Using the WSU International Phonetic Alphabet

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1 Preface

This users guide is intended to serve as a help and supplement to the Washington State University International Phonetic Alphabet (WSUIPA) fonts. It is not intended to be a manual on TEX, LATEX, linguistics, or the correct usage of the characters, accents and diacritics contained within the font. It is assumed that the user is familiar with the version of LATEX he or she is using and with the characters contained within the WSUIPA font. Because the uses for a phonetic alphabet font are probably as varied as the many disciplines which use the characters, this guide is intended to merely show some of the most common ways of using the WSUIPA font. Surely each person who implements the font will develop his or her own favorite way of working with and using the font.

The principal source of information regarding the characters and their shapes has come from sources within the linguistic field—most notably, Geoffrey K. Pullum and William A. Ladusaw, whose book, *Phonetic Symbol Guide* was used extensively. The *Phonetic Symbol Guide* not only lists the International Phonetic Alphabet (IPA) characters and diacritics, it also gives an enlarged illustration of each character which shows its baseline, height,

*Adapted for LATEX and NFSS
†Adapted for LATEX and NFSS2

depth and x-height. These character illustrations were invaluable in the design of the WSUIPA METAFONT characters.

Several other people involved in the wonderful world of linguistics also aided in the design of the WSUIPA font. Their input concerning everything from character shape, to placement within the font, to determining which characters should be included, is gratefully acknowledged. I would especially like to thank Karen Mullen, Associate Professor of English, University of Louisville, Louisville, Kentucky. She tested, used the WSUIPA fonts, and took the time to give several suggestions and recommendations that have improved the font. Also, Christina A. Thiele, Managing Director, Journal Production Centre, Carleton University, Ottawa, Ontario, who not only provided a wealth of phonetic information, but also a wealth of encouragement throughout the entire font designing process.

Included with the WSUIPA fonts are:

- The basic WSUIPA font which contains 128 phonetic characters and/or diacritics in five different point sizes (8, 9, 10, 11 and 12) and in three typefaces (roman, slanted and bold extended).
- Each size and typeface includes a TFM (TEX Font Metric) file and its related GF, PK or PXL file (after you generate them).
- A macro package (IPAMACS.TEX) for use with the WSUIPA font for TEX and LATEX without NFSS users. Note, that this package is not necessary for NFSS LATEXusers.
- A style file (IPA.STY) for NFSS LATEX users, and
- three *WSUIPA Font User's Guides.* The first one is for TEX (IPAMAN.TEX – the original manual), the second one for LATEX without NFSS (IPAMAN.LTX – the manual adapted by W. Antweiler) and the third one is this one.

This guide is divided into three main sections:

1. an introduction to the WSUIPA font,
2. a description of the font layout and the characters included in the font and

3. how to use IPA more in more sophisticated and in simpler way.

Although the WSUIPA fonts are written in METAFONT, the user does not need experience with or knowledge of METAFONT to use the font.

2 Introduction to the WSUIPA Font

The WSUIPA fonts are written in METAFONT and use the same font parameter values as their Computer Modern (CM) counterparts (cmr and cmbx). In fact, while designing the character shapes, the computer modern code was left intact or modified only slightly whenever possible. Therefore, the WSUIPA fonts are totally compatible with computer modern fonts—the design and shape of the characters are computer modern wherever possible. For the characters that are drastically different from any computer modern characters or symbols, such as the "Gamma," "Baby Gamma" and the "Esh," Pullum and Ladusaw's *Phonetic Symbol Guide* was used as the character design standard.

The WSUIPA fonts are obviously not an exhaustive collection of phonetic or even recognized International Phonetic Alphabet characters. The characters included in the WSUIPA font were chosen either because they were listed as a "major" entry in Pullum and Ladusaw's *Phonetic Symbol Guide*, or because of the recommendations from various people with an interest in the font.

Phonetic Symbol Guide contains what it classifies as "major" and "minor" characters, based upon whether the symbol is an officially recognized IPA character or is determined by Pullum and Ladusaw to be a standard symbol in current American transcriptual practice. *Phonetic Symbol Guide* lists 78 "major" entries which are not easily attainable in the CM fonts. All 78 of these characters are included in the WSUIPA font, along with 50 "minor" entries from *Phonetic Symbol Guide*. The selection of which "minor" entries to include was based on information and requests from various phoneticians and linguists who contacted WSU during the beginning stages of the creation of the font.

3 The Layout of the WSUIPA Font

The character-grouping pattern followed by Pullum and Ladusaw in their *Phonetic Symbol Guide* was adopted as the basis for the WSUIPA font layout. The characters are grouped together according to shape rather than usage. Therefore, the "a" shapes occupy the first positions: '00 through '04, "b" shapes are in positions '05 through '11 and so forth. The accents and diacritics follow the character shapes and are in the last positions in the font. This approach was taken because under it was assumed that under most circumstances, the user would most likely be accessing the characters with the use of macros rather than by typing large portions of entirely phonetic text. Aside from keeping like shapes together, the positioning of the WSUIPA font was fairly arbitrary.

4 Character Description

Within this section each of the WSUIPA characters are shown in a METAFONT "smoke mode" proof. The octal character position is indicated, along with the corresponding macro name in IPAMACS, and the name of the character given in *Phonetic Symbol Guide*. Only the roman characters will be illustrated since the shapes of the slanted and bold extended are the same.

There are several Greek characters included in the WSUIPA font, and initially it may appear these are merely copies of the corresponding CM Greek characters. That is true with one very important distinction: the WSUIPA Greek characters included are not italic. All the lowercase Greek characters included in the CM fonts are italic which makes them unsuitable for some situations in phonetics where a non-italic Greek character is essential.

WSUIPA Characters			
Char Code	Char	IPAMACS Name	PULLUM & LADUSAW Name
'00	ɐ	\inva	turned a
'01	ɑ	\scripta	script a
'02	ɑ	\nialpha	lowercase non-italic alpha
'03	ɒ	\invscripta	turned script a
'04	ʌ	\invv	inverted v
'05	ƀ	\crossb	crossed b
'06	ƀ	\barb	barred b
'07	ⱡ	\slashb	slashed b
'10	ɓ	\hookb	hooktop b
'11	β	\nibeta	non-italic lowercase beta
'12	ȼ	\slashc	slashed c
'13	ɕ	\curlyc	curly-tail c
'14	ʗ	\clickc	stretched c
'15	đ	\crossd	crossed d
'16	ɖ	\bard	barred d
'17	ⱡ	\slashd	slashed d
'20	ɗ	\hookd	hooktop d
'21	ɖ	\taild	right-tail d
'22	ʤ	\dz	d-yogh ligature
'23	ð	\eth	eth
'24	ᴅ	\scd	small capital D
'25	ə	\schwa	schwa
'26	ɚ	\er	right-hook schwa
'27	ɘ	\reve	reversed e
'30	ɛ	\niepsilon	non-italic greek epsilon
'31	ɜ	\revepsilon	reversed non-italic epsilon
'32	ɝ	\hookrevepsilon	right-hook reversed non-italic epsilon
'33	ɞ	\closedrevepsilon	closed reversed non-italic epsilon
'34	ɡ	\scriptg	lowercase variant g
'35	ɠ	\hookg	hooktop g
'36	ɢ	\scg	small capital G
'37	ɣ	\nigamma	non-italic gamma

WSUIPA Characters			
Char Code	Char	IPAMACS Name	Pullum & Ladusaw Name
'40	ɣ	\ipagamma	IPA Gamma
'41	ɤ	\babygamma	baby gamma
'42	ʰʊ	\hv	h-v ligature
'43	ħ	\crossh	crossed h
'44	ɦ	\hookg	hooktop g
'45	ɧ	\hookheng	hooktop heng
'46	ɥ	\invh	turned h
'47	ɨ	\bari	barred i
'50	ɨ	\dlbari	barred dotless i
'51	ι	\niiota	non-italic greek iota
'52	ɪ	\sci	small capital I
'53	ɨ	\barsci	barred small capital I
'54	ɟ	\invf	barred dotless j
'55	ɬ	\tildel	l with tilde
'56	ɬ	\barl	barred l
'57	ɬ	\latfric	belted l
'60	ɭ	\taill	l with right tail
'61	ɮ	\lz	l-yogh ligature
'62	λ	\nilambda	non-italic greek lambda
'63	ƛ	\crossnilambda	crossed lambda
'64	ɱ	\labdentalnas	m with leftward tail at right
'65	ɯ	\invm	turned m
'66	ɰ	\legm	turned m with long right leg
'67	ɲ	\nj	n with leftward hook at left
'70	ŋ	\eng	eng
'71	ɳ	\tailn	n with right tail
'72	ɴ	\scn	small capital N
'73	⊙	\clickb	bull's eye
'74	ɵ	\baro	barred o
'75	ɔ	\openo	open o
'76	ω	\niomega	non-italic lowercase greek omega
'77	ϖ	\closedniomega	closed omega

WSUIPA Characters			
Char Code	Char	IPAMACS Name	Pullum & Ladusaw Name
'100	ɶ	\oo	double o
'101	ᵽ	\barp	barred p
'102	þ	\thorn	thorn
'103	ɸ	\niphi	non-italic lowercase greek phi
'104	ɾ	\flapr	fish hook r
'105	ɼ	\legr	r with long leg
'106	ɽ	\tailr	r with right tail
'107	ɹ	\invr	turned r
'110	ɻ	\tailinvr	turned r with right tail
'111	ɺ	\invlegr	turned long-legged r
'112	ʀ	\scr	small capital R
'113	ʁ	\invscr	inverted small capital R
'114	ʂ	\tails	s with right tail
'115	ʃ	\esh	esh
'116	ʆ	\curlyesh	curly-tail esh
'117	σ	\nisigma	non-italic lowercase greek sigma
'120	ʇ	\tailt	t with right tail
'121	ʧ	\tesh	t-esh ligature
'122	ʇ	\clickt	turned t
'123	θ	\nitheta	non-italic lowercase greek theta
'124	ᵾ	\baru	barred u
'125	ʉ	\slashu	slashed u
'126	ʊ	\niupsilon	non-italic lowercase greek upsilon
'127	ᴜ	\scu	small capital U
'130	ᵿ	\barscu	barred small capital U
'131	ʋ	\scriptv	script v
'132	ʍ	\invw	inverted w
'133	χ	\nichi	non-italic lowercase greek chi
'134	ʎ	\invy	turned y
'135	ʏ	\scy	small capital Y
'136	ʐ	\curlyz	curly-tail z
'137	ʐ	\tailz	z with right tail

WSUIPA Characters			
Char Code	Char	IPAMACS Name	PULLUM & LADUSAW Name
'140	ʒ	\yogh	yogh
'141	ʒ̆	\curlyyogh	curly-tail yogh
'142	ʔ	\glotstop	glottal stop
'143	ʕ	\revglotstop	reversed glottal stop
'144	ɓ	\invglotstop	inverted glottal stop
'145	ʔ	\ejective	ejective
'146	ʕ	\reveject	reversed ejective
'147	◌̪	\dental#1	subscript bridge
'150	◌ˈ	\stress	vertical stroke (superior)
'151	◌ˌ	\secstress	vertical stroke (inferior)
'152	◌̩	\syllabic	syllabicity mark
'153	◌˺	\corner	corner
'154	⊥	\upt	IPA pointer
'155	⊤	\downt	IPA pointer
'156	⊣	\leftt	IPA pointer
'157	⊢	\rightt	IPA pointer
'160	ˑ	\halflength	half-length mark
'161	ː	\length	length mark
'162	◌̤	\underdots	subscript umlaut
'163	ʿ	\ain	reversed apostrophe
'164	˄	\upp	pointer
'165	˅	\downp	pointer
'166	˂	\leftp	pointer
'167	˃	\rightp	pointer
'170	◌°	\overring	over-ring
'171	◌̥	\underring	under-ring
'172	◌̜	\open	subscript left half-ring
'173	◌̃	\midtilde	superimposed (mid-) tilde
'174	◌̰	\undertilde	subscript tilde
'175	◌̬	\underwedge	subscript wedge
'176	◌̨	\polishhook	polish hook
'177	◌̯	\underarch	subscript arch

5 Using the `ipa.sty` Style File

In addition to the necessary font-related files, the WSUIPA font package also includes a file called IPA.STY. This is a macro style file which supports LaTeX under NFSS (new font selection scheme). It greatly simplifies the usage of new font as it will be seen in this section. The file also defines mnemonics for simpler usage of characters from a new font. They are the same as ones given in tables in the previous section.

If you are using IPA font all what you need to do is to mention IPA style file in the header of your LaTeX source. For example:

```
\documentstyle[ipa]{article}
```

The IPA style file defines a new font family \ipa, but you don't need to know this, because you will use it only through the mnemonics.

Because the new font is installed under NFSS, the system will also always choose the correct shape, series, and size whenever you wish to use it. For example:

```
A shibilant is a term occasionally found for a
fricative corresponding to a ``hushing'' sound,
e.g., IPA [\esh] (more technically, a grooved
laminal fricative with a sign {\large\bf \esh}.).
```

which will print as:

> A shibilant is a term occasionally found for a fricative corresponding to a "hushing" sound, e.g., IPA [ʃ] (more technically, a grooved laminal fricative with a sign **ʃ**.).

or even

```
\dots which is the case in the aforementioned
instances, however, {\large\bf we get the other
retroflex consonants:
[\nj], [\taill], [\taild], and [\tailr]}. They
are printed {\small\sl also as
[\nj], [\taill], [\taild], and [\tailr]}.
```

will print as,

> ...which is the case in the aforementioned instances, however, we get the other retroflex consonants: [ɲ], [ɭ], [ɖ], and [ʈ]. They are printed also as [ɲ], [ɭ], [ɖ], and [ʈ].

This means that you can freely change sizes, series, shapes and fonts (assuming that there exists a wanted font – note however, that IPA font comes only in bold extended and medium series, and in normal and slanted shape.)

A number of WSUIPA diacritics can be used on top or the bottom of other characters. To handle this IPA provides two macros: \diatop and \diaunder. The first one (\diatop) has the syntax:

```
\diatop[diacritics|character]
```

It takes one argument which is delimited by square brackets ([]) rather than curly braces, and has two parts.[1] The first part of the argument is delimited, or separated, from the second part by a vertical bar (|). The macro \diatop puts the first part of the argument over the second.

Using \diatop we can put a ring over another character by,

```
The overring may be used over letters with descenders
as an alternative to under-ring to indicate devoicing,
e.g. [\diatop[\overring|g]].
```

and the output would be,

> The overring may be used over letters with descenders as an alternative to under-ring to indicate devoicing, e.g. [g̊].

The \diatop macro also allows placement more than one character stacked over another character. For example,

```
For a really special \diatop[{\diatop[\'|\overring]}|n]
```

will print as:

> For a really special n̊́

[1] From the LaTeX perspective more correctly would be to use curly braces ({}) instead of square brackets ([]), but we left the square brackets to remain compatible with the previous versions of the IPAMACS file.

Notice the use of curly braces to group the argument of the first \diatop when more than one \diatop command is used.

The second macro (\diaunder) has a similar syntax:

```
\diaunder[diacritics|character]
```

As \diatop it also takes one argument which is delimited by square brackets, and has two parts separated by a vertical bar (|). It puts the first part of the argument under the second.

Using \diaunder we can put ◌̰ under r as in:

```
A voiceless trilled r \diaunder[\underring|r]
in certain Scottish dialects.
```

which will print as:

A voiceless trilled r r̰ in certain Scottish dialects.

Furthermore, it is also possible to get one or more accents over a character and another accent or character under it. For example:

```
This is a really, really special
\diatop[\overring|{\diaunder[\underring|r]}]
```

will print as:

This is a really, really special r̰̊

6 Historical remarks

The first version of this manual was written by W. Antweiler of the University of Cologne Computing Centre, Robert-Koch-Str. 10, D-5000 Köln 41, Germany, e-mail: `a0062@uvax.rrz.uni-koeln.de`. This manual did not include information about the original author. All fonts along with the TEX-macros and the original manual can be retrieved via anonymous ftp from `ymir.claremont.edu`.

The next version consisted of a changed manual and new LATEX style file `ipa.sty`, which supported NFSS. The style file was based on previous TEX-macros. It with an accompanying WSUIPA manual was prepared by Andrej

Brodnik (Andy) of the University of Waterloo, Department of Computer Science, 200 University Avenue West, Waterloo, Ontario, N2L 3G1, Canada, e-mail: abrodnik@uwaterloo.ca.

This version of the manual is almost the same as the previous one, only style file was upgraded for LaTeX NFSS2. They were prepared by Denis Roegel of CRIN (Centre de Recherche en Informatique de Nancy), F-54506 Vandoeuvre-les-Nancy, France, e-mail: roegel@loria.fr and Andrej Brodnik.