## Scientific Word; TEX à la WYSIWYG

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#### Abstract

A software package for Windows and OS2WIN for inputting mathematical formulas WYSIWYG according to all TEX rules. Internal storage format is a mixture of TEX, LATEX and macros of own design. Mathematical formulas are immediately shown the way they will be printed. Line width for text is limited to the width of the window for ease of use. The built in previewer from TurboTEX shows the whole document layout. There are also dvi drivers included for PostScript, LaserJet, DeskJet and matrixprinters. Pictures can be called just as easy as formulas can be inputted. A description of the philosophy of this pacakge and how to work with it.

### 1 Introduction

SCIENTIFIC WORD is a Windows front-end to  $IAT_EX$ . It is a full document editor, not just an equation editor. The SCIENTIFIC WORD package includes a complete implementation of  $T_EX$  for Windows. If you want the outstanding typeset output provided by  $T_EX$ , but don't want to use the  $T_EX$  language, SCIENTIFIC WORD is the word processor for you.

In SCIENTIFIC WORD, you interact directly with mathematics in familiar form, not with TEX codes. You can create your document at the computer with no intermediate coding step. Making changes and corrections is equally straightforward.



Scientific Word screen at 2x view

<sup>\*</sup>In cooperation with TCI Software Research

#### 1.1 Save Time and Increase Your Productivity

SCIENTIFIC WORD will save you time in five essential ways:

- 1. Time spent entering and correcting TEX codes is "dead time" during which you cannot think about the content of the document itself. By eliminating the coding and by showing mathematics on-screen in familiar form, SCIENTIFIC WORD let's you compose your document directly at the computer.
- 2. SCIENTIFIC WORD eliminates the need to print or preview a document to check that it is correctly coded. A Windows previewer is provided for you to check the final printed appearance.
- 3. Some word processors include an equation editor. While they are fine to type an occasional equation, you waste time going back and forth between the body text and equation frames. With SCIENTIFIC WORD, you enter text and mathematics on one continuous screen so you don't waste time popping in and out of equation boxes.
- 4. By handling all of the spacing, by automatically italicizing mathematics, and by providing intelligent objects like fractions, radicals and matrices, SCI-ENTIFIC WORD saves you the tedious job of hand formatting which often leads to inconsistent results.
- 5. Unlike other Windows word processors which focus on the appearance of text, SCIENTIFIC WORD focuses on the meaning or content. If you've ever been through the process of changing the format of an even moderately sized document with a WYSI-WYG (What You See Is What You Get) system, you'll appreciate that SCIENTIFIC WORD's revolutionary approach has the potential to save you an extraordinary amount of time. The small initial investment in "unlearning" the habits developed for WYSIWYG systems is handsomely rewarded in a very short time. For more details, see the section entitled **Logical Design**.

#### 1.2 Objects

SCIENTIFIC WORD is object-oriented. That means the program deals with familiar objects you understand, such as fractions, matrices, brackets, and radicals. You'll find these objects have specific properties and that they behave intelligently.

For example, the numerator and denominator of a fraction are automatically centered and the fraction bar expands as you type. Brackets and radicals also expand or contract as you enter an expression. Because the objects themselves are intelligent and adjust themselves as you build a complex expression, it makes your job of entering mathematics that much easier.

Furthermore, SCIENTIFIC WORD is an intelligent interpreter of what you type. If you are in mathematics and type cos, the software recognizes it as a function and stores and displays it accordingly. And SCIENTIFIC WORD selects the correct typeface, spacing and placement of limits required by functions as you type.

#### 2 Entering Mathematics—An Example

In the following two tables, we describe two ways you can enter the expression  $\int_a^b \frac{2}{\sqrt{3-5x^2}} dx + 1$  in SCI-ENTIFIC WORD. The first uses the mouse wherever possible and the second uses the keyboard only. In this example, you will see that you add limits to an operator like  $\int$  by applying a subscript and a superscript. An alternative approach taken by other systems is to provide a special icon with the limits already present. This leads to a bewildering array of icons on the screen. The SCIENTIFIC WORD approach uses a much smaller set of icons. Another large reduction in the number of icons comes from the unique feature that the size and position of limits on operators like  $\sum_{n=1}^{\infty}$  to their display form

$$\sum_{n=1}^{\infty}$$

Entering an Integral Using the Mouse	
Action	Result
Click	ſ
Click N <sub>X</sub>	ſ <sub>Φ</sub>

Here are the steps to enter  $\int_a^b \frac{2}{\sqrt{3-5x^2}} dx + 1$  using the mouse.

Action	Result
Type $a$ , click to the right, click <b>N</b> <sup>X</sup>	$\int_a^{\oplus}$
Type $b$ , click to the right, click	¶ ¢
Type 2 and click in the denominator box	₽°₽
Click	$\int_a^b \frac{2}{\sqrt{\Phi}}$
Type $3 - 5x$ , click <b>N</b> <sup>X</sup> type 2, click to the right	$\int_a^b \frac{2}{\sqrt{3 \cdot 5x^2}}$
Type $dx + 1$	$\int_{a}^{b} \frac{2}{\sqrt{3-5x^2}} dx + 1$

Here are the steps to enter the same formula  $\int_a^b \frac{2}{\sqrt{3-5x^2}} dx + 1$  directly from the keyboard.

Entering an Integral Using the Keyboard	
Action	Result
Press <i>ctrl+i</i>	ſ
Press ctrl+l or ctrl+down arrow	∫ <sub>¢</sub>
Type <i>a</i> , press <i>tab</i>	$\int_a^{\oplus}$
Type <i>b</i> , press <i>spacebar</i> , press <i>ctrl+f</i>	」 プa 告
Type 2, press down arrow	J° ₽
Type <i>ctrl+r</i>	$\int_{a}^{b} \frac{2}{\sqrt{\Phi}}$
Type $3 - 5x$ , press <i>ctrl+H</i> , type 2, press <i>end</i>	$\int_a^b \frac{2}{\sqrt{3 \cdot 5a^2}}$
Type $dx + 1$	$\int_a^b \frac{2}{\sqrt{3-5x^2}} dx + 1$

The number of keystrokes is small and follows the same logic as the mouse operations. SCIENTIFIC WORD is designed so that you can get started using the mouse with very little effort. Once you learn the keyboard shortcuts, you can enter text and mathematics very quickly without the mouse.

#### 3 Available Symbols

The available symbols are grouped in seven drop-down panels. The symbol panels drop down from the icon area at the top of the screen:

Scientific Word - BOSTON.TEX
<u>File E</u> dit <u>I</u> nsert ⊻iew <u>T</u> ag Too <u>l</u> s <u>H</u> elp
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
Benchmark 5:
Jerrold E. Marsden, Elementary Classical Analysis, W. H. $\subseteq \subseteq \sqsubseteq \sqsubseteq$ nd Co., 1
974, page 234, proof of Theorem 2.
<i>Proof</i> : Define the function $G: A \subset \mathbb{R}^n \times \mathbb{R}^m \to \mathbb{R}^n \times \mathbb{R}^m$ by $\# = - \# k, F(x, y)$ .
ince F is of class $C^p$ , and the identity mapping is of class $C^{\infty}$ , $\mathbf{i}_{\times} \ge \mathbf{i}_{\times}$ hat G is of
f class $C^p$ . The matrix of partial derivatives of G (Jacobian matrix $\ge > \supset \supseteq$
$\partial F_1$ $\partial F_1$ $\partial F_1$ $\partial F_1$
$\overline{\partial x_1}$ $\cdots$ $\overline{\partial x_n}$ $\overline{\partial y_1}$ $\cdots$ $\overline{\partial y_m}$
$\partial \dot{F}_m$ $\partial \dot{F}_m$ $\partial \dot{F}_m$ $\partial \dot{F}_m$
$\left[\begin{array}{ccc} \overline{\partial x_1} & \cdots & \overline{\partial x_n} & \overline{\partial y_1} & \cdots & \overline{\partial y_m} \end{array}\right]$
•
💶 🛛 🖉 Subsubsection 🖌 💭 🛛 🖓 🔤 👘

The binary relations symbol panel

The panels and their contents are as follows:

#### 3.1 Lowercase Greek

 $\alpha\beta\gamma\delta\epsilon\zeta\eta\theta\vartheta\iota\kappa\lambda\mu\nu\xi\pi\varpi\rho\sigma\varsigma\tau\upsilon\phi\varphi\chi\psi\omega$ 

#### 3.2 Uppercase Greek

 $\Gamma \Delta \Theta \Lambda \Xi \Pi \Sigma \Upsilon \Phi \Psi \Omega$ 

#### **3.3 Binary Operations**

 $\begin{array}{c} \pm \mp \setminus \cdot \times \ast \star \diamond \circ \bullet \div \triangleleft \lor \land \oplus \ominus \otimes \oslash \cap \cup \uplus \sqcap \sqcup \triangleleft \triangleright \wr \\ \bigcirc \bigtriangleup \bigtriangledown \lor \odot \dagger \ddagger \amalg \trianglelefteq \underbar \trianglerighteq \end{array}$ 

#### 3.4 Binary Relations

#### 3.5 Arrows

 $\begin{array}{c} \leftarrow \leftarrow \rightarrow \rightarrow \leftrightarrow \Leftrightarrow \mapsto \leftarrow \leftarrow \leftarrow \rightarrow \uparrow \Uparrow \downarrow \Downarrow \downarrow \leftarrow \leftarrow \rightarrow \rightarrow \\ \leftarrow \rightarrow \leftarrow \rightarrow \leftarrow \rightarrow \rightarrow \rightarrow \Rightarrow \Uparrow \nearrow \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark$ 

#### 3.6 Miscellaneous

 $\dots \dots \vdots \dots f \otimes \hbar \imath j \ell \wp \Re \Im \partial \infty \Box \forall \exists \neg \flat \sharp \mho \prime \emptyset \nabla \sqrt{\top} \bot \| \angle \triangle \diamond \\ \sharp \clubsuit \diamond \heartsuit \blacklozenge$ 

## **3.7** Special Delimiters |||[]⟨⟩

Symbols can also be typed directly from the supplied Greek and symbol keyboards. Alternatively, if you

know the TEX name of a symbol, you can type it directly. For example, to enter  $\alpha$ , you hold down the *ctrl* key and with the key held down, type alpha.

#### 4 Text and Mathematics

SCIENTIFIC WORD treats plain text in much the same way as any other word processor, following the standard Windows conventions for inserting, deleting, selecting, cutting, copying and pasting. To switch from text to mathematics, you click the Math/Text icon at the top of the screen, or press ctrl+m. While you are in mathematics, characters are italicized, functions like sin and cos are recognized automatically, and the spacing is supplied around binary operations and relations like + and =. You can convert any selection to or from mathematics by clicking the Math/Text icon. By default, mathematics is shown in red on the screen. This feature makes it easy to discern and read the mathematics, and also makes clear whether punctuation is or is not part of the mathematics.

#### **5** More Mathematics

The most frequently used mathematical objects are available with a single mouse click. A complete range of objects is available through SCIENTIFIC WORD's dialogs. Here is the operator dialog which gives you the full set of large operators available in  $\mathcal{AMS}$ -TFX.



The Operator dialog

To create a mathematical display, you click the display icon and type the mathematics. Or, you can select the mathematics and click the display icon. A display can be set up so that it is automatically numbered. Displays can be given symbol names so that they can be cross-referenced in the body of the document. When the document is printed, the cross-reference is replaced by the automatically generated equation number.

Complex expressions are easy to create. The process is made even easier by the ability to apply radicals, brackets, fractions, and displays to selections. For example, if you have already typed a large expression and you want to apply brackets to all or part of it, you select that part, then click on the brackets icon.

You enter a matrix by specifying the number of rows and columns. Typing the entries is the same as entering any other mathematics in SCIENTIFIC WORD. You can select rows or columns and delete them. You can left, center, or right align columns, and you can align the entire matrix vertically at its center, at the top row, or at the bottom row. It is a simple matter to insert additional rows or columns in an existing matrix.

The document you are now reading was created with SCIENTIFIC WORD. The following sample expressions were created using the operations discussed above.



 $\begin{pmatrix}
0 & 1 \\
\vdots & \ddots & \vdots & \vdots & \vdots \\
0 & \cdots & 1 & 0 & \cdots & 0 \\
\frac{\partial F_1}{\partial x_1} & \cdots & \frac{\partial F_1}{\partial x_n} & \frac{\partial F_1}{\partial y_1} & \cdots & \frac{\partial F_1}{\partial y_m} \\
\vdots & \vdots & \vdots & \vdots & \vdots \\
\frac{\partial F_m}{\partial x_1} & \cdots & \frac{\partial F_m}{\partial x_n} & \frac{\partial F_m}{\partial y_1} & \cdots & \frac{\partial F_m}{\partial y_m}
\end{pmatrix}$ 

0

0

$$iB_r [\tilde{a}_{kl}^n] \equiv \frac{1}{2} (h_{n-1} + h_n) \int_0^R 2\pi r \, dr \left[\rho_k^{n_*}(r)\right] \frac{d}{dr} \left[\Psi_l^n(r)\right]$$

$$\left[D_{r,kl}^{n}\right]^{-1} \equiv \int_{0}^{R} 2\pi r \, dr \int_{z_{n}-\frac{1}{2}h_{n}-1}^{z_{n}+\frac{1}{2}h_{n}} \left[\rho_{k}^{n^{*}}(r)\right] \left[D^{-1}(r,z)\right] \left[\rho_{l}^{n}(r)\right],$$

$$\psi = -\frac{\kappa \varpi \varpi'}{4\pi} \int_0^{2\pi} \frac{\cos(\theta - \theta')d\theta}{\sqrt{\{(x - x')^2 + \varpi^2 + \varpi'^2 - 2\varpi \varpi' \cos(\theta - \theta')\}}}$$
$$1/f(x) = \frac{1}{c_0} \left[ \frac{1}{1 + \left(\sum_{1}^\infty + \sum_{-\infty}^{-1}\right)\frac{c_n}{c_0}e^{inx}} \right]$$
$$\underbrace{\left\{ \left( \left[ \left\| \sum \right\| \right] \right) \right\}}$$

Dutch TEX Users Group (NTG), P.O. Box 394, 1740 AJ Schagen, The Netherlands

 $\hat{a}\hat{A}\check{a}\check{A}\check{a}\check{A}\check{a}\check{A}\check{a}\dot{A}\dot{a}\dot{A}aA\ddot{a}\ddot{A}\ddot{a}\ddot{A}\bar{a}\bar{A}\vec{a}\vec{A}$ 

$$\tau \stackrel{\text{def}}{=} \frac{\mathbf{R} \cdot (\mathbf{\ddot{R}} \times \mathbf{R})}{\left\| \mathbf{R} \times \mathbf{\ddot{R}} \right\|^2}$$

$$\min_{u \in U} \max_{v \in V} \Phi(u, v) \ge \max_{v \in V} \min_{u \in U} \Phi(u, v)$$

$$\hat{\beta} = \frac{\sum_{i=1}^{m} x_i y_i - n\bar{x}\bar{y}}{\sum_{i=1}^{n} x_i^2 - n\bar{x}^2} = \frac{\sum_{i=1}^{m} x_i y_i - \frac{1}{n} \left(\sum_{i=1}^{m} x_i\right) \left(\sum_{i=1}^{m} y_i\right)}{\sum_{i=1}^{m} x_i^2 - \frac{1}{n} \left(\sum_{i=1}^{m} x_i\right)}$$

#### **6** Fragments

You can select a portion of a document (called a fragment) and save it for later recall. This macro-like feature is useful for creating a library of frequently-used formulas and phrases. To recall a fragment, you place the cursor where you want to insert the fragment, then click on the fragment icon at the bottom of the screen. This pops up a list of fragments to choose from.

#### 7 Document Structuring

SCIENTIFIC WORD provides a direct interface to the document structuring features of IATEX. To create a section heading, you type the text of the heading, select it, then click on Section in the list of sectioning tags which pop up from the bottom of the screen.

Items in lists, theorem statements, and bibliography entries are all created in the same way—by applying the appropriate tag to a selection. Cross-references and citations are entered as special fields.

The components of the document front matter, including the title, abstract, and list of authors, are entered into a separate section of the document. A table of contents is generated automatically by checking an entry in the dialog box which configures the document front matter.

#### 8 T<sub>E</sub>X, IAT<sub>E</sub>X and Scientific Word

As those of you familiar with TEX already know, TEX is the mathematical typesetting system created by Donald Knuth and supported by the American Mathematical Society. It is the acknowledged leader in high-quality scientific typesetting. LATEX is a TEX macro package created by Leslie Lamport. LATEX enhances TEX with document structuring features such as lists, automatic table of contents generation, cross-references, automatic theorem numbering, bibliographies, and tables. The Windows implementation of TEX and LATEX supplied with SCIENTIFIC WORD is called TurboTEX, a product of Kinch Computer Company. By using  $T_EX$  for printing, SCIENTIFIC WORD takes advantage of the many automatic typesetting features available within  $T_EX$ , such as kerning, hyphenation, and automatic sizing, placement, and positioning of mathematics.

Some features of TEX and LATEX are not directly accessible in the first release of SCIENTIFIC WORD but will be added in future releases. These features include tables, footnotes, and marginal notes. To handle these cases in the first release, SCIENTIFIC WORD provides a TEX field for direct entry of LATEX commands. Using TEX fields requires a knowledge of TEX and LATEX. A selection of pre-defined TEX fields for the most common items is supplied in the form of recorded fragments.

Future releases will include a direct interface for entering tables, footnotes and marginal notes so that the user will not be required to use TEX fields to take advantage of these features.

#### 9 Logical Design

The heart of the SCIENTIFIC WORD approach is the separation between content and appearance. The purpose of writing is to convey ideas, so the creative process of forming ideas and putting them into words should be the writer's primary concern. The mechanical process of displaying the document on the printed page in the most readable and organized format is a function of typesetting, not writing, and should not be the writer's primary concern.

SCIENTIFIC WORD's separation of the creative process of writing from the mechanical process of layout is known as *logical design*<sup>1</sup>. Logical design results in greatly increased productivity because the writer is freed from formatting concerns and can focus on creating content. Logical design also leads to better, more consistent typeset results because choices of fonts, spacing, emphasis, and countless other aspects of the document's appearance are made automatically. Before SCIENTIFIC WORD, this approach was only available in batch systems like TEX, LATEX, and production typesetting systems which use markup languages. The unique feature of SCIENTIFIC WORD is that it provides a graphical interface to logical design.

An alternative approach to word processing, called *visual design*, is to make the screen look as close to the printed page as possible. This approach has also been called WYSIWYG for What You See Is What You Get. It is the approach taken by  $T^3$ , Ami Pro, Word for Windows and WordPerfect for Windows.

Why is it important that you understand the difference between logical design and visual design? Because a logical system requires a very different interface from a visual system. If you are familiar with a WYSIWYG

<sup>&</sup>lt;sup>1</sup>This concept of "logical design" vs "visual design" is used by Leslie Lamport in his book, the LATEX User's Guide and Reference Manual.

system, you may at first be surprised by some of the differences:

- WYSIWYG systems divide documents into pages according to their anticipated typeset appearance. To see an entire line, you often have to scroll horizontally because the screen dimensions and page dimensions do not match. In a logical design, working with pages is unnecessary, since the division of a document into pages has no connection with the document's logical structure. Thus, SCIENTIFIC WORD breaks lines to fit the window. If you resize the window, SCIENTIFIC WORD reshapes the text to fit. You never need to scroll horizontally.
- In WYSIWYG systems, you are constantly giving commands which affect the appearance of textyou select text and then select a font, point size, or typeface. You apply alignment commands like center, left justify, and right justify. To center an equation, you select it and choose the center alignment. In SCIENTIFIC WORD, all of these commands are replaced by commands which define the logical structure instead of the appearance. There is no command to center-it is replaced by commands to create a title, to create a section head, and to create a displayed equation. The format of the title, the alignment of section heads, and the alignment of equations, are all determined separately by the print style, which can be changed in an instant. SCI-ENTIFIC WORD comes with a range of pre-defined styles. If none of these fits your needs, TCI will endeavour to create one for you. LATEX style experts can create their own and add them to the list of predefined styles available within SCIENTIFIC WORD.
- In systems that focus on appearance instead of content, pressing the *spacebar* inserts a space that shows on the screen and is duplicated in print. Pressing the *spacebar* a second time inserts a second space. In a logical system like SCIENTIFIC WORD, a space is the separation between words. Pressing the *spacebar* a second time has no meaning, so it has no effect.

SCIENTIFIC WORD's emphasis on logical structure doesn't ignore the fact that documents must still be printed in a readable, organized, and visually pleasing format. SCIENTIFIC WORD provides a variety of article, report, and books styles that you can apply to your document to produce a high-quality, typeset appearance in print. Because you must be able to see how a document will look without actually printing it, SCIENTIFIC WORD provides an on-screen preview feature.

#### 10 Scientific Word File Formats

SCIENTIFIC WORD stores documents as ASCII files in IATEX format. Wherever possible, SCIENTIFIC WORD writes standard IATEX commands. In cases where this is not possible, SCIENTIFIC WORD uses special macros supplied with the system. These include macros for mathematical constructs not directly supported in IATEX, and macros for importing graphics.

Most existing LATEX documents can be read into SCI-ENTIFIC WORD.

SCIENTIFIC WORD imports documents created by  $T^3$ 's T3toTeX converter.

#### **11** Scientific Word's Mathematics

The mathematical objects in SCIENTIFIC WORD are designed to provide the simplest and most natural editing possible. When we read plain text, we deal with whole words at a time. However, the best and most natural text editors deal with individual characters at the lowest level-the cursor moves between the letters of a word and you make changes at the lowest level by inserting or deleting individual characters. Although there are hundreds of thousands of words in the English language, there are only 26 characters and a few punctuation symbols which are the "atoms" of plain text editing. In the same way, SCIENTIFIC WORD provides a small set of mathematical "characters" as the atoms for the two-dimensional structure of familiar mathematical notation. This notation is used to represent thousands of mathematical objects and concepts.

For example, the SCIENTIFIC WORD formula  $\int_{a}^{b} \frac{2}{\sqrt{3-5x^2}} dx + 1$  is a five-element list: an integral operator, a fraction, the word dx, the binary operator +, and the word 1. The integral operator is a template containing the two one-element lists a and b. The fraction is a template containing the one-element list 2 and a one-element list containing a radical. The radical is a template containing a four-element list: the word 3, the binary operator -, the word 5x, and a superscript. The superscript contains the one-element list 2. The atoms are the operator, fraction, radical, and superscript. The cursor moves naturally through this structure, and you can edit it without constraint.

This approach avoids the awkwardness of systems which insist, for example, that operators have a distinct argument component  $(\frac{2}{\sqrt{3-5x^2}}$  in our example), forcing the user to be aware of invisible boundaries. To get around this, the argument region is surrounded by a dotted box on screen, cluttering the screen and making the mathematics unreadable.

Another feature of SCIENTIFIC WORD's objects is that the empty input boxes of templates like operators are suppressed as much as possible, again with the goal of making the mathematics look as natural as possible at all times to enhance readability.

#### 12 Summary

Scientific Word is a Windows based software package that makes it possible that even the non-knowledgeable  $T_EX$ -person can write  $T_EX$  documents! The knowledgeable  $T_EX$ -person can add to the internal storage format his knowledge, either by making small changes or by adding macros or complete style sheets to the many

provided. The price of the package is H.Fl. 2000,-.<sup>2</sup> Further information<sup>3</sup> can be obtained from Technical Marketing Consulting, Gagelweg 3, 4651 VL Steenbergen, phone 01670-64422 and fax 01670-66555.

# A Note added in proof by Kees van der Laan

 $T_{\ensuremath{E}\xspace X}$  à la WYSIWYG does appeal. Like similar systems it suffers from the following general drawbacks.

#### Cost-effectiveness

It is doubtful whether the keyboarding is the most expensive part of (La)TEX-ing, see experience  $\mathcal{A}_{\mathcal{M}}\mathcal{S}$ . Syntactical correction and fine-tuning—that is adaptation of the results to the traditional high-quality proofs—is hard.

#### • Incompleteness

What about graphics? What about tables? What about programmable items? What about general constructs, for example figures, which are reused, slightly modified? And what about real difficult things like commutative diagrams?

#### • Entering vs. correction

What about correcting/adapting an already existing document?

#### • Context dependence

From the example on the first page the integral sign is too small and does not 'know of' the size of the integrand. The systems I have seen lack context awareness.

• Interfacing with other tools

What about inclusion of encapsulated PostScript? What about Metafont prepared graphics à la 'When Metafont and TEX work together?'

• High-Quality?

For high-quality typesetting math explicit kernings and awareness of formula classes are needed. The classical example is ':' as operator or as separator.

Furthermore, the general advice to keep the typesetting as simple as possible is neglected. Confer the example of 1/f(x), and the representation of  $\hat{\beta}$ .

• Formats

What about the role of formats c.q. sty-fyles?

Portability

Can resulting documents easily be exchanged via e-mail?

Remember that this kind of software needs a powerful machine, while elementary processing -plain+know-how can be done on a very modest equipped machine, and is portable.

### **B** Note added by MAPS editor

Up to now, I have the following experience with this product:

- The paper in this issue of the MAPS was originally generated by SCIENTIFIC WORD. Both IATEX files, style files and encapsulated PostScript files were send by author to the editor using diskettes. After a minor correction within the SCIENTIFIC WORD style file, the pictures were included in the MAPS without any problem.
- The main function of SCIENTIFIC WORD is in my opinion the easy generation of mathematics IATEX code, especially for the novice and occasional user. Besides that,

the software could be a first introduction for the use of LATEX, or can be used by the non-LATEX interested (or WordPerfect minded) user community.

• This kind of tools could force the user not to start directly with TEX. As most of my colleagues knows, your MAPS editor strongly discourage the use of *plain* TEX, both by novice and experienced users. The only function of plain TEX should be the construction of building blocks (objects/macros) in order to use these in a logical (con)text environment (IATEX).

In additions to this, A. Al Dhahir forwarded me the following information:

- SCIENTIFIC WORD is based on LATEX, with corresponding restrictions.
- It is not really WYSIWYG. On the screen you see Post-Script ATM fonts (also for mathematics). In the printing or preview mode, CM fonts are used. SCIENTIFIC WORD has an interface with TurboTFX for

SCIENTIFIC WORD has an interface with TurboTEX for windows, and works as a layer between Windows and LATEX of TurboTEX.

• Tables were not used, but they can be expected in a next release.

#### C Note added by author

#### • Cost-effective for the average user

SCIENTIFIC WORD is intended to make it easy for the user to input text and formula's. The resulting document can be fine-tuned within SCIENTIFIC WORD to a large degree. But for the final publication the publisher with its elaborate practical experience can and will fine-tune the document created by SCIENTIFIC WORD anyway.

#### • Incompleteness

Graphics are supported and tables will be fully supported in the next release. General constructs can be stored as keyboard macro's and be recalled.

#### • Entering and correction

A TEX document under SCIENTIFIC WORD is much easier to correct than a document without a WYSIWYG interface. In many instances an existing TEX document can be read into SCIENTIFIC WORD for correction.

#### Context dependence

SCIENTIFIC WORD has full context awareness. Size of subscript and superscript is dependent on the contents like for in-line or display formula's. Due to the limited screen resolution that may not always be visible on the screen but it is there on the print out.

• Interfacing with other tools

SCIENTIFIC WORD does import Encapsulated PostScript files not Metafont files.

#### High Quality

High quality can be accomplished but the average user can and will leave this to the final publisher, see under Cost-effective.

• Formats

SCIENTIFIC WORD is delivered with many style files. With TEX knowledge they can be changed.

• Portability

There is freely available a special utility to 'pack' a SCI-ENTIFIC WORD file into a format suited for e-mail. Obviously it can do the reverse too.

<sup>&</sup>lt;sup>2</sup>Special for NTG members there will be a 25% discount if they order the software before the end of this year. More details about this offer can be found elsewhere in this MAPS.

<sup>&</sup>lt;sup>3</sup>In the next issue of the MAPS, an evaluation of Scientific Word by one of the NTG members, will be published