

TypeTool[®] 1.3

User Manual

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Introduction

Thank you for purchasing TypeTool - a new product from the creators of FontLab. With TypeTool you can create a new digital font or modify an existing font with easy-to-use but powerful editing tools.

The key features of TypeTool are:

- Outline editors with more than 10 tools and 200-level undo/redo
- Importing and exporting of fonts in TrueType and PostScript Type 1 formats
- Importing and exporting of individual characters in EPS format
- Metric and kerning editing module with customizable autospacing and autokerning features
- Importing and exporting of font metrics files in PFM and AFM format
- Importing metrics from Macintosh Font Suitcases
- Support of multiple encoding tables
- Easy-to-use drag/drop interface
- Popup menus and property panels everywhere
- Sample printing of fonts, sample strings and individual characters

About this Manual

The following chapters describe all of TypeTool's features in full detail. They are organized to cover all the functions in their usual sequence.

Editing Fonts

This chapter explains how to modify fonts, copy characters, change encoding tables, select characters for editing and edit font info fields.

Editing Glyphs

TypeTool includes powerful outline-editing tools that are described in this chapter.

Editing of Font Metrics

If you want to create a professional-looking font, you have to edit the font's metric data. The characters' widths, sidebearings, and kerning can be edited in TypeTool automatically or manually. Read this chapter, and you will become a professional at editing font metrics.

System Requirements

TypeTool requires the following hardware and software configuration:

1. Power Macintosh or Power Macintosh G3/G4 computer
2. At least 16 Mb of the physical RAM
3. Mac OS 8.1 or better

A Note on Intellectual Property

Digital fonts are complex computer programs created with a good deal of hard work by individuals and companies. They are valuable intellectual property and are protected by trademark, copyright, and patent laws. The details and extent of this protection vary in different countries, but the basics are as follows:

Trademark: A font name (and only the name) may be trademarked. Only the trademark owner or licensees may use the name to describe a font.

Copyright: Computer programs are copyrighted. In the U.S.A. this happens automatically as soon as the program is written. Further rights may be secured by registering the copyright.

Patent: Some fonts, if they are distinctive and unusual enough, may be granted a design patent. Only the patent holder or licensees may use this font design.

If you purchase a font and then modify it for your own use you are probably within the bounds of “fair use” and the font licensing agreement. However, if you modify a purchased font and then sell or distribute it you may be in violation of copyright, patent or licensing laws. Please read your font license agreement carefully or contact the licensor to determine your rights and obligations.

Editing Fonts

In this chapter we will discuss the editing of fonts. A font is a collection of characters with similar design and some header information. The information includes font identification names, copyright data, character encoding information and other data that is necessary for font usage.

Opening Fonts

You can use TypeTool to create new fonts or to modify existing ones. To modify an existing font you must open the font in TypeTool. Be sure that this does not violate copyright laws. Carefully read the license agreement that comes with every font.

To open the font for editing, select the **Open Font** command in the **File** menu. If you have not saved a modified font, TypeTool will prompt you to do so. If the Font Window is active, the **Open Font** command appears directly in the **File** menu. If another window is active, Open Font will be located in the **Font** submenu of the **File** menu.

Another way to open a font is to press the  button on the **Standard** toolbar of TypeTool.

You will see the standard Mac OS Open File dialog box where you can select a font file to open. (Note that in this dialog box you will see all the fonts that can be imported: TrueType (TTF), Type 1 in binary (PFB) and ASCII form (PFA) for Macintosh and Windows and fonts in FontLab format (VFB)). If you want to list only fonts in a particular format, select the format in the combo box located at the bottom of the **Open** dialog box.

➤ **Note:** You can open fonts located in the Fonts folder in the system folder of your Macintosh, but it is not recommended. It's better to make a copy of font files to another folder and open the fonts from there. As an alternative you can simply drag-drop the font files onto the TypeTool icon.

Font Opening Options

You can customize font importing parameters for TrueType fonts in the Import/Export page of the Preferences dialog box:



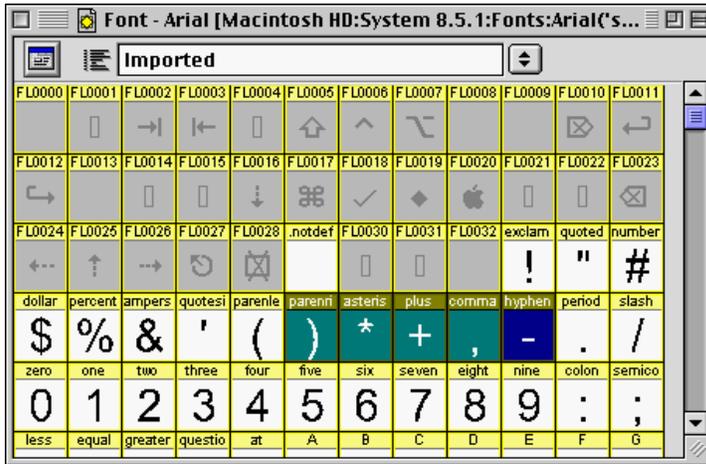
There is only one option controlling the import of TrueType fonts:

Autohint imported font If this option is switched on, TypeTool's autohinting algorithm will try to automatically generate Type 1 hints while importing the TrueType font.

Font Window

The Font Window is used to display an entire font. You can open the Font Window by selecting the **Font** command in the **Window** menu.

The Font Window opens automatically when you open existing fonts for editing.



The Font Window consists of the header, which includes a little toolbar and combo box (used to choose one of the available encodings), and a table of characters, where each character is represented by a single cell:



Each cell has a caption showing the name of the character or its code in various forms, from a decimal to an octal number.

The characters' cells may have a gray or white background and a white or yellow caption.

A gray cell means that there is no character in this place in the font. Instead of the character, a sample template character from one of the system fonts is shown in the empty cell. You can select a font for the templates or switch off the templates using the Font Window page in the **Preferences** dialog box.

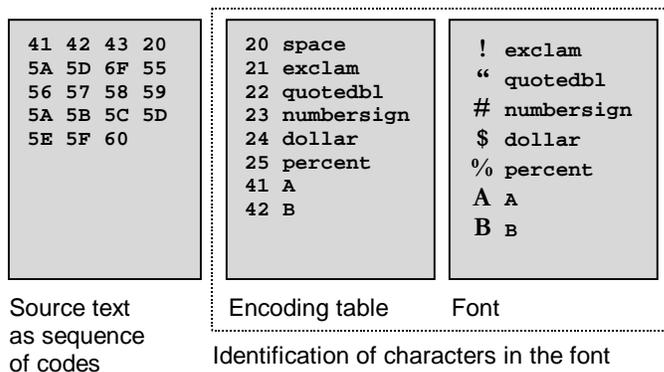
A yellow frame and caption in the character's cell means that this character is in the top 256-character range. Characters whose codes are above 256 have a gray caption and no yellow frame.

Encoding Vectors

A font is a collection of characters that have a common design. Each font has a header that stores top-level information, such as the font name and style, in an organized way. To let a program have direct access to characters, each character has unique identifiers. In most fonts, the identifiers are names.

Because accessing characters by names is a very time consuming operation, a more simple identification is used – codes. With codes you can directly select the characters in a font. To transform character codes into the names that must be used to actually select characters, a special table exists called the Encoding Table.

The Encoding Table declares references between character codes and names. The table is loaded and stays stored in memory while the font is used. The character selection processing consists of two parts:



The Encoding Table can also add more flexibility to fonts. Only 256 characters of a font may be used at a time, because in most operating systems only 256 characters may be accessible. You can put many more characters into one font, assign a unique name, and supply several encoding tables that will allow you to select different characters of that font.

For example, in symbol fonts the Greek characters take places that are usually occupied by Latin characters. With the encoding tables, you can include both characters. Just assign the correct names (like **alpha** for the ‘α’ character and **A** for the ‘A’ character) and later you can choose the symbol encoding to work with the Greek version of your font or choose Roman encoding to use the Latin characters.

In TypeTool you can include any number of characters into a font. You can also select any of the predefined encodings to examine a font and then include it as the default encoding upon export.

To select the encoding for the font, use the **Encoding** combo box. When you open it you will see the following available encodings:

Imported	The encoding that was loaded with an imported font.
Default	The default encoding for all the applications in the FontLab family. This provides the best support for Windows.
Adobe Standard	Adobe Standard Encoding. This is useful if you want to create a PostScript font.
ISO Latin 1	Adobe ISO Latin 1 standard encoding.
Macintosh	Standard encoding for the Macintosh computers. This encoding is the default for the Macintosh version of TypeTool.
Adobe Cyrillic	Standard encoding for supporting Cyrillic characters on PostScript printers and in Windows.
Macintosh Cyrillic	Standard encoding for supporting Cyrillic characters on Macintosh computers.
Symbol	Standard encoding for supporting fonts that include mathematical and other characters.
ANSI	Standard encoding used in Windows.

All encodings that you select are stored in text files that can be edited in any text processor. This is not recommended, but may help if you find that our standard encodings do not work for you.

If you want to define a non-standard encoding, this can be done by saving this file in a TypeTool directory:

To create custom encoding files:

1. Copy the .enc file located in the TypeTool directory to use it as base for your encoding file.
2. Open the copied file in any text editor (SimpleText will do) and then edit it, following the same structure that you found in the original file.
3. Change the name of the encoding in the first line of the file.
4. Save this encoding file with the different name but be sure to use the .enc file extension. Put this file into a directory where all the other .enc files are located.

The new encoding will appear in the **Encoding selection** combo box the next time TypeTool is used.

Using the Font Window

The character chart in the Font Window is a visual representation of all the characters in the font. To modify the font you have to learn how to use the character chart: navigate, select characters and select commands.

Navigating

To move to different places in the font chart you can either use the vertical scroll bar or the autoscroll mode. If you place the mouse anywhere in the chart, press the mouse button and move the mouse cursor above the top or bottom of the chart. It will scroll up or down accordingly.

alternative:

You can use the keyboard keys to navigate in the font chart.

Arrow keys	Moves the current character mark one cell right, left, up or down, according to the key used
Cmd+Right arrow	Moves 2 cells right
Cmd+Left arrow	Moves 2 cells left
Page Up and Page Down	Moves the character mark one screen up or down
Home	Moves the character mark to the leftmost character on the current row
End	Moves the character mark to the rightmost character on the current row
Cmd+Home	Moves the character mark to the first character on the chart
Cmd+End	Moves the character mark to the last character on the chart

Selecting

To select one or more cells, press the mouse button on the first or last cell of your selection and drag the mouse. You will see the selection highlighted. If you drag the mouse cursor outside the visible part of the chart, it will scroll accordingly. To cancel your selection, click the mouse button on the gray area between the rightmost cell and the scroll bar.

alternative:

Using the navigating keys on the keyboard, set the current cell marker on the first (or last) cell of a selection, then press the **SHIFT** key. Move the current cell marker and select the cells.

Popup Menus

Most commands available in the Font Window can be selected from the popup menu.

To open the popup menu, press the **CTRL** key and click the mouse button anywhere in the chart area.

Here is a sample of the popup menu that you will see in the Font Window:



As you can see, the commands in this menu duplicate the commands from other menus, but in the popup menu they are concentrated and may be instantly used.

Moving Characters in the Font Window

You can change the positions of characters in the font chart and move them to a new place.

To move characters in the font chart:

1. Select the characters that you want to move.
2. Position the mouse cursor on the selected characters.
3. Press the mouse button.
4. Drag the characters to the new place. Release the button to finish moving.

If you move characters over existing characters, you will see a dialog box prompting you to replace the existing characters or save them by moving them to the end of the encoding:



Leave the **Keep replaced symbols under new names** checked to save characters or clear it to replace them.

Deleting Characters

To remove characters from the font

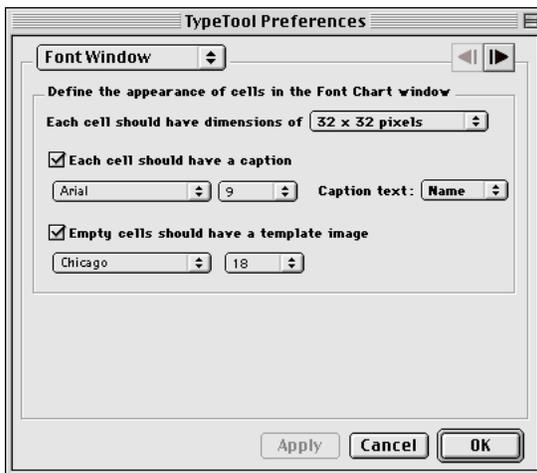
1. Select the characters that you want to remove.
2. Select the **Delete** command from the **Edit** menu or from the popup menu. Or, press the **BACKSPACE** key on the keyboard.
3. A dialog box appears asking you if you are sure that you want to delete.

➔ **Note:** Deleting characters from the font is not undoable, so save your work before deleting characters.

Customizing a Font Window

To change the look of the chart section of the Font Window, use the Preferences dialog box:

1. Select the **Preferences** command in the **Edit** menu.
2. Switch to the **Font Window** page:



Select the desired size of each character cell in the popup menu. Possible sizes vary from 16x16 up to 64x64 pixels. Smaller cells occupy less space but hide details.

Use the check boxes to switch on or off the cell captions and the template in the empty cells. Use the font and size popup menus to select the fonts that appear in the caption and as templates in the empty cells.

Use the **Caption text** popup menu to select the type of information that appears in the caption of the cell. You can select Name, several types of code representation, and ANSI characters to show a character from the caption font. All cells that are above the 256 character limit will have a decimal code in their captions.

Editing Font Info Fields

Every font may be recognized at one of three levels: as a common information unit, as a collection of characters, or as a collection of mathematically determined outlines. The Font Window lets you modify fonts at the second level. The Glyph Window discussed below handles the third level. To edit fonts at the first level, you use the Font Info dialog box.

Font Info is a collection of information that defines a font. The best example of this information is the Font Name (the text string that you see in font menus and font selection dialog boxes). Font Info data also includes the typeface (or font family) name, copyright information and other registration data.

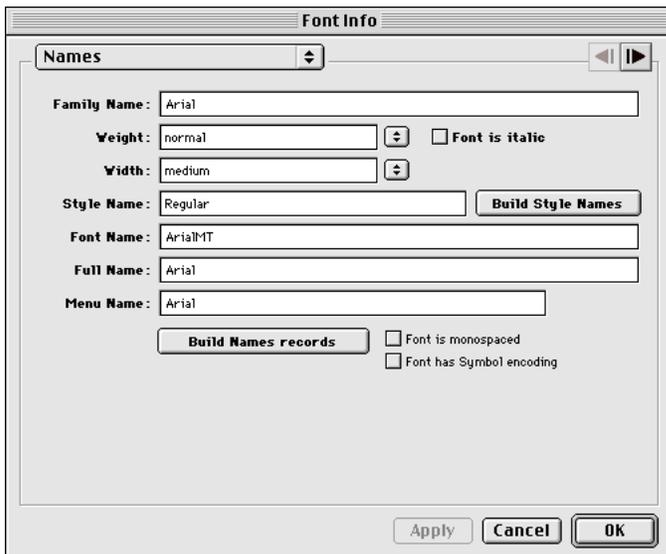
When you create a new font, you must review the Font Info and enter the proper values into all fields.

If you use TypeTool to modify an existing font, you may want to change some Font Info data fields so that the modified font will not replace the original one.

To open the Font Info dialog box you must select the **Font Info** command in the **File** menu. As with all other font related commands, this command is located directly in the **File** menu if the Font Window is active, or in the **Font** submenu if another window is active.

The Font Info dialog box can also be opened by pressing on the  button located in the Font Window toolbar.

The Font Info dialog box looks like this:



and includes four pages: **Names**, **Copyright**, **Version & Identification** and **Vertical Metrics**. All the pages are important, but the **Names** page contains the most critical information.

Names Page

The names page includes the most important font-registration information. All programs use the information on this page to refer to a font. Be sure to enter all the values very carefully and use the automatic features where available.

Family Name	Name of the typeface to which the font belongs. All fonts that are from the same typeface must have the same Family Name field. The Family Name is used as the root of the Font Name, so we recommend that you fill this field first.
Weight	Weight of the font. You may enter a custom value in this field or select one of the predefined weight names in the box. Values in this list are sorted by increased weight value. Choose Normal or leave this field empty if you do not care about the font's weight.
Width	The average width of the font's characters. Enter a custom value or select one of the predefined width values from the drop-down list. Leave this field empty or select Normal width if you don't care about the font's width.
Font is Italic	Check this check box if you are creating an italic font.
Build Style Name	Press this button to automatically generate the Style Name field. Style names are based on the Width, Weight and Italic information.
Style Name	Contains complete style information about the font. We recommend that you fill in the Weight, Width and Italic data, to automatically generate this field using the Build Style Name button and edit this field if necessary.
Font Name	Complete font name. This name will appear in the font selection menu and dialog boxes of applications which use fonts. Do not include spaces.
Full Name	More detailed font name. May include spaces as well as any other characters.
Build Names Records	Press this button to automatically generate the Font Name and Full Name fields. If you are creating a new font, we recommend that you fill in the Family Name field, generate or manually fill in the Style Name field and press this button to create the Font and Full names. If necessary you can edit the names.
Font is monospaced	Check this check box if you are creating a monospaced font.
Font has Symbol encoding	Check this check box if you are creating a font with the Symbol encoding.

Copyright Page

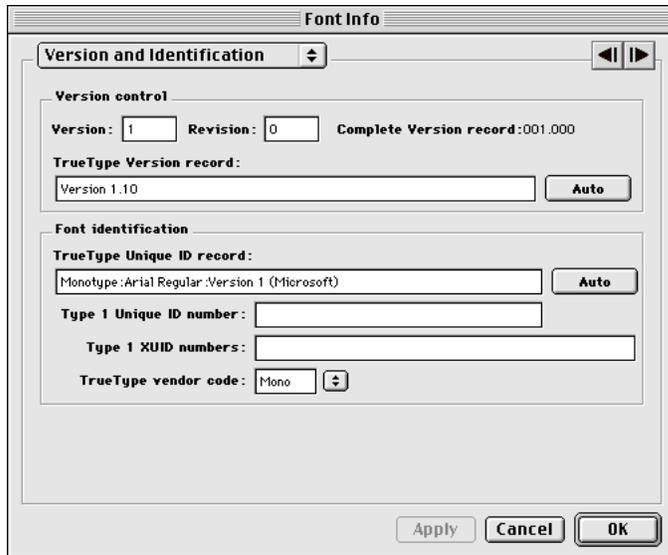
On this page you can enter information about the creators of the font. If you have created a new font, you should enter your copyright notice here. If you have edited an existing font that was not your creation, you must not change the information contained on this page, or you may violate copyright laws:

The screenshot shows the 'Font Info' dialog box with the 'Copyright' tab selected. The 'Created by' field is filled with 'The Monotype Corporation plc'. The 'Creation year' field is filled with '1920'. The 'Copyright' field contains the text: 'Typeface © The Monotype Corporation plc. Data © The Monotype Corporation plc/Type Solutions Inc. 1990-1992. All Rights Reserved'. Below this field is a button labeled 'Build Copyright and Trademark records'. The 'Notice' field is empty. At the bottom of the dialog are 'Apply', 'Cancel', and 'OK' buttons.

- | | |
|---|---|
| Created by | Name of the company that created the font. If you create a new font enter your name or the name of your company here. |
| Creation year | Year when font was created. |
| Copyright | Copyright message. Must include (c) sign or “Copyright” word, name of company that owns the copyright and copyright year. |
| Build Copyright and Trademark Record | Press this button to create the standard Copyright record based on Created By and Creation Year fields. |
| Notice | Additional information that you want to include into Font Info. |

Version & Identification Page

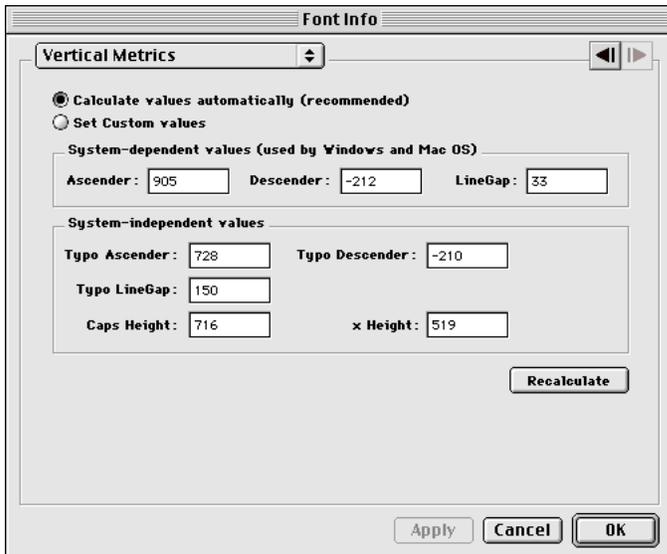
On this page you can enter information about the font’s version and sub-version. Also enter the special identification codes necessary for programs that will use this font to distinguish it from other fonts.



Version	Version of the font.
Revision	Revision of the font. Version and revision numbers are combined and build a complete version record that appears in the Type 1 fonts’ headers.
TrueType Version Record	TrueType fonts’ version records have a different format. You may enter the TrueType version record here or just press the Recalc button at the right of the field to fill this record automatically. You must have the Names and Copyright pages filled to use the automatic features on this page. Press the Apply button at the bottom of the dialog box to enter new Font Info values into the font’s header.
TrueType Unique ID Record	This field is necessary to identify TrueType fonts. Usually it includes the creator’s name, family name and creation year. The format of this field is free, but we recommend that you use the Recalc button to fill this field automatically.
Type 1 Unique ID Record	Integer number identifying the font. Unique ID numbers must be registered with Adobe Systems. However, you may leave 0 in this field or enter a value from the users Unique ID zone that varies from 4000000 to 4999999. If you enter this value and plan to export Type 1 fonts, be sure not to have more than one font with the same Unique ID value because that may cause a problem with PostScript printers or Adobe Type Manager software.
Type 1 XUID Numbers	More advanced identification codes for Type 1 fonts. This number may be used only in PostScript Level 2 printers. Please, refer to Adobe documentation for more information concerning the XUID field.
TrueType Vendor Code	Up to a four letter length code that is assigned to most TrueType producers to identify their fonts. An <i>uppercase</i> vendor code must be registered with Microsoft or Apple. All registered Vendor codes known at the time of TypeTool’s release are placed in the drop-down list box. If you want to identify yourself without registering you may enter a <i>lowercase</i> four-letter vendor code.

Vertical Metrics Page

This page is used to customize values that define vertical alignment of text lines.



Switch on the “Calculate values automatically” option to get TypeTool to automatically calculate optimal values for all fields. If you want to manually set all values, switch on the Set custom values option.

Refer to the TrueType specification (<http://www.microsoft.com/typography/OTSPEC/os2.htm>) for detailed descriptions of all the fields.

You can press the Recalculate button to automatically calculate all values and later customize them.

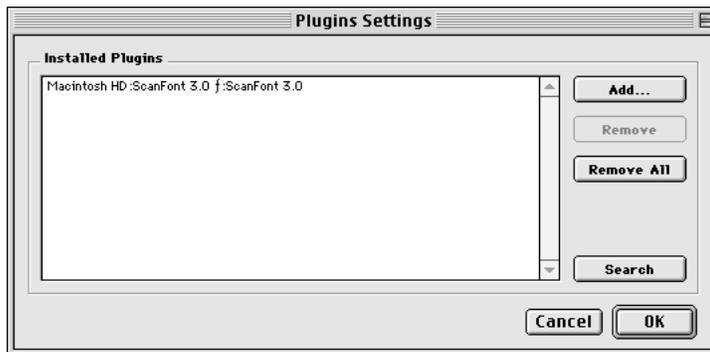
Using Plugins

TypeTool, as a FontLab family application for Macintosh, can use a special *plugin interface* that allows you to extend TypeTool's features with separate programs. For example, with the ScanFont plugin you can convert images of characters into outline fonts.

To use any of the FontLab plugins you need to install them on your computer and “connect” them to TypeTool.

To connect the FontLab plugin to TypeTool:

1. Select the **Settings...** command from the **Plugins** submenu of the **File** menu. A dialog box appears:



2. To add the installed plugin, press the **Add** button and select the plugin's application file in the standard File Open dialog box.
4. Use the **Search** button to search your hard disk for all available FontLab plugins.

To remove one of the plugins, select it in the **Installed Plugins** list and press the **Remove** button.

To remove all plugins use the **Remove All** button.

To run a plugin select its name from the **Plugins** submenu of the **File** menu.

Saving Fonts

When you have finished working on your font or want to save intermediate results, you must save your font.

To save font as a FontLab (VFB) file you may use the **Save Font** command in the **File** menu. If a window other than the Font Window is active, you will find this command located in the **Font** submenu of the **File** menu.

FontLab format can be opened and saved instantly. It also stores much more information than any of the standard formats.

To save the font under a different name you must use the **Save Font As** command located in the **File** menu. When you select this command, the standard Mac OS Save As dialog box appears. Enter the file name and select the directory where you want to save your font.

To save the font in a Macintosh Type 1 or True Type format you may use the **Build Suitcase** command in the **File** menu.

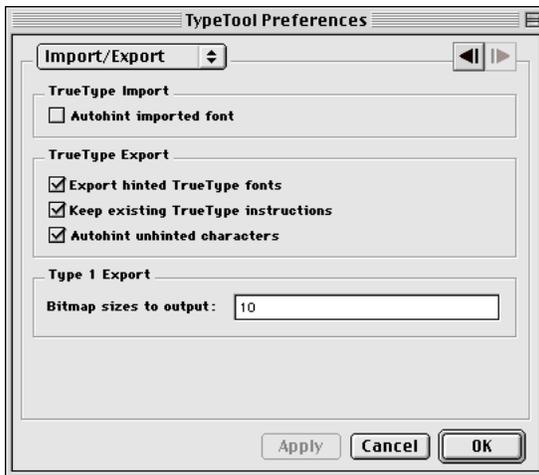
Available export formats are:

FontLab 3.0 (vfb)	FontLab font format - fastest format available. Fonts in this format may be opened by any application in the FontLab 3.0 family.
Macintosh Type 1	Type 1 font format.
Macintosh TrueType	TrueType font format.

- **Note:** TypeTool has a unique feature called “Transparent TrueType Export”. This feature stores all the important TrueType information when a TrueType font is opened in TypeTool and restores it when it is exported in TrueType format. “Transparent” means that the characters that were not edited in TypeTool are completely unchanged after export. All the internal information (called instructions or hinting data) remains unchanged. This additional data is stored if you save your font in the FontLab format, but it will be lost if you export the font in Type 1 format. In addition, touching any portion of any character in the Glyph Window will force TypeTool to drop out all the TrueType data for this character. It will be changed after exporting even if it does not look modified.

Font Saving Options

You can customize font saving options in the Import/Export page of the Preferences dialog box:



Export hinted TrueType fonts

If this option is switched on, TypeTool's autohinting algorithm will try to automatically generate TrueType hints when exporting the font. If this option is switched off, no autohinting will be done.

Keep existing TrueType instructions

If this option is switched on, all hinting information that exists in the font will be saved and appear in the resulting TrueType font file. If you switch this option off, all hinting information will be replaced by TypeTool's autohinting algorithm.

Please remember that if you modify any imported character, it will lose any TrueType hinting information.

Autohint unhinted characters

If this option is switched on, the autohinting algorithm will be applied for unhinted characters only.

Building Macintosh Font Suitcases

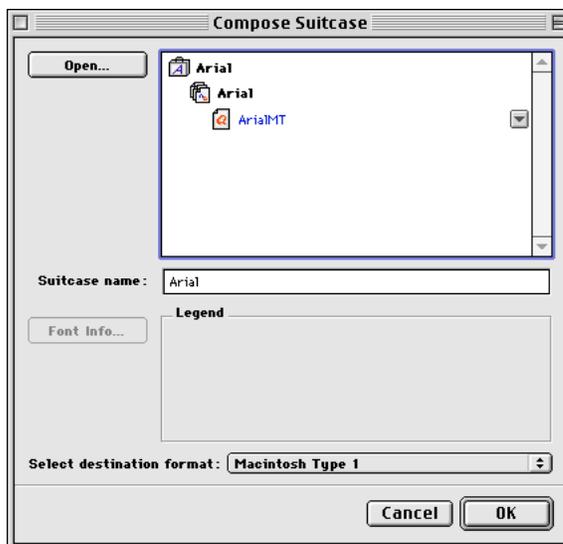
On the Macintosh each font is enclosed in a special kind of folder called a font suitcase. These structures contain font files and some additional information necessary to the Mac OS to properly render fonts on screen and on printer. Both TrueType and Type 1 fonts need to use a font suitcase.

The Mac OS requires that Type 1 fonts be accompanied by at least one bitmap font file. TypeTool automatically generates these bitmap files during font export. By default it creates a 10pt bitmap font but you can customize this value in the Import/Export page of the Preferences dialog box:



To build a Mac font suitcase:

1. Select the Build Suitcase command in the File menu. When the Font window is active, this command appears directly in the File menu. If another (Glyph or Metrics) window is active, this command appears in the Font submenu of the File menu.
2. The Build suitcase dialog box appears:



3. Select a destination format (TrueType or Type 1) in the bottom of the dialog box.
4. To append your font to an existing font suitcase, press the Open button and select the existing suitcase. Please note that your font must be compatible with the other fonts in the existing suitcase – the family name must be the same and it must not have a font style (normal, bold, italic or bold-italic) that already exist in the suitcase.

If the font is not compatible, it will appear below the list of suitcase fonts and the legend panel below the list will explain the problem. Follow the instructions to fix this situation.

5. To change font settings you can press the Font Info button and modify font header information.

Printing Fonts

To print the font table select the **Print** command in the **File** menu. You will see the standard Mac OS printing dialog box that will ask you to choose a printer and modify the printer settings. When you press the **OK** button, TypeTool will print a font table containing samples for all font characters, their names and codes according to the current encoding.

Editing Glyphs

TypeTool includes professional character-editing tools. These same tools are found in professional font-editing packages that are several times more expensive.

You can edit any character in a font by double-clicking on its cell in the Font Window or, by selecting the desired character in the characters chart and selecting the **Edit** command from the **Operation** menu or from the Font Window popup menu. You will see the Glyph Window with the contour of the selected character, nodes, hints and many other features.

What is a Glyph?

When we speak about characters we assume two things: the image that we see and the symbolic information that relates to this image. The specific form (shape) of a character is called a glyph.

A glyph is a minimal unit of font information. Each glyph may be defined in two ways: information about the character for which this glyph stands and specific information about the glyph. For example, we may define the character “H” as “two vertical strokes with one horizontal stroke that connects them at half their height.” All possible shapes of the character H may be defined that way. To get a glyph definition, we would add the following words (for the Times typeface): “The vertical strokes are wider than the horizontal strokes and each of them is finished by thin rounded serifs.”

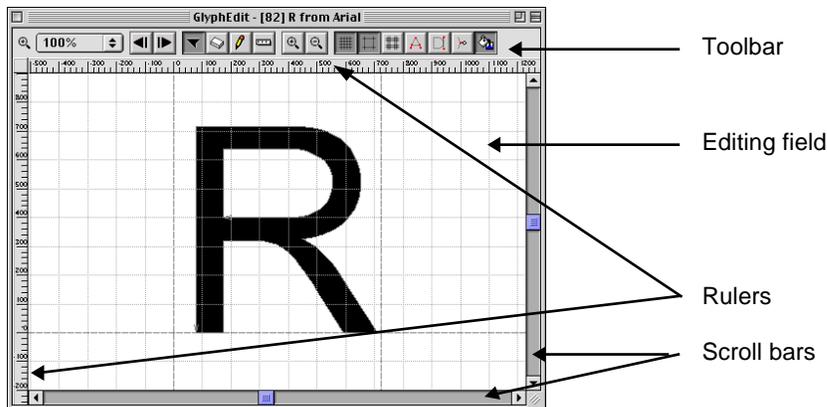
That same image may have many meanings, for example the character “H” means one letter in the English language and a very different letter in the Russian language (very close to an English “N”). To avoid additional notations for a character’s shapes we will call every character shape a glyph.

Glyph Window

The Glyph Window is a standard tool in all FontLab based applications. It is a universal and very powerful contour-editing module that also allows you to perform many font-specific operations.

You can easily open the Glyph Window by double-clicking any character sample in the Font Window or Metrics Window.

The Glyph Window is a little more complex than the windows that we discussed earlier:



The Glyph Window consists of the following parts:

- Toolbar
- Editing Field
- Top and left rulers
- Left-Top box
- Scroll Bars

The *Toolbar* is the command center of the Glyph Window. You can see a combo box with zoom selection and several groups of buttons.

The first group of buttons includes two buttons that are used to select characters for editing.

The second group of buttons allows you to choose an editing tool. In TypeTool you can use the following editing tools:

	Edit	to make contour modifications, select parts of a contour and move them, insert and delete nodes and perform several other special operations.
	Eraser	to delete unnecessary nodes.
	Contour	to draw new contours or modify existing contours.
	Meter	to measure the contour dimensions.

The next two buttons are for zoom in and return to the original zoom state.

Buttons in the last group allow you to choose one or more of the editing planes that TypeTool can show you. We will call this area of the Toolbar the *Options Bar*.

Glyph Structure

All glyphs consist of several information groups:

1. Information about the glyph's shape.
2. Information about the glyph's metrics.
3. Information about the character-level hints that are used to improve the rendering quality of a glyph on low-resolution devices.

Units of Measurement

The coordinates of any object in the font are presented in a standard measurement system. One unit of this system is called a font unit and is equal to 1/1000th of the font height. The font height is equal to the height of eM squared. Formally, the width of eM squared is equal to the width of the character 'M', but usually it means just the height of the font. The Font height is not equal to the height of the tallest character of the font, but includes some space to cover the characters' parts that are below the font baseline and some free space above the uppercase letters, like 'H'. Usually, the height of the uppercase letters of the Roman alphabet is about 700 font units. The font height is always 1000 units. There are fonts in which the height of 'H' is 500 font units, and fonts where it is 950 font units. The difference in the height of the characters in different fonts will result in different heights of characters when printed. The font height is used as the basis of font scaling.

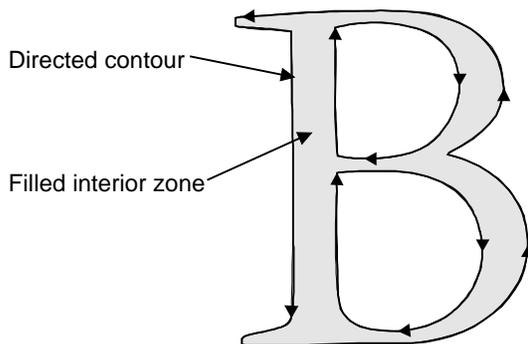
When a font is printed, the point size of the text string that is printed is used to scale characters of the font. And the value of 1000 font units (the font height) is used to scale characters to produce the desired point size.

Contours

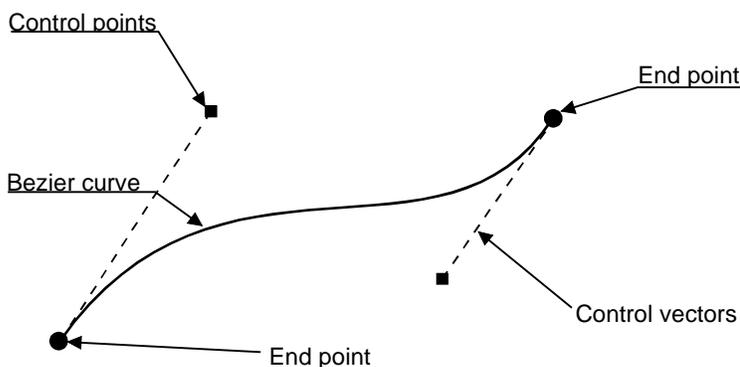
The most important and most complex information is the glyph's shape. All glyphs are defined as a series of contours. All contours consist of a series of graphical primitives: straight lines and curves. All graphical primitives are defined by nodes - points that know their type.

Some details:

1. Contours may be of two types: black or white. They may also be of two directions: clockwise and counter-clockwise. The rule is simple: clockwise-directed contours are white and counterclockwise contours are black. A simpler form of the rule, known as the rule of the left hand, is: if you face along the direction of a contour, black will be on your left side.

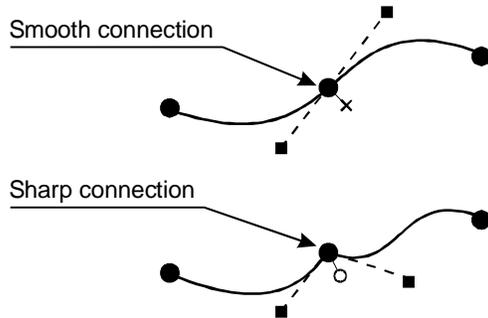


2. All contours have a startpoint. The startpoint is the first node of the contour. The last node of the contour is automatically connected to the startpoint with an arrow-like straight line. Thus, all contours are closed. The color of the start point in the Glyph Window is blue.
3. All graphical primitives are of two types: straight lines and curves. Straight lines (we will call them vectors) are just straight lines that connect two sequential nodes. Curves are Bezier curves (3rd order). To modify the form of the curves two additional subnodes are used:



These subnodes are called control points and the vectors that connect control points with the curve's ends are called control vectors. In the Glyph Window vectors (straight lines) end in red dots and curves end with green dots.

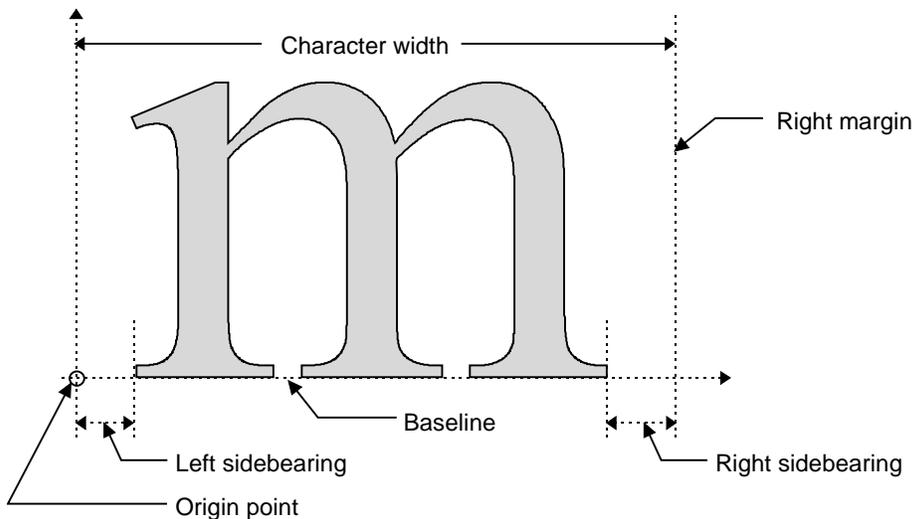
- The type of connection between the graphical primitives is very important if you want to keep the contour smooth where it is necessary. There are two major types of connections: sharp and smooth. With a sharp connection, two connected graphical primitives (curve and curve or vector and curve) are absolutely independent in their movements. With a smooth connection, the direction of the vector and control vector of a curve or control vectors of two sequential curves are preserved collinear (lie on the same straight line).



It is very important to maintain the smoothness of the glyph's contours where necessary. Small corners (sharp connections which are invisible when characters are small) become visible (and ugly) when you print large text. Furthermore, rasterizing programs that convert outline characters into bitmap images on paper do not like outlines where corners are present in places where the outline should be smooth.

Metrics

The Metric data of a glyph includes information about the horizontal and vertical width. Glyphs have an origin point, a baseline, and left and right margins:



The baseline is used to align characters in a series. Left and right margins are used to declare the positions of sequential characters in a series when the horizontal writing mode is selected. In the vertical writing mode the left and right margins are used to horizontally align characters and the top margin is used to vertically align characters.

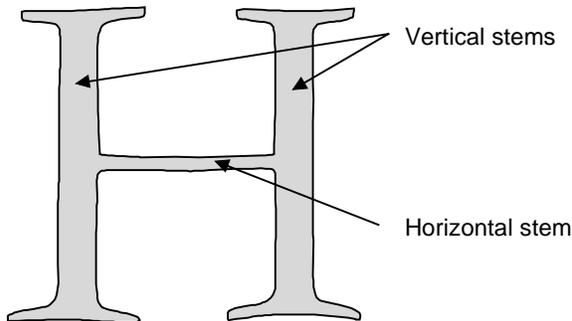
In TypeTool, the position of the origin point is equal to the position of the left margin in the horizontal direction, and the position of the baseline in the vertical direction. However, you can modify the position of any of the four margins. If you move the baseline or left margin line you will shift the entire glyph, but as a result the left margin is moved.

Hints

Usually you will not have to worry about hints, because TypeTool will create hints automatically when it exports the font. However, if you want to create fonts of a very high quality, manual hinting may be necessary.

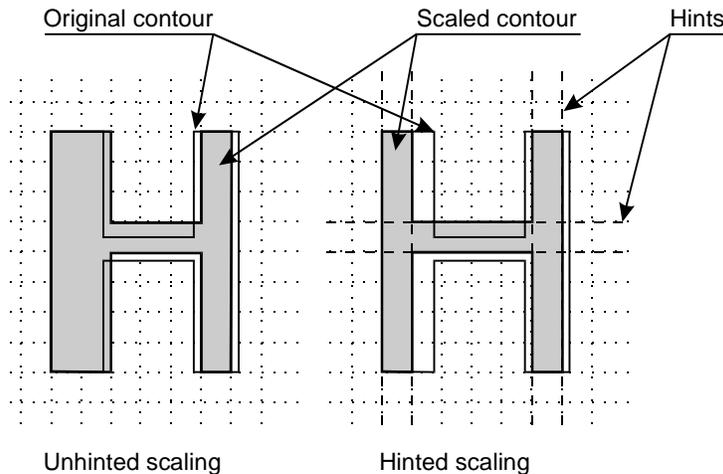
There are two hinting methods applied to Type 1 fonts (hints for True Type fonts are always generated automatically): font-level hinting and character-level hinting. Font-level hinting is generated automatically in TypeTool, so you do not have to edit it manually.

Character-level hinting is applied to the characters stems:



All important stems in a character are declared with stem hints, a pair of vertical or horizontal lines. The information about the hint includes not just the position of each of the two lines that “builds” a hint, but it stores the position of one (major) line and the width of a hint.

Therefore, the font-rendering algorithm knows the positions and widths of all the important stems in the glyph and can keep the correct form of the stems under all conditions.



You can declare stem hints in TypeTool very easily, just by dragging them and modifying their width. Because hints in TypeTool are very “intelligent,” they automatically snap to the contour minimizing your work. In most cases, however, the autohinting algorithm that is included in TypeTool produces good results, usually not any worse than the results of manual hinting.

Editing Layers

In TypeTool, you may use many special layers to help you edit glyphs. All layers are switchable through the **Options** bar on the top part of the Glyph Window.

The first layer is the glyph's contour. It may be presented in an outline or filled mode. These modes are absolutely equivalent for all editing operations, but the filled mode is a little bit slower. However, in the filled mode you always see how the glyphs will look in the resulting font. Previewing modes are switched with the  button on the **Options** bar.

You may choose various options for previewing the contour layer:



Nodes

To show nodes or not.



Control vectors

To show the curves' control vectors or not.



Connection mode

To show connection mode marks.

All modes of contour presentation may be combined in any way.

Other layers are:



Grid

Allows you to show gridlines. Gridline options (snap or not and distance between gridlines) may be edited in the Preferences dialog box that will be described later.



Guidelines

Allows you to show guidelines - special lines that are used to mark specific elements of a glyph. Guidelines may not only be vertical or horizontal, but slanted at any angle. Guidelines are presented as blue dashed lines. All nodes stick to guidelines during editing.

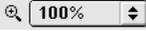


Hints

Allows you to show stem hints. Hints are presented as pairs of green dashed lines. As with guidelines, nodes will stick to hints, so you can use hints to mark a glyph.

Changing the View in the Glyph Window

To change the view in the editing field of the Glyph Window, use the zoom mode and scroll bars. By using the scroll bars, you can scroll the viewing field of a symbol. With the zoom mode, you can define how the symbol coordinates are converted to screen coordinates and vice versa. So, if you choose a bigger zoom mode, you will see a more detailed symbol and you can do the editing operations more precisely. However, in the larger zoom modes not all of the symbol will lie inside the editing field, so you will have to use the scroll bars to examine the different parts of the symbol.

There are fixed zoom modes and custom zoom modes. You can select one of the fixed zoom modes in the **Zoom** popup menu located in the upper part of the Glyph Window: . When you choose the fixed zoom mode TypeTool will return to this glyph mode on every **Zoom Out** command.

To magnify part of the glyph, select the **Zoom** tool ( button on toolbar or the **CMD+SPACE** keys on the keyboard) and declare a custom zoom mode. This mode is temporary and you always can return to the previously selected fixed zoom mode by pressing on the  button (or **CMD+OPT+SPACE** key combination).

When you select the zoom tool, move the mouse pointer in one of the corners of the rectangular area that you want to zoom in and click the mouse button. Then, holding the button, define the zoom-in area with the rectangle that appears. Release the button and the new zoom mode will be selected.

Tools and Operations

There are several ways to modify glyphs in TypeTool: *tools*, *operations* and *actions*.

Tools are permanent and are used to do the most common things.

There are four tools:

	Edit tool	Main tool used to move everything in the glyph, from guidelines to nodes to glyph margins.
	Erase tool	Used to quickly delete unnecessary nodes.
	Contour tool	Used to draw new contours in freehand mode. Can be used to modify existing contours.
	Meter tool	Used to measure contours.

All tools may be selected in the toolbar on the top side of the Glyph Window.

Operations are temporary tools used to perform special interactive routines. A good example of an operation is the **Transform** operation - used to modify part of a contour - scale it, rotate it, move or slant it.

There are three operations in TypeTool:

Transform	Used to modify part of a glyph.
Set startpoint	Used to change startpoints of contours and renumber contours.
Change direction	Used to reverse contours.

The last way to modify glyphs in TypeTool is to apply actions. Actions are simple operations that do not require interaction with the user. A good example of an action is the Autohint. You select the action in the menu and the action occurs.

Here is a list of all available actions:

Remove overlap	Removes overlapping parts of a glyph's contours.
Snap to guides	Snaps nodes that are close to the guiding elements (like guidelines, grids or hints) to them.
Remove all hints	Removes all stem hints.
Autohinting	Automatically generates stem hints. Autohinting options may be set up in the Preferences dialog box.
Nodes at extremes	Automatically inserts nodes at the extreme points of curves.

All tools, actions and operations are described in full detail later.

Edit Tool

The **Edit** tool is the most important and most used tool in TypeTool. It is used to modify contours, hints, guidelines and metric lines (baseline and margins).

All operations that you perform with the edit tool may be undone with the **Undo** command of the **Edit** menu, or just by clicking the **Undo** button  on the toolbar at the top of the Glyph Window. You can undo 200 operations. All undone operations may be redone with the **Redo** command of the **Edit** menu or with the **Redo** button  on the toolbar.

Moving Nodes

The most important editing operation is the modification of the contours that build each glyph. You can modify contours by three ways: moving nodes, editing graphical primitives using non-node editing and selecting several nodes and moving them together.

Moving individual nodes

To move individual nodes:

1. Make nodes visible.
 - 1.1 Switch on the nodes layer in the **Options** bar. You will see all the nodes of the glyph.

alternative:

- 1.2 Move the mouse cursor onto the graphical primitive that contains the node that you want to move and click the mouse button. You will see that the nodes at both ends of the primitive appear.
2. Move the mouse cursor onto the node that you want to move and press the mouse button. You will see a gray crosshair that shows the position of the node. The node coordinates appear on the edit status bar in the bottom part of TypeTool's main window.
3. Move the node with the mouse to the desired place. The node will stick to all guiding elements, such as the grid, guidelines or hints.
 - ☞ **Tip 1:** Hold the **SHIFT** key to constrain the direction of the node's movement in 15 degree increments and snap the cursor to the original node's position. If you press the **SHIFT** key while you are editing curve's control vector, it's direction will be fixed and you can only modify it's length. If you press the **SHIFT** key while you are moving point between two smoothly connected curves, it will move along the vector connecting two control points.
 - ☞ **Tip 2:** Hold the **OPTION** key when you are moving point between two curves to switch to alternative editing mode: if curves are smoothly connected, control vectors will move to make connection as smooth as possible. If connection is sharp, point will move without the control points.
4. When you position the node in a new place, release the mouse button.

Non-nodes editing

Sometimes you may want to modify a contour in a more flexible way than by moving nodes. For example, to adjust the shape of a curve in node editing you would make the control points of a curve visible and move them to modify the curve. A better way would be to “grab” the curve somewhere between the ending nodes and move this imaginary “inside” point. The curve’s shape should change accordingly. We call this method “non-node editing”. It means that you can move not only nodes, but every point of a glyph’s contour. You can even switch off nodes and still be able to edit the contour as you wish.

To modify a curve or vector with the non-node editing method:

1. Move the mouse cursor onto the place on the curve (vector) that you want to move.
2. Press the mouse button. You will see a small color point that will show you the temporary point that you are moving.
3. Drag the mouse and observe how the shape of the curve changes. After several experiments (which can be undone) you will have enough experience to use this method of editing.

Several notes that you should remember:

1. In non-node editing, guiding objects aren’t sticky. So, temporary points do not snap to the grid, guidelines, hints or anything else.
2. If you choose a temporary point near one of the ends of a curve, you will move that end, not just change the curve’s shape. This is a useful method to locate the curve’s endpoints.
3. When you press the mouse button to begin non-node editing you will see that the endpoints of the curve as well as the control vectors appear, simplifying editing of this primitive.

Changing Connection Type

The type of connection between graphical primitives is very important in maintaining the smoothness of the contours. Connections may be of two basic types: smooth and sharp.

Smooth connections may be free or fixed. The differences between free and fixed smooth connections occur when you use the non-node editing method when editing a curve that is connected to another curve. With a free smooth connection, changing a curve’s shape means changing the positions of the control vectors of that curve. This also means that the neighboring curve will change too. With a fixed connection, the direction of the control vectors of only the edited curve will change.

To change the type of connections between primitives:

1. Switch on the connection marks  layer to see the current types of connections.
2. Make the node that you want to change visible. Switch on all nodes, or only that node (see page 38 for instructions).
3. Double-click on the node. You will see that the type of connection changes every time you click on the mouse button.

alternative:

1. Make the desired node visible (with this method it is not necessary to switch on the alignment marks in the whole contour).
2. Position the mouse cursor on the desired node.
3. Press the **CTRL** key on the keyboard and click the mouse button. You will see a popup menu with a submenu **Connection**. Open that submenu and change the connection type.

Deleting Nodes

To delete nodes using the Edit tool:

1. Click the mouse button on the desired node.
2. Press the **BACKSPACE** key on the keyboard.

alternative:

1. Move the mouse cursor onto the node, press and hold the **CTRL** key and click the mouse button.
2. In the popup menu that appears, choose the **Delete node** command.

alternative:

While you are moving node, press the **CTRL** key, release mouse button and click it again. Node will be removed. This combination of action seems to be complex, but it will save you a lot of time after some training.

Inserting Nodes

To insert a new node on a vector or curve:

1. Position the mouse cursor on the primitive where you want to insert the node.
2. Press **CTRL** and **OPTION** keys on the keyboard.
3. Holding **CTRL** and **OPTION** keys, click the mouse button. The new node will appear in that place.

➤ **Note:** You can insert nodes on a closing vector that automatically connects the first and last nodes of a contour. If you insert nodes on the first half of a closing vector (closer to the ending node of a contour), then the new node will be added to the contour. If you insert the node on the last half of the closing vector, then it will be inserted before the starting point.

Converting Primitives

Sometimes you may want to convert a curve to a vector or vice versa. **To convert a curve to a vector** you should “delete” one of the control points of that curve, or “delete” the curve while you are in the non-nodes editing mode.

To convert a vector (normal or closing) to a curve, try to drag an inside point of the vector while holding down the **OPTION** key.

To convert a curve to a 1/4 part of an ellipse (the curve’s control vectors will be treated as an ellipse axis), press the **OPTION** key and click on the curve.

Selections

Many operations may be applied not only to nodes or graphical primitives, but to several nodes together. For example, you may want to move many nodes or delete part of a contour. First, select the nodes that you want to process.

To select nodes:

1. Position the mouse cursor somewhere on the editing field near one of the nodes that you want to select.
2. Press the mouse button and drag the mouse. You will see a marquee rectangle, that will follow the movement of the mouse cursor.
3. Surround the nodes that you want to select with the rectangle and release the mouse button. If you press the **SHIFT** key, the newly selected nodes will be added to any existing selection, if not the new selection will replace the existing one.

To select the whole contour double click the contour with the mouse button.

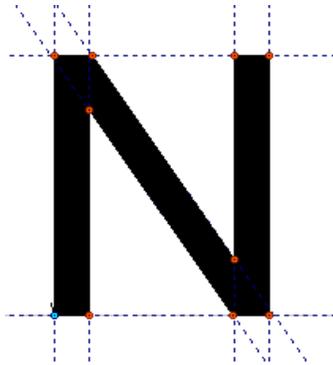
To select all the contours in a glyph use the **Select all** command from the **Edit** menu.

To Unselect nodes click the mouse button somewhere in the free place of the editing field.

Editing Guidelines

As mentioned above, guidelines are used to mark specific parts of a glyph's contour and to simplify the creation of well-aligned characters. Guidelines may be vertical or horizontal and are nothing more than straight lines that lie through the editing field of the Glyph Window.

All guidelines may be slanted at any degree from -45 to +45 from a vertical or horizontal direction. Slanted guidelines may help to mark *italic* characters, or specific slanted elements in normal characters, like the inner bar in the letter 'N'.



To start learning all the guideline-related commands, switch on the guidelines layer  on the **Options** bar at the top of the Glyph Window.

To add a new guideline:

1. Position the mouse cursor on the horizontal ruler bar (for a horizontal guideline) or on the vertical bar (for a vertical guideline).
2. Press the mouse button. The bar will become “pressed” and the new guideline appears.
3. Holding the mouse button, drag the guideline to the desired place and release the button.

To move the guideline:

1. Move the mouse cursor onto the guideline that you want to move. Be sure that no other objects (such as nodes or hints) are near that point.
2. Press the mouse button and drag the guideline to the new place.

To slant the guideline:

1. Move the cursor onto the guideline near one of the sides of the editing fields of the Glyph Window.
2. Press the mouse button. The mouse cursor will change to a pair of curved arrows  that shows you the guideline slant direction.
3. Moving the mouse, slant the guideline to the angle that you want. Hold down the **SHIFT** key to constrain the slanting angle to 3 degree increments.

To remove the guideline:

1. Position the cursor on the guideline, press and hold the **CTRL** key and click the mouse button.
2. In the menu that appears, select the **Delete** command
3. As an alternative you can try following combination: while you are moving the guideline, press the **CTRL** key, temporary release and click the mouse button.

Editing Hints

Editing hints is very similar to editing guidelines. You can add new hints through the ruler bar of the Glyph Window, drag them with the mouse, and delete them by using the menu command or by clicking on both mouse buttons.

In contrast to guides, hints consist of two lines that can be moved together or separately. Hints cannot be slanted.

To add a new hint:

1. Position the mouse cursor on the horizontal ruler bar (for horizontal hint) or on the vertical bar (for vertical hint).
2. Press and hold the **CMD** key. Press the mouse button. The bar will become “pressed” and a new hint will appear. Release the **CMD** key.
3. Holding the mouse button, drag the hint to the desired place and release the button.

To move a hint:

1. Move the mouse cursor on one of the hint’s lines.
2. Press the mouse button and drag the hint to its new place. Both hint lines will move together.

To move a hint’s lines separately hold down the **SHIFT** key while dragging one of the hint’s lines. Using this procedure, you can change the width of the hint.

➤ **Note:** While you are editing the hint, its parameters are shown on the status bar.

To remove a hint:

1. Position the cursor on the hint, press and hold the **CTRL** key and click the mouse button.
2. In the menu that appears, select the **Delete** command.
3. As an alternative you can try following combination: while you are moving the hint, press the **CTRL** key, temporary release and click the mouse button.

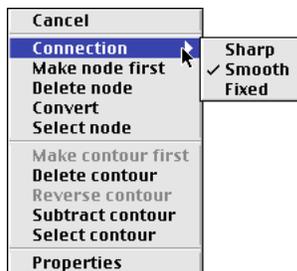
Popup Menu Commands

As explained in previous paragraphs, several commands that can be performed on various objects in the Glyph Window, can be accessed through the popup menu that appears when you put the mouse cursor on the object, press the **CTRL** key on the keyboard and click the mouse button.

All menus begin with **Cancel** and end with the **Properties** command. If you select **Cancel**, nothing happens. If you select **Properties**, the property panel for that object appears allowing you to interactively change its parameters.

Node Popup Menu

As with all popup menus, this can be accessed by positioning the mouse cursor on the node, press and hold the **CTRL** key and click the mouse button. The node menu contains two groups of commands: those relating to the selected node and those relating to the contour that includes the node.



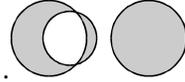
The first group of commands is related to the operation of the node and the primitive to which that node belongs.

Make node first	Begins the contour from the selected node. This command is gray if the node is already at the startpoint of a contour.
Delete node	Removes a node.
Select node	Selects current node.
Convert	Changes a curve to a vector and vice versa.
Connection	Pops up a connection menu where you can change the connection type between primitives. This command is gray for nodes that are between two vectors.

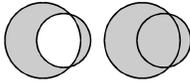
The second group of commands deals with the contours that include the selected node.

Make contour first Begins the glyph from the selected contour. Renumbering of contours is important for hint-substitution programming.

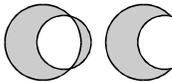
Delete contour Removes the whole contour



Reverse contour Reverses the direction of the contour.



Subtract contour Subtracts the contour.



Select contour Reverses the selection state of the contour.

Guideline and Hint Popup Menu

Both menus include only one command (except the **Cancel** and **Properties** command) **Delete**. If you select **Delete**, the active guideline or hint will be removed.

Selection Popup Menu

If you press and hold the **CTRL** key and click the mouse button on any of the selected nodes (or selected primitives that are red), you will see the following commands in the popup menu:



Cut Works like the general **Edit** and **Cut** command: removes the selection and puts it onto the Clipboard.

Copy Copies the selection to the clipboard.

Delete Removes the selection.

Baseline and Margin Popup Menu

These menus are the simplest and have only two commands: **Cancel** that does nothing, and **Properties** that opens the property panel.

Common Popup Menu

This menu appears if you press and hold the **CTRL** key and click the mouse button somewhere on the free space of an editing field in the Glyph Window.

Undo
Redo
Remove Overlap
Snap to Guides
Remove Hints
Autohinting
Transform Selection
Reverse Contours
Set Startpoint

Undo	Undoes the last action.
Redo	Redoes the previously undone action.
Remove overlap	Removes the overlapping parts of contours and resolves self-intersections.
Snap to guides	Sticks all nodes to close guiding elements (Activates Snap to guides action).
Remove hints	Removes all hints (activates Remove hints action).
Autohinting	Automatically generates hints for a glyph (activates Autohint action).
Transform selection	Activates the Transform selection operation.
Reverse contours	Activates the Reverse contours operation.
Set startpoint	Activates the Set startpoint operation.

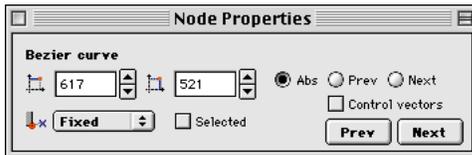
Property Panel

The easiest way to edit the various objects in the Glyph Window, from nodes to guidelines to hints, is to use the property panels. The property panel is a small window that allows you to modify the parameters of objects with which it is linked.

If you open the property panel for a node, you will see the coordinates for that node and all the other options that are available for those nodes. A different set of parameters will be available for hints, guidelines and selection areas.

To open the property panel for one of the objects, move the mouse cursor onto that object (node, hint, guideline or selection), press and hold the **CTRL** key and click the mouse button. Select the **Properties** command in the popup menu that appears. Another way is to click the mouse button on the object while holding down the **CMD** key on the keyboard.

Node Property Panel



In this property panel you can control the position of the node, the alignment type, the selection status of the node and the position of the control points of the curves.

To change the position of a node:

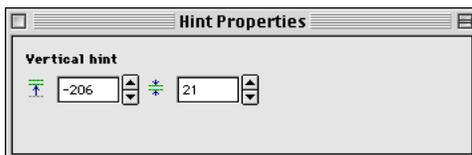
1. Select the origin point from where you want to measure and set the coordinates of the node. By default, it is the glyph's origin point. With the radio buttons you can select the previous or next node as the origin point.
2. Modify the coordinates of the node in the edit boxes. You can use the spin buttons to increase or decrease the coordinates. New coordinates will be applied to the node when you press the **ENTER** key on the keyboard or move the focus from one edit control to the other or when you close the property panel by clicking on a free space in the edit field.

To change the connection mode for a node: select the new mode in the combo box in the lower part of the panel.

To change the selection state of a node: modify the state of the selected check box.

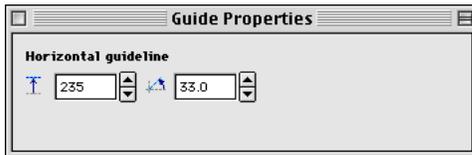
To edit the position of the curve's control vectors: switch on the **Control vectors** check box (it will be gray if you are editing a node between two vectors) and modify the relative position of the previous or next control point that belongs to that node.

Hint Property Panel



In the hint property panel, you can modify the position of a hint in the left edit box and modify the width of the hint in the right box.

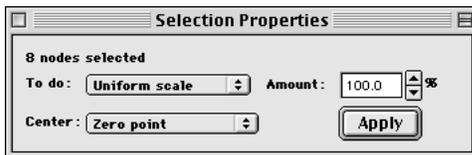
Guideline Property Panel



In this property panel you can change the position and slant angle of a guideline.

Selection Property Panel

The Selection Property Panel allows you to apply several simple transformations to the selected area:

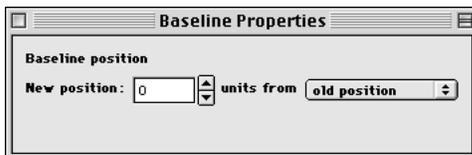


To transform the selected area:

1. Select the center of the transformation in the **Center** combo box. It can be one of the following: the origin point of the glyph, the center of the selected area, or the bottom left corner of the bounding box of the selected area.
2. Select the transformation in the **To Do** combo box. You can choose **Horizontal move**, **Vertical move**, **Uniform scale**, **Horizontal scale**, **Vertical scale**, or **Rotate** and **Slant**.
3. Select the amount of the transformation in the **Amount** edit box.
4. Press the **Apply** button to apply the transformation to the selected area.

Baseline Property Panel

With this property panel you can easily adjust the position of the glyph's baseline. To open it, press and hold the **CTRL** key, click the mouse button on the baseline and select the **Properties** command in the popup menu or click the baseline holding down the **CMD** key on the keyboard.

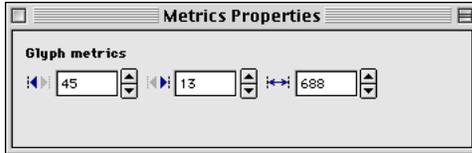


To change the position of the baseline:

1. Select the base level of the modification. It can be the old position (for relative offset) the top of the glyph, or the bottom of the glyph.
2. Change the position of the baseline relative to the base level.
3. Press the **ENTER** key or click anywhere in the editing field to apply changes.

Metrics Property Panel

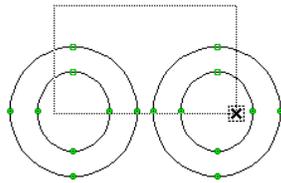
To open the metrics property panel, position the mouse cursor on the left or right glyph margin, press and hold the **CTRL** key, click the mouse button and select the **Properties** command, or **CMD**-click the mouse button on one of the margins.



In this panel you can easily modify a glyph's sidebearing and/or width.

Eraser Tool

The eraser tool can be used to quickly remove nodes. Sometimes this is necessary, for example, when contours are the result of an auto-tracing program. The eraser tool may work in two modes: like a real eraser or as a rectangle eraser. In the first mode, all nodes that are inside the rectangle of the eraser mouse cursor are deleted. In the second mode, you define a rectangle (as when you select nodes with the **Edit** tool or change the zoom of a Glyph Window) and all the nodes inside that rectangle are removed.



The first (eraser-like) mode is the default for the **Erase** tool. To switch to the rectangle mode, hold the **CMD** key.



Contour Tool

With the **Contour** tool you can create new contours or modify existing contours in a more artistic manner than with the **Edit** tool. When you use the **Contour** tool, you can draw new contours just as you do on paper. TypeTool will approximate your drawing with a series of curves and lines.

How to create a new contour:

If you begin a contour in a free space (the cursor will have its ordinary form ) , you will define a new contour. If you want to begin a new contour and its starting point is on an existing contour, press the **CMD** key to force TypeTool to create a new contour.

How to modify an existing contour:

When you move the cursor of a **Contour** tool onto an existing contour or node, it changes to  . This means that if you begin drawing (without holding down the **CMD** key), a new contour will be inserted into the existing one. If the finishing point of your drawing is on an existing contour also, and the starting and finishing points are on the same contour, then the new drawing will replace that part of the existing contour that lies between the starting and finishing points.

How to draw a single curve:

Hold the **SHIFT** key while you release the mouse button after drawing a new line. Your drawing will be approximated by a single curve. This is a good way to draw a new contour step-by-step.

Meter Tool

With this tool you can measure any distance and angle in your glyph. It is very useful if you want to create very precise, extremely high quality symbols.

To measure distances between two points:

1. Select the **Meter** tool . The **Meter** tool panel appears:



2. Position the mouse cursor on the first point.
3. Press the mouse button and drag the mouse to the second point. In the **Meter** tool panel you will see the vertical, horizontal and direct distance between two points and the angle of the vector connecting these points. Hold down the **SHIFT** key while you drag the mouse to constrain the measurement to 15 degree increments.

While you are dragging the mouse, you will see that the **Meter** tool sticks to any object that it can find in the editing field.

To measure the distance from a contour:

1. Put the mouse cursor on the contour from which you want to measure.
2. Press the mouse button and drag the mouse. Hold down the **SHIFT** key and the direction of the mouse's movement will be constrained to the normal direction of the contour starting point.
3. When you're done, release the button.

Transform Selection

This is a very useful operation. When using it you can modify selected nodes in many ways; from a simple offset move to rotation around a selected center.

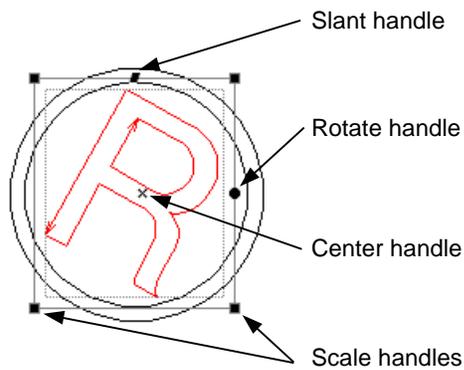
To activate the Transform operation, select the **Transform Selection** command from the **Tools** menu or select the **Transform Selection** in the editing field common popup menu.

Or you can double-click on any selected node or graphical primitive to activate the **Transform** operation.

When this operation is activated, you will see a command panel with two buttons: **OK** and **Cancel**



and a transformation rectangle surrounding the selected area. If nothing is selected, the entire glyph will be subject to transformation.



So, what do all these handles mean, and how can they be used?

To move a selection:

1. Position the mouse cursor somewhere inside the transformation rectangle but not on the center handle.
2. Press the mouse button and drag the rectangle to its new place.
3. Release the button. The selection will be moved.

To scale or skew a selection:

1. Position the mouse cursor on one of the scale handles.
2. Press the button and drag the mouse. You will see that the transformation rectangle is scaled. Hold down the Shift key on the keyboard to constrain the scale proportions.
3. Release the button when you are done. The selection will be modified.

To rotate a selection:

1. Move the mouse cursor onto the rotation handle .
2. Press the mouse button and drag the mouse. The transformation rectangle will be rotated around its center. Hold down the **SHIFT** key to constrain the rotation angle to 15 degree increments.
3. Release the button to accept the rotation.

To move the center of the rotation just drag the center handle  by the mouse to its new place.

To slant a selection:

1. Move the mouse cursor onto the slant handle .
2. Press the mouse button and drag the mouse. The transformation rectangle will be slanted. Hold down the **SHIFT** key to constrain the rotation angle to 15 degree increments.
3. Release the button to accept the slanting.

Click the **OK** button on the command panel to accept the completed transformation or click the **Cancel** button to reject it.

Reversing a Contour's Direction

Sometimes you need to reverse the direction of a contour. In TypeTool you can do this in one of two ways: **CTRL**+click the mouse button on each contour that you want to reverse and select the **Reverse Contour** command in the popup menu, or activate the **Reverse Contour** operation.

To activate the operation select the **Reverse Contours** command in the **Tools** menu.

When you are using the **Reverse Contour** operation, you will see a command panel with two buttons: **OK** and **Cancel**



By clicking **OK**, you can finish the operation and accept all the changes that you just made. By clicking **Cancel** you finish the operation and reject all the changes.

- **Tip:** If you press **Cancel**, but change your mind and want to accept the changes of the last operation, you can use the **Redo** command in the **Edit** menu.

When you activate the **Reverse Contours** operation, you will see that all the contours now have arrows that show their direction.

You can reverse any contour by clicking on it with the mouse button.

- **Tip:** We recommend that you switch to the **Preview** mode when you use this operation. Directions of contours change the contours' "colors," so in the **Preview** (filled) mode you will see the changes immediately.

Rearranging Contours

To simplify the programming of hint substitution, sometimes you need to change a contour's sequence. You can do this by selecting the **Make contour** command in the node's popup menu which sets contours on top of each other; but an easier way is to use the **Rearranging Contours** operation.

Select the **Rearrange Contours** operation in the **Tools** menu.

When you activate this operation, you will see the command panel (as with all operations):



and yellow marks that show the contour's numbers.

To change a contour's startpoint just click on a new startpoint position.

To change a contour's sequence:

1. Locate the mouse cursor on the contour that you want to move in the contour's sequence.
2. Press the mouse button, holding down the **CTRL** key. The selected contour will be highlighted.
3. In the popup menu choose one of these commands:

- Up** To move the contour one step up (contour #3 will be #2).
- Down** To move the contour one step down (contour #3 will be #4).
- First** Move the contour to the top of the sequence (contour #3 will be #1).
- Last** Move the contour to the bottom of the sequence (contour #3 will be the last contour in the sequence).

Actions

An Action is the simplest thing that you can do to a glyph. Just select an action in the **Actions** menu or select an action in the common popup menu.

Here is a list of available actions and their descriptions:

- Remove hints** Removes all hints.
- Autohinting** Automatically generates stem hints for a glyph.
- Remove overlap** Removes overlapping areas of a glyph's contours and resolves self-intersecting contours.
- Snap to guides** Sticks all nodes to nearby guiding elements (grid, hints or guidelines).

Copying Glyphs and Their Parts

Sometimes you need to copy glyphs or a glyph's parts to another place in the font or even into a different font. With TypeTool, you can put any part of a glyph, or an entire glyph (with hints, guides, etc.) into the Mac OS Clipboard and paste it in a different place.

To do this you use the commands from the **Edit** menu:

Cut	To copy a selected part of the glyph into the Clipboard and delete it from the glyph.
Copy	To copy a selected part of the glyph into the Clipboard.
Paste	To place a contour part copied to the Clipboard into the current glyph.
Delete	To remove a selected part of a glyph's contour.
Copy Glyph	To copy an entire glyph to the Clipboard.
Paste Glyph	To replace the current glyph with a glyph copied to the Clipboard.

Because the Clipboard is used as a buffer for copying contours, you can paste glyphs and their parts not only to the current font, but to any glyph of any font of any application that is compatible with TypeTool. FontLab Composer or FontLab 3.0 are good examples of such applications.

Importing and Exporting Glyphs

The most common format for contour-based data is Encapsulated PostScript (EPS). Because this format is a native format of a well-known contour-manipulation program, Adobe Illustrator, another name for it is Adobe Illustrator format (AI). If we go deeper, we will see that EPS is much more common than AI, but due to a well-defined internal structure, AI format has become a standard way of exchanging contour-based graphics.

With TypeTool, you can export any glyph as an AI-compatible file and use it in any other program and you can import any EPS/AI file (compatible with Adobe Illustrator) to add to any glyph of your font.

To export a glyph as an EPS/AI file:

1. Select the **Save EPS** command from the **File** menu.
2. Select the exporting directory and enter the name of the EPS/AI file in the standard Mac OS File Save dialog box.

To add an EPS/AI file to the current glyph:

1. Select the **Open EPS** command from the **File** menu.
2. Choose the file that you want to add in the standard File Open dialog box.
3. Press the **OK** button in the File Open dialog box, and the EPS/AI file will be imported, added to the current glyph, and selected to simplify its modifications.

Printing a Glyph

To print a sample of the current glyph, select the Print command in the File menu while the Glyph Window is active.

You will see a standard printing dialog where you can choose a printer and select the printer's options.

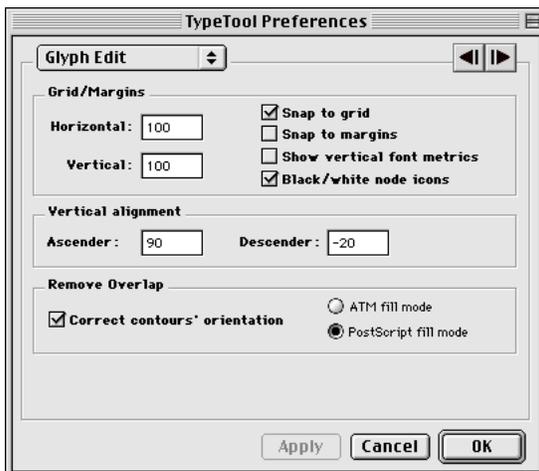
To begin printing press the **OK** button. When printing is complete you will see an example of the current glyph as seen in the Glyph Window. So, if you see nodes on the screen, they will appear on the paper. If you are in preview mode, the printed glyph sample will be filled.

Zoom mode on the screen also will be applied to the printed sample of the glyph. Using this feature you can print very detailed samples of the glyph.

Editing Glyph Window Preferences

Some options of the glyph-editing process can be adjusted in the Glyph Window-related pages of the Preferences dialog box. You can open the Preferences dialog box by choosing the **Preferences** command in the **Edit** menu.

The Preferences dialog box consists of many pages, two of which we will discuss now: **Glyph Edit** and **Auto-hinting**:



Glyph Edit Options

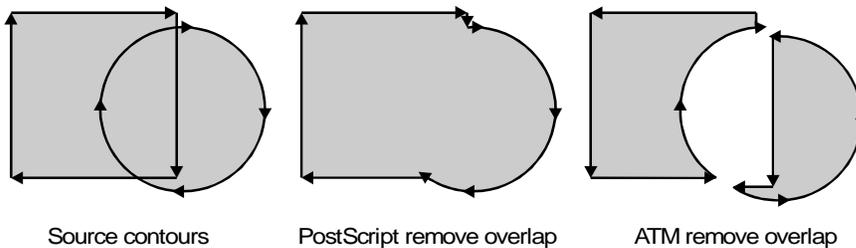
The Glyph Edit options page consists of several groups of controls: **Grid/Margins**, **Vertical Alignment** and **Remove Overlap**.

The first group of controls lets you choose the steps of gridlines and switch on or off the snap-to-grid feature. If you check the **Snap to Margins** check box, then all the glyph margin lines will work as guidelines.

The second group is used to declare the vertical dimensions of the fonts that you work with. These dimensions are used to calculate the 100% zoom mode and to calculate the size of the sample icons that you see in all the chart windows. **Ascender** defines the top size of the font, usually 900-1000 units. **Descender** declares the bottom size of the font, usually it is equivalent to the position of the bottom line of the lowest part of a character in the font. The general value is 200-300 units.

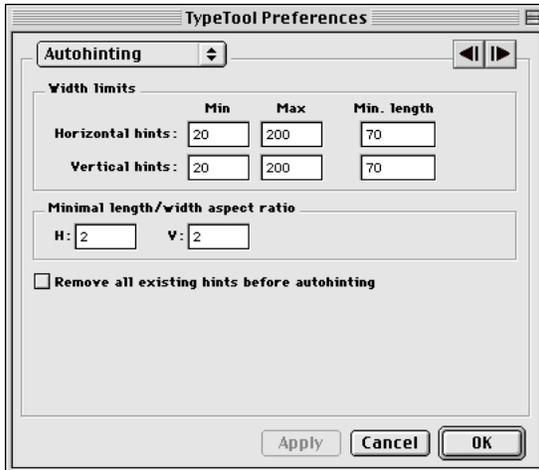
The last group of commands deals with the **Remove Overlap** command. The **Correct contours orientation** check box lets you switch on or off the automatic correction of the contour's orientation after the application of the **Remove Overlap** command. So, if you draw a simple circle and direct it in the wrong direction (clockwise), the **Remove Overlap** command will not "remove" any overlap. But, if the **Correct Contours Orientation** check box is activated, **Remove Overlap** will reverse the contour to the correct direction.

Two other options (**ATM fill mode** and **PostScript fill mode**) may be easily explained by this example:



Autohinting Options

The **Autohinting** option lets you fine-tune the algorithm for automatically building stem hints. Improper use of this option may cause autohinting to work incorrectly or not work at all, so be careful with any modifications.



Width limits	Declares the minimum and maximum width of hints that the autohinting algorithm is allowed to create.
Min. length	Declares the minimum length of the nearest vertical (or nearest horizontal) vectors (or curve control vectors) that can be a candidate for building a hint
Minimal length/ width aspect ratio	Declares a critical correlation between the width of a candidate for the hint and the length of the vector that builds that candidate.
Remove all existing hints before autohinting	Allows you to remove all existing hints before autohinting the glyph. If this option is switched off, new hints will be added to the existing hint set. Of course, a hints substitution program will be built.

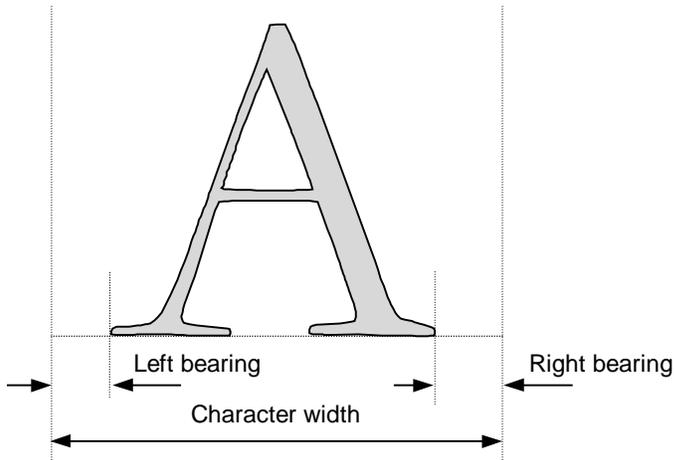
Editing Font Metrics

The tools that you can use to edit the metrics data in TypeTool are common to all FontLab applications, so if you have learned how to use these tools in TypeTool you will be ready to use those same tools in any of the FontLab programs.

What are Font Metrics?

A program that aligns and spaces text calculates the total width of all the characters in a paragraph. It then adjusts the widths of the space characters that separate the words and tries to put as many characters as possible into one line. The information about the words that are used to make a paragraph, and the information about the width of the individual characters is the only information necessary. This is what is known as font metrics.

To position the individual characters, the page layout program must have information about each character's sidebearings:



Using this information the page layout program positions all the characters. Kerning information is also necessary for the best results.

Kerning

Kerning information is used to adjust the space between specific pairs of characters. As you can see in the following picture, some characters may be well spaced with just the bearings rectangle but other characters are not. To fix this problem a special technique called kerning has been developed.

Kerning defines the additional modification of inter-character space in specific pairs. A good example is the AV pair. In the following picture you can see two examples of inter-character spacing, with and without kerning:



As you can see, only the kerned image is optically correct, because it can compensate for the special form of the V and A characters printed in sequence.

Metrics Files

Information about a characters' width usually is located in font files. Kerning information may be also be included in this file. In TrueType and FontLab font formats both metrics and kerning data are located in font files. In case of Type 1 (PostScript) font files metrics and kerning data are located in separate files.

There are two possible formats for metrics files that are used with Type 1 fonts in Windows: AFM and PFM. AFM files (*Adobe Font Metrics*) are text files containing all the metrics and kerning information for a given font. These files are legible and can be edited in any text editor. PFM files (*Printer Font Metrics*) are metrics and kerning files used by the Windows operating system. They are binary files and cannot be read without special utilities. AFM files are a standard format for the exchange of metrics information for PostScript fonts. This information can be read directly by several operating systems and programs.

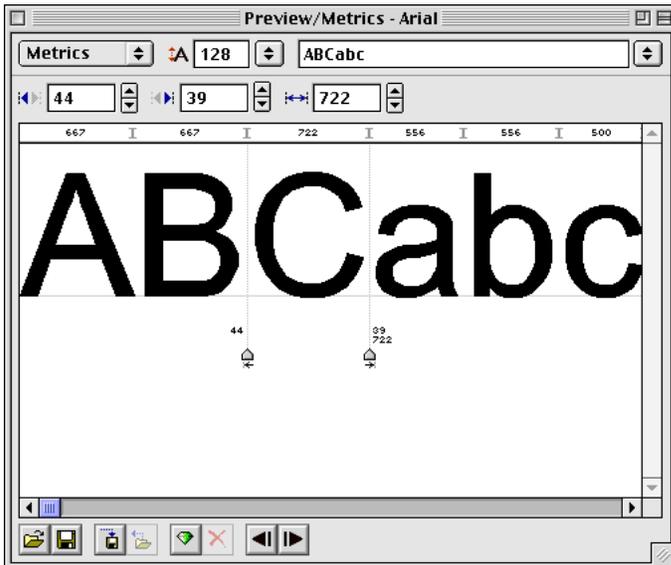
On Macintosh font metrics information is stored in the font suitcase file in binary form. TypeTool automatically generates all metrics information necessary for Macintosh during font export, but we recommend using separate Windows-style Metrics files to temporarily store metrics information. AFM files are preferable because they are text files, well documented and can be read and edited in any text editor.

TypeTool can import and export metrics and kerning information in any of these formats.

Metrics Window

TypeTool has a special window where you can edit the metrics and kerning information. It is called the Metrics Window.

To open the Metrics Window select the **Metrics** command in the **Window** menu. The Metrics Window will appear:



As you can see, the Metrics Window consists of several parts:

- The topmost area is used to select a mode for the Metrics Window and a string for metrics or kerning editing.
- The property area includes “live” digital information about metrics or kerning for the current character or character pair.
- The editing area where the edited string with controls appears.
- The Bottom toolbar area with controls for importing and exporting metrics files, automating metrics or kerning generation and other commands.

Previewing a String

There are three possible modes of the Metrics Window: **Preview**, **Metrics** and **Kerning**. The default is the **Preview** mode.

In the **Preview** mode you cannot edit the metrics or kerning data of the font. You can only preview the sample string and look at the characters' that are aligned together. This mode is useful when you edit individual characters because it allows you to compare different characters and develop a common design element for them.

In the **Preview** mode you also can edit the position of the underline line that will appear if the font that you edit is used in the underline mode.

To switch to the **Preview** mode from any other mode of the Metrics Window, select the **Preview** option in the mode selection popup menu:



or select the **Preview** command in the **View** menu;

or select the **Preview** command in the popup menu that appears if you **CTRL**-click the mouse button in the editing area of the Metrics Window.

Selecting a String for Previewing or Metrics Editing

If you are in the **Preview** mode you may want to enter a string to preview. The easiest way to do this is to enter the string in the editing field of the Metrics Window:



Or, you can open a list box of predefined strings and select one of them for editing.

All strings that appear in the list box are read from the `preview.txt` file located in TypeTool's installation directory. This file is an ordinary text file and can be edited in any text editor to add your own strings.

If you want to modify the list box content, press the **CTRL** key and click on the list box button. You will see the following popup menu:



If you want to fill the string selection list box from a different file, choose the **Load list from file** command and select any text file in the generic Mac OS Open File dialog box.

If you enter a custom sample string in the edit box you can choose the **Add** command to add this string to the list box.

To save the contents of the list box in the text file, choose the **Save list to file** command and select the destination file and folder.

Navigating in the Sample String

Use  and  buttons to move to the previous or next characters in the string if one of them is selected. These buttons are useful if one of the characters has a negative width value.

Entering Special Characters

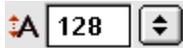
Some characters are not represented by the ANSI characters. However, by using special rules you can enter ANSI names in the sample string. To enter a character's name, begin with the slash character (/) and finish with a space character or another slash. To enter a slash, type it twice (/).

The decimal code of a character can follow the slash instead of using its name.

The easiest way to fill a sample string is **using the drag-drop method**. You can simply drag any character from the Font Window and drop it in the Metrics Window and it will be added to the sample string.

Selecting Previewing Size

In the **String Size** combo box:

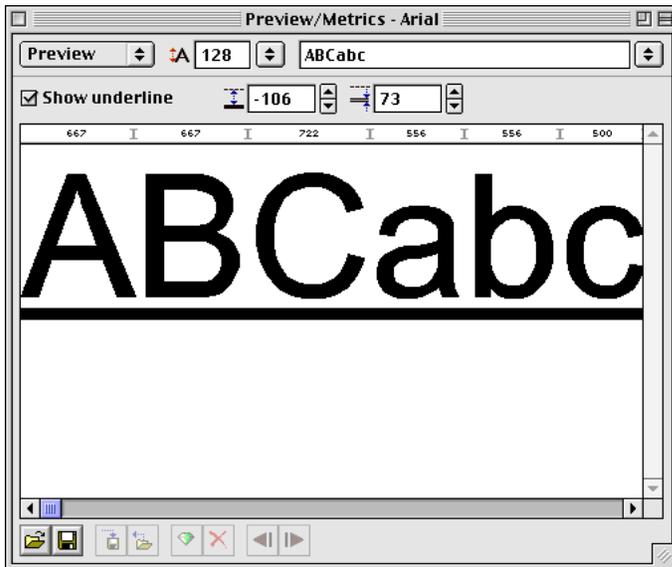


you can select the size of the previewed string. If the string becomes too large to fit in the window, a vertical scroll bar will appear allowing you to view all the editing areas of the Metrics Window.

Editing an Underline

In the **Preview** mode of the Metrics Window, you can view and edit the position of the underline that appears in a text editing application when the underline style is chosen. The position and thickness of an underline are considered a font parameter and are part of the font's design.

To view an underline in the Metrics Window **Preview** mode, switch on the **Show Underline** check box located in the property area:



You will see the underline appear in the editing area and underline controls in the property area of the Metrics Window:



The left control is used to edit an underline's position and the right control the underline's thickness. If you change values in the control boxes you will see the underline's position and/or thickness modified.

Editing Metrics

By “metrics”, we refer to information about a character’s width and sidebearings. In TypeTool you can modify this information either manually or automatically.

To modify a character’s metrics you must switch the Metrics Window to the Metrics mode. To do this select **Metrics** in the mode selection combo box:

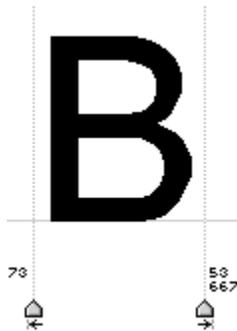


or, select the **Metrics** command in the **View** menu or in the popup menu that appears if you **CTRL**-click the mouse button on the editing area of the Metrics Window.

In the **Default Mode Property** area, the Metrics Window is empty. To make the metrics editing controls visible, click on the mouse button on a character in the editing field. The metrics editing controls will appear:



and the sidebearings lines with editing handles will appear on the sides of the character.



The numbers at the bottom of the character are the left and right sidebearing values and the character’s width.

Manual Editing of Metrics

To modify a character’s metrics you can use 3 methods:

1. Move the sidebearings lines using the mouse button.
2. Edit the values in the property area of the Metrics Window.
3. Drag the character within the editing area.

To move the sidebearings lines just position the mouse cursor on the line, press the mouse button and drag the mouse. Release the mouse button when you are done.

To drag a character within the editing area, position the mouse cursor on the characters’ image; press the mouse button and drag the mouse to position the character inside its width. Hold the **OPTION** key while dragging the mouse to modify the character’s width.

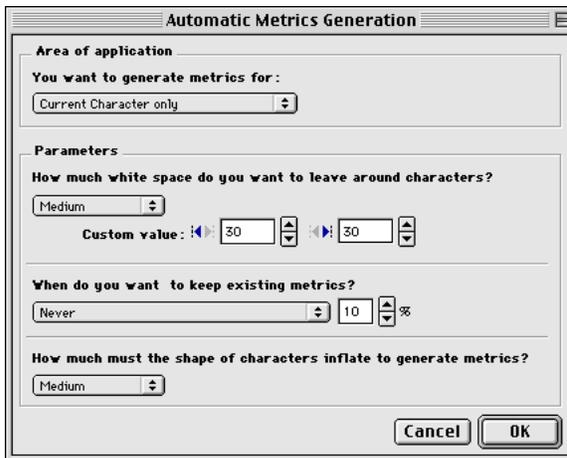
You can easily **modify the vertical position of the character** relative to its baseline. Just press and hold the **SHIFT** key on the keyboard while dragging the character and you will modify its vertical position.

Automatic Metrics Generation

TypeTool can automatically detect a character's metrics using a special algorithm. This algorithm usually produces good results, but it is recommended that you use manual editing.

To detect the metrics parameters automatically press the  button in the bottom toolbar area or select the **Auto** command in the **Operations** menu or select the **Auto Metrics** command in the popup menu.

The **Automatic Metrics Generation** dialog box appears:



This dialog box includes two areas: **Area of application** and **Parameters**. In the first area you select the character(s) to which the automatic algorithm will be applied.

The Possible choices are:

- Current character only** This option is available and is the default if any character is selected in the editing area.
- All characters in the current string** This option generates metrics for all characters in the current string in the editing area.
- Whole font** This forces TypeTool to generate metrics for all characters in the font, and is not recommended. This operation is not undoable. TypeTool prompts you and asks that you save the current metrics information in a special file from which it may be easily restored if you are not satisfied with the results that the autometrics algorithm produced.

In the **Parameters** area of the Autometrics dialog box, you can choose the parameters for the algorithm. All the parameters are displayed. We recommend that you experiment with various parameters using the autometrics application.

Quick Save and Quick Open

You may use these commands to temporarily save the current state of the metrics and kerning information. To quick save a metrics file ~SAVE.AFM in the TypeTool directory, press the  button on the bottom toolbar of the Metrics Window or select the **Quick Save** command in the **Operation** menu.

To open a previously saved file, press the  button or select the **Quick Open** command in the **Operation** menu. The Warning dialog box appears prompting you to save the current (modified) state of metrics into the same temporary file.

Editing Kerning

To edit kerning data, switch the Metrics Window to the kerning mode. To do this select **Kerning** in the Mode selection combo box:



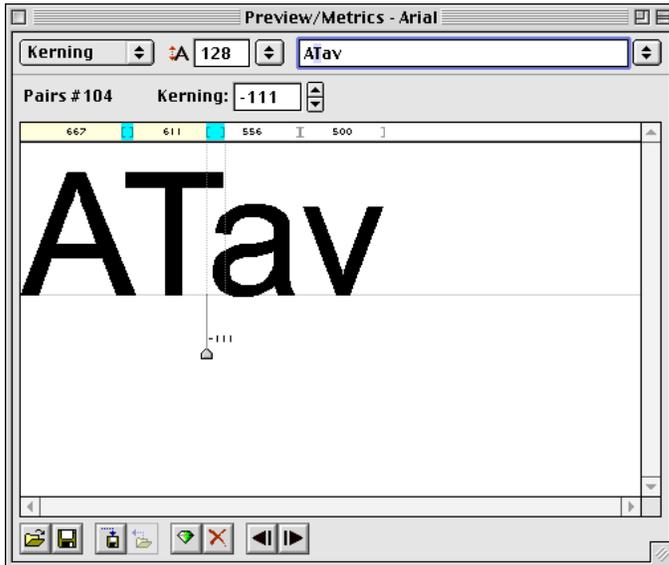
or select the **Kerning** command in the **View** menu or the **Edit Kerning** command in the popup menu.

When you switch to the kerning mode, you will see the total number of defined kerning pairs appear in the property area of the Metrics Window:

Pairs # 104

To make the Kerning Editing controls visible, you must select the pair that you want to edit. To do this, position the mouse cursor on the right character of the pair and click the mouse button.

You will see the Kerning Editing controls appear in the property area and the kerning line and handle appear in the editing area:



There is now a blue area in the metrics bar at the top part of the editing area. This means that kerning exists for that pair in the current preview string.

Manual Kerning Editing

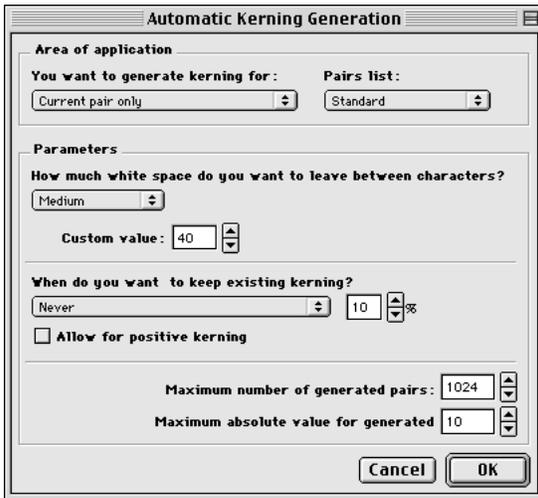
To edit kerning manually, you must drag the kerning line (or right character of the kerning pair) using the mouse button.

Automatic Kerning Generation

The easiest way to apply kerning to a font is to use TypeTool's auto-kerning algorithm. This algorithm analyses the shape of the characters in the given pairs and automatically kerns them. You can control the pairs list which the autokerning algorithm processes, as well as other parameters.

To detect kerning automatically press the  button at the bottom of the toolbar area, or select the **Auto** command in the **Operations** menu, or select the **Auto Kerning** command in the popup menu.

The **Automatic Kerning Generation** dialog box appears:



This dialog box consists of two areas: **Area of application** and **Parameters**.

In the first area you may select the pairs for which the algorithm will compute kerning values. You can choose between **Current pair only** (available if one of the pairs is selected in the editing area), **All Pairs in the current string**, or **All Pairs in the following list**.

The second area allows you to generate kerning for all the pairs located in a special list file. The list files are stored in a Kerning subdirectory of TypeTool's installation directory. You can create your own kerning pair files using files placed there at the time of TypeTool's installation.

The **Parameters** option lets you customize the autokerning algorithm. The most used option is: **How much white space do you want to leave between characters?** This controls how close the characters can be moved together while computing kerning in the pair.

The **Allow for positive kerning** check box lets the autokerning algorithm produce positive kerning in pairs. Positive kerning moves characters apart from each other. Positive kerning is usually not recommended.

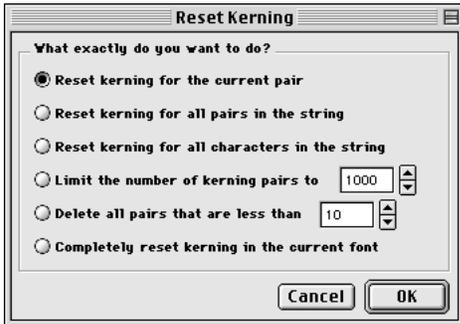
If you want to keep the existing kerning, the combo box lets you control the disposition of the existing (imported or manually created) kerning pairs. You can replace existing pairs by automatically generating new ones, keep them unchanged, or select the condition mode.

The **Maximum number of generated pairs** and **Maximum absolute value for generated kerning** options, control the possible number of automatically created pairs and the maximum normal (negative or positive) kerning value.

Resetting Kerning

To remove the kerning information for some characters or for the entire font, you must use the *Reset Kerning* feature. To open the Reset Kerning dialog box, press on the  or select the **Reset Kerning** command in the **Operations** menu or popup menu.

The **Reset Kerning** dialog box appears:



This dialog box includes options that control kerning removal.

Available options are:

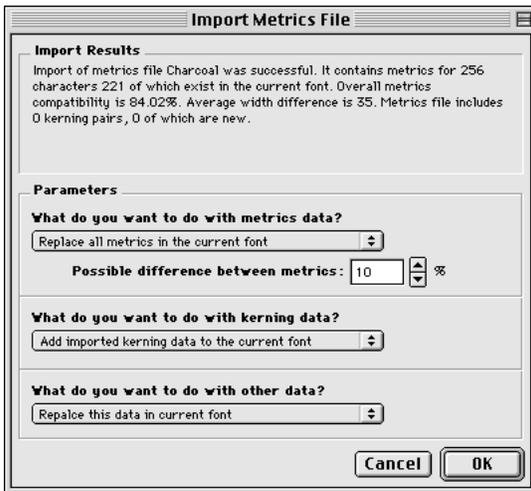
Reset kerning for the current pair	This is the default if a pair is selected. Removes kerning for that pair only. You can get the same result by clicking on the Ctrl+mouse button while editing kerning in the current pair.
Reset kerning for all pairs in the string	Default if no pairs are selected. Removes kerning in all pairs that exist in the current string.
Reset kerning for all characters in the string	Removes kerning in all pairs that include characters in the current string.
Limit number of kerning pairs to...	Leaves only the given number of pairs with the largest absolute kerning value.
Delete all pairs that are less than...	Removes all pairs that have a kerning value less than the given value. The absolute value of kerning is compared.
Completely reset kerning in the current font	Removes all the kerning pairs available in the font. Because this is not an undoable operation, the warning dialog asks you to save the current metrics and kerning data in the temporary file.

Opening Metrics Files

TypeTool allows you to import metrics and/or kerning information into the current font. Using this feature, you can create metric and kerning information once and use it in several similar fonts.

To import a metrics file into TypeTool, press on the  button of the bottom toolbar or select the **Open Metrics** command in the **File** menu. You will see the standard Mac OS Open File dialog box. Select the metrics file (in PFM or AFM format) or a Macintosh font suitcase that you want to import and press the **OK** button.

The **Import Metrics** dialog box appears:



The topmost control contains a legend describing the metrics file that you are importing and its compatibility with the current font.

Some options in the **Parameters** area let you select various metrics importing options:

What do you want to do with metrics data:

Do nothing

Do not import metrics data from this file.

Replace all metrics in the current font

Import all metrics data (characters' widths and sidebearings) and replace the metrics data in the current font. We recommend that you use this option only if your font is very similar to the metrics file that you are importing.

Replace all metrics that are close to current

Replace only those metrics records that are similar to the imported metrics. **Possible difference between metrics** option controls the allowed difference.

Replace metrics that are thinner than in the current font

These options are obvious.

Replace metrics that are wider than in the current font

What do you want to do with the kerning data:

Do nothing	Do not import kerning data from the metrics file.
Completely replace kerning data in the current font	Remove all existing kerning pairs and replace them with pairs imported from the metrics file.
Add imported kerning data to the current font	Leave the existing kerning pairs unchanged but add new kerning pairs from the metrics file.
Add new kerning pairs but autokern them	Import information about the characters that form each kerning pair in the metrics file and apply an autokerning algorithm to these pairs.

The **What do you want to do with other data?** option, controls the font header importing option. TypeTool can import the Font Info data from the metrics file and replace the current font info data if the **Replace this data in the current font** options is selected.

Saving Metrics Files

When you export a font file in Type 1 font format, the metrics files (in AFM and PFM formats) are automatically written. TrueType font format includes all metrics information inside, so it is not necessary to export additional files.

However, if you want to export a metrics file, you can always do that by using the Metrics Window. Just press the  button on the Metrics Window bottom toolbar, or select the **Save Metrics** command in the **File** menu. Select the destination format (AFM or PFM), and the destination directory. Enter the file name in the standard Mac OS Save File dialog box.

Printing Sample Strings

While you are in the Metrics Window you can print sample strings with or without metrics and kerning information. To do that, select the Print command in the file menu.

You will see the standard print dialog box where you select the printer and modify printing options. Press OK to begin printing.

TypeTool will print the string that is currently selected for editing or previewing in the Metrics Window. The size of the printed string will be the same that is selected for previewing on the screen. The string may occupy more than one line or even more than one page on the paper if necessary.

If metrics or kerning editing mode is selected, additional information will be printed below the baseline: in metrics mode - the widths of the characters and the characters' sidebearings; and in the kerning mode - the pair kerning values.

In the metrics editing mode kerning will not be applied to the printed string.

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