DISCUSSION OF LARGE PRINT KEYBOARDS

Creating large print keyboards involves much more than just making the letters on the keys larger.

Since the contents of the keys are already different sizes and shapes, making them bigger usually requires changes in (a) spatial arrangement, (b) relative proportions and (c) height/width ratios.

We are faced with the decision of whether to apply some uniform principle to the process or simply to maximize the size of every letter and symbol based on the space available.

When working with languages other than English, we note that most of the world's keyboards have 3 or even 4 letters on many keys. This makes increasing their sizes almost impossible.

Here is an example from a Malayalam keyboard of 4 letters on a key--already *reduced* from the standard size in order to fit.

And whereas upper case Latin script letters are almost all of uniform heights and widths, this is seldom the case with other writing systems. This section of an Arabic keyboard shows the extremes in heights and widths that make a uniform re-sizing difficult. However, changing the relative sizes of the letters is also not acceptable to people who use the language.
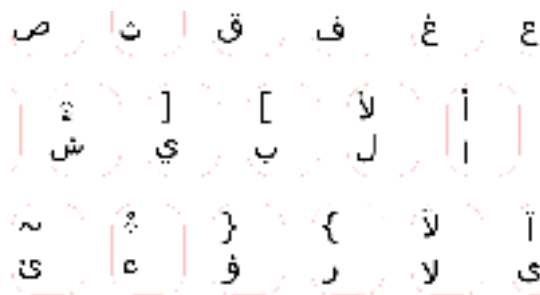
After working with a many large print keyboards, it becomes apparent that the most critical constraint of all is retaining the curent keyoard layouts. If allowed to move letters and symbols to different keys, the job becomes much easier and the results significantly better.
Let us illustrate these points with examples.

KEYS WITH SINGLE LETTERS

Generally, we can center these letters and increase their size 250-300%. At 300%, we are using the entire surface of the keys. This means exacting standards for printing and cutting stickers. If we increase the size of the sticker, this makes putting stickers on the keys very difficult. If any part of a sticker goes over the edge of a key, its useful lifespan becomes very short.

On the other hand, at 250%, there is sufficient tolerance to make manufacture and installation of the stickers reasonably easy and insure a better overall outcome.

A 100%   S 125%   D 150%   F 200%   G 250%   H 300%

KEYS WITH TWO LETTERS

Most of the time, the two letters are stacked vertically at normal size. When we increase their size, this is not always possible.

•If both letters are small, we can increase them by 250%. Examples: [' "], [- _] [` ~]

•If one letter is small and the other of standard size, we can increase both by 250%, but usually need to adjust their positions on the key. Examples: [8 *], [, <], [. >].

•If both letters are of standard size, their shape determines how large we can make them and how we can arrange them on the key. Some can be made 250% larger if stacked horizontally instead of vertically. Examples: [[{}, [] }], [; :], [\ |], [1 !].

- For most numbers and symbols, however, we can only increase their size by 150%. Even then, we usually need to stagger the arrangement, one in the lower left corner, the other in the upper right corner.
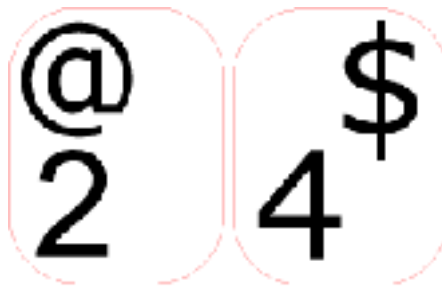
- Attempts have been made to overlap letters in order to increase their size. The outcome is very distracting, especially if applied to the entire number row. An example of 200% resizing with overlap.

- It is possible to get around this size constraint by stretching or skewing the letters. If the change in height/width ratio is less than 10%, the outcome is usually acceptable. Examples: [**0)** - the 0 becomes thinner by 10%]

- For an example of how shape affects this process, look at the difference of the [**9 (**] undergoing the same transition. This outcome would not be acceptable because the letters virtually touch each other.
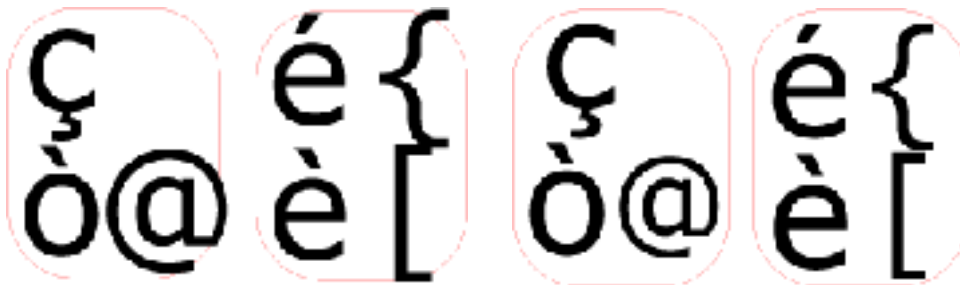
•An example of distortion in horizontal compression. Generally not acceptable.

KEYS WITH THREE OR FOUR LETTERS
Keys displaying 3 or 4 letters already fill the key to capacity. An increase in size of 150% is usually unworkable.

In this example from an Italian keyboard, the attempt to increase the size unformly by 150% runs aground. If we use 112% for the @ symbol, or 125% for the brackets, everything fits, although things are a bit cramped.

Remember, the purpose of resizing the letters is to make them easier to see. Crowding the keys and removing space between letters can actually make them more difficult to see and use.

When there are 3 or 4 letters per key, their relative location is critical because it indicates which of 4 registers to use to access that letter (default, shift, right alt, right alt+shift). This limits our flexibility in shifting elements on a key to maximize their size.

For instance, we could not move the @ up for a better fit with the left side letters because it would then be ambiguous whether it belonged in the right alt+shift register or not.

OVERALL IMPACT

It also raises a question about the whole process. Is it useful to dramatically increase the size of some letters, uwhile not changing the size of others at all? Those who wear bifocals or trifocals can attest to the difficulty of reading lines of text on signs when the contents are of very different sizes.

Given that most European languages have accented letters and a large inventory of signs on their keyboards, almost all of them fall in this category.

Here is a French large print keyboard, which is pretty typical of any large print European keyboard. The increase is size for the letters is terrific. Yet, the number and symbol keys have become very cramped and messy without achieving the benefits of optimum re-sizing.

ALTERNATIVE LARGE PRINT KEYBOARDS

If we can remove the constraint of using the standard keyboard layout, there are a number of things we can do to improve a large print keyboard.

•Remove redundant items. For example, the number pad of all desktop keyboards contain the numbers and symbols **0, 1, 2, 3, 4, 5, 6, 7, 8, 9, +, -, /, *.** Removing these characters opens up a lot of space for enlargement.

•Remove seldom-used items. Computer keyboards inherented a lot of their content from 19th century typewriters. Carrying over old formats was intended to make the technology transition more acceptable and lower the learning curve.

While it may have done that, it grandfathered a lot of baggage into the content and format of today's computer keyboards. Suppose we eliminate the some of the symbols found on the French keyboard not found on the English keyboard, **µ, ¤, §, °, ²** . And just to be fair, let's remove some items that are also found on the English keyboard that can easily be replaced with words or abbreviations or are not frequently used by the non-technical person-- **\, |, {, }, [,], #, %, &,** £.

•The result is a streamlined keyboard with sufficient space to present each retained letter and symbol with an optimum resizing. We also include in the presentation, the command and function keys, and number pad keys to show the full inventory of symbols. We have also used the International Keyboard Command And Function Key Symbols (ISO 9995), rather than any specific language on these keys. Text would also be smaller than the symbols, so there is a double benefit there.

Such a radical change to the format would pose problems to those who are adverse to change in the standard layout. It also requires a special piece of keyboard driver software (which we willingly provide at no extra charge with the stickers and keyoard covers using our rendition of the large print layouts. However, from the standpoint of simplicity, size and consistency of letters and symbols, there are considerable benefits to offer this alternative large print layou, in addition to the standard layout in large print.

LANGUAGES OFFERED IN LARGE PRINT
LATIN SCRIPT

Language	Standard Layouts in Large Print	LFC Layouts in Large Print
Albanian	Albanian	Albanian LP
Aromanian	-none-	Aromanian LP
Asturian	-none-	Asturian LP
Azeri	Azeri Latin	Azeri Latin LP
Basque	-none-	Basque LP
Bosnian	-none-	Bosnian LP
Breton	-none-	Breton LP
Catalan	-none-	Catalan LP
Croatian	Croatian	Croatian LP
Czech	Czech	Czech LP
	Czech Programmers	
	Czech QWERTY	
Danish	Danish	Danish LP
Dutch	Dutch	Dutch LP
English	English (US)	English LP
	English (UK)	
Esperanto	-none-	Esperanto
Estonian	Estonian	Estonian LP
Faroese	Faroese	Faroese LP
Finnish	Finnish	Finnish LP
French	French	French LP
	French Belgian	
	French Canadian	
	French Canadian Legacy	
	French Multilingual	
Frisian	-none-	Frisian LP
Friulian	-none-	Friulian LP
Gaelic	-none-	Gaelic LP
Gagauz	Gagauz Latin	Gagauz Latin LP
Galician	-none-	Galician LP
German	German	German LP
	German IBM	
	German Swiss	
Greenlandic	Greenlandic	Greenlandic LP
Hungarian	Hungarian	Hungarian LP
	Hungarian 101	
Icelandic	Icelandic	Icelandic LP
Irish	Irish	Irish LP
Istro-romanian	-none-	Istro-romanian LP
Italian	Italian	Italian LP
	Italian 142	
Karelian	-none-	Karelian LP
Kashubian	-none-	Kashubian LP

Latin	-none-	Latin LP
Latin American	Latin American	-none-
Latvian	Latvian	Latvian LP
	Latvian QWERTY	
Lithuanian	Lithuanian	Lithuanian LP
	Lithuanian IBM	
Luxemburgish	-none-	Luxembourgish
Maltese	-none-	Maltese
Megleno-romanian	-none-	Meglo-romanian LP
Moldavian	-none-	Moldavian LP
Norwegian	Norwegian	Norwegian LP
Occitan	-none-	Occitan LP
Polish	Polish Programmers	Polish LP
	Polish 214	
Portuguese	Portuguese	Portuguese LP
	Portuguese Brazilian	
Romanian	Romanian	Romanian LP
Romansch	-none-	Romansch LP
Saami	-none-	Saami LP
Serbian Latin	Serbian Latin	Serbian Latin
Slovak	Slovak	Slovak LP
	Slovak QWERTY	
Slovenian	Slovenian	Slovenian LP
Sorbian	-none-	Sorbian LP
Spanish	Spanish	Spanish LP
	Spanish Varian	
Turkish	Turkish Q	Turkish LP
	Turkish F	
Welsh	-none-	Welsh LP

LANGUAGES OFFERED IN LARGE PRINT
NON-LATIN SCRIPTS

Language	Standard Layouts in Large Print	LFC Layouts in Large Print
Arabic	Arabic 101	Arabic LP
Armenian	Armenian Western	Armenian LP
	Armenian Eastern	
Azeri Cyrillic	Azeri Cyrillic	
Belorussian	Belorussian	
Bulgarian Cyrillic	Bulgarian	
Chinese	Chinese Zhuyin IME	
Farsi		Farsi LP
Georgian	Georgian	Georgian LP
Hebrew	Hebrew	Hebrew LP
Japanese	Japanese Hiragana IME	
Kazakh	Kazakh	Kazakh LP
Korean	Korean IME	
Kyrghyz	Kyrghyz	Kyrghyz LP
Macedonian	Macedonian	Macedonian LP
Mongolian	Mongolian Cyrillic	
Serbian	Serbian Cyrillic	Serbian Cyrillic LP
Ukrainian	Ukrainian	Ukrainian LP
Uzbek	Uzbek	Uzbek LP