WARNING! *This is the (almost unchanged) manual of the version 2.0. It will be replaced by the manual of the version 3.0 before this beta release becomes official. A (temporary) brief description of the new features of ArmTEX 3.0 can be found at the end of the "README" file.*

ArmTEX: a System for Writing in Armenian with TEX and LATEX

(ԱրմTEX՝ TEX-ում և LATEX-ում Հայերեն Լեզվով Գրելու Համակարգ)

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1 Introduction

ArmTEX is a system for writing in Armenian with TEX and LATEX. To use this system, you need to have a TEX compiler (with plain TEX and/or LATEX 2_ε formats) as well as the METAFONT program. The system can be used with a standard Latin keyboard (without any special support for Armenian letters). It can also be used with any keyboard which uses an encoding having Armenian letters in the second half (characters 128–255) of extended ASCII table. An example of such an encoding is the ArmSCII8 Armenian standard.

ArmTEX system is freeware. Feel free to give copies of it to your friends and relatives, and be sure to include all the files. If you have any questions and/or propositions, do not hesitate to contact us.

ArmTEX installation instructions can be found in the "README" file.

To use the system, you need to know how to call it from your documents, how to select different Armenian fonts, and how to enter Armenian text from the keyboard. These operations are described in the following three sections.

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2 How to enter Armenian letters and punctuation signs

If you do not have an Armenian keyboard, Armenian letters must be entered according to the following transliteration table.

Ա ա	a	Ի ի	i	Յ յ	y	Տ տ	t
Բ բ	b	Լ լ	l	Ն ն	n	Ր ր	r
Գ գ	g	Խ խ	x	Շ շ	sh	Ց ց	c
Դ դ	d	Ծ ծ	c’	Ո ո	o	Ւ ւ	w
Ե ե	e	Կ կ	k	Չ չ	ch	Փ փ	p’, ph
Զ զ	z	Հ հ	h	Պ պ	p	Ք ք	q
Է է	e’	Ձ ձ	dz	Ջ ջ	j	և	ev
Ը ը	u’	Ղ ղ	gh	Ռ ռ	r’	Օ օ	o’
Թ թ	t’, th	Ճ ճ	j’	Ս ս	s	Ֆ ֆ	f
Ժ ժ	g’	Մ մ	m	Վ վ	v	ՈՒ ու	u, ow

Table 1: Transliteration

As you can see from this table, some Armenian letters have two possible transliterations. For example, the letter «թ» can be obtained by entering either [`t’`] or [`th`]. To obtain a capital Armenian letter, the Latin letters in the corresponding transliteration (all, or only the first one) must be capitalized. For example, in order to obtain the letter «Ը», you can enter [`T’`], [`TH`] or [`Th`]. The exceptions are the letter «և», which does not have a capital, and the letter «ու», whose capital has two versions: by entering [`U`] or [`OW`] you obtain «ՈՒ», while by entering [`Ow`] you get «Ու».

Let us note that the transliteration scheme used in ArmTEX 1.0 was different from the one given in Table 1. More precisely:

- the old transliterations [`z’`] and [`zh`] of the letter «ժ» are now replaced by [`g’`],
- the old transliteration [`ts`] of the letter «ծ» is now replaced by [`c’`],
- only the first of the old transliterations [`j’`] and [`ch’`] of the letter «ճ» is included in the new version of ArmTEX.

Because of these modifications, a slight (re)editing of your own documents written with ArmTEX 1.0 can be necessary. We are sorry for this inconvenience. The choice (and the modification) of the transliteration scheme can

seem surprising and/or unnecessary, but it is based on some objective reasons which will be discussed at the end of this section.

Besides letters, the system possesses the following punctuation signs (and miscellaneous symbols):

. Armenian dot (միջակետ), entered as [`.`];

, Armenian coma (սպորակետ), entered as [`,`];

: Armenian full stop (վերջակետ), entered as [`:`];

՝ Armenian separation mark (բութ), entered as [`‘`];

՛ Armenian emphasis mark (շեշտ), entered as [`|`];

՞ Armenian question mark (պարույց/հարցական նշան), entered as [`?`];

՜ Armenian exclamation mark (երկարացման/բացականչական նշան), entered as [`!`];

- Armenian en-dash (միության գծիկ), entered as [`-`];

— Armenian em-dash (անջատման գիծ), entered as [`\textanjgic`] or [`\|`];

– Armenian hyphen (ենթամնա/տողադարձի նշան), entered as [`--`];

’ Armenian apostrophe (ապաթարց), entered as [`’`];

... Armenian ellipsis (կախման կետեր), entered as [`...`];

.... Armenian multi-dot (բազմակետ), entered as [`....`];

(left parenthesis, entered as [`(`];

) right parenthesis, entered as [`)`];

[left bracket, entered as [`[`];

] right bracket, entered as [`]`];

{ left brace, entered as [`\textbraceleft`] or [`\{`];

} right brace, entered as [`\textbraceright`] or [`\}`];

! Latin exclamation mark, entered as [`\textexclam`] or [`\!`];

; semicolon, entered as [`;`];

“ English left quotation mark, entered as [` ``];

” English right quotation mark, entered as [`''`] or [`"`];

$ dollar sign, entered as [`\textdollar`] or [`\$`];

% percent sign, entered as [`\textpercent`] or [`\%`];

* asterisk, entered as [`*`];

+ plus sign, entered as [`+`];

/ slash, entered as [`/`];

« Armenian left quotation mark, entered as [`<`] or [`<<`];

» Armenian right quotation mark, entered as [`>`] or [`>>`];

= equality sign, entered as [`=`];

@ at sign, entered as [`@`];

? Latin question mark, entered as [`\textquestion`] or [`\?`];

— Latin em-dash, entered as [`---`];

hash, entered as [`\texthash`] or [`\#`];

& ampersand, entered as [`\textand`] or [`\&`].

As you have probably noticed, there are two different ways (with one of them of the form `\text...`) to enter some of the above symbols. The more secure way to enter such symbols are the `\text...` commands. The other commands producing the same symbols are, of course, more convenient, but may conflict with other LaTeX packages, or even with future releases of LaTeX. As we well see in Section 3.1, the user can even disable some of the latter commands.

If you possess an Armenian keyboard — which uses an encoding having Armenian letters in the second half (characters 128–255) of extended ASCII table — you can also enter the Armenian letters and symbols present on the keyboard directly.

Note that, unfortunately, the hyphenation in Armenian text is not performed automatically. However, you can manually hyphenate any word, using LaTeX's `\-` and ԱՊՀTEX's `\armuh` (ARMenian Unconditional Hyphenation) commands. The last command does an unconditional hyphenation and must be used for the words having the vowel «ը» in a "secret syllable" (գաղտնավանկ) and when breaking the ligature «և». For example, you can enter [`si\-ra\-marg`], [`bu'\armuh nuthyun`] or [`Se\armuh van`].

Finally remark, that in some very rare cases, the obtained result may differ from your expectations. For example, if the letter «փ» is immediately followed by the letter «h», then one would naturally use the transliteration [`th`]. However, the latter will be interpreted as the letter «թ». To avoid such misinterpretations, instead of [`th`] one can enter [`t\textbreaklig h`] or [`t\*h`]. Let us note, that the second principle used for the creation and perfection of our transliteration scheme (the first one, of course, being the phonetic correspondence with the Eastern Armenian) is the minimization of similar misinterpretations. For example, while typing this manual, we never encountered such cases (except, of course, the intentionally given examples). Below, we give the full list of such known misinterpretations.

1. All the words containing the pair of letters «եվ». For example, the word «պարեվերջ» can be transliterated as [`tare\*verj`].

2. An apostrophe or an English right quotation mark following some letters. For example, if you enter [`‘‘mat’’`], you will unexpectedly obtain «“մաթ’» instead of «“մապ”». Note that in this case, besides using the command `\*`, you have also the following solution: [`‘‘mat"`].

3. The following words and the words derived from them (including compound words):

   – դզզալ [`d\*zzal`],
   – փհաճ [`t\*haj'`],
   – փհաս [`t\*has`].

If you encounter similar cases, do not hesitate to let us know about them, so we can complete the above list.

3 How to call ArmTEX from your documents

3.1 LaTeX case

In order to use ArmTEX in LaTeX, first of all you must load the `armtex` LaTeX package by adding the command

```
\usepackage{armtex}
```

to the preamble of your document (between the commands `\documentclass` and `\begin{document}`).

The package accepts the following optional arguments: `latin`, `notstar`, `notbar`, `notexclam`, `notdots` and `safe`. These arguments can be combined like, for example,

```
\usepackage[latin,notbar,notexclam]{armtex}
```

.

Now, let us describe each of these arguments.

If the argument `latin` is not present, ArmTEX will typeset in Armenian the main text of your document, as well as the table of contents, chapter and section names, and so on. However, if this is not the desired behavior, you can specify the argument `latin` and use the font selection commands described in Section 4.1 in order to typeset Armenian text.

ArmTEX redefines the standard LaTeX commands `\*`, `\|` and `\!`, preserving their meaning in math mode. If you run into problems related to these redefinitions, you can disable each of them using the optional arguments `notstar`, `notbar` or `notexclam` respectively.

LaTeX commands `\vdots` and `\ddots` use dots from the current font (in contrast to other commands producing dots in math mode). ArmTEX corrects this strange behavior of LaTeX by redefining these commands. If you run into problems related to these redefinitions, you can disable them using the argument `notdots`.

If you need to disable simultaneously the five above-mentioned redefinitions, you can use the argument `safe`.

Let us note that in the Armenian fonts used in ArmTEX, the letters and symbols are positioned according to the `OT6` encoding. If you use the `armtex` LaTeX package, the `OT6` encoding is loaded automatically. In this case, you do not need (and, moreover, you must not) load the `OT6` encoding "manually", that is, using `fontenc` standard LaTeX package.

Finally, in order to use an Armenian keyboard, you must call the LaTeX

standard package `inputenc`, specifying the name of the encoding produced by your keyboard as an argument (in lower case) like, for example,

```
\usepackage[armscii8]{inputenc}
```

.

Unfortunately, only the `ArmSCII8` encoding is provided with ArmTEX 2.0. It is defined in the "armscii8.def" file, which can be used as a template for designing similar files for other encodings. In the case you do write and test such an encoding file, do not hesitate to send it to us, so we can include it in future releases of ArmTEX.

3.2 Plain TEX case

In order to use ArmTEX in plain TEX, first of all you must load the "arm.tex" file by putting the following command in the beginning of your document:

```
\input arm
```

.

In order to use an Armenian keyboard, you must additionally load the "armkb-a8.tex" file:

```
\input armkb-a8
```

.

The "armkb-a8.tex" file is designed for the `ArmSCII8` encoding. It can be used as a template for designing similar files for other encodings. In the case you do write and test such an encoding file, do not hesitate to send it to us, so we can include it in future releases of ArmTEX.

4 Font selection related commands

4.1 LATEX case

4.1.1 Orthogonal commands

LATEX 2_ε possesses a very flexible font selection system. A font is determined by five parameters (encoding, family, series, shape and size), which can be changed independently (in an orthogonal way). For example, the Computer Modern Roman (cmr) family is chosen by `\rmfamily` command, and italic shape by the `\itshape` command. So, for example, entering

```
{\rmfamily\itshape cat}
```

will typeset the word "cat" in the italic shape of the cmr family. Let us also note, that each orthogonal command has an equivalent of the form `\text...`,

which applies the corresponding change to the text given in the argument. For example, an equivalent way to write the previous example is

```
\textrm{\textit{cat}}
```
.

ArmTEX provides two family of fonts: cmr and cmss. The first family contains the bold and medium series of the normal, italic and slanted shapes. The second one contains the bold and medium series of the normal and slanted shapes. These fonts can be selected using the orthogonal commands listed in Table 2.

`\artmfamily`	`\armtm`
`\arssfamily`	`\armss`
`\armdseries`	`\armmd`
`\arbfseries`	`\armbf`
`\arupshape`	`\armup`
`\aritshape`	`\armit`
`\arslshape`	`\armsl`

Table 2: Orthogonal commands

The font selection commands starting with `\arm` correspond to LATEX commands starting with `\text`. Note that the commands listed in Table 2 are orthogonal with each other, but are not orthogonal with LATEX standard font selection commands. This is due to the fact that the commands from Table 2, if they are called when LATEX is not already in Armenian mode, first enter Armenian mode by performing a series of actions which (together with the command for leaving the Armenian mode) will be described in Section 4.1.4.

Finally, let us note that for historical reasons, as well as for compatibility with ArmTEX 1.0, the commands for selecting cmr and cmss families use `tm` and `ss` "roots" respectively (instead of traditional `rm` and `sf`).

4.1.2 Non-orthogonal (old style) commands

Besides orthogonal commands described in the previous section, LATEX also possesses old style (inherited from plain TeX) non-orthogonal font selection commands `\rm`, `\sf`, `\tt`, `\bf`, `\it`, `\sl` and `\sc` (some of which work also in math mode). ArmTEX redefines these commands so, that if they are called

when LaTeX is in Armenian mode, they first leave the Armenian mode (see Section 4.1.4 for more details).

\artm	*
\artmit	*
\artmsl	
\artmbf	*
\artmbfit	*
\artmbfsl	
\arss	
\arsssl	
\arssbf	
\arssbfsl	

Table 3: Non-orthogonal commands

For selecting Armenian fonts, ArmTeX provides its own non-orthogonal commands which are listed in Table 3. The commands marked with an asterisk work also in math mode.

4.1.3 Math mode commands

For selecting fonts in math mode, LaTeX 2_ε provides equally (new style) commands like `\mathrm`, `\mathbf`, and so on. For example, in the formula $\mathbf{P}(\xi = \eta)$, the bold letter "P" can be obtained by entering either [`${\bf P}(\xi=\eta)$`] or [`$\mathbf{P}(\xi=\eta)$`]:

\mathartm
\mathartmit
\mathartmbf
\mathartmbfit

Table 4: Math mode commands

For selecting Armenian fonts in math mode, ArmTeX provides analogous commands which are listed in Table 4.

Note that the commands from the last table correspond to the commands marked with an asterisk in Table 3.

4.1.4 Miscellaneous commands

As we have already mentioned in the previous sections, the commands for selecting Armenian fonts "if they are called when LaTeX is not already in Armenian mode, first enter Armenian mode". Entering Armenian mode consists in selecting the normal Armenian font (`\artm`) and performing the commands `\armdate` and `\armhyph`. The last two commands adapt the commands `\today` and `\-` to Armenian language. To restore the original behavior of these commands, you can use the commands `\armdateoff` and `\armhyphoff` respectively. And the command to leave the Armenian mode is `\aroff`, which selects the normal non-Armenian font and performs the commands `\armdateoff` and `\armhyphoff`.

ArmTeX provides also the commands `\armnames` and `\armnamesoff`, which respectively translate to Armenian and restore to the original state the words like "Chapter", "Part", "Table", and so on. In principle, there is no need to use these commands directly, but this can become necessary when using, for example, the `babel` package.

Finally, let us mention the commands `\latArmTeX` and `\ArmTeX` which typeset the logos ArmTeX and UniTeX respectively. These commands work irrespectively of whether LaTeX is in Armenian mode or not, and are (in both cases) orthogonal to the corresponding font selection commands.

4.2 Plain TeX case

Plain TeX does not possess the flexible font selection system of LaTeX 2_ε. For this reason, among the above described commands, only the commands `\armdate`, `\armhyph`, `\armdateoff`, `\armhyphoff`, `\aroff`, `\latArmTeX` and `\ArmTeX`, as well as the commands listed in Table 3, are available when using ArmTeX in plain TeX.

Another difference is that the commands `\rm`, `\sf`, `\tt`, `\bf`, `\it`, `\sl` and `\sc` do not possess the feature to leave the Armenian mode. If you have to leave the Armenian mode, you can use the command `\aroff`. The latter, uses the value of `\arofffont` for selecting the normal non-Armenian font. The default value of `\arofffont` is `\rm`, but it can be changed by entering, for example, [`\let\arofffont=\bf`].

Finally, let us note that the commands `\latArmTeX` and `\ArmTeX` work in a slightly different way than in LaTeX. The first difference is that the command `\ArmTeX` (resp. `\latArmTeX`) must be used only when TeX is (resp. is not) in Armenian mode. Besides, in order for the command `\ArmTeX` to produce the desired result, it may be necessary to change the value of `\arofffont`. For example, in order to typeset «**ԱՐՄՏեX**», you must enter

```
{\artmbf \let\arofffont=\bf \ArmTeX}
```

.

Appendix

A OT6 character tables

A.1 artmr10 font

	0	1	2	3	4	5	6	7
′00		̆	̇	̨	̊	̃	̋	̛
′01	̏	̑	̉	̓	̔	̕	̖	̗
′02		̜	̝	̞	̟	̠	̡	̢
′03	̣	̤	̥	̦	̧	̨	̩	̪
′04	̫	̬	̭	̮	̯	̰	̱	̲
′05	(	)	*	+	,	-	.	/
′06	0	1	2	3	4	5	6	7
′07	8	9	:	;	«	=	»	̳
′10	@	̵	̶	̷	̸	̹	̺	̻
′11	̼	̽	̾	̿	̀	́	͂	̓
′12	̈́	ͅ	͆	͇	͈	͉	͊	͋
′13	͌	͍	͎	[	“	]	{	}
′14	`	͐	͑	͒	͓	͔	͕	͖
′15	h	͘	͙	͚	͛	͜	͝	͞
′16	͟	͠	͡	͢	ͣ	ͤ	ͥ	ͦ
′17	ͧ	ͨ	ͩ	ͪ	–	́	—	!	?

A.2 arssr10 font

	0	1	2	3	4	5	6	7
′00		◡	'	Ձ	Ղ	Ճ	Է	Ը
′01	Թ	Ժ	Շ	Չ	Ռ	Ց	Փ	Ք
′02		Ֆ	֑	֒	֓	֔	֕	֖
′03	֗	֘	֙	֚	֛	֜	֝	֞
′04	և	֟	”	#	$	%	&	’
′05	(	)	*	+	،	-	.	/
′06	0	1	2	3	4	5	6	7
′07	8	9	:	;	«	=	»	؟
′10	@	Ա	Բ	Ց	Դ	Ե	Ֆ	Գ
′11	Ջ	Ի	Ձ	Կ	Լ	Մ	Ն	Ո
′12	Պ	Ք	Ր	Ս	Տ	ՈՒ	Վ	Ի
′13	Խ	Յ	Զ	[	“	]	{	}
′14	՝	ա	բ	ց	դ	ե	ֆ	գ
′15	հ	ի	ջ	կ	լ	մ	ն	ո
′16	պ	ք	ր	ս	տ	ու	վ	ւ
′17	խ	յ	զ	–	՛	—	!	?

B ArmTEX version history

ArmTEX 1.0 (June 25, 1997). This is the first version of ArmTEX. It consists essentially of Armenian fonts and provides a minimal set of simple commands for using them in plain TEX.

ArmTEX 2.0 (June 1, 1999). This version of ArmTEX includes the following important changes from the previous one.

- The transliteration scheme was improved (see Section 2).
- The set of ArmTEX commands was essentially extended and a package for using the system with LaTeX 2_ε was created.
- Some minor bugs were corrected.
- The Armenian manual and several example files for both LaTeX and plain TEX were written.
- Some unnecessary files were removed.