

ELECTRONIC EDITION OF PHONETIC SYMBOL GUIDE

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ABSTRACT

Reference and teaching materials for use by scholars and students of phonetics have traditionally included books and audiotapes. A problem with these materials is that books do not contain sound and tapes do not contain text or pictures. However, recently available computer software makes possible the combining of text, sound, and pictures into so-called *hypertexts*, i.e. modular, linked documents which encourage exploration of material along multiple dimensions of information. This paper describes such a version of *Phonetic Symbol Guide* [1], written in HyperCard for Apple Macintosh microcomputers.

1. PSG – THE BOOK

Phonetic Symbol Guide [1], hereafter “PSG,” is an encyclopedia of phonetic symbols. Except for an excursive *Introduction* section, *PSG* is organized as a series of short entries (approximately one-half to two pages in length) for each of the over 300 phonetic symbols “...that linguists, phoneticians, and other students of language are likely to encounter in reading either contemporary books and journals or older works that are important enough to be consulted today” (xvii). These include all of the standard IPA usages (prior to the 1989 revision) as widely employed by the international linguistic community as well as interpretations and symbols from other systems. Along with a large, clear picture of the symbol, each entry contains one or more sections, devoted to *IPA Usage*, *American Usage*, *Other Uses*, *Comments*

and *Source*. In addition to these entries for the individual symbols, there are also several charts, a glossary, a list of references cited, and a complete table of entries. Altogether, *PSG* presents a comprehensive view of the developing world standard established by the International Phonetic Association.

2. PSG – HYPERTEXT

The electronic version of *PSG* follows the structure of the book closely. It contains sections corresponding to those found in the book, namely **Introduction**, **Symbols** (corresponding to Character and Diacritic Entries), **Charts**, **Glossary**, **References**, and **Index** (corresponding to Table of Entries). In addition, however, it contains an instructional **Tutorial**, **Exercises** for students, and, most important, **sounds**. The text of the **Introduction**, **Symbols**, **Charts**, **Glossary**, and **References** sections is taken *verbatim* from *PSG*, whereas the other sections have been created especially for the hypertext version. Although the published version of *PSG* is useful primarily as a guide to the interpretation of phonetic symbols, the additions made in the hypertext presentation make it also a useful tool for learning phonetic transcription.

2.1. About HyperCard

HyperCard is a program which runs on Apple Macintosh microcomputers. Based on the metaphor of cards grouped into stacks, HyperCard contains a wide variety of tools for creating and linking modules

combining text, graphics, and, most important for our purposes, sounds. It is thus ideally suited to representing so-called “exploratory hypertexts,” i.e. large complex documents, such as encyclopedias, which are intended to be used in different ways by different readers. *PSG* is a perfect example of such a document.

2.2. Symbols Cards

As in the book, the most important section in the hypertext is the cards holding the information about individual symbols. Of the 311 entries in *PSG*, 107 were selected for inclusion in this version. (Expanded coverage of *PSG*, taking into account the 1989 revisions to the IPA, is anticipated.) These 107 represent most of the major entries in *PSG* (those with names in all capitals) and the ones of greatest interest to potential users of the document.

Figure 1 shows the screen display for the symbol *LOWER-CASE A* (page 3 of *PSG*). The upper part of the display shows the title, an enlarged picture of the symbol, a scrolling text field, and five buttons which permit the user to select which information appears in that text field. These five choices correspond to the presentation of information in *PSG*. The lower part of the display contains buttons which permit the user to **Hear it** (the sound), to navigate throughout the document (several buttons), and various other actions. This screen display format remains the same for all symbols in the document.

The scrolling text fields are “clickable,” i.e. when the user clicks the mouse on selected items of text, appropriate actions occur. For example, Figure 1 shows that the words **Cardinal**, **low**, **front**, and **unrounded** appear in **bold** style. This indicates that clicking on any of them will take the user to the **Glossary** page for that word. Note also that the book title *Principles* appears in *italics*; clicking on it (or on authors’ names) will take the user to the correct **References** page. Finally, words which are underlined (e.g. back, patte, pop) or which appear in square brackets (e.g. [pap]) are

pronounceable, i.e. clicking on them causes their pronunciation to be played.

Among the buttons at the bottom of the display are the **Browse** buttons, consisting of left- and rightward pointing arrows, and buttons which take the user to the main **Menu**, to the overall system **Map**, to the **Charts**, to a **Help** screen, or out of the program (**Quit**).

2.3. Charts

The symbol charts follow as closely as possible the *PSG* format. For example, Figure 2 shows the screen display for the Cardinal Vowels 1–8, found on page 255 of *PSG*. Note that, in addition to the chart and the navigation buttons, there are two additional buttons called **Hear it** and **Find it**. These two buttons are mutually exclusive, i.e. turning one on turns the other off. When the **Hear it** button is “on,” then clicking on a symbol in the chart causes its sound to be played. When the **Find it** button is enabled, on the other hand, clicking on a symbol takes the user to the card for that symbol. For example, if the user were to click on [a] (cardinal 4) with the **Find it** button on, as in Figure 2, the screen display would change to that of Figure 1.

All of the *PSG* charts are represented in the hypertext version, although there has been some reorganization due to constraints on Macintosh screen size and legibility. Furthermore, two of the charts (*Bloch and Trager’s Vowel Symbols* and *The Chomsky/Halle Vowel System*) are not clickable, since their entries represent a more phonological than phonetic classification of sounds.

2.4. Glossary and References

The **Glossary** and **References** sections are organized alphabetically. All of the entries beginning with the same letter are found together in a scrolling text field.

2.5. Index

The **Index** is a set of three scrolling lists, one for **vowel** symbols, one for **consonant** symbols, and one for

diacritics. By clicking on the name of one of the symbols in these lists, the user is taken to the appropriate Symbol card (see Fig. 1).

2.6. Exercises

One of the exciting features of this electronic book is that it contains an infinitely expandable set of exercises. One kind of exercise is traditional listening practice, in which the user clicks on a test sound and has to find the correct symbol. Another exercise is of the symbol-to-feature type, the user being required to match symbols with their phonetic feature descriptions, and *vice versa*. A third kind of exercise, not normally found in phonetics classes, is what we call a "treasure hunt," in which the user is asked to find out certain information from the encyclopedic resources. An example might be "For which symbols do the IPA and American systems agree the most? For which do they disagree the most?"

3. INNOVATIVE FEATURES

The electronic *PSG* incorporates several features which are relatively unusual in instructional software. These relate to the social nature of learning and the advantages which come from collaboration in the classroom.

Recent research with so-called "intelligent tutoring systems" suggests that computers can never have enough "intelligence" to behave as true partners in learning. In other words, they remain artifacts, however complex. Thus, we have incorporated into the *Exercises* procedures for more than one user (e.g. two or more students, or a teacher plus one or more students) to use the hypertext simultaneously. For example, similar to some traditional listening and transcribing practice drills, one user serves as the talker, the others then being listeners. First, the talker views the target phonetic symbol or string and then hides it again. Then, as the listener attempts to transcribe the talker's productions, the talker obtains immediate feedback as the correctness of his or her productions from the sounds

played and text viewed by the listener. In this situation, the hypertext *PSG* acts as a non-judgemental authority, available for instant consultation by the students.

Another collaborative aspect of the electronic *PSG* is the **Comments** button, available widely throughout the document (see Fig. 1). By clicking this button, the user is taken to a *Comments* screen, where comments by previous users may be read, and new comments may be entered. In this way, the user communicates with other users, including the authors, and a learning community is established. Frustrations with program content or operation are easily vented, leading to more positive views of the learning experience.

One final innovation which we shall mention here is what we might call the *auto-trace* feature. It is easy to capture the name of each button or field clicked on by users as they navigate the hypertext. This sequence of names is then used in two ways. First, it serves as an aid to the user, who can visit the list in order to recall where they have been recently. They do this by clicking the **See recent history** button (see Fig. 1). By simply clicking on one of the names in the list, they are then taken to the appropriate display. This list also serves a second, pedagogical use. When the user leaves the program (by clicking the **Quit** button), the list is written to disk, whence it can be viewed by the teacher (and eventually the authors) as evidence of the success or failure of the program in serving the needs of that user.

Together, these collaborative and auto-trace features make possible the evaluation and validation of the electronic *PSG* as a teaching tool. As we collect information on the document's use over the next few years, we will thus be able to extend and improve it even further.

4. REFERENCE

[1] PULLUM, G. K. & LADUSAW, W. A. (1986) *Phonetic Symbol Guide*. Chicago: University of Chicago Press.

Figure 1.

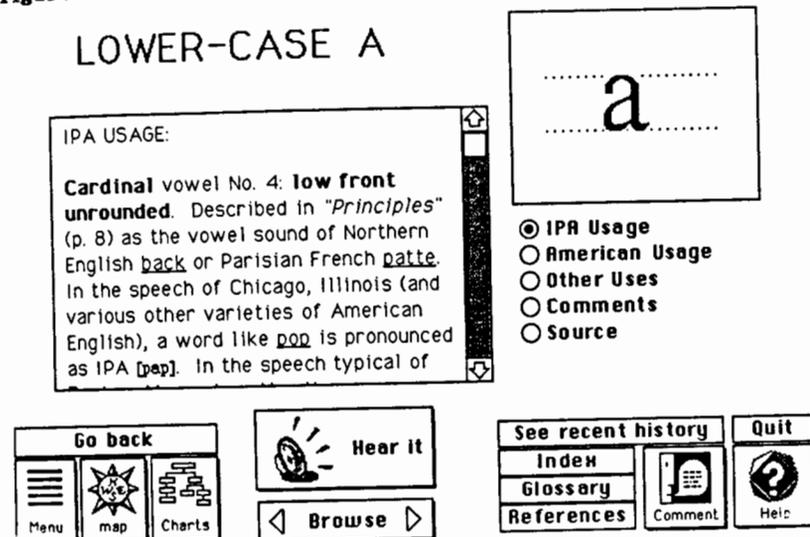


Figure 2.

