WORD TO LaTeX INPUT SOFTWARE

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There is a time saving means to publish TeX/LaTeX technical papers. It does not, in fact, require that one even learn TeX/LaTeX in order to publish TeX/LaTeX papers, and so can save students and other newcomers to scientific publishing the long climb up the TeX/LaTeX learning curve.

In essence it is a software program called Word2TeX that translates Microsoft Word files into TeX/LaTeX (AMS or non-AMS). You don't need any other word processor than Microsoft Word, and so can do everything you do (letters, technical papers, etc.) in the same word processor.

Equations in Word are created by pointing and clicking without having to memorize an extraordinarily long list of ASCII commands. Add footnotes with two simple clicks on the insert menu. Add figures simply by copying and pasting from any Windows graphics program. Create and edit tables with Word's great table editing features instead of the cumbersome TeX/LaTeX method.

When one adds the MathType software add-on package to Word, equation creating, editing, numbering, and cross referencing become extremely elegant, streamlined and efficient. I highly recommend MathType (MT). See http://www.dessci.com/en/products/mathtype/. For Word2TeX, see https://www.chikrii.com/products/word2tex/ .There are other products that do what Word2TeX does. I tried a couple and did not have great success, but someone else I know liked one of these products better than Word2TeX. See http://grindeq.com/index.php?p=latex2word, http://www.wordtolatex.com/ , and http://www.word2latex.net/convert-ms-word-to-latex-online-automatically/ .

Many technical journals now accept Microsoft Word documents (Physical Review journals, for example) in addition to LaTeX, so you may not need to carry out the conversion to LaTeX if your target journal is one of those. Microsoft Word can do everything it does easier, faster, better, and more efficiently. AND Word is wysiwig (what you see is what you get), whereas LaTeX is not, as it uses line-by anachronistic DOS-like commands in a what is essentially a text file.

You can even get a LaTeX format look in a Word doc, i.e., the Word doc looks exactly like a LaTeX doc. The Word doc can then be output (via print command) as a pdf file. See page 18 for more info on this. This can suffice for some instances (like submitting pdf to arXiv or emailing to colleagues for feedback), but some journals may still require LaTeX documents.

THE FOLLOWING INFORMATION ON Word2TeX/MT CONSISTS OF

Part 1: Summary: TeX/LaTeX publishing using Word conversion

Part 2: Websites for software & more info

Part 3: Things to watch out for in Word2TeX and MiKTeX

1   SUMMARY INFO FOR WORD → TeX/LaTeX

1.1   For newcomers to TeX/LaTeX:

TeX (pronounced "Tech" or "Tek") is a software program originally developed in the late 1970's to write technical papers. In using it, one inputs only ASCII code alphanumeric characters (i.e., basically, those on your keyboard). For example, instead of having the actual symbol for the Greek letter alpha, one writes \alpha. (The backslash tells the program that what follows is not usual text.) Subscripts are indicated by an underscore, i.e., like v_i, where v is a vector and i is the index. Superscripts are indicated by ^. And so on.

This is just the beginning. Learning all the procedures and symbols one needs, like integration signs, derivatives, dot products, bold, italics, Greek, etc takes a while. This method, decidedly non-user friendly, may seem way outdated now-a-days, and it is. But it still is the presently accepted standard. See the Wikipedia article https://en.wikipedia.org/wiki/LaTeX for more info.

LaTeX is, in simplest terms, a more recent, upgraded version of TeX. Last I knew, LaTeX2e is the current version of LaTeX, as it replaced LaTeX 2.09 in 1994. LaTeX3, started in the early 1990s, has been a long-term development project, and may even be available as I write this. I use LaTeX2e at present.

The American Mathematics Society (AMS) has its own versions of TeX/LaTeX called AMS TeX and AMS LaTeX.

Note that TeX/LaTeX files are text files, and any formatting you may adopt is not used by the TeX/LaTeX compiler. Instead, TeX/LaTeX uses standard fonts and other formatting that are essentially universal for all TeX/LaTeX produced articles. The author then does not have to worry about appearance of the article, and can concentrate on content.

The usual (i.e., before Word2TeX) process for creating a TeX/LaTeX file and associated files goes like this.

i)   Using some vanilla word processor, type your paper in ASCII characters using TeX/LaTeX commands. Save the file as a text file with file extension tex, e.g., filename.tex.

ii) Run the TeX/LaTeX compiler program (there are many different ones to choose from – a recommended free one is listed below in Part 2) with your *.tex file as input to get an output file that is independent of the machine it is read on. The output of the TeX/LaTeX compiler is a file with the extension .dvi (for "device independent" file). In our example you would end up with a file named filename.dvi. Note that the TeX/LaTeX compiler I recommend below is run at DOS level command (command prompt in modern terms) and not Windows.

iii) There are dvi readers capable of reading the dvi file and displaying it on screen[1]. You can obtain one of these for free, which works in Windows and which can output to your printer for hard copies. (See MiKTeX in Part 2 below.)

iv) Using an appropriate software translator (see Part 2) one can then convert the *.dvi file to *.pdf (Acrobat reader file). These files can be displayed onscreen and/or printed using Adobe Acroba reader.

1.2   Summary of the usual TeX/LaTeX article creation process.

any word processor → *.tex file → LaTeX compiler → *.dvi file

→ pdf or ps translator → *.pdf or *.ps file.

1.3   Using Word and Word2TeX to create TeX/LaTeX articles.

Using Microsoft Word and Word2TeX to create articles entails only a change in the first step above. One installs Word2TeX into Microsoft Word and instead of using any word processor, one uses Word. Then instead of inputting TeX/LaTeX commands, one simply uses Equation Editor in Word, or far better, MathType. That is, one simply points and clicks using the mouse to build equations. What-you-see-is-what-you-get (WYSIWYG), unlike in TeX/LaTeX, so you know right away whether your equation is correct or not.

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[1] IBM used to have a TechExplorer plugin to view *.tex files directly in a web browser. I don't use this.

You then simply save your Word file (e.g. filename.docx) as a *.tex file (e.g. filename.tex) by clicking on File, SaveAs, Save as Type (scroll down), TeX (*.tex), Save. You then use this *.tex file in the subsequent steps described above.

Inserting figures and tables in TeX/LaTeX tex files is cumbersome at best. Using Word/Word2TeX, however, it is a snap. Just copy the figures you want from any Windows graphics program and paste them in the Word (*.docx) file where you want them. Unlike TeX/LaTeX files, the figures in Word do not have to be in encapsulated postscript format, i.e., *.eps type files, but can be in almost any graphic format. Word2TeX will automatically convert figures to *.eps files (one file per figure) when the *.docx file is saved as a *.tex file.

Instead of the complicated, non-user friendly, and non-WYSIWYG TeX/LaTeX table creation commands, one simply uses the convenient Word table builder/editor to create and edit tables. Word2TeX then converts all such tables into the appropriate TeX/LaTeX language.

1.4 MathType

The standard Equation Editor in Microsoft Word has its limitations. Many papers can probably be written with it, but it does not have 100% of all possible mathematical symbols. Further, there are no means for automatically renumbering equations and updating cross references to equations when one inserts or deletes equations in the middle of a series of existing equations.

There is, however, an excellent add-on to Microsoft Word called MathType that does incorporate virtually all symbols into Equation Editor and can do automatic renumbering and cross reference updating. It also has a number of other great features (like memorizing groups of symbols or whole equations that you may use repeatedly so you can input them with a single mouse click.) I highly recommend MathType.

Word2TeX functions either with Microsoft Word alone or with Microsoft Word and MathType combined.

2 WEBSITES FOR S/W & TeX/LaTeX INFO

1. For information on MathType: http://www.dessci.com/en/products/mathtype/

2. For Word2Tex: http://www.dessci.com/en/products/mathtype/

3. For MiKTeX, a free, highly recommended LaTeX compiler with manual, excellent tex and pdf file viewer, and dvi to pdf translators: https://miktek.org .

4. For general information on TeX/LaTeX

   TeX User's Group ("tug") website: www.tug.org

   An Intro to LaTeX: www.latex-project.org/intro.html

   getting started with TeX/LaTeX: www.tug.org/begin.html

   Getting Started with LaTeX: www.maths.tcd.ie/~dwilkins/LaTeXPrimer

   A Simplified Introduction to LaTeX: www.cudenver.edu/~hgreenbe/

   The following two manuals need Adobe Acrobat installed in order to read:

   A Gentle Introduction to TeX: www.tex.ac.uk/tex-archive/info/gentle/gentle.pdf

   The Not So Short Intro to LaTeX2e: http://ctan.tug.org/tex-archive/info/lshort/english/lshort.pdf

3 THINGS TO WATCH OUT FOR IN Word2TeX & LaTeX

3.1 Going from Word to LaTeX via Word2TeX

3.1.1 Occasional Crashes

Maybe 20% of the time I save to *.tex in Word2TeX, Word crashes. I've just rebooted Word and tried again, and typically it works. I have not noticed any long-term effects in Word. The crashes may be just due to my

particular computer, or may be related to the 2016 version of Word, as I don't recall the problem on the computer I had before my present one with Word 2003.

3.1.2 Endnotes to LaTeX Bibliography

Citations in Word put in as endnotes are converted by Word2TeX into LaTeX bibliography. Superscript endnote numbers in Word like" ref[1]", become "ref [1]" in the final pdf created from the LaTeX file.

3.1.3 Figures in Word2TeX

Figures in LaTeX are postscript, so Word2TeX converts the Windows metafile figures in the Word document into *.eps files (postscript). The *.tex file then calls those figures to place them in the final pdf file.

There are different options in Word2TeX for figures. (See next section.) I could never get the rasterize option to work, but following the instructions in the next section should work.

With the options checked as in that section below, Word2TeX will look for a postscript printer driver on your computer. If you don't have a PS printer, download and install the HP Universal PS printer from the HP website https://support.hp.com/us-en/drivers/selfservice/UPD/4157320/model/4157320 . Click on "Driver-Universal Print Driver" and choose the Post Script printer download.

3.1.4 Settings in Word2TeX

Have the following checked in Word2TeX (at least that was best for me).

> LaTex2e
> ANSI
> LF (UNIX/Windows)
> 90% Table scaling
> Use longtable   Always trans/justify
> Trans refs to eqs
> Recognize inline on every trans

On the figures panel, check the below items

> Convert figs
> EPS
> Use encapsulate
> Print to HP Universal PS printer

This will produce *.eps files, one for each figure in the Word document.

3.1.5 Using Word2TeX

Word2TeX is generally excellent, but it has a few wrinkles/bugs it is best to know about ahead of time. These are listed below. Note the list is accurate as February 17, 2018.

- When you save your Word (*.docx) file as a *.tex file using Word2TeX the file appearance on screen may not change even though Word tells you it is now a tex file. Simply close the file and reopen the file of the same (*.tex) name to see the text file of TeX/LaTeX commands.

- To compile the *.tex file into a *.dvi file, close the *.tex file in Word and run the compiler (the command in the MiKTeX software is "texify filename.tex") in command prompt mode. See Section 3.2 below.

- Word2TeX saves figures as separate *.eps files (postscript files). These must be uploaded along with the article's tex file when submitting for publication on a website such as arXiv. However, when you create *.dvi, *.pdf, and *.ps files the figures are automatically included directly in the files themselves.

- At the beginning of a TeX/LaTeX file is a preamble that designates the document type (book, article, etc.), font size, title, author's name, and date. This is put into the file either 1) by the information in the Word2TeX save panel under the headings "Title" and "Preamble", or 2) by typing directly into the *.tex file after Word2TeX has translated the *.docx file. Just before conversion to tex takes place you have the option of inputting/editing the title and preamble information. The commands below are typical and may be of help. You can put these commands in either the "Title" or the "Preamble" sections, or you can type them directly into the *.tex document.

- When you change the preamble in Word2TeX, and then save the document as a tex file, the changes will not appear in that tex file version. The next time you save as a tex file in Word2TeX, those changes will show up in the preamble.

- It is recommended that you use the commands below and comment out (i.e., put "%" sign in front of) the default lines in the "Title" and "Preamble" sections. Uncheck maketitle in "Title" panel. Perhaps best to only use preamble panel to get everything in correct order. Using both title panel and preamble panel seems to confuse the compiler.

- Note that \documentstyle command is for the old LaTeX (LaTeX 2.09); whereas \documentclass is for the newer LaTeX (LaTeX2e).

    \documentclass [12pt]{article}
    \title{Non-time-orthogonality and\\tests of special relativity}
    \author{name\\address\\email}
    \date{February 15, 2018}
    \usepackage {graphicx}
    \usepackage {longtable}
    % Note that percentage sign indicates a comment and is ignored by TeX/LaTeX
    % default type size can be changed, e.g. 10 pt, if desired
    % double backslash causes following text to appear on the next line
    % if no date is input, current date is used
    % there appears to be no way to leave the date out
    % usepackage commands are input by Word2TeX to facilitate figure and table inclusion.
    % be careful to use {} brackets as shown and not () parentheses.

Command \usepackage{latexsym} Word2TeX puts this in and it seems to make figs disappear (but maybe that was due to something else.) Don't see a need for it. Seems best to just comment if out with % at start.

Command \usepackage{hyperref} If you put the command \usepackage{hyperref} in the preamble, cross references and URL citations in the bibliography will be hyperlinks in the pdf file. See Section 3.4.23, page 15, for details.

Changing margins. The default margins seem to be 2 inches all around. To change these use the commands below in your preamble. You can input these commands in the Word2TeX "Preamble" panel or you can type them directly into the *.tex file on screen in Word (but not the *.docx file in Word).

    % Next 4 lines below these comments set the margins
    % Larger neg num topmarg means smaller top margin
    % Neg odd-evenside means moving text to left (decreasing
    %   left margin) of odd and even pages respectively
    % textwidth&height are for whole page dimensions
    % biggest you want for 8.5 X 11 inch paper is topmarg of –2.0
    %   width 17.5; height 24.0; odd-evenside -.5cm
    % typical size might be as below (although -2.0 top; 17.1 width; 23.5 height may work better)
    % if want more than single spacing between lines, use \linspread{*factor*} command.

% *Factor* = 1.3 → 1½ spacing, *Factor* = 1.6 → double spacing between lines. Default = 1.

```
\topmargin -1.4 cm
\oddsidemargin 0cm \evensidemargin 0cm
\textwidth 16cm
\textheight 22cm
%\linespead{factor}
```

- After the preamble there is a command \begin{document} after which your article starts. Note that you need to input the command \maketitle AFTER the begin command or all of the title, name, address info input in the preamble will not appear. You must input this command directly into the *.tex file in Word (not the *.docx file) before you compile the *.tex file.

```
\begin{document}
\maketitle
```

- In the preamble I have typed specially into Word2TeX, I've put the maketitle command in already, but the program inserts another one. So, you have to delete the second one. You may find an extra \begin document command giving you an error message in the compiler. If so, delete the one that is not in the order shown above.

- If you had a title, author name, etc in your original *.docx file, it will reappear in your *tex and hence your *.dvi and *.pdf and *.ps files as normal text. You will then have two titles, author names, etc in your tex file since this information is also input in the opening lines of your tex file as shown above. Hence you must either delete the original title, author, etc. lines in your *.tex file or comment them out (with %) before compiling the *.tex file.

- The order of commands is quite important in LaTeX and you will get weird error messages if you change the order given above.

Command \usepackage{latexsym} Word2TeX puts this in and it seems to make figs disappear (but maybe that was due to something else.) Don't see a need for it. Seems best to just comment if out with % at start.

Word2TeX puts an extra \usepackage{graphic} in at beginning and an extra \begin{document} in later on before main text starts. Take these out or will get errors.

- For your abstract, you must insert a \begin{abstract} command line before the abstract and a \end{abstract} command line after the abstract. Be sure to use {} and not ().

```
\begin{abstract}
This article addresses the issue of ….
\end{abstract}
```

- Also, in your *.tex file delete or comment out any heading you had in the *.docx file saying "Abstract" or this will appear as normal text in the *.dvi file. The TeX compiler will put this heading in automatically.

- Prior to any appendices you must insert the following command lines.

```
\appendix
\section{This is a sample title}
\section{Sample title of second appendix}
```

- Appendix headings for above will appear as: Appendix A. This is a sample title; Appendix B. Sample title of second appendix. To eliminate the letter designation (if you only have a single appendix) use

```
\section*{This is a sample title for a non-lettered appendix heading}
```

- Word2TeX uses the Word paragraph styles heading1, heading2, and heading3 as section, subsection, and sub-sub section titles in the *.tex file. However, some formatting as seen in Word for these paragraph styles is lost upon translation to tex. (I believe upper or lower case formatting is preserved upon translation.)

- If you want any section to not be numbered, search out that heading in the text file and insert an asterisk as shown.

    \section*{Title of non-numbered section heading}

- Don't use the TeX/LaTeX command \address. \maketitle doesn't take it. The address command is used for letters. \maketitle inserts title, author, and date. That's it. Include your address inside the \author command as shown above. Exception: see REVTeX instructions below.

- A separate \titlepage command exists in LaTeX to put title on its own page if you need to. You would have to hand input this into the *.tex file before compiling.

- Word2TeX makes bibliographies from the endnote/footnotes created in Word. These are numbered sequentially as they appear in the text. For alphabetic author list, type bibliographies referenced in the text by name, one could probably simply type in the information in the *.docx file.

3.2   Going from tex to pdf with MiKTeX compiler

At the command prompt line (such as c:\physics\my research) the basic commands in MiKTeX to use are as follows.

Command	Result
texify filename.tex	outputs filename.dvi
dvipdfm filename.dvi	outputs filename.pdf
texify -p filename.tex	outputs filename.pdf

You can go in two steps to pdf via the first two commands, or do it all in one step with the third command.

Error messages

As you compile in MiKTeX, you will almost certainly get error messages in your first few runs. Below are some commands to respond to the error message.

Help or H	Tips on what is wrong at that point in tex document
?	Help for list of commands
X	Quit
S	Salvage the rest as best as can be done
e	Edit. Shows tex and pdf files onscreen. Tex location highlighted is place where present error message is. You can change the *.tex file there or in Word. May be easier there.

Things to be aware of

Ignore "overfull" messages when running MiKTeX texify compiler. They don't affect output.

If texify runs and says it has cross ref problems, then just run it again on same tex file and it will get them correctly in that second run.

MiKTeX style file (.sty) and other template type files. In the old days, you needed to put these in \c:\texmf\tex\latex\base directory. Then you had to let MiKTeX know that they are there by: Start, MiKTeX, MiKTeX options, refresh now. I don't think any of this is needed now (at least it wasn't for me.)

3.3 Figures

Cross hatching in figures (as put in by Freelance Graphics program anyway) won't convert to tex. You generally get a compiling error saying something like it can't convert that figure. (As of early 2000s anyway.)

Cropping of figures in Word using the figure format command for cropping skews the picture (it looks slanted) and can make font look like different face.

Sometimes the converter may not center figures in the pdf version. They can be snugged up against the left margin. One fix is to put a space in the original figure in the graphics package way over on the left side. This then lines up with the margin in the dvi, ps, and pdf files so the figure looks more centered. There is probably a place in the actual text file to specify the figure location, but doing this over and over whenever you debug a file is more cumbersome.

Sometimes, from Word2TeX, the figure will not come out in correct place. If not, as can happen, see below.

IF YOU HAVE PROBLEMS WITH THE FIGURE NOT BEING IN THE RIGHT PLACE

Figures "float" in LaTeX and the program decides where to put them. Often they are just lost or put at the end of the doc running off the page.To get figures in the place you want. The \begin{figure} [htbp] command, i.e.,

Command \begin{figure} [htbp],

is supposed to try here (h) first, then top (t) of the page, then bottom (b), then I think last page (p)_ You are supposed to select one of these if that is where you want it, but choosing h seems to have no effect. Figs can still end up off the margin at the end or wherever. You can try eliminating the [htbp] part and seeing if it helps.

A possible fix:

Command \input psfig

To use PSFIG, put the statement \input psfig in the preamble or add psfig as an option in the \documentstyle *command*. Then the \psfig *command* is used to place a PostScript figure at the current position on the page. The syntax of the \psfig *command* is \psfig{file=,height=,width=,bbllx=,bblly=,bburx=,*bbury*=,rheight=,rwidth= ...

I have **no experience with the \psfig command** as of February 2018.

Another possible fix: Use the \centering command, but I believe you have to include the figure size.

Another possible (better?) fix:

Parameters bbllx, bblly, etc can be used in above PSFIG command and also in the \include raphics command

```
\begin{figure}
\includegraphics[bbllx=.26in,bblly=0.13in,bburx=5.26in,bbury=3.94in,scale=1.00]{filename.eps}
\label{fig1}
\end{figure}
```
bbllx = box lower left x coord; bblly = lower left y coord; bburx= upper right x coord; bbury=upper right y coord.

The following worked (including the \caption command) on Jan 26, 2018 to get figures to appear in proper spacing and place with text. the \input psfig command was not needed this time. (This all seems to have a mind of its own, so you often just keep trying things.)

Setting bblly=0.0in and bbury =1.0in

To center, good x parameters to start are bbllx=-1.3in and bburx=4.26in

Note that moving bblly to lower numbers, including more negative, puts more space below the figure. bbury lowered brings the text above the figure closer to the figure. Higher number equals more space above.

SAMPLE FIGURE COMMANDS THAT SEEM TO WORK OK

```
\begin{figure}
\includegraphics[bbllx=-1.3in,bblly=0.0in,bburx=4.26in,bbury=1.0in,scale=1.00]{filename.eps}
```

```
\caption{Figure title here}
\label{fig1}
\end{figure}
```

NOTE: I think I had problems when not using the bb… placement commands.

IF FIGURE IS BLURRY AND NOT CLEAR

Go to figures in your drawing program and make them as big as possible on the page. Then copy and paste into a Word doc (can use a dummy file). Make figures as big as possible on the page. Then convert using Word2TeX. When you get eps files change name to that of original_file1.eps, original_file2.eps, etc. The original text file will then pull in higher quality figures.

TO CHANGE FIGURE SIZE

If you were lucky enough to get figures in the right place from the get-go with the center command, can change figure width and height there. If have to use above bblly etc numbers, can adjust to change size there.

Figure captions inserted by Word's convenient caption maker sometimes translate in the earlier Word2TeX version, but in they didn't work for me in the latest version (Feb 2018). It can sometimes be better for some purposes to put figure numbers and captions inside the graphic figure itself. This works for submission to arXiv web site and for initial submission to some journals, but not for final electronic submission (which need figures plain without Fig titles embedded.) To insert your own captions in LaTeX, insert the caption command after the \includegraphics command (see below). Note that LaTeX inserts the words "Figure X" before the Figure title, where X is the number of that figure sequentially in the document.

```
\begin{figure}
\includegraphics[bbllx=.26in,bblly=0.13in,bburx=5.26in,bbury=3.94in,scale=1.00]{filename.eps}
\caption{Figure title here}
\label{fig1}
\end{figure}
```

3.4   Other Issues

3.4.1   Greek letters

Word2TeX generally takes Greek letters input via inline text (i.e. using symbols font in the middle of a sentence) in addition to inline equations from Equation Editor. Note that on relatively rare occasions inline text equations don't come out quite correctly and you will need to use the Equation Editor. You do need to make display equations (those having their own paragraph and typically numbered) in Equation Editor. Regular ASCII symbol font display equations don't come out right (early 2000s experience).

Bold Greek __in eqs__ doesn't translate into TeX (as of March 01.. maybe it does now).

Solution: input directly into the LaTeX file output by Word2TeX the following command (sample is for ω.) Note: this must be outside $ signs ($ signs designate math, e.g., equations). So if it appears in the middle of an equation you have to end the preceding part of math by inserting a $ sign before the command below, then insert a $ sign after the command to begin math mode for the remainder of the equation. Need amsfonts option in \documentclass in preamble for this to work.

\bm {omega}

My Pre Aug 2003 Solution: input directly into the LaTeX file output by Word2TeX the following command (sample is for Ω.)

\mbox{\boldmath Ω}

Bold Greek __in text__ translates into\textbf{Ω} in the *.tex file, but then it doesn't print bold in the dvi/pdf files. Solution: see above \bm command. (March 01 Solution: replace this \texbf command with the \mbox command above.)

3.4.2 Dot Product

Dot product in MathType has 3 choices- small, medium, large. Medium does not translate. Small and large do. (As of March 2001 anyway.)

3.4.3 Underling in equations

One of the ways to underline in Mathtype equations translates to *.tex, one does not. In the MT taskbar, top row, 3rd panel from left, the underline feature there does not translate. In the 2nd row, 6th panel from the left, there is a "box" underline option that does translate. Everything inside the box will be underlined.

3.4.4 Symbols

As of July 2000, generally symbol codes (symbol font with ALT + NUMLOCK + code number) seem to work though general character codes (normal font with ALT + NUMLOCK + number code) do not. As of March 2001, many, but not all, character codes seem to work.

The > sign doesn't translate using Word2TeX (May 02) without italics. This is true in text and also with the symbol font and code. Note that Equation Editor eq translates this correctly.   [Method using symbol code (symbol font, hold down ALT w/ num lock on) 062. For some reason you need 2 or 3 spaces after the character before the > sign to get spacing right as of June 01. Symbol code for < is 060.]

Mathtype equations having more than one line where MT has them lined up at = sign do not translate lined up the same way into TeX. Each line ends up centered. (May 2002).

If entries in a column vector run together top and bottom, use blank subscript, blank subscript to give space between. In trying blank sub, blank super I needed to insert a space in each spot for it to work. Even then in some tables it didn't work.

For equations that are put in without the number in MT, they seem to align LHS and don't give space at top and bottom. Inside equation itself put a blank line before and after equation and put large space on RHS then "fake" eq num, and large space on LHS.

All of subsection 3 paragraph will be bold, so don't run title and text in same paragraph.

3.4.5 Carets over indices

This seems to be fixed in present version of Word2TeX. Prior notes for correction follow:

The form below works for indices with hats. This is what Word2TeX in prior version gave.

v^{\hat {i}} = \sqrt {g_{\underline {i} \underline {i}} }

The form <u>below doesn't work</u>. This is what Word2TeX in latest version (June 2002) gives.

```
v^\hat {i} = \sqrt {g_{\underline{i}\underline{i}} }
```

<u>Best solution</u>: in MathType after the index with the hat on it place a small em space.

3.4.6 Tables

- Captions for tables don't always translate correctly from Word. You may have to hand input them. At the end of the table insertion put it in as follows. Make sure the label command appears after the caption command or you get errors from the compiler.

```
\caption{table title}
\label{tab1}
\end{longtable}
```

Footnotes in tables get screwed up by Word2TeX (as of early 2000s, not sure of present version). The only thing that seems to work so far is putting the footnotes outside the table, converting to tex, then hand cut and paste the \cite{Michelson:1} command inside the table where wanted. (Michelson here is first word in footnote.) See my file table footnote fix.docx for sample of what to do. **Note:** You can just copy and paste along with the footnote

number (so it will be in two places.) Then just delete footnotes from inside the table in Word. Copying the whole phrase can help when you get to the tex file, as the phrase is in two places (inside and outside the table) and it is easier to keep track.

- To prevent the table from running off the RH side of the page, use the scale down option on the Word2TeX panel. 85% worked well for me once.

- Word2TeX 3.0 (March 2003) can't handle a split column like below, no matter what I did.

•	•	•	
•	•	•	•
•	•	•	•

-

- Checking "Always translate justification" on main panel for tables seems to work somewhat OK. Check use longtable.

3.4.7 Special Characters

The following characters play a special role in LaTeX and are called "special printing characters", or simply "special characters".

$$\# \ \$ \ \% \ \& \ \sim \ \_ \ \^{} \ \backslash \ \{ \ \}$$

Whenever you put one of these special characters into your file, you are doing something special. If you simply want the character to be printed just as any other letter, include a \ in front of the character. For example, **\$** will produce **$** in your output. NOTE: not sure this worked for me.

One exception to this rule is the \ itself because \\ has its own special meaning. A \ is produced by typing **$\backslash$** in your file.

Also, \~ means `place a tilde accent over the following letter', so you will probably want to use **\verb** instead.

In addition, you can access any character of a font once you know its number by using the **\symbol** command. For example, the character used for displaying spaces in the **\verb*** command has the code decimal 32, so it can be typed as **\symbol{32}**.

You can also specify octal numbers with **'** or hexadecimal numbers with **"**, so the previous example could also be written as **\symbol{'40}** or **\symbol{"20}**.

quotes: use 2 single apostrophes rather than ".

underlines: to get http://hubblesite.org/press_resources/ in LaTeX, type
`{http://hubblesite.org/newscenter/press\underline{ }resources/`. That is, underline command for a space to get an underline.

3.4.8 Numbering in LaTeX:

- To number sequential paragraphs with other paragraphs in between

```
\begin{enumeration}
\item … paragraph text here    ← this will be number 1
…….. non numbered paragraphs indented with above number paragraph
\item … paragraph text here    ← this will be number 2
…….. non numbered paragraphs indented with above number paragraph
\end{enumeration}
……….. paragraph text here   ← this will be non-numbered and non-indented
\begin{enumeration}
\setcounter{enumi}{2}   ← next item will have number 2+1 = 3
\item … paragraph text here  ← this paragraph will have number 3 & be indented
\end{enumeration}
```

- Note the counters for sublevels are: enumii, enumiii, enumiv

3.4.9 Indentions:

Place the following command in the line immediately before a paragraph to have it not indented.

`\noindent`

There are also flush left commands for a whole group of lines but each line needs a \\ at end.

3.4.10 Inserting a blank line:

In LaTeX, a carriage return at the end of a line will be ignored, i.e., sentence will continue onto the next line without a break.

TWO carriage returns (leaving a blank line in the tex doc) leaves a blank line in the final document.

January 26, 2018: didn't seem to work at this time. Two forwardslash, i.e., \\, can work (at least inside arguments of commands).

3.4.11 Line spacing

`\smallskip`, `\medskip`, `\bigskip` or a fixed `\vspace{<len>}` where you specify <len>. For a fixed/hard, single blank line, use `\vspace{\baselineskip}` (roughly the same as `\bigskip`)

3.4.12 Subheadings that aren't sections:

In tex doc (if want sentence in same line as bold underline subhead). Example.

> between them, and they exist at different points in 4D.
>
> \medskip
> \noindent
> \underline {\textbf{Conclusion:}} The time discontinuity is physical, not merely coordinate.
> Peres was aware

Appears in pdf file as:

between them, and they exist at different points in 4D.

Conclusion: The time discontinuity is physical, not merely coordinate. Peres was aware

In tex doc (if want sentence on next line after bold underline subhead)

> between them, and they exist at different points in 4D.
>
> \medskip
> \noindent
> \underline {\textbf{Conclusion:}}
>
> The time discontinuity is physical, not merely coordinate.
> Peres was aware

Appears in pdf file as:

between them, and they exist at different points in 4D.

Conclusion:
The time discontinuity is physical, not merely coordinate. Peres was aware

3.4.13 Indenting Whole Paragraphs on Right and Left

To indent a paragraph form both sides, as you might want to do with a quote, you need first to insert the following usepackage command in the *tex file preamble.

\usepackage{changepage}

Then for the particular paragraph you want to indent, follow similar steps to that below. I believe you can change indentations with cm and pt modifiers instead of inches. In the example, the right and left edges of the paragraph are indented .4 inches. and .5 inches, respectively The \textit command makes it italic (the \textellipsis command may be doing a similar thing). To indent the source (Princeton University Press in the example), use the \hspace{200pt} command. Indentation can probably be in in or cm, instead.

\begin{adjustwidth}{.4in}{.5in}
\textit{``\textellipsis a good part of science is distinguishing between useful crazy ideas and those that are just plain nutty"}
\end{adjustwidth}
\hspace{200pt}Princeton University Press book advertisement

3.4.14 Multi-line subscripts:

(As of Spring 2003 Word2TeX). In LaTeX file after conversion by Word2TeX, must insert the \scriptsize command just after { beginning subscript text as shown in example below. The array environment is put in by Word2TeX to get multilines. Note that in preprint mode (using preprint option in ReVTeX \documentclass preamble command) the spacing between lines in the subscript is large. In the twocolumn mode it comes out OK.

```
….  E_{\scriptsize \begin{array}{l} ……}
```

3.4.15 Multi-line equations:

(Spring 2003). If set up in Word as multiline, I think it works out OK. If set up in Word as single line and twocolumn mode in ReVTeX, for example, has overflow, then do the following. Change \begin{equation} and \end{equation} commands to \begin{eqnarray} amd \end{eqnarray}. Put & signs on either side of both first and second lines. & signs supposedly break eq line into three parts. This puts all of both lines into middle part and you end up with both lines centered. Trying to put two & signs at end, so line would be flushleft didn't work at all, and screwed things up good.

```
\begin{eqnarray}  &  \sin x = \frac{x^{3}}  &  \nonumber \\*
  &  \frac{x^{5}}  + …   &
\end{eqnarray}
```

Note \nonumber command suppresses equation number for first line. * command is a line break where the * ensures a pagebreak won't occur between lines.

Note that the following aligns equations on the = sign.

```
\begin{eqnarray}   \f(x)  & = &  \frac{x^{3}}   \nonumber \\*
  g(x)  &  =  &  \frac{x^{5}}
\end{eqnarray}
```

3.4.16 LaTeX versions and document commands

```
\documentstyle        ← old LaTeX 2.09 preamble, wont work with 2e software
\documentclass        ← new LaTeX 2e  preamble.
```

3.4.17 Indents

First line only of paragraph

In line before paragraph:

\hspace{15pt} will indent first line of paragraph 15 pts.

\noindent in paragraph (first line only I think)

<u>Whole paragraph</u>

Left and right margins below can be in pts, cm, inches, or em.

```
\usepackage{changepage}   % in preamble for the adjustwidth environment
…………..
\begin{adjustwidth}{<left margin>}{right margin>}
...paragraph here…
\end{adjustwidth}
```
Example:
```
\begin{adjustwidth}{2cm}{1cm}
…. paragraph here …
\end{adjustwidth}
\end{document}
```

3.4.18 If Get Scripty Type ϕ

If you get ϕ's that have a wriggle in them, the ϕ in MT is being converted to varphi (i.e. phi as a variable) rther than just phi. Do a search and replace of varphi with phi in tex file. I fixed this in Word2Tex Jan 30 2018 in characters panel.

3.4.19 Script letters

For Lagrangian and Hamiltonian densities: Wherever an $\mathcal{L}$ shows up as an L, in the tex file change \L to \cal L. For $\mathcal{H}$ showing up as H, change \H to \cal H.

In older version of Word2TeX (I haven't checked this in the latest version), script used in text didn't translate, e.g., $\not{p}$ becomes p.

Italics can't have the space after them in italics also or funny characters print and the following word can be snugged up against the italicized letter without any space between.

Symbol font can have same effect as italics above if the space after a symbol is a symbol font space rather than a normal font space.

_____

Standard LaTeX "calligraphic" font: No special package needed. THIS ONLY DOES CAPITAL LETTERS.

$\mathcal{ABC….Z}$ $\rightarrow$ $\mathcal{ABCDEFGHIJKLMNOPQRSTUVWXY}$

For italic (but not really script) use \mathit{ABCdef123} $\rightarrow$ $\mathit{ABCdef123}$

For lower case script, need to include the line(s) below in the preamble.

> % Use Chancery Font
> \DeclareMathAlphabet{\mathpzc}{OT1}{pzc}{m}{it}
>
> If you want to make the resulting characters smaller, use this instead:
> \DeclareFontFamily{OT1}{pzc}{}
> \DeclareFontShape{OT1}{pzc}{m}{it}{<-> s * [0.900] pzcmi7t}{}
> \DeclareMathAlphabet{\mathpzc}{OT1}{pzc}{m}{it}

You can then set any alphabetical characters in math mode to use the calligraphic Chancery font by using \mathpzc:

> (I've never needed to actually do this)
> \[\mathpzc{ABCdef}\]

3.4.20 Planck's Constant

Word2TeX may translate $\hbar$ as \hslash, which the compiler doesn't like. Substitute \hbar. I fixed this by changing the default in Word2TeX in the character panel, so you can fix it there too.

3.4.21 Underlining, strikethrough, and overbar

Underlining box 3rd in from left in top row of MT does not translate into LaTeX, either in Word2TeX or with MT conversion. Must use underlining in 6th box from left in second row of MT.

I set up MT so CTL+ALT+SHFT+_ gives this box for underlining.

For strikethrough in equations, need to use 3rd box from left in top row, NOT 6th box from left in second row. The former works; the latter, no.

For overbar, you can use 6th box from left in second row successfully, even in tandem with an underlining. But it looks nicer if you use overline from 3rd box in top row instead.

3.4.22 Bras, Kets, Brackets, and Absolute Values

Best to use: | from keyboard and $\rangle$ from MT character 4th panel in top row of MT for bra; and $\langle$ MT character from same panel with | from keyboard for ket. The bracket template $<\lceil\rceil\,|\,\lceil\rceil>$ in first panel of 2nd row in MT does work OK. So does absolute value template $|\lceil\rceil|$ from same panel.

Details:

The ket template $|\lceil\rceil>$, first box on 2nd row of MT does not work in Word2TeX. But the $\lceil\rceil>$ template along with a | from the keyboard in front does. You can also use the | from the keyboard, then input the quantity, then use the > from the keyboard, but that gives a narrow angle >, not the $\rangle$ form the MT character.

The bra template $<\lceil\rceil|$ seems to work fine. Just the ket template is screwed up. But better to use method above in first paragraph, as then the < has same format as the >. Otherwise they look different.

Shortcuts: In MT I made a shortcut macro as CTL+ALT+SHFT+> or < to get $\rangle$ and $\langle$. Put same shortcut macros in Word.

3.4.23 Hyperlinks and Internal Cross Ref Links

The following, according to some, needs to be the last usepackage in preamble.

$\qquad$ \usepackage{hyperref}

This will automatically cross ref equations, etc inside the tex file. To get URLs to be hyperlinks, use

$\qquad$ \url {http://www.website name.ext}

NOTE: With MikTeX compiler texify filename.tex then dvipdfm filename.dvi, the links don't come out and you get a whole bunch of warning messages in the dvipdfm routine.

USE texify – p filename.tex to get pdf file directly and links work then.

ALSO: If you want to change coloring or text size or other things in the link, see my Hyperlinks in LaTeX.pdf file in Word2TeX folder or look online.

You can also have a link title with underlying URL hidden if you want, as follows.

\href{http://www.websitename.ext} {link title here}

dvipdfm may have a special option for hyperlinks. Check it sometime

3.4.24 Special Features in Making a Bibliography

The *.bib File

As an alternative to having all your citation listed in the document, you can create something called a *.bib file that contains all references you use in this paper. Then, in the preamble of the main *.tex file you simply call this file (let's call it "myreferences.bib") using

\bibliography{myreferences}   (Do NOT add .bib to file name)

\bibliographystyle{unsrt}   (This gives an unsorted bibliography, i.e., citations are simply numbered in order of appearance, not alphabetical or whatever.)

The advantage of this is that each time you write a new paper, you can use the references you've already typed into the *.bib file. Each reference has a tag name, so only the ones you cite in a given document are taken from the *.bib file, none of the others. Just keep adding to the *.bib file as you write papers, and each new paper will only pull out the ones cited in that paper. You don't have to retype the references each time you use them in each paper.

The *.bib file is plain text constructed like this. Note "Peeble:2003" is the tag name for the first article. "Mandl:1984" is the tag name for the first book cited. Any line can be omitted (like "MONTH" for example) if it is not needed. "INBOOK is for when pages are cited inside a book. I think just the line @BOOK{Book Name} is used for a book where pages are not cited. (You can search online for more info and more commands.) The @MISC command is used for URLs.

Some inputs for sample file myreferences.bib

@ARTICLE{Peebles:2003,
AUTHOR = "P.J.E. Peebles and B. Ratra",
TITLE = {The Cosmological Constant and Dark Energy},
JOURNAL= {Rev. Mod. Phys.},
VOLUME={75},
PAGES={559-606},
YEAR = {2003},
MONTH={May}
NOTE= {\url{http://www.arxiv.org/abs/astro-ph/0207347}},

@INBOOK{Mandl:1984,
AUTHOR= {F. Mandl and G. Shaw},
TITLE= {Quantum Field Theory},
PUBLISHER= {Wiley (NY)},
YEAR={1984},
PAGES={88-89},
}

@MISC{Chen:1,
HOWPUBLISHED={\url {http://www.arxiv.org/abs/hep-th/0103234}},
AUTHOR= {S. Chen},
TITLE= {A Possible Candidate for Dark Matter},
YEAR={2001},
}

In the *.tex file, for the first reference above, you would use

\cite{Peebles:2003}

Etc.

The *.bbl file

Some journals, like Phys Rev, want the citations listed in a format that can be output as a *.bbl file. They then want you to copy the *.bbl file and paste it at the end of your document in place of having the references listed (as they are in the Word2TeX output). The LaTeX compiler can figure it all out from there.

I believe MiKTeX makes the *.bbl file for you from your *.bib file when you compile with MiKTeX. Otherwise, you can create one doing the following (where "latex" is the command prompt command for whatever LaTeX compiler you are using (which in the case of MiKTeX would be" texify" or for another program, some other command.) The filename of the article is considered "myarticle" in this example.

> c: /directoyname latex myarticle
> c: /directoyname bibtex myarticle
> c: /directoyname latex myarticle
> c: /directoyname latex myarticle.

Note you have to run the latex compiler three times. That is, you have to run the sequence as shown above. Otherwise the program does not work. (Who knows why.)

You then get a *.bbl file titled (in this example) myarticle.bbl. Just copy the contents and paste in place of any listed citations already in your *.tex file. If you used a *.bib file as described in "The *.bib File" section above, the you have to remove or comment out (with "%" in front), the bibliography commands shown about in that section.

3.4.25 Special Equation Numbering in Appendices

To number eqs in a appendices as (A.1), (A.2), ... and (B.1), (B.2), ... Put cursor at beginning of appendix, go to Mathtype pull down menu, insert section break, click "section number" and input the letter of the section you want. E.g., for Appendix A type in A. Then highlight entire section, then in format equation numbers on the MT menu, click on both current selection and new eq numbers, select section number "A,B,C ...", and insert a period for the separator.

3.4.26 Footnote to Author's Name with Email Address

The following in the preamble author's name line will put email@acme.edu as an asterik footnote on the first page for the author named John Smith.

\author{John Smith\thanks{email@acme.edu}}

4 Uploading to arXiv and Journals

4.1 arXiv

When and if you upload an article to arXiv, just upload the tex and eps files as separate files all at the same time.

When I submitted in February 2018, the tex compiler at arXiv punted on the first line \documentclass[11pt]{article}. It showed some characters in front of that command. I saved the tex file as txt file, then changed the extension back to tex, as I think Word may put hidden characters for its own use at the beginning of Word files. The txt file was saved as Other encoding, Western European (Windows). Then I commented out with % the \documentclass command.

Then, when I processed it at arXiv, the processor (see box in panel listing the files uploading) was LaTeX2e, whereas before it had been just TeX, I believe. This alone may have been the problem, as \documentclass was not used in old TeX.

But with these things, the file processed on arXiv.

4.2 Journals

Look to the journal submission page instructions for how they want the LaTeX.

Formatting Word Document to Look Like LaTeX

OVERVIEW

To set up a Microsoft Word document to look like a LaTeX pdf doc, you need to do 3 things. (See below for details.)

1. Install the fonts used in LaTeX
2. Use the Word template at www.quantumfieldtheory.info/LateX_Word_mockup.dotm .
3. Change the equations fonts to those used in LaTeX.

When you have your finished document, just save as a pdf using the Word pdf converter.

SAMPLE DOCUMENT

For a sample document produced in Word see http://www.quantumfieldtheory.info/pedagog_U_Konstanz.pdf

DETAILED STEPS

1. Install fonts

The font type to install is Latin Modern. You only need the following files:

lmroman12-regular.otf
lmroman12-bold.otf
lmroman12-italic.otf.

Word will automatically scale from the 12 pt size of these files for any text you use that is not 12 pt. For example, larger size Latin Modern font in headings is done by Word just using these 3 font files.

Note that fonts with extension *.mp instead of *.otf, will not install on Windows. Get a "cannot install", "appears to be invalid font" error message. Fonts with *.otf extensions will install. There are other types of font files for these same fonts with different extensions. I know nothing about whether these will install in Word or not.

To get the fonts, you can

a) download these fonts from elsewhere or my website www.quantumfieldtheory.info/lmroman12-regular.otf ,

www.quantumfieldtheory.info/lmroman12-bold.otf , www.quantumfieldtheory.info/lmroman12-italic.otf .

b) if you have installed MiKTeX (see Section 2, pargraph 3, page 3), you can find the above font files in the directory C:\program files\MiKTeX2.9\fonts\opentype\public\lm .

To install the fonts, note you cannot install the whole folder with fonts in it. You need to do each *.otf (or whatever other extensions work) file one at a time. Windows will assemble them into the same font folder for you. There are two ways to install.

a) Open folder with desired fonts in Windows File Explorer. Right click on each font file and choose install, OR

b) open Control Panel, Fonts, and drag and drop desired font files into Fonts.

2. Use the Word template

Just open the Word template from the link above in Overview section, then save that in Word as a macro enabled template. Further instructions are included in the template. URLs printed out in full will work as links in the pdf doc. Hyperlinks with different names for the URL will not.

3. Get Correct Fonts in Equations

For Word without MathType installed, I don't know how to get the correct fonts for equations, but you can probably figure it out. I use MathType exclusively, so the following instructions are for that.

In the MathType menu command in the ribbon, click Equation Preferences, This Document's Equation Preferences, Load from MathType preference file, and select Tex Look.eqp. That's all there is to it. Your equations now look like LaTeX generated equations.