather than vertical, with Xa being the top half and Xb being the bottom half, i.e., <Xa:Xb>.
 - For very complex glyph-blocks, the glyph-block may even be split into quarters, to give an Xa-row (top left quarter), an Xb-row (bottom left quarter), an Xc-row (top right quarter), and an Xd-row (bottom right quarter), i.e., "first down, then across": <Xa:Xb>.<Xc:Xd>. Very occasionally, the order might be "first across, then down": <Xa.Xb>:<Xc.Xd>.
 - As everywhere else on this website, "·" is a horizontal join and ":" is a vertical join. However, these joins are not explicitly indicated in the table: the sub-blocks are

just given “in reading order”, and the reader has to intuit whether the progression is vertical or horizontal (or look in detail at the glyphs themselves to tell).

- Occasionally, there may be a further column of glyph-block labels on the left, when there’s more than one system of glyph-block labelling in existence. When present, the reason for the extra column will be explained in the introductory notes.

D2. MHD codes (optional display)

- Optionally, the user can choose to display the MHD codes of the equivalent MHD transliteration (= the blcodes column of MHD for the relevant inscription).
- This may sometimes be different from the CMGG transliteration one column further to the right.
 - One difference is a minor one in methodology/style. The CMGG transliteration shows *<logogram> or *<syllabogram>, when there is considerable erosion / wear-and-tear but where the intended logogram or syllabogram is quite clear from context. MHD (with much more self-confidence because of greater experience and knowledge of glyphs) is more “black and white”: if known with high confidence, the MHD code for the logogram or syllabogram is just given, and then transliterated as such; if known with some doubt, the logogram or syllabogram is transliterated with a question mark; and if there is considerable doubt, then the logogram or syllabogram is *not* transliterated, but the Classic Maya word which would have resulted if that doubt hadn’t been present is given in the transcription (with or without a question mark, depending on the degree of confidence in the reading). MHD’s approach is the standard one of professional epigraphers. The CMGG approach is partly as a result of there being no transcription column in the CMGG TTT (see section C. *Why no “middle T” (why T-T only) ?* above for the reasons for this). All of this uncertainty is hence given (with asterisks and/or question marks) in the transliteration column or with question marks in the translation column.
 - A more apparent difference is when the CMGG TTT (occasionally) breaks up the transliteration of a glyph-block into more sub-blocks than MHD does. This is usually just from practical considerations, when having the entire transliteration of a glyph-block in one cell would result in an exceedingly complex transliteration, with too deep a nesting of angle brackets for grouping the glyphs. In that case, there will be more table rows for that glyph-block, but the later cells in the MHD column will be empty. This may make the MHD transliteration *look* quite different from the CMGG one, but it could purely be this difference in sub-blocks, with an identical transliteration in both MHD and CMGG.
 - Lastly, the difference might be neither of the above and quite considerable. That’s when I’ve come to a different conclusion than MHD, as to the transliteration (usually with consequences for the translation). As I take MHD to be extremely authoritative, instances of such differences are rare. When they do occur, there will be an end note to explain my reasons for my different conclusion.

D3. Transliteration

- Logograms:
 - Logograms are given in full uppercase in accordance with the widely accepted convention for transliterating Maya logograms. They are however not bolded (see below). In line with common practice, logograms used as rebuses are rendered as logograms, even though they represent sound rather than meaning.
 - Logograms are given in the “standardized orthography” of the CMGG: long, short, glottalized, and (occasionally) the underspelled aspirated vowels are indicated.
 - I’m aware that some epigraphers consider this to be very wrong, and that *no* vowel qualities or underspelled sounds should be given in the transliteration step. They consider that these should all only be introduced in the transcription step. *I fully understand and respect this position.* The reason I don’t adopt it is, again, from “practical considerations”: it’s another whole step, adding perhaps 5% more information (the vowel quality), but 95% of which is just “repeating the information already present in the transliteration step” (albeit in a significantly different format). As I don’t even *have* a transcription step, I have nowhere else to record the vowel qualities, except in the transliteration step. I also bear in mind that *some epigraphers are perfectly happy* with indicating vowel quality (especially length, sometimes even glottalization or aspiration) in the transliteration of a logogram.
 - Where there is no consensus on the actual vowel quality, I’ve just picked one arbitrary possibility for the transliteration. For example, I write **CHAPAAT, NAHB** where it could have been **CHAPAHT, CHAPAAHT, NAAB**. The alternative forms are often listed in the home page of the LMGG (to facilitate finding the vocabulary item), but having them all in a TTT would make it unnecessarily long and too “busy”. The form I use in the TTT is of course my “preferred” form – listed as such for that vocabulary item on the home page.
 - At the moment, logograms are linked to the corresponding CMGG logogram entry.
- Syllabograms:
 - Syllabograms are given in full lowercase, also in accordance with the widely accepted convention for transliterating Maya syllabograms. As in the case of logograms, they too are not bolded (see below).
 - At the moment, syllabograms are not linked to the corresponding CMGG syllabogram entry. This could later be done, if it’s deemed to be desirable.
- The absence of bolding of logograms and syllabograms only applies in the context of the transliteration column, where it’s clear enough that these are transliterations and where having a column where everything is bolded would be meaningless and unaesthetic. In the end notes, where transliterations may be interspersed with transcriptions, translations, and *(in particular) explanatory text*, the complete convention of full uppercase vs. full lowercase *plus bolding* is used for transliterations. This is an identical convention to that for the CMGG entries, where the transliterations under the screenshot examples are also never bolded, while they are in the bullet-point notes, for exactly the same reasons.
- In the transliteration column, the relative placement of the logograms and syllabograms within the glyph-block is indicated using the full panoply of joiners:

- “.” – horizontal joining (X.Y means that X is to the left of Y).
- “:” – vertical joining (X:Y means that X is above Y).
- “[]” – infixing (X[Y] means that Y is inside X).
- “+” – conflation (X+Y means that characteristics of both X and Y are present/merged).
- “{ }” – underspelling ({X} means that X is not present in the example, but inferred). In the standard convention underspelling is given in transcriptions, not in transliterations. But, as explained above, my TTT’s indicate underspellings in the transliteration.
- “*” – reconstructions ({X} means that X is not present in the example, but inferred, based on syntax or expectation/context), when the glyph is eroded or even totally missing. In the standard convention reconstructions are given in transcriptions, not in transliterations. But, for the reasons explained above, my TTT’s indicate reconstructions in the transliteration.
- “?” – unknown/unreadable/undeciphered glyphs.
- “<>” – grouping glyphs together in a hierarchical structure.

I feel the use of these detailed joiners instead of just the generic hyphen is particularly important for TTT’s. In a glyph-block with, say, five glyphs, if some are partially eroded and others have unusual forms, it can be difficult to work out what’s going on. In a transcription like **ba-?-ma?-to?-li**, it can be unclear to the reader which parts of the glyph-block the epigrapher identifies as **ma?** and **to?**, and which part the epigrapher is unable to even guess at. Having these detailed joiners – e.g., <<ba.?:ma?>.to?:li> – leaves the reader with much less uncertainty as to what the epigrapher intends.

D4. Translation

- I’ve tried to strike a balance between extremely literal and extremely idiomatic translations. Again, some very thorough epigraphers provide three levels: extremely literal, idiomatic, and even a poetic translation. So *utook’ upakal* might be “the flint and the shield of” (extremely literal), “the army of” (idiomatic), and “the military might of” (poetic).
- I respect the sentiment of wishing to provide multiple levels (I even think it can be beneficial to the reader). But in the interest of practicality, I provide just the “middle ground” of “as literal a translation as possible, while not offending normal English usage”. The literalness makes matching the Classic Maya words to the English translation easy, while the idiomaticness produces a readable English translation.
- An important part of having the translation in idiomatic English is adding “the” and “on” or “at” to the translation, where these are absent in the Classic Maya equivalent (Classic Maya didn’t use articles, and prepositions (particularly for locations or dates of events) didn’t need to be explicit). Classic Maya also didn’t have an explicit copula (“to be”). It’s hence also helpful to insert these into the idiomatic translation. When this is done, these additions are given in brackets, for example: **u.BAAH <YAXUUN:BAHLAM> 3.<WINIKHAAB:AJAW> u.<cha:CHAN> AJ.<u:ku{l}> → Ubaah Yaxuun Bahlam Ux-Winikhaab Ajaw ucha’an Aj Ukul = “(It/this is the) image of Yaxuun Bahlam, (the) 3-Katun Lord, (the) Captor of He of Ukul” or <i:u{h}:ti> <1:KIB> 14:UN:ni:wa → i-uhti 1-Kib 14-**

Uniw = “then it happened (on) 1-Kib 14-K’anki’n”. Such words will obviously have no counterpart in the transliteration column. If there is a *ti* written in the glyphs between the *i-uhti* and the *1-Kib 14-Uniw*, then there would be a *ti* in the transliteration column, and the “on” would be present in the translation column, but not in brackets.

- For a compound noun (e.g., *Baah Kab*, *Yajaw Te’*, *Nahbna*, etc) it’s difficult to know when to write it as separate words or as a single-word compound (perhaps with hyphens). To avoid arbitrary choices which differ from compound to compound, I always write separate words. This makes searching easier for the user, as they don’t have to second guess which decision I made, for each compound. There are only two exceptions: *-nal* and *-taak*. These feel so much like part of the preceding word (a “bound morpheme” in linguistic terminology) that I write them joined to the previous word, without even a hyphen.

D4.1 Specific examples of literal vs. idiomatic translations

- *Ch’ak baah*. There’s a choice between the literal “chop head”, “head-chop(ping)” and the more idiomatic “beheading” or more interpretive “ritual execution”, “ritual beheading”. I would actually have preferred the idiomatic translation, but I’ve gone for the literal translation to make the correspondence between the Maya and English more obvious. That’s particularly important for this verb, because of *baah* sometimes being *ubaah* = “the head of”. The literal translation allows “chopping (the) head of”, which “beheading” doesn’t. That is to say, “beheading of” exists, but the former has the “of” clearly modifying only the word “head” whereas the latter doesn’t.
- *Chok*. There appears to be some uncertainty about what exactly was scattered during the scattering ritual. When an explicit object (*ch’aaj*) is present, then I translate that as “incense scattering”. Some epigraphers seem to assume an implicit *ch’aaj* in the absence of an explicit one. But here too, I’ve erred on the side of caution and just called it a “scattering ritual”, leaving the object (incense droplets?, seeds?) open, in the absence of an explicit object.
- *Tuun*. In the context of *tz’ap*, I’ve gone for the more idiomatic “(raising the) stela” instead of the more literal “(raising the) stone” for *tuun*.
- *Tz’ap*. While some epigraphers translate *tz’ap* as “to dedicate” (*utz’apaw tuun* = “he dedicated a/the stela”), I have erred on the side of caution and stayed with the more literal “to raise”. This is partly because I’m uncertain to what extent a stela could be considered “dedicated” if only the *tz’ap* verb occurs. Would a proper dedication require a scattering as well? I haven’t come across any instances of simply raising a stela (*tz’ap*) and then performing a scattering (*chok*) at a later date (just a few days later), so it stands to reason that the raising itself (with or without mentioning a scattering) is sufficient to translate the act as a dedication (which is what many epigraphers seem to do). But opinion seems to be divided as to the validity of this, so I’ve stayed with the more literal “raised”. (Note that scattering of incense around an existing stela *many years later*, e.g., in connection with a period ending does seem to occur. But this doesn’t take away the doubts about the appropriateness of using the word “dedicate” for occurrences of *tz’ap* without *chok*, when the stela is first raised.)

D5. Dates

- When giving the equivalent date of an LC date according to the Western calendar, I give the Julian rather than Gregorian date, calculated using a correlation constant of 584,285. This correlation constant is the default one used in the Villaseñor calendar program and the Bonn Project's calendar program – the two calendrical calculation aids which I use the most.
 - It seems to me that some epigraphers prefer giving the Julian date and others prefer the Gregorian date (some give both). Most of the calendar calculation programs give both.
 - I prefer the Julian date because the Gregorian calendar was introduced only in 1582 AD and in the Classic Maya period, the Julian calendar was in force in Europe. So, in correlating Maya calendar dates to Western calendar dates of that time, it seems more sensible to me to correlate to the Julian calendar. MHD uses a correlation constant of 584,286 and the Gregorian calendar. This makes the MHD values one day later than the dates given here (when converted to the Gregorian calendar). Ultimately, it doesn't really matter which one is used, as long as an author's chosen convention is made clear to the reader.
 - This does however produce a problem when speaking of the "End of the World" date in December 2012. There it doesn't make sense to give the Julian date, as the Gregorian calendar had been in force for more than 400 years by then.
 - There's no way of reconciling these two principles. I continue to give all dates in the Classic Maya period as the Julian date, and give the Gregorian date solely for the "End of the World" date in December 2012 (and the small handful of other dates even later than that one).
 - The two date columns on the TTT's page also have Julian dates, to agree with those given in the TTT's themselves.
- I'm aware of the preference of modern scholars for BCE/CE rather than BC/AD (and, broadly speaking, I'm supportive of the reasoning behind that preference). Despite this, I have stuck to the older system because I feel that BC and AD present (visually) a much better contrast than BCE and CE. The former pair are evenly matched in that both consist of two letters, *with no letters in common*, whereas the latter pair are "asymmetric" in having different numbers of letters *and differing only by the presence or absence of an initial B-*.
- For the purposes of most modern computer programs which assist in Classic Maya calendrical calculations, the beginning of the "Classic Maya universe" (the well-known CR = 4-Ajaw 8-Kumk'u date of 8 September 3114 BC) is considered to be 0.0.0.0.0. I feel a need to point this out, as it can appear as 13.0.0.0.0 on actual Classic Maya inscriptions. From the point of view of modern calendrical programs, 13.0.0.0.0 stands for the "end of the Classic Maya PIK-cycle", namely the (formerly) much spoken of CR = 4-Ajaw 3-K'ankin date of 23 December 2012 (Gregorian calendar).

D6. Table row dividers

- An (essentially) “empty” row can be used to divide a series of table rows from another series.
 - Such a row is grey *in the transliteration column* when the physical position of the glyph-blocks changes in a major way. For example, if the inscription consists of columns AB, CD, EF, and rows 1 to 6, then there will be such a divider between the table rows for B6 and C1, and also between those for D6 and E1, because the text has “jumped” from the bottom of the right column of one double-column to the top of the left column of the next double-column. A similar table row divider will be present when runs of glyph-blocks are separated from one another by iconography.
 - Such a row is grey *in the translation column* when a “sentence” ends. Of course a layperson, an epigrapher, or a linguist might each have a slightly different definition of what a sentence actually *is* in a Classic Maya inscription. Nevertheless, at an informal level, I feel that there *can* be a sort of “feeling” for a “Classic Maya sentence”. I hence delineate such “sentences” from one another, by having a table row divider which is grey in the translation column, between the end of one “sentence” and the start of the next.
 - I treat the *ukabjiy* and *itaaj* phrases as part of the preceding sentence, separated from it by a semicolon.
 - I treat a DN or a DNIG + DN as the start of a new sentence.
 - Such a row is grey *all the way across the table* at the end of the inscription.
- It’s well-known that in Classic Maya, the layout of the text doesn’t necessarily reflect the syntax/grammar of the sentences being written – i.e., a sentence doesn’t often end at the end of a run of glyphic text. In fact, a sentence may consist of several glyph-blocks on the left, then, midway in the sentence, there may be some iconography, with the sentence resuming elsewhere in the monument (much further down or on the right). This is especially so in monuments where there is a mix of glyphic text and iconography. The grey table row dividers give the reader additional clues as to the physical and the linguistic structure of the glyphic text:
- In the transliteration column, they divide the “physically separate” runs of glyphic text (i.e., visual connection/separation).
 - In the translation column, they divide “sentences” (i.e., linguistic/semantic connection/separation).
- Occasionally, some text will appear in such a table row divider, in the transliteration column. This is information concerning where the glyphic text is found on the monument, e.g., “South side”, “Base”, “Edge of lintel”, “Rim of sarcophagus”, etc.

D7. Ellipses and casing in the translation column

- Beginning of a sentence in English:
 - The initial letter of the first word is in uppercase.
 - The remaining words of the translation are given in full lowercase (except for proper nouns).
 - Ends in an ellipsis.
- Middle of a sentence in English:
 - Begins with an ellipsis.

- The words of the translation are given in full lowercase (except for proper nouns).
- Ends in an ellipsis.
- End of a sentence in English:
 - Begins with an ellipsis.
 - The words of the translation are given in full lowercase (except for proper nouns).
 - Ends in a full-stop.

That is to say:

- Text text text ... = beginning of sentence.
- ... text text text ... = middle of sentence.
- ... text text text. = end of sentence.

The above conventions are meant to help the reader relate the information in the TTT table to the physical layout of the glyph-blocks of the inscription and to the (broad) syntactical/grammatical structure of the text of the inscription.

As a nod to English usage, proper nouns (= personal names and titles, names of gods, toponyms, etc) have an initial capital in all words of the name, title or toponym, e.g.: Te' Kuy Sip, Chan "Uhman", Haluum. Furthermore, I place commas between the sub-parts of the extended name/title of the protagonists. Where possible, I also provide a "translation" of the name/title or toponym (where relevant/known).

E. TTT's in the LMGG

E1. The TTT's page

The TTT's page of the LMGG provides access to the TTT's. It consists of a table with five columns. Each row in the table corresponds to an inscription.

The columns of the table are:

- Inscription:
 - The "modern-day name" of the object.
 - Alternative names (e.g. according to a different nomenclature).
 - The "MHD objabbr" of the object.
- TTT and Drawings:
 - The drawings and the TTT have been deliberately made available as separate entities, to enable the user to have maximum flexibility of relative positioning on the screen. That can be done by clicking on the images and the PDF link, which will result in them being in completely separate windows. These can then be independently positioned (and even allowed to overlap one another, if the user so desires).
 - For long inscriptions, the "pedagogical aids" of additional glyph-block labels on the right and bottom of the inscription and (where deemed necessary) double column dividers have been added.

- The “View TTT (with Drawings)” link produces a single window where the drawing(s), TTT table, Introductory Notes and End Notes can be viewed as a single entity in a 3-pane window. For more information, see next section.
- Photos: Links to publicly available photos of the object. This includes 3D models, where available.
- Summary: A summary of the content of the inscription as well as any distinguishing features.
- Inscription Dates – dates associated with the inscription, given as an LC and as YYYY-MM-DD of the corresponding Julian date:
 - Inscription Date: The MHD objlc date (creation date of text).
 - Date(s) in Inscription: the dates of events recounted in the inscription. The exceptionally rare references to dates in the distant future (from the point of view of the Classic Maya period) are given as YYYY-MM-DD of the corresponding Gregorian date (see section “D5. Dates” above for the reasoning behind this).

E2. The flexible 3-pane layout in HTML

- Clicking on the "HTML" link in the TTT table brings up the drawing(s) as well as the TTT in a flexible 3-pane layout:
 - Left pane: the drawing(s).
 - Middle pane: The TTT Table, with T-T.
 - Right pane: The Introductory Notes and the End Notes.
- These panes can be scrolled independently to enable the drawing of a glyph-block to be physically close to the TTT of that glyph-block and to any end note relating to that glyph-block. Clicking on end note numbers in either the middle or the right pane will cause the browser to try to reposition the corresponding other pane (right or middle, respectively) so as to have the relevant text at the top of the pane.
- Zooming in or out of each of the panes (using a scroll-mouse or Ctrl+/Ctrl-) can also be done independently. This feature is particularly useful when the user wishes to zoom in on the drawing of the glyph-blocks in the left pane. This can be done without a corresponding zooming in of the middle and right panes. This means that the letter size which is comfortable for reading by the user remains at that size when zooming in or out of the drawing in the left pane.

F. Historical development of the TTT’s and “critical mass”

I’ve been doing TTT’s almost since the very start of my learning Classic Maya in 2020. Once I had mastered the basic logograms and syllabograms, and the calendar system, I was advised to start doing TTT’s. I indeed found that this was one of the best ways to make progress in my knowledge of Maya glyphs.

To date I have done more than 200 TTT's. They were all done at various stages of my increasing knowledge of Maya glyphs. The time span over which they were done (about five years) also means that the degree of standardization of the TTT's over the whole set is less than ideal. Also, the amount of detail put into a TTT increased over time, so the latest TTT's hold much more information than the earlier ones. Lastly, the very format itself evolved over time. Standardizing the entire set of TTT's is obviously something to be desired. Because of the considerable effort involved updating each TTT, we decided to add TTT's to the TTT's page in batches.

The first batch – TTT's of eight of the “best preserved” QRG stelae – was added in November 2024. *We realize that there's no point having just a few TTT's.* That's because a small number of TTT's might mean that none of them are of interest to some learners. In order for the collection to be of value to any particular learner, there must be a sufficient number uploaded to have reached a sort of “critical mass”. Perhaps 200 is about the right number? The currently existing ones are mostly from monuments (BPK, CNC, CPN, CRN, LTI, NAR, PAL, PNG, QRG, TNA, and YAX), but there are some (about 40) from inscriptions on ceramic vessels; and a small number are from incised bones or shells, wooden boxes, rattles, etc. We feel that this spread over various media is also a positive aspect of the collection. The plan is hence to eventually upload – appropriately upgraded for uniformity in presentation – all 200+ of the TTT's.

G. “Granularity”

The last aspect to explain is “granularity”. This addresses the question: “What are the smallest chunks of text to transliterate, transcribe, and translate?”

At one extreme, one can write out the transliteration for the entire inscription in one block of text. What then follows is the transcription for the entire inscription, also in one block of text, ending with the translation for the entire inscription, yet again in one block of text. This has the advantage that one can “smoothly” read the whole transliteration in glyphs or the whole transcription in Classic Maya, or the whole translation in English. The disadvantage is that for anywhere other than at the very beginning or very end of the inscription, it's difficult to relate the transliteration of two or three glyph-blocks to the corresponding transcription and to the corresponding translation. Some epigraphers solve this by putting the glyph-block references in, among the text of each of the T's, but it's still a lot of work to find the corresponding bits. For longer texts, correlating equivalent parts of each consists of a lot of flipping physical pages back and forth or scrolling up and down a computer window.

At the opposite extreme, one can present the TTT one glyph-block at a time: the transliteration for that glyph-block, then the corresponding transcription, and finally the corresponding translation. This has the advantage that one can very easily relate the transliteration of any glyph-block to its corresponding transcription and translation. The disadvantage is that the transliteration, transcription, and translation of the entire inscription is broken up into extremely tiny fragments. In fact, it becomes very difficult to read a smooth transcription, transcription, or translation, as one has to be constantly skipping intervening text holding “some other T”.

The positive and negative aspects of the choice of granularity become particularly acute for a long inscription, say, anything above 30-40 glyph-blocks. Some epigraphers address the problems of each of the two extremes by having an intermediate level of granularity: they present the TTT one sentence at a time. Unfortunately, this also results in having some of the disadvantages of both extremes as well.

Closely related to this is how to show the corresponding drawing of the glyphic text. If the drawing of each glyph-block is completely parallel to its corresponding transliteration (say glyph-block by glyph-block), then even a very short sentence takes a lot of (vertical) space on a page – an A4-page might not even hold five glyph-blocks (if the drawing of the glyph-block is shown in any degree of magnification / zooming in). At this level of granularity, it becomes completely impossible to see the translation of the entire inscription in one go, as it would go over several pages.

The format that I finally settled on for my TTT's is a compromise between all these approaches, to maximize the advantages and minimize the disadvantages:

- The drawing is completely uncoupled from the TTT. It can be independently viewed and scrolled up or down, according to the requirements and wishes of the reader.
- The granularity of the transliteration and translation is chosen to be “glyph-block by glyph-block”. This makes associating any transliteration with its corresponding translation very easy.
 - That this level of granularity is a good one is supported by the fact that MHD has also chosen it as its basic format (though MHD has, of course, a lot more functionality in addition to that).
 - A relatively early work, Pitts-BHPN (*A Brief History of Piedras Negras - As Told by the Ancient Maya* (Pitts; 2011)) also has a very similar format for each TTT.
 - In fact, it goes even further and provides a Transcription (-T-) column and a contiguous “Rough Translation” into English as well – both absent from the CMGG TTT's.
 - It provides a “General Commentary” and detailed notes on specific glyph-blocks, which correspond to the CMGG's TTT's “Introductory Notes” and “End Notes” respectively.

That I should have arrived – after trying a number of other formats (“false starts”) – at a TTT format which so closely corresponds to that of MHD and Pitts-BHPN shows yet again that this is the information – given at this granularity – which is of interest to many readers, particularly students of Maya glyphs.

- At the same time as enabling easy association of any transliteration to its corresponding translation, this format also makes reading the continuous transliteration or translation quite easy: one just needs to scan up and down the corresponding transliteration or translation column of the TTT table. This is where the table row dividers (with their grey bars to delineate either contiguous physical glyph-blocks or coherent Classic Maya sentences) enable easy orientation and navigation over the entire inscription, as well as enabling ease of relating the transliterations and translations to the independently scrollable drawing in the left pane.
- Leaving out the transcription (-T-) also means that the entire TTT doesn't take up so much vertical space. This is because having the transcription as well would have meant having an additional column, and that in turn would have meant that each of the columns

would have had to be much narrower, resulting in more vertical space required per glyph-block. (At least, that was an important consideration when I first began the TTT's, as "static" Word documents and, later, as PDF's. In their presentation as HTML there are possibilities for the user to hide or display columns, and to adjust the font size, so a separate transcription column would be a possibility. However, the consideration of saving all the additional work involved in writing out the transcription is still a factor in the decision to omit this step.)

For all the reasons given above, I feel that the TTT format used is the optimal one, maximizing the positive aspects and minimizing the negative ones of all the different possible formats. I do realize, however, that this is all a matter of taste, and that the choices I've made may not appeal to everyone.