

RESEARCH IN WORD PROCESSING NEWSLETTER

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November 1986

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Research in Word Processing Newsletter, Volume 4, Number 8. Copyright © 1986 by the South Dakota School of Mines and Technology. All rights reserved. ISSN: 0748-5484. Also indexed by ERIC and INSPEC. The *Research in Word Processing Newsletter* is published 9 times a year (September through May) by the South Dakota School of Mines and Technology, Rapid City, South Dakota 57701-3995; telephone (605)394-2481. Postage paid at Rapid City, South Dakota. **SUBSCRIPTION:** \$15 per year (U.S.); \$21 per year (Canada); \$27 per year (foreign). Address all subscription inquiries and manuscripts to the Editors, *Research in Word Processing Newsletter*, South Dakota School of Mines and Technology, 501 E. St. Joseph, Rapid City, SD 57701-3995. Please allow four to six weeks for subscription processing. **POSTMASTER:** Send address changes to RWPN, South Dakota School of Mines and Technology, 501 E. St. Joseph, Rapid City, SD 57701-3995.

The Global Microcomputer: Multi-Lingual Word Processing With the Macintosh

William Kemp

An alphabet is a wonderful thing. Using a mere twenty to thirty symbols, it can encode and preserve the semantic complexity of language. And as far as we know, we're lucky to have an alphabet. Humans have invented writing itself so many hundreds of times in so many different places that we can sensibly regard writing systems as normal (though not necessary) products of human culture. Most writing systems are either logographic, representing ideas by symbols as Chinese does; or syllabic, representing sound groups by symbols as Japanese katakana does. But alphabetic writing, in which symbols represent the phonemes of a language, seems to have arisen only once in our species' history—probably in the Sinai, as a radical extension by local Semitic people of Egyptian hieroglyphics. Representing language at a very low level of organization, alphabetic writing is extremely economical, and the principle is easily transferable from one language to another.

It's also transferable to a computer simply by assigning an arbitrary numeric code to each alphabetic symbol a given language requires. From there the evolution of sophisticated word processing such as the English-speaking world now enjoys is probably inevitable. For all the wonders of word-wrap, automatic footnoting, and so on, word processing from the computer's point of view is little more than stringing one group of numbers after another. As the user presses a given switch on the keyboard, the computer enters some number arbitrarily assigned to that switch into its memory and almost simultaneously paints a pattern of dots onto its screen. To the user that pattern of dots is a letter, digit, or punctuation mark. To the computer it's merely dot pattern number 01000001. The technology is so simple that in 1984 Joseph Becker declared word processing to be easily possible for all the languages of the world, no matter how immense a horde of symbols a given writing system might require (*Scientific American*, p. 96). Even Chinese, with its inventory of over 7,000 common ideographs, can be tamed to the computer.

Becker is right about the technology of multilingual word processing. So why is finding a microcomputer that will readily handle even two ordinary Western languages like Swedish and English difficult? Why is

word processing still unusual in academic foreign language departments? Because the text-handling technology which most microcomputer manufacturers have chosen to implement is strongly biased toward English, with a passing nod toward the most common variations of the Roman alphabet. Those working in the Greek alphabet, its Cyrillic descendants, or any of the Asian derivatives of Devanagari or Chinese might as well maintain good penmanship as far as the microcomputer world goes.

Fortunately, the theoretical multilingual word processor Becker describes has reached the market in somewhat simplified form. His work was done on a Xerox Star, the direct conceptual parent of the Macintosh. From the Star the Macintosh gets its mouse, its icon-based interface, its windows, its menus. From the Star the Macintosh also gets the one design principle essential for multilingual word processing: that the links binding keyboard, computer memory, and character representation should be established in the system software and easily changed by the user.

Most microcomputers, using separate screen-display modes for text and graphics, have built-in character forms to display text but provide no direct means of modifying how characters look on the screen. At best, you must turn to software utilities to draw special characters, insert them one by one into the resident character set, then evoke them onscreen through combination keystrokes. In some cases the special characters will then appear both on-screen and in printed copy; in other cases, eliciting printed output will require embedding special codes in the text, or passing the text through a "translation" loop which coordinates keystrokes and printer output.

In contrast, the Macintosh displays all screen images, including letter forms, as graphic patterns and treats fonts (as the Macintosh world calls typefaces or letter sets) as movable system resources. Using a utility program called *Font/DA Mover* which Apple provides free of charge, you can install the font of your choice in any system file. Once a font containing the characters you need is installed in the system file, the characters will appear readily both on-screen and in print; the computer will behave as if the characters were a normal

part of its resources—as indeed they are. So system files for different copies of word processing software can have different font inventories on call; or you can customize the system file for a specific task, then restore your standard font inventory when a particular job is finished. Even more usefully, different fonts (and different sizes of fonts) can be used in one document; through menu choices, the Macintosh user can switch back and forth within a given document between the character sets of different languages.

The character set Apple provides with the Macintosh includes all the non-English lower-case characters needed for word processing in many western European languages:

á à â ã ä é è ê ë í î ï ï
 ó ò ô õ ø ú ù û ü ç ñ ð
 æ œ Σ π Β δ ς Ω ϳ μ.

The inventory of special upper-case forms is much smaller: **À Ø Œ Ç Æ Π.**

If you are willing to tolerate this limitation, you will find the Macintosh exactly as it comes out of its box useful for word processing in the more common European languages.

But compromise is unnecessary. You can often buy the character set you need from among the numerous commercial products, or (even better) get it free through a user's group. Clapp and Ryall's *THE COMPLETE MACINTOSH SOURCEBOOK* lists 23 commercially available disks, each containing a number of different fonts; *SOURCEBOOK* also reports that hundreds of other fonts are available in the public domain. Most of these typefaces, commercial or public domain, are useful chiefly in creating eye-catching (sometimes ugly) display text for flyers and announcements. The special character they contain tend to be cute pictures, special symbols (what typographers call "dingbats") or designs for borders and ornaments. But some do provide special symbols or whole character sets of more than ornamental value. *SOURCEBOOK* includes illustrations and listings of many fonts available on commercial disks. Michael Houlberg's home-produced *MACINTOSH TYPEFACES: A REFERENCE GUIDE TO SHAPES, SIZES, AND STYLES* contains samples of nearly all commercial fonts, though more appear on the market each season, and new public domain fonts appear frequently.

The full character sets available for word processing in languages requiring non-Roman alphabets concentrate

on Cyrillic and its relatives, with several alternatives available for Greek as well. Casady Company's two-disk *Fluent Fonts* set include Cyrillic, Polish, Czech, Slovak, and Hebrew (though not right-to-left word processing). Devonian International Software Company offers several disks containing foreign-language fonts. The most useful of them is *Fontagenix Foreign Fonts Edition*, which includes 22 fonts covering Arabic, Aramaic, Armenian, cuneiform, Cyrillic, Czech, Greek (two fonts), Hebrew (two fonts, one classical and one modern cursive, but no right-to-left word processing), hieroglyphics, Hungarian/Turkish/Finnish, IPA, Korean, Laotian, Minoan Linear B, Polish, and Thai. The company plans to release a second disk of foreign-language fonts late in 1986. 21st Century Software's *Ultrafonts Edition Two* offers accents and special characters for Albanian, Czech, Esperanto, Hawaiian, Hungarian, Lithuanian, Polish, Samoan, Turkish and Welsh. Megatherium Enterprises has a *Mac the Linguist 2* disk containing most of the symbols in the International Phonetic Alphabet.

Linguists' Software offers separate disks to fill a number of specialized word processing needs. Their *MacCyrillic* disks uses a standard Russian keyboard layout and includes in addition to Cyrillic the symbols for Byelorussian, Bulgarian, Macedonian, Moldavian, Ossette, Old Rumanian, Serbian, Ukranian, and Yakut, along with assorted Old Slavonic symbols. The same company also offers two disks of Japanese symbols including hiragana, katakana, and some kanji. Other Linguists' Software disks contain Arabic, Korean, Classical Greek, Hebrew, hieroglyphics, phonetics, Semitic, Coptic, Devanagari, and technical-symbol fonts. Their *SuperFrench/German/Spanish* disk contains 41 accents and diacritical marks which, the documentation claims, provide the complete character sets for 77 languages.

Most of these commercial font disks cost approximately \$25 each in the real marketplace (list prices are higher). The typical discounted price for Linguists' Software disks is approximately \$60 apiece. *Indiawrite* has advertised fonts for Hindi, Bengali, Tamil, Sinhala, Gujerati, and Punjabi at \$99 each, and Sanskrit for \$149 (list prices). The April 1986 issue of *MACUSER* briefly reviews a Japanese word processor, *Egword*, which produces either Kanji or Kana output using semi-automatic "translation" into Kanji; the process parallels ideas Becker described in 1984. I have also seen a few advertisements for Macintosh word processing in Arabic and Hebrew (right-to-left) but have neither used the software nor found reviews of it.

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No general directory of materials available from users' groups exists, but much of the freeware on CompuServe and The Source can also be purchased through distribution houses. I have found Educomp to be prompt and efficient; their catalogue describes the contents of disks clearly, including illustrations of fonts. Their *Language Fonts* disk includes Arabic, Coptic, Cyrillic, Greek, International, Isengard (for Tolkien fans), Math-Greek, Moscow, Rehovat (Hebrew), Runes, and Troyes (Hebrew again). The large Macintosh users' groups in Berkeley, Boston, New York and San Diego also maintain substantial freeware libraries, accept memberships from people in other geographic areas, and will mail copies of disks. Club Mac is a national for-profit users' group which provides similar services.

The most prolific source of specialized fonts for word processing is the Macintosh Consortium, created by Apple to encourage academic use of their computer. Recent issues of the Consortium quarterly *WHEELS FOR THE MIND* (edited by Peter Olivieri of Boston College) lists fonts for Armenian, Chinese, Cyrillic, formal logic, Greek, and Polish, most of them available free or in trade for an extra diskette. Consortium members are so prolific in producing specialized fonts that almost anyone needing to do word processing in Greek, Russian, or other East European languages can choose from a variety of fonts designed specifically to meet academic needs. For example, the Boston College Font Project, under the direction of M.J. Connolly, provides an impressive range of fonts for East European languages, old and modern. The inventory offers a choice of Cyrillic and transliteration fonts, proportional and monospaced fonts, and even keyboard maps. The project also offers a complete Greek font, a technical font of mathematical symbols, and fonts designed at Humboldt State University for use with Hupa, Yurok, Karuk, and Tolowa American Indian Languages. All are available on one disk in exchange for two best-quality blank disks, with labels and wrappers. A number of language fonts have been developed at the University of Chicago, among the first of them *SMK GreekKeys*, an excellent adaptation of classical Greek to the Macintosh. Besides two Greek fonts, with complete diacriticals and obsolete letters, designed to complement standard Apple fonts for English, *GreekKeys* includes a MacTerminal document for connecting to the Thesaurus Linguae Graecae. With modem access to a TLG host computer, you can search the TLG corpus for specific passages and see them displayed on the Macintosh in Greek alphabet. After selecting a passage and saving it to a separate file on the TLG host, you can transfer the passage to your Macintosh, switch from the default font to a *GreekKeys* font, and

treat it as a MacWrite document for editing, printing, or saving. Other departments at the University of Chicago have developed fonts called Khmer, Arabic, Akkadian, Armenian, Bombay, Coptic, Cyrillic, Der, Demotic, Devanagari, Gaelic, Harmal, Hebrew, Latinica, Latvian, Moscow, Tamil, Vilne, and Yerkes, as well as an astronomical and scientific symbol font. The Computing Services Center at Wayne State University has also produced a font called Colophon for classical Greek, and a selection of fonts for East European languages. Like the Boston College disk, theirs includes the Hupa, Yurok, Karuk, and Tolowa fonts. David Wyatt at Cornell is developing a number of fonts for Southeast Asian languages.

If you need a whole character set for a non-Roman alphabet, a freeware or commercial product makes sense. But simply having access to the characters is only part of the story. Most obviously, the characters themselves need to be well-formed and easily legible. The resolution of the Macintosh screen makes this criterion easy to satisfy. You should also make sure, especially in languages which use diacritical or inflectional marks of any kind, that a given product includes the necessary marks. For example, in addition to three different tone markings (´ ˘ ˙) classical Greek also requires breathings—symbols (ˊ ˋ) which indicate the presence or absence of aspiration on initial sounds, usually vowels; many Greek forms also use iota subscripts, sometimes in combination with tone and breathing marks. While beginning Greek courses which omit rules for tonal change would find a Greek alphabet without those markings usable, the breathing symbols and iota subscripts are absolutely necessary. Yet at least one Greek font for the Macintosh (the public domain Princeton font) provides tone markings while omitting the breathing symbols. The Symbols font which Apple provides for the LaserWriter is even worse; omitting all Greek diacritical marks, it is useless for any linguistic or literary purpose. Moral: make sure a product really does contain everything your language needs. Some font creators seem to regard diacritical marks as superfluous decoration.

A second point to examine is how the font in question maps its character set onto the keyboard. The various Cyrillic fonts, for instance, do so in several different ways. An ad hoc committee of the American Association of Teachers of Slavic and East European Languages, chaired by Barry Scherr of Dartmouth, recommended in late 1984 several standard keyboard maps, because different microcomputers have different numbers of keys. The 44-key Macintosh is a little pinched for Cyrillic, and Russian fonts from dif-

ferent sources distribute the various characters somewhat differently. Having them wander across the keyboard as you switch fonts would be more than slightly annoying.

The question of how diacritical marks are displayed is also important. In classical Greek, breath and tone markings can occur on the same initial sound, so you must be able to type combinations of marks and have them come out properly placed. Some fonts are unable to handle the microspacing involved in placing multiple diacriticals on a single letter. Others include changes in the system software controlling the keyboard so that groups of accents can be placed appropriately over a single character. The various Apple consortium fonts, being designed for academic use, solve such problems effectively. The *Signifier*, available from Brown University, provides one-time keyboard remapping for Cyrillic and Greek which does not interfere with using the same keyboard to type in English. It includes appropriate fonts as well.

A more subtle consideration is that in acquiring a finished product you must accept someone else's solutions to these problems—often combined with solutions to a number of other problems as well. Equipping a Macintosh to type phonetic and phonemic symbols for linguistics illustrates possible difficulties. Three commercial products—Magatherium's *Mac The Linguist 2*, Linguists' Software's *MacPhonetics*, and Devonian Software's IPA font—address this need, providing a wide range of standard symbols and diacritical markings drawn from the International Phonetic Alphabet. But the IPA is an enormous repository designed for transcribing many languages; in actual work, few linguists or phoneticians are likely to need all its resources at once. And the more complex a keyboard map the software writer has designed, the harder the keyboard map is to learn, and the slower you type. From a developer's point of view, loading the keyboard with as many symbols as possible makes sense; a single product can fulfill many needs. But for the user working at a specific task, less is almost always more. Having quick access to the fifty or sixty symbols you need to work with a given language is much easier than hunting and pecking through ninety percent of the IPA fitted onto one keyboard through tortuous combinations of option and shift keys.

For many purposes, software which allows you to design or adapt character sets for particular tasks is the best solution. The Macintosh software of choice is an inexpensive utility program called *FONTastic*, from Altsys Corporation. With it you can design a font from

scratch to meet almost any need. But the work involved (which requires an elementary knowledge of typography) is repetitive and tedious, with a good bit of trial and error.

Using *FONTastic* to modify an existing Macintosh font to suit your purposes is far more practical; often you can quickly reshape an existing character to meet your desire. Using this approach, I produced in an hour or so the phonemic symbols necessary for tests and handouts in an introductory linguistics course. Through familiar Macintosh procedures, I could easily copy a standard lower case e, for instance, paste it where I wanted it to come up in the keyboard character set, then transform it into a schwa (ə). An o became an open o (ɔ), an i a barred i (i), and so on, each special symbol appearing when I type a logical combination of option, shift, and character keys. The resulting font contains exactly and only the symbols I need, placed on the keyboard where I chose to place them. **WARNING: you should be extremely careful running *FONTastic* under *Switcher*.** Trying to close it inside *Switcher* invariably produces the infamous Macintosh bomb, telling you that your computer just quit. Unless *FONTastic* is the last application closed, your unsaved data in other applications will vanish into byte heaven. Run alone, *FONTastic* behaves impeccably.

My linguistics task illustrates another power of *FONTastic*: the control it gives you over the keyboard placement of symbols. The character grid *FONTastic* uses is a disguised keyboard map, and *FONTastic* includes a font called "Key Map" correlating its grid squares with keystroke combinations. With the Key Map font you can take advantage of all features built into the operating system segment which tells the computer how to read the keyboard (the "keyboard driver"). A commercial product called *MacKeymeleon 1.1* also offers control over the keyboard placement of characters in the standard Apple character set; it comes with fourteen different keyboard layouts to suit various national standards; having been created in Quebec, it also offers menus in French as well as English. Educomp has a freeware disk accessory called *Keyboard* which also allows you to redefine keyboard characters.

If you are interested in completely transforming the Macintosh keyboard, you should realize that none of these products will let you create additional "dead" keys. These are keys, usually for diacritical marks, which do not advance the cursor when pressed. The Macintosh operating system does provide five dead keys (` ~ - ^) but will not operate them in certain

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combinations. In the standard character set, for example, the tilde (~) is available as a dead key symbol by holding down the *option* key and typing an n. If you next release the option key and type another n, the result is ñ. But you cannot type a tilde over any other character. Nor can you type an f, for example, with an acute accent or an umlaut. And so on. The standard Macintosh operating system contains routines which allow dead keys—and as a consequence diacritical markings—only in selected cases. So a great advantage of commercially available fonts such as *Super-French* by Linguists' Software and *Lunaria* on Devonian Software's *Foreign Fonts Edition* is their rewritten keyboard drivers which allow a plethora of dead keys; any *SuperFrench* diacritical can appear over any alphabetic character, so it will give you all the umlauted f's you can use. A less expensive alternative is Paul Rapoport's shareware "International" font, designed to produce Roman alphabet transliterations; Rapoport has modified the keyboard driver to allow for a much greater range of accent and accent combinations than the standard Macintosh character set provides.

The public domain does include several utility programs for changing elements of the Macintosh operating system such as the keyboard driver. Most are imperfect (prone to bombing) and only for the knowledgeable. Even Apple's *Font/DA Mover* (which loads fonts into the operating system and takes them out) sometimes messes up. *Font Manager*, a utility available from Dreams of the Phoenix, seems cleaner and more thorough than *Font/DA Mover*. It also allows you to print font samples using any text passage you choose.

The final design element which makes the Macintosh especially attractive for word processing in non-English character sets is how the machine drives its printer. It treats every print file as a graphics image to be "painted" on paper by the dot matrix printer. Whatever the computer finds on the screen it reproduces on the page. As a result the printer itself need not contain a character set analogous to the font you use on-screen. The price of this great convenience is that the print file for a Macintosh page is quite large. The computer takes ten or fifteen seconds to construct each page's print file, and the files are much too large for a conventional print spooler to handle.

Still, print quality with the Imagerwriter dot matrix printers is good enough for all but the most formal tasks; and the Apple LaserWriter, though very expensive indeed, produces print superior to that of a clean

electric typewriter. But fonts designed for the Imagerwriter (as are all those I've mentioned so far) do not pass directly through to the LaserWriter; they must be translated into special LaserWriter fonts. Fortunately, recent issues of *WHEELS FOR THE MIND* report that Greek and Cyrillic fonts for the LaserWriter are being designed, and Linguists' Software already offers a very attractive LaserGreek font. E.D.O. Communications has recently begun advertising *LaserWorks*, designed to create fonts for the LaserWriter (the company's advertisements have also mentioned *Biword*, an Arabic/English word processor), and Altsys has released a LaserWriter companion to *FONTastic* called *Fontographer* (described in the July, 1986 issue of *MacWorld*). Unfortunately, designing LaserWriter fonts from scratch is extremely demanding. Users of Russian and Greek have a solution: Casady offers a disk of laser fonts which includes Cyrillic, and in late summer 1986 Allotype Typographics began advertising downloadable LaserWriter fonts for classical Greek, scientific symbols, Polish, and modern Greek.

The development of non-English fonts for the LaserWriter is of great interest because the machine works by translating Macintosh text files into *Postscript*, a page description language developed by Adobe Systems of Palo Alto, California. Because the latest models of several Linotype typesetters also read *Postscript* files, it is now possible to go straight from a personal computer screen to a professionally printed page without galley or page proofs intervening. The chain isn't perfect yet, for various reasons, but microcomputers like the Macintosh, which readily display non-standard character sets, combined with output control languages like *Postscript*, promise significantly lower printing costs. For low-circulation books involving high typesetting and proofreading costs because they contain substantial text in foreign languages, the savings to be gained might make the difference between publishing and not publishing.

Three years after the Macintosh was introduced, anyone needing left-to-right word processing with an unusual character set will find it an extremely useful microcomputer. Under competitive pressure, software designers and other microcomputer manufacturers are beginning to emulate some Macintosh features. But Macintosh still offers the easiest way to achieve uncompromised word processing in foreign languages.

The information included in this survey is accurate at the time of writing (September, 1986). By the time of publication it will undoubtedly have decayed. Some products mentioned will have disappeared; others will

have been improved; and new, different products will have come onto the market. I would appreciate hearing from both users and producers about any Macintosh software which facilitates word processing in languages other than English. Since I'm not a polyglot,

evaluative comments from knowledgeable users are especially welcome. If in a year the range of available products has changed significantly, I'll update this survey.

Sources and Items Mentioned

Commercial Software

<i>Egword</i>	Counterpoint Box 1685 Cambridge, Mass. 02138	<i>LaserWorks Biword</i>	E.D.O. Communications 63 Arnold Way West Hartford, Ct. 06119 (203) 233-5850
<i>Fluent Fonts Fluent Laser Fonts</i>	Casady Company Box 223779 Carmel, Ca. 93922 (408) 646-4660 Contains Czech, Cyrillic, Hebrew, Polish, Slovak	<i>MacCyrillic MacKana MacKanji MacKorean MacPhonetics SuperFrench/ German/Spanish SuperGreek SuperHebrew MacArabic</i>	Linguists' Software Box 231 Mount Herman, CA 95041 (408)335-2577
<i>Fontagenics I, II, III Foreign Fonts Edition</i>	Devonian International Software Company Box 2531 Montclair, Ca. 91763	<i>MacKeymeleon 1.1</i>	Avenue Software, Inc. 1173 Charest Blvd. #250 Quebec City, Quebec G1N2C9 Canada 418/682-3088
<i>FONTastic Fontographer</i>	Altsys Corp. Box 865410 Plano, Texas 75086 (214) 596-4970	<i>Mac the Linguist 2</i>	Megatherium Enterprises Box 7000-417 Redondo Beach, CA 90277 (213) 545-5913
<i>Font Manager</i>	Dreams of the Phoenix Box 10273 Jacksonville, Fla. 32247 (904) 396-6952	<i>UltraFonts 1 & 2</i>	21st Century Software 2306 Cortner Avenue Los Angeles, Ca. 90064 (213) 829-4436 Contains Albanian, Czech, Esperanto, Greek, Hawaiian, Hungarian, Lithuanian, Polish, Samoan, Turish, Welsh
<i>GreekKeys 2.3 +</i>	SMK GreekKeys 5760 S. Blackstone Ave. Chicago, Ill. 60637 (312) 947-9157		
<i>Indiawrite</i>	735 West 183rd St. #2A New York, N.Y. 10033 or 24 rue Macarez Valenciennes 593000 France		

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Macintosh Consortium Products

**Boston College
Font Project** Professor M.J. Connolly
Dept. of Slavic & East
European Languages
Boston College
Carney 236
Chestnut Hill, Ma. 02167
(617) 552-3912

**Fonts
(Greek, Cyrillic, Hupa)** Documentation Librarian
Computing Services
Center, Wayne State Univ.
5925 Woodward Avenue
Detroit, Mich. 48202

Fonts William Sterner, Lead
Staff Analyst, Information
Technologies & New Ser-
vices, Computation Center
University of Chicago
1155 East 60th Street
Chicago, Ill. 60637
(312) 962-7172

Hupa fonts Dr. Ruth Bennett, Dir.
Bilingual Emphasis Prog.
Center for Community
Development
Humboldt State University
Graves Annex (No. 30)
Arcata, Ca. 95521

Southeast Asian fonts David Wyatt
Professor of Southeast
Asian History
Cornell University
415 Warren Road
Ithaca, N.Y. 14850
(605) 257-1894

Signifier IRIS
Box 1946
Brown University
Providence, R.I. 02912

Public Domain Software Exchanges

Educomp 2139 Newcastle Avenue
Cardiff, Ca. 92007
(619) 942-3838

**The Public Domain
Exchange** 673 Hermitage Place #1A
San Jose, Ca. 95134
(408) 942-0309

Club Mac 735 Walnut Street
Boulder, Colo. 80302
(303) 449-5533

Berkeley User's Group 1442A Walnut Street,
Suite 153
Berkeley, Ca. 94709
(415) 849-9114

**Boston Computer Society
Macintosh User's Group** 1 Center Plaza
Boston, Mass. 02108
(617) 227-5528

**New York
Mac User Group** Box 6686
Yorkville Station
New York, N.Y. 10128
(212) 535-1943

San Diego User's Group Box 12561
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- Wheels for the Mind*. A quarterly covering work at Apple Consortium colleges and universities. Available at \$12 annually from Apple Computer, Inc., *Wheels for the Mind* 23L, Box 810, Cupertino, Ca. 95015.

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Computers and the Humanities Conference

The Eighth International Conference on Computers and the Humanities, ICCH87, will be held April 9-11, 1987, at the University of South Carolina in Columbia. Sponsored jointly by the University and the Association for Computers and Humanities, the conference has accepted proposed paper-topic abstracts until October 31, 1987. Contact Dr. Robert L. Oakman or Dr. Caroline Eastman, Department of Computer Science, University of South Carolina, Columbia, SC 29208, or call (803) 777-2840.

Computational Linguistic Conference in Denmark

Meeting every two years, the Third Conference of the European Chapter of the Association for Computational Linguistics will take at Copenhagen University, Copenhagen, Denmark, on April 1-3, 1986. Summaries of papers were accepted until November 15, 1986. Proceedings will be published. Contact Bente Maegaard, Institut for Anvendt og Matematisk Lingvistik, Kobenhavs Universitet, Njalsgade 96, DK-2300 Kobenhavn S, Denmark.

Winter Writing Workshop in Florida

The fourth annual CCCC/NCTE Winter Workshop on Teaching Composition to Undergraduates will be held January 5-7, 1987, in Clearwater Beach, Florida. Besides workshops by Toby Fulwiler (Writing Across the Curriculum) and Tori Haring-Smith (Collaborative Learning), Helen J. Schwartz will conduct a workshop on "Computers throughout the Writing Process: Practice and Practicalities." Her discussion groups will be led by Dawn Rodrigues and Michael Spitzer. Registration has been set at \$225.00. Contact 1987 CCCC Winter Workshop, 1111 Kenyon Road, Urbana, IL 61801.

English Microlab Registry

With well over a hundred labs listed, the English Microlab Registry is a database of information about facilities in colleges and universities that use microcomputers to teach composition, business, and technical writing. Its purpose is to facilitate the exchange of information among instructors, administrators, researchers, and hardware and

software vendors. It lists computers, word processing programs, and CAI. Writing Centers, Learning Assistance Centers, Business Communications Labs, Engineering Writing Labs, and labs that are shared with others qualify as "microlabs" as long as they use computers to teach writing. Orders, registrations, and updates are accepted year-round. Custom searches and mailing labels are also available. Subscriptions with index cost \$10.00 per year (2 issues), with no cost for registrations and updates. December 1, 1986, is the deadline for the Fall 1986 registration. Contact Dr. Thomas T. Barker, The English Microlab Registry, 2513 61st Street, Lubbock, TX 79413, or call (806) 793-3351.

Call for Papers in Computational Linguistics

The 25th annual meeting of the Association for Computational Linguistics will be held July 6-9, 1986, at Stanford University. Ten copies of extended abstracts (not more than eight double-spaced pages without references) must be received by January 12, 1987, in a font no smaller than 10 point. Title pages should include titles, author names, complete addresses, five-line summaries, and specifications of topic areas.

Papers in theoretical and applied linguistics might include the following topic areas: ■ phonology ■ morphology ■ the lexicon ■ syntax ■ semantics ■ discourse ■ pragmatics ■ parsing and generation ■ language understanding ■ knowledge representation ■ speech acts and planning ■ language interfaces ■ language acquisition ■ speech analysis and synthesis ■ information and document retrieval ■ computational ■ mathematical, and psychological models ■ programming strategies ■ computer architectures.

Contact Candy Sidner, ACL-87 Program Chair, BBN Laboratories, 10 Moulton Street, Cambridge, MA 02238, or call (617) 497-3566.

Microcomputers in Education Conference

The 7th Annual Microcomputers in Education Conference will take place March 11-13, 1987, at Arizona State University in Tempe. Sessions on word processing, language arts, foreign languages, and thinking skills will also be included. Pre-registration through January, 1987, has been set at \$90.00. Contact Microcomputers in Education, University Conference Services, Arizona State University, Tempe, AZ 85287.

THE PROFESSIONAL WRITER'S WORKSTATION

Bryan Pfaffenberger

A Plethora (Deluge? Surplus? Surfeit?) of Memory-Resident Thesaurus Programs

The thesaurus, a treasury of synonyms, has helped writers out of jams since the remarkable Roget published the first one in 1852. The result of more than four decades of work, Roget's first thesaurus (as well as its direct descendants) is a useful writer's tool. Today's writers, however, need thumb thesaurus pages no longer; the computerized, memory-resident thesaurus has arrived.

The term "memory-resident" means that the program resides in memory along with whatever application program you're using, such as a word processing program. After you type a word whose synonyms you want to see, pressing the memory-resident thesaurus program's "hot" key suspends your word processing program's execution. After consulting its disk-based dictionary, the thesaurus program shows the word's

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synonyms on the screen for your perusal. If you see a synonym that you like, you place the cursor on it, hit another key, and in an instant the original word is erased and the new one appears in its place.

Software companies seem to be convinced that a good market exists for memory-resident thesaurus software; well over a half-dozen products containing a thesaurus are now on the market. Actually, the memory-resident thesaurus is far from new; the first such program--*The Random House Electronic Thesaurus*--dates back to the formative epoch of personal computing, the days of CP/M. It was, however, all but useless. Owing to the constraints imposed by the limited internal memories and disk drives of its day, it included only 5,000 root words and 15,000 synonyms. If you went hunting for synonyms, you'd more than likely come back empty-handed. Even if you did, few synonyms were likely to appear; each root word retrieves, on average, only three synonyms. It was a cute toy, but in the end it amounted to little more than a hint of what was to come.

The first memory-resident thesaurus keeps popping up, however, no doubt because the licensing fee is, as such things go, relatively inexpensive. And so it reappears, for instance, in Borland International's *Turbo Lightning*, a program that blends memory-resident spell checking with the thesaurus features. (The *Word-Perfect* people, to their discredit, have included this rather ancient thesaurus in their otherwise praiseworthy version 4.1.) In its *Turbo Lightning* incarnation, the *Random House Electronic Thesaurus* is the same old wine in a new bottle: it still fails to find synonyms frequently, a limitation dictated by the 5,000-word root dictionary. The *Turbo Lightning* version, however, includes 50,000 synonyms, so if by chance you ask for the synonyms of one of the 5,000 root words, you see more than two or three. Note, however, that Borland's income being what it is, it's probable that a new, expanded version of the program will soon appear that includes many more root words and synonyms.

Turbo Lightning's spelling checker, it should be noted, is easy to love--so long as you don't mind being beeped at. It scrutinizes your spelling as you type words at the keyboard. Should you type a mistake--or, more accurately, type a word that isn't in its dictionary--it beeps at you. At a keystroke, the program uses a remarkably effective search algorithm to retrieve the word's probable correct spelling, and another keystroke inserts the correct word in your document. You can, therefore, correct mistakes as you go, eliminating the often time-consuming routine of run-

ing a spelling checker on your file after you've saved it to disk and quit your word processor. As I have learned from sorry experience, however, this strategy should be used only when pinched for time; you hear the beep often enough so that, after a while, you start to tune it out, and mistakes can get by. It's still a good idea to run an ordinary, non-memory-resident spelling checker on your file even after using *Turbo Lightning*.

The *Random House Reference Set*, another entrant in the thesaurus contest, offers the same Random House thesaurus (5,000 root words and 50,000 synonyms) that *Turbo Lightning* does, but blends it with a spelling checker that works in the normal fashion--that is, it checks your spelling after you've quit your word processing program, not while you're typing. The 83,000 word spelling checker is of exceptional quality. Indeed, those hunting for a good spelling checker could profitably view this program as a way of getting a free introduction to the electronic thesaurus. For those short on RAM, moreover, *Reference Set* gobbles up no more than 45K, compared to *Turbo Lightning's* voracious maximum of 102K. What is more, *Reference Set* currently offers free upgrades to registered users; it's possible that a more useful version of the thesaurus will be forthcoming.

While *Turbo Lightning* and *Reference Set* were busy going head-to-head with what can only be viewed as inadequate thesauruses, two companies--Microlytics, Inc., and Simon and Schuster, the publishing firm, were busily at work on breaking the 5,000 root word barrier. Such efforts were encouraged, to say the least, by the rapid penetration into the PC market of inexpensive hard disks. The hard-disk boom has emboldened software developers to assume at least 10 megabytes as a standard configuration. And that means big dictionaries suddenly become feasible--in the marketing sense, mind you.

The Microlytics entry, *Word Finder*, features 15,000 root words and 220,000 synonyms in a remarkable package that all professional writers will want to consider. One's first reaction to the program is gushing enthusiasm--"At last! The Computer Age has arrived!" Such exclamations, even if effusive, have nonetheless issued from the lips of personages no less distinguished than William F. Buckley, Jr., who stated via electronic mail that *Word Finder* had "changed his life." It may not have changed it in the direction I would have preferred, but there is no discounting *Word Finder's* appeal.

Few are the strokes of *Word Finder's* "hot key" that do not reveal a treasury of synonyms, and it is a treasury indeed. No mere transfer of book-learned synonyms to a jungle of computer code, the *Word Finder* thesaurus should be seen (if there is any justice for us computer freaks) as a distinguished achievement in the annals of the English language. Roget, who himself fiddled around with a mechanical calculator, would not have found a computerized version of his pet project objectionable; on the contrary, he would have loved *Word Finder*. Writers may indeed find themselves utterly seduced by the wit, intelligence, and breadth captured in the synonym lists, which are not parsimonious (cheap, mean greedy, miserly, etc.); usually, there are at least a dozen, if not two dozen or more, synonyms to ponder. Often, so many synonyms appear that they will not fit in *Word Finder's* 11-line window; you'll have to use PgDn and PgUp to see them all.

Yet *Word Finder* poses an even a greater peril. You can get synonyms of synonyms, a feature that the *Word Finder* people call "infinite word exploration." It is, in a word, fun--indeed, for me, *Word Finder* is much more fun than Microsoft's *Flight Simulator*. After all, with *Flight Simulator*, there are only so many airports at which you can land. With *Word Finder's* hot key at your finger instead of a simulated stick, you never know where you'll wind up. You travel endlessly among the pathways of meaning in the English language until, in the end, you find yourself far removed indeed from whatever you were thinking when you started. For some reason (I was thinking, probably, about the evils of the last academic paper I wrote), I got started on "grandiose" and wound up on "periphery." If you wish, you can retrace your steps--up to ten of them. For all this, *Word Finder* takes up only 29K, and using the program is simplicity itself.

Neck and neck with *Word Finder* is Simon and Schuster's entry, *Webster's New World On-Line Thesaurus*, which offers 20,000 root words and 120,000 synonyms--more root words than *Word Finder*, but fewer synonyms. Because the synonyms are automatically cross-referenced, however, the program gives you a grand total of 500,000 replacement alternatives. What all this means in practice is that, although the synonym lists that appear on the screen are not as lengthy or as entertaining as *Word Finder's*, *Webster's New World On-Line Thesaurus* is somewhat less likely to tell you that it can find no synonyms for the word you typed.

Webster's New World On-Line Thesaurus is far and

away the most flexible of the programs reviewed here. Like *Word Finder*, the program includes the infinite word-exploration feature and allows you to retrace your steps. But that's just the beginning. You can display two thesaurus pages on the screen at once. You can also open a note pad page; as you scroll through the thesaurus pages, you can add words to the note pad that you believe might work for you. You can hide all the windows and see your document again, momentarily, just to remind yourself what you're doing. You can retrace your steps back through an infinite word exploration. You can, if you wish, browse through the entire thesaurus. And if you're not happy with the replacement you've made in your document, an undo command restores your original word.

Most readers of this column will, I believe, prefer *Word Finder* or *Webster's New World On-Line Thesaurus*, but you should be aware of one important caveat: memory-resident programs pose no small risk to professional writers. There are no standards for the wilderness of unused memory in your computer, and not all programs behave well on the frontier--particularly if you ask them to co-reside with other memory-resident programs. If you try to load two or more memory-resident programs, you're all but certain experience a monumental system crash, wiping out your work. **Tip: save your document to disk before asking for a synonym.** Those who would prefer to avoid such risks, however, need not despair: thesaurus modules are now finding their way into word processing packages. Since the thesaurus and word processor are designed to work together, there's virtually no risk of system crashes when you go hunting for synonyms. An example of this new direction in word processing is *Webster's New World Writer*, a new "what-you-see-is-what-you-get" package from Simon and Schuster.

Webster's New World Writer is not in the same class as *Microsoft Word* or *Word Perfect*; it does not attempt to offer every word processing feature known to humanity, such as multiple windows, arithmetic functions, and automatic table of contents generation. What it does offer is a host of features that writers need (such as footnotes, macros, and style sheets), coupled with the *Webster's New World On-Line Thesaurus* and the highly respected *Webster's New World Spelling Checker*. The program, in short, isn't a formatter's program; it's a writer's program.

New World Writer is exceptionally easy to use, thanks to a lucid manual and a cunning implementation of context-sensitive, online help. If, when giving a command, you hesitate or pick the wrong option, a window

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opens with a genuinely instructive help message. (You can disable this feature once you've learned the program.) *New World Writer* goes further than any program I've seen in making computer tools available to ordinary people--that is, people who do not want to take time off just to learn how to use a computer.

Readers of this column are, doubtless, power users who eat *Symphony* for breakfast and learn *Nota Bene* in two hours. But keep *Webster's New World Writer* in mind when someone says, "Look. I want to get started in word processing, but I don't want to spend days or weeks learning a difficult program. On the other hand, I want the features that a professional writer needs." For \$150, your neophyte gets a remarkably easy-to-use WYSIWYG word processor, a 120,000 word thesaurus program, and what is arguably the best spelling checker around.

Turbo Lightning 1.0

Borland International; 4585 Scotts Valley Drive; Scotts Valley, CA 95066

Category: Memory-resident thesaurus

List Price: \$79.95

Requires: IBM PC or compatible with 128K RAM, 2 disk drives

Summary: Offers a memory-resident spelling checker that scrutinizes your spelling as you type; can be a timesaver when there's no time to run a spelling checker on a file. The 5,000 root word thesaurus is inadequate.

Random House Reference Set 2.0

330 Townsend Street, Suite 232; San Francisco, CA 94107; (800) 826-2222; (415) 947-1000 (CA)

Category: Memory-resident thesaurus program with non-memory-resident spelling checker

List Price: \$89 (\$69 for dictionary or thesaurus alone)

Requires: IBM PC or compatible with 128K RAM (requires 25K-45K of resident memory)

Summary: Although this program includes the same, limited 5,000 root word thesaurus that Turbo Lightning does, it includes an outstanding non-memory-resident spelling checker.

Word Finder 3.2

Microlytics, Inc.; Techniplex, 300 Main St. East; Rochester, N.Y. 14445; (716) 248-9150

Category: Memory-resident thesaurus

List Price: \$79.95

Requires: IBM PC or compatible with 128K RAM, 2 disk drives

Summary: Superb thesaurus is itself a scholarly achievement; offers 15,000 root words and 220,000 synonyms. Highly recommended.

Webster's New World On-Line Thesaurus

Simon & Schuster Software; Gulf & Western Building; 1 Gulf & Western Plaza; New York, New York 10023; (212) 333-5800

List Price: \$69.95

Requires: IBM PC or compatible with 128K RAM.

Summary: Offers more root words (but fewer synonyms) than *Word Finder*; compensates by offering more commands and flexibility. Highly recommended.

Webster's New World Writer

Simon & Schuster Software; Gulf & Western Building; 1 Gulf & Western Plaza; New York, New York 10023; (212) 333-5800

Category: Integrated word processing/spelling checker/ thesaurus package

List Price: \$150.00

Requires: IBM PC or compatible with 256K RAM

Summary: Although not as full-featured as *Microsoft Word* or *Word Perfect*, this well-conceived program nevertheless offers footnoting, style sheets, a 120,000 word thesaurus, and a fine spelling checker. Exceptionally easy to use and highly recommended for beginners in professional-level word processing.

Contributing Editor **Bryan Pfaffenberger** is a writer and anthropologist who teaches in the Division of Humanities, School of Engineering & Applied Science, University of Virginia. He's the author of numerous articles and books, including *The College Student's Personal Computer Handbook* and *Macintosh for College Students* (both published by Sybex Computer Books). His more recent *The Scholar's Personal Computing Handbook: A Practical Guide*, is available from Little, Brown and Company. Bryan has currently published another text, *Dynamics of Microsoft Word*, in both IBM and Apple Macintosh editions for Dow Jones/Irwin. Comments and dialogue are welcome; contact Bryan at 218 Sunset Ave., Charlottesville, VA 22903.

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The *Newsletter* welcomes article submissions that pertain to word-processing, text-analysis, and research applications in professional writing situations. Also, hardware and software reviews are accepted, but please contact Dr. Jim Schwartz, Hardware/Software Review Editor, **before** submitting them (call Jim at 605-394-1246). Manuscripts either may be submitted as hard copy or on 5¼" diskettes using *WordStar*, *WordStar 2000*, or standard ASCII code. If submitting disks, please make sure they are formatted either in MS-DOS, PC-DOS, or a popular CP/M format (Kaypro, Zenith, etc.) The Editors reserve the right to edit manuscripts, if necessary. If you want your manuscript or diskette returned, please send enough postage to cover the return along with a self-addressed envelope. Address all correspondence to the Editors, *Research in Word Processing Newsletter*, South Dakota School of Mines and Technology, 501 E. St. Joseph, Rapid City, SD 57701-3995. The Editors may also be reached on CompuServe (70177,1154).

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