

Blitz Latin Publications:

Latin Standard Phrases in Blitz Latin

Their creation and application.

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Summary

The application of predefined Latin Standard Phrases (as English translations) to the machine translator Blitz Latin is described. The ambiguity and inconsistent word-order of Latin make the language equally a very attractive and a very difficult target for the use of standard phrases. Programming considerations are outlined, together with the effects on translation quality and speed of translation.

About Blitz Latin

Blitz Latin is an extremely fast, rule-based machine translator dedicated to translations from the Latin language into English only. It was first created in 2002 from the contemporary version of William Whitaker's electronic dictionary 'Words', and has subsequently been enhanced by the addition of numerous Latin words discovered by sweeps of a large test set of Latin files, and by the addition of several specialist vocabularies for medieval, ecclesiastical, neo- and botanical Latin. It provides translations of Latin texts that are grammatically to a high standard, but can be marred by the ambiguity of Latin and the stilted rendition of its translations.

Rule-based and jigsaw translators

There are essentially two ways of creating a modern machine translator. The first is to create a parser that examines each word in a sentence for its grammatical context and assigns a meaning based on that context. This generally provides a 'rule-based' machine translator that can be very accurate grammatically, but provides a stilted, non-flowing translation into English. Ambiguous words with several meanings may be wrongly assigned, a particular problem for a language as ambiguous as Latin. This is the method used by Blitz Latin, where a massive effort has been put into resolving ambiguities.

A major problem for the rule-based translator from Latin into English is that there cannot be a translation which will be both grammatically accurate and of good English readability, since there is no mechanism to effect this. The Latin language deals in concepts (and therefore lacks the definite article 'the' and the indefinite article 'a'), while modern European languages, including English, use precise words. Latin dictionaries can devote columns of space to show how the meaning of a concept such as *lex* ('law') varies according to its context. The professional translations that one sees from Latin to English, made by human experts, have all been fudged in some way in order to render them into proper English. It is for this reason that there are so many expert translations of single Latin texts - no two experts can ever agree on how the text should best be translated!

The second method is that currently used by the creators of machine translators between modern languages. These modern languages are 'rich' languages; that is, they suffer very little from ambiguity and can normally be translated word-for-word from one language to the other. Consequently it is possible to obtain large quantities of texts ('construction texts') in one language, which have been translated into English (or other foreign language) by human professional translators. Documents provided for the United Nations and the European Parliament provide fertile sources. These dual language documents can be chopped into small phrases of 1-4 words, with the professional translation of each phrase added as the 'meaning' of the phrase. Longer phrases are preferred, since they provide more context.

Thus the second type of translator, commonly called a 'statistical translator', but which we may better describe as a 'jigsaw translator', regards every new text as a jigsaw puzzle, to be divided into small phrases, compared with its precomputed jigsaw pieces, and the corresponding professional translations re-inserted.

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The best way to imagine a jigsaw translator is as a piece of cardboard where the foreign text has been printed on one side, and a professional English translation has been printed on the other side in such a way that the foreign words on one side correspond to English words on the other. If we now chop up the cardboard into lots of small pieces of different shapes and sizes, each with a piece of foreign text on one side and the professional translation on the other, we have the jigsaw pieces that can be used by a translator.

Note that such a jigsaw translator rarely has any concept of vocabulary (its words are character patterns separated by spaces, and replaced by the corresponding character pattern of the professional translation), nor does it have much (if any) concept of grammar. A further difficulty is that different translators may assign different translations to different jigsaw pieces, while different writers may have used ambiguous phrases to signify different meanings. This is particularly a problem with ambiguous languages such as Latin, but can be partly resolved on a statistical basis: the more occurrences of one translation for a particular jigsaw piece, the more likely it is to be used. Alternative translations can be offered as user-selectable options from a menu.

It is worth emphasising that, unlike the literal translations made by rule-based machine translators, the translations of a jigsaw translator are all rearrangements of existing, beautifully crafted, English prose created by a human professional. Naturally, the output, however inaccurate, has the advantage of easy readability. In the early days of computing, there was a brief vogue for making English sentences by random selection from short English clauses. The results were surprisingly easy to read - but they conveyed no meaning. The output from a jigsaw translator suffers from the same advantage and disadvantage: wonderfully easy to read, but perhaps not so accurate. Perhaps not accurate at all. Those who cannot read the original language may be impressed by the superb readability of the output, but cannot tell whether what they have read may be a random jumble.

The advantages of a jigsaw translator therefore are these:

- i) An idiomatic phrase can be replaced by a polished English phrase.
- ii) Ambiguous words, i.e. those which can have more than one unrelated meaning, will be assigned their meaning *either* by the frequency in which they occur in the test set, *or* by their appearance in the pre-translated standard phrase.
- iii) The translator is particularly effective with unique short clauses, those that occur only once and therefore for which no alternative translation is possible.
- iv) The resulting elegant output provides the illusion that the translator knows what it is doing.

The disadvantages are these:

- i) The translator has no understanding of grammar.
- ii) Its vocabulary is limited to the words found within the construction texts.
- iii) For an inflected language, many inflections of words may be missing altogether, since they did not appear in the construction texts.
- iv) For an ambiguous language (such as Latin), common short clauses may be used by their authors in different ways, and the translator cannot recognise the differences between grammar or meaning.

Translations between rich modern European languages using the jigsaw model are quite surprisingly good, and are championed by such giants of the translation industry as Systran (USA) and SDL (UK). But both now prefer to use a combination of rule-based and jigsaw translations - the jigsaw approach alone has been found to be insufficient for word-for-word translations of even modern languages.

An alternative approach for Latin

Can a jigsaw translator be effective with an ambiguous ancient language like Latin, which has two unusual characteristics (when compared with most modern languages):

1. It is a heavily inflected language, so the ending of each word modifies the meaning and use of the word. For example, 'rex' means 'king', whereas 'regis' means 'of the king', 'regibus' means 'to (or from) the kings' and so on. This requires knowledge of grammar and of context in order to distinguish 'regibus' = 'to the kings' or 'from the kings'.
2. The word order is not the conventional Subject-Verb-Object ('the king loves the queen') of most modern languages, but an order that places the words in order of their intended emphasis - which may vary from

one writer to another. That is, the writer could choose to say *rex amat reginam* (literally ‘king (subject) loves queen (object)’) or use any other ordering. For example, the word order *reginam amat rex* (literally ‘queen (object) loves king (subject)’) has exactly the same meaning as *rex amat reginam*, but with emphasis that it is the queen who is loved, and the reader is presumed to understand the inverted word order by reading the inflections of each word.

One can be fairly sure that a jigsaw translator created, for example, by chopping up professional translations of the Vulgate Bible and the collected works of Cicero is likely to be very effective at translating the Vulgate Bible and the collected works of Cicero. It is difficult to imagine that it will fare so well with writers with other styles, or with medieval texts, or with modern Vatican texts. Even if the writers intend the same phrases as those found in Cicero, they may vary the word order of the Latin in order to change the emphasis. In short, once a jigsaw translator is taken out of its comfort zone, from which its jigsaw ‘pieces’ were created, it becomes rapidly less reliable. Moreover, the Latin language is particularly susceptible to the construction of compound words, where a new word, that will be easily recognisable to the experienced reader, is created by adding an appropriate prefix or suffix to an existing Latin word. These compound words will not be recognised by a jigsaw translator. By contrast, a rule-based translator can be made to recognise compound words, and has no ‘comfort zone’, since its function is independent of any other Latin text. However, its translation is much less readable than that of a jigsaw translator.

Is there a better route for translation from Latin into English, that combines the accuracy of a rule-based translator with the improved English wording of a jigsaw translator? I believe that there is, and over six months of programmers’ time has been put into implementing the alternative with Blitz Latin (from version 2.0).

The central idea is to create the finest rule-based Latin translator possible, but to overlay its output with precompiled ‘Latin Standard Phrases’, which replace the worst examples of poor wording (or mis-translation) from the original English output. The application of the Latin Standard Phrases depends very much on the Latin words that have been finally agreed from ambiguous text by the underlying rule-based translator - unlike the case with a jigsaw translator, the replacement English phrase will only be used if it makes sense according to the rules.

Let us take a Latin phrase as an example. The following sentence is taken from Vopiscus’ biography of the Roman emperor Aurelian in the ‘Augustan Histories’:

ex quo constat illam mulierem scisse fatalia. ‘from which it is clear that the woman knew something of fate’ (translation by David Magie, *Scriptores Historiae Augustae*, Vol III, Loeb Library, 1938).

However, the literal translation (Blitz Latin 2.00; author agrees) is: ‘out of which it is agreed that woman to have known (something) fated.’ Arguably (see Conclusion), it would be preferable to replace the literal translation with Magie’s phrase.

Blitz Latin has long offered the option to users to add their own standard phrases to a file named ‘userphrases.txt’, in which a few standard phrases have already been placed as examples. For example, *mihi subolet* (‘I detect’). An arbitrary limit of only 100 phrases was applied, partly to limit consumption of computer memory (some 200 bytes per phrase), but mostly to limit the time overhead of translation. Each word in a Latin text has to be examined individually in order to test whether it forms the beginning of a Latin Standard Phrase. However, the biggest burden was anticipated to be the technical difficulty of adding standard phrases to words from a language which is heavily inflected.

Latin Standard Phrases (LSPs)

Standard phrases are not well adapted for use with an inflected language such as Latin. For example, the single verb *amare* (to love) has about 180 inflected variants, incorporating such forms as *amo* (I love), *amabas* (you [singular] were loving), *amabit* (he will love), *amavistis* (you [plural] have loved), *amarantur* (they might have been loved), to cite only a small selection. If we wish to incorporate a LSP such as *amare reginam* (to love the queen), then the phrase will have to be added 180 times if it is to catch every possible alternative. It is true that a statistical search of real Latin texts will determine that far fewer than 180 variations of this LSP actually exist, but who is to say whether other forms might not exist in a wider set of Latin files?

A particular complication for Latin is that the word order of a Latin sentence does not follow the conventional Subject-Verb-Object ordering that is so familiar to users of modern European languages. In the case of the simple example *amare reginam* cited above, it is in fact more likely that the phrase will be encountered in the form *reginam amare*, so that it will be necessary to add another 180 variations of this LSP in order to cover all possibilities. In particular, the emphasis of words that is required by one writer of Latin may be inverted by another writer of the same phrase, according to the latter's idea of which words need to be emphasised.

Conjugation of verbs

However, careful coding enables the verb to be picked out in a short Latin clause such as *amabas reginam*, even when it is not the first verb in the clause. Then, knowing the grammatical structure of the verb from the original Latin text, it is possible to determine that the infinitive form is *amare*, and hence the LSP *amare reginam* should be used. Thus Blitz Latin now contains the standard phrase 'scire fatalia/to know something of fate', which embraces options as diverse as *scisse fatalia* ('to have known something of fate', see above) and *scio fatalia* ('I know something of fate.')

A serious confounding issue is that many nouns can be construed as verbs, and vice-versa - for example, *reges* can mean 'the kings' or 'you will rule'. This means that the Latin translator must first have assigned correctly the verbs in the LSP under consideration. *causas reges* - 'you will rule the causes' or 'you will excuse yourself kings'. The machine translator has to decide which is the controlling verb, and therefore it must itself be as accurate as possible.

Similarly, nouns and adjectives also have inflections that require separation, typically twelve for a noun and 36 for an adjective. To add to the confusion, many of these inflections are re-used, further adding to the ambiguity of translating Latin text. It is much harder to connect these nouns and adjectives to their use in a LSP, and at present Blitz Latin does not attempt this. Thus, Blitz Latin can translate the various inflections of the verb in the LSP *amare reginam*, where the accusative form of the noun *regina* is used, but it cannot assign correctly a similar LSP *amare regina* if encountered as *amare reginam*.

Misspellings in Latin

It is customary for modern machine translators to search simply in order to match jigsaw pieces to the text to be translated. However, Latin is an ancient language, written originally in the days before dictionaries were widespread and hence liable to misspellings. During medieval times, many words became spelled phonetically, rather than according to classical example. For example, the Latin word *gratia* (grace) might be spelled as *gracia*. During the same period, the letters 'j' and 'v', unknown to classical Latin except on inscriptions (when 'v' is easier to carve than 'u'), became widespread. Moreover, the speakers of Latin were as lazy in their speech as any modern teenager, and contracted words, or the inflections on words, to shorter forms for their own convenience. A simple example is the Latin word *ille* ('that one', 'that thing', the precursor of the definite articles *il/la* in modern Italian), which is shortened repeatedly in early Roman plays to *ill'*.

It is evident that any attempt to apply LSPs to Latin text with these imperfections is likely to give unreliable results. Blitz Latin, however, has long enjoyed the ability to correct all these errors and to store the corrected word within its data structure. Thus, for Blitz Latin, LSPs are compared with the corrected forms of the Latin, and not with the original Latin text.

Consider the short phrase *gracia Domini Jesu* - 'the grace of the Lord Jesus'. An alternative translation, grammatically accurate, would be 'with the grace of the Lord to Jesus', so this is a good candidate to have a LSP applied. The original text, with its misspelling *gracia*, would not discover the required LSP. Blitz Latin, however, has no problem, since it has already substituted the correct word *gratia* for *gracia*.

LSPs in Blitz Latin

Blitz Latin now incorporates more than 3,100 *published* LSPs. The majority have been taken from Carl Meissner's personal list, published in English in 1894 from the 6th edition of the original German text.

Meissner's words are heavily biased towards the use of phrases with infinitives (eg *fortuna secundi uti* - 'to be fortunate') which are particularly useful with Blitz Latin's coding for infinitive verbs. They also include a large number of generic terms, such as *alicuius*, *aliquid*, *ad aliquem*, which function effectively as 'wild-cards', and are intended to be substituted. For example *ad exemplum alicuius se conformare* - literally 'to adapt oneself to the example of another', but given in Meissner as 'to shape one's conduct after another's model'. However, this generic phrase is intended to incorporate such potential examples as 'to shape one's conduct after the model of a foreign king', or 'to shape one's conduct after the model of a boat with all sails set'. The possibilities are limitless, and at present Blitz Latin does not consider generically such an extreme range of alternatives. It is unlikely that the jigsaw pieces of any other translator for modern languages offer the same possibilities either.

Meissner's phrases possess also the defect that they are taken exclusively from classical Latin. In order to fill the gaps for medieval and neo-Latin, the dictionaries of Lewis and Short ("A Latin Dictionary", OUP, 2002 reprint), Collins ("Latin Dictionary plus Grammar", HarperCollins Publishers, 1997), Stelten ("Dictionary of Ecclesiastical Latin", Hendrickson Publishers, 1995) and Latham ("Revised Medieval Word List", British Academy, 1965) have all been consulted and suitable short phrases adapted for use with Blitz Latin, while a large number of user phrases from the author's personal collection (acquired while puzzling over some of the less comprehensible translations from Blitz Latin) and from other minor sources have also been included.

Users of Blitz Latin can also add their own LSPs to the supplied long list. These additions are subject to certain rules.

Selection of LSPs for use with Blitz Latin

All the LSPs, taken from all sources, have been soak-tested against the author's collection of representative Latin texts, more than 4,000 electronic text files. For test purposes, code was added to count the number of times that each LSP was called in total. Those that occurred only once or not at all (a surprisingly large number) were rejected, so as not to over-burden unnecessarily the speed of search. This process resulted in the current file of more than 3,100 LSPs.

The majority of rejections were from the Meissner LSPs. This is not surprising, since firstly they constituted by far the majority of the original standard phrases; secondly many of these Meissner phrases comprise several words, and are therefore statistically less likely to be encountered than two-word phrases; and thirdly there were too many examples of the '*alicuius*' problem, explained in the previous section.

The problem of clashing LSPs, where for example the first and second words form one standard phrase, and the second and third Latin words could form another LSP, is resolved on the basis of first-come-first-served, and the internal counter to test Latin words is advanced to the end of the first LSP. To supply a contrived example, the Latin clause *ita ut quid...* contains the LSPs *ita ut* ('just as') and *ut quid* ('to what purpose'). Blitz Latin's translation is therefore 'just as what' and not 'just as to what purpose'.

A statistical approach

An alternative method for adding Latin Standard Phrases to Blitz Latin is to make a fast computer search of an existing set of Latin files. The author's test collection of Latin files includes the Packard Humanities Institute (PHI) selection, used with permission, and containing all known Latin texts up to about 200 AD, together with a few later files. Other sources have provided almost every other Latin text known to the author from later Latin (up to about 500 AD), so that classical and late Latin are covered very well. The 1,500 years of Latin writing that have elapsed since then are covered in a haphazard way that reflects broadly the medieval and neo-Latin files that others have found sufficiently interesting to type up and post on the Internet. A few have been sent in by users of Blitz Latin, a confidential procedure that ensures that Latin words hitherto unknown to its electronic dictionary are likely to be included in future.

Such is the speed and disk capacity of modern personal computers, it has proved feasible to search through all these files and to store every combination of 2-, 3-, 4- and 5-word clauses. Longer clauses seem to have little general value. These initial files are then processed electronically in order to collate them by alphabetical groups and to sort these groups into decreasing frequency of occurrence. Naturally, those clauses that occur most frequently are those selected first for inclusion in the existing long list of LSPs.

It is evident that these automated procedures must include a lot of useless repetition. For example, the original sentence *rex et regina amant suum canem qui habitat in stabulo* ('the king and queen love their dog which lives in a kennel') will give the following clauses:

*rex et regina amant suum; rex et regina amant; rex et regina; rex et;
et regina amant suum canem; et regina amant suum; et regina amant; et regina.*

And so on until the end of the sentence.

However, this is less a problem than is at first apparent, since the great majority of the clauses so created will be idiosyncratic and will occur only very rarely. We can isolate those clauses that are genuinely useful simply by including only those which occur very frequently, after the automated sorting process mentioned above.

How are the meanings of the most frequent clauses to be assigned? The obvious solution is to process them in Blitz Latin, and to examine the Latin translations. If the translations are clearly defective (usually due to incorrect selection of a meaning from ambiguous text), a LSP is required as a substitute. What if the correct translation is not obvious? It is then that the stunning speed of Blitz Latin becomes invaluable. The program contains a Search facility for multiple files. If the correct meaning of one of the extracted clauses remains unclear, it is simple to search for the clause across every one of the Latin files of the test collection in seconds, and to obtain a text file with every Latin sentence containing the test clause together with its translation by Blitz Latin. Manual translation of the sentences, comparing each sentence one with the other, provides an adequate LSP - although naturally it occurs sometimes that the same clause may have two or three different translations across a hundred original Latin sentences in which it occurs.

Analysis merely of those LSPs extracted by this statistical approach that exceeded 500 occurrences added another 4,000 entries to the Blitz Latin list, to make a total of about 7,100 entries. Deeper delving into the extracted LSPs, as currently planned, will certainly increase the number of entries steeply, since there is a long tail after the most common entries. At the time of writing, second and third sweeps of the same data has raised the number of LSPs in Blitz Latin to 11,800.

The obvious criticism that might be made of the method of collecting LSPs from a real collection of Latin files is that the phrases will be bounded by the Latin found in the test set. Other users might have different Latin collections.

Another difficulty may be mentioned in connection with the statistical process for collecting LSPs. Latin authors in ancient and (especially) in medieval times showed a marked tendency to copy verbatim chunks out of each others' texts. For example, difficult Latin phrases from the poet Vergil were discussed by later writers, asking what the poet actually meant. Vergil's poetry was constrained by the need to fit words to his favourite meters, and therefore later writers quoted several of his phrases verbatim in order to discuss them. Thus it happens that what was originally just one idiosyncratic phrase becomes magnified into a popular 'standard phrase'. A large number of medieval writers quoted Boemus, who wrote a long treatise on the subject of music theory. Again, large chunks of Boemus' work are quoted verbatim. And again, Christian writers, especially St Augustine, repeatedly quote large chunks out of the Latin Bible. It is difficult to know how best to handle these potential LSPs, since on the one hand a single rare phrase has been copied into prominence. On the other hand, undoubtedly the phrase now occurs frequently, spread across several later writers. The current policy is to include these much-quoted phrases as LSPs, with the important exception of phrases taken originally from the poets where the phrases are artificial constructs anyway.

Effect of LSPs on Translation Speed

A characteristic of Blitz Latin is that it is intended to execute very quickly, as the name suggests. The author has a vivid recollection of the frustration of waiting 20 minutes for a single paragraph to complete translation - badly - with one of the early Latin translators used on a contemporary computer in year 2001. The earliest version of Blitz Latin could translate the same paragraph, on the same computer, to a higher standard in fewer than 0.1 seconds.

A key issue with the coding for Blitz Latin of the LSPs therefore remains a preoccupation with the effect on the run-time speed for translation of real Latin texts. It is necessary that every word in the original Latin text - after programmatic correction of the scribe's errors - must be examined at some point to

determine whether it is the first word of a longer LSP. If a match is found, then subsequent Latin words have to be matched to the table of LSPs. There are various technical ways to accelerate the code for this problem, not described here.

In speed trials, involving the sequential translation of groups of the 4,000+ Latin files of the standard test set, we discovered that use of LSPs with Blitz Latin resulted in an overhead of some 5-15% of translation time, compared with the same version of Blitz Latin without any LSPs. It was those Latin files that benefitted most from substitutions (predominantly the files of classical Latin) whose translation speed was affected most adversely. Even an increase of as much as 15% in translation time, starting from the very high speed of Blitz Latin, is an overhead that could easily have been borne for a superior translation quality. However, application to the LSP code of the same AI principles used to search Latin stems resulted in the time overhead being reduced to just 0.6% on the standard set of PHI files of classical Latin. Moreover, there are technical reasons of coding why a considerable expansion of the LSPs supplied with Blitz Latin should have little further effect on program translation speed (confirmed in practice as the original list of LSPs grew from 1,000 to 3,100 to 7,000 to 9,500 entries). We do not yet need to rename 'Blitz Latin' as 'The translator that died of shame'.

Conclusion

The addition of Latin Standard Phrases has markedly improved the translations of Blitz Latin, in those places where they occur. The most disappointing feature has been the comparatively low frequency with which they occur in real Latin texts, a consequence of too many inflections and excessively variable word orders. However, we anticipate that user feedback will increase steeply the number of valuable LSPs from their own work.

The huge advantage of this method of improvement of the translation of real Latin (compared with the output from a jigsaw translator) is that the Standard Phrases have been checked manually (by Meissner, by the originators of standard Latin dictionaries, by this programmer) for their general utility, and are backed by the superior accuracy of a rule-based Latin translator whose code will not permit the use of LSPs in situations that are obviously inappropriate.

My old Latin teacher would have hated it. He despised folksy or 'popular' translations, explaining that, if you do not make a literal translation, then probably you will make a wrong translation and certainly you will lose the flavour of the original Latin.

Instructions for Users

Menu options Edit/User Phrases/Allowed and Edit/User Phrases/Show permit the user respectively to switch any use of the LSPs ON or OFF, or whether or not to show the encapsulating characters <...> (see below).

The LSPs of Blitz Latin are contained in a single text file, entitled 'UserPhrases.txt'. The entries are pre-sorted into alphabetical order for the convenience of users, but the latter can add their own LSPs freely to the bottom of the text file. [NOTE: In order to protect intellectual property, most users will receive encrypted files of Latin Standard Phrases. However, such users can still add their own further LSPs in unencrypted form to the bottom of the file, providing the rules stated below are still met.] Since all the LSPs will ultimately be stored in computer memory for speed of access, it has been necessary to provide a finite limit on the number of such additions, currently an arbitrary 10,000 entries, requiring some 2MBytes of RAM.

The structure of the LSPs in the file is exemplified thus:

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a retro/behind\in arrears
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The forward slash ("/") is essential, and separates the Latin phrase being sought from the English translation. The back-slash ("\") is entirely optional and serves only to separate alternative translations. Very few of the LSPs used in Blitz Latin require such alternatives.

The only other requirements are these:

Maximum five Latin words in the LSP, each of a maximum of 20 characters.

Maximum 78 characters in the English meaning.

Any use of a Latin verb infinitive must have the preposition "to " placed as the first word of the translation, for example:

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a re publica recedere/to retire from public life
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The use of a LSP in Blitz Latin is marked with a preceding "<" and a trailing ">", for example:

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a re publica recessi. <I have retired from public life>.
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These enclosing characters can be switched on and off at will by the user.

All the Latin words must be provided in lower-case characters only. The translation program sorts out whether or not words with upper-case characters in the original text can be matched to the LSP.

Likewise, Blitz Latin is indifferent to whether the user has provided Latin phrases with the letters 'u' or 'v', or with 'i' or 'j'. These can be jumbled up indiscriminately, and the program will convert all into 'u' and 'i', as used internally.

A more awkward problem concerns the use of enclitic words (-que, -ve, -ne), exemplified by the short Latin phrase *rex reginaque amant suum canem* ('the king and the queen love their dog'). To the machine translator, there is no difference between this phrase and the similar *rex et regina amant suum canem*. However, the standard phrase for *rex reginaque* must be entered as *rex que regina*, because that is how Blitz Latin handles the text internally.

Unwanted single LSPs can be switched off by the simple expedient of placing a double hyphen "--" in front of the offending line in the text file of LSPs.