

John White's *BLITZ LATIN* automatic translator.

LSP Versions 2.0+ (Windows XP/Vista/Windows-7, 8 or 10 ONLY)

© John F. White, William A. Whitaker

PRINT PAGES 1-19 OF THIS MANUAL FOR EASY REFERENCE

Contents

I. THE BASICS.....	2
1. OVERVIEW.....	2
2. SYSTEM REQUIREMENTS.....	3
3. INSTALLATION/DE-INSTALLATION OF BLITZ LATIN.....	3
4. GETTING STARTED WITH BLITZ LATIN.....	4
5. TRANSLATING LATIN TEXT FILES.....	6
6. ON-SCREEN EDITING.....	6
7. RENAME FILE (= SAVE FILE).....	7
8. HELP.....	8
9. USEFULNESS AND RELIABILITY OF BLITZ LATIN.....	8
10. EASY (TEACHING) LATIN TRANSLATION.....	9
11. THE AMBIGUITY OF LATIN.....	10
12. GRAMMATICAL/USER ISSUES WITH BLITZ LATIN.....	13
13. REAL EXAMPLE FROM CHURCH LATIN TRANSLATION.....	15
14. GRAMMATICAL ABBREVIATIONS USED BY BLITZ LATIN.....	18
15. REGISTRATION.....	19
II. USER-ADJUSTABLE SETTINGS.....	20
16. USER PHRASES / LATIN STANDARD PHRASES (LSPs).....	20
17. USER SETTINGS.....	22
18. USER DICTIONARY.....	23
III. INFORMATION / ADVANCED.....	25
19. THE ELECTRONIC LATIN DICTIONARY.....	25
20. STEMS AND INFLECTIONS.....	26
21. PROPER NAMES (ARE NOT EASY).....	27
22. INTELLIGENT GUESSES AT UNKNOWN WORDS.....	28
23. ABBREVIATIONS IN LATIN TEXT.....	29
24. SINGLE WORD UNDERScore.....	29
25. SINGLE WORD TRANSLATIONS.....	30
26. 'CANNOT TRANSLATE A SINGLE WORD CORRECTLY.'.....	30
27. SVOE AND BEST ORDER FLAG.....	31
28. AREA PREFERRED.....	32
29. AGE PREFERRED.....	33
30. CONSISTENCY CODE.....	33
31. LOCATIVES IN BLITZ LATIN.....	34
32. MEDIEVAL LATIN.....	34

33. MEDIEVAL TRICKS.....	36
34. MEDIEVAL PHONETICS.....	36
35. PLAUTUS ELISIONS.....	37
36. ROMAN INSCRIPTIONS.....	37
37. ABOUT SEARCHING MULTIPLE LATIN FILES.....	38
38. HOW TO USE THE BLITZ LATIN SEARCH ROUTINE.....	39
39. SPELL-CHECKER.....	41
40. LIMITATIONS OF BLITZ LATIN.....	41
41. PRINT OUTPUT.....	43
42. RELOAD TRANSLATION.....	43
43. VIEW.....	43
44. TWO OUTPUT WINDOWS.....	44
45. USEFUL WEB ADDRESSES.....	44
46. ADDITIONAL PROGRAMS SUPPLIED WITH BLITZ LATIN.....	44
TECHNICAL.....	45
47. THE TRANSLATOR.....	45
48. NEURAL NETWORK.....	46
49. TECHNICAL LIMITATIONS.....	46
50. HIGH-SPEED HASHING.....	47
51. VERB INFLECTIONS.....	47
52. PROGRAM FILES.....	48
53. THE HISTORY OF MUSIC IN LATIN.....	49

I. THE BASICS

1. Overview.

Blitz Latin is a stunningly fast Latin translator written in C++. It translates Latin text into English, but not English into Latin. New techniques have been used to accelerate both the reading of the dictionary and the automatic translation.

Blitz Latin combines the grammatical wizardry of Dr. William A. Whitaker (U.S.A.), who created a giant Latin dictionary with algorithms to match Latin stems with inflections, with the expertise in Artificial Intelligence (A.I.) of Dr. John F. White (U.K.), who also did the coding.

Blitz Latin is NOT in the Public Domain. The ownership of this program is here asserted by the author, John White, of Wokingham, England. The ownership of the Latin Dictionary used in *Blitz Latin* is here asserted by William A. Whitaker, of McLean VA, USA. The ownership of the 'Calepinus Novus' Dictionary used in *Blitz Latin* is here asserted by the Melissa Foundation (Guy Licoppe) of Belgium.

The user may select single words, multiple words, multiple paragraphs or complete Latin files for reading through the dictionary or for automatic translation. Conventional Roman numerals, such as 'VII', are also understood and accepted.

2. System Requirements.

1. IBM-compatible PC with Microsoft's WINDOWS XP or later.
2. Free RAM on computer of 20 MBytes after WINDOWS (and any other installed programs) have taken their cut.
3. Sufficient free hard-drive space to unzip the program (if you have that much space, you have enough for normal program operation).

If you can read the help file from *Blitz Latin*, your computer almost certainly has enough system resources to run this program properly. Very little further RAM is required when the program operates; most was allocated during initialisation. Nominal RAM requirement is 24 MBytes in addition to that required by the WINDOWS operating system (+ 0.5 MBytes for the program itself).

3. Installation/De-Installation of *Blitz Latin*.

Program Provided:

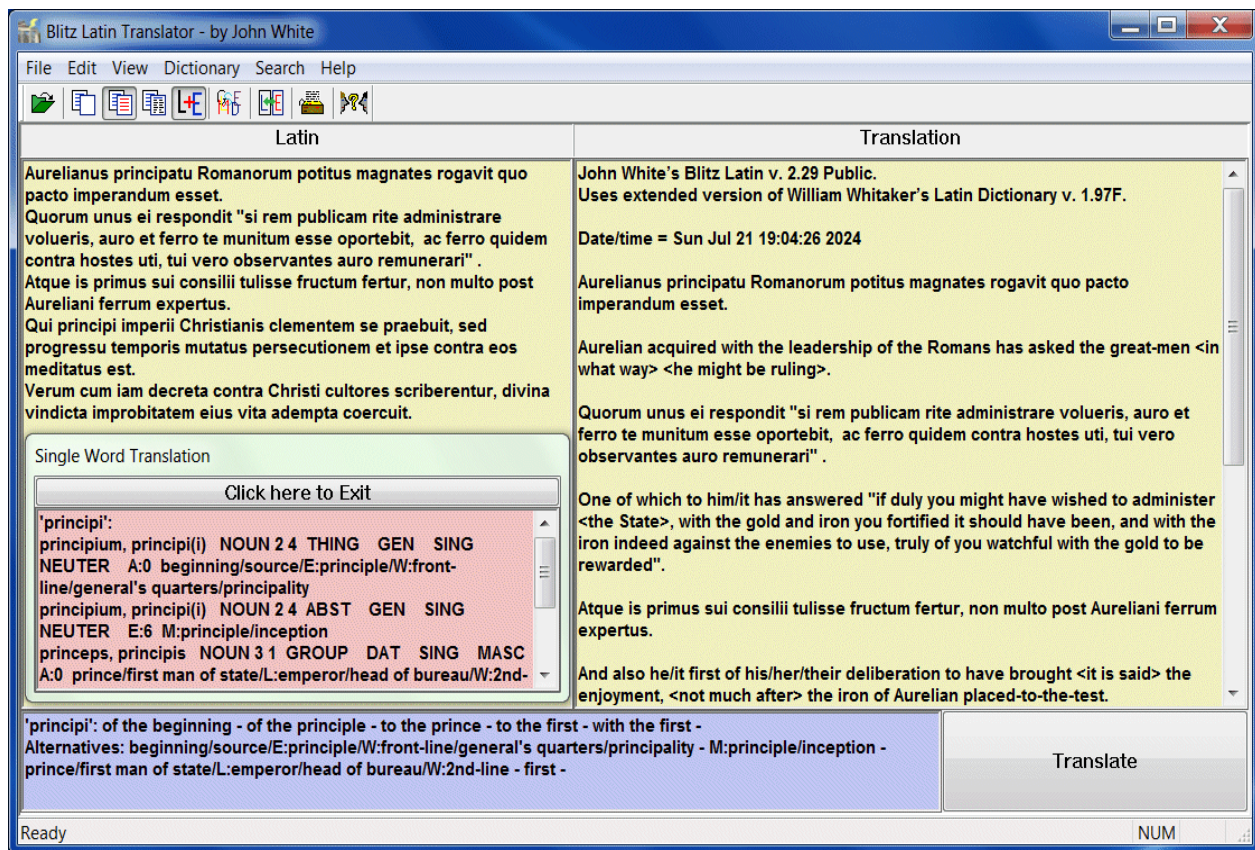
BlitzLatinSETUP.zip. This is a standard zip file that can be un-zipped with WinZip or some other programs that can unzip ZIP files, such as 7-Zip. When unzipped, BlitzLatinSETUP.zip contains all the necessary data files, help files and an instruction manual 'BLITZ2.PDF'. BlitzLatinSETUP.zip also contains the executable file BLITZ2.EXE.

Method:

1. VIRUS CHECK the file BlitzLatinSETUP.zip!! Then you will know it is safe.
2. Create a sub-directory/folder called 'BlitzLatin' on any convenient drive. The C: drive that you will have already on your computer is a very good choice. Let us call this folder C:\BlitzLatin. Place file BlitzLatinSETUP.zip in your new folder C:\BlitzLatin. Double-click on the file BlitzLatinSETUP.zip and follow the on-screen instructions to install *Blitz Latin* into the same sub-directory. [Note: If you have already a version of *Blitz Latin* on your computer, be sure to remove it first (see below) or use a different sub-directory (no two versions of *Blitz Latin* are ever compatible, for reasons of economy of use of RAM space).]
3. Create a short-cut to the executable file blitz2.exe, by single-right-clicking on the file Blitz2.exe and selecting 'create shortcut'. Then drag the shortcut onto your desk-top and rename it to 'Blitz Latin'.
4. Print out the instruction manual BLITZ2.PDF, using Adobe's Acrobat Reader (available on many computing magazine covers, or direct from ADOBE (see 'useful Web addresses')). The first 19 pages will suffice for basic instruction. Note: BLITZ2.PDF contains virtually the same information as in the Blitz 'HELP' files, but is much easier to read.
5. Click on the '*Blitz Latin*' icon on your main screen, and you're up and running!
6. Test that the program works properly with the example in the instruction manual.

To Remove *Blitz Latin* from your computer:

Simply right-click on Blitz Latin's folder on your C:\drive and click 'delete'. That is, you need to delete folder C:\BlitzLatin, if you followed the instructions above.



4. Getting Started with *Blitz Latin*.

Follow this tutorial, which tests that all the key features are working properly:

1. First maximise the screen display so that you can see the 'TRANSLATE' button at the bottom of the screen. (If you have difficulty, try setting your computer to 1024x768 screen resolution.)
2. Observe the Latin text window on the left, and the English translation window on the right. At present, the right window contains start-up information. [Version 1.40+:] At the bottom is a small window that will hold data for a single Latin word when clicked in the Latin window.
3. Type in a Latin word into the Latin window. You can use the normal editing commands, including cut and paste (CTRL-C/ CTRL-V). For example, type in the single word '*huius*'. Now click on the TRANSLATE button to get the meaning in the English window.
4. Add '*modi*' to '*huius*' to create the single word '*huiusmodi*'. Click on the TRANSLATE button. *Huiusmodi* actually comprises two Latin words joined together, as *Blitz Latin* recognises (tests Addons file).
5. Clear the Latin text (click on 'Empty Latin' in the EDIT menu, or on the toolbar button). Type in '*Huiusmodi Oinkus amat reginam*'. Click on the TRANSLATE button - five words are shown, and the imaginary word 'Oinkus' has also been recognised. Change 'Oinkus' to 'oinkus' and translate. The word 'oinkus' has not been recognised - it is not a proper name. Similarly 'Oink' will not be recognised, since it lacks the proper inflection.

6. Type in '*huiusmodi Aurelianus amat reginam*' (without any punctuation). Now toggle ON the Translation option (in the EDIT menu, or on the toolbar). Click on the TRANSLATE button. Now you have the translation (tests User file). Observe that a period (full-stop) has magically appeared at the end of your Latin sentence. This is essential for automatic translation, and you should take care to provide periods properly in all lengthy Latin text for translation. Note that the 'Translation Option' does NOT have the same effect as the TRANSLATE button.
7. Replace '*huiusmodi*' with '*huiuscemodi*', a more emphatic form, and click on the TRANSLATE button (tests Uniques file working correctly).
8. Now use the menu item FILE/OPEN to select the example file 'WORDFILE.TXT' provided with *Blitz Latin* (actually, you might like to read what is in this file before translating it - use a word processor). Use the standard file dialogue selector to open WORDFILE.TXT. The file is automatically translated without need to use the TRANSLATE button.
9. Try the file translation with the 'Translate Option' toggled on and off. You may also toggle the joint Latin/English text button on and off. The 'Joint Button' causes single Latin sentences to be followed by their translations, alternating until the translation is complete. The button is only active when translation mode has been selected.
10. Now try the file translation of WORDFILE.TXT with the Detail button (EDIT menu or toolbar button) toggled ON (with the Translation Option also ON). The output now contains the options examined by *Blitz Latin* before and after the automatic translation, showing which stems and inflections were eliminated and why. You may wish to make manual adjustments on the basis of this information. Again, this is best done by examination of the output file 'PARSER.TXT' in a word processor. (Don't forget that each new translation in *Blitz Latin* overwrites the previous 'PARSER.TXT'.)
11. You can also translate single words by SELECTION. Highlight with the mouse the word or words in the Latin window that you wish to translate, click the TRANSLATE button, and they will be selectively examined. This option is intended to provide instant feedback of a few selected words, not for use on lengthy files (limit 2,000 characters).
12. Selection of single words in translation mode only provides the grammatical structure of the word in a small dialogue box. Highlight the single word 'primus' (from WORDFILE.TXT) and click the TRANSLATE button. More conveniently, single-clicking on a Latin word in the Latin text window will provide alternative translations in the lower text window. Click on 'primus'. The alternative meanings of 'the chief', 'first' and 'the first' will be shown. Highlight 'the first' with the mouse, press CTRL+C, point with the mouse to the translation 'chief' in the line 'And that chief of his/her/their debate' in the right window, and press CTL+V. 'The first' is inserted at the point you selected. Delete the unwanted word 'chief'. [Owing to *Blitz Latin*'s policy of continuous improvement, the initial translation may differ from that shown.]
13. Save the changes with the rename option (File/Rename) to 'Myfile.txt'. Read it later in a word processor.
14. Finally, check out the time that *Blitz Latin* takes to complete automatic translations of your files. The time is printed at the bottom of each translation file in the right-hand window. Pretty good, eh?

Note: *Blitz Latin* lacks any facility to save Latin text that you type into it. *Always* type lengthy Latin texts into a word-processor, then save them as .TXT files for subsequent translation with *Blitz Latin*.

5. Translating Latin Text Files.

Latin text in any '.TXT' or '.ASC' file can be read easily into *Blitz Latin* and processed. An example is given with 'WORDFILE.TXT'.

First of all, prepare your text:

1. Obtain your file in a '.TXT' or '.ASC' form (text only), *not* HTML, RTF or DOC, which must all be converted to a text file with a word-processor.
2. Check that all words comply with these rules:
 - a) Roman names must have the first letter only capitalised, eg Augustus.
 - b) Roman numerals must be all capitalised, eg VII (not vii).
 - c) Convert title words, such as CICERO IN CATILINAM, to predominantly lower case: 'Cicero in Catilinam.' Be sure to add a period after the title, as shown.
 - d) Place periods at the end of every complete sentence, including at the end of the text. This is especially important with the Latin poets, who ramble on for line after line without punctuation!

Process the text, simply by selecting whether or not the translation button should be toggled on/off, then by opening the file from the menu option 'File/Open'.

If the total text exceeds 200,000 characters, either as Latin or as the translation, the text displayed on screen will show the legend 'TRUNCATED'. However, the files will still have been fully processed, and the translation file PARSER.TXT can be viewed in its entirety in a conventional word-processor.

Pressing the ESCAPE key will terminate the processing of a long Latin text file.

Any user line beginning with '--' (two hyphens) is commented out from the text file, rather like a REM in the Basic programming language. Such lines will not be processed.

6. On-Screen Editing.

You can change the background screen colour for the two large text windows with menu option 'View/Select Font And Background Colour'. Options are limited to pale yellow (default), white and light-grey.

It is possible to edit the translation after completion by typing corrections into the translation window and saving the resulting corrected file 'PARSER.TXT' (see 7. Rename File (= Save File).)

In addition, *in translation mode only*, highlighting a single word with the mouse will provide alternative translations and grammatical information. An easier method is just to left-click with the mouse on the Latin word of interest. The alternative translations can be cut-and-pasted (CTRL-C to cut the highlighted text, CTRL-V to paste it into the new location where the cursor resides) into the translation. In order to preserve your corrections, it will be necessary to RENAME the existing file.

The single word translation shows all possible stem alternatives, with all inflections. If you're dissatisfied with *Blitz Latin*'s translation, and looking for alternatives, there is little point in the program trying to guess the correct inflection. In addition, alternative meanings for each stem type are given (version 1.37+).

Owing to the finite capacity of the translation window, on-screen editing will NOT be possible if the translation file 'PARSER.TXT', which holds the full translation, exceeds 200,000 characters. If this occurs (a warning of truncation will be given when the file attempts to load), the best solution is to take your original Latin text, divide it into two (or more) parts, and translate each part separately. After all, *Blitz Latin* is so fast that this can hardly be called an irksome task!

Interruptions to editing: Suppose that your on-screen editing becomes interrupted. For example, you might have done enough for today and wish to continue tomorrow. The solution is to rename (save) your edited text, eg as 'myfile1.txt', then reload the translation (see section 42. Reload Translation.).

You may notice during editing that a Latin word was mis-spelled in the original text. If you correct the error and re-translate the whole document, you will lose all your previous editing. Save the existing edited translation as 'myfile1.txt' and re-translate the amended Latin text, continuing with editing at the point you had last reached. Then save this new edited text as eg 'myfile2.txt'. Finally re-load 'myfile1.txt' and 'myfile2.txt' into a word-processor, and cut-and-paste the edited parts of each file so as to make a complete edited document.

Copy, Cut, Paste.

Many users have adopted the translation policy of copying a Latin text by paragraphs from a word-processor into *Blitz Latin*, creating the automatic translation, editing the translation, then copying the corrected translation back into the word-processor.

Loren Kellogg (USA) kindly suggested a more efficient way of effecting the cut/copy/paste process, which hitherto required memorisation of the necessary keyboard commands. This has now been implemented for versions 1.66+.

1. Menu items 'Edit/Copy', 'Edit/Cut' and 'Edit/Paste' have now been added to the main menus.
 2. A click on the two large translation windows with the right mouse button will also bring up a floating menu. Select from 'Copy', 'Cut' and 'Paste'.
 3. The keyboard alternatives (Copy = Ctrl+C, Cut = Ctrl+X, Paste=Ctrl+V) still work as previously.
- In all cases, first highlight the text to be copied or cut by dragging the mouse over it, or place the cursor in the position to which you wish to paste text.

Note that it is never possible to 'cut' from, or 'paste' to, the bottom window of *Blitz Latin*, nor into the right hand 'Translation' window unless the Translation Button has first been used to translate some Latin text (and not even then, if the text already fills the window's storage capacity).

7. Rename File (= Save File).

Click on this menu option to rename the translation output file 'PARSER.TXT' to another filename of your choice. The new file is actually a copy of the old, placed with your new filename in your new selected location. The original file remains in place.

Remember that 'PARSER.TXT' becomes re-written every time that you carry out a new translation. It is therefore essential to rename the PARSER.TXT file if you plan to examine old translations at some later date. The recommended procedure is to carry out as many translations as you wish, renaming the translation file each time, then to exit from *Blitz Latin* and to re-examine the renamed translation files in a word processor.

A visual cue is given after a renamed file has been saved. All the text in the translation window will become highlighted. Click anywhere in the translation text to remove the highlighting and (if necessary) to continue editing.

8. HELP.

Three Help menu items are available.

1. HELP gives this help text.
2. ABOUT BLITZ LATIN provides details of this version of *Blitz Latin*. Quote these details to the program author in the event of any query.

9. Usefulness and Reliability of *Blitz Latin*.

Blitz Latin is very rugged in use.

Versions of *Blitz Latin* from 1.33 upwards have been tested without failure on multiple scans of nearly 1,000 Latin texts downloaded from 'Latin Library' (see 'useful Web addresses'), a prime repository for Latin files (in HTML format) of uncertain accuracy. The files contain all the works of such well-known Latin writers as St. Augustine, Caesar, Cicero, Livy, Ovid and Vergil, as well as numerous other files, including fragmentary texts, by less well-known authors. Thus the file set can be regarded as representative of classical Latin, and contains over 5 million Latin words in all. In addition, all the Latin texts provided by P.H.I. CD ROM No. 5.3 (many overlapping with the Latin files described above; some 7.3 million words) have been translated, courtesy of the Packard Humanities Institute, USA. These include all known Latin texts, including fragments but excluding inscriptions, up to about 200 AD, and many subsequent texts. Another 1.7 million legal words from Justinian's Digest/Codex and from Theodosius' Codex, and 600,000 words from the Vulgate Latin bible, have also been tested and all the most common words incorporated. 7.8 million words from medieval documents (mostly from 'Augsburg', see 'useful Web addresses') have been translated and all the most common words incorporated. A further one million Latin words describing the medieval theory of music ('TMT project') have been processed, as well as 600,000 Latin words from Bracton's medieval Law. More recently, one million Latin words from 16th-19th Century mathematical and technological texts (courtesy of Ian Bruce, Australia) and 11.5 million (sic) words from the Vatican's Acta Apostolicae Sedis documents (after removal of non-Latin paragraphs) have been churned through *Blitz Latin*.

The only unknown Latin words (excepting proper names and mis-spellings) that will be encountered with *Blitz Latin* will be those with a frequency of four or fewer occurrences across all the range of files listed above. Most less-frequent words will also be translated. And *Blitz Latin* manages the translation of *all* these files within 15 minutes with a modern 1.4 GHz computer.

Versions of *Blitz Latin* from 1.36 upwards additionally include the ability:

- i) to make intelligent guesses at many unknown words, found by experience to be the most likely to be calculable. [1.36]
- ii) to translate Latin inscriptions as presented in Frankfurt University's database (see 'useful Web addresses'). [1.36]
- iii) to assign mis-spelled medieval words phonetically. [1.51; revised 2.17]
- iv) to spell-check one or more Latin files. [1.51]
- v) to assign some ambiguous Latin words, such as *plaga*, according to context with a neural network. [1.62]
- vi) to obtain Latin glossary of individual Latin words simply by clicking on them. [1.71]
- vii) to translate Botanical Latin. [1.80]
- viii) to classify Latin nouns and verbs. [1.81]
- ix) to substitute pre-translated English phrases from a giant list for many Latin phrases. [2.00]
- x) to recognise many ablative-absolute constructions. [2.07]
- xi) to force medieval/neolatin meanings instead of classical meanings for medieval/neolatin texts. [2.19]

For further new additions, refer to 'What's New?' in *Blitz Latin's* Help file.

10. Easy (Teaching) Latin Translation.

The huge dictionary of *Blitz Latin* is very beneficial when translating real Latin texts, since classical and medieval writers tended to use the whole range of their vocabularies to express themselves. The importance of having a sufficient dictionary for real, ambiguous Latin texts can scarcely be exaggerated.

However, a giant vocabulary can sometimes complicate the translation of the simpler Latin texts used for teaching purposes. Teachers and students using such texts should toggle ON the menu option 'Edit/Easy Latin' (or press Ctrl+L). The default is OFF.

There are three effects:

1. The preferred age is switched immediately to 'CLASSICAL LATIN'.
2. All less common words, defined as those with a frequency of 'D' or higher, will be deleted from consideration during translation. Note that the rarer words will still be seen when you click on a Latin word in one of the windows, or when viewing in non-translation mode (translation toggle off), or when viewing the dictionary.
3. If no common word is found in the dictionary for a Latin word, then all the less common Latin words will be considered instead. For example, *improbatio* is very rare, but if you type in *rex habet improbationem*, *improbatio* will still be translated since it is a classical word and there is no more common alternative. However, if *improbatio* were a medieval word only, it would not be used either.

You can over-ride the 'Classical Latin' age, if you wish, by changing 29. Age Preferred. Finally, when you have finished with this mode, don't forget to reset 'Preferred Age' to your preference (default is medieval age).

11. THE AMBIGUITY OF LATIN.

Every user of *Blitz Latin* should be aware of the great difficulty of translating Latin, relative to its derived west-European successor languages such as French, Italian and Spanish. Teachers and students of Latin will be well familiar with the difficulties of translating the language - difficulties which are not encountered when translating the successor languages.

An inflected language is always prone to ambiguities in translation. Written Latin is a concise, inflected and over-loaded language, where a single word may have several meanings depending on context. Thus it differs significantly from the verbose modern European languages. It is remarkable how many words can be construed as a verb or a noun; and how many as a noun or an adjective. Consequently Latin words are frequently ambiguous, so that an automatic translator often has to make difficult decisions about which of several alternative meanings are intended. Moreover, even when the grammatical types can be distinguished, the word may have several different meanings separated by custom (unknown to the translator) or by pronunciation (also inaccessible to *Blitz Latin*).

A further difficulty is that Latin does not have a word for 'the' or for 'a'. Thus in general it is not possible to distinguish between 'the king' and 'a king'. Modern inflected languages, such as German, greatly reduce the ambiguity of the inflection by combination of the word with an inflected article ('the' or 'a'). This was a problem also for the ancient Romans, most of whom would speak in Vulgate Latin (a spoken version of Latin with many added prepositions to aid clarity) or even in Greek.

Here is an example of the problem with over-loaded meanings: *rex est contentus*. The word *contentus* can be an adjective, meaning 'content', or the past participle of the verbs *contendere* ('stretch') or *continere* ('secure'). The Latin phrase can therefore be translated as 'the king is content/has been stretched/has been secured'. Which is correct? I have no idea (without much more information which might or might not be present in the original Latin text), and neither does *Blitz Latin*.

Therefore accurate translation frequently requires general knowledge or even actual knowledge of Roman history, which obviously *Blitz Latin* does not possess. Sometimes the knowledge is unavailable even to a modern expert in Latin. A well-known example is the emperor Nero's reported last words, *qualis artifex pereo*, which have been expertly translated as 'What an artistic way to die', 'Dead. And so great an artist' and 'What an artist dies with me'. (Try out *Blitz Latin*'s translation of the same words.) Presumably contemporary Romans had some way of distinguishing the alternatives by common usage, which has now been lost. Even worse is the common short phrase *liber primus*, which can mean 'The First Book' or 'The Free Leading-man'.

Here is another example of the difficulties of Latin translation: *Aurelianus...rogavit quo pacto imperandum esset*. This may be translated literally as 'Aurelian ... has asked by which manner it might be ruled.' *Blitz Latin*'s translation is 'Aurelian ... has asked with which bargain might be requiring-to-be-commanded.' The professional translation is 'Aurelian...asked how he should rule.' Clearly, the inelegant translation of *Blitz Latin* is actually pretty good, but there is a big step of imagination required to reach the professional translation.

The modern west-European languages can largely be translated word-for-word into English, whereas in Latin the word order shows the emphasis that the writer required. The subject, verb and object of a Latin sentence may be placed anywhere within it. Indeed, books about Latin grammar go to great lengths to instruct students in the principles of which Latin word is connected with which other Latin word. You do not find that in books of French or German grammar!

Thus word-for-word translations are impossible from Latin to English. For example, in Italian we can say 'contro i discepoli di Cristo', a phrase that can be translated word-for-word to give: 'against the followers of Christ' (a common theme in the early Christian literature). In Latin this becomes '*contra Christi cultores*'. You may notice that the Latin version has only three words, and their order is different from the Italian/English. Moreover, *cultores* can mean 'inhabitants, cultivators, supporters'.

Again, many medieval writers wrote truly awful Latin. They couldn't spell and they invented new words. To take just one example, the word listed in Lewis and Short's Latin Dictionary as *synemmenon* is variously spelled as *synnemenon*, *synhemmenon*, *synemenon*, *sinemenon* and *sinemmenon*. How should *Blitz Latin* respond? It can no more list every alternative mis-spelling of a difficult word than can (say) a modern English dictionary. [The phonetic checker from version 1.51 handles all the above mis-spellings.] Thus users of *Blitz Latin* for medieval documents are certain to suffer some disappointments, although the translator is actually very good (far beyond reasonable expectation) in trying to adjust for medieval errors. Example of difficulty: the famous Magna Carta was a Latin document limiting the king's powers, that was signed at the instigation of his powerful barons by a reluctant King John in 1215 in England. The barons are addressed repeatedly in the Magna Carta as *barones*. Every single (printed) classical Latin dictionary that you can find lists *barones* as 'blockheads/dunces' with NO alternatives! How will you react, dear reader, if you attempt to translate the Magna Carta and encounter references to 'the king's loyal blockheads' in every other sentence?

It is not only medieval authors who wrote dreadful Latin. There is an irritating modern trend for children's authors to use short Latin phrases in their books, apparently to impress their young readers. Many of these sentences make no sense at all, so naturally *Blitz Latin* cannot interpret them properly either. Example: *damnatio tuum* [sic]. If you are a young person, please remember that the Latin in your favourite book probably makes no sense even to a human Latin expert.

The 1.6/1.7/2.0/2.1/2.2 series of *Blitz Latin* has been heavily checked in recent years against the Latin texts of the Packard Humanities Institute (PHI; CD ROM #5.3), used with kind permission. These double-checked, highly accurate texts contain all known Latin up to 200 AD, and many subsequent writings to 600 AD. Thus the accuracy of *Blitz Latin's* translations can be readily assessed.

It has become possible to assert from release 1.67 that *Blitz Latin's* grammatical accuracy has become generally very good. This does not mean that the translations are perfect, since Latin ambiguity remains an insuperable problem for a computer program that lacks human general knowledge. As stated elsewhere, Latin words tend to be very ambiguous, making Latin one of the most difficult of all languages to translate. One of my favourite errors is this line of authentic

text: ‘*victos in Hellesponto navali bello*’, which should mean ‘conquered in the Hellespontic naval war’, but which is translated (with complete grammatical accuracy) by *Blitz Latin* as ‘lived in naval pretty Hellespontus’.

There are a number of reasons why these ancient texts have survived. Some are instructive (of history, grammar, medicine, law, poetic metre, architecture, Christianity), others are philosophical (both secular and religious), while others have been preserved for their style and eloquence (poetry, Cicero). Experience with the PHI texts shows that *Blitz Latin* handles the instructive texts pretty well, the philosophical texts less well, and the poetic and eloquent texts poorly. Broadly speaking, short sentences are handled better than long ones. But that is what one would expect from the nature of the texts. How many readers would expect to be able to read philosophy or poetry accurately in their school-taught second language? These texts are difficult.

A further complication is that Roman knowledge of medicine and astronomy was wildly inaccurate by modern standards. I find it incomprehensible even after I have translated it! Equally, one does need to ‘think Roman’ when translating ancient Latin texts. The Romans used their own slang and euphemisms. For example, a person is often described as ‘*sublatus*’. This means that he has died, not that he is ‘lifted’ (literal translation), still less that he is ‘elated’ (alternative adjective). Unfortunately, the only way to acquire the Roman mind-set is to read a lot of classical Latin literature.

Experience shows that most purchasers of *Blitz Latin* use it to translate medieval or post-medieval Latin texts. Generally speaking, such texts lack the obscure ‘style’ of a grammarian and certainly are encountered rarely as poetry. Translations by *Blitz Latin* from ‘real’ medieval documents should provide better results than from many classical texts. And finally don’t forget that, in the days before printed books of grammar, ancient educated writers, and ill-educated medieval scribes, may use worse grammar than is understood by *Blitz Latin*, which therefore cannot comprehend their sentence construction.

Blitz Latin is a very fast, very capable translator of Latin with a huge vocabulary. The most common reported fault with *Blitz Latin* concerns apparently defective translations. On examination, the translations are almost always legal, and the only reason the complaint has been made is because the user happens to know that an alternative translation would be more appropriate. Not all translation problems that you may encounter with Latin are the fault of *Blitz Latin*! It knows a lot of Latin grammar, and its translations will almost always be technically legal renditions. It doesn’t know anything about world affairs, Roman history, the difference between painting a house and painting a canvas, or any similar matters that may be obvious to you. That is why it has an editing mode - so that you, who do possess the required general knowledge, can make manual changes to the translation of an ambiguous sentence. Go back to the example file ‘Wordfile.txt’ and examine the Latin word *principi*. The correct translation is ‘of the beginning’. *Blitz Latin* has provided ‘to the prince’. Both translations are legal, and I know which is correct only because I have read other Latin sources.

Nevertheless, *Blitz Latin*’s translations will generally be good enough to follow the text easily. Its breathtaking speed has enabled a huge number of translation algorithms/heuristics to be packed in - far more than conventional translators could manage. I myself use *Blitz Latin* all the time to grasp successfully the meaning of many Latin texts that were hitherto unknown to me.

12. Grammatical/User Issues with *Blitz Latin*.

By far the most important issues for the translation of Latin into English are:

i) Latin ambiguity.

ii) Latin word order.

These are the principal targets for the programmers of *Blitz Latin*; these items dominate all attempted translations, and besides them all other grammatical issues appear trivial.

Nevertheless, we have put a lot of effort into other features of Latin translation. Perhaps the biggest problem is where one should draw the line. One of our Latin teachers used to place great emphasis on the importance of a very literal translation. If it isn't literal (he would say) then probably you have translated it wrongly and certainly you will lose the flavour of the original language. This consideration has influenced *Blitz Latin*'s translations in the issues that follow.

Subordinate clauses and subjunctives.

Blitz Latin has throughout the 1.6 series (and earlier) attempted to tie up subordinating conjunctions (such as 'ut'), that control the subjunctive, to their verbs. Like many grammatical features, this was not visible to the user, since the subjunctive was left unaltered: *rex amat reginam ut regina regem amet* (the king loves the queen in order that the queen may love the king). However, it is customary in such cases to replace the subjunctive verb with the indicative, in the interests of 'good English': the king loves the queen in order that the queen loves the king. Whether this is really an improvement is a matter of opinion – this writer much prefers the original subjunctive. Nevertheless, the change has been made in the interests of satisfying those who mark Latin translations – and has the side effect that now the user has visible evidence that *Blitz Latin* is recognising subordinate clauses. Also recognised are many verbs and other words that can cause subordinate (consecutive, indirect) clauses. [From version 2.12, after a handful of complaints from users who also prefer the subjunctive in the translation, the construction *ut* + subjunctive-verb now retains the subjunctive in the English translation.]

Gerunds and Gerundives.

The gerund (verbal noun, -ndum, i, nt) and gerundive (verbal adjective, -ndus/a/um) of a verb are grammatically defined as future passive past participles. However, a translation of *amandus* as 'will be loved' would probably not be accepted by most Latin readers. The Collins Latin Dictionary Plus Grammar (1) provides a number of examples of gerunds and gerundives with suitable translations that show no consistent pattern which can be used mindlessly by a computer program. We have experimented with *amandus* = 'soon loved' and *amandus* = 'to be loved' (in the sense of 'requiring to be loved'). Neither alternative is particularly satisfactory, but both will fit the Collins examples with some stretch of the imagination. . From version 1.65, *amandus* is translated as 'requiring to be loved'.

Ablative Absolute.

This occurs within a sentence where a noun in the ablative case is matched with a variable participle (or another noun) to give an independent adverbial phrase. Again, Collins (2) provides several examples, eg *hostibus victis* which is translated as 'after beating the enemy', or *exigua*

parte aestatis reliqua, translated as ‘although only a little of the summer remained’. It seems to us, though, that a literal translation (‘with the enemies beaten’, ‘with the small remaining part of the summer’) is perfectly adequate, and for a long time we made no effort to re-cast ablative absolutes adverbially.

However . . . from version 2.07 the menu option ‘Edit/Ablative Absolute’ permits the recognition of many ablative absolutes as such in *Blitz Latin*. Specifically, a single ablative noun with a single ablative verb participle will be recognised for adverbial construction, provided that the noun and the participle are close enough together to be recognised as a connected pair.

Deponent verbs.

A number of classical Latin words are deponent (passive in form with active meaning). However, ignorant medieval scribes frequently did not understand this concept (or the usage), and rendered the deponent verbs as conventional verbs. It has been necessary to provide a perfect form for many deponent forms, for use with medieval texts. From version 2.11, deponent verbs are no longer permitted to take active forms, nor semi-deponent verbs passive forms, in the present tense.

Vocatives.

Vocatives can be recognised, in text translated by *Blitz Latin*, by their prefix ‘O’. For example: *rex amat reginam, Puer*. ‘The king loves the queen, O boy.’ However, a number of rules apply:

1. If the only inflection that *Blitz Latin* can find for a Latin word is that of a vocative, then a vocative will be shown, no matter how inappropriate. (Probably a new word needs to be added to the electronic dictionary, if the vocative appears to be incorrect.)
2. Subject to rule 1, the noun addressed must be marked in the electronic dictionary as a person (you cannot address a table), and the Latin word must have an upper-case first character. Thus *Puer*, not *puer*; *Caesar*, not *caesar*. The clause must not contain a verb, and vocatives in the second clause are particularly favoured.

Another issue with vocatives is found mostly in Latin poetry. A complete clause within a sentence is broken up by the casual exertion of a vocative within the clause. A convenient short test sentence (of originally a single clause) is *reginam, Rex, meam*. (‘my queen, O King.’) Note that *Rex* is a person, ‘King’, with an upper-case initial character for the English meaning, and is therefore counted as a vocative. These simple vocatives are no longer permitted to break the connection between *reginam* and *meam*. [In searches through our test Latin texts, these clause-breaking vocatives are very rare.] Since version 2.13, *Blitz Latin* will move the vocative clause to the end of the sentence in simple sentences, in order to aid correct assignments of the remainder of the text. For example, *da mi catillum, Puer, mundum* (‘give to me the plate, O Boy, clean’) is now rearranged internally to: *da mi catillum mundum, Puer* (‘give to me the clean plate, O Boy.’). Clauses involving *inquam* and *inquit* (I say, he says) are similarly rearranged.

Bridged prepositions.

Classical Latin likes to flaunt its style with phrases in which adjectives and nouns are linked across a bridging preposition, for example *nullo in loco*. This basic form is also found in English, for example, ‘strong in heart’. However, for reasons of style, classical authors frequently used much more complex constructions involving words linked across a preposition. These constructions are very hard for a machine translator to unravel, since there is a real danger that

the words found on either side of the preposition should correctly be linked to other words on their same side of the preposition. Moreover, this artificial stylistic form is found much less frequently outside the classical period. *Blitz Latin* now attempts to reconstruct the simple bridge found in examples such as ‘nullo in loco’.

1. *Collins Latin Dictionary Plus Grammar*, Harper-Collins Press (1997), pages 183-185.

2. *Collins Latin Dictionary Plus Grammar*, pages 22, 136.

And finally:

Many thanks to those users who have suggested improvements to *Blitz Latin*. We are particularly concerned to avoid ‘feature-creep’, where more and more idiosyncratic features are added to a program, resulting in the bloating, slowing and increasing bugginess of the original intent. Thus suggestions are much more likely to be implemented if made by several users. However, all suggestions are considered seriously. Some have been implemented in recent releases; some have been regrettably put aside owing to the excessive programming effort required; some have been insufficiently popular. All feed-back is warmly welcomed, whether concerning use of *Blitz Latin*, or concerning its translation abilities. Contact John White at johnpye-white1@ntlworld.com.

13. Real Example from Church Latin Translation.

EFFECT OF ERRATIC SPELLING AND GRAMMAR.

The following was posted on an ecclesiastical web-site discussion forum towards the end of year 2005. The writer wished to know if anyone could provide a translation of the following Latin hymn:

Tantum ergo Sacramentum Venere mae cernui
Et anti quum documentum Novo cedat ritui
Praestet fides supplementum Sensuum defectui

Genitori, Genetoeque Laus et Jubilatio
Salus, honor, virtus quoque Sit et benedictio
Procedenti, Ab utroque Comparsit Laudatio

Amen, Amen.

A helpful reader replied with the translation by *Blitz Latin*:

Only therefore Sacramentum with Venus [mae] head foremost and to the row when the lesson s/he/it goes to the new rite s/he/it excels the faiths the reinforcement Sensuum to the failure of Genitorus, and with Genetus the praise and with Iubilatus Salus, the honour, the manliness it may be likewise and the blessing of Procedentus, from the each Laudatus has saved amen, amen.

This translation caused a certain amount of ill-founded mirth on the forum but, as a wise contributor pointed up, if you provide garbage in, you will get garbage out (a point also made forcibly elsewhere in this manual).

What is the problem here? Firstly, either the original writer, or the original printer, has created typing errors. The word [mae] above baffled me, until I realised that ‘venere mae’ was supposed

to be ‘veneremus’ (‘s’ and ‘e’ are close on the keyboard.). The words ‘Genetoque’ and ‘antiquum’ need to be replaced with ‘Genitoque’ and ‘antiquum’.

Secundly, as Well as the problemm of miss peling
There is the Problem of the bizarre Line spacing and
The random introduction of Capital letters into The Text

The text lacks any full Stops (periods)
Except at the End, although
Verses Are apparently Separated by empty Lines

Therefore what the user should do to improve readability is to make these changes to the original text:

1. Replace ALL capital letters with lower-case letters, unless they are obviously proper names such as Christus or Amen. *Blitz Latin* assumes all words beginning with a capital letter are proper names (except the first word of a sentence).
2. Place a full-stop (period) at the end of each verse. Otherwise, place a comma at the end of each line.

Now we have (with known spelling errors also corrected):

tantum ergo sacramentum veneremus cernui,
et antiquum documentum novo cedat ritui,
praestet fides supplementum sensuum defectui.

genitori, genitoque laus et jubilatio,
salus, honor, virtus quoque sit et benedictio,
procedenti, ab utroque comparsit laudatio.

Amen, Amen.

The literal translation by *Blitz Latin* of the above (with ‘Ecclesiastical’ option switch on) was:

Only therefore the sacrament we adore head foremost, and the old lesson may go to the new rite, the faith may excel the reinforcement of the feelings to the failure.
To the father, and the praise and the shouting will beget!, the salvation, the honour, the virtue it may be likewise and the blessing, with the proceeding, from the each the commendation has saved.
Amen, amen.

This makes much better sense than the original translation.

The process of placing commas at the end of every line is a compromise, not strictly accurate. My literal translation of the original text would be:

Therefore we adore head-foremost the so-great sacrament, and the old lesson may go to the new rite, faith may ameliorate the reinforcement of the feelings to failure.

To the Father, and to the begotten proceeding [from the Father], the praise and the [joyful] shouting, the salvation the honour the virtue and the blessing likewise may be, the commendation from each has saved [us].

Blitz Latin's translation is, incidentally, much more accurate than the poetic loose English translation provided in an old prayer book.

Botanical Supplement Available.

For those who wish to make translations of botanical texts written in Latin, there is also a substantial botanical supplement available with the download package.

The official language for describing botanical research work was Latin, until 2013 (now it is English). If you wish to translate any botanical work (for example in a scientific horticultural magazine) that precedes year 2013, you will need *Blitz Latin's* botanical supplement.

14. Grammatical Abbreviations Used by *Blitz Latin*.

These abbreviations will be encountered when:

1. the 'Translate' button is clicked with the 'Translation' option toggled OFF.
2. the 'Translation Detail' option is toggled ON.
3. the 'Dictionary/Search Dictionary' menu item is selected.

(1= 1st person, 2= 2nd person, 3= 3rd person)

ABL:- Ablative OR verb takes Ablative case

ABST:- Abstract idea

ACC:- Accusative

ACTIVE:- Active voice (verb)

ADJ:- Adjective

ADJECT:- Adjectival pronoun

ADJ-LIKE:- Adjectival participle

ADV:- Adverb

ADVERB:- Numeric Adverb, eg 'once'

CARD:- Cardinal number, eg 'one'

COMMON:- Masculine *or* Feminine

COMP:- Comparative

CONJ:- Conjunction

COUNTRY:- Country, continent, sea, river

DAT:- Dative OR verb takes Dative case

DEMONST:- Demonstrative pronoun

DEP:- Deponent verb, passive with active meaning

DIST:- Distributive number, eg 'one each'

FEM:- Feminine

FUT:- Future tense (verb)

FUTP:- Future-perfect tense (verb)

GEN:- Genitive OR verb takes Genitive case

GER:- Gerund-participle (verb)

GROUP:- proper name Group, eg tribe

IMP:- Imperative mood (verb)

IMPER:- Impersonal verb ('it' or 'they' implied)

IMPF:- Imperfect tense (verb)

IND:- Indicative mood (verb)

INDEF:- Indefinite pronoun

INF:- Infinitive mood (verb)

INTER:- Interrogative pronoun

INTERJ:- Interjection

INTRANS:- Intransitive verb (does not take object)

INVAR:- Invariable (only one form)

LOCALE:- Locale, town or small island

MASC:- Masculine

MODAL:- Modal verb (takes infinitive)

MULT:- Multiple (plural) forms only

NEUTER:- Neuter

NOM:- Nominative

NOUN:- Noun

NUM:- Numeral

ORD:- Ordinal number, eg 'first'

PASSIVE:- Passive voice (verb)

PERF:- Perfect tense (verb)

PERFDEF:- verb has only perfect stem, with present meaning.

PERS:- Personal pronoun

PERSON:- Person

PLUP:- Pluperfect tense (verb)

PLUR:- Plural

POS:- Positive

PPL:- verb Participle

PREP:- Preposition

PRES:- Present tense (verb)

PRON:- Pronoun

PROPER:- Proper name

REFLEX:- Reflexive pronoun

REL:- Relative pronoun

SADJ:- SuperAdjective (adjective commonly used as pronoun)

SEMIDEP:- Semi-deponent verb, perfect passive has active meaning

SING:- Singular; for noun-kind, Singular form only

SUB:- Subjunctive mood (verb)

SUBJ:- item takes subjunctive

SUPER:- Superlative

SUPINE:- verb Supine (used after verbs of motion)

TACKON:- word (eg '-que') tacked onto end of another Latin word

THING:- noun is a thing

TO_BE:- verb of type 'esse' or modal verb

TO_BEING:- verb, compounds of type 'esse'

TRANS:- Transitive verb (takes object)

UNCOMMON:- not used in Easy Latin

VARIABLE:- noun with variable meanings

VERB:- Verb

VOC:- Vocative

VPAR:- Verb Participle

WHERE:- place Where

Frequency:Age (1.53+):

(Frequency with which the Latin stem is encountered in standard dictionaries; Age is the time period when the stem is first encountered.)

Frequency:

A-F: A = most common, F = very rare.

J: clashes with a more-common word.

O: neoLatin only.

X: general usage or frequency not recorded (usually very common).

Age (the lower the number, the earlier the Latin word is first encountered):

0 = general, or all ages

1-4 = classical

5 = late Latin

6 = medieval

7-8 = neoLatin.

15. Registration.

It is no longer necessary to register use of Blitz Latin.

Unauthorised copying or the use of a pirated copy of *Blitz Latin* is always dishonest and is in most countries illegal.

The usual disclaimers apply. Rather than give you pages of legal drivel to read, I have summarised the usual disclaimers thus:

Our obligation to you concerning the use of this program: NOTHING.

Your obligation to us concerning the use of this program: EVERYTHING.

Don't forget to check the *Blitz Latin* download site occasionally to see if upgrades are available!

II. USER-ADJUSTABLE SETTINGS

16. User Phrases / Latin Standard Phrases (LSPs).

The old rule-based system, of translating words as they are encountered in a text according to grammatical rules, is being superseded increasingly in modern commercial machine translators by statistical methods in which huge volumes of translated modern texts (United Nations documents provide a favourite example) are examined electronically, and the most commonly occurring chunks, or ‘jigsaw pieces’, of words are identified together with their translations by human professionals. The method involves identification, in other texts to be translated, of common blocks of adjacent words, and their translation from the table of jigsaw pieces.

The advantages of such ‘jigsaw translators’ (as we may call them) are these:

- i) Idiomatic phrases can be replaced by a polished English phrase.
- ii) Ambiguous words, i.e. those that 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 resulting elegant output provides the illusion that the translator knows what it is doing.

Jigsaw translators, by their nature, will be very effective at translating the original texts from which they were constructed. They will be less effective when translating texts previously unknown to them. They are likely to be still less effective with the Latin language, principally owing to the arrangement of Latin words in sentences according to their emphasis (which may vary from writer to writer), to their inability to handle words with inflections different from those stored in their database of jigsaw-pieces and to their inability to handle the compound word constructions that are so common. In particular, it is *not* possible to assign word-for-word translations between Latin and English sentences - the sentence has to be translated as a whole.

Blitz Latin seeks to combine the grammatical accuracy of a rule-based translator with the word fluency of a jigsaw translator by a different route. Thousands of ‘Latin Standard Phrases’ have been prepared, partly by references to standard works on the subject and partly by extraction of all phrases of 2-5 words in length from the author’s large collection of Latin files, and incorporation of those phrases which occur most often (with their English translations) into the translator.

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’ (*Scriptores Historiae Augustae*):

ex quo constat illam mulierem scisse fatalia. ‘From that fact, it is agreed that the woman must have known something of fate.’

However, the literal translation is: ‘Out of which it is agreed that woman to have known the (=something) fated.’

Thus the replacement of the clause ‘to have known the fated’ with the phrase ‘must have known something of fate’ will immediately improve translation quality.

User Phrases.

Blitz Latin incorporates a user text file, 'UserPhrases.txt'. The file that is supplied with the basic form of *Blitz Latin* contains only about 30 user phrases. The phrases are supplied in the format 'mihi crede/believe me'. When two consecutive Latin words 'mihi' and 'crede' are encountered, the meaning 'believe me' is supplied automatically. The big advantage of the facility is to enable users of *Blitz Latin* to provide pre-translated meanings for phrases commonly encountered in their own work, and which *Blitz Latin* persistently mis-translates.

Latin Standard Phrases (LSPs).

Blitz Latin includes an enormous extra file called 'UserPhrases.txt', with currently more than 16,830 entries of 'Latin Standard Phrases'. This has its own detailed file for instructions provided as part of the *Blitz Latin* package. The following provides the basic instructions:

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

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, according to the correct rules. [NOTE: in order to protect intellectual property, most users will receive an encrypted form of the Latin Standard Phrases, where encrypted entries are marked with a leading asterisk '*'.]

All the LSPs will be stored in computer memory (RAM) for speed of access, and the only limit is that of unoccupied RAM on your computer at the time *Blitz Latin* tries to load them into memory. You will be warned if there is insufficient memory to load all of the LSPs, but this error should never occur unless you have some other very large computer programs functioning on your computer at the same time. Since every single Latin word has to be checked for its inclusion in the userphrases text file, there is a small time overhead, currently around 5%, on the original translation time. The addition of many phrases to the text file has very little further effect on time of translation.

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

a retro/behind/in arrears

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.

Limitations:

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 requires identification of the infinitive (INF) in the Latin phrase and of the word 'to' (TO) of the verb in the English meaning. The infinitives are identified by their position in the phrase, counting the first word as '1'. For example:

a re publica recedere/INF4TO1to retire from public life

where *recedere* is the 4th word of the Latin phrase, and ‘to’ (of ‘to retire’, the verb) is the 1st word of the English meaning. This usage distinguishes ‘to’ pertaining to the verb from ‘to’ as in ‘to the dog’.

Other examples:

ad te scribere/INF3TO1 to write to you

nisi opus esse/INF3TO3 unless there to be need

A further option permits the use of a pair of stems, where one stem is of a noun or pronoun, and the other is of an adjective or verb participle. For example, *mens. ligne./the wooden table* (note the full-stops after each stem). This will provide the translation for (eg) *mensae lignae* as ‘of the wooden table’ (or perhaps as ‘to the wooden table’ or ‘the wooden tables’, depending on the case-type GEN, DAT or NOM-PLURAL assigned by *Blitz Latin* during its earlier search.)

Use of 3rd-declension nouns and adjectives can provide more of a problem. For example, in order to cover all variants of ‘the loving king’, it will be necessary to add two LSPs: *rex amans/the loving king* and *reg. amant./the loving king*. Note the presence of full-stops in the second LSP, but not in the first.

A further issue is that of Latin word order. The LSPs *mens. ligne.* and *reg. amant.* will assign their standard phrases to *mensae lignae* and to *regem amantem*, but not to *lignae mensae* and *amantem regem*.

The use of a LSP in *Blitz Latin* is marked with a preceding “<” and a trailing “>”, for example: *a re publica recessi. < I have retired from public life >.*

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 of ‘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 enclytic 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.

Any user line beginning with ‘--’ (two hyphens) is commented out from the text file, rather like a REM in the Basic programming language. Thus unwanted (faulty, irrelevant) LSPs can be switched off by the simple expedient of placing the double hyphen in front of the offending text line.

17. User Settings.

Blitz Latin now recognises a file called ‘usersettings.txt’, supplied in your default installation folder for *Blitz Latin*. This is a simple text file whose purpose is to enable the user to predetermine how certain menu options are pre-set when *Blitz Latin* is first loaded into computer memory. If you examine the file in a word-processor, a full explanation of all the options is given.

Here is a short extract from the file:

```
-- AGE can be CLASSICAL, MEDIEVAL (default) or ALLAGES.
AGE=MEDIEVAL

-- MEDIEVALTRICKS can be FALSE (default) or TRUE.
MEDIEVALTRICKS=TRUE

-- MEDIEVALPHONETICS can be FALSE (default) or TRUE. TRUE will be ignored if
MEDIEVALTRICKS is not also set equal to TRUE.
MEDIEVALPHONETICS=FALSE

-- PLAUTUS can be FALSE (default) or TRUE.
PLAUTUS=FALSE

-- BESTORDER can be AUTOORDER (default), NOMVERB (nom before verb), SVOE or
NONE.
BESTORDER=AUTOORDER

-- EASYLATIN can be FALSE (default) or TRUE. When TRUE, it overrides earlier
settings for AGE, MEDIEVALTRICKS and MEDIEVALPHONETIC.
EASYLATIN=FALSE

-- FONTSIZE can be any integer from 8 to 14. (Default is 9.)
FONTSIZE=9

-- FONTTYPE can be ARIAL (proportional, Serif), ROMAN (proportional, Serif) or
COURIER (fixed-width). Default is ARIAL.
FONTTYPE=ARIAL
```

If the user changes the default setting of AGE=MEDIEVAL to AGE=CLASSICAL, and the default setting of MEDIEVALTRICKS=TRUE to MEDIEVALTRICKS=FALSE, *Blitz Latin* will start with the perfect environment for translating pure classical Latin texts. (Do not insert any spaces around the '=' sign.)

Note that *Blitz Latin* will use the original default settings if it cannot find the file 'usersettings.txt'.

18. User Dictionary.

In the event that some Latin words are missing from the dictionary, the user may modify the text file 'USERFILE.TXT'. This requires technical knowledge of the construction of the dictionary, see Whitaker's original documentation; however, recent versions of *Blitz Latin* contain an auxiliary program 'LatinWords' that will assist the user to add new Latin words to the userfile for any common declension or conjugation. See section 46. Additional Programs Supplied with Blitz Latin. The program 'LatinWords.exe' and the 'USERFILE.TXT' *must* be placed in the same folder if they are to work together. An example 'USERFILE.TXT' file is provided:

```

Aurelian Aurelian/N 2 1 M/Aurelian (emp.)/
--the following are just imaginary examples
inmag inmag inmagav inmagat/V 1 1/use one's imagination/
vgood vgood/ADJ 1 1 POS/very good/
good good betteri bestissi/ADJ 1 1 X/good/
betteri/ADJ 1 1 COMP/better/
bestissi/ADJ 1 1 SUPER/best/
avante/ADV 0 0 POS/in front of/

```

Here we see a noun, a verb, adjectives and an adverb. The ‘N’, ‘V’, ‘ADJ’ and ‘ADV’ are self explanatory. The Aurelian entry shows the nominative and genitive types for the noun, while the ‘2 1 M’ means 2nd declension, 1st variant, masculine. Note the mandatory slashes ‘/’ to separate the parts of the line, followed by the translation.

The verb ‘inmag’ has four stems (1st person singular, infinitive, perfect and past participle). This example is imaginary in every respect - I don’t even know if it exists! The verb has the 1st conjugation, followed by the first variant. The translation here is an example of what NOT to add to your userfile: it is too wordy for the automatic translator to make good sense of it. Finally there are examples of how to arrange simple adjectives, which might also be COMP (comparative) or SUPER (superlative) instead of POS(itive).

Any user line beginning with ‘--’ (two hyphens) is commented out from the text file, rather like a REM in the Basic programming language.

By far the most common omission from any dictionary is that of proper names (personal or place names). *Blitz Latin* assumes that any unknown word beginning with a capital letter is a proper-name-noun, and looks for the correct noun inflections. This trick picks up an amazingly high percentage of unknown words! However male proper names of the 3rd declension, such as ‘Sinonem’, may be incorrectly handled, since the program cannot always guess the correct nominative stem (Sino or Sinon).

The maximum number of words that can be added to the user dictionary is 1,000.

From version 2.16:

Pliny words: As explained in 40. Limitations of *Blitz Latin*., words found only in the writings of the Elder Pliny are not included in the electronic dictionary. However, for those who require them, an extra user file entitled *XPlinyUserFile.txt* is supplied as part of the installation package. The list of Pliny words is not complete, but is certainly comprehensive with just over 1,200 words. [Version 2.29 – just over 1,380 words.]

When *Blitz Latin* starts up, it looks first for *UserFile.txt*, then for *PlinyUserFile.txt*, so if you wish to use the Pliny vocabulary, you must rename *XPlinyUserFile.txt* to *PlinyUserFile.txt* (the file name is not case-sensitive).

Use of the Pliny file results in an overhead of about 5% of the translation time for Latin files that use only the original *Userfile.txt*, and serves no purpose for virtually all users! Only use this option if you want to translate the Elder Pliny! When you have finished translating the Elder Pliny, rename *PlinyUserFile.txt* back to *XPlinyUserFile.txt*.

III. INFORMATION / ADVANCED

19. The Electronic Latin Dictionary.

The electronic dictionary was created by William A. Whitaker (now deceased), of which the last version was ‘Words 1.97F’ (2010; 37,000 words). *Blitz Latin* uses a much augmented and modified version of this, which now (2024) comprises over 79,000 Latin words as they would be counted in a paper dictionary. Whitaker’s original dictionary provided lengthy meanings for each Latin word. For the purposes of automatic translation, the lengthy meanings have been modified and shortened. Furthermore, whereas the original dictionary used American-English, *Blitz Latin* uses British-English (I have only a British spell-checker). The many words found only in Pliny’s Natural History are by definition rare, and are not included. (See section [Pliny words](#) for details.)

I thank Ian Bruce of Australia for sending me in late 2015 his high-quality images of every page of his copy of Smith’s Latin-English Dictionary (published in 1850). Use of Optical Character Recognition software has enabled the extraction of all late-Latin, Medieval and neo-Latin words from the dictionary to fill-out omissions in the existing *Blitz Latin* dictionary, after verification in more recent Latin dictionaries. Indeed, there were few words (and all extremely rare) to add from classical Latin or Late Latin, an indication of the very high coverage already provided by this machine translator. Nevertheless, we have added more than 2,700 rare Latin words to the electronic dictionary.

The vocabulary of *Blitz Latin* has been further augmented with some 2,500 modern Latin stems from ‘Calepinus Novus’, courtesy of Guy Licoppe (Belgium). Thus the Latin for words such as ‘car’ and ‘aeroplane’ can now be translated. Toggle ON ‘Edit/Area Preferred/NeoLatin’ to get modern meanings for classical Latin words. [From version 2.12: Another 1,300 modern Latin stems have been added from Internet searches for verifiable words.]

Blitz Latin now contains an extra 2,500 Latin words that may often be found in Catholic or Vatican Latin. This should be of particular value to those researching Latin documents from the Vatican, a prime repository of thousands of medieval and post-medieval Latin texts. These hard-to-find Latin words do not appear in general Latin dictionaries, and for a long time Vatican Latin texts were very poorly represented in our thousands of test Latin files. This shortcoming has now been remedied, resulting in the discovery of the new words. In order to use these words within *Blitz Latin*, you should ensure that the ‘Age Preferred’ (see section 29. Age Preferred.) is set to ‘Medieval Latin’ or to ‘Latin of all ages’. The ‘Area Preferred’ (see section 28. Area Preferred.) should be set to ‘ecclesiastical’. [From version 2.11: Another 550 ecclesiastic words added after searching of the Vatican’s *Acta Apostolica Sedis* texts.]

Patricio (‘Patrick’) Shaw, who has used *Blitz Latin* many times for translation of late-medieval/neolatin texts, has persuaded me that the option should exist for the user to select medieval meanings over classical meanings for many Latin words. Thus *Blitz Latin* from version 2.2 contains the option (Menu)‘Edit/Area Preferred/PreferMedievalMeanings’, which can be selected after the user has first selected ‘Medieval age’ for translations. Patrick has very kindly

sent me many dozens of medieval/neoLatin words, with their meanings, to augment their classical meanings. A characteristic of these medieval words and their English meanings is that frequently the meaning in English is very similar to that of the Latin stem. In addition, known alternative medieval meanings for many existing classical Latin words in the electronic dictionary will now be accessible to users requiring medieval translations. This will be a big step forward for the majority of users of *Blitz Latin*, who use the program very predominantly for translation of medieval and post-medieval Latin texts, and I am pleased to acknowledge here Patrick's large contribution to *Blitz Latin*. Patrick also sent me a most generous number of his own medieval Latin Standard Phrases (LSPs) for incorporation into *Blitz Latin*.

Other medieval, modern and ecclesiastical extensions bring the total to more than 70,900 Latin words. *Blitz Latin* has an enormous dictionary by any definition. The electronic dictionary may be searched by stem-name, see section 20. Stems and Inflections.

The letters 'u' and 'v', and also 'i' and 'j', are virtually interchangeable in Latin ('v' and 'i' are easier to carve on inscriptions). All internal processing is carried out on the assumption that 'v' and 'j' are really 'u' and 'i' respectively. The user may select either when typing in Latin text; *Blitz Latin* will make an automatic conversion.

During translation you may occasionally see an asterisk (*) at the end of a translated word. This denotes that the original meaning of the dictionary has been truncated to fit the allowed space. I shall amend the dictionary at some later date when I observe the occurrence.

You may also see a tilde (~) at the beginning of a translated word. This denotes that the word has been translated by application of a medieval trick or phonetics search, and is therefore less reliable.

A very few words occur sufficiently often that the dictionary knows the grammatical type, but we do not know the English meaning. So that *Blitz Latin* may enjoy full use of the unknown word's grammatical structure during translation, the meaning is given simply as the stem in upper-case. Such words are extremely rare in the dictionary. An example is 'cofus, -i, masc', meaning COF (apparently some kind of medieval coin).

Words enclosed within square brackets [] are unknown to *Blitz Latin*'s dictionary.

20. Stems and Inflections.

Latin words comprise, for the most part, a stem and an inflection.

For example, the noun 'dominus' contains the stem 'domin', which tells us the translation of the word (owner or lord), and the inflection '-us', which tells us how the word is to be used. In this case, as a nominative (subject) noun which will control a verb. *Blitz Latin* will represent this as 'domin.us'.

Another example of a noun is 'regin.am', where the stem is 'regin' - a queen - and the inflection is '-am' - accusative (object) case. A noun which is acted upon.

A third example is the verb 'am.at', where the stem comes from the verb 'amare' (to love) and the inflection '-at' indicates an active, indicative, 3rd-person singular verb.

Putting it all together, we have the sentence: ‘dominus amat reginam’ - *the* owner loves *the* queen. Or possibly *an* owner loves *a* queen, or some such permutation. Latin does not differentiate the bare nouns.

There are various types of *speechtype* included within the stems, which can be examined by looking up words with the translation option off. Most are obvious (NOUN, VERB, ADJ(ective) and so on), but VPAR, TACKON and SADJ may need further explanation. VPAR stands for verb participle, and behaves as an adjective or even as a pronoun. TACKON is an ending tacked onto a stem, and modifies the meaning of the stem. An example is ‘modi’ in the word previously used as an example: ‘*huiusmodi*’. SADJ stands for ‘super-adjective’. It has the same inflections as the underlying adjective, but behaves like a pronoun. An example is the stem ‘qual’ (eg in ‘qualem’). SADJ is an artificial construction for *Blitz Latin*’s translation routines, and is not found in Whitaker’s dictionary.

Owing to the problems presented by incorrect use of Latin stems by some, especially medieval, Latin authors, *Blitz Latin* (version 1.37+) offers the facility to search for stems in the electronic dictionary. Click on the menu option ‘Dictionary/Search Dictionary’, then type in the name of the suspect stem to see alternatives available in the dictionary. For example, type in ‘sti’ into the search dialogue box to see all Latin stems beginning with ‘sti-’.

The **letter:number** following the stem (eg A:0) refers to the frequency of use of the stem (A=most common, F=very rare) and the age period in which the word is most commonly found (0=general, 1-5=classical, 6=medieval, 7-8=neoLatin).

21. Proper Names (Are Not Easy).

Proper names require very careful handling in a translator.

‘Aper’ was a 3rd Century AD praetorian prefect. If one searches the dictionary without regard to case, Aper is incorrectly translated as ‘boar’. Therefore the dictionary must be case-sensitive to prevent such mishaps in edited texts. Complications arise with words which may or may not be capitalised, depending on the writer. A good example is the stem ‘Roman’, which may or may not be capitalised. Both types are given in the *Blitz Latin* dictionary.

A leading capital letter denotes a proper name - unless it is the first word of the sentence. *Blitz Latin* assumes that the first word is intended to be of lower case (as it should be in Latin) but, if the first word has the first letter capitalised, it still checks for proper names in the dictionary before searching again with the first letter made lower case. Thus, if the example ‘Aper’ appears as the first word of a sentence, it will usually be correctly translated as ‘Aper’, not ‘boar’.

Menu option ‘Dictionary/Force Proper Names’.

This option forces *Blitz Latin* to treat all words beginning with an initial upper-case letter as proper names. Exceptions:

1. The first word of a sentence.
2. Words of fewer than five characters.

The option will be of most value with medieval texts with non-Latinized proper names (eg Beowulf, Godwin). The default is OFF.

Capitalised words (such as occur in TITLES) pose a severe problem to *Blitz Latin*. Unless the word is clearly a Roman numeral, the program ‘solves’ the problem by converting all letters in the word to lower case. This may not provide what was intended - especially for proper names.

The user should clearly understand that confusion may result through careless use of capital letters to begin words, or in title words.

1.72+: Another problem with translating proper names arises from the common use of a full-stop (period) to abbreviate proper names; for example ‘Quintus Numerius’ may be abbreviated to ‘Q. Numerius’. The difficulty occurs when *Blitz Latin* tries to interpret the full-stop as the end of the sentence. From version 1.72, *Blitz Latin* now handles the problem by conversion of this type of full-stop to an underscore. Thus, in this example, you will see ‘Q_Numerius’ instead of ‘Q. Numerius’. The new word is now handled internally as a proper name.

22. Intelligent Guesses at Unknown Words.

When *Blitz Latin* cannot find a word in its dictionary, it will make the following substitutions in an attempt to synthesise the correct word.

Slurs. Many Latin writers, especially medieval, ‘slurred’ the beginning of many words. *Blitz Latin* corrects these slurs automatically when found. The list of slur corrections is too long to be given here, but typical examples include:

(‘=>’ means ‘corrected to’)

inm- => imm-. im- => imm-. irr- => inr-. inp- => imp-.

The following syntheses of unknown words are also made:

prefixes:

re- (‘re-’) prae- (‘pre-’)

per- (‘very-’) super- (‘over-’)

inter- (‘inter-’) pre- (‘pre-’)

in- (‘in-’) sub- (‘under-’)

ex- (‘out-’) sesqui- (‘1½-’)

e- (‘from-’) ante- (‘before-’)

im- (‘in-’) anti- (‘before-’)

suffixes:

-io, -ion (‘-ing’)

-or (‘-er’)

-iter (‘-ly’)

-ari (‘-related’)

-ul (‘-small’)

-in (‘-derived’)

-issi (‘-ed’)

-abil (‘-able’)

-itat (‘-ity’)

-ori (‘-ory’)

-ic (‘-ic’)

-al (‘-al’)

These substitutions have been found by examination of lists of unknown words to be the most useful, without imposing too much of a burden on translation times.

Synthetic adverbs are from version 1.80 created from simple adjectives and verb participles (eg *perurbane* from *perurbanus*).

These adverbs are created only for classical Latin, owing to potential confusion caused by medieval scribes who wrote -e when they intended -ae.

The correction of medieval -e to -ae is since version 2.02 handled correctly by *Blitz Latin*. However, in view of the possibilities of confusion, this option will be activated (automatically)

only when the user toggles ON the menu options of 'Edit/Medieval Age' and 'Edit/Medieval Phonetics'. Examples: regine->reginae; reginene->reginae+ne.

23. Abbreviations in Latin Text.

Writers of Latin, from the earliest time, were accustomed to shorten commonly used words to abbreviations, just as we still do today (i.e. = id est). However, since there was no common agreement about which words could be abbreviated, there is no consistent pattern - the original writer assumed the present meaning would be obvious to the reader.

A file 'UserAbbreviations.txt' is now provided with *Blitz Latin* versions 1.81+. This file may be altered freely by the user, subject to the limitations stated in the file itself :

Format: abbreviation[TAB]expanded-abbreviation. The TAB is essential (use the TAB key to create it.)

Maximum length of abbreviation is 9 characters, INCLUDING a terminal '!

Maximum length of expanded-abbreviation is 18 characters. (NO terminal '!')

Maximum no. of entries is 99.

All entries must be unique; you cannot use eg 'p.' to mean 'pondo' and 'parte'.

Example of entries:

ann.[TAB]anno

cons.[TAB]consul

However, the large remaining number of one-letter abbreviations, such as 'd. ', are particularly tiresome, since *Blitz Latin* assumes each full-stop (period) denotes the end of the sentence. Thus a series such as 'a. b. c. d.' will create four untranslated single-character sentences! For this reason, *Blitz Latin* replaces any single-character followed by a full-stop and then a space with the character followed by an underscore. For example, 'd. ' will be replaced with 'd_'. The presence of the terminal space is essential: 'a.b.c.d.' will still be translated as four sentences.

24. Single Word Underscore.

Menu item Edit/Single Word Underscore. When you toggle this option on, clicking any Latin word (in the Latin text box only) will wrap the word with a pair of underscores. For example 'rex' -> '_rex_'. This has the effect of marking the word as a word which must not be translated.

Why would anyone want to mark a word as untranslatable? By far the most common use of this facility (in my hands) has been to mark single letters of the alphabet. For example, a Latin text may discuss the vowels a, e, i, o and u. However, both 'a' and 'e' can also be prepositions, which if translated would cause a disastrous breakdown for *Blitz Latin*'s comprehension of the text. Other uses occur in marking text sections, for example where each sentence might be marked as (a), (b), (c) and so on.

It is expected that only expert users of *Blitz Latin* will require this facility, and then only rarely. Don't forget to toggle the option off as soon as you have finished with it.

25. Single Word Translations.

Single word translation (where you click on a single Latin word with the mouse) has been completely overhauled and re-coded for the 1.7 series of *Blitz Latin*.

Click on menu option 'Edit/Single Word' (or on the new toolbar option, or press CTRL-G) to obtain the new dialogue box with three options:

1. English Translation lower window. This is the default option, and mimicks that supplied with earlier versions of *Blitz Latin*. For example, if you click on 'domini' you will see:

'domini': o owners - of the owner - the owners -

Alternatives: owner/E:Lord/title for ecclesiastics -

2. Latin Glossary lower window. This supplies a Latin glossary of all the Latin alternatives, with grammatical structure. For example, if you click on 'domini' you will see:

'domini':

dominus, domini NOUN PERSON VOC PLUR MASC A:0 owner/E:Lord/title for ecclesiastics

dominus, domini NOUN PERSON GEN SING MASC A:0 owner/E:Lord/title for ecclesiastics

dominus, domini NOUN PERSON NOM PLUR MASC A:0 owner/E:Lord/title for ecclesiastics

3. Latin Glossary modeless dialog box. Since the Latin glossary of (2) is often very long, the better option is to show it in a dialogue box. The output in the dialogue box is identical to that of (2). A 'modeless' dialogue box is one that can remain open while you are clicking on Latin words elsewhere in *Blitz Latin*. You can shrink the modeless box to move it out of the way at other times.

The new instant Latin glossary options are designed for experienced Latin users who may not require the translation routines of *Blitz Latin*, but would like to obtain instant access to the various grammatical forms of each Latin word.

The default font size is 9 points. This can be adjusted equally with other text font sizes by selecting the menu option 'View/Select Font Size'. The conjugation/declension numbers have been omitted.

The same modeless dialogue box will also be called now whenever a single Latin word is highlighted with a mouse, with the menu 'Translation' toggle ON, and the large 'Translate' button is clicked. The output in this case will mimick that of the older 'modal' dialogue box of earlier versions of *Blitz Latin*.

26. 'Cannot translate a single word correctly.'

Latin is a very ambiguous language, and therefore it requires context to translate Latin sentences correctly. A single Latin word in a clause or sentence lacks context, and since there will often be several Latin words that might fit the single word to be translated, a warning is given at the point of translation: 'Cannot translate a single word correctly'.

This tiresome warning is intended only for novice users of *Blitz Latin*, and the experienced user should switch off the warning by toggling off menu entry ‘Edit/Single Word in Sentence’. The warning can be switched off permanently by now clicking on menu entry ‘View/Save User Settings’.

Equally, the warning can be reinstated by reversing the above instructions: that is, toggle ON menu entry ‘Edit/Single Word in Sentence’ (temporary restoral of warning), and then again clicking on ‘View/Save User Settings’.

27. SVOE and Best Order Flag.

A key ingredient of *Blitz Latin*’s translation ability is the ‘Best Order’ routine, which seeks to improve the word order of a translated sentence. This can sometimes make a big difference to comprehension of the final Latin translation. The user may choose to select the full SVOE word-ordering from the menu selection (‘Edit/Best Order’), or to retain the older ‘Verb-After-Subject’ ordering system, which has also been much improved for versions 1.6+. However, the default option is ‘Auto-Order’, which automatically switches between the two options.

SVOE (Subject-verb-object-else).

This is the new translational improvement incorporated into *Blitz Latin*, versions 1.6+. Latin sentences are placed in subject-verb-object word order (the ‘else’ of SVOE usually appears at the beginning of *Blitz Latin*’s word-ordering). This may involve movement of quite large chunks of text within Latin clauses. Since Latin is a very ambiguous language, there is a real danger that the translator may have passed an incorrect assignment of a word to the ordering routine. For example, *reges* may be transmitted as ‘you will rule’ (verb), instead of as the intended ‘the kings’ (noun). For this reason, *Blitz Latin*’s default word-ordering mode is now ‘**Auto-Order**’ (see below). *SVOE re-ordering is less important for medieval and modern texts.*

Verb-After-Nom.

This offers an improved version of the ‘Verb-After-Subject’ (nominative) word ordering used in earlier versions of *Blitz Latin* (1.4 and 1.5 series).

Auto-Order (Default).

The translator assesses the complexity of a sentence, and selects between SVOE ordering and the ‘Verb-After-Subject’ word ordering that used to be employed by older versions of *Blitz Latin*.

No word ordering.

However, occasionally the word ordering result is more confusing than if the routine had not been evoked at all. In such cases, select ‘No Word Ordering’.

IMPORTANT - medieval scribes are much less likely to invert the word order of Latin texts than the writers of classical Latin (relative to modern usage). The ancient writers placed Latin words in order of their emphasis, whereas medieval and modern writers are much more likely to use the subject-verb-object word-ordering of modern languages. For this reason, it will often be preferable to TURN OFF the AUTO or SVOE re-ordering routines from *Blitz Latin* with non-classical texts. Prefer instead either ‘Verb after NOM’ or ‘No word ordering’, as seems best by experiment.

The old option of re-ordering the sentence by placing verbs before accusative-case nouns ('Verb-Before-Object') has been found to be inferior, and is discontinued in *Blitz Latin* versions 1.6+.

28. Area Preferred.

Some Latin words have different meanings according to the **area** (eg legal, military, ecclesiastical, technical, biological) in which they are used, instead of being used generally. In addition, some classical words have been assigned medieval or modern (NeoLatin) meanings. *Blitz Latin* will normally translate in General mode (strongly recommended!), but some Latin texts may be better translated if the user changes the subject area with this menu option. The great majority of Latin words will be unaffected by this change.

[Since v. 1.52] Where alternative stems with different areas are encountered, *Blitz Latin* now favours the word whose area matches that selected.

The user should be alert to the possibility that a word assigned (for example) a musical meaning might have been *intended* to have a general meaning on this occasion. This applies whether the current area was auto-selected (below) or chosen by the user.

You may notice, when you single-click on some Latin words on screen, that the meaning shown in the lower screen contains an entry such as B:(something) or C: or other letter. These meanings will be selected according to the correct area you have chosen. For example, a B: or a C: will be associated with the Biological(Medical)/Cooking area, if selected; a Z: denotes a meaning in neo-Latin. The letter M: in the meaning denotes an alternative meaning found in the medieval age. This meaning can be selected automatically by use of menu option Edit/Prefer Medieval meanings. However, many medieval writers used the classical meanings for a word.

IMPORTANT: 'Area Preferred' means just that. You cannot select more than one preference from the options given. 'Prefer Medieval Meanings' and 'Prefer NeoLatin meanings' can only be selected when menu item Edit/Age Preferred is first set to 'Medieval' or 'Neolatin' respectively. This has created a problem for those translating Medieval or Neolatin texts. Suppose you wish to translate a Latin text that is simultaneously Scientific and Neolatin, or a text that is simultaneously Ecclesiastical and Medieval? For previous versions of *Blitz Latin*, you had to decide which 'Area Preferred' and 'Age Preferred' gave the better result. Thus if you chose the Area option of 'Scientific' with 'All Ages' as the preferred age, then for Latin words that were not scientific, but had separate classical and Neolatin meanings, *Blitz Latin* would choose the classical meaning. From version 2.2 *Blitz Latin* will test first to see if there is a Latin word with a scientific meaning. If it cannot find such a word, *Blitz Latin* will test again to see if it can find a Neolatin meaning. Only if that fails too will *Blitz Latin* resort to a classical meaning. The same principle will apply to those trying to translate Latin texts that are simultaneously Ecclesiastical and Medieval-age (or other permutations).

Auto Select Area.

This option can be toggled ON from the 'Edit/Area Preferred' menu or from the toolbar button. The default is (currently) OFF. The option can be applied only in translation mode.

When selected, *Blitz Latin* automatically tries to assess the area (eg general, legal, military) of each sentence to be translated. Once a sufficient predominance of one area has been established, the program automatically translates future sentences as though for that area. That is, if the translator repeatedly encounters military words, it will preferentially provide military meanings for all future words, until a new area becomes sufficiently dominant.

If an auto-selected area is not reinforced by a sufficient number of further examples, the area reverts to ‘general’ translation after (currently) 50 sentences.

This auto-selection technique works very well in trials, but the user should be aware of its deficiencies:

1. Any text already translated will not be re-translated with the new, auto-selected area (excepting the sentence that prompted the change). Thus, if a music file begins with an insufficient number of music terms, the early words may be incorrectly assigned a general (non-musical) translation. For this reason, if more than 40% of all sentences in a Latin file are auto-translated in a single non-general mode (such as military or theatre/music), the user will be informed at the end of translation with a suggestion that the whole file should be re-translated with that area manually selected.
2. NeoLatin and Medieval Latin are *never* auto-selected. They must be selected by the user from the menu option ‘Edit/Area Preferred’.

29. Age Preferred.

Medieval Latin used classical Latin and its own new additions to the vocabulary. Modern (neo-)Latin uses the words of classical and medieval Latin as well as its own new additions. Classical Latin, however, does not require any vocabulary from later ages, and use of such words may actually confuse the translator. For example, the word ‘virum’ has all the classical meanings, but can also mean ‘virus’ in NeoLatin.

Therefore *Blitz Latin* contains the menu option ‘Edit/Age Preferred’ to use the classical Latin vocabulary alone (‘Classical Latin only’), or to use the medieval extended vocabulary (‘Medieval Latin’) or to use the full vocabulary including neo-Latin (‘Latin from all ages’). The default option is Medieval Latin.

Many Latin words are classical in origin, but have been assigned different meanings by medieval or modern Latin writers. If you select also ‘Prefer Medieval meanings’ or ‘Prefer NeoLatin meanings’ from menu items ‘Edit/Area Preferred’, the medieval and modern meanings will, as the names suggest, be preferred.

30. Consistency Code.

This code tries to ensure consistency, or continuity, across clauses in single sentences.

For example, a long list of nouns will generally now be of the same case: *rex, navis, luna, omnes amant mare* (‘the king, the queen, the ship, they all love the sea’). Previously, *regina* might have been translated as ‘with the queen’ and *navis* as ‘of the ship’.

Similarly, the verb *farcito* ('you will stuff!' OR 's/he/it will stuff!') will now be translated according to the forms 2nd or 3rd person previously encountered.

Again, when handling unknown proper nouns, if the program can unambiguously assign a form to the 1st, 2nd or 3rd declension, it will remember this fact indefinitely (or until its storage table is used up). For example, if the program encounters the phrase *cum Dappette*, it may be assumed fairly safely that *Dappett* is a 3rd-declension proper name. Thus a later reference to *rex Dappetti donat*, will be translated as 'the king presents to Dappett', and not (as formerly) 'the king of Dappett presents'.

Of course, this code is not perfect, since the Consistency Code cannot correct translations already made, and sometimes alternative translations will have been intended anyway. Furthermore, the storage table for unknown proper names whose declension can be accurately assigned from unique inflections is limited to 20 examples. Once the limit has been reached, later entries overwrite earlier entries.

31. Locatives in *Blitz Latin*.

The locative case (describes place 'where?') is now partially handled in *Blitz Latin* for nouns of the 1st, 2nd and 3rd declensions. The answer given will always be interpreted as 'at' somewhere, such as 'at Rome'. The original Roman usage was mostly confined to the names of towns and small islands, with a smattering of other examples such as *domi* ('at home').

The case endings for the locative are identical to those of the much more common dative and genitive cases; therefore, in order to restrict use of locatives to a bare minimum, the following conditions are met:

1. The meaning of the noun must be a proper word, distinguished by having an upper-case letter for its first character (eg *romae* or *Romae*, with meaning 'Rome').
2. The noun must be defined in the electronic dictionary as a 'locale'.
3. The noun must not be in concordance (that is, matched) with any other qualifying word, such as an adjective.
4. The noun must be singular, not plural.

It follows inevitably from these conditions that some other well known locatives, such as *domi*, will continue to be assigned the usual case; in this example, the genitive. The locative case will only be assigned during translation of words, when a change will be made to the existing case according to the criteria listed above.

As a consequence of these criteria, many non-qualifying proper names in the electronic dictionary, such as countries, continents, lakes, seas and rivers, are now described as 'country', where previously they were 'locale'.

The locative case will never be assigned to a proper name which has been generated by *Blitz Latin* for any noun not found in its electronic dictionary. The program has no way of distinguishing towns and small islands from other proper names created synthetically.

32. Medieval Latin.

Gibbon famously defined the 'Middle Ages' to be that period extending from the fall of Rome in 476 AD to the fall of Constantinople in 1453 AD. However, we prefer to use a more pragmatic definition. For *Blitz Latin*'s dictionary, the medieval era begins in 600 AD, when most classical Latin dictionaries drop out, and ends in 1500 AD, the beginning of the Enlightenment or the Reformation.

IMPORTANT - medieval scribes are much less likely to invert the word order of Latin texts than the writers of classical Latin (relative to modern usage). The ancient writers placed Latin words

in order of their emphasis, whereas medieval and modern writers are much more likely to use the subject-verb-object word-ordering of modern languages. For this reason, it will often be preferable to TURN OFF the SVOE re-ordering routines from Blitz Latin with non-classical texts.

The medieval dictionary has been enhanced by the addition of all the most common words found in sweeps of medieval texts and/or listed in standard medieval dictionaries (such as Latham's "Revised Medieval Latin Word List" (Oxford University Press, 1980); and Lynn Nelson's "Medieval Word List"). There are now so many medieval words in our electronic dictionary that some clash with older, classical Latin words. For this reason, we now advise strongly that those users studying classical Latin should toggle on the AGE era (EDIT/AGE PREFERRED) to 'Classical Latin only'.

Medieval words pose something of a dilemma to the dictionary compiler. On the one hand the scribe may have mis-spelled existing words. Many of the less-educated scribes tended to spell as they spoke, and therefore spelled essentially phonetically. On the other hand, in the days before dictionaries, two unconnected scribes may have constructed the same compound Latin word but used it for different purposes. There is also the practical problem that many medieval English terms have fallen out of modern common English usage; for example 'socage'. Indeed, the large majority of the new medieval Latin words derive from medieval law or ecclesiastical use. Where possible, we have provided an additional expanded meaning for obscure medieval English terms, but the user of *Blitz Latin* who is not a native English speaker may well need to refer to a very detailed English dictionary as well.

Blitz Latin copes with these problems with two, unrelated methods:

A. All dictionary words in *Blitz Latin* are tagged with a rough value to denote their first appearance in texts (where known). Words that appear first, or solely, in the medieval age are tagged internally with an age value for 'Medieval'. The ages of translation can be found by clicking in *Blitz Latin* on menu item 'Edit/Age Preferred', and clicking on your preferred choice of age. Thus, for an ambiguous Latin word, both classical and medieval meanings will be considered. Where there are ambiguities or alternatives in the meanings, one of the classical meanings of the Latin word will usually be taken as the correct choice of word for the translation. In practice, nearly always a classical meaning will be used for the machine translation by *Blitz Latin*, but the alternatives will be available in the bottom window of the program for the user to consider and to make corrections on screen.

B. All words in *Blitz Latin* that have a medieval variant for their meaning (as well as their classical and sometimes modern meanings) are tagged in the electronic dictionary to denote their optional use in texts for translation. Such words can be favoured during *Blitz Latin*'s translation by setting 'Edit/Area Preferred' to 'Medieval Latin' as in 'A' above, and then selecting 'Edit/Area Preferred/Prefer Medieval Meanings'.

Trial and error will usually be needed to determine which of options 'A' and 'B' above gives the better results for the user's own medieval Latin texts.

Blitz Latin uses other techniques to handle medieval Latin. See also *Preferred Age*, *Medieval Tricks* and *Medieval Phonetics*.

33. Medieval Tricks.

This option is available from the Edit menu, and is toggled ON by default. It implements a number of rather slow tricks to compensate for some of the mis-spellings of medieval writers. (This is not a complete list.)

Examples ('->' means 'corrected to'):

Internal ci -> ti. Internal chi -> ci. Internal d -> t. Internal e -> ae.

Internal cu -> quu and vice-versa. Internal single consonants -> double consonants, and vice-versa. Internal thi -> ti. Final unque -> umque. Final in -> im. Final an -> am. Internal ti->ci.

Internal nn->mn. Internal ae->e. Internal oe->e. Internal f->ph.

Internal ph->f. Internal ho->o. Internal s->z. Initial y->hy.

While changes to medieval patterns are reasonably accurate, changes of single characters (eg 'd' -> 't') are less likely to be valid. A tilde (~) is now used to mark such words as uncertainly translated.

34. Medieval Phonetics.

This option is rather slow (10% overhead in a recent sweep of files), and can ONLY be used when Medieval Tricks are toggled on (menu option 'Edit/Phonetics', follows 'Medieval Tricks'). The option is toggled OFF by default.

Medieval writers often spelled phonetically, due to poor communications and a lack of printed Latin dictionaries. One writer may use synemmenon, another sinemmenon, another synnemenon, another sinemenon, and so on. Versions of *Blitz Latin* from 1.42 allow a slowish search of the phonetic form of a medieval Latin word against the phonetic forms of words in the electronic Latin dictionary. This trick is quite effective at picking up mis-spelled medieval words. It is of little value with Latin words used in pre-medieval times (say before the 6th Century AD) or post-Renaissance (say after the 16th Century AD).

Since the time to search the whole dictionary for phonetic matches would be excessive, the search is tightly bounded within 2-4 areas of the dictionary. Thus it is possible that some phonetic matches may be missed even if they exist within the dictionary.

Some medieval writers (eg St. Gregory of Tours, 6th Century AD) not only spelled-as-they-spoke, but spoke with accents, altering vowels on the stressed syllable. *Blitz Latin* now contains code to change these words too.

A tilde (~) is now placed before words translated by phonetic search to mark uncertainty of translation.

(Versions 2.17+): For years now, *Blitz Latin* has used a phonetics system that is hard-coded within *Blitz Latin* itself. However, for experimental purposes, we have always had an alternative phonetics system that involved reading in a phonetics file named `phoneticUK.dat`. These two systems give mostly over-lapping answers to that which the original medieval author intended, but there are also some differences. The new innovation for *Blitz Latin* is to use BOTH phonetic systems (code and file) to check each other, so that only solutions agreed by both systems will be used by *Blitz Latin*.

Inevitably, this system will result in fewer phonetics matches being found, but they should be much more reliable. In tests on our large library of medieval files, there were markedly fewer unwanted conversions of dubious words caused by transcription error (often due to e.g. poor typing or inaccurate optical character recognition). Average speed of processing is a little increased (ca. 10%) relative to the original system. More initial processing to assess the correct Latin word intended results in less processing of false Latin words later.

File `phoneticUK.dat` is now included with the *Blitz Latin* package. If, for some reason, the file is missing or defective, *Blitz Latin* will revert to using the (modified) coded phonetics system only.

35. Plautus Elisions.

This option is available from the Edit menu, and is toggled OFF by default. Echoes of the way the ordinary Romans actually spoke Latin can be found in their printed plays, such as those of Plautus (ca. 250-184 BC). A particular feature of Plautus' Latin is his habit of eliding a 'word' followed by 'est' to give 'wordst'; for example, *factum* + *est* = *factumst*. Less regular are words ending in -s, such as *opus* + *est* = *opust*. The early writer Terence (born ca. 170 BC) made similar elisions in works such as *Hecyra*, and furthermore truncated words ending in -is, -os and -us to give respectively -i', -o' and -u'. A good example from Terence is the short phrase: *agendi tempu' mihi datumst*.

Toggle the Plautus option ON to handle words ending in '-xst'. The option converts all endings where 'x' is equal to 'm, a, e, i, o' to give '-x' + 'est', and endings where 'x' is equal to 'u' are converted to '-xs' + 'est'. The Latin words *post* and *ast* are not altered. This heuristic is quite successful and very fast at resolving the 'Plautus-problem', although inevitably some words are mishandled. Since the alternative is not to translate these words at all, the result must be accounted beneficial to the user. The modification also tackles the Terence ending of -x'.

36. Roman Inscriptions.

Blitz Latin provides automatic translations of Roman inscriptions available from Frankfurt University ('Frankfurt', see 'useful Web addresses'). These inscriptions are available either through the web-site browser, or through John White's INSCRIPT search engine, also distributed by Frankfurt University.

An example inscription follows:

1*** IRT 953.

Imp(erator) Cae/s(ar) L(ucius) D(o)mit/ius Aure/lianus Inv/ictus P(ius)
F(elix) A/ug(ustus) ponti/f(ex) max(imus) tri/b(unicia) pot(estate)
II / mil(iarium) / C[

Click on the menu item ‘Edit/Inscriptions’ (CTRL+I) before attempting to translate inscriptions. Note that the absence of verbs in most inscriptions may upset the quality of automatic translation. It is probably best to examine inscriptions with the translation toggle turned OFF.

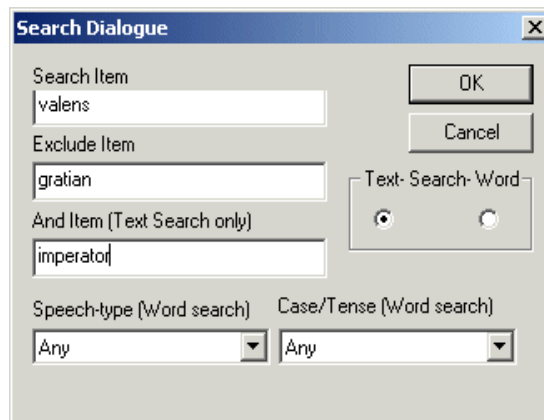
WARNING: The Inscriptions menu item should be toggled ON *only* when you need to translate mixed-case, edited inscriptions. A message ‘This file is created with INSCRIPTIONS FLAG ON’ is always printed at the head of the translation file.

To see why you should not use the inscriptions flag at other times, try translating this sentence with the inscriptions menu item toggled first off, then on:

patres sancti.

37. About Searching Multiple Latin Files.

The extraordinary search speed of *Blitz Latin* enables the implementation of a powerful research tool within versions 1.4+. Users can search through their collection of Latin files for occurrences of Latin stems. Two types of search (Text/Word) are available, and it is important to understand the difference.



1. Text Search.

Searches for text patterns within individual sentences as delineated by *Blitz Latin*. The user may optionally specify that another word or part-word must be present in the same sentence (AND item), and/or that another word or part-word must not be present (EXCLUDE item). The output comprises each individual sentence where the search criteria are met, together with the relevant filename. This search is very fast.

For example, suppose that you wish to research laws passed by the Roman emperor Valens in your Latin files of Justinian’s legal codex. Use ‘valens’ as the search item, ‘imperator’ as the AND item. When you run the search, you will get a lot of hits, some with Valentinian as co-emperor, and some with Gratian. If you search again with ‘gratian’ as the EXCLUDE item, you will retain only the hits for Valens and Valentinian.

2. Word Search.

Searches for individual Latin stems recognised by *Blitz Latin*. The user may choose to EXCLUDE longer stems sharing the same initial letters. The AND option has no meaning, and is ignored. The user may optionally select the speechtype (eg noun or verb) and the case/tense. Output is of the Latin stem and its inflection (if any) and the clause where the stem was found, together with the relevant filename. Thus the context of how the stem is used can easily be read. The Word Search, which uses *Blitz Latin*'s parsing abilities to recognise every Latin word, is inevitably some 10-30x slower than the Text Search.

For example, if you Word-Search for the stem 'aureli', you will locate every reference to the name Aureli.us (with all permutations of inflections) together with every reference to Aurelian.us (among others). By typing in the stem 'aurelian' as the EXCLUDED item, these unwanted entries can be rejected.

The advantages of this tool will be readily apparent:

1. For researchers looking for references to their research topics (eg Valens, for a Roman historian).
2. For linguists/dictionary-compilers seeking to create a list of inflections associated with a stem. This procedure was used to create the dictionary entries in *Blitz Latin* for the Latin music stems alluded to in section 53. The History of Music in Latin. We have even used it to correct a few rare stems inappropriately assigned in Latin dictionaries.
3. For researchers seeking to locate the development of key concepts (eg 'hypat-' in medieval music) or the manner in which stems/inflections changed over a period of centuries.

Latin files.

It is evident that, for such a search procedure to succeed, the user must own a sufficiently large collection of Latin files. We recommend that you download all the Latin HTML files from the Latin Library, the Augsburg Library and the medieval music files from the TMT library. We recommend Softbyte's 'Black Widow' multiple-file grabber for this purpose. Then use the HTML converter supplied as part of the package of *Blitz Latin* 'Extras' to bulk convert the HTML files to suitable text (.TXT) files. The resulting text files should be saved in their own sub-directories, eg C:\LatinFiles\LatinLib\..., C:\LatinFiles\Augsburg\... C:\Latinfiles\Music\..., and C:\LatinFiles\Others\... We use now about 4,000 Latin text files for test purposes, after weeding out duplicates.

Blitz Latin's Search procedure may NOT be used directly over the Internet on Latin files. Downloading the files first to your hard-drive will a) make the search process faster, b) enable duplicate files to be removed before searching, and c) save you any Internet connection charges.

38. How to Use the *Blitz Latin* Search Routine.

There are three Search menu options:

Create File List.

Search File List.

Save Search Results.

The first creates the list of files to be searched; the second enables search parameters to be set and initiates the search; the third saves the search results to a file specified by the user.

Create File List...

First of all, place all your Latin text files in their own directory, such as C:\LatinFiles\..., as explained above.

Then use the menu option 'Create File List' to locate this directory (C:\LatinFiles in this example). Click on OPEN to create the entire list of '*.TXT' files (only) within this directory and also in sub-directories nested up to 10 deep. This list is stored in the main *Blitz Latin* directory as the file DIRBLITZ.TXT, and can be examined/modified in a word-processor. If fewer than 1,000 files were found, the list will be sorted.

Alternatively, you might like to search only Latin music files. In that case, navigate in Create File List to C:\LatinFiles\Music (in this example) to list only those text files held in the music directory and its sub-directories.

Once you have created your directory listing, you may re-use it indefinitely, until such time as you want to search a different directory, or you add/remove Latin files to the existing directory.

Search File List...

Click on this menu item to bring up a dialogue box. The same search dialogue box is used for both Text and Word searches. Then type in a Latin word/stem for which to search (eg gallien). The search ignores any capital letters, so that search items 'gallien', 'Gallien' and 'gaLLien' will all locate every reference to either 'Gallienus' or 'gallienus'. Optionally, also type in a stem to exclude that is related to the search item. This can be any word for a Text Search, but for a Word Search to make sense, the excluded stem must include all of the included stem, plus at least one more character (eg 'galla' if you are seeking all stems beginning with 'gall-').

If required (Word Search only), select the speechtype (Noun, verb etc) and case/tense of the noun/verb being searched for. Usually the defaults 'ANY' will suffice. If you do select specified speechtype or case/tense options, any stems unknown to *Blitz Latin*'s dictionary will not be located, since they will have had no speechtype/case/tense assigned to them.

Finally, click on OK. The Text Search will zoom along, and can be followed on the file counter at the bottom left of the screen. The Word Search is slower, but progress will be marked at the bottom-left of the screen by the count of files being examined; the usual warnings about corrupt texts will not be displayed. In both cases, the results will be saved to a file FAILS.TXT in *Blitz Latin*'s directory, and can be examined in a word-processor. Note: each new search will overwrite the previous search results, which should therefore be saved with the menu option 'Save Search Results'.

If necessary, interrupt a search by pressing the ESCAPE key.

Save Search Results.

Click on this option to copy the search results file 'FAILS.TXT' to a new file of your own choosing.

39. Spell-Checker.

Latin text files may be formally spell-checked in two independent ways. Neither procedure applies to Latin text in the text window, only to text(s) imported as a text file.

1. On-screen editing of short Latin texts.

Click on menu items DICTIONARY/SPELL CHECK. You will be asked to select a single Latin file from the standard file selector. The output is given in the translation window with all unknown words underlined. You may now make manual corrections to the text, and save the result with RENAME FILE (section 7. Rename File (= Save File).) in the usual way. Saving the text removes the formatting. The text in the translation window has also been saved as 'fails.txt' with a Rich Text Format (RTF). This can be viewed in a conventional word processor with all formatting still in place.

The condition of the Plautus, Medieval and Phonetics toggles will affect whether a word is accepted or rejected during the spelling check. If you are checking Latin text you have written yourself, it is desirable to turn all these toggles OFF.

2. Listing of all errors from many Latin texts.

This option enables the user to put several Latin texts, of any size or complexity, in their own sub-folder, then to create a list of all the files and finally to search them all. It uses the Search routines of section 37. About Searching Multiple Latin Files., and the spelling failures are listed in a simple text file (again 'fails.txt'). Create the list of files with 'Create File List...' (see section 38. How to Use the Blitz Latin Search Routine.). Select Word Search and speechtype = UNKnown with NO search item selected. All the files in the directory listing will be spell-checked, and the result saved to the file FAILS.TXT.

40. Limitations of *Blitz Latin*.

No automatic translator can be perfect. *Blitz Latin* provides an English translation with a strong Germanic flavour - verbs are often found at the end of a sentence, for example. However the sense of the sentence should be readily apparent. Usually.

Another example of the limitations of an inflected language like Latin can be seen with the very last sentence of the example file 'Wordfile.txt':

'divina vindicta improbitatem eius vita adempta coercuit'. (In case you are wondering, this example file was selected as a test owing to its difficulty of translation, not as a showcase for *Blitz Latin*.) Both 'divina vindicta' and 'vita adempta' can be translated as the NOMINATIVE or as the ABLATIVE case. In fact, the first phrase should be NOM, and the second ABL. This is apparent since the three alternative combinations (NOM-NOM, ABL-NOM and ABL-ABL) do not make sense to us, dear reader, with our wide experience and knowledge of Roman history and similar English sentences seen elsewhere. But *Blitz Latin* lacks this experience and (depending on your current version) makes an alternative *legal* translation.

The ablative case in Latin may be translated as 'by the...' or 'with the...' or 'from the...'. *Blitz Latin* invariably uses the second form.

Syncope, the name given to the contraction of some Latin verb perfect forms (eg *perivisse* → *periisse*) is since version 1.42 fully handled by *Blitz Latin*. The original fast-searching code missed occasional syncope forms, but the time overhead required for an exhaustive search proved to be less than feared.

Other practical limitations of *Blitz Latin* may be briefly summarised:

1. Medieval writers are a pain in the neck, being frequently dreadful users of Latin grammar and spelling. *Blitz Latin* is engineered to tackle many common defects, but there remains the philosophical problem of the extent to which any grammar/dictionary source should burden itself by listing idiosyncratic errors. A further problem is that medieval writers keep inventing new words for their own use, not found elsewhere. Medieval tricks (Section 33. Medieval Tricks.) provides a partial antidote.

2. The Theodosian and Justinian legal codices put *all* proper names into lower case text. This is terribly confusing to *Blitz Latin*, which keeps rejecting words such as ‘theodosius’ and ‘roma’. The best solution is to add such lower case words to the user dictionary.

3. Words found only in Pliny are, by definition, rare, and are not in *Blitz Latin*’s dictionary. Examination of Pliny’s unique words shows that, in a very high proportion of cases, they are attempts to Latin-ize Greek names for plants, animals or minerals. Thus many of the Latin stems bear rare inflections, eg *eryngion*, -ii, nt; *eleliphacos*, -i, m; *helxines*, -ae, f; *hexaphoros*, -on (adj.). Where known elsewhere, other Latin writers have chosen to use the original Greek name directly.

Many of the plants/animals/minerals described by Pliny cannot be safely assigned today to their modern equivalents. Pliny himself often attempts descriptions that are used unaltered in dictionaries. To use an (imaginary) example, he might say that “the ‘snakeon’ is a snake found in water”. If the dictionary definition of ‘snakeon, -i, nt’ is therefore ‘water-snake’, *Blitz Latin* will provide the worthless translation of the Latin sentence as ‘the water-snake is a snake found in water.’ (!)

There exists a perfectly good English translation, side-by-side with the Latin, of Pliny’s Natural History in the well-known Loeb series. Thus those who wish only to study Pliny’s Latin have no need for *Blitz Latin*. Nevertheless... *Blitz Latin* now contains an optional file *XPlinyUserfile.txt* that contains most of these missing words. To use it, locate the *XPlinyUserFile* main directory in your *Blitz Latin* files, and rename the file to *PlinyUserFile.txt* (‘X’ removed). To deactivate the Pliny file, rename the *PlinyUserFile.txt* back to *XPlinyUserFile.txt*.

4. Double words, such as ‘nonesse’, are not recognised by *Blitz Latin*. Such double words have to be split manually by the user before translation.

5. Spaced titles, eg ‘B I B L I O T H E C A’. are not recognised, and must be condensed to ‘BIBLIOTHECA’.

6. The translated word ‘not’ occasionally follows its verb for technical reasons. This is actually good, albeit quaint, usage of English: ‘The king loves not the queen.’ Usually the translation is better, eg ‘rex non amat reginam: the king does not love the queen.’

The amount of text that can be shown on screen is limited to 200,000 characters. However, the entire translation will have been saved to the file ‘PARSER.TXT’, and can be fully viewed in a conventional word-processor. Note that each new translation over-writes the original ‘PARSER.TXT’ file. However, the option exists to rename PARSER.TXT to another file (section 7. Rename File (= Save File)).

Garbage In = Garbage Out.

The automatic translation routines in *Blitz Latin* work on the assumption that there is sense to be found in the sentence that the user provides. If you doggedly type in nonsense, the program will with equal determination provide an output of nonsense.

41. Print Output.

The standard FILE/PRINTER menu item sends the contents of the 'PARSER.TXT' file directly to the printer with crude formatting (an 80-column printer is assumed). You can use PRINT PREVIEW to select which pages to print.

As stated often in this help text, it is much preferable to read 'PARSER.TXT' into a word-processor for closer examination and proper printing.

42. Reload Translation.

The menu item FILE/RELOAD TRANSLATION allows you to reload a renamed-translation (see previous section) that you made previously. The purpose is to allow you to continue an interrupted editing session on a translated text, while still within *Blitz Latin's* interactive environment. Don't forget to rename (save) the re-edited file again!

You will NOT be able to reload the original translation file 'PARSER.TXT'.

If you have renamed (saved) a very long file (>200,000 characters), an attempt to reload this translation will result in it being truncated before being shown in the translation window, a warning will be given, and it will not be possible to edit the text in the window. Shorten the file first, and reload it in two or more sections for editing.

43. View.

The 'VIEW-TOOLBAR' and 'VIEW-STATUS BAR' menu items are standard Windows items that toggle parts of the default screen on and off. You can't do any harm by clicking these items on and off to see what happens. Toggling one of these items OFF may also help the program display fit to your monitor screen.

The menu option 'Select Font And Background Colour...' brings up a dialogue box that now enables the font to be changed, to Arial (Non-Serif, default), Roman (Serif) and Courier (fixed-width, like a type-writer), and the size to be altered, between points 8 (default) and 14. In addition, the background colour of the screens for your Latin text and its translation can be changed from yellow (default) to pure white or light-grey. The bottom light-blue screen cannot be changed. From version 2.17, current user settings can be saved by the user from menu item 'View – Save User Settings'.

44. Two Output Windows.

Most modern automatic translators have two windows mounted one above the other. The top window is used for the foreign language, the bottom for the translation. That is pretty un-natural, actually.

Newspapers are arranged by columns, not by rows, you will print out your letters in portrait, not landscape, mode, and books combining text and translation (e.g. the famous Loeb series) arrange the Latin text on the left-hand page and the translation on the right-hand page.

So that is the method favoured by *Blitz Latin*.

45. Useful Web Addresses.

Adobe PDF document reader: <http://www.adobe.com/products/acrobat/readstep.html>

Augsburg Library: http://www.fh_augsburg.de/~harsch/a_chron.html

Frankfurt Latin inscriptions: <http://www.rz.uni-frankfurt.de/~clauss/index-e.html>

The Latin Library: <http://www.theLatinLibrary.com>

Softbytelabs (multiple file copier): <http://www.softbytelabs.com>

The TMT (music) project: [http:// www.music.indiana.edu/tml/](http://www.music.indiana.edu/tml/)

John White: www.johnwhiteauthor.co.uk. johnpye-white1@ntlworld.com.

William Whitaker: [Dr Whitaker died in December 2010.]

46. Additional Programs Supplied with *Blitz Latin*.

Four additional programs are supplied for the benefit of researchers:

Counter is a program that counts Latin words in a text, and provides statistical analysis of word densities in sentences and standard deviations. These can be used to compare frequencies of words per sentence between different Latin texts.

Inscript is an extremely fast means for searching the database of inscriptions held at Frankfurt University.

HTMSTRIP provides a fast and convenient method to convert bulk HTM or HTML files into the corresponding text files.

LatinWords gives the user a nice easy way to load self-selected Latin words into the ‘userfile.txt’ for *Blitz Latin*.

These free ‘Extras’ programs are provided with *Blitz Latin* as part of the self-installing package, and contain their own documentation in the form of a PDF file.

TECHNICAL

47. The Translator.

Blitz Latin is sentence-based. That is, it carries out all its processing by reading in individual sentences and acting on each sentence in isolation. Some time is spent in advance on breaking the user's input into proper sentences, and saving the results to a temporary file which will later be used in place of the user's actual input file. Sentences are deemed to end with a period, a colon, a semi-colon, a question mark or an exclamation.

Blitz Latin carries out automatic translation in several stages:

1. 'Load-Text'. Delineation of sentences and sub-clauses. Intelligent tidying-up is done at this stage, checking for punctuation.
2. 'Parser'. Construction of tables for each word in a sentence. One original word may have several Latin stems (e.g. nouns, pronouns, verbs, adjectives) each with several inflections modifying the meanings. All the possible combinations are stored for each original word provided by the user. If the full translation option has not been selected, this is the output that will be displayed.
3. 'Clear-out'. Removal of improbable words or meanings using grammatical principles.
4. 'AI-Select'. Use of AI heuristics to determine which surviving meanings for a word are the most probable. The most probable combination of stem and inflection is selected. The latest versions of *Blitz Latin* employ a multi-pass translation procedure using dynamic weightings to establish the best meanings for every Latin word. The initial result is reviewed and, if the review is not satisfactory (for example, a nominative and accusative noun are both present, but not a verb), the weightings are adjusted and the clause re-translated until no further improvement can be made. This procedure is only viable due to the translator's colossal speed of operation.
5. 'Elaborate'. Use of the best meaning from the best word's translation and its inflection. For example, a 2nd person future of the verb 'amare' will be constructed as 'you will love'.
6. 'Polish'. Use of look-up tables to polish dis-jointed meanings as far as possible.
7. 'Best Order'. Analysis of the best polished meanings to improve the word order. This can make a big difference to comprehension of the final output.
8. 'Output'. Output of the polished translation to a file 'PARSER.TXT'. This file is subsequently displayed on screen.

A change of emphasis. (Versions 1.63+)

The speed of *Blitz Latin* has allowed the AI to be extended and improved so much that it is now becoming possible to render the grammatical deletions less fierce. Thus the AI is being asked increasingly to make more sophisticated choices. An example is the phrase '*bellum bonum*', which could be translated as 'the good war' (subject), 'the good war' (object), 'the fine good thing' (subject) or 'the fine good thing' (object). In earlier versions of *Blitz Latin*, the grammatical parser would make a decision and ruthlessly delete the alternatives from consideration. Now – depending on context – the grammatical parser may leave the decision to the more delicate touch of the AI. The result is, we hope, another large step in the translation of Latin text, becoming more and more apparent through the 1.6 series – but much more noticeable from version 1.63 onwards.

48. Neural Network.

This feature is really an experiment.

The ambiguity of Latin is neatly exemplified by the three nouns *plaga*, *-ae*, *fem*, which can mean: *blow* (also related words such as wound, plague, stroke, disaster, slaughter); *region* (such as a tract of ground or a zone of sky); *snare* (trap, ambush).

These Latin words are partly separated by pronunciation, which can not be distinguished in text. *Blitz Latin* lacks the intelligence to apply context to a sentence in order to separate their meanings.

The situation is further complicated by the antiquated term *plaga*, *-ae*, *fem*, which once meant 'curtain', and by the medieval word *plagis*, *-is*, *fem*, which meant a certain type of musical stroke or chord. However, 'curtain' is very rare, while *plagis* can be easily distinguished by its use in Latin music theory.

Neural networks can be trained to identify patterns among seemingly random information. We have trained a neural network with one-tenth of all examples of *plaga* in our 3,000-file Latin collection, covering all periods from antiquity to the present. The pre-trained parameters are used to confer context on all occurrences of *plaga* in user texts.

In trials, the trained program gives the correct answer (blow, region or snare) in about two-thirds of examples. This is a marked improvement over the original *Blitz Latin*, which was right somewhat more than one-third of the time simply because it always supplied 'blow' as the most commonly used meaning (rather like the stopped clock that is more accurate - twice a day - than the clock that loses one minute per day). The time overhead is only significant when measured over millions of words.

Versions 1.63+: the neural network has been extended to cover not only *plaga*, *-ae*, *fem*, but also *contentus/a/um*, *saltus*, *-us*, *m*, *liber*, *pilum*, *-i*, *nt* and *lustrum*, *-i*, *nt*.

The effort to train a neural network is considerable. If this experiment with *plaga* proves to be successful, we shall try to identify other common ambiguous Latin words with which to train our network.

If you don't like this feature, turn it off by toggling the menu item DICTIONARY/NEURAL NETWORK.

49. Technical Limitations.

Max. number of clauses in a sentence: 50 (since version 1.75, was 25.)

Max. no. of original words (including punctuation) in one sentence: 400 (was 200.)

Max. number of characters in one word: 100.

Max. number of characters in one sentence: 2,000.

Max. number of all possible stems, inflections and punctuation in one sentence: 1,200.

Max. number of characters selected by the mouse for translation: 2,000.

Max. number of user text lines (for user-added dictionary): 1,000 lines.

50. High-Speed Hashing.

A high-speed hashing system is used to save calculations for commonly encountered Latin nouns, so that it is not necessary to keep calculating tables for them when they are re-used.

This is particularly effective for:

1. proper names (average 7% time saving).
2. 'unknown' words (average 2½% time saving when they recur frequently in one text).

Some 50 Kbytes of RAM are required for the hash entries. Note that re-use of pre-calculated information has no effect on the final translation, only on the speed with which the translation is acquired.

High-speed look-ups.

The latest versions of *Blitz Latin* provide a binary look-up file, 'fixedhashfile.dat', that contains pre-computed tables for the 300 most common Latin words across our 20 million test Latin words. This feature will only be available if the user's computer has sufficient RAM capacity, and the necessary RAM will be allocated if it is available. Results from translations will be identical to those whether the look-up file is employed or not. Time savings with the look-up tables in place amount to some 15%.

The option exists to turn off the high-speed look-up facility (menu Dictionary/Lookup). The main reason is that, in order to save space, the full range of meanings and the typical inflections are not available to the user in non-translation mode. However, simply clicking on the Latin word will generate the full range of meanings in the bottom translation box. A good example is the Latin word 'causam'. Type this single word into the Latin text box, turn off the translation toggle, and then click the Translate button with and without the high-speed look-up option. In both cases, also left-click on the word to see the translation options in the bottom translation box.

51. Verb Inflections.

Latin is a very ambiguous language, where individual words can often be translated as nouns, adjectives, verbs and other speech-types. A good example is any single Latin word ending in -ator (eg *amator*), which can be translated as derived from a noun ('lover', common) or from a verb ('to love', very common). *Blitz Latin* has always taken into account the frequency of use of Latin stems (for nouns, adjectives, verbs and other speech-types) when assigning which should be selected from an ambiguous mixture, so *amator* (verb, future passive imperative) would always have been considered as first candidate. Usually (depending on the rest of the sentence) the AI routines would then reject the verb as improbable - a plausible, slightly less common noun *amator* was available as an alternative. But verbs as future-perfect or passive or imperatives are actually very rare in real Latin texts; the noun should have been first in the list of choices! If the verb stem is a common one and the noun stem is rare, the implausible ending with the common verb stem will be accepted by the AI routines.

This problem has been recognised for a long time, and special-purpose AI code punishes such verbs heavily. Even so, sometimes these implausible verbs are accepted (rarely, they are correct anyway!)

The solution, introduced from *Blitz Latin* 2.24, has been to ‘degrade’ verbs (i.e. pretend that they have less common verb stems) for each of these improbable inflections: future-perfect; passive; imperative. It is achieved by marking down the frequency of the verb stem from its original value in the electronic dictionary. The verb stem is made one unit less frequent for each occurrence of future-perfect or passive or imperative, so that *amator* will be double-degraded. The verb is now counted as ‘C’ frequency, where it was originally ‘A’ frequency.

This solution has markedly improved assignments of nouns versus verbs where the verbs are encountered as any of future-perfect, passive or imperative.

52. Program Files.

Blitz Latin requires these files to operate:

BLITZ2.EXE (the translator program)

TRANSL.DAT (translations)

DICTUK.DAT (the Latin stems)

INFLECTS.DAT (the inflections)

ADDONS.DAT (list of addons)

UNIQUES.DAT (Latin words with unique inflections)

POLISH.DAT (look-up tables for polishing of single words of translation)

PHRASEDUD.DAT (look-up tables for polishing of adjacent words of translation)

FINALPOLISH.DAT (look-up tables for final polishing of the translation)

BLITZ2A.CHM (help text)

FIXEDHASHFILE.DAT (look-up tables)

PHONETICUK.DAT (aids assignment of phonetically-spelled words to their classical form.)

None of the above files can be modified by the user.

Optional input files:

USERFILE.TXT - a text file of additional dictionary words and meanings created by the user. An example is provided.

USERPHRASES.TXT - a text file of Latin phrases created by the user. Example given.

USERSETTINGS.TXT - a text file that predefines the menu options of *Blitz Latin*.

ANYLATIN.TXT - any text file of Latin words created by the user.

In addition, *Blitz Latin* creates the following files:

PARSER.TXT - the output file of translations, which the user is encouraged to rename and store for future examination in a word-processor.

TEMP.LAT - a temporary file

LATIN.LAT - another temporary file

DIRBLITZ.TXT - holds the directory of files to search

FAILS.TXT - output file with search results, which the user should examine in a word-processor after each search by *Blitz Latin*.

53. The History of Music in Latin.

Blitz Latin contains a considerable sub-dictionary devoted to the early history of music. The words involved tend not to appear in conventional Latin dictionaries, and have been obtained by search of Latin medieval files that attempt definitions of the musical terms. Limitations of space prevent a lengthy translation when the Latin words are encountered during translation, therefore the following explanation is given. The music-dictionary has been compiled in good faith, but we would welcome any corrections from those more knowledgeable.

The simplest instruments were of percussion (percussionale), simple horns (inflatile) and 3-stringed lyres (tensibile), but later advances resulted in multi-string instruments becoming available, widening the range of tones (or frequencies, as we would say today).

There were three musical parts: harmonica, rhythmica and metrica.
Metrica was divided also into three- heroicum, iambicum and elegiacum.

A symphonia contained a tuneful mixture of sounds from any musical instrument. There were 6 symphoniae:

Diatesseron - 4 notes [*Also a name for the combined four gospels.*]

Diapente - 5 notes

Diapason - 8 notes, 'the whole octave'

Diapason simul et diatesseron - 11 notes

Diapason simul et diapente - 12 notes

Disdiapason - 15 notes, two octaves.

[This is extremely confused in the literature, where the above names are also used to describe contiguous sets of 6 semi-tones (diatesseron), 8 semi-tones (diapente) and 13 semi-tones (diapason).]

There were originally up to 8 tones:

hypodorius (deepest), hypophrygius, hypolydius, doricus, phrygius, lydius, mixolydius, hypermixolydius (highest).

These became widened to 15:

hypodorius (deepest), hypojastius, hypophrygius, hypoeolius, hypolydius, doricus, jastius, phrygius, aeolius, lydius, hyperdorius, hyperjastius, hyperphrygius, hyperaeolius, hyperlydius (highest). Each differs from the previous by one semi-tone.

The original stringed instrument had only three strings:

hypate (deepest), mese (middle), nete (highest).

As more strings were added, the list became divided and sub-divided. By the time of Boemus, we have the following string-names:

hypate-hypaton (lowest), parhypate-hypaton, lichanos-hypaton

hypate-meson, parhypate-meson, lichanos-meson

lichanos, mese, paramese

trite-synemmenon, nete-synemmenon [these seem to replace other strings]

trite-diazeugmenon, paranete-diazeugmenon, nete-diazeugmenon

trite-hyperboleon, paranete-hyperboleon, nete-hyperboleon.

By the later medieval period, melodies (also called voices, also called tones) were divided into eight, of which the 'higher four' (their definition) were:
autentus protus, autentus deuterus, autentus tritus, autentus tetrardus.
(Protus was sometimes called archoos or, rarely, archos.) The lower four were based on plagius, instead of autentus. Plagis/plagius is the lower counterpart to autentus.

Naturally, subsequent medieval writers could not resist the opportunity to mis-spell all these words in every conceivable manner. The most common mis-spellings are also listed within the *Blitz Latin* dictionary.