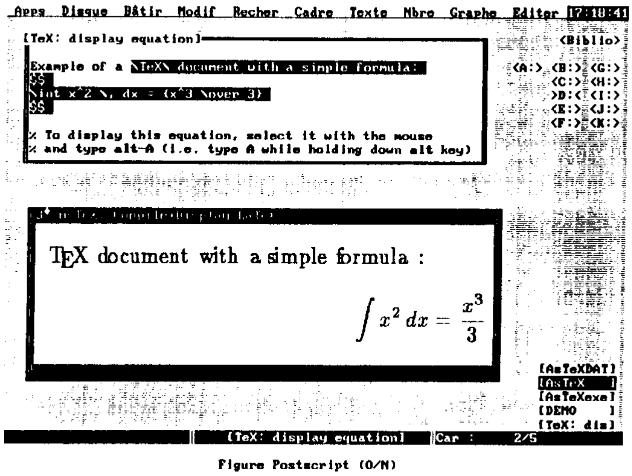

Figure 2: *Mathematical equations written in TEX can be previewed in a window.*

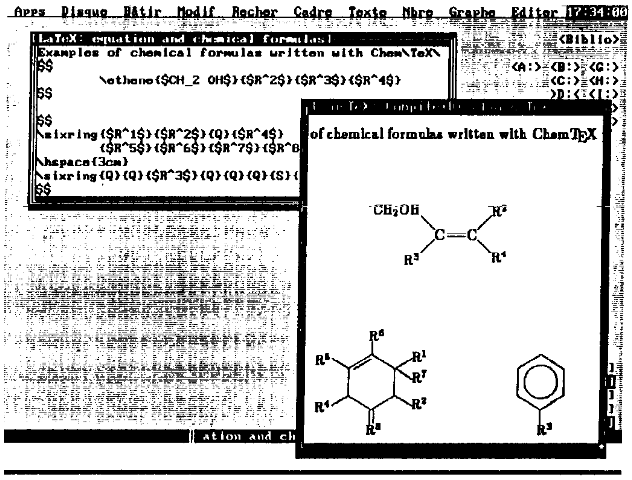

Figure 3: *Chemical formulas written with the ChemTEX package can be previewed as easily as mathematical formulas.*

```
\begin{enumerate}
   \begin{itemize}
      –
   \end{itemize}
\end{enumerate}
```

Transcoding of character attributes of Framework

ASTEX allows to transcode the attributes of characters of Framework (italic, bold, underlined, overstrike, indices and exponents). However, this facility is provided only to automatize the migration of files from Framework format to LATEX format and as an introduction to LATEX commands, for Framework users who are new to TEX. The transcoding is made interactively on the screen, in the subset of selected windows, and it ought to be done once and for all. Version 2 allows to performs the translation for selected, not-necessarily consecutive objects containing texts, worksheets or databases.

Displaying mathematical, chemical and formal equations

With ASTEX, mathematical equations are typed in native LATEX. They can be selected with the mouse or the key arrows and previewed by hitting a single key, in a window that is created automatically (see Fig. 2). Zooming can be done on the formula. In case of space-windowing with Desqview, the window can be moved and resized and the formula can be scrolled in the window with the mouse.

Chemical formulas can also be previewed in a window with a single keystroke (see Fig. 3). More generally, any portion of text can be debugged by selecting it and trying to preview it. A customizable prolog is automatically added, to allow using style files and personal commands defined in the current document.

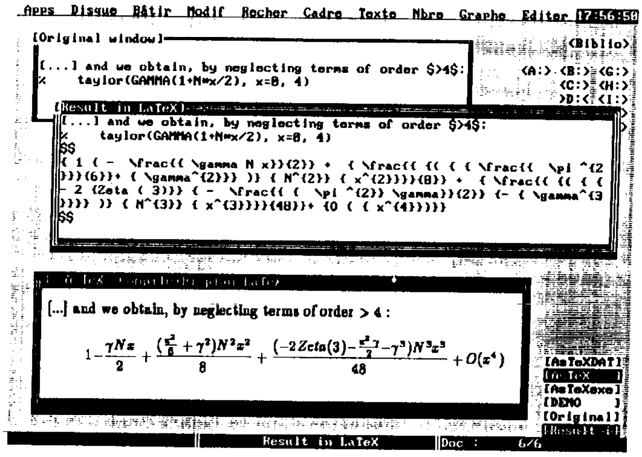

Figure 4: *Results of formal computations with Maple can be included as LATEX formulas in the text.*

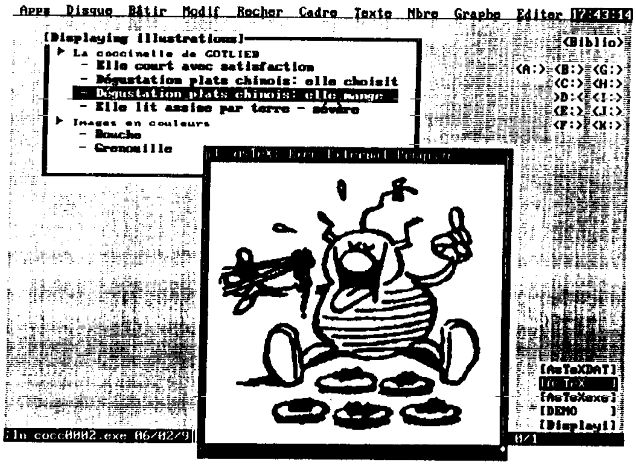

Figure 5: *Archiving and displaying external images.*

Equations written in the computer algebra language Maple can be *computed* and the result *previewed* in a separate window and included in the text as LATEX formulas, with a single keystroke (see Fig. 4).

It can be noted that the way used by AsTEX to preview mathematical formulas is analogous to the one used by Wordperfect 5.1. But Wordperfect uses eqn to describe formulas, which is much less powerful than TEX[7]. Moreover, Wordperfect does not know about chemical formulas nor computer algebra languages: Maple outputs must be retyped manually. This is time-consuming and very much error-prone, especially for long formulas.

5.5 Displaying illustrations and sounds

Internal images are created either with the drawing module of Framework or by a CAD program and imported as CGM files. They can be displayed in a window of Framework, and thus on any PC.

External images (i.e. images stored in any format other than CGM) can be previewed in a window[8] with a single keystroke (cf. Fig. 5).

Images (either internal or external) can be *archived hierarchically.* They can also be archived in databases or hierarchies of databases and displayed or previewed at any time from the document.

Musical sequences can also be archived and played from a document exactly as external images (cf. Fig. 6) and played at any time. Multimedia applications could also be run from a document in the same way, at least in principle (the real problem with multimedia is storage capacity and data compression).

[7] eqn is a system for typesetting mathematics devised by B. Kernigan and L. Cherry for Unix systems. Mathematical expressions are described in the eqn language and translated by the eqn program into troff commands, for final troff formatting.

[8] "Space-windowing" or "Time-windowing" is used, depending on the type of the machine (cf. section "Definitions" above).