Poor Man's Chinese in TEX
featuring simplified characters

Thomas Ridgeway
Humanities and Arts Computing Center
University of Washington

This little document is intended as an illustration of and preliminary guide to *poor man's Chinese* [pmC]. pmC is a temporary expedient for printing texts with Chinese via TEX until such time as we have a well-thought-out system (and fonts) for handling Chinese.

pmC has a small number of virtues; among these are:

- pmC is available now.
- pmC is available free of charge.
- pmC is available now.
- pmC is device-independent (although it must be admitted that you will get relatively more pleasing results on less sophisticated printers)
- pmC is available now.
- pmC is sufficiently simple-minded you will not need to be a rocket scientist to make modifications for your own use.
- pmC is available now.
- pmC uses fonts mechanically faked-up from dot matrix quality fonts; if you want you can incorporate new characters of your own design using a bitmap font editor which *may* be easier to use than METAFONT.

For those who might be previously unacquainted with TEX, let us put forth a few of the advantages of TEX which are inherited by pmC: it can run on almost any modern computer; it can print to any of a large number of printers/typesetters; it can print (if desired and suitably instructed) elaborate formatting of the text; it is available at very low cost, or free (which is an instance of very low cost).

The disadvantages are at least equally compelling:

- pmC is crude and unlikely to ever be greatly improved as regards the quality of its Chinese.
- pmC uses emulation-in-METAFONT techniques to produce a dot-matrix font on your output device. No matter how talented your printer may be, the Chinese output by pmC will looked like it was stripped in from a dot-matrix printer.
- pmC is crude and unlikely to ever be greatly improved as regards the quality of its Chinese.
- pmC uses a large number of fonts which occupy a finite and measurable quantity of diskspace for each font. Your screen previewer had *better* be able to use the same resolution your printer uses, or you may experience a little tightness

around the disk. You probably will not want the fonts in multiple magsteps (they will just get uglier if you enlarge them).

- `pmC` is crude and unlikely to ever be greatly improved as regards the quality of its Chinese.
- `pmC` does not do slanted, bold, or other fancy Chinese although one could in principle. However, insofar as even a minimal installation requires 88 fonts *for Chinese alone*, we must at this point quote The Master:

  > the format of a *char_node* allows for up to 256 different fonts and up to 256 characters per font; ... TeX intended for oriental languages will need even more than 256 $\times$ 256 possible characters when we consider different sizes and styles of type. Donald E. Knuth, *TeX: The Program*. Addison Wesley, Reading MA: 1986. (Volume B of *Computers and Typesetting*). §134, p. 57.
  >
  > Ahh-hum. If we wanted to combine different-face or different-size versions of characters in a font, we could make fuller use of the fonts which are declared for `pmC`. Since currently only 94 characters are defined in each font, we could put a different version of each character into currently empty space in the same font. A light rewriting of the macro which handles the chinese characters could then select one or the other version of a character depending on what we have indicated our desires to be. As of November 21, 1990 I am not convinced that this is worth doing.

- `pmC` is based on TeX (hooray!), not on JTeX (hooray!) nor any not-known-to-me to-be-extant ChiTeX (huh?) which might know how to set type vertically, handle thousands of fonts, make doughnuts, and do all the other things that we might want software to do. `pmC`, therefore, does not set type vertically, handle thousands of fonts, emulate Spads or Spitfires, or any of the other real neat stuff.
- `pmC` may take a long time to set up if you need to make your own fonts. Preparing *one* set of fonts on a NeXT computer for use at 400 dpi required a METAFONT run of over 18 hours. The METAFONT source code files for the fonts occupied 17 megabytes of disk space when all were stored. If one looks at the simple-minded brute-force METAFONT code which the `pmC` fonts use, one may roughly estimate that a staggering number of computations (probably even more than eight) are needed to emulate a dot-matrix font through this method. There might, indeed, be a better way to do it. On the other hand, Pac-Man worldwide has consumed several hundred million times the number of CPU cycles consumed by compiling `pmC` fonts, so we are not exactly talking about wasting a scarce resource, are we? You will not ordinarily wish to make up the fonts more than once, assuming a relative absence of masochism in your

personality makeup, nor will you probably want to keep the METAFONT source code permanently *since you can mechanically regenerate it.*

How to use pmC

Assume a text editor capable of enabling entering text in GB-encoded Chinese characters. Assume a text editor capable of editing text in "normal" Latin characters. Use the first text editor to prepare a plain text file containing the Chinese text; *plain text file* means that there are no tricky codes in the text file which are intended to be used only by the program that produced the file—"ASCII file" frequently conveys what we mean by "plain text file", but by virtue of having encoded Chinese, your file will not be ASCII. Use the second text editor to enter the Latin-letter strings providing instructions to TEX; (if your first text editor is o.k. for Latin too, you can continue using it for this step! — but watch out, the JIS and GB encoding schemes have some Latin characters (graphemes) included in the two-byte code space: we need "normal" Latin (one-byte coded) text). On a separate line before the first line of Chinese, put a line saying "\input pmc \beginchinese". Pmc.tex is intended to be the name of a file containing the basic set of instructions for pmC. "\beginchinese" is a pmC-defined magic-word signifying that everything until an "\endchinese" is to be interpreted as Chinese, if possible. Using whatever text editor you want, incorporate text in whatever other language you want. Other languages will conflict with Chinese in pmC only if they use character codes in the range 160 to 254; such languages must be separated from Chinese by enclosing the Chinese in "\beginchinese" "\endchinese" structures. Create a new last line saying "\bye". Put a blank line between paragraphs in the text, and use any other TEX commands with which you may be familiar to further adorn your text. Save the file, and say the appropriate words to run TEX on your file, preview it, print it, or whatever.

What can go wrong

Well, for one, you may not have an editor for entering Chinese. [Sorry; pmC has nothing to offer you if you have no way to compose your text]. Or, for another, your editor may not use GB-encoding. [Easy: convert your text to GB-encoding! (How? That's not my problem; or, to be a *little* more gracious about it, there are some converters out there, see if you can find one ...)]. You may not know "any other TEX commands with which you may further adorn your text"§Careful study will reveal this phrase to be a direct quotation of nothing except itself. [So take a class]. Something else goes wrong. [Fix it]. You don't have a copy of pmC. [Get one].

How to get pmC

From a friend is good. If you have no friend who has pmC and is prepared to make a copy for you ... (that was supposed to be phrased as delicately as possible) ... you may get it through an *Established Channel.* There are a number of "TEX distributions" which may elect to incorporate `pmC` in their offerings of TEX and TEX-related software. You will very likely be able to get a copy from the NWCSC, distributors of TEX for Unix systems; they will have to charge you a fee, however, as even though they are non-profit they still have to pay their employees, pay phone bills, and all the rest of the drag with which I am sure you are familiar. You might also be able to get it electronically and free-of-charge via **ftp** from some place or other, but I couldn't tell you where. As I write, November 21, 1990, none of these alternatives which I have suggested will actually work, and there is no way that you can get `pmC` short of enrolling in a course of study at the University of Washington, or you have a friend who has done so.

Are we really going to show any Chinese or what?

Oh yes, this is roughly how it looks: 至今为止，大家所用的中文 编辑器，毋论用的是何输入方式 都不过于 WYSWYG (What you see is what you get) 类型 ，例如中文 WordStar 即联想汉字， 天马，飞马， 五笔字型。(Please note that we may intermix all kinds of other stuff in with the Chinese, such as Родина, Москва, Киев. 这些软件有它们好的一面， 即 直观性强。它们大都用于 IBM 兼容机与 Macintosh 个人微机， 并需 特殊的中文操作系统来启动机器。然而，它们的弱点却是不可弥补的， 即输入速度太慢而且太费脑力和眼 力。 想想看，当键盘 输入英文时

你只需机械地挥动手指，眼睛和头脑 全力贯注在屏幕上出现的文章 十分轻松， 愉快，同时也能保证出好 文章。但是用中文 WordStar 时，你的 头脑和眼睛却要繁忙地碾转在打字 、选字、和文章内容之间，如连续 两小时如此作业，你将觉得腰酸 眼痛脑力竭尽，毫无乐趣可言。下回一提起打 中文你便有一种恐惧感。本人三年 以来使用中文软件的结论便是如此。 那末 ChText 用的又是什么方法呢？ 首先 ChText 不是个编辑器 ，而是个 拼音