

RESEARCH IN

WORD PROCESSING

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Cyrillic Word Processing

Alan R. Neibauer and Eugene Chen

1

1987 CCCC Convention Program

7

Bibliography Update

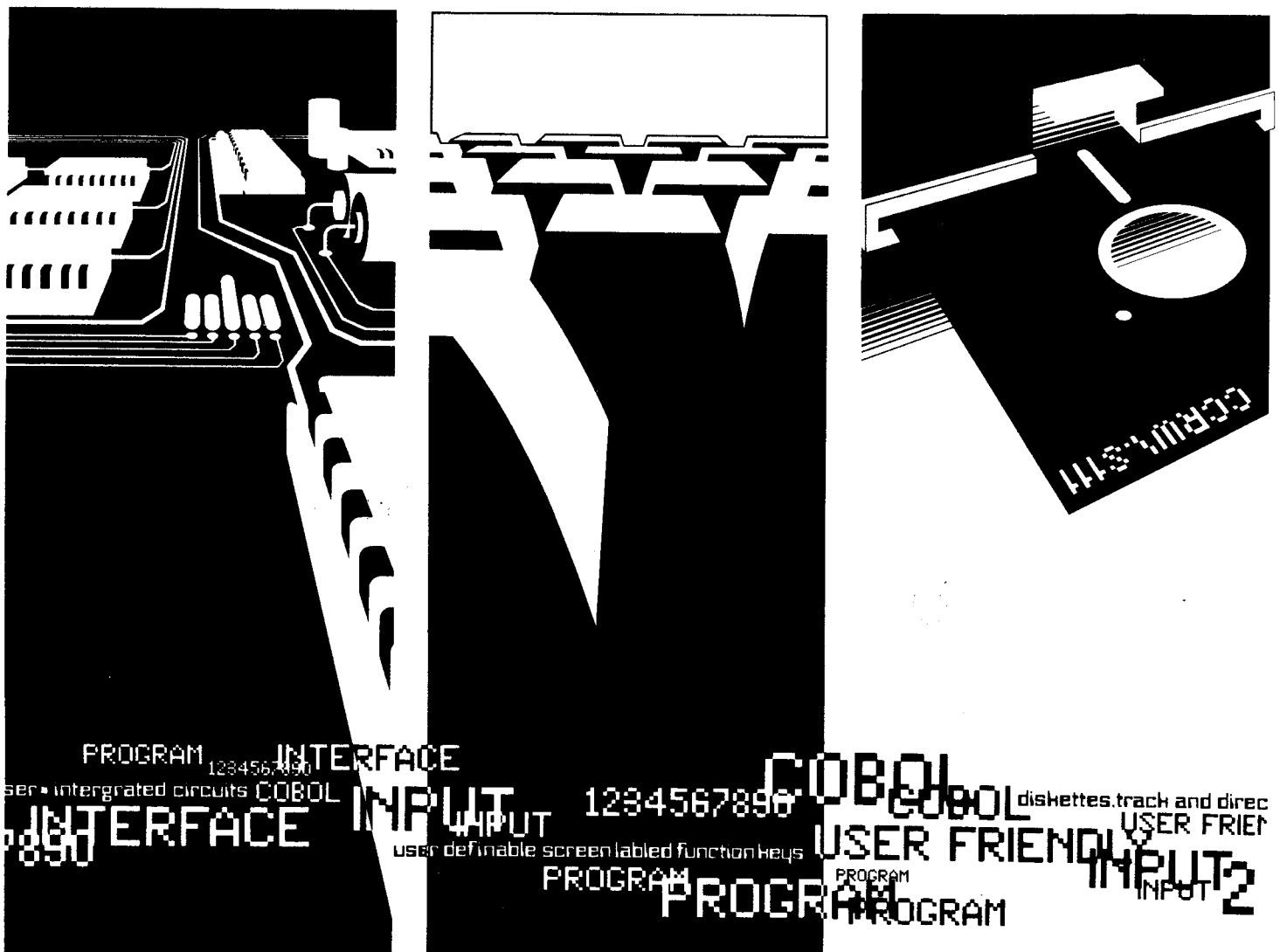
8

By Bradford A. Morgan

The Professional Writer's Workstation

10

By Bryan Pfaffenberger



Cyrillic Word Processing

Alan R. Heibauer and Eugene Chen

Holy Family College has been active in the field of international education, with interdisciplinary curricula combining languages and business administration, as well as in promoting foreign language skills in all professional areas. So we were receptive when we were approached with a rather unique request.

A Russian colleague at another college wanted to prepare documents using the Cyrillic character set. He was familiar with several word processing programs and knew of their abilities to display and print characters in Spanish, French and German. But he had been unable to find any "reasonably priced" software for use as a Russian word processor and wanted to know if such a program could be developed.

His specifications were simple: use existing hardware but be able to both *print* the characters and *display* them on the monitor. Existing hardware included several popular dot matrix printers, and Zenith 148, 158, and 100 16-bit computers. But most important, he wanted a system that could be developed quickly and that when used would not interfere with any "normal" operations of the hardware.

Fortunately, our solution met all of his requirements.

Because the project at first appeared quite complex, we divided the task into four steps:

1. Prepare the display of the characters on the monitor.
2. Design a program to print the corresponding characters on a dot matrix printer.
3. As a test, prepare small batch files for the creation and printing of simple documents, without any editing capabilities.
4. Locate a public domain editor and translate the on-screen prompts and instructions to Russian. Our idea was to use the editor for the creation and editing of the document file, save the file as ASCII text, and use the printing program to prepare the finished document.

To our surprise, divided in this way the project became not only manageable but remarkably simple. First, we decided on the Zenith Z100 computer over the available IBM-compatible models. Instead of hardware determined character sets, those of the Z100 are software selected through a file called ALTCHAR.SYS. When DOS boots, it reads the ALTCHAR.SYS file for the keyboard mapping and the design of the character set. So, for example, by renaming SPANISH.CHR (provided on DOS) as ALTCHAR.SYS, Spanish characters will be displayed and mapped.

The ALTCHAR.SYS file can be modified, or new character files created, using the FONT program supplied with Zenith's MS-DOS 2. FONT provides two main functions. First, you can map the keyboard any way desired. Mapping

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FONT Version 2.21
Copyright(C) 1984, Zenith Data Systems Corporation
KEY MAP EDITOR

```
00 -> 00  01 -> 01  02 -> 02  03 -> 03  04 -> 04  05 -> 05  06 -> 06  07 -> 07
08 -> 08  09 -> 09  0A -> 0A  0B -> 0B  0C -> 0C  0D -> 0D  0E -> 0E  0F -> 0F
10 -> 10  11 -> 11  12 -> 12  13 -> 13  14 -> 14  15 -> 15  16 -> 16  17 -> 17
18 -> 18  19 -> 19  1A -> 1A  1B -> 1B  1C -> 1C  1D -> 1D  1E -> 1E  1F -> 1F
20 -> 20  21 -> 21  22 -> 22  23 -> 23  24 -> 24  25 -> 25  26 -> 26  27 -> 27
28 -> 28  29 -> 29  2A -> 2A  2B -> 2B  2C -> 2C  2D -> 2D  2E -> 2E  2F -> 2F
30 -> 30  31 -> 31  32 -> 32  33 -> 33  34 -> 34  35 -> 35  36 -> 36  37 -> 37
38 -> 38  39 -> 39  3A -> 3A  3B -> 3B  3C -> 3C  3D -> 3D  3E -> 3E  3F -> 3F
40 -> 40  41 -> 41  42 -> 42  43 -> 43  44 -> 44  45 -> 45  46 -> 46  47 -> 47
48 -> 48  49 -> 49  4A -> 4A  4B -> 4B  4C -> 4C  4D -> 4D  4E -> 4E  4F -> 4F
50 -> 50  51 -> 51  52 -> 52  53 -> 53  54 -> 54  55 -> 55  56 -> 56  57 -> 57
58 -> 58  59 -> 59  5A -> 5A  5B -> 5B  5C -> 5C  5D -> 5D  5E -> 5E  5F -> 5F
60 -> 60  61 -> 61  62 -> 62  63 -> 63  64 -> 64  65 -> 65  66 -> 66  67 -> 67
68 -> 68  69 -> 69  6A -> 6A  6B -> 6B  6C -> 6C  6D -> 6D  6E -> 6E  6F -> 6F
70 -> 70  71 -> 71  72 -> 72  73 -> 73  74 -> 74  75 -> 75  76 -> 76  77 -> 77
78 -> 78  79 -> 79  7A -> 7A  7B -> 7B  7C -> 7C  7D -> 7D  7E -> 7E  7F -> 7F
```

F0 RESET F1 PAGE F2 MAP F3 EXIT

Figure 1: The key map editor of Zenith's MS-DOS 2 for the Z100 computer. By changing the mapping, different ASCII codes become associated with the keyboard keys.

associates a specific keyboard key with an ASCII code. For example, pressing the "A" key normally internally stores an ASCII 65. By remapping the keyboard, the ASCII code associated with each keystroke can be changed, such as storing an ASCII 68 when the "A" is pressed. *Figure 1* is the key map editor used by the *FONT* program to change mapping.

Second, you can edit the shape of the actual characters displayed on the screen, without changing the associated ASCII code. Again using *FONT*, for example, you can associate the character "B" with the "A" key on the keyboard. This will result in the character "B" being displayed every time the "A" key is depressed, even though an ASCII 65, which corresponds to the uppercase "A," would still be stored internally.

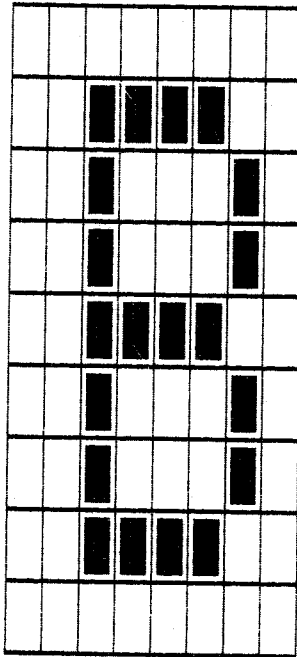
But in addition to linking existing character shapes, the design of new characters can be edited to any figure in a 9-by-8 matrix. The MS-DOS manual gives a very simple example of this process, showing how a slash can be added to the "Z" character. Using the *FONT* program, the character linked with a specific key can be edited to appear as Cyrillic, Japanese, or any character or symbol.

The process involves first designating which key the new character will be associated with, then using *FONT*'s graphic editor to create the character.

Before starting *FONT*, we obtained a layout of the Russian typewriter and the Cyrillic alphabet. Luckily, many of the characters correspond to English ones, although not at the same keyboard location. These characters only had to be associated with their appropriate keys. For example, the Russian keyboard displays the character "B" when the "D" key is pressed. Because "B" is already in the *ALTCHAR.SYS* file, it only has to be linked to the "D" key. *Figure 2* shows the screen used for font editing. On the right are the current character shapes available and the keys they represent. On the left is an editing grid where new characters can be created or existing ones edited. The graphics character set on the bottom is contained in a separate font file linked with the lowercase letters.

Figure 3 shows the same grid after the "B" character is associated with the "D" key. The "B" shape was first transferred into the editing grid then associated, unchanged, with the "D" key. Notice that the character "D" no longer appears in the character set but has been replaced by the "B."

Character Editing Grid



B

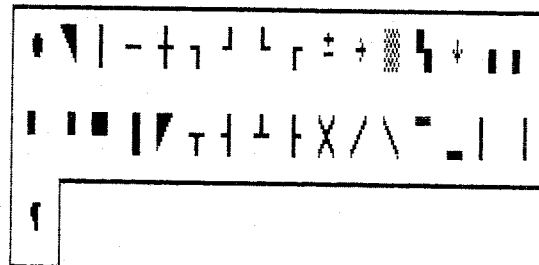
Standard Character Set

```

! " # $ % & ' ( ) * + , - . /
0 1 2 3 4 5 6 7 8 9 : ; < = > ?
@ A B C D E F G H I J K L M N O
      ^
P Q R S T U V W X Y Z [ \ ] ^ _
` a b c d e f g h i j k l m n o
p q r s t u v w x y z { | } ~

```

Graphics Character Set



F0 RESET F1 MODE F2 COPY F3 EXIT

Figure 3: Here the B character has been placed into the editing grid then transferred to the D key keystroke. That is the position of the B character on the Russian keyboard.

ding characters on a dot matrix printer. At first we toyed with the idea of writing our own printer drive. But because time was short, we looked for an inexpensive commercial package that would take care of this for us. We found one in *Fancy Font* [RWPN, March '86].

Fancy Font, a product of SoftCraft, Inc., reads an ASCII text file containing imbedded codes, and prints it using a variety of typefaces, sizes, or symbols. All of the characters are contained in the Hershey database, and they can be loaded as individual character sets as needed. Characters not in the Hershey database can be created using part of the *Fancy Font* package, a program called *EFONT*. But making our task easier is the fact that the Hershey set already includes the Cyrillic characters.

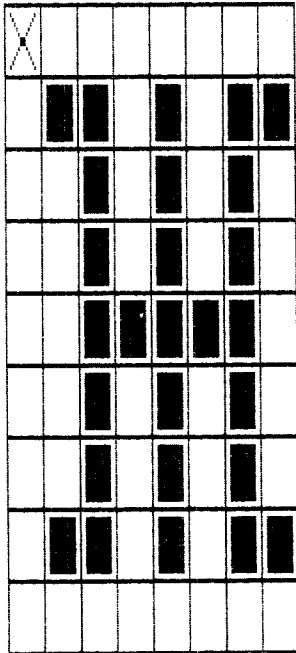
A *Fancy Font* program called *CFONT* allowed us to combine all of the Cyrillic characters from the Hershey set into one subset (we called it *RUSS18*). This file is also mapped to the keyboard. Whatever character we want printed when the "A" key is depressed is mapped to any ASCII 65 in the text file, etc.

Finally, we created two simple batch files. The first (Copy COM: TEXT.FF) allows the creation of a small ASCII file directly from DOS. Because of the new *ALTCHAR.SYS* file, pressing the "A" key would display the corresponding Russian character but still record an ASCII 65 in the file.

The second batch file calls the *Fancy Font PFONT* program that reads the ASCII file and prints the ap-

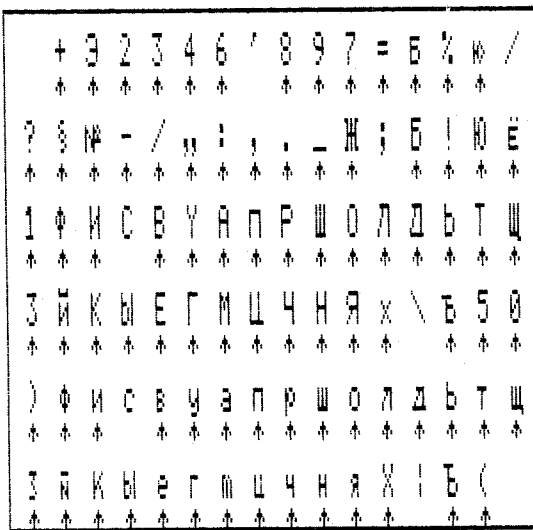
*** Active Mode ***

Character Editing Grid



- F0 RESET
- F1 MODE
- F2 COPY
- F3 EXIT
- F4 BLANK
- F5 FILL

Standard Character Set



Graphics Character Set

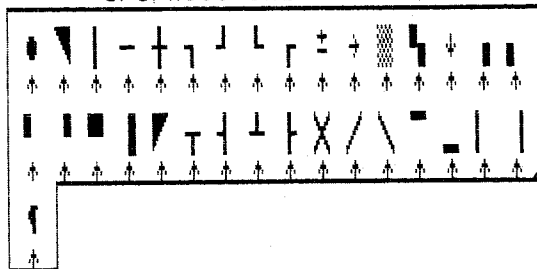


Figure 4: The Cyrillic alphabet has been designed and associated with the corresponding keycaps.

appropriate characters. *PFONT* uses the new font file, *RUSS18*. So, if the file contains an ASCII 65, the correct Russian character—the one displayed on the screen when "A" is pressed—is printed. The batch file calls the *PFONT* program and names the appropriate font and text files:

Pfont C:TEXT.FF + FO RUSS18

TEXT.FF is the ASCII file containing the document, stored in drive C. The command +FO designates that the name of the font file follows, *RUSS18*, approximately an 18-point typeface. Using *CFONT*, the point size can be reduced or expanded.

The initial effort resulted in a very limited Russian composition system. Under DOS, the only editing possible was use of the backspace key before pressing "Return." However, the only limit to document size was disk space, although once lines scrolled out of view there was no way to retrieve them, let alone edit. When the text had been entered, the user presses Ctrl-Z to "copy" the console input to the disk file *TEXT*. We named the batch files *WRITE* and *PRINT*, although these could be translated into the appropriate Russian word and renamed.

Some additional functions were possible using the *EDLIN* editor, also supplied with DOS. Since commands were all single character or control codes, a non-English speaker could easily start *EDLIN*, compose or edit a document and save it before running the *PRINT* batch file. In fact, this is the current state of the project and it is being found quite useful.

Of course, both methods are far from what a "word processor" should be. However, with the screen display and printing problems out of the way, the last step, which we have yet to tackle, doesn't appear too formidable.

We plan to use a public domain word processor where the source code is available, such as in *PASCAL* or *BASIC*. All of the on-screen prompts and commands will be translated into Russian and the code modified to accept these commands. We'll add an additional command that will save the text as an ASCII file and call up the *Fancy Font PFONT* program.

The Russian word processor will then be complete with the on-screen display of Cyrillic characters, the ability to print them, and the capabilities to edit text.

Alan R. Neibauer is the Coordinator of Management Information Systems, and Eugene Chen is a faculty member, at Holy Family College (Torresdale, Philadelphia, PA 19114).

Computers and Humanities Conference in England

The University of Southampton will be the site of a conference on April 10-11, 1987, entitled "Computers and Teaching in the Humanities: Computers, Communication and the Undergraduate." Three questions will provide thematic direction: What aspects of computing are appropriate to undergraduate courses in the Humanities? What should be the underlying principles of teaching computing? and What are the practical considerations in selecting and obtaining hardware and software?

Parallel workshops and guest speakers will represent various disciplines, including philosophy, history, archaeology, literature, art history, music, librarianship, theology, linguistics, classics, and languages. Contact May Katzen, Office for Humanities Communication, University of Leicester, Leicester LE1 7RH, England, or call 0533-544081.

Literary and Linguistic Computing Conference in Sweden

The fourteenth International Association for Literary and Linguistic Computing Conference will be held June 1-5, 1987, at the University of Gothenburg in Sweden. The main theme of the conference will be linguistic databases. Contact Gudrun Magnusdottir or Prof. Sture Allen, Dept. of Computational Linguistics, University of Gothenburg, S-412 98 Gothenburg, Sweden, or call 031-634554.

Call for Papers: Humanities and Technology Conference

The Humanities and Technology Association is calling for papers to be presented at its "INTERFACE '87: Eleventh Annual Humanities and Technology Conference" scheduled for October 22-23, 1987, in Marietta, Georgia, near Atlanta. A wide range of topics dealing with computer applications to text is possible. One-page, single-spaced, camera-ready abstracts are due by May 1, 1987, with the title, author, address, and affiliation centered at the top. Contact Joan McCoy or Rex Recoulley, Department of Humanities and Social Sciences, Southern College of Technology, Marietta, GA 30060, or call (404) 424-7202.

Workshops for English Teachers

Two workshops are scheduled for the summer of 1987 in Houghton, Michigan. Dr. Cynthia Selfe will cover "Computers in Writing-intensive Classrooms" on June 8-19 or June 22-July 3, and Dr. Billie J. Wahlstrom will offer "Research and Evaluation of Computers in Writing Programs" on July 6-17. Each two-week workshop costs \$600.00, not including room and board. Contact Susan Bucheger, Coordinator, Division of Education and Public Services, Michigan Technological University, Houghton, MI 49931, or call (906) 487-2262.

Call for Papers: ADCIS Conference in California

The 29th International Conference of the Association for the Development of Computer-Based Instructional Systems (ADCIS) will meet in Oakland, California, on November 9-12, 1987. In addition to possible pre-session workshops—as well as one, two, or three-hour panel discussions and how-to sessions—most presentations will fall into 20-minute or 40-minute blocks (some with formal papers and some without). Presentations will be sponsored by one of ADCIS's 14 Special Interest Groups. The deadline for all presentation abstracts is March 1, 1987. Presentation forms and information are available from Conference Presentation, ADCIS, 409 Miller Hall, Western Washington University, Bellingham, WA 98225, or call (206) 676-2860.

1987 Conference on College Composition and Communication

The 1987 CCCC Annual Convention will meet in Atlanta, Georgia, on March 18-21, 1987. The following workshops and concurrent sessions deal with computer applications to writing; together, they provide one glimpse of current patterns of interest in the field:

Wednesday, March 18

9:00-5:00

- Preconvention Workshop: — Making the Best Better: Using Computers in the University or College Writing Center (Elray L. Pedersen, Helen J. Schwartz, Cynthia Selfe, Dawn Rodrigues)

Thursday, March 19

10:45-Noon

- Computers and Writing: A Critical Perspective
- Classroom Computer Networks
- Computers and Literacy: Methods and Empowerment

12:30-1:45

- Pre-Writing CAI: Programs, Practice, and Composition Theory
- Computer Technology and the New Literacy

2:15-3:30

- The Politics of Computers and Composition
- Writing Computer Manuals: Research, Issues, and Strategies for Teaching

4:00-5:15

- Three Empirical Studies of the Effects of Word Processing on College Student Writers and Their Writing
- Computers in the Classroom: The Steps toward Literacy

5:30-6:30

- The Fifth C: Computers (Special Interest Group)

Friday, March 20

8:30-9:45

- Applying Computer Technology to the Writing Curriculum
- Uses of Software in the Composition Classroom: Notebook II, the Writer's Plan, and Note Card.

10:15-11:30

- Computer-Based Curricula: Reading and Writing On-Line
- Word Processing, Basic Writing, and English As a Second Language

Noon-1:15

- The Writer's Work: Computer Support for Writing across the Curriculum
- The Voice-Activated typewriter—Word Processing without Keyboarding

1:45-3:00

- Computerized Writing: Issues in the New Literacy
- Developing a Sense of Audience: Computers and the Social Context of Writing

3:30-4:45

- Research on the Effectiveness of Computer Tutors and Word Processing
- Computer Aids to Invention: Limitations and Potentials

5:00-6:30

- Computer-Assisted Instruction for Students with Physical or Learning Disabilities
- The Impact of Computer Labs on Pedagogy

Saturday, March 21

10:00-11:15

- Recent Research on CAI
- Writing and Technology: What Research with Computers Can Tell Us about the Process
- Creating Multi-Literate Students in a Computer-Supported Writing Program
- The Figure on the Screen: Writing, Graphics, and the Computer

11:45-1:00

- Style Analysis Software: Uses and Abuses

1:30-5:30

- Postconvention Workshop (1:30-5:30): — Using Computers to Teach ESL and Basic Skills (Bobby Cummings, Andrew MacDonald, Virginia MacDonald)

Contact 1987 CCCC, 1111 Kenyon Road, Urbana, IL 61801.

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IBM Journal of Research and Development

The January 1988 issue of the *IBM Journal of Research and Development* will have a special issue on natural-language processing. Diverse areas of computational linguistics will be covered, including grammar and style checking as well as document-content analysis by computer. Contact Paul S. Cohen, Associate Editor, *IBM Journal of Research and Development*, 500 Columbus Avenue, TPD-2B71, Thornwood, NY 10594.

Defense Language Institute Foreign Language Center

CALICO '87, a conference covering a broad range of technological applications to language teaching and research, will take place April 6-10, 1987, at the Defense Language Institute Foreign Language Center in Monterey, California. Workshops will include focuses on French and German courseware, authoring languages, word processing in LISP, interactive video, and other applications in computational linguistics and CAI. Registration for the first three days (main conference) is \$60 for CALICO members and \$75 for nonmembers before March 1, 1987 (\$15 more afterwards). Special workshops on the last two days are \$95 each. Contact CALICO, 3078 JKHB, Brigham Young University, Provo, UT 84602, or call (801) 378-7079.

THE PROFESSIONAL WRITER'S WORKSTATION

Integrated Word Processing Software: Has It Arrived?

Bryan Pfaffenberger

Here's my idea of the exemplary writing tool: the green box on your screen is not merely a space in which to write; it's also a gateway to a world of writing accessories, all of which are available at a keystroke: an outlining program (which helps you maintain high standards of document organization), a dictionary (not just a list of words, mind you, but a real dictionary, with definitions), a text-oriented data base manager, a thesaurus, a context-sensitive style guide (now there's a programming challenge for you!), and style analysis software (along the lines of the famed *Writer's Workbench*). What I'm describing is the ideal integrated word processing package—a program that integrates a wide variety of word processing functions and accessories.

Does it exist? Not yet, and it won't until PC users buy CD-ROM drives in great numbers. But I'll wager that it's coming. The technical foundation already exists, and so does most of the software. It's going to be great fun. But there's no need to go into cryogenic suspension until the 21st century to get a taste, at least, of integrated word processing software. Just have a look at version 3.1 of *Microsoft Word*—or, if your budget is more modest, *PC-Type +* and *PC-Style* from the shareware freaks at Jim Button.

Longtime readers of this column know that I have frequently extolled the merits of *Microsoft Word*, with occasional grumblings about its slow speed and confusing command names. (What is a "GALLERY" doing in a word processing program?) The program has improved over time, recently (v. 3.0) with the addition of a superbly integrated outlining function. The newest revision, 3.1, weds *Word's* already imposing list of features with what is arguably the best thesaurus on the market, Microlytic's *Word Finder*. At a keystroke (CONTROL-F6, to be specific), *Word* opens up a fascinating world of 15,000 root words and 220,000 synonyms. As noted in a previous review in these pages (*RWPH*, 4:8 [November, 1986]), the *Word Finder* thesaurus (which was created especially for Microlytics by a talented lexicographer) is itself a scholarly achievement.

Word Finder, of course, is still available as a memory-resident program that works with a wide variety of word processors. So what's the advantage of working it into *Word's* code? Anyone who has used memory-resident software will know the answer to this ques-

tion immediately. To use a memory-resident program is to set sail in an ocean of computerized uncertainty. The world of memory beyond your application program is a world of chaos. The competition among memory-resident programs, if you should be so audacious as to load two or more of them at once, is nasty and brutish, and in consequence the life of your RAM-based work is likely to be short. It's no fun to lose work. *Word's* implementation of *Word Finder* takes all the uncertainty away; embedded as it is in Microsoft's code, the avenues into and out of the thesaurus are sure and certain. What is more, the thesaurus function works faster, and it makes fewer transposition errors when the program erases your root word to make room for a newly-discovered synonym. These are not small matters if the integrity of your text is of professional concern.

On the shareware front, the ButtonWare people have unleashed a new version of *PC-TYPE*, which used to be an easy-to-use (but very simple) word processing program. The new version, *PC-Type +*, is still easy to use (much more so than Quicksort's *PC-Write*), but a wealth of new features have been added, including mail merging; label printing; keyboard macros; a 100,000 word spelling dictionary with on-line, memory-based spelling correction; and many other goodies.

For our purposes here, most appealing of all the new features is *PC-Type +*'s ready interface with *PC-Style*, ButtonWare's style analysis program. *PC-Style* is available as a standalone program and will work with any ASCII text file. It can also be run from within *PC-Type +*, providing style feedback on your text while you're writing it. At 150 words-per-second, it "reads" what you've written, and produces a report showing the number of sentences, the number of words, the average number of words per sentence, the percentage of long words, the percentage of personal words, the percentage of action verbs, the average number of syllables per word, and the readability level (expressed as a grade level). A chart is produced showing the text's performance (ranging from "poor" to "best" on all these indices, and the user can set the parameters to suit varied writing styles.

Not everyone, to be sure, believes that readability analysis is worthwhile—and with good reason. School textbook writers seem to take it so seriously that, in

pursuit of "4th-grade readability," they churn out reams of disjointed prose that lacks logical continuity. Readability analysis can be used effectively only when put into proper perspective. It's only one way to look at your writing—and it's not the most important way. Writing experts agree that the single most important criterion of writing quality is the overall logical coherence of the text. With this point in mind, however, readability statistics such as those provided by *PC-Style* provide writers with tools that can help improve writing quality. They encourage the writer to ask questions such as these: Are some sentences needlessly long? Can I use simpler, more familiar words? Does this writing have punch and vigor? Is it personal or impersonal?

The *PC-Type + /PC-Style* link is useful, loads of fun, and shows the value of the integrated word processing software concept: it's interactive. You can write a paragraph, do an analysis of it, ponder the results, make some changes, and do the analysis again. Readability checkers (including those in *Writer's Workbench*) formerly functioned only in batch-processing mode, which made it difficult to do this "what-if" experimentation with text.

PC-Type + and *PC-Style* will prove of strong interest to educators hoping to work word processing and style analysis into school and college curricula: ButtonWare asks only that an educational institution purchase one registered copy of each program, after which the program disks (but not the documentation) can be freely duplicated for classroom use. I am sure that the many educators who read this column will join with me in giving warm thanks to the ButtonWare folks for their support of educational computing.

Software Factfile

Microsoft Word 3.1

Microsoft Corporation, Box 97017, Redmond, Washington 98073

Category: Full-featured word processing program with integrated outlining and thesaurus

List price: \$450 (widely available via mail order for approximately \$275)

Requires: IBM PC or compatible with 256K RAM, 2 disk drives

Of Interest To: All professional writers

Summary: New version 3.1 includes the superb *Word Finder* thesaurus, which offers 15,000 root words and 220,000 synonyms

PC-Type + 1.0

ButtonWare, Inc., PO Box 5786, Bellevue, WA 98006

Category: Full-featured word processing program with integrated spelling checker and style analysis

List Price: \$69.95 for full registration; toll-free order line, 800JBUTTON

Requires: IBM PC or compatible with 256K RAM, 2 disk drives

Of Interest To: All professional writers; of particular interest to educators

Summary: Easy to use and full-featured word processing program; includes interactive access to *PC-Style*, a style analysis program

PC-Style 1.1

ButtonWare, Inc., PO Box 5786, Bellevue, WA 98006

Category: Style analysis

List Price: \$29.95 for full registration; toll-free order line, 800-JBUTTON

Requires: IBM PC or compatible with 128K RAM, 1 disk drive

Of Interest To: All professional writers; of particular interest to educators

Summary: When used with *PC-Type +*, provides online and interactive style analysis; also available as a standalone program and will work with any ASCII text file.

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 107 Woodstock Drive, Charlottesville, VA 22901.

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