Bible Software for Septuagint Studies: A Comparison of Accordance 10, BibleWorks 9, and Logos 5

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Technological advances in recent years have enabled more universal access to important texts for Septuagint studies, as well as faster and more streamlined ways to search relevant textual data and utilize the results. The following review article evaluates computer software resources available to both the scholar and the student who is engaged in Septuagint studies.

The review assesses three major commercial Bible software programs (Accordance 10, BibleWorks 9, and Logos 5) as to their contributions to the field of Septuagint studies. First, there is an overview of available Septuagint texts and resources (lexicons, grammars, and monographs) in each software. Second, there is description of notable features in each program, including the sorts of searches and queries one can perform. After an analysis of each of the three programs, there is an evaluative comparison of the texts of the Göttingen Septuagint, as they appear in Accordance and in Logos. (BibleWorks does not have the Göttingen Septuagint.) “Platforms, Devices, and Cross-Functionality” offers a short overview of the electronic platforms and devices on which one can (and cannot) access the three programs. Finally, the concluding “Software Collections and Sources for Help” section gives brief attention to collections and packages available, as well as lists means of support (with Web urls) for Accordance, BibleWorks, and Logos.

1. Accordance 10

1.1 Available Texts and Resources in Accordance

*English translations of the Septuagint* include Brenton’s translation (with “apocryphal books”) and the New English Translation of the Septuagint (NETS). As for Greek Septuagint texts, Accordance has:

- The 2006 *Rahlfs-Hanhart* text, which is “tagged” morphologically and with lemmas, so that the user can hover over or click on a word to pull up more information about it (its parsing and lexical form). Accordance also offers the apparatus to this text.
Swete’s Old Testament in Greek, also tagged. Swete’s basic apparatus is available, as is the larger Cambridge apparatus. Much but not all of what exists in Cambridge is available in Accordance (e.g., Esther, Judith, and Tobit).

13 of the 23 existing volumes of the Göttingen Septuagint (as of April 2014), with more volumes currently in preparation and soon to be released. Volumes include the text, apparatus(es), and introductions.

There are several accompanying Septuagint research tools to be found in Accordance, as well:

- Greek-English Lexicon of the Septuagint
- Grammar of Septuagint Greek by Conybeare and Stock. Just the grammar itself (not the selected readings and vocabulary) is included
- The searchable Revised CATSS Hebrew/Greek Parallel text by Tov and Polak. Whether in interlinear or side-by-side column arrangement, one can see each Hebrew word in the Masoretic Text with the Greek word to which it corresponds. The database (Figure 1) has hyperlinked sigla throughout, noting, for example, reconstructions, pluses, minuses, possibly different source texts, and more.

![MT-LXX Parallel database in Accordance](image)

[Figure 1] MT-LXX Parallel database in Accordance

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2F.C. Conybeare and St. George Stock, Grammar of Septuagint Greek (Ginn and Company: Boston, 1905).
In addition, Accordance has a morphologically tagged OT Syriac Peshitta, tagged Vulgate (with apparatus), tagged Targums, and tagged Samaritan Pentateuch. There is also an extensive collection of tagged biblical and non-biblical Dead Sea Scrolls documents, with translations and some images (all exceeding the scope of what’s available in the other two programs). Accordance at present is the only one of the three programs with non-biblical, non-Qumran documents (its “Judean Desert Corpus” module). Philo and Josephus are also available in Greek and English, and tagged.

1.2 Notable Features in Accordance

There are multiple methods for finding information immediately – lexical, grammatical, and otherwise – in Accordance. In addition to its instant return of search results, of the three programs surveyed here, Accordance has the fastest program start-up time.

Accordance allows the user to “amplify” from any word, phrase, or verse reference. A user can select text or a reference and amplify to a selected resource from her library, via a drop-down Amplify menu at the top of the screen, or by right-clicking and selecting one of several search options. This permits the immediate look-up of a Greek word in multiple lexicons and grammars (even at the same time, if one sets it up correctly beforehand). Amplifying by reference takes one to a host of reference tools and biblical commentaries. (There are no LXX-specific commentaries as of yet). A simple right-click on a word or phrase brings up a menu which can look up its occurrences in the current text or any other text, displaying results which can then be customized and manipulated for additional use through Accordance’s analytics functions.

The Instant Details panel in Accordance shows parsing and lexical information about words, as well as anything else Accordance is set up to hyperlink. A simple hover over a noun, for example, immediately shows its gender, number, and case, as well as the entry for the user’s preferred lexicon.

Searching in Accordance is incredibly fast. One can search for a lemma, a given inflection, or even according to morphology. Inserting the @ symbol after a Greek word searches the word by its morphological tag. For example, to find all the times γινωσκω occurs as an aorist infinitive, one simply types into the search entry bar:

γινωσκω@ [VERB aorist infinitive]
To find all the nouns that an Accordance LXX text has tagged as feminine singular vocative, this search is used: [NOUN feminine singular vocative].

Syntax searches are also possible in Accordance in a more than halfway complete Hebrew Old Testament database and an in-progress Greek New Testament database. One can search word by its use as subject, predicate, complement, adjunct, and so on, but there is not yet a syntax database for the Septuagint. One can also take advantage of Accordance’s intuitive Construct searches, which offer a visual interface for searches and can quickly show the user things like how many times a comparative adjective and a superlative adjective occur within five words of each other. Construct searches can be used for the LXX and are easily accessible via the File menu by selecting “New Construct.”

Accordance also allows the user to easily search its MT-LXX database in multiple ways with different search fields, selectable from within the search entry box: Entry; Hebrew; Greek; Reconstructions; Symbols; Comments; MSS; Scripture. After selecting the appropriate search field(s), one enters the search term(s) and receives hit results back instantaneously.

[Figure 2] A search using MT-LXX and MERGE command. Instant Details pane at bottom

With the proper “workspace” set up, which can then be saved for future use, one can use the MT-LXX text in conjunction with a Hebrew text and Greek
text (and Accordance’s “MERGE” command, Figure 2) to see, for example, a list of how a given Hebrew word is translated throughout the Old Greek.

Another profitable use of Accordance is for textual criticism. Apart from the benefit of having a searchable BHS and critical apparatus at hand, one can also line up Accordance’s various Septuagint texts and apparatuses to see them on the same screen, in an Accordance workspace, as here (Figure 3):

![Figure 3] Accordance workspace for textual criticism

Using the “Compare” feature, Accordance in the above example marks within the texts themselves the orthographical differences in place names in Genesis 10 between Göttingen, Swete, and Rahlfs (Figure 3). This comparison feature itself is customizable: one can choose whether or not to have it be case-sensitive, to ignore accents, and so on.

Pictured on the right side of Figure 3 above is a particularly useful “Text Differences” feature, by which one can instantaneously view a separate table of all textual differences between two texts – in this case, between Göttingen and Swete.

Accordance allows text export using Accordance’s own Greek and Hebrew fonts, or as Unicode. In the Preferences setting, one can choose whether to export Greek with or without accents and breathing marks, and whether to export Hebrew with or without vowel pointings and cantillation marks.
2. BibleWorks 9

2.1 Available Texts and Resources in BibleWorks

*English translations of the Septuagint* in BibleWorks are limited to just Brenton’s translation, with deuterocanonical books. NETS is expected to be made available in BibleWorks in the near future.

As for *Greek Septuagint texts*, BibleWorks has the 2006 Rahlfs-Hanhart text. As in Accordance and Logos, it is tagged morphologically. An instant mouse hover or click on a word shows grammatical and lexical information about it in the Analysis Window. No LXX apparatus, however, is available in BibleWorks.

There are just a handful of Septuagint research tools in BibleWorks, none of which enable text-critical work, but which nonetheless facilitate analysis of the Rahlfs text:

- The *LEH lexicon* (second edition)
- *Conybeare and Stock’s grammar*, without the selected readings

Of the three Bible softwares’ presentation of the database, BibleWorks has the most immediately intuitive, thorough, and useful display (*Figure 4*):

![Figure 4] MT-LXX Database in BibleWorks
The search function of the MT-LXX parallel in BibleWorks allows for: entry of a Greek word to see a table of Hebrew words it is supposed to translate, entry of a Hebrew word to see the various Greek words used for it, and entry of Greek and Hebrew words to see how many times a given correspondence occurs.

Other texts that would be useful for textual criticism are somewhat sparse in BibleWorks. There is no Syriac OT Peshitta, nor tagged Samaritan Pentateuch (an untagged SP is available online as user-created files). BibleWorks has two DSS-related add-ons: “Dead Sea Scrolls English Translation Bundle: Biblical and Sectarian Texts” and Qumran sectarian (non-biblical) manuscripts, but not the biblical DSS in Hebrew. Its base package also includes tagged Targums, an untagged Vulgate (without apparatus, and with some “word analysis”), tagged Philo, and tagged Josephus (with English translations).

2.2 Notable Features in BibleWorks

The interface of BibleWorks is less customizable than that of Accordance or Logos, though users still have options for setting up a workflow that is most useful to them. BibleWorks has a Search Window, Browse Window, and Analysis Window (which can be one window or split into two Analysis Windows).

Searching is easy and very fast in BibleWorks. The command line in the Search Window is the place to begin, enabling a wide variety of word and phrase and more complex searches. As with Accordance and Logos, a morphological search is possible, using the @ symbol. The proper search string instantaneously can display verses where two given words occur together, or where just one of two words appears (among other possibilities). A “compound” search (using the / symbol) even allows one to show results for two searches at once.

The so-called search syntax in BibleWorks (how to string together a search command) takes some time to learn. To find all occurrences of an aorist passive subjunctive verb, for example, one searches the string

`.*@vsap*`

In Accordance, by comparison, the search string is the somewhat more intuitive `*@ [VERB aorist passive subjunctive],` although BibleWorks has plenty of help features to help the user learn its logic. A search through the morphological codes in the help files lead the user to discover, for example, that a search of `*@nvfs*` returns results for all feminine vocative singular nouns in a morphologically tagged Greek text. More advanced users will be able to take advantage of the Graphical Search Engine, comparable in layout and
function to Accordance’s Construct search. The BibleWorks help files and videos explain its use.

Two things immediately set BibleWorks apart in Septuagint studies, especially for scenarios where one might wish to also access the New Testament. First, BibleWorks alone has a combined Greek Bible: a single version that puts the Septuagint and Greek New Testament together (“BGT”). One can use an LXX text or GNT text alone, but the advantage to BibleWorks’s combined BGT is that searches turn up instantaneous results for a word or phrase in both corpuses at once.

The Use Tab (shown at far right of Figure 5 above, in an Analysis Window) is nothing short of technologically astounding. Hovering with the cursor over a word in a biblical text almost immediately (in a matter of milliseconds) returns a display full of all the other verses where that word is used. One finds noted the number of hits in a given Book or “Version” (like the BGT, LXX, or GNT), as well as a list of each of those verses, available for further exploration. While a word search can still return similar information, not having to leave one’s Browse Window (where one is working through the text) and being able to see a word’s uses at a glance, throughout the larger book or corpus, is quite convenient.

As with Accordance and Logos, lexical and parsing information is immediately available for any word. Similarly, text comparison and highlight features show textual differences between versions, although the lack of another Greek LXX besides Rahlfs means the user cannot now take advantage of that feature for Septuagint studies.

BibleWorks’s export options make queries easily manipulable. Using the Report Generator, for example, one can build a “report” with selected text to
show all words used in that passage with their frequency counts and lexicon entries (Figure 6).

[Figure 6] A simple report using the Report Generator in BibleWorks

Like Accordance, BibleWorks allows text export using its own Greek and Hebrew fonts, or as Unicode. Hebrew can export with or without pointing, which can also be toggled off and on when viewing a Hebrew text. Exported Greek text retains its accents and breathing marks.

3. Logos 5

3.1 Available Texts and Resources in Logos

As for English translations of the Septuagint, Logos has made its own, new translation: The Lexham English Septuagint. It uses Swete’s Greek text as its base. Brenton’s English translation is available, though – surprisingly – NETS is not. For Greek Septuagint texts:
- Logos is the only Bible software program to offer all of the 23 published volumes of the *Göttingen Septuagint*. Logos also includes the 2004 *Göttingen Supplementum*.
- Logos offers *Swete’s Greek OT* text with its basic apparatus, but the Larger Cambridge apparatus is not available.
- The *Rahlfs-Hanhart* text with critical apparatus is available. There are several research tools in Logos:
  - The *LEH lexicon* (revised edition)
  - *Conybeare and Stock’s grammar*, including the selected readings
  - *Tov and Polak’s MT-LXX database*. This is less versatile than in Accordance or BibleWorks, and it is not the revised release that the other two programs have. Though the database’s sigla are hyperlinked throughout, the MT-LXX only displays as a two-line interlinear, so that searches using the database are not possible. Using other texts and searches, however (like the Bible Word Study guide and the ANDEQUALS and NOTEQUALS commands with Greek and Hebrew lemma searches), one can still find out how the Greek does or doesn’t translate a given Hebrew word. Logos’s version of Rahlfs Septuagint has an interlinear option that also displays Hebrew, and a search on a Greek lemma pulls up corresponding Hebrew word(s).
- In partnership with the International Greek New Testament Project, Logos has a transcription of Codex Sinaiticus. A transcription of that codex (plus images) is available in Accordance and BibleWorks, but only in Logos does the transcription include the extant Septuagint portions. It is untagged, but can be used in parallel with a tagged Septuagint text.
- Although neither his full Septuagint lexicon nor his *Two-way Index* are available (in any platform) digitally, Logos alone carries T. Muraoka’s *Hebrew/Aramaic Index to the Septuagint*. Even without Muraoka’s *Index*, one can use Logos’s Bible Word Study guide (*Figure 7*) to trace Greek-Hebrew equivalencies.

Logos has more monographs and collections of articles than any other platform (even including Amazon Kindle). Some examples are:

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The usefulness of each of these resources is greatly enhanced, compared to print, by the ability to search each book by word or phrase. Hyperlinked Scripture references (which can be set to link to a biblical text of choice, whether in Greek or any other language) allow the user to instantly (on click or hover) see the text of a verse mentioned as a reference. Footnotes are similarly hyperlinked.

[Figure 7] Graphically displayed results of a Bible Word Study in Logos

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Logos offers tagged biblical and non-biblical Dead Sea Scrolls transcriptions (with English translation), tagged Vulgate (with apparatus), the Leiden Peshitta (untagged), and tagged Targums. There is no Samaritan Pentateuch. Philo and Josephus are available in Greek and English, also tagged.

3.2 Notable Features in Logos

Logos’s layout is highly customizable, so that one can link a large number of tools together and save the layout. One can access Greek, Hebrew, and English texts, together with apparatuses and lexicons, in a single layout, as here (Figure 8):

[Figure 8] Customizable layout in Logos

The various texts and apparatuses can be made to scroll in sync with each other.

At top right in Figure 8 is the “Text Comparison” feature, which one can use to quickly view marked-up textual differences between Septuagint versions available in Logos (Rahlfs, Swete, and Göttingen, for example). This is similar to Accordance’s “Compare” feature, but one cannot create an isolated list of text differences in Logos, as one can in Accordance.
As with Accordance and BibleWorks, Logos offers multiple kinds of searches. Its return of search results (especially on a Mac computer, but also on a PC) is noticeably slower than in Accordance and BibleWorks. A single-word search can take five or more seconds in Logos, whereas a search for the same word in Accordance and BibleWorks shows instantaneous results. Logos 5 has shown improvements from previous versions of Logos, but one hopes that future iterations of the program will have greater speed.

The slow search speed could be due, in part, to Logos’s goal of functioning as a “universal digital library,” but even with a small library, a user can encounter sluggish responsiveness in Logos (especially on a Mac), a long “preparing your library” message that delays program startup, and regular “indexing” that slows the rest of the computer’s performance.

There are six primary search categories in Logos 5: Basic, Bible, Image, Clause, Morph, and Syntax. A “Basic” search combs through one’s Logos library of articles, monographs, commentaries, and other resources. “Bible” narrows the search to biblical texts. “Image” returns results for maps, photographs, diagrams, and so on. Clause searching can take a search string like “subject: Jesus object: disciples” and show every time in the New Testament that Jesus is speaking to his disciples, even if “he” and “them” occur in the text with “Jesus” and “disciples” just as referents. Presently, however, clause searching can only be used with a Hebrew Bible (Logos’s “Lexham Hebrew Bible”) and a Greek New Testament (SBL edition).

A “morph” search gives results according to a specified inflection or part of speech. One can initiate a morphological search via a search bar, or one can right click on a word in an appropriately tagged text to do a search from a given word where it occurs in a text. For example, entering the command “lemma:βασιλεύς@N[DG]S” in the search bar finds all the times that the noun βασιλεύς occurs in the singular dative or singular genitive. There are several display options (Verses, Aligned, or Analysis).

Of the three software programs surveyed here, only Logos is fully Unicode already in its Greek and Hebrew texts. That is, there is no export as Unicode option because the texts already are Unicode and export as such.

4. The Göttingen Texts in Logos and Accordance, Compared

When Accordance initially released its Göttingen Isaiah volume, there were a number of typos and inaccuracies, compared against the print edition of that text, but those have since been corrected in an updated module that is now available. Perhaps inevitably, both softwares contain typos at various spots,
but for the texts I have examined, they were generally reliable when compared against the print text, with Logos having the edge on accuracy in the Göttingen Septuagint.

Given a choice, users will probably find Accordance easier to utilize with respect to the critical apparatuses, since it offers multiple search fields. One can search the apparatus using such fields as “Manuscripts,” “Greek Content,” “Latin Content,” “Scripture,” “Page Numbers,” and more. One can even search by multiple fields, to conduct, for example, a search for a given Greek variant in a single manuscript, throughout a Septuagint book. A simple command+F (Mac) or control+F (PC) in Logos allows one to find most of what one needs in the Logos apparatuses, but working with the search results in a meaningful way is more difficult. The Accordance method generally allows a user to drill down more quickly to what she or he is looking for.

The Pentateuch volumes of LXX-G in Accordance combine the dual apparatuses of those volumes into a single apparatus. The result is still searchable, but it can be difficult to do work within a single apparatus. The combined apparatus essentially mirrors the print page, but does not take advantage of all that a program could otherwise do. Search results for a given variant, for example, cannot be narrowed down to a single apparatus in Accordance’s Pentateuch volumes. In Isaiah, a newer release for Accordance, the two critical apparatuses come as separate tools and are more easily searchable, with the search results easy to interpret and manipulate.

In Logos, where two critical apparatuses exist in a Göttingen volume, they open as separate modules, which one can link together to scroll in tandem, as well as search and read separately. Logos does not include the Kopfleiste (manuscript Source List) for the Göttingen volumes that have one in print, but Accordance does include it. It is true that the Kopfleiste makes more sense on the print page, but a researcher of the Septuagint may still feel its absence in Logos (and appreciate its presence in Accordance).

Researchers will find features to facilitate study of LXX-G in both Accordance and Logos. In both, for example, a lexical entry in LEH for a word in the critical apparatus is just a click away (to be exact: a triple-click in Accordance; double-click in Logos).

In both programs one can mouse over blue hyperlinked abbreviations and verse references in the introduction and critical apparatuses to see what they stand for - a time-saver especially for those who are new to using the apparatus. The manuscripts listed in the apparatuses generally hyperlink to the information given about them in the introduction, so that one can get manu-
script information with a simple move of the cursor. Neither Logos nor Accordance (at the time of the writing of this article) offer a German-English dictionary to use for looking up the German of the LXX-G volumes, so knowledge of German is still needed to be able to read the volume introductions. (The reader may already know that that John William Wevers’s English translations of his introductions to much of the Göttingen Pentateuch are available freely online.)

The Göttingen volumes are significantly more affordable in Logos (especially with an academic discount). Only Accordance, however, offers the ability to purchase individual volumes. Accordance has continued to produce new Göttingen volumes; two volumes (Psalms with Odes and Esther) released in the first half of 2014.

5. Platforms, Devices, and Cross-Functionality

To review the mobile offerings from Accordance and Logos would exceed the scope of this article. After all, for serious research one will probably require the full computing power of the desktop/laptop programs. However, a few words can be said about program availability on various devices, as well as syncing capability.

Accordance runs on Mac, Windows, and iOS (iPhone and iPad). There is at present no Android app for Accordance. Once a user owns a text or module in Accordance, she or he can access it anywhere. Using Dropbox, Accordance can sync across devices, though the syncing is not (at the time of writing this article) automatic yet, and not as integrated with Windows as it is with Mac and iOS.

Of the three programs explored here, only Logos is fully cross-platform. One can access one’s library on Mac, Windows, iOS, and Android, as well as automatically sync across devices. A highlight or note one makes on an iPad, for example, automatically shows up when one returns to a computer. Logos even gives users Web-based access to purchased resources via www.biblia.com.

BibleWorks is a Windows program, though recently available on a Mac via CodeWeavers, which permits a Mac computer to run a Windows program. The Mac version does not retain 100% of the Windows functionality, but it’s still quite useable and functional on a Mac. BibleWorks has no mobile presence.
6. Software Collections and Sources for Help

Accordance offers various “collections,” including an “Original Languages” one. LEH and the Rahlfs LXX are included, and additional texts and tools (Göttingen volumes, the MT-LXX Parallel tool, etc.) are available as separate add-ons. More information is at http://www.accordancebible.com. BibleWorks, rather than having multiple purchase options, comes with many texts and tools bundled together at one purchase level. More details, including a few additional add-on modules, are at http://www.bibleworks.com. Logos offers a wide array of packages, including a “Biblical Languages” option, with other items (additional lexicons, monographs, and so on) available for separate purchase. Their site is http://www.logos.com.

Accordance, Logos, and BibleWorks all have extensive sources of help and active user forums. Accordance offers various means of support at http://www.accordancebible.com/support. Theirs are the most extensive sources of support, including over 100 podcasts, interactive webinars (which are also recorded for later viewing), training seminars, thorough help files, and others.

BibleWorks has support available at http://www.bibleworks.com/support, as well as extensive help files at http://www.bibleworks.com/bw9help/. Purchasers of the program also have access to more than six hours of video tutorials.

At https://www.logos.com/support, Logos links to help files, videos, a blog, and more. (Logos is unique in offering paid advanced training, which can easily be gotten for free in Accordance and BibleWorks.)

More could be said about each of the programs. All three can do much more than has been noted in this space: user-created notes tied to specific verses, highlighting, creation of vocabulary lists, and so on.

As with any advanced computer software there is a learning curve for each. Depending on the scope of one’s study, using a combination of all three softwares may be advisable, though one’s specific research needs (as they relate to available texts, resources, and functionality) will finally dictate how and where one decides to engage with a Bible software program for Septuagint studies.