

U.S. Navy SEALs needed a more reliable keyboard on their smartphones.

Delta II Smartphone Keyboard Layout

U.S. Patent 7,658,562

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Introduction & Affirmations

Smartphones have one nagging UX problem - inhumanly tiny keyboard buttons. Bigger buttons are easy to implement, but require a non-QWERTY layout. Non-QWERTY layouts have been notoriously painful to learn and therefore doomed in the market.

This paper discusses a new, modified-QWERTY smartphone keyboard layout that is extremely fast to learn. It relies on the user's existing muscle memory reflexes to reduce the learning curve from weeks, to minutes.

Currently, most people can't type a sentence on a smartphone keyboard without hitting the wrong button. Many older folks can't even read the buttons. This problem has spawned useful innovations such as Swype & Swiftkey, however they do not address the core problem - inhumanly tiny keyboard buttons.

Solution: **Delta II global smartphone keyboard matrix** a.k.a. **Big Buttons Keyboard** app:

- **CNET** *"We keyed faster and with fewer mistakes using **Big Buttons** than with our phone's usual keyboard. The clincher? We briefly restored the default keyboard but went right back to **Big Buttons**."* -CNET 5-star editor's review
- **The Institution of Engineering and Technology (IET)** *"Its designers claim it makes typing easier and more reliable for anyone. In our evaluation it certainly did well on both counts."* -IET Magazine - largest multidisciplinary professional engineering institution in the world.
- **The Economic Times** *"These [big buttons] make it easier for those with poor eyesight."* -Karan Bajaj, ET Bureau
- **U.S. Commander NAVSPECWAR** *"We have looked at your **Delta II** keypad and we see some important applications that your device may provide us for our operations."* -Commander Naval Special Warfare Group Two
- **U.S. Navy SEALs** *"**Delta II** drastically reduces the time from eyes-on, to decision making, to direct action when necessary."* -U.S. Navy SEAL Capt. C.P., GMC, Land Warfare Cell, WEPS/ORD REP, TRADET
- **Dr. Donald A. Norman** *"It's very nice. I have an HTC Android with a physical keyboard, but this is so good I don't think I need it."* -Dr. Donald A. Norman, world-renowned usability expert, cognitive scientist, author of the seminal *"The Design of Everyday Things"*
- **Lake Forest Illinois Police Department** *"I just got a new android phone and down loaded **big buttons**. It is a great app, and works awesome. I'm showing it to everybody I know."* -Sgt. Marty Blitstein, LFPD

Purpose

People want bigger buttons on their smartphone keyboards.

QWERTY keyboards were designed to be 12 inches (30 cm) wide - not 2 inches (5 cm) wide. Squeezing a venerable 10-button wide QWERTY layout designed for a desktop, into a pocket-sized smartphone, results in tiny, error-prone keyboard buttons. The tiny keyboard buttons are the #1 reason frustrated customers return their smartphones for refunds. In an otherwise remarkable, reliable smartphone, the misguided QWERTY keyboard layout (and in fact any ten button wide layout) will always be problematic.

Why hasn't the problem been fixed?

It's because no one considered the user's muscle memory reflexes. There's ample room for bigger keyboard buttons on a smartphone. However, and this has been a vexing UI problem for decades - bigger buttons necessitate a different (non-QWERTY) keyboard layout and unfortunately, new keyboard layouts have been notoriously difficult to learn and therefore shunned by users.

People's QWERTY muscle memory reflexes are burned in and are hard to unlearn. Try to write your name upside-down, or throw a ball with your "other" hand. It's awkward and slow, because your muscle memory reflexes are fighting you.

Example - the LG Fastap™ phone used an ABCD keyboard layout and failed in the market. None of the letters were located where people were used to seeing and reaching for them. Typing was *painfully slow*, due to the non-QWERTY layout. And there are millions of other non-QWERTY keyboard layouts that won't work either.

Except for the patented Delta II keyboard layout.

Skydiving equipment designers understand the power of your muscle memory reflexes. They considered your muscle memory reflexes when relocating emergency handles on newer parachute harnesses, reducing student fatalities when transitioning to more advanced gear.

The **Delta II** keyboard matrix uses the same muscle memory reflex consideration. Every letter is located in direct proximity to where you already look and reach for it on your old QWERTY keyboard.

The result?

Instant, drastic typing accuracy improvement but more importantly, your QWERTY muscle memory reflexes allow you to learn the new layout almost immediately - no instructions needed, no thinking, it's painless. Augments existing keyboard technologies such as Swype™ and Swiftkey™.

Benefits

1. Typing on smartphones instantly gets easier, more reliable and more satisfying. Double-sized buttons offer a vastly improved typing experience - zero-typo capable.
2. ***But here's the magic*** - the elegant modified QWERTY matrix is *extremely fast to learn*.
3. No instructions needed. Just start typing and your QWERTY reflexes do the rest.
4. Desirable portrait mode operation - one or two-handed operation.
5. Buttons are even bigger than landscape QWERTY buttons.
6. Augments word prediction, swiping and error-correction methods used in Swiftkey, Swype, etc.
7. Buttons are easier to read and reduce the need for glasses.
8. Numbers & punctuation buttons are also double-sized, better arranged, easier to read, more accurate and faster to type on.
9. Easier to type passwords.
10. Superior in adverse conditions. Better for outdoor use. Easier to type on while wearing gloves.
11. Switching back and forth between Delta II & QWERTY keyboards is unnoticeable because your muscle memory reflexes remain the same. They coexist perfectly.
12. Handicapped community: Delta II is **essential** for older folks, people with larger hands, plus people with vision, nerve, muscle and limb disabilities.
13. Delta II works everywhere - touch screens, hard button keyboards, Smart TV/ DVR remotes, handheld medical devices, IOT, automobile and aircraft cockpits, etc.

Downsides

1. Takes up more screen than QWERTY, but no one cares because it does not affect their typing.

Strategic

1. **Delta II** is the only simple, painless solution to a globally annoying smartphone UX problem - inhumanly tiny keyboard buttons. Bigger buttons arranged in the Delta II Global matrix mean easier typing, more app usage, more smartphone sales, more search, more data usage, happier customers and fewer returned phones. This means more revenue for phone vendors, carriers & app developers. Delta II works standalone or can be integrated into other QWERTY keyboard typing methods such as Swype™, Swiftkey™, hard-button keyboards, IOT, smart watches, stylus keyboards, etc.
2. **Future-proof** - Delta II will be around for as long as QWERTY.
3. **Ideal for emerging markets** - where a user may experience a smartphone first (with Delta II's large, no-problem buttons) and a PC keyboard later on. The user's muscle memory reflexes learned while using Delta II will later help them quickly learn a PC QWERTY keyboard. And if they never need a PC QWERTY keyboard -- Delta II's double-sized, "no problem" buttons will still benefit them for life.
4. **Works beyond QWERTY** - please see modified Cyrillic, Arabic & Hebrew layouts below and in the *Big Buttons Keyboard Demo* app.

Try the matrix.

Download [Big Buttons Keyboard Standard](#). It's secure & free. Notice the high accuracy, high readability and how quickly people learn the new matrix. If needed, increase the "Keyboard Height" for even larger buttons. For additional big buttons and modified layouts such as Cyrillic, Arabic & Hebrew, please contact us for our recent global app.

Delta II Smartphone Keyboard Matrix



Q	E	T	U	O
W	R	Y	I	P
A	D	G	J	L
S	F	H	K	
Z	C	B	M	
X	V	N		

Born for mobile.

U.S. Patent 7,658,562

Appendix A: Patent Claim Benefit Map

Patent 7,658,562 Claims (8)

Benefits

1. A data entry interface arrangement including all twenty-six letters of a top, middle, and bottom row of a standard three-row QWERTY keyboard, comprising:

a non-staggered, linearly aligned six-row matrix including a first set of two rows, a second set of two rows, and a third set of two rows, wherein said first set includes all letters in the top row of the QWERTY keyboard, said second set includes all letters in the middle row of the QWERTY keyboard, and said third set includes all letters in the bottom row of the QWERTY keyboard; and wherein at least one set of two rows is arranged in a layout consisting of every other letter of a corresponding top, middle, or bottom row of said standard QWERTY keyboard.

2. The data entry interface arrangement of claim 1, wherein said non-staggered, linearly aligned six-row matrix comprises:

Q E T U O
W R Y I P
A D G J L
S F H K
Z C B M
X V N.

3. The data entry interface arrangement of claim 1, wherein said non-staggered, linearly aligned six-row matrix is manifested electronically upon a touch screen.

4. The data entry interface arrangement of claim 1, wherein said non-staggered, linearly aligned six-row matrix is disposed upon a plurality of keys or buttons.

Double-wide keyboard buttons immediately improve accuracy when typing, swiping, predicting and error-correcting, as per fitt's law.

Keeping letters in direct proximity to their original locations on a QWERTY keyboard allows the user's muscle memory reflexes to learn the new arrangement considerably faster than other letter arrangements - see attached graphs.

Switching back and forth between QWERTY and Delta II keyboards is unnoticeable because the user's muscle memory reflexes remain the same.

The 5 x 6 matrix allows hosting of the familiar 3 x 4 numeric telephone keypad submatrix, improving accuracy and speed when typing numbers.

Optimal letter arrangement.

Improves typing and swiping accuracy on touchscreen devices such as smartphones, painlessly.

Above benefits also apply to hard button keyboards used in smartphones, TV remotes, IOT, portable medical and diagnostic equipment, etc.

Appendix A: Patent Claims (continued)

5. A data entry interface arrangement including all twenty-six letters of a top, middle, and bottom row of a standard three-row QWERTY keyboard, comprising:

a non-staggered, linearly aligned six-row matrix including a first set of two rows, a second set of two rows, and a third set of two rows, wherein said first set includes all letters in the top row of the QWERTY keyboard, said second set includes all letters in the middle row of the QWERTY keyboard, and said third set includes all letters in the bottom row of the QWERTY keyboard, wherein said arrangement excludes:

OWERT

YUIOP

ASFGH

HJKL

ZXCVB

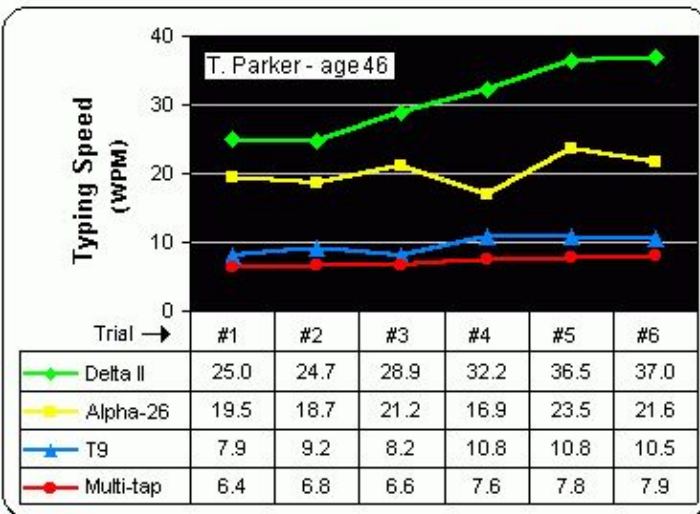
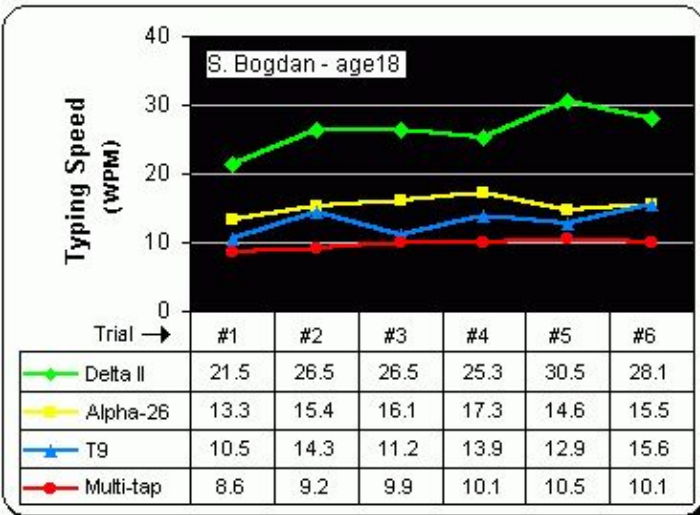
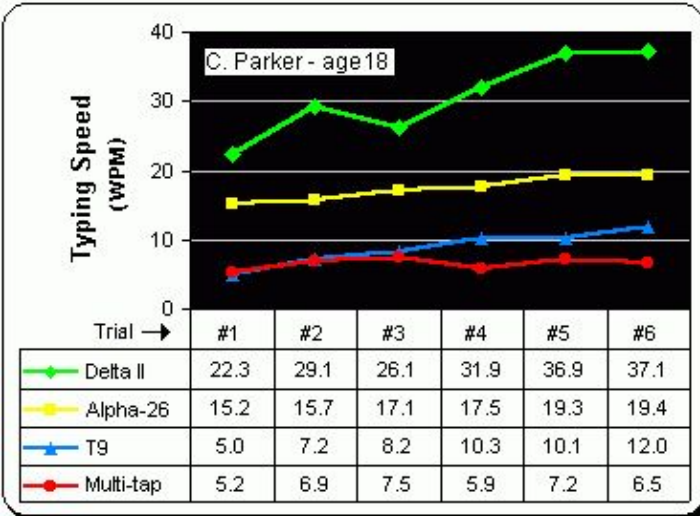
NM.

6. The interface arrangement of claim 5, wherein any two adjacent letters are transposed vertically or horizontally.

7. The data entry interface arrangement of claim 5, wherein said six-row matrix is disposed upon a plurality of keys or buttons.

8. The data entry interface arrangement of claim 5, wherein said six-row matrix is manifested electronically upon a touch screen.

Appendix B: Alphabetic vs. Delta II Typing Speeds



- Delta II matrix.
- Alphabetically ordered matrix.
- T9 enhanced cell phone keypad.
- 12-button keypad using **multi-tap**.

Delta II Matrix:

```

Q E T U O
W R Y I P
A D G J L
S F H K
Z C B M
X V N
    
```

Alphabetical Matrix:

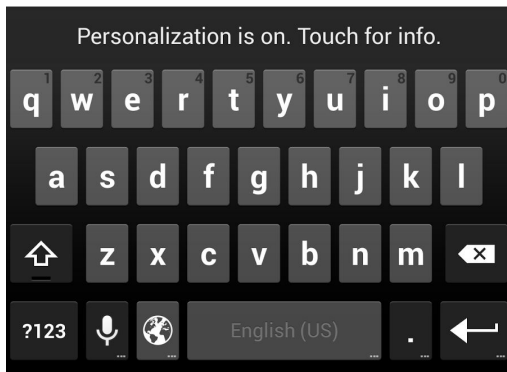
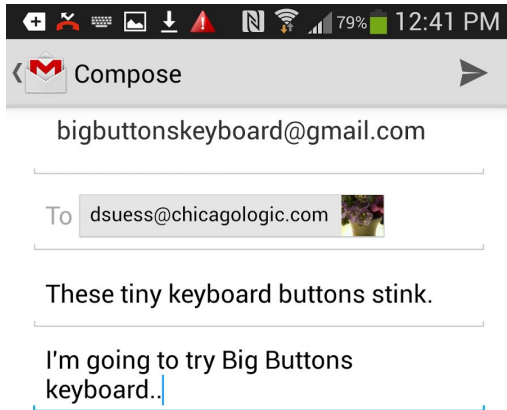
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A B C D E
F G H I J
K L M N O
P Q R S T
U V W X Y
Z
    
```

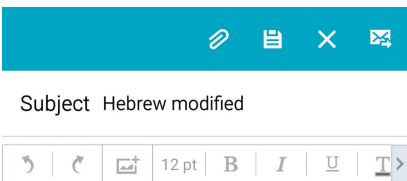
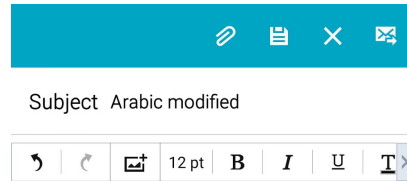
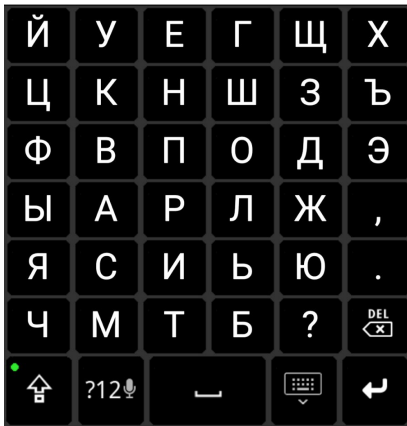
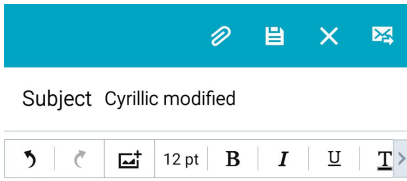
Users were timed while typing "the quick brown fox jumps over the lazy dog" six times into four keyboard layouts. Times were converted to word-per-minute typing speeds and graphed by **trials #1 - #6**.

Test subjects were average typists with essentially **no text-entry experience** on any of the four keypad types except for S. Bogdan, who had previous experience with multi-tap. Results shown here are typical and consistent with other users tested.

Appendix C: QWERTY vs. Delta II - Bigger is Better



Appendix D: International & Hard Button Keyboard Derivatives



Appendix E: Contact Information

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“Things which are different in order simply to be different are seldom better, but that which is made to be better is almost always different.” -Industrial Designer Dieter Rams