Diglot Typesetting

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This article describes \TeX macros that print Scripture in parallel-column diglot form. The program has been used to typeset the New Testament in the San Bartolomé Zoogocho dialect of Zapotec, a language spoken in southern Mexico.

Diglot means "two languages". A diglot book contains a running translation of the primary text in some secondary language. In the context of our work with the indigenous peoples of Mexico, the primary text (the "idiom") is a language such as Zapotec, and the secondary text (the "diglot") is Spanish. Printing the two languages side-by-side serves a number of purposes. It gives them equal status, sometimes helping to settle questions about the "legitimacy" of one language or the other. It helps speakers of one of the languages make comparisons to the other. And it has the practical effect of producing shorter lines, which is important to those who are not skilled readers.

Traditionally, our parallel-column diglot versions of the New Testament were done largely by hand. The idiom and the Spanish were typeset in two separate runs. The pages were created by cutting the appropriate strips of the idiom and diglot copy and pasting them side by side. As might be expected, the process was slow and quite expensive.

Because of a growing interest in diglot New Testaments, we have created \TeX macros that page the two languages together automatically. What follows is a simplified description of how the diglot.tex program does its work.

The basic feature of \TeX being exploited by diglot.tex is its ability to read from and/or write to auxiliary files while typesetting. The Zoogocho Zapotec book of Matthew is contained in a single 325k-byte file. At the beginning of chapter one, the file contains the command \df{svpmatl}. This tells \TeX that the diglot material to be used with this portion of the idiom is found under the filename svpmat1.tex.

The \df{diglot-filename} command opens the auxiliary input channel diglotfile and searches for svpmat1.tex. The Spanish Versión Popular edition of Matthew is a 200k-byte file. We've found that smaller files are easier to handle, so we use chapter-sized files for the diglot text, which for Matthew average a comfortable 7k-bytes each. A \df command placed in the idiom text at the beginning of each chapter calls up the appropriate diglot file as typesetting progresses. After diglotfile is opened, verse processing begins.

Each time a new idiom verse is encountered, several things happen. First, the verse number is saved. Verses are usually marked by a single number, but sometimes the translator elects to create a synthesis of two or more verses, in which case the verses are marked by two numbers separated by a comma or hyphen (e.g., 12-14). The verse command has the form \iv \m. \n, where \m is the starting verse number and \n is the (optional) ending verse number. \m is compared to the current verse number in an effort to guard against missing or duplicated verses. If all is well, the \getdiglot routine is called.

The listing below is a simplified version of the \getdiglot routine. \TeX treats each verse in diglotfile as a unit. \getdiglot pulls a verse from diglotfile, increases the value of diglotverse by one, makes an insert of the diglot verse, and compares the verse number of the idiom text with the diglot. If the idiom verse was a synthesis of several verses, the routine repeats until the verse counts for both the idiom and the diglot match. When \getdiglot has finished inserting the diglot material, the verse routine contributes the idiom text to the current page.

Pages are constructed using the routines called "marginal hacks" in the \TeXbook (pp. 415–416). The pagecontents macro has been altered as shown below to place the diglot material
% Get a verse from the diglotfile and make an insertion of it
\def\getdiglot{\loop\read\diglotfile to \diglottext
  \ifeof\diglotfile\closein\diglotfile
  \else
    \advance\diglotverse by 1
    \insert\diglotins{\diglottext}
  \fi
  \ifnum\diglotverse < \lastverse
  \repeat

on the page as an insertion, much like a footnote. \TeX really sees the page as a fairly narrow column of text with an extraordinarily large right margin into which we are dumping the contents of \diglotins.

% Redefine pagecontents to allow for diglotins
\def\pagecontents{
  \hrule width \pagewidth
  \global\bardepth = \ht\diglotins
  \rlap{\kern\hspace{\tbar
    \vbox to \Opt{\vglue 6pt\unvbox\diglotins \vss}}}
  \ifvoid\topins\else\unvbox\topins\fi
  \global\pagedim = \dp255 \unvbox255
  ...
}

The new \pagecontents macro draws a horizontal line just below the header. It then stores the height of \diglotins which is used to draw the vertical line between the columns. Next, it kerns to the right \hsize (the width of the idiom text column) and prints the vertical line (using the \tbar macro) followed by the diglot text. After the diglot text is printed, \pagecontents continues as it would under normal conditions.

Because of the narrow columns used, line-breaks can become difficult. We help the program along by allowing it to stretch the white space on a line a bit more than usual. We often avoid hyphenation and justification because whole words and ragged margins are a help to beginning readers. The Zoogocho Zapotec New Testament is an example of this style. Some languages, however, have much longer words and are impossible to typeset without hyphenation. Had hyphenation been required, it would have been necessary to hyphenate the idiom and diglot texts simultaneously using two sets of rules. Unfortunately, \TeX was not designed to hyphenate two different languages at the same time. \TeX's hyphenation rules (for English) could be changed to work correctly for Zapotec, but then the Spanish text would also be hyphenated using Zapotec rules.

The easiest solution seems to be to combine the use of discretionary hyphens with penalties that make hyphenation somewhat limited. Before typesetting, we run both texts through programs that insert discretionary hyphens in each word according to the rules of that particular language. In any word containing a discretionary hyphen, \TeX will suspend its hyphenation rules and break the word where the user has indicated. This works, but we are looking for other solutions.

The sample shown here is a page from the Zoogocho Zapotec Matthew. Each column has attributes that can be altered independently of the other. These include: column width, typesize, typestyle, leading, hyphenation (on or off) and justification (on or off).
San Mateo 13, 14

yodaol chegaqüen'. Na' leca besyebande! len xtižen' na' gosi! leže!:
—¿Ga jasedel yela' sina'? na'
¿naćechen' chac chone! yela' guac
cäl? 55 Nombia'chone!, le naque' xi'ín
ben! chonšague'! yag. Na' xne'en!a' lie!
María, na' Jacobo, José, Simón na'
Judas zjanaqué! bene' biše'. 56 Na' lecje
bene' zane' ca! nite' lažho nga. ¿Naxe
chaquen! cho'e diža' ca! na' chacte! chone!
yela' guac?
57 Na' dan! gosone! xbab nac
Jesús'en! con to beqe' gualaz cheqaqüe', bi
gosacalaze' yesejle'łe čhe'. Na' gož Jesús'en!
legaque!:
—Yogote bene' chonla'añe' bene'
choe' xtiža! Diosen', perw bene'
gualaz čhe' na' bene' lo' lo' o' čhe' bi
chesonla'añe' le'!
58 Na' to chopze yela' guac ben
Jesús'en! Nazareten! dan! bitw gosejle'łe
čhe'!

Quingan' goc gosote! Juan
ben' bzoa beqe' nis
(Mr. 6.14-29; Lc. 9.7-9)
14 Na' ca tiempen' Herodes ben'
naque' gobernador che distritw
Galilean', bene' diža' ca nac yogo'lo'
dan! chon Jesús'en!. 2 Nach goże' xmose'
ca!:
—Bengan' da' Juanna', ben' bzoa
bene' nis. Ba bebane' ladjo bene' guat
cal', da'nan' chaque! chone! yela' guac.
3-4 Herodesen! gwne' ca! dan' bene'
mandadw gosote' da' Juanna'. Quingan'
goc: Herodesen! beqeye' Herodías ca
xo'ole' la'czia' Herodías naque' xo'ole'
bene' biše' Felipe. Na' Juanna' gože'!
Herodesen!:
—Bi cheyala' soalen no'ol čhe bene'
bisón!.

55 Pues este es el hijo
del carpintero, y su madre
es María. Es hermano de
Jacobo, José, Simón y
Judas, y sus hermanas también
viven aquí entre nosotros.
¿De dónde, pues, sabe todo
esto?
57 Por eso no quisieron
hacerle caso. Pero Jesús les
dijo:
—Todos aprecian a un
profeta, menos los de su
propia tierra y los de su
casa.
58 Y no hizo muchos mi-
lagros allí, porque ellos no
creían en él.

La muerte de Juan
el Bautista
(Mr. 6.14-29; Lc. 9.7-9)
14 1 En ese tiempo Hero-
des, el que gobernaba en
Galilea, tuvo noticias de
Jesús,
y dijo a los que estaban
con él:
—Ese es Juan el
Bautista, que ha sido resu-
citado de la muerte. Por eso
tiene este poder milagroso.
3 Es que Herodes había
hecho detener a Juan y lle-
varlo atado a la cárcel. Lo
hizo por causa de Herodias,
que era esposa de su herma-
nó Felipe.
4 Juan había dicho a
Herodes:
—No debes tenerla como
tu mujer.