No knowledge of the world's languages or writing systems is required to understand this patent. This application offers teaching modules beginning with the needed geo-linguistic orientation and an introduction to how each writing system works and how this patent utilizes the inherent features of each language to create mnemonic layouts. Various layouts schemes are explained, however the language and writing system organization must be in color for an examiner to easily understand the features of each language, the inventive steps, the differences between each layout claim, differences between and within languages (and parts of languages) without an examiner having any prior knowledge of any of these languages. The layouts are not random, but are based on intrinsic properties of the language or writing system arranged in patterns analogous to a musical instrument where each key has a qualitative relationship to all other keys in a spatial pattern, that the brain will recognize. The images can be converted to grey scale when needed.

SUGGESTION / REQUEST:

(57) Abstract: The invention is a system comprised of a suite of tools and steps resulting in solutions and component attributes to optimally produce a writing instrument to serve the need for a small keypad on electronic devices in a global marketplace. Qwerty was designed for the mechanical typewriter age with an ad hoc arrangement of letters, which inhibits the invention of new devices. OrrPad maximizes motor- skill on the small platform to optimize a digital writing instrument for electronic interface, that best accommodates the world's writing systems, permitting a vast new ecosystem of devices. Orrpad can be integrated to a mouse to form a Mousekeypad combo for controlling computer devices.
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PCT PATENT APPLICATION

Title: A mnemonic relative position International keyboard system set on a new focus-field platform.

Inventor: Nancy Beth Orr, California USA

ABSTRACT

The invention is a system comprised of a suite of tools and steps resulting in solutions and component attributes to optimally produce a writing instrument to serve the need for a small keypad on electronic devices in a global marketplace. Qwerty was designed for the mechanical typewriter age with an ad hoc arrangement of letters, which inhibits the invention of new devices. OrrPad maximizes motor-skill on the small platform to optimize a digital writing instrument for electronic interface, that best accommodates the world's writing systems, permitting a vast new ecosystem of devices.

OrrPad meets the motor-skill and language needs for new devices and emerging global marketplace far better than Qwerty. Its small platform and optimized motor-skill allows typing accuracy on small devices, not possible with a micro-Qwerty, resulting in new devices and the possibility of an education in the pocket of billions of children worldwide, which the too-wide, two-handed, inherently poor motor-skill Qwerty prohibits. Children do not need a big two-handed keyboard, just an OrrPad as a typing device that enables proper and accurate typing, in the world's languages; that stores lessons in its drive, and serve as a combination mouse-keyboard that can connect to other PCs, monitors or web without the need for a big PC, separate mouse or big keyboard.

OrrPad keypad design logic is analogously equivalent to the potential benefits of proposing a metric standard of measurement in the arbitrary medieval standard of inches and feet. The OrrPad system allows the construction of a matrix of human language on a tiny keypad that can fit on the increasing array of electronic devices, with one hardware software worldwide where each language is organized in a common way so memory-friendly that user can cognitively memorize the layout scheme at first use- in any language. The Orr pad system provides a writing instrument and communication tool for the electronic age in a global communication era.

1. The OrrPad System is based on a 5x6 or 6x5 grid as the structural point of departure rather than the 10x3 so-called "standard" layout. (5x6 of 6x5 versus 10x3 as a platform is analogous to base-10 as a system for counting versus base-2 as a binary system.) Just as the Qwerty-style adds or subtracts the number of keys as needed. For example, Qwerty expands keys on a keyboard to accommodate function, punctuation keys, etc. OrrPad too, may add or detract keys as needed to the 5x6 or 6x5 base for specific needs or devices.

In order to discover a platform for the optimal digital writing instrument, all focus field grids that approximately fit under one hand were evaluated and the world's major languages and their writing systems were analyzed to find structural mnemonic elements within each language to build a mnemonic pattern out of those elements for each, that best enhances memory and motor-skill. This task revealed that of all possible focus field grids, the 5x6 or 6x5 format was the best platform for the maximum number of world's languages, while still being small enough to be used under one hand, or reached by one thumb. Some languages can be accommodated and claimed on a 5x5 and others could use larger platforms, such as 5x8, 6x8, etc. The prior art reveals a few 6x5 layouts in the Latin script, but all fail to adequately show or teach how to create a global platform to serve as a digital writing instrument, of the world's key writing systems, with both Latin and non-Latin keypads within one system, and provide new systems for punctuation, function accents and special letters. An ABC 6x5 vertical or horizontal is also claimed without the cross mnemonic.

2. A keyboard mnemonic of language properties: A mnemonic is a memory aid of the many bits comprising a greater whole, whereby each part has a relationship within the whole that the brain recognizes, which by memorizing the whole, one memorizes the detailed myriad of parts. A melody, for example, is a mnemonic, as each note is memorized as the details of remembering the melody as a larger entity. Once one begins the song as a whole, the minute details are durably remembered, often for life. If the same musical notes were to be scrambled, very few of the single units of notes would be memorized. Memory is preferential to learning sequences, strings, blocks, pitch patterns, cross-patterns or other patterns of related units of individual bits of memories, while unrelated information bits tends to be discarded by the brain as orphans. The alphabet order is a potent mnemonic string as it is learned when we are very young. The use of the alphabet on a two-handed typewriter where the alphabet order is broken between two hands is harder to control as a tool. Whereas the OrrPad presents the full writing set of
letters under one hand on a focus field ready for operation as a writing tool. Unlike Qwerty, that is an ill-conceived jumble of letters with no mnemonic whatsoever, the OrrPad system creates mnemonic layouts where each letter has a qualitative relationship to all other letters in a spatial pattern that the brain recognizes.

The OrrPad organizes the world's writing systems mnemonically on the 5x6 or 6x5 grid in the best meme-matrix layout possible to enhance motor-skill. OrrPad balances a letter mnemonic with the neurophysiological and physical factor underlying optimal human tool-use, as well as the modern need to have a small keypad suitable for the electronic and Internet age, while reflecting existing writing and language customs. A matrix of language values is identified in each specific language or writing system organized in a mnemonic layout on the 5x6 or 6x5 grid or more grids if possible. Mnemonic strings or mnemonic blocks of letters sometimes cross-positioned, and preferably with vertical finger assignments to sub-system of creating mnemonic layouts in the world's languages by arranging upon the 5x6 platform, the letters of each language are organized as mnemonic grids, mnemonic blocks, preferably in vertical column finger assignments, and by other methods to create a mnemonic layout.

The OrrPad objective is to provide the ideal writing instrument for electronic devices, that can permits a new ecosystem of useful devices, to maximize motor-skill and linguistic accessibility.

The best possible technique to achieve the digital writing instrument ideal is a small meme-matrix comprised of mnemonic threads of letters cross-woven into an x-y grid, which confers geo-location attributes akin to the x-y coordinates of latitude and longitude grids on maps. Instead of numbers imposed artificially on a map, the OrrPad identifies intrinsic linguistic properties and patterns of the writing systems of the world and arranges them into a mnemonic matrix unique to the writing system of each language. Because the properties are already in the brain of the native speaker, the brain will intuitively recognize that each letter has a qualitative relationship to all other keys in a woven spatial-linguistic pattern the brain will recognize through use, similar to musical instruments, which organizes each sound to have a qualitative relationship to all other sounds in a spatial relationship that reflect those qualities.

Sounds are organized along a "spine" as a point of reference all variant sounds, ideally in a grid. However, on the OrrPad, language properties are organized as mnemonic strings instead of musical notes. Other keyboard layouts tout virtue based on frequency of use or other criteria, while OrrPad seeks to maximize the memory of a brain-map of the location of keys to enhance motor-skill. Each OrrPad is a Meme-Matrix on a focus-field small enough to satisfy as a one-hand writing instrument. One-Hand 5x6 or 6x5 Grid focus field enables the reach of all keys under one hand without looking at the keys; much as an accountant can keep eyes on a spreadsheet while rapidly operating a ten-key calculator, because the calculator is entirely under one hand and number order is relative. Eyes stay on the page, not looking at the keyboard. Users can look at the monitor, TV screen if OrrPad is on a remote, pilots out the window, or soldiers can keep eyes on their heads-up display while typing, not looking at the keyboard. The 6x5 grid is claimed in this patent as a new use as an omni-mode global writing instrument, but since mnemonic vertical finger assignments are lost, 5x6 is a second choice.

Cross-Coordinate Navigation of vowels and consonants, or other Mnemonic blocks of other language properties, as reference coordinates to create a relative position "map" to locate keys, akin to a musical instrument where each sound/letter has a predictable relationship to all others and to the whole.

The OrrPad preferred mode was selected for use by the blind. The layout can be cognitively memorized at first use, and with minimal practice, it may be operated with one-hand without the need to look at the keypad. However, there are many other layouts also claimed within this system.

One Thumb Stamp and Masking mode allows the keypad to be operated as small as a postage stamp, if the software has an OrrPad claimed "masking" feature, which masks all but a small point of finger contact to allow precision selection.

Vertical Alphabet allows finger assignments to be more readily memorized in alphabetical order.

Index Finger Fan layout allows the "smarter" index finger the range of freedom to observe its natural fan motion to cover keys of columns A&E.

Thumb Sweep allows the thumb to access function keys in a natural horizontal sweep below fingers and in a natural Toggle between thumb and fingers to alternate between functions and letters.

Key Assignment Load of each finger is commensurate with the neural capacity of each finger. A "smart" finger, such as the index finger (due to higher neuronal capacity) has more keys assigned to it. Whereas Qwerty has more keys assigned to the less coordinated baby fingers.

Global Language Scripts: For billions across the globe, and for those who write in multiple languages, this system can be applied to any script.
An Education in every child’s pocket worldwide is possible, as the OrrPad can serve as an educational platform on handhelds to allow kids to type correctly with an easy punctuation system on a small hand-pad, rather than typing acronyms such as OMG and THNX because Qwerty at 10 keys wide is ill suited for handheld use. One cannot type a term paper easily on a Qwerty smartphone, but could with an OrrPad handheld.

Universal Application of OrrPad is possible for computers, TV, public kiosk, vehicle air or sea craft, or on any device (PC/PDA/Mp3/Phone/GPS) to enable a universal input system.

SUMMARY:

The invention is a global keyboard platform system. The OrrPad solves the need to provide a small one hand or one thumb capable keypad that can fit on the increasing array of small electronics on which the Qwerty design is ill-fitting at 10 keys wide while the preferred embodiment of OrrPad is a narrower 5 or 6 keys.

A novel or new use of the 5x6 or 6x5 grid as a keyboard platform standard as the structural point of departure upon which to set the world’s writing systems in mnemonic layouts that maximize motor-skill and thus accessibility for both the able and disabled, to create a global electronic writing instrument to serve everyone. This small form-factor makes possible a whole new class of computer products, promoting business and communication opportunity, and enables an education in every child’s pocket worldwide.

FIELD OF THE INVENTION:

This invention satisfies the pressing need for a small, comfortable, memory-friendly multi-lingual alphanumeric optimized global one-hand keyboard system as an efficient writing instrument. The OrrPad one-hand form permits a new ecosystem of electronic devices. It increases access for the able or disabled, on devices that are one or two-handed, watch-sized, palm-sized, desktop or laptop sized, mounted, virtual reality, and in the small form much needed for the world’s writing systems, the new array of small electronic devices for billions of new users, and an education in every pocket.

PRIOR ART:
The 10x3 Qwerty-style standard keyboard base discourages, rather than encourages, motor-skill. (1) The 10x3 base has each key in an uneven offset relationship to its neighbors, instead of a grid, which discourages motor-skill, as the brain cannot calculate distances along a tidy xy axis, since keys are uneven and offset, and not even arrayed in a tidy honeycomb. (2) Qwerty assigns the bulk of letters and shift duty to the pinkies, which are the weakest fingers, and the fingers with the least amount of brain matter dedicated to their control. (2) The 10x3 base requires two hands, which are essentially two wide and fuzzy focus fields. (3) Qwerty forces us to engage the hands and brain in an unnatural symmetric use of the hands, rather than complementary cooperation of the left and right hands, which ordinarily is a hallmark of human tool use, ever since man acquired the ability to use tools. The human brain divides responsibility between the two hands: the so-called less dominant hand (usually the left) The 10x3 base interferes with the brain’s optimal preference to use tool in a complementary rather than symmetric relationship.

The Qwerty layout is not an ordered system. It is a myth that it was designed to separate the most frequently used pairs, as the letters ER is the most frequently used pair in the English language. The Qwerty layout was designed as a sales gimmick that put the letters that spell YOUR TYPEWRITER on the top row so that salesmen had two words they could type for prospective buyers, to conceal from potential buyers the difficulty of using Qwerty.

It is so difficult to memorize the layout of Qwerty even on a full size keyboard that before auto-correct secretaries were needed to work fulltime to type for others. Navigating "asdfghkl" or: "zxcvbnm" of the "qwertyuiop" is difficult because there is no mnemonic pattern to help memory. The Miss Nimble Fingers USA typing champion of 1952 needed 1,660 hours of practice per year, for 6 years, to achieve her typing speed. Typing was so difficult that secretaries were essentially trained specialists at typing: hired to type other people's thoughts. The typist was so valuable, they spent their time typing, not thinking. Today, everyone needs to do their own thinking and their own typing for email, web, and document creation. Kids now average up to as many as 100 texts per day, most of which without correct punctuation, capitalization, or spelling absent automated spelling correction. Students need a handheld that allows them to use it for educational purposes and to create bona fide documents. OrrPad offers an educational tool in every pocket.

Qwerty results in texting OMG and THNX on smartphones, instead of writing words out properly or relying on predictive text correction. Micro-qwerty is a poor writing tool and discourages
proper punctuation. It thus cannot serve as a key educational platform, as kids cannot write properly on micro-Qwerty absent auto-correct, and teachers are concerned about the negative impact it has on the writing and typing ability of young people.

The QWERTY Division of Labor is a Problem:

<table>
<thead>
<tr>
<th>TWO HAND FULL SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left Hand</strong></td>
</tr>
<tr>
<td>2 3 4 5</td>
</tr>
<tr>
<td>W E R T Y U I O</td>
</tr>
<tr>
<td>S D F G H J K L</td>
</tr>
<tr>
<td>X C V B N M O</td>
</tr>
<tr>
<td><strong>Right Hand</strong></td>
</tr>
<tr>
<td>6 7 8 9</td>
</tr>
<tr>
<td>A B C D E F G H I J</td>
</tr>
</tbody>
</table>

As many as 21 keys are assigned to the right pinkie finger: the shortest and weakest finger.

One index finger or two thumbs carry the load on a micro-Qwerty with one finger or the left thumb assuming the greater burden.

Mnemonic cross-positioning: OrrPad teaches how to weave patterns of the world's writing systems to serve as mnemonic keyboards. Each key or sound has a qualitative relationship to all other keys in a spatial pattern, analogous to a musical instrument or spatial location benefits of latitude and longitude. For example:

1. ABC and AEIOU are cross-position in latitude and longitude coordinates like GPS navigation. This applies to Roman, Cyrillic and Greek writing systems and their many derivative languages.

2. ABC order is intact for vowels and consonants. A new column begins at each vowel.

3. Each finger is assigned a vowel and all the letters in that column. Thumbs control its natural sweep of functions and punctuation. Users will acquire definitive motor-skill just using the pad.

"Cross-navigational" coordinates, allows the brain to maximally locate keys: mentally memorizing the layout with one use and acquiring maximum motor speed with minimal practice. For optimal memory, the pad is oriented vertically.

OrrPad does not organize all writing systems like Roman, Cyrillic and Greek. Korean cross-positions vowels and syllables without an intersection. Brahmi OrrPads weave places of articulation, while Japanese is organized according to vowel sounds. Chinese, Arabic and Hebrew each employ unique layout techniques.

We all benefit if the world is finally given the option of a layout that can serve as a better one-hand writing tool. The industry already requires that users adopt new skills every year, with every new product, so it is possible for the industry to finally give the world a best mode writing-tool, which would be a benefit to humanity; for example, billions of children could have an education in their pocket if they had a better digital writing tool allowing them to write properly, while manufacturers better profit by opening a large new ecosystem of a new class of products to be made.

OrrPad can incorporate outside innovations into its system. It appears no one has hitherto recognized the potential of the OrrPad principles and elements to the point of proving a viable platform system as OrrPad has done. Where there is the incidence of isolated 5x6 or 6x5 base keyboard layouts or other OrrPad features, which was not developed into a system, they need not be orphaned. Suitable layouts or other OrrPad compatible features in the public domain or under a prior patent can be incorporated into the Orrpad. No claim is made for any prior art in the public domain that is incorporated or prior art that is licensed into the Orrpad family. However, Orrpad has advanced beyond the prior art, and has established its own claims including a new claim of a platform system and a system for creating mnemonic layouts. OrrPad substantially teaches its system, including why and how to draft mnemonic keyboard layouts for the 5x6 platform.

Examples of devices on which OrrPad may be applied: email and web capable phones, PDAs, music players, navigation systems, all-in-one one-handed combination mouse-and-keypad for PC (MousekeyPad), multi-function combination a portable hard-drive with self-contained keypad (OnePad), virtual reality SpacePad where one may merely type in space, a WatchPad, an alphanumeric capable remote control or calculator and a musical instrument, etc.

Featured is an optimal method for organizing human language as a mnemonic matrix that allows a user to maximally memorize a layout at first use, applicable to multiple languages, resulting in the achievement of a written matrix of human language. Introduced is a cross-navigational memory mnemonic of blocked or woven threads of linguistic properties applicable to multiple languages. Proprietary methods teaches how to achieve Relative Position System typing whereby each key and character has a maximal qualitative relationship in spatial pattern of each key to all other keys, akin to a musical instrument, thus aiding user interface, cognitive memory, motor-skill and utility. Intervals of sound in a spatial pattern are the two related mnemonic properties of
how music is memorized by the human brain. The OrrPad applies both properties by organizing the writing systems of human language similar to the way a musical instrument is organized. The OrrPad arranges letters of over 150 languages into a mnemonic where each sound has a qualitative relationship to all other sounds in a spatial pattern.

Other features of the OrrPad system includes: accent access methods, hardware design principles, user skill principles, disability aides, a scientific calculator, language matrix techniques and musical keypad, etc. The Orr Pad provides one keypad worldwide that can fit on small electronic devices or any application requiring keyed entry or mnemonic display of letters.

With less practice than on Qwerty, the preferred embodiments of the Orr Pad system can be optimally used one-handed without looking at the keyboard. This is useful at the desk for one-handed operation of a keypad or a combined mouse-and-keypad for use by one hand; and essential for mobile handheld PDA or phone units, GPS navigation in a moving vehicle; military applications and other one-handed, virtual reality or sight-less need situations.

Path of Invention: The invention is based on expertise in the acquisition of motor-skill and analysis of the world's writing systems

A Common Organization of Language- One human brain has produced the myriad of unique and varied human language. The Orr Pad keypad system converts into practical technology a common method to organize and present different writing systems on one keypad tool; that both echoes the way the human brain innately organizes language and reflects and respects five-thousand years of local writing customs.

Orr Pad Mnemonic Blocking and/or Cross Navigation is a technique whereby linguistic properties are displayed in a block or pattern as a mnemonic aid; ideally in a cross arrangement of vertical and horizontal coordinates to assist in the location of keys. This is similar to astronomical, celestial maritime or GPS navigation systems; except Orr Pad is somewhat like a musical instrument in that each letter has an innate qualitative relationship to the other by blocking and crossing linguistic values rather than merely superimposing a numbered grid as in GPS. The use of linguistic properties make the Orr Pad technique akin to a musical instrument in that each sound has a spatial and an innate pitch relationship to every other sound and here each key has a spatial, structural sequential, and linguistic relationship to the whole. Through blocking and cross-navigation, the Orr Pad gives each part (letter) a spatial and linguistic relationship to the whole in a system. Like GPS, RPS (Relative Position System) typing, with cross-coordination of references, establishes planes of latitude and longitude and allows the brain to maximally calculate the positions of keys.

Cross Navigational Arrangement of the Roman Character Set: Consonants are in vertical alphabetical order in columns begun with the occasion of a Vowel; which are laid in horizontal alphabetical order serving as reference points. Each finger moves up and down to control the vertical domain of resident consonants below its assigned vowel while retaining alphabetical order. Vertical arrangement allows instant alphabetical memorization of letter assignments for each finger. A keypad with an innate logic where each part (letter) has a spatial and linguistic relationship to the whole as a system provides a mnemonic and motor memory structure; and thus, the enabling of blind and virtual reality spacekeypads.

English and the Roman character set is the base with 115+ accents, to serve 48 languages and up to 2 billion speakers. Alternative character sets currently offered and organized with a common logic include: Greek, Cyrillic, fully accented representing 50 languages and over 250 million speakers; Chinese ideograms serving over 2 billion people; Japanese, 110 million speakers; Korean, 63 million speakers; Brahmi scripts with 1 billion speakers of more than 16 languages; Arabic, for 400 million speaking 27 languages; and Hebrew.

Accent System- The Roman character languages (except English) require accents to understand written communication. Orr Pad introduces a robust and highly intuitive accent system to finally make easily accessible the 100 or more accents of the Roman character set, accents for the Cyrillic character set and any other character set with their myriad array of diacritics and special characters. This accent system includes an innovative Sequential shift key to access accents by tapping a shift or option key to choose the desired accent clustered on its host letter. The accent system may be deployed as software on Qwerty systems as well as Orr Pads.

Hand Brain Language Tool Axis- The Orr Pad hardware preferences were designed informed by the way the human brain and hand produces tool use. The homo-sapiens brain development of
increased lateralization, which enabled the fine articulation of tools, is a precondition neural change that allows the articulation of detailed language: including writing skill. Orr Pad research has produced a preferred embodiment, which offers a one-handed pad to exploit this innate human right-hand, left-brain Language Tool Axis. Finger channeling flow is vertical the way fingers move with an open index finger fan to exploit its range and relative neural "intelligence". All assignments are according to the unique neural and relative coordination capacity of each finger. The thumb movement is in a toggle and sweep consistent with natural thumb to index articulation; flow, strength and neural capacity.

Relative System Typing enables a Spacekeypad-Orr Pad relative position system typing, where each key has a unique spatial and linguistic relationship to the whole, enables a claimed virtual reality spacekeypad where the user may merely type in space, breaking electromagnetic or acoustic fields, lines, forces, signals or other; emanating from a watch-like device or other, to achieve proximity detection; rendering the user without the need for a hardware keypad.

Vertical Assignment channels of the alphabet improves typing skill. This is because all fingers move relative to the forearm at the wrist and a single alphabetical mnemonic allows users to know where letters may be found by finger assignments for each mnemonic block. If the hand remains moving up-and-down on the vertical plane, the vertical Y axis remains constant and thus the frame of reference for the fingers (which move relative to the wrist) remains constant, thus significantly improving typing skill. However, if the wrist is moved horizontally, sawing back-and-forth, the frame of reference becomes more diffuse, thus reduces accuracy of typing. For one handed typing, a vertical arrangement helps preserve Relative Position references. All touch typing motor-skill depends on the establishment of a reliable frame of reference (the wrist in this case, rather than the home keys are Qwerty) from which neural connections encode precise distance along an XY axis for the neural connections to encode how far a finger should move from the point of reference to the target key. Preserving one axis (the vertical Y axis) allows the user to "extend" the frame of reference of the wrist to include the domain of the keypad. The domain of the keypad arena is the reach of fingers relative to the wrist in the vertical, rotation, and fan scope of reach.

Vertical movement is the "Y axis" of the keypad. Moving the typing hand horizontally on (the X axis) reduces motor-skill. Arranging most keys in a vertical arrangement increases motor-skill.

A World Language Matrix keypad enables a Rosetta Stone type tool and writing instrument for either modern or ancient languages.

Other Applications- A member of the Orr Pad system is a combination mouse and keypad (mousekeypad) is introduced; plus the spacekeypad, watchkeypad. Orr Pad scientific calculator, a Musickeypad, Direct 411 Directory, and other accommodations for the blind, deaf and paralyzed are given, and are so claimed herein.

14. The chart of Orr Pad is to offer a design and method to produce a global standard, motor memory friendly, electronic interface writing tool.

OrrPad solves problems of: (1) A small keyboard (2) World languages (3) Mobility (4) Extended consumer use.

Meeting Today's Public Need for:
1- A world standard keypad system: suitable for all sized products, especially small electronics, accessible in all languages and motor-memory friendly (so as to facilitate those learning) and to provide keyed entry access for as many people as possible.
2- Access to keyed entry on maximum number of devices; improved access particularly needed on small electronics
3- Access to maximum number of Languages on one master keypad design
4- Access to language Accents to provide full access for language expression for indigenous languages

Problems solved by Orr pad keypad system:
1- Small electronic access
2- One world standard keypad
3- World language access in small form
4- Language accent access
5- Orr Pad mnemonic system allows keypad layout to be memorized at first use. This method is applied to the other languages, which can also be memorized at first use.
6- Improved cognitive and motor memory design to solve QWERTY's problem of poor typing skill.
7- Improved accessibility to the left-brain right-hand language tool axis
8- Improved use of the hand, its function, and its conformation to an electronic keypad.
9- Informed by field research in understanding the neurophysiology of motor-skill.
10- Maximizes speed and ease of use

11- Improved access by the handicapped

12- Improved accessibility for the writing systems of the world's languages. Thus improving access to global education and preservation of culture.

12- Improved versatility: Can enable new products and are so claimed such as novel: calculator, a Mousekeypad, a Musickeypad, a Spacekeypad. Mousekeypad. Watchkeypad, etc.

13- Standard text keypad interface to electronic instruments such as scientific, medical industrial, robotic and military user interfaces.

14- Standard dispatch and inventory input keypad.

15- Allows QWERTY and AZERTY etc. to be used simultaneously with some of the features of the OrrPad. Allows concurrent use while transitioning to the new standard.

Reference to "Qwerty" in this patent refers to the 10 key across standard keyboard hardware base onto which may be placed Qwerty or any of its derivatives in any language such as Azerty, QwertZ and any character set of any language.

The flaws of Qwerty are as follows:

1) No Vertical Spine: Qwerty has keys that are not only offset but offset unevenly. Offset and uneven are two separate flaws. Uneven or offset letter positions are more likely to result in a more diffuse memory. Fingers physically move vertically up and down: like waving bye-bye. The whole hand must move to find keys on the horizontal plane. Fingers waving bye-bye can easily find keys by just moving up and down without moving the wrist, hand or forearm. The spine of any keypad is the establishment of a straight vertical plane of reference from which the user may slide up and down to find all keys. Fingers on a keyboard should be able to find keys by merely moving up and down as the first plane-of-motion to establish optimal motor-skill. Deviations from the vertical spine should be secondary. On Qwerty every motion is offset and or uneven on the vertical plane. Just as a keyboard needs horizontal home keys to establish a horizontal axis from which fingers memorize all relationships- keyboards also need a vertical axis as a frame of reference from which to anchor memory of position. Establishing a vertical axis by straight grid alignment is lacking in Qwerty. Look at your Qwerty keyboard and you will see the distances between the center of the two superior letters of the ASDF row and the inferior letters of the QWERTY row is offset and uneven. It is not even a tidy honeycomb. Additionally, he superior letters of the ZXCV row and the inferior letters to the ASDF row are offset in honeycomb. All of Qwerty keys are offset with no vertical spine as frame of reference. To make matters worse; curiously, half of Qwerty is even honeycomb half uneven. This uneven offset arrangement of hardware keys is the worst possible arrangement from which to establish motor-skill. The most stable plane is the flat striking surface and yet, the original typewriter had an uneven strike surface as keys were graduated in terrace relief where keys higher keys were unnecessarily elevated- making motor-skill less likely still. It made it more difficult akin to the way the most complicated multi-terraced organs are more difficult to master than just playing the piano on one horizontal "terrace" plane.

The trick to assisting motor skill is to design hardware that establishes three planes of reference from which all keys may be found systematically:

1. STRIKE SURFACE
2. VERTICAL SPINE for each finger to slide up and down according to the capacity of each finger.
3. HORIZONTAL PLANE in vertical steps according to natural finger reach.

BRIEF DESCRIPTION OF THE DRAWINGS:

Two Documents:

1) Devices upon which is placed a 5x5, 5x6 or 6x5 OrrPad layout in various writing systems. Some devices are claimed as novel.

2) Sample Layouts in different writing systems.
Cross Coordinate Navigation along an xy axis is a compelling technique for spatial location used in seafaring navigation, missile guidance, GPS and satellite technologies.

Spatial location by cross coordinates may also be used in a writing input system for digital devices. Instead of imposing an artificial numerical grid, such as a numbered latitude and longitude for spatial location, OrrPad is more akin to a musical instrument, which are hand operated musical tools designed so that, each sound has a qualitative relationship to all other sounds, in a predictable spatial location within a pattern, with an xy axis. Each sound has a qualitative, and ultimately quantitative, relationship in a pattern that informs where to find all sounds relative to each other.

OrrPad organizes the world’s writing systems similar to a musical instrument. The elements of the world’s writing systems are mnemonically organized in a pattern, within a predictable frame of reference, to best enable the location of letters.

Each part (letter) has a relationship to the whole in a system. A keypad possessing an innate logic will enable each letter to serve as reference points and thus speed, comfort and accuracy. It also enables a new class of electronic products. Any sequential or informational criteria can establish coordinates for latitude and longitude and become a cross-positional arrangement. A numerical grid, sequential criteria, qualitative structural features, or mnemonic strings of related information can be applied to create a cross-navigational arrangement; including, but not limited to the elements listed below:


EXAMPLE ONE: CROSSING OF VOCALS AND CONSONANTS OR VOCALS AND SYLLABLES:

The three-vector matrix of a writing input system where the order of vocals, consonant and syllables serve as Cross-Navigational matrix Orr Pad:

Consonants are in vertical alphabetical order in columns begun with the occasion of a Vocal: which are laid in horizontal alphabetical order serving as reference points.

Vowel Order: Horizontal Longitude Reference
Consonant Order: Vertical Latitudinal Reference
1. Surface Strike Plane of fingers serves as the first spatial point of reference for motor-skill.
2. Vowels are placed in native order as a prime vector, at one side, top or bottom of the matrix.
3. Consonants or Syllables intersect vowels in the native order speakers learned as children.

A consonant meme-block is begun at the occasion of each vowel, in alphabetical order, to create a cross-coordinate nexus as a navigational reference to facilitate cognitive and motor-memory.

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

In the Roman Cross navigational Orr Pad, the navigational elements include the mnemonics of:
(1) Cross-positional Navigation of (2) Horizontal Vowel Order and (3) Vertical Consonant Order in (4) Alphabetical order for both Vowels and Consonants, with (5) Accents found Clustered on Host Keys, accessed by a (6) Sequential Shift or dedicated Option Key(s) (7) on a motor-memory 5x6 or 5x5 one-hand focus field grid. (8) Blocking or clustering of four writing elements: vocals, consonants, accents and punctuation.
The cross position can intersect alphabetical order such as "A" in AEIOU crossing with the alphabetical order of ABCD. The "A" holds an intersecting position for both vowels and consonants in alphabetical order. However, vowels may be simply laid in one direction (horizontal or vertical) and consonants may be laid in an oppositional order (vertical or horizontal). Because of the well-organized nature of the Korean language a Cross-positional keypad

In the preferred embodiment: (1) Vowels are laid horizontally in a top block in alphabetical order. (2) A vertical channel of consonants in alphabetical order begins at the occasion of a vowel. (3) The reverse arrangement is also claimed whereby vowels are laid vertically and consonants are laid horizontally with the apparent advantage of reading in the more familiar horizontal alphabetical order to which we are accustomed and thus users might believe they prefer the horizontal consonant with vertical vowel arrangement. However the preferred embodiment for a mnemonic keypad is the vertical consonant order with horizontal vowels because of the following over-whelming memory advantage: a) Each finger moves up and down to control the vertical domain of resident consonants below each vowel. This vertical arrangement of consonant alphabetical order allows the immediate memorization of the letter order following under each vowel for each finger. Thus, for example, in the Japanese cross-navigation of vowels and syllables, the user knows all syllables using the sound of "A" falls in the vertical domain of the index finger.

VERTICAL ALPHABETICAL ORDER allows the user to memorize finger assignments instantly. Motor-memory follows with actual physical practice.

Natural flow of finger movement is vertical, (like a child waving fingers bye-bye up and down). Thus, it is a vertical axis of finger flow along which is best laid alphabetical order to promote motor-memory. Fingers are independent entities- it is easiest to acquire motor-memory for each finger when each finger has its own easy-to-memorize set of letter assignments along a clear referential axis. Anyone can instantly remember ADCB for the index finger, etc. This is why "home" keys were identified, to artificially create a point of reference from which motor memory is hung. However, the body has its own innate point of reference- the natural vertical flow of finger movement. As evidenced in the learning of musical instruments, motor-memory is expedited, when one cognitively memorizes the finger assignments before attempting practice. Musicians attest they are more accurate on their better-designed musical instruments than with their typing skills; hour for hour of practice. Even if they spend more hours over a lifetime typing than playing music, the music playing tends to be more error free than their eternally error-plagued typing. Qwerly is a badly designed as a hand tool. The vertical cross navigation keypad has the relative organization of a musical instrument, where each key has a relationship to the whole; along the vertical axis of natural finger flow; which provides the first reference in all instrumentation upon which motor-memory can be fostered. Musical instruments all have each sound in a logical relationship to all other sounds. This is why musicians can ultimately be more accurate; even though musicianship is a much more complicated task than typing. With the necessary practice, typing on an Orr Pad can be like playing music fluently.

Japanese: A cross-navigational keypad in Japanese keeps perfect alphabetical order in four crossed dimensions (rather than merely the two of the Roman Orr Pad). It also blocks eight linguistic values of written communication: vowels, and their descendant consonant syllables, diacritics, consonants, accents and punctuation. Plus radicals and their descendant character trees to accommodate four scripts on the same tiny keypad: Chinese, Roman, Hiragana and Katakana.

The Process: Begin with optimally sized hardware: The 1st Orr Pad Meme Matrix mnemonic aide is to choose a Focus Field by selecting a smaller-than-a-palm keypad hardware foundation with small fingertip sized keys arranged in the preferred 5x6 straight grid so that fingers can move in vertical channels with additional punctuation, function, and accent keys easily accessed by a Thumb Toggle & Sweep.

Mnemonic Letter Layout: The 2nd mnemonic is the placement of Vowels in Horizontal Alphabetical Order to establish a plane of longitude. Users can memorize the top 5 vowel letters instantly.

The 3rd mnemonic is the crossing of the horizontal vowel plane by Consonants in Vertical Alphabetical Order. The user may thus simply memorize that the layout of the keypad is: vertical alphabetical order and at the occasion of a vowel a new row is begun.

4th Finger Assignments: Consonants in vertical alphabetical order crossed with horizontal vowels in alphabetical order allows instant memorization of the letter assignment for each finger.
As each finger descends in its natural channel of movement, the user knows the top vowel begins the alphabetical sequence of consonants for each finger. The mnemonic follows the alphabet song sequence we all remember from childhood.

Claim 2: A blocking arrangement with cross of blocks of letters to create a cognitive mnemonic to assist in the navigation on a keypad for input into electronic devices. Blocking of information with or without cross-position of blocks or intersected cross-coordinate navigational weaves as a technique to create a mnemonic and navigable matrix grid of human language or other information:

A crossed or blocked positional arrangement of values such as vowels and consonants or syllables (or other information set) cluster blocked possibly intersected to create a navigational tool to assist in the location of characters or symbols on a keyboard or other product with an array of information. Studies show remembering blocks of information of units of 5 to 7 items is easiest. Additionally, crossed information, preferably intersected, maximizes ease of navigation. Blocking, unitizing to 5-7, cross positioning and where possible— with intersecting weaves, produces the most navigable matrix of information. Orr Pad provides a system to create a flexible and maximally navigable matrix of world language on a keypad. Claimed is the system and its individual component techniques.

(a) Grid with Intersected information blocks
(AEIOU intersect alphabetically with consonants.)
In this case, a new column of the matrix grid is begun at the occasion of a vowel preserving alphabetical order of both vowels and consonants on a grid; thus making cross-navigation latitude and longitude references and intersections on a keypad possible.

Roman Vertical or Horizontal Alphabetical Order

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<table>
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<tr>
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<td>U</td>
<td>V</td>
<td>W</td>
</tr>
<tr>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Positional blocking without intersection:
Where intersection is not possible information may be organized by the positional blocking of information as a mnemonic aid, (such as vowels versus consonants or syllables; on sides or top and bottom or other pattern within a matrix.

Information may be blocked horizontally or vertically in relative positions that enhance utility. In an Orr Pad blocking is an important tool (and the choice of what and how to block) to enable a keypad with greater economic, mnemonic or ergonomic value than the Qwerty arrangement.

Korean Samples of blocked Orr Pad grids:

All Horizontal Korean: Vertical Vowel Sidebar:

Conversely, Japanese, Roman, Greek and Cyrillic have an alphabetical order where vowels happen to interperse the consonant order very four or six letters in a single sequence to permit a cross-navigational mnemonic.

In Korean, the language the order of vowels and consonants is learned by rote in a separate sequence rather than in one consecutive sequence, thus a blocked rather than intersected arrangement on a small keypad. If vowels were interspersed in one sequence, intersection would be possible or if the keypad was very large, then Korean can be displayed cross-navigationally with all 140 syllable sounds found where their component vowels and consonants intersect as phoneme. (See Korean section of this patent). However, a grid of 140 syllables is too large. Since this full display is too large for small electronic units, the inventor has produced a blocked mnemonic method.

(c) Cross Blocking with or without intersection is when a block of information is in one direction and the other block runs in the opposite direction.

Cross-blocked example: Blocked example:

Horizontal Vowel w/ Vertical Consonant: All Vertical Korean:

The cross blocking occurs naturally in intersected matrices such as the Roman, Cyrillic, Greek,
Japanese, Brahmi; and partially in Arabic and Hebrew. Cross blocking in a matrix where there is no intersection would be selected to more closely comply to the logic of a world standard of a cross-navigational language matrix. However, it is not required, as the all vertical Korean still complies to the matrix vertical channeling feature ideal for space-keypads, where a user merely types in space. Additionally, the vertical pairings are related to one another in shape and sound, while the horizontal vowel layout, though more familiar and more akin to the horizontal disposition of other language keypads, the horizontal breaks the vowel sound pairing between the 5th and 6th vowels while the vertical preserves this relationship in an extremely fast and tidy mnemonic; which still ends up reading left to right, and the vertical aspect is in keeping with the fact that Korean was originally written vertically and still is done so in applications that have remained in the vertical custom. Both are possible, and claimed.

See Korean section for its Preferred Embodiments.

The two best Korean solutions are the adoption of either 2 horizontal rows of vowels with broken vowel meme pairs or the preferred embodiment below of 5 double vowel memes that preserves both traditional Korean order and the global Romanized position of “A” in the far left corner.

Korean Preferred Embodiment:

Vowels are encircled and comprise two rows or columns. As in other Orr Pads, vowels, consonants, syllables or other linguistic values may be blocked vertically or horizontally or as a combination of vertical and horizontal. Blocking can place the vowel block (or other linguistic values such as diacritics) at the sides or bottom. Blocking is also claimed if a blocked arrangement of characters is placed on the Qwerty style keyboard hardware.

Preference in blocking should be given to alphabetical order, but in special instances, when weighing competing values, breaking order may be preferred and is also claimed when blocking on a keypad grid is employed.

On a keypad, the surface plane of keys, or the breaking of a signal plane with the movement of a finger, is plane number one with two or more cross-coordinates; which may or may not intersect, to establish a useful organizational mnemonic of letters or other information.

HORIZONTAL & VERTICAL ORGANIZATION IN OTHER LANGUAGE CHARACTER SETS: PART 2

"X" and "Y" cross coordinates of writing system elements were found by the inventor in over 100 languages, however not all of the patterns in the varying languages are of the crossing of vowels and consonants at a nexus point. For example Korean is organized where vowels and consonant order are in separate sequences as a table. Thus, the Korean OrrPad results in not one, but many possible patterns of block n patterns of blocks of vertical and horizontal vowels and consonants to produce syllables.

Japanese weaves threads of vowels, syllables and diacritics; and, unlike in English, the Japanese OrrPad also allows all syllable sounds of each vowel to be assigned to one descending finger and remarkably those syllable sounds can remain in alphabetical order.

One human brain with a neural capacity for language produced all of the disparate languages of the world. But these languages of the world are exactly that- disparate- and distinctly different one from the other. Thus, each language OrrPad is quite different reflecting the unique organization of each language system. The Orr Pad employs a system of organizing the different linguistic values of a given language into some kind of woven entity whereby values of that language are displayed as a mnemonic weave of that language.

ANY VOWEL ORDER or REASSIGNMENT

In the Orr Pad, vowel order is often used as a mnemonic thread for use in a weave. Orr Pad reflects the fact that vowels in the various languages are different in their disposition and organization and thus recommends placing a high value on arranging vowel order according to the traditional custom of native speakers.

Music as a Mnemonic: A powerful mnemonic is the song each child sings to learn the alphabet of the script of their language. A song better encodes the memory of sequential order than merely flatly droning the alphabet sequence because the up and down sounds of the letters forms a cross-position
matrix on a spine of time duration, along which each sound goes up or down in pitch. Written music reflects this as an xy axis chart of the pattern of pitch along an axis of time duration. If the alphabet were taught with no song, just as a single flat string, with no vertical pitch, the alphabet string would be much harder to memorize; like remembering the sequence of the numbers of Pi. The matrix of pitch along the spine of duration creates a mnemonic structural matrix that helps us memorize the sounds and letters. Additionally, alphabet songs are our earliest and first exposure to the alphabet and therefore the most durable language mnemonic for each of us.

Mnemonic Alphabet Song

Inherent Mnemonic Cross Weave of Song
Horizontal Thread: Progression in time and lyric

A song illustrates the mnemonic power of crossed X and Y threads of information. The vertical spine (pitch) woven with a horizontal "string" (time progression of connected meaning) In this case where there is no lyric, the vertical spine of pitch crosses just a progressive (time) thread of an otherwise disconnected string of information (alphabet) which becomes connected to the pitch thread to eventually become a meaningful thread. The changes in pitch allows us to more easily memorize a string of information of otherwise unrelated letters. If mathematics were taught using song- or crossed mnemonics of any kind- learning would be enhanced. OrrPad has invented and encourages the implementation of mnemonic cross-weaving of language values on keypads to thus capitalize on the mnemonic and navigational advantage of cross positional arrangement. Both cognitive memory and motor-skill navigation are maximized when cross-woven patterns of mnemonic threads are used.

Languages that are organized and taught with an XY cross of linguistic values do not need an alphabet song. For example, Japanese needs no alphabet song if a mnemonic is taught to children which established a weave of vowels crossed with consonants to create syllables. In Japanese, a horizontal axis can be established by 5 vowels AIUEO crossed with 9 vertical consonants sounds beginning with: KST-NHM-YRW. Each row repeats 5 vowel sounds to create the 48 Japanese syllables that begin with the 9 vertical consonant sounds: KST-NHM-YRW.

This "cross" of 5 vowels and 9 consonant sounds is all the Japanese need to remember in order to learn every syllable possible in Japanese language:

<table>
<thead>
<tr>
<th>A</th>
<th>I</th>
<th>U</th>
<th>E</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ka</td>
<td>Ki</td>
<td>Ku</td>
<td>Ke</td>
<td>Ko</td>
</tr>
<tr>
<td>Sa</td>
<td>Si</td>
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<td>Me</td>
<td>Mo</td>
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<td>Yi</td>
<td>Yu</td>
<td>Ye</td>
<td>Yo</td>
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<td>Ra</td>
<td>Ri</td>
<td>Ru</td>
<td>Re</td>
<td>Ro</td>
</tr>
<tr>
<td>Wa</td>
<td>Wi</td>
<td>Wu</td>
<td>We</td>
<td>Wo</td>
</tr>
</tbody>
</table>

Japanese speakers can learn the cross-weave above to derive 45 syllables shown in the table below:

A fully cross-woven Japanese OrrPad might look like this: Vowels in red. Black are syllables.
Notice the Roman alphabet is an alternate script on the Japanese OrrPad. It is cross-woven here weaving vowels with consonants descending from each vowel in alphabetical order. Each column begins at the occasion of a vowel.

OrrPad favors the order that follows tradition as close as possible for the native speaker. OrrPad does not routinely conform vowels or other letters according to Roman custom such as found on other keypads where sounds of other languages are required to fit to Roman custom. Remarkably, OrrPad has been very successful in managing to find a pattern that preserves native order that resonates with the order of other languages. This is principally because the diverse human languages were produced by one human brain and the human brain organizes language the same way with diverse manifestation. The trick was to recognize primary patterns of human language that could be found in all languages. For example, all languages have vowels. Many languages have more than 5 vowels. For example, Korean has 10 vowels. However, all vowels roughly correspond or descend from 5 vowels sounds.

There has been a fashion whereby keypads have been conforming other languages to the English or Roman order. This is not necessary, however if preferred by a client; a claim is made for OrrPad keypads that make other languages conform to the Roman order or English phonetic sound. Example given below in Japanese:

Instead of traditional Japanese order below which OrrPad favors preserving:

あいうえお Translating to: (AIUEO).

Also is claimed in an OrrPad where the order of characters is made to conform to English sounds or Roman alphabet order; for example:

あいうえお Translating to: (AIUEO).

Also claimed is the OrrPad where English or Roman order is made to conform to the order of other languages.

OrrPad favors preserving native order for the market of native speakers because it is preferable to their needs and their mnemonic linguistic threads. Furthermore, children born into that language will continue to learn traditional order; if for no other reason than that dictionaries, name directories and encyclopedias, etc are already in the traditional alphabetical order. Children must learn that order to easily use references traditional to their native tongue. Besides, the Orr Pad design, more than any other design possible, preserves native order as much as possible while maximizing consistency of resonant letter placement from one language to another.

The Orr Pad system weighs values and depending on the use and need of the manufacturer marries the competing values into a compromise. Thus, vowel order may be approximate or rearranged in any order such as AIUEO, UOIEA, AEIYO, AEIOUY, and is so claimed in this patent application or other combinations OR order of vowels as appropriate to the language or use. Vowel order may be in the order customary to the particular language or rearranged to afford a better fit or accommodation to the keypad or partner languages of the keypad. A claim is made for any order of the vowels in any language character set. Vowel order examples are given below. Order may be rearranged or omitted per the linguistic or space demands of the particular keypad. Traditional order strings as point of departure used in OrrPad given below:

1- Latin Vowel order: A E I O U

2- Greek Vowel order: A E I O Y

3- Cyrillic Vowel order: A E I O U Y O E Y

4- Chinese “Vowel” order: (Bopomofo and Pinyin)

5- Japanese Vowel order:

あいうえお Translating to: (AIUEO).

6- Korean Vowel order:

(a) (ya) (o) (yo) (o) (yo) (u) (yu) (u) (i)

7- Hindi Vowel order:

अ आ इ ई उ ऊ ए ऐ ओ औ (a ½a) (i ee) (ou uu) (ae aee) (o ou)

Cross Navigation in Other Languages: cross-blocking navigational techniques can be used in other languages and are also claimed.

Example 2: In Japanese, a cross arrangement of Vowels and Sounds or Syllables may be used for navigation and is claimed in this patent.

Example 3: In Korean, Vowels and Consonants may be arranged horizontally and vertically to significantly improve navigation. It does not have a cross point like the Roman or Japanese cross navigation Orr Pad. Korean has the next best thing; which is a horizontal arrangement of vowels and a vertical arrangement of consonants. An
integrated cross-navigational weave with a common axis point such as found in the Roman, Greek, Cyrillic and Japanese Orr Pads is not on the Korean keypad. Instead, the Korean Orr Pad enjoys benefits of cross arrangement without an integrated axis point of a woven pattern.

Claim 3 – A keypad layout of letters with the CROSSING of VOWEL and CONSONANT ORDER as a letter arrangement.

The cross-navigational Vowel Consonant Orr Pad has a keypad arrangement whereby the keypad reads its letters in alphabetical order with a special difference: at the occasion of a vowel a new column or row is begun. While maintaining maximum alphabet order, a new row is begun at each vowel, thereby creating an intersection of two universally known, powerfully retained, childhood mnemonics to aid in the memory of the location of keys: the alphabet song of letter order and vowel order; Roman alphabet letters include: A E I O U as the vowel-set for the alphabetical order of: 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. Other letters, languages, and language characters may be applied to this system and are so claimed.

Example 1:

Example 2

5x6
6x5

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

The above Example 1 Orr Pad features the mnemonic ideas of:

A Focus Field (2) arranged as a Grid, (3) smaller than a palm sized (4) with letters presented in the alphabetical order when possible including: (5) Vertical alphabetical order of letters in (6) Vertical finger channels, featuring (7) Cross-navigational coordinates by juxtaposing (8) Alphabetical order of vowels serving as end row horizontal coordinates against (9) a vertical and discrete main body of consonants also in alphabetical order. (10) Ideally, with a shared intersecting axis of mnemonic meaning at the horizontal and vertical point of juxtaposition of the referential navigational coordinates with (11) extra key spaces available for dedicated accent or punctuation keys which can be accessed by a (12) thumb toggle or sweep.

Example 2 shares all features except: it is unnecessarily wider, and no vertical alphabetical order with its highly valuable finger channeling mnemonic, thumb toggle. The only advantage of Example 2 is a horizontal reading of alphabetical order seems more familiar; but it is ultimately far less mnemonically functional.

3b. CROSSING of Vowels and Alphabet Order is CLAIMED - The crossing of vowel order and alphabet order is claimed in any direction or shape arranged in any orientation: vertical, horizontal, mirror, upside-down, diagonal, offset, curvilinear, 3-D, varying sizes, key distances, changes in key shape or tactile quality, etc.

ROMAN FOCUS FIELD GRIDS:
The current typing standard is a wide 10x3 Qwerty keyboard. The OrrPad introduces a new standard for the Internet and small electronics age, by re-ordering writing systems to fit beneath one thumb. OrrPad identifies one “focus field” or more, if they exist, to underserve the language matrix for one-thumb writing tool. Focus field layouts have been identified in all world scripts and most languages. In another section of this patent find the discussion of the theory of how to create a digital writing instrument and the task of identifying all focus fields and best mode. In the Roman Accent section find a full comparison of this system set of 8 claimed Roman alphabet focus field layouts:

Roman Focus Field Grids with Layouts

Also claimed w/ any piggies

5x6
6x5

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

5x6
4x7

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

5x6
5x5 w/ 1 piggie
4x7

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

(See Roman Accents for a comparison of layouts)

All layouts above are set on a focus field grid, which is the basis of a one-thumb or one-hand writing tool. However, not all focus fields or
OrrPad - Technical Specification Notes

layouts are best mode. The specifics of the layout can better endow it as a writing tool. The task is to order elements of each writing system in mnemonic blocks in such a way that each letter has a qualitative relationship to all other letters in a spatial pattern that the brain recognizes, even if a pattern is not cognitively noticed. Since it is not obvious, the average person is not likely to recognize best mode. Yet, whichever field is selected, manufacturers and users alike are then saddled with any unnoticed limitations, just as the public was saddled with Qwerty, today's poor default as a one-hand writing tool. Since English is the world's largest single language, and the Chinese the largest single user of Roman script, and 80 other unique languages also use the Roman script; the choice of focus field grid and layout for the world's Roman script is not a decision to make absent understanding of motor-skill, which relies on the brain's language-tool axis, (which is neither computer science nor ergonomics), while equally satisfying the needs of all other writing script users, which collectively comprise a comparable number of users. See the technological discussions, Roman Accents, and each of all other scripts for an analytic comparison of layouts as a writing tool according to language and motor-skill.

OrrPad can produce focus field grid shapes for other scripts, but not all scripts well on all grids. For example some Asian scripts would do well with grid of 4, 5, 6, 7 or 8. However, 8 is almost as long as a Qwerty and is to be encouraged to be reduced to fit on a new class of products possible with a more square-ish keyboard. In the incident of 4 key base, it can be a standalone small pad or placed on a larger 5 or 6 grid to accommodate other languages on a device. 4x7 is just too long to serve as best mode.

Alphabetical order, meme blocking, cross-positioning, vertical finger assignments, etc., all underpin motor-skill and the keypad as a digital writing instrument.

All of these Roman layouts can fit in a small space and operated with one thumb, but in order to promote manufacturer selection of the best mode writing instrument, the claimed system of 8 Roman focus field layouts below is needed to discourage arbitrary device design and encourage the best informed engineering of a global writing tool, to fit all devices and language markets. They may all seem the same, but for many linguistic and motor-skill reasons the best mode to serve as a writing tool is the vertical 5x6 AIEOU cross. However, the whole system of 8 layouts is also claimed, in case manufacturers insist on another focus field base, because the best mode, and comparison of all modes, is not obvious to the average person or manufacturer, since motor-skill is not their domain of expertise.

The choice of layout for devices is usually made by those with expertise in computer science, ergonomics, or business, which confers no expertise in writing systems and motor-skill, which perpetuates their familiar flawed Qwerty; even though the majority of the world's population of billions of people have never used a 10x3 keyboard, or any keyboard. Yet, they will in the next decade. Why saddle many billions of new users with the 10x3? Qwerty is too wide for one-hand use and offered no motor-skill or linguistic advantages from the day it was ill conceived. Tablets, like iPad, become desktops because they need a desk surface in order to type with two hands, or become a laptop with an attached keyboard while a one-hand OrrPad would allow one-hand typing on a tablet.
SPACE-KEYPAD OR SPACE-PAD: A claim for a space-keypad, or space-pad, is made whereby one may merely type in free space, by breaking a field, emanating from a base of a watch-type device on the wrist, ring, clothing, or other base.

The mnemonic OrrPad AEIOU CROSS layout enables the space-pad, as a space-pad is best-served by a narrow field for one-hand use, and vertical fan finger assignments in alphabetical order. Qwerty is too wide for a space-pad, keys are offset unevenly, and all keys cannot be reached without moving the hand, violating the necessary relative position for locating in free space.

The use of a space-pad is well within the capability of the average person. If the user is already skilled in the use of a hard or touchscreen vertical Orrpad and the layout is embedded into memory as a motor-skill, the user does not need to "see" the keys, but may merely type on unmarked spatial domains. The input could be seen on a head-up display or other monitor. Dancers and athletes "find" points in free space with great precision, and so might typists find free spaces. Yet, even if the user has no prior skill, the OrrPad layout allows the user to cognitively carry a mental map of letter layout because vertical finger assignments allow all consonants to be found descending from vowels in alphabetical order. Vertical finger assignments and knowing the order of vowels lets a beginner find all consonants, even at first use. The spatial shape that the fingers follow would be curved following the natural way fingers move in the spatial domain. Wherever it is that fingers fall is the domain of the keyboard. That spatial shape is curved. The motor-skill of free space typing is made possible by the OrrPad layout. A hurdle is that it would need to be turned off and on conveniently, so that it is not on continuously. Thus, for this, a surface is useful.

Any Surface Keyboard: Similar to a space-pad, is the typing onto any surface, which would feel more natural to type with surface contact, and technologically easier to implement.

A combat soldier in the field, in the dark of night, could quietly type communications in complete darkness on a small portable wafer-like keypad placed anywhere, such as placed on one's leg, chest, arm, or on a surface within a vehicle, instead of using the relatively large chunky laptop now found in military vehicles. Input can be seen on a heads up or monitor display.

Also: See image of an OrrPad for use on a fighter jet console, with before and after images.

Touch-Fabric: If an inexpensive fabric, capable of receiving typed input was inexpensive enough, even clothing could offer a small field of "touch-fabric" to receive the typed input of the soldier, so that one could type on a pants leg or other surface. The OrrPad layout makes this possible, because the layout allows blind-use in the dark, where one need not see the keys. Yet fabric keyboards can also be imprinted with visible key-face letters.

The best layout is the AEIOU ABC cross. However, if Qwerty or other layout is employed it is also claimed in this patent as a space-pad.

SPACE-PAD- Finger Assignment Example A:

Typing is in free "space" on letter positions can be fixed, or custom programmed to each individual, exactly to where their own fingers fall naturally.

The placement of all finger motion happens to be relative to the wrist, and so must a space-pad accommodate wrist-relative motion. Wherever the hand moves so too moves the "keypad". Qwerty is both too wide for one-hand space-pad and does not lend itself to a relative-to-the-wrist arrangement. The relative position in Qwerty is relative-to-the-home-keys, not the wrist. Users, in theory, are supposed to return their fingers to the home keys before striking their next letter. A keypad arrangement that allows finding spaces within motion relative-to-the-wrist makes the ideal space-typewriting instrument. This is because all fingers naturally already move relative-to-the-wrist. Thus the ideal keypad exploits the hand's natural finger movement relative-to-the-wrist, as this is the natural default. A space-keypad layout should have letters available in a pattern whereby fingers can access all letters within the small domain of motion from the wrist to finger-reach. After all, wherever the hand moves, so too is found the spatial keyboard.
**OmnPad - Technical Specification Notes**

**RIGHT HAND SPACEPAD**
Finger Assignment Example B:

Index Finger Domain:

A B C D

Middle Finger Domain:

E F G H

Ring Finger Domain:

I J K L

Baby Finger Domain:

M N O P

**LEFT-HAND SPACERAD**
Finger Assignment Example D:

Ring Finger Domain:

O P Q R

Middle Finger Domain:

I J K L

Index Finger Domain:

E F G H

Baby Finger Domain:

X Y Z

**RIGHT HAND SPACEPAD**
Finger Assignment Example C:

Index Finger Domain:

A B C D

Middle Finger Domain:

E F G H

Ring Finger Domain:

I J K L

Baby Finger Domain:

M N O P

**LEFT-HAND SPACEPAD**
Finger Assignment Example E:

Ring Finger Domain:

O P Q R

Middle Finger Domain:

I J K L

Index Finger Domain:

E F G H

Baby Finger Domain:

X Y Z

**Horizontal Space-Pad Layout Options:**

<table>
<thead>
<tr>
<th>IAPO</th>
<th>AFOK</th>
<th>FKP</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJEP</td>
<td>AFKLQ</td>
<td>BGLQ</td>
</tr>
<tr>
<td>BFKUX</td>
<td>CHMRUX</td>
<td>CGLRVY</td>
</tr>
<tr>
<td>DHIJN</td>
<td>DINSVY</td>
<td>DHMSTWZ</td>
</tr>
<tr>
<td>EN</td>
<td>EJOTWZ</td>
<td>N</td>
</tr>
</tbody>
</table>
3c. PIGGY-BACK VARIATIONS - Piggybacking is used to allow a keypad to be fewer keys and/or rows. Letters infrequently used are the best candidates for piggy backing. Alphabet order of piggy backing is kept approximately intact, so that the user may still employ the mnemonic of alphabet order to remember where keys are located. The value of reducing the size of the keypad with Piggybacking should be weighed against the value of a full layout. Examples of piggy backing in the Latin alphabet are given below. An Orr Pad may have multiple variations of piggybacking. In addition to reducing the number of keys and rows, piggybacking is used in other language character sets and in multi-language keypads. A claim is made for multi-language piggybacking with more piggyback examples given in the multi-language section of the Orr Pad patent.

Piggyback Example 1: PIGGYBACK J, Q, Z (5x5) Piggyback Example 2: PIGGYBACK J, Q, X (5x5)
A E I O U A E I O U
B F J K P0 V B F J K P0 V
C G L R W C G L R W
D H M S X D H M S X
Y Z Y Z
NT NT NT

Piggyback Example 3: PIGGY J, Q, M, S, X, Z (5x4) Piggyback Example 4: PIGGY J, Q, M, S, X, Z (5x5)
A E I O U A E I O U
B F J K P0 V B F J K P0 V
C G L R W C G L R W
D H MN T Y Z D H MN T X
Y Z

A E I O U A B C D
B F JK P0 R Q V E F G H
C G M S W I J K L M N
D H NT X Y Z O P0 Q R S T
U V W X Y Z

3d. APPROXIMATE Alphabetical order.
If alphabetical order is approximately preserved, a keypad remains within the bounds of the OrrPad with slight rearrangements of the alphabetical order of letters; as approximate order still permits the user to localize any letter by alphabetical order cross-coordinates. The AEIOU order and A-Z order (ABCDEFGHJKLMNPQRSTUVWXYZ) interface in a cross arrangement that simultaneously preserves their approximate mnemonic orders as a learned as a child. Approximate order may be employed for one or more of the following reasons:
1- To fit characters onto keys. 2- To reduce the overall numbers of keys and/or number of rows.
3- To maximize the overall preservation of any native alphabetical order. 4- To minimize variation in design from language to language. 5- To maximize coherence between host and guest languages. 6- To optimize utility of accent and option keys. 7- To wholly improve the understanding or the function of the keypad.

Example of Approximate alphabet order: Piggybacked in the following:
A B C D
E F G H
I J K L M N
O Q P R S T
U V W X Z Y2

Transposing position of alphabetical order slightly as in: Q P still allows RPS (relative position system) typing; as approximate alphabetical order allows the user still use cross-coordinate references to help locate keys. A possible reason for approximating alphabet order in this case is to allow any piggybacked letter on the left to be activated by an option key programmed to just activate any letters on the left. Another reason would be to allow all characters of a particular language to be located on the left of center. Both are acceptable reasons to give an approximate, rather than perfect, alphabetical order.

There is value to the order of the letters as well as an independent value to having a straight grid. Even without arrangement on a straight grid, this arrangement of the letters remains claimed because the value of the cross navigation remains even though the value of the grid is lost.

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

OrrPad TROJAN HORSE FOCUS FIELD ARRANGEMENTS: Trojan Horse Orr Pads are the claimed second-string Orr Pad design alternatives that are not the preferred embodiment of the vertical AEIOU cross grid. They may appear to be a matrix, but are not: hence a perfectly good-looking Trojan Horse at first glance; but filled with hidden demons to be-devil the manufacturer, software programmer and end-user alike. In
contrast, each AEIOU ABC cross-navigational grid is extraordinarily well-organized according to the way natives learn their language in the universal way world human language.

Misleading to deploy a Trojan Horse and a misuse of the opportunity to have an extremely well-organized user interface for electronic communication, language logical. Some manufacturers may choose the secondary embodiments and Orr Pad has the know how to organize them as well as is possible to interface one onto the others, thus a claim is made for them should they be selected. Some examples of claimed secondary Trojan Horse embodiments include: (a) HORIZONTAL ABC GRID, (b) VERTICAL ABC GRID, (C) HORIZONTAL CROSS-NAVIGATIONAL GRID, (d) QWERTY ADAPTED FOCUS FIELD GRID, (e) ROMAN ADAPTED ORDER. Each appears on the surface to be meeting the need for a global keypad for electronic devices as each looks like it "fits" on small devices and each of the inferior embodiments has one or more desirable features. However, it is the vertical AEIOU cross-navigational vertical ABC 5x6 focus field grid that is the preferred embodiment because it uniquely best enables a world language matrix, as well as being the most enabling design for the futuristic mousekeypad and spacekeypad and creating a workable single hardware software interface worldwide on any device. A world language matrix in the palm of one's hand can be a crucial instrument in the cross communication between speakers of diverse languages, allow universal electronic access and be a tool to maximally preserve and or integrate world languages. Trojan Horse arrangements physically "fit" on the pad. Look similar or seem to have an advantage, but this is an illusion: the Trojan Horses cannot deliver to the public the long-term, personal and global advantages as the matrix.

The invention of the most ideal world language matrix is the signature of this patent filing. However, initially a manufacturer (or user) may not recognize this advantage and may choose lesser embodiments over the ideal. Individual features of this patent may be employed a la carte and should be patent protected in their own right. The purpose of this invention is to solve the need for a maximally universal keypad on small electronics. The preferred embodiment solves this problem where the others have hidden failings that may not be identified by casual observers. If manufacturers had recognized the cocktail of design elements that enables a world matrix keypad, it would have been already been invented.

The matrix accomplishes its position as most ideal design given the constraints of (1) the way human language is constructed and is learned, (2) the way the human mind acquires motor-memory (3) the way the human hand is shaped and works and given (4) the cultural language and writing customs that already exist. The four items above are prior constraints to which any k

In the interests of short-term earning or design shortsightedness one of the inferior embodiments may be selected. If this occurs and it becomes the standard through

Because on the surface, certain embodiments may superficially appear to be a language matrix, the patent can help protect the public from products that appear to have equal utility but in fact do not and cannot, and encouraging the use of the ideal protects the public interests. In order to protect the public from manufacturers choosing inferior layouts to avoid the nominal licensing fee of this patent the inventor claims some of the inferior layouts that may masquerade as a world language matrix at first glance, but are not. Some examples are given below:

HORIZONTAL ABC GRID: To date, until Orr Pad research, it seems the full value of a 5x5 grid, 5x6 grid as a focus field foundation for a world language matrix as a motor-memory hand tool for language production, preservation of language diversity and communication potential has been unanticipated by manufacturers. It is Orr Pad research with its innovative and flexible system that can demonstrate the value of the focus field and thus establish the 5x5 or 5x6 grid in the marketplace as the hardware foundation solution for communication and text input using a small keypad interface.

The 5x5, the 5x6 or 4x7 grids are not currently the standard for electronic communication and text production in the marketplace. Today, the use of a focus field grid exists (with an ABC layout) on other products such as the 4x7 ABC grid on UPS inventory hand units or the 5x6 ABC grid of the Road Navigator.

Where these grids have been used, the enormous human language-tool potential of the grid was not exploited or anticipated, nor did these devices inspire or teach others of the value of the foundation grid as evidenced by their limited design, mis-design, and limited use of the grid.
The best use of the 5x6 grid is as a world language matrix using the AEIOU.

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

The ABC focus field grid. At the onset of this invention process there were no focus field grids found in the patent literature or marketplace. Records of the calendar of this invention are available. During the lengthy patent process to design and produce a patent filing for a complete system for a world language matrix, a few focus field ABC grids have appeared such as on the UPS inventory unit and Road Navigator. The inventor knows of no others. They all appeared after the inventor's development of the grid research and none of them have influenced the marketplace as they have not been propagated as a design.

Additionally, the language matrix value of the grid seems to have not been anticipated by these manufacturers. The use of the ABC grid minimizes the potential world language matrix value of the focus field grid. ABC is not a matrix of human language and has only three desirable features; small size, alphabetical order, and the focus field mathematical proportions ideal for creating a world language matrix by the use of the AEIOU cross navigation and the matrix cross positioning of all the other languages woven in one tiny keypad. Unicode can now fit on the face of a cell phone. One hardware-software worldwide. The inventor makes a claim on the 5x5 or 5x6 grid on new products.

It is Orr Pad research, innovation and principles of cognitive memory, motor-memory and linguistics across world language that can demonstrate the new use and high value of the grid as a keypad that has heretofore been unanticipated. A manufacturer or potential licensee may deploy an ABC horizontal grid on the Orr Pad foundation and mislead the consumer into believing they have the full benefits of the Orr Pad system, just because it looks, at first glance, like the general dimensions of the preferred 5x6 embodiment of the cross navigation Orr Pad. The Orr Pad system is a matrix of human language that can fit in the palm of one's hand. Cross-navigation of blocked linguistic properties allows instant cognitive memorization of each layout. Combined with vertical channeling of alphabetical order the matrix enables a world standard keypad. If manufacturer's choose the ABC grid to avoid the AEIOU grid and vertical channeling, this would be a great disservice to the public.

Encouraging the Trojan horse of the ABC grid in the marketplace may foreclose the possibility of a world language matrix whereby users worldwide may navigate not only their own language but the matrix allows the possibility of other languages to be accessed and navigated with ease as all of the languages of the matrix share a common method of organization. If you can use the matrix for your own language you can substantially access other languages. It has been one human brain that produced all of the disparate languages and the Orr Pad matrix organizes language according to their common roots—vowels, consonants, syllables, radicals, ideograms, diacritic markings, etc— all organized on one tiny matrix with each part of the language found in the same place on the same keypad worldwide. One hardware-software worldwide. The ABC grid cannot accomplish this. If the ABC grid could have accomplished this, the inventor would have employed it and encouraged its use because of the superficial fact that the horizontal disposition is more familiar to users. However, it is the preferred AEIOU embodiment that is the only way to create the most complete matrix of world language which is the best way possible to organize human language on one small communication device that can be used worldwide. The establishment of a world language matrix keypad suitable for small electronics requires being placed on a focus field. The ABC horizontal grid has a focus field and alphabetical order, but it has no mnemonic linguistic blocking, no cross navigational advantage, no vertical channel alphabetical mnemonic. Additionally, it has no organizational mapping relationship such as cross-navigational organization that can be held in common across other languages.

The maximum number of world languages may be preserved for posterity and the maximum number of persons may access electronic communication with the maximum motor-skill with the vertical AEIOU-ABC cross-navigational keypad. However, the horizontal AEIOU cross-navigational keypad and the ABC grid (both horizontal and vertical) is also claimed in this patent.

Horizontal 5x6 ABC Grid: As this layout is already employed on the Road Warrior GPS navigational keypad, OrrPad claims this layout for
all other uses. Road Warrior did not anticipate the potential value of the 5x6 focus field grid for general typing purposes such as cell phones, land phones, PDA's, pagers, remote controls, mousekeypads, spacekeypads, watchpads, OnePads, etc. OrrPad makes a claim for all uses of the ABC 5x6 grid layout, except for those devices which may already be found to employ the 5x6 ABC grid.

The ABC grid, at first glance, may appear to have the advantages of the AEIOU cross-navigational keypad. However, the AEIOU cross pad is a far superior as a writing instrument. It allows the user to immediately memorize the letter assignments for each finger as follows: for example in the Roman AEIOU OrrPad—each finger is assigned a sequence of letters in alphabetical order beginning with the occasion of a vowel. The AEIOU cross pad comprises a matrix of world languages in a maximally woven pattern of consistent intuitive logic that the brain recognizes even if not explained cognitively. Cross-navigation is the state-of-the-art technology for the location of position that science has ever found. OrrPad has made new use of cross-navigation as a writing instrument. The AEIOU OrrPad provides the brain XY coordinates to create references for the location of letters.

Although the AEIOU cross pad is the preferred embodiment, Orr Pad feels it is in the best interests of humanity to also claim the ABC grid. Orr Pad is concerned that if Orr Pad does not own the general use patent for the ABC horizontal grid, licensees may choose the ABC horizontal grid over the AEIOU cross pad because they do not realize the many motor, neuro-physiological, cognitive and multi-language benefits of the AEIOU cross upon superficial inspection as it requires the benefits to be explained to the potential user. Additionally, if the ABC grid is not claimed, the licensee may simply wish to avoid license fees for the AEIOU and thus deliberately or inadvertently rob the end-user in the public domain from the advantages of the AEIOU cross-navigational writing instrument. However, if the ABC grid is claimed by OrrPad for all applications (other than where is may be already employed) manufacturers will have licensing costs associated with both the ABC grid and the AEIOU cross and thus not have a financial motive to impose the inferior ABC grid on the public. Current keypads such as Qwerty were not designed for the electronic age and the increasing array of small electronics. Nor was it designed.

Should the ABC grid become the standard for small electronics, humanity loses this opportunity in the history of human technology to adopt the best possible keypad designed for electronic use.

```
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
```

**Horizontal ABC Grid w/Drop or Piggy Letter:** the horizontal ABC 5x5 or 5x6 grid with a dropped Z or the piggybacked Z (or other piggybacked letter) on the 5x5 or 5x6 grid should users prefer an ABC on the meme-matrix 5x6 or 5x5 hardware. The drop Z and piggy Z are claimed in their own right on any pad arrangement.

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

In the example above Z is piggyed but any letter can be piggyed and is so claimed as an OrrPad. However, non-cross navigational pads are not as easy to navigate because they do not possess the navigational and memory advantage of the crossing of values.

**Vertical ABC Grid:** A claim is made for the Vertical alphabetical arrangement of letters. The vertical arrangement is particularly powerful in enabling a spacekeypad where users may simply type in space. This is because with a vertical arrangement, a user may more readily memorize letter assignments for each finger when the letters run in alphabetical order. Although the vertical cross-navigation arrangement is the best for a spacekeypad and world language matrix, it is possible a licensee will choose to place an ABC on a grid. The vertical ABC arrangement is claimed for its innovation in enabling vertical memorization of ABC order finger assignments.

```
A F K P U   A F K P U   A G M T
B G L Q V   B G L Q V   B H N U
C H M R W   C H M R W   C I O V
D I N S X   D I N S X   D J P W
E J O T Y   E J O T Yz  E K Q X
Z
F L R Y   S Z
```
Horizontal Cross-Navigational Keypad Grid: Horizontal cross-navigational keypads possess the cross-navigational memory advantage; but as they do not channel vertically, they lack the memory advantage of each finger being able to "memorize" its assignment immediately, especially in the case of a space keypad. Additionally, the four squares in the bottom row allow a thumb toggle of other features such as accents in the Roman key-set. Horizontal Cross-Navigational grid matrices are generally not the preferred embodiment but are claimed in this patent and there are occasions where it could be the preferred layout principally because the horizontal ABC is familiar. The horizontal AEIOU cross-navigation layout is claimed.

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  

Non-Cross-navigational & Non-Vertical Alphabet: 
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  

7. The Orr Pad can be any SIZE 
Below are listed 6 basic size ranges. Item #2, 3, 4, are preferred embodiments of the ideal comfort range, but larger or smaller are also claimed. 
1-BigScreen or Super-size  
2-Desktop Laptop or Notebook-size  
3-Palm-size  
4-Phone-size  
5-Watch-size  
6-Ring or Pen-size, etc.

8. OrrPad keypad designs are claimed in any MANUFACTURING MATERIAL. Including but not limited to: plastics, wood, metals, composite, natural or man-made materials, with LCD, or otherwise lighted or backlit keypads, having flat, raised, recessed keys, with touch-pads and computer screen keypads, etc.

10 Any partnering combination with QWERTY (or other design) adjacent, superimposed or piggybacked with features of the Orr Pad is claimed. A claim is made for any of the Orr Pad design features if paired with QWERTY. Such as: alphabet or number arrangements in ANY language, the accent-diactitic key, language character changing key, the yellow-pages directory feature. No claim is made for patent provisions of the OTHER DESIGNS, except when using the Universal Keypad and when in violation of claims of the One Pad Universal Keypad. Any partnered superimposition of an Orr Pad on QWERTY or other keypad design is claimed.

Examples of Qwerty Partnering: 

\[ \begin{align*} 
Q & \quad W & \quad E & \quad I & \quad R & \quad T & \quad U \\
A & \quad S & \quad D & \quad F & \quad G & \quad H & \quad J \\
B & \quad L & \quad N & \quad O & \quad P & \quad R & \quad Y \\
C & \quad M & \quad N & \quad O & \quad P & \quad Q & \quad Z \\
D & \quad E & \quad F & \quad G & \quad H & \quad I & \quad J \\
E & \quad F & \quad G & \quad H & \quad I & \quad J & \quad K \\
F & \quad G & \quad H & \quad I & \quad J & \quad K & \quad L \\
G & \quad H & \quad I & \quad J & \quad K & \quad L & \quad M \\
H & \quad I & \quad J & \quad K & \quad L & \quad M & \quad N \\
I & \quad J & \quad K & \quad L & \quad M & \quad N & \quad O \\
J & \quad K & \quad L & \quad M & \quad N & \quad O & \quad P \\
K & \quad L & \quad M & \quad N & \quad O & \quad P & \quad Q \\
L & \quad M & \quad N & \quad O & \quad P & \quad Q & \quad R \\
M & \quad N & \quad O & \quad P & \quad Q & \quad R & \quad S \\
N & \quad O & \quad P & \quad Q & \quad R & \quad S & \quad T \\
O & \quad P & \quad Q & \quad R & \quad S & \quad T & \quad U \\
P & \quad Q & \quad R & \quad S & \quad T & \quad U & \quad V \\
Q & \quad R & \quad S & \quad T & \quad U & \quad V & \quad W \\
R & \quad S & \quad T & \quad U & \quad V & \quad W & \quad X \\
S & \quad T & \quad U & \quad V & \quad W & \quad X & \quad Y \\
T & \quad U & \quad V & \quad W & \quad X & \quad Y & \quad Z \\
U & \quad V & \quad W & \quad X & \quad Y & \quad Z & \\
V & \quad W & \quad X & \quad Y & \quad Z & & \\
W & \quad X & \quad Y & \quad Z & & & \\
X & \quad Y & \quad Z & & & & \\
Y & \quad Z & & & & & \\
Z & & & & & & \\
\end{align*} \]

12th QWERTY 5x6: Motor-memory grid with QWERTY motor mnemonics. 
(a) Left-side 1st / Right-side 2nd Stacked  
(b) Left-to-Right Row-by-Row  

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

Any VARIATION of 1 or 2 hand, Left or Right hand, 1 or 2 side or combined with other features is claimed. Keypads may have one or more sections. They may be placed on any unclaimed hardware (QWERTY, AZERTY, etc) or the claimed Orr Pad meme-matrix world grid. Orr Pads can be vertical or horizontal, reshaped, of any width, row-to-column ratio, language, alphanumeric combination. Orr Pads may be combined other OrrPad features or unclaimed features (such as GPS) or writing, LCD or other panels, mouse, calculator. Examples include, but not limited to: 

Example 1: Alpha-Numeric w/Panel (reversible) 

A E I O U 1 2 3  
B F J P V 4 5 6  
C G K Q W 7 8 9  
D H L R X * 0 #  
O M S Y  
O N T Z  
Panel  

Example 2: Alpha-Numeric (Piggy) 

1 2 3 A E I O U  
4 5 6 B F K P V  
7 8 9 C G L R W  
* 0 # D H M S X  

Panel
Example 3: Alpha-Calculator w/ extra functions
A E I O U 0 0 0 0 0
B F J P V 7 8 9 +
C G K Q W 4 5 6 x
D H L R X 1 2 3 -
o o M S Y * 0 = +
o o N T Z 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Example 4a: MIRROR
U O I E A A E I O U
V P J F B B F J P V
W Q K G C C G K Q W
X R L H D D H L R X
Y S M O O 0 0 M S Y
Z T N O O 0 N T Z
Example 4b: MIRROR w/ TelCalc & Panel
U O I E A 1 2 3 A E I O U
V P J F B 4 5 6 B F J P V
W Q K G C 7 8 9 C G K Q W
X R L H D * 0 # D H L R X
Y S M O O 0 0 M S Y
Z T N O O 0 N T Z
Example 14: MATCHED Pair
A E I O U A E I O U
B F J P V B F J P V
C G K Q W C G K Q W
D H L R X D H L R X
o o M S Y o o M S Y
o o N T Z o o N T Z
Example 5: SPLIT Top on Left
A E I O U D H L R X
B F J P V o o M S Y
C G K Q W o o N T Z
Example 6: Horizontal AEIOU cross
A B C D 0 0 1 2 3
E F G H 0 0 4 5 6
I J K L M N 7 8 9
O P Q R S T * 0 #
U V W X Y Z 0 0 0
Example 7: Alpha-Numeric (Top Numbers)
1 2 3 4 5
4 5 6
1 2 3 4 5
6 7 8 9 0 * 0 #
A E I O U A E I O U
B F J P V B F J P V
C G K Q W C G K Q W
D H L R X D H L R X
o o M S Y o o M S Y
o o N T Z o o N T Z
Example 8: Horizontal ABC (Corner Z)
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility- Part D
Musical Instrument, Hospitals, Military, Calc, Direct 411/911, Spacepad, Sample Scripts.

OnePad:
A Flip Cover OrrPad OnePad Hard Drive is equipped with a flip cover screen (or slide screen) to serve as a monitor. It can be oriented vertically or horizontally or even with a swivel mechanism to flip it back as an easel stand or flipped flat to the back of the unit when used as a desk mousekeypad.

Folding clamshell OnePad w/ hard drive. With Optional phone, PDA, mini PC or other feature
Simple Phone Style One Pad or Orrpad text capable phone- Optional flip back monitor to allow better mousekeypad operation when plugged into a desktop monitor. A rotating monitor would allow better web browsing capability:

3. Orrpad as an input keyboard on a phone: Only 5 keys wide (good for fat fingers)
Prior Art: Compared to micro-Qwerty:
Ten keys across, is too many keys wide, and the keys are narrow

5. Orr Pad for those with a Disability The OrrPad system offers many features for the blind, deaf mute, or even quadriplegic; and others with special needs. An OrrPad would be the best keyboard layout for the systems designed for quadriplegics who choose letters from a monitor, by mouse or by nodes implanted in the brain, because the layout has mnemonic order.

6. The Blind- An electronic writing tool for the blind an early Orr Pad invention.
Focus Field: Claimed is the Orr Pad focus field grid base of 4x7, 5x5 and 5x6 as a new use.
Cross Layout: Also claimed is the mnemonic layout of the AEIOU cross or meme blocks. Vertical Channeling: Vertical channeling of any mnemonic allows the user to instantly memorize the letter assignments for each finger. The OrrPad was initially conceived in a horizontal layout and then turned vertically, as it is easier to use blindly.

3.2b. The Blind OrrPad is claimed for those with sight-deficits. This is very helpful to the blind as the OrrPad layouts can be memorized without the benefit of sight. The OrrPad mnemonics are easily memorized at first use, and like a musical instrument the brain recognizes that each letter has a qualitative relationship to the whole and can predict the location of each letters in a spatial relationship to the whole. Furthermore, the keypad is entirely under one hand. The Braille OrrPad is offered in English and its variants, and is also claimed in other character sets with a different Braille system. Braille enabled OrrPad devices can offer sound to state which letter was struck.

3.2c. Finger Guides of raised or depressed areas enhances RPS (Relative Position System) typing, and optional finger guides can assist the beginner or physically impaired.

3.2d. Braille Bump Key faces for the Blind may be employed. We have optional colored key faces, why not bumps?
3.2e. Audio Feedback Verification for the Blind may be optionally employed for the blind to verify with a sound, with each strike, the identity of each key which key has been struck for numbers, letters, punctuation, and function keys, etc.

3.1 Quadriplegic Communication Pad- An improvement is claimed for the system whereby a quadriplegic person can control a cursor on a computer screen with his thoughts alone. This feat is accomplished by implanting an electrode in the brain, in the area that controls the hand. As the quadriplegic person thinks about moving the hand he is gradually able to effect moving the cursor on the screen and thus able to control a computer and communicate with the outside world. The Orr Pad

Orr Pad: for Blind Use
AEIOU layout better enables a neural implant system of cursor control because the Orr Pad AEIOU layout is a much easier and a more neurophysiologically efficient layout to enable the location of keys. The problem with Qwerty and the electrode cursor device is that as Qwerty requires more "searching" the user confuses the electrode and thus effects less control over the cursor with his more diffuse and confused thoughts alone. Searching on an AEIOU system is direct and logical, not random. Furthermore, the astronomy, maritime and GPS inspired Relative Position System navigation organization and the musical instrument aspects of the AEIOU layout where each key has a logical systemic relationship to the whole, allows the brain to "learn" the "system" not just the precise location of each key as one must with the disorganized Qwerty. It is easier for an electrode user to find keys on an AEIOU Orr Pad than it is to find a letter on the random QWERTY arrangement. The Orr Pad has systemic logic that the neurophysiology of the brain will recognize; while QWERTY has no logic the brain recognizes.

OrrPad for the Quadriplegic: Advances in neuroscience has yielded a new approach to enabling the quadriplegic to operate a computer. Researchers have been able to successfully implant electrodes into the brain of a paralyzed person in the area of the brain that controls forefinger, hand or eyelid etc motion. As the paralyzed person imagines using that body part he sends signals from the brain to the computer and gradually is able to learn to control a cursor on a computer screen to select onscreen letters and button, etc.

OrrPad can enhance the success of the brain implant user interface by providing the best layout possible. OrrPad makes the location of keys easier for the brain to calculate with frames of reference, mnemonic blocks, vertical finger assignments, and cross navigation with X and Y coordinates.

Before: Qwerty was tried first but it proved difficult for users to find anything with no cognitive mnemonic whatsoever and motor-skill does not apply once it is no longer used by the two hands as in normal typing:

```
1 2 3 4 5 6 7 8 9 0
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
```

Before: So, researchers tried an alphabetical layout with only one mnemonic- the single alphabetical sequence. It was easier for users.

(1) The one mnemonic string is:
```
ABCDEFHIJKLMNOPQRSTUVWXYZ
```

After: OrrPad improves user interface by providing multiple mnemonic strings and the XY element of cross navigation references: The AEIOU cross (horizontal or vertical) OrrPad is the most mnemonic layout possible for the location of Roman letters. The AEIOU cross has 7 mnemonic alphabetical strings plus 5 cross intersections creating X and Y coordinates to allow the brain to find Roman letters the easiest way physically possible.

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

The horizontal AEIOU cross has:
7 mnemonic alphabetical strings:
(1) ADCD
(2) EFGH
(3) IJLKM
(4) OPRST
(5) UWXZ.
(6) AEIOU
(7) ABCDEFGHIJKLMNOPQRSTUVWXYZ

Plus 5 cross intersections to establish 5 X and Y coordinates: AEIOU
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility - Part D
Musical Instrument, Hospitals, Military, Calc, Direct 4 119 11, Spacepad, Sample Scripts.

Cross intersections break-up an otherwise single alphabetical string of the ABC mnemonic to create reference points within alphabetical order and thus establishes X and Y cross-coordinates.

X and Y cross coordinates allows the brain to pinpoint location just as X and Y coordinates allows location finding in GPS and maritime navigation where X Y coordinates are also used.

3.2f. Public Access - Claimed is public access to Orr Pad. MOUNTED: The unique one-hand capability of the preferred embodiment of the Orr Pad enables mounted placement of the Orr Pad keypad on flat, angled or wall surfaces allowing one hand touch-typing for the maximum number of persons and languages not possible with a Qwerty (Azerty, etc.) style keypad.

PLUG AND CARRY: Furthermore, if desired, blind (or other) persons could carry and plug-in their own Orr Pad to communicate on any public or private computer made accessible with a plug-in port for USB or Firewire, etc. This would also be useful for any person with a claimed "One Pad". The only public accommodation needed would be to have a port for USB or Firewire, etc. on public devices by which to attach an Orr Pad. Part of the beauty of the Orr Pad design is that it does not necessarily rely on Braille; the fact that the Orr Pad preferred embodiment layout enhances motor-memory makes it possible to type, with practice, exceedingly accurately even in one-handed applications, such as mounted or handheld as well as on a desk surface.

Ideally, if the Orr Pad became a standard interface for public access units, pay phones, cell phones and in offices etc, the blind could always be able to communicate electronically wherever they might be, if the Orr Pad was commonly used as a keypad interface.

3.4. The Mute: Those who cannot speak for themselves; the mute, could carry an Orr Pad to speak for them. A person no capable of speech could carry their little Orr Pad, type in their text and have the text speak aloud for them, or the person to whom they are communicating could read their input. The Orr Pad design best enables this because of the small and rapid user-friendly interface in multiple languages that can be in the palm of the hand. The tiny thumb operated Qwerty keypad is too clumsy and slow compared to the preferred embodiment of the Orr Pad.

3.5. Hospital Patient Communicator, Patient Monitor and Care Chart - Claimed is a bedside communication device that can fit in one hand or at bedside to be used by the bed-bound. The Orr Pad can be employed to access hospital personnel, email and type documents or surf on the internet or control hospital TV or monitors. The Orr Pad can be used as a phone or to retrieve or send email and can include an Mp3 player. It could be enabled with a claimed option of an Orr Pad feature whereby the key-set may be changed into tilted icon images representing various communication needs of the ill such as an emergency call button; but also non-emergency or urgent requests such as "water" or "pain". If the unit cannot be hand operated by the patient it might be equipped with speech operation or a biting mechanism for those unable to use their hands. Additionally, a claim is made for allowing the One Pad (or a separate pad) to keep track of the patient's vital information such as heart rate, blood pressure, temperature, intracranial pressure, blood gas levels, blood medication levels, etc, as well as doctor and healthcare worker input such as the patient's chart, records of medication and treatment. The pad would stay with the patient, insuring better care.

4. Orr Pad "One Pad" for Students: If each student had their own Orr Pad enabled One Pad as a Mousekeypad with hard drive they would only need to plug it into a monitor at school. Thus they would be responsible for their own data and hardware. This would substantially save money for schools if they only needed to provide a monitor for each desk in each room, not an entire computer for each desk in each room. Students may use a laptop for full-sized use, with an Orr Pad / One Pad as their small device that can be carried in a pocket or purse that also has an Mp3 player feature and phone in one unit. Orr Pad / One Pad units may contain educational applications that allows the student to study even without a full-sized computer or with heavy books to carry. The books can be within the Orr Pad /
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility - Part D
Musical Instrument, Hospitals, Military, Calc, Direct 4 11/911, Spacespad, Sample Scripts.

One Pad, by downloading reading materials or by reading directly on the web. Online courses and teacher course notes and assignments are currently available. A laptop cannot always be carried safely or easily; a OnePad can be carried in the pocket thus more safely by students than a laptop.

5. Orr Pad for Military Applications:
The Orr Pad keypad would allow each soldier to carry his own One Pad with all of his information and communication needs in hand and be able to type one-handed, full handed or even one thumbed in the field using a small monitor or a heads-up display rather than relying on a large laptop in a military vehicle. He/she could type with the Orr pad attached to his wrist as a watch or on his clothing and type one-handed in the dark. The two thumb-operated Qwerty uses a visual hunt and peck with one or two thumbs or one finger. The OrrPad keypad preferred embodiment design allows the operation of a full alphanumeric keypad with one hand while simultaneously operating a vehicle and keeping one's eyes on the travel path ahead. Ideal for: aircraft, submarines, spacecraft, cars, trucks, tanks and other vehicles.

Military Wearables: Soldiers can place, attach, or embed an OrrPad to their pants leg or other location to allow them to type with just one hand, and not have to hold a device with the other hand.

Military Vehicles - F-16 Fighter Jet

BEFORE- current hunt-and-peck design of the F-16 Fighter jet pilot keypad:

AFTER- with Orr Pad: F-16 FIGHTER JET Orr Pad enabled Pilot Keypad:
• Cross-Coordinate Navigation of vowels and consonants, or mem blocks of other language properties, as reference coordinates to create a relative position "map" to locate keys, akin to a musical instrument where each sound/letter has a predictable relationship to others and to the whole.
• One Hand 5x6 Grid enables reach of all keys under one hand without looking at the keys, much as an accountant can keep eyes on a spreadsheet while simultaneously rapidly operating a ten key calculator, because it is with under one hand. Eyes stay on the page, not looking at the keyboard. Pilots can look out the window or at a heads-up display while typing, not looking at the keyboard.
• Blind was designed for use by the blind. The layout can be cognitively memorized at first use, and with minimal practice, it may be operated with one-hand without the need to look at the keypad.
• Masking Feature allows the keypad to be operated as small as a postage stamp, if the software has an OrrPad claimed "masking" feature, which identifies the center of contact, essentially masking all but a small point of finger contact to allow precision selection in a small area, even though the finger covers a much larger area. Masking allows fingers to act as a precision stylus.
• Vertical Alphabet allows fingers to locate keys along a vertical mnemonic spinal assignment unique to each finger, not possible with a horizontal mnemonic.
• Index Finger Fan layout allows the "smarter" index finger the range of freedom to observe its natural fan motion to cover keys of columns A&E.
• Thumb Sweep allows the thumb to access function keys in a natural horizontal sweep below fingers and in a natural Toggle between thumb and fingers to alternate between functions and letters.
• Key Assignment Load of each finger is commensurate with the neural capacity of each finger. A "smart" finger, such as the index finger (due to high neuronal capacity) has more keys assigned to it. Whereas Qwerty has more keys assigned to the less coordinated baby fingers; thus, users index hunt and peck on Qwerty.
• Global Language Scripts: For billions across the globe, and for those who write in multiple languages, this system can be applied to any script.
• Universal Application of OrrPad is possible for any vehicle air or sea craft or on any device (PC/PDA/Mp3/Phone/GPS) to enable a universal input system.

6. A Human Language Matrix- Orr Pad for Foreign Language Access:
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility - **Part D**

Musical Instrument, Hospitals, Military, Calc, Direct 411/911, Spacepad, Sample Scripts.

The OrrPad keypad system enables a matrix of the world's writing systems. The inscription known as the Rosetta Stone once permitted the translation of an extinct language by multiple side-by-side record of known languages. Today, in reference to the Rosetta Stone, the RosePad is a keypad that can write, identify and translate either ancient languages in the field for archeologists and other interested parties.

### 7. Samples of Modern Orr Pad Scripts:

**Roman OrrPad**

<table>
<thead>
<tr>
<th>A</th>
<th>E</th>
<th>I</th>
<th>O</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>F</td>
<td>J</td>
<td>P</td>
<td>V</td>
</tr>
<tr>
<td>C</td>
<td>G</td>
<td>K</td>
<td>Q</td>
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<td>D</td>
<td>H</td>
<td>L</td>
<td>R</td>
<td>X</td>
</tr>
<tr>
<td>M</td>
<td>S</td>
<td>Y</td>
<td>N</td>
<td>T</td>
</tr>
</tbody>
</table>

**Accented Roman Alphabet:** 110+ accents enables 47 languages to serve 4 billion native and secondary speakers.

**Cyrillic Alphabet:** serves 600 million speakers of 50 Euro-Asiatic Cyrillic languages

**Arabic OrrPad:**

**Greek OrrPad** serves 11 million speakers and International scientific standard of Greek symbols

**Chinese OrrPad:** Pinyin & Wubiziing serves 1.3 billion speakers of 8,000 Chinese dialects in Mainland China with an alternate of Cang Jie and
for offshore Chinese. Bopomofo piggybacked and Q9 on the number panel for users in Taiwan and Hong Kong. Japanese and Korean OrrPads also feature Chinese characters. (SEE Chinese section for preferred Chinese OrrPads)

**Japanese OrrPad**: Hiragana presented below. Katakana matches with one-to-one mapping and Chinese and Roman scripts piggybacked to provide full Japanese language and writing capability in all Japanese scripts of Hiragana, Katakana, Romaji and Kanji Chinese characters.

**Brahmi OrrPad**: is an intricately woven cross-navigational linguistic system that can be applied to 16 different unique Brahmi scripts. Although the actual letters of the 16 scripts are different, the 16 Brahmi scripts share similar linguistic roots. (SEE Brahmi section for best mode Brahmi OrrPad)

**Korean OrrPad**

7a. Orr Pad Musical Instrument: Claimed is a digital musical instrument (DMI) on a one or two OrrPad focus fields. A piano is not the size of a
focus field; it possesses two *work arenas* the size of an octave moving within the peripheral reach of four octaves per hand. The Orr Pad musical keyboard contains its musical scale within one (or two) hand-sized *focus fields*. In the electronic age, without the need for acoustic capability, there is no reason why a keyboard instrument cannot be made to be small. After all, violinists and guitarists move their hands in very small focus fields to depress strings. The Orr Pad keypad system claims the use of the keys of a focus-field (a set of keys that can fit within the reach of one hand) as a digital musical instrument. Shown in the enclosed drawing is a schematic of how the sounds of the musical staff might be arranged on a 5x8 hand-sized keypad. However, any-sized focus field is claimed. A smaller focus field such as 5x5 would simply have fewer octaves available. The digital musical instrument (DMI) may be adapted for the Qwerty and is so claimed. The inventive idea is still the same. The instrument can be integrated into another device or a standalone device played with one or two hands.

Note Modifying Toggle: Additionally, *the inventor claims the toggling capability of each key for the purpose of modifying its sound qualities in a similar fashion as a violinist might wiggle strings in his left hand or with his bow in his right to modify sound qualities or to provide a means of transforming a natural sound into a sharp or flat as found in the utility of piano black keys which provides sharp-flat versions of the adjacent natural notes; or other modification of sounds.*

7b. Voice-based Composer: The new use claimed, which permits the recording and modification of the voice for the purpose of inputting melody or sound as the basis of new musical composition or to modify existing musical compositions on an OrrPad. This would allow users to merely hum or sing new melodies or melody modifications into their Orrpad as a musical device and then have the electronic capability to rework those sounds or pitch sequences into any instrument or octave or other musical modification by any person. Thus, anyone who can hum could compose. Even notes deemed faulty, hummed or sung by, could be corrected at will by the composer. Nearly every human being is endowed with the ability to play a musical instrument, their natural musical instrument, is the wind instrument of their natural voice. Digitizing those sounds will allow users to compose and correct flaws, transpose into musical score and transpose those vocal sounds into any instrument or combination of instruments. This tool could also allow those who do not have the motor-skill of keyboards or other instruments to be able to write their own musical compositions, thus enabling more persons to write their own music, even absent musical instrument motor-skill.

Currently, keyboards and sampling of other person's works are the principle means of composition on digital instruments today. Digitizing vocal information into compositions could revolutionize music making and increase access to the joy of song writing. The means of making such a device is simple and is a new-use combination of existing technologies: allow composers to record their voice and simply modify the software user interface to make using vocal input as easy as keyboard input as the basis of musical composition or modifying existing compositions. A voice-based composer requires only a vocal recording input method and corresponding software interface. It is not necessary to have a musical keyboard available or skill to play it. If you can hum or sing, you can have those compositions written into music and then electronically changed into instruments. Here, the voice becomes a means and a point of departure for creating and modifying musical composition. However with a keyboard one would have the additional means of accessing and modifying musical notes that perhaps was initially created by the singing voice.

8. Orr Pad Scientific or Business Calculator: *Claimed is an Orr Pad Business and Scientific Calculator whereby: a full text keypad is integrated onto a calculator. For use as one or more (or other purpose) such as the following:*

(1) A Mathematical Alphabetical Directory is claimed which allows the user to alphabetically locate scientific or business calculation functions. For example: listing "logarithmic functions" under the letter "L" or "Square root symbol may be found clustered with the letter "S".

(2) Word Problem Capability by making the alphabetical keypad available to the calculating functions to state and solve mathematical word problems. This claimed innovation of a text calculator could be used to state and solve word problems such as "How much is 3.016% of $89,045.16?"

(3) Alphabetical TextAugmentation of calculations or numerical lists tables or charts. A combination alphabetical keypad and calculator makes available an alphabet to augment mathematical functions
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility- Part D
Musical Instrument, Hospitals, Military, Calc, Direct 4119/1, Spacepad, Sample Scripts.

with ordinary text such as item listings like "Rent" or "Dr. Smith" or "coefficient".
(4) International Standard for the location of the International Language of Scientific Greek Keys:
The innovation is claimed of locating international Greek and scientific functions where they can be alphabetically found. The Greek symbols, scientific and mathematical functions are clustered on or near the host letter with the closest alphabetical relationship. Thus, placement of international Greek scientific symbols on or near an alphabetical host such as listing the Greek symbol and mathematical function of delta "Δ" under the host letter D or beta "β" under "B" which is also in correct Greek order; or listing in a queue of choices square root and sine as well as the Greek symbol and mathematical function of "Σ" under the host of the letter "S". The Orr Pad preferred embodiment design with the AEIOU / ABC cross navigation allows the best consistency possible of congruent international placement of both a Greek and Roman alphabetical order. However, the claim is made for Greek clustering on any keypad design. This system would finally permit convenient casual and integrated insertion of full text capability in business, scientific and other mathematical documents and vice versa and standardize the location of scientific functions on calculators so that they are located where they are most easily found: alphabetically.

Orr Pad Scientific Calculator:
\[ A_v \alpha \quad E_x p \quad I_n \quad \Omega_{O_t}/\quad V_{U_c} \quad M_o n_{M_r}/\quad D_{M_d}/\quad S_{y}\n\]
\[ B_{I_n} \quad F_{r_e} \quad J^g \quad P_{i} \quad V_{x} \quad 7 \quad 8 \quad 9 \quad \div \n\]
\[ C_{o_s} \quad G_{D_e} \quad I_{L_n} \quad K_{O_{i}^2} \quad Q_{\%} \quad W_{1/\times} \quad 4 \quad 5 \quad 6 \quad \times \n\]
\[ D_{s_{c}} \quad H_{y^2} \quad L_{o_i} \quad \Delta_{R_{a_d}} \quad X_{y^2} \quad 1 \quad 2 \quad 3 \quad - \n\]
\[ O \quad O \quad M_{o_d} \quad S_{i_{t}} \quad Y_{s_{d}^2} \quad 0 \quad = \quad + \n\]
\[ O \quad N_{N_{i}} \quad T_{a_n} \quad Z_{x^2} \quad 0 \quad 0 \quad 0 \quad 0 \n\]
Orr Calculator Text keypad on QWERTY:
\[ Q_{w/\times} \quad E_{x} \quad R_{a_d} \quad T_{a_n} \quad Y_{s_{d}} \quad U_{s_{c}} \quad I_{n} \quad O_{/\times} \quad P_{i} \quad M_o n_{M_r} \quad D_{M_d} \quad S_{y}\n\]
\[ A_{v} \quad S_{i_{t}} \quad D_{s_{c}} \quad F_{r_e} \quad G_{D_e} \quad H_{y^2} \quad J \quad K_{L_{o_i}} \quad L_{o_i} \quad \Delta_{R_{a_d}} \quad X_{y^2} \quad C_{o_s} \quad V_{x} \quad B_{a} \quad N_{N_{i}} \quad M_{o_d} \n\]

All claims of the Orr Scientific Calculator or Orr Business Calculator are made for any language and any style text keypad, such as QWERTY, not just the Orr Pad preferred embodiment. Though the precise order of symbols may be modified until a consensus within the scientific community is found the innovation is still claimed. (See separate section for "Orr Pad Scientific Calculator Claim" in this patent filing.)

I CLAIM M: ORR PAD SCIENTIFIC CALCULATOR:
The Orr calculator can have any of the options of a business or scientific calculator; but unlike other calculators, the Orr calculator features the following aids; all of which are helpful to the disabled in locating keys, as an underlying system of logic is given.

16.1 Alphabetic Function Location- Functions are listed as logically as possible with the first way being to look under the letter heading of the function according to alphabetical order. The name of the function can be matched to the letter of the key face. This feature makes it substantially easier to find functions. For example, "exponent" is found under the letter key E. "Cosine" is found under C. "Radians" is found under R. "Tangent" under T and so forth. Any function or symbol needed on a calculator can be organized in the Orr alpha-proximate locator system.

16.1.1 Piggybacking of Functions- If and when the target alphabetical order key already has an occupant function, secondary and additional functions under that same letter may be piggybacked and found with shift or option keys. Symbols for functions found by using shift and option keys may be shown on the face of the keys in the corner or may just be seen after striking the shift or option

16.1.2 Proximal Alphabetic Location of Functions- In addition to, or alternatively; functions may be located on adjacent keys laterally or diagonally in keeping with an approximate alphabetical order; so that functions are clustered adjacently in the environs of the alphabetical target. In the example below, D is already occupied by "decimal"; so an additional function, "degree", was located diagonally adjacent under G. This way, users can find most functions by looking for them alphabetically and then shifting or looking on adjacent keys.

16.1.3 Shape & Concept Location of Functions- In addition to looking in alphabetical order, including an alpha-proximate adjacent key search, and option or shift keys; the next locator mnemonics are ideas, shape or sound, etc. For example, letters O and U; which have been given in other arenas as symbols of universality may be used for more "universal" general functions such as + and sci. An example of a shape mnemonic is as follows: Q bears a visual resemblance to Θ and % are thus located clustered with Q.
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility- Part D
Musical Instrument, Hospitals, Military, Calc, Direct 4/1/9 11, Spacepad, Sample Scripts.

16.2. Scientific & Business Functions given here are examples of how to apply the Orr method of combining an alphanumeric keypad with a calculator and the Orr method of function location. However, functions are not just restricted to the functions given in these examples. Any other function is claimed when employing the Orr method. Other functions deemed necessary by a user or manufacturer may be incorporated into a keypad by the Orr method.

16.2. Orr Calculator Specialized Layers may be changed with an option key; in the same way we change language character sets in order to access the specialized calculators such as: everyman calculator, tax, stock-market, loan, investment, actuary or other business calculators, a real estate calculator, engineering calculator, a graphing calculator, astronomical calculator, etc. Additional functions may be substituted, custom-programmed, or added by shifting and/or adding another change of character/function layer.

16.3 The Alphanumeric Typing Calculator. The idea of placing a scientific or business calculator on top on an alphanumeric keypad also provides for a keypad with which to type text. The Orr Scientific Calculator can type text of any usual purpose, and for accounting may type text headings, to identify a list of accounted items or more fully describe a mathematical problem.

16.3.1 Word Problems- The Orr Pad also enables the technology to read, write, understand and solve word problems, such as "What is 5% of 100?" just by typing in the text of the question, or with voice recognition, asking the question verbally. The On-alphanumeric keypad claims these features. Can be compatible with existing word problem software such as Math Cad.

16.4 Languages- As English, Roman and Greek Letters are the current standards in the scientific community, the keypad complies with that standard. The Orr methods may also be adapted to other languages and are similarly so claimed. Any language keypad can be made to have an On-scientific calculator and may be be applied to other language keypads.

16.5 The Calculator Option- The Orr Scientific Calculator may be an option for any keypad. Selected by option keys or menus, similar to changing a language. Additionally, a computer can have a pop-up on-screen Orr calculator window that may be clicked on and off as needed.

9. Wristpad, Watchpad or Watchphone:

Claimed is a communication or information device with a keypad or a phone or both affixed to the body on the wrist in a similar fashion as a watch and can also be inclusive of a watch. The Orr Pad preferred embodiment keypad design best enables the placement of a keypad on the wrist because of its suitability for being made small and operated with one hand or a stylus. (See fig. drawing)

Claimed is a wrist-based spacekeypad or spacepad whereby signals are cast and or received by a device worn on the wrist to create a keypad in free space into which a user may type. An Orr spacepad can cast a hardware free keypad for users to type in free space or a claim for a wrist based laser keypad whereby a laser keypad is cast onto a surface from the wrist device so that the user may enjoy the familiarity of typing on a hard surface.

10. Orr Pad Spacekeypad or Spacepad: Claimed is a spacekeypad communication or information device, worn on the wrist like a watch, as a ring, or other method, to set a field to thus enable a spacepad, whereby the user merely types in space into the field cast from the watch-like device, which registers the placement of the fingers to enable the user to break a field to create a signal, that is entered as keystroke information. A writing instrument that allows the user to type or handwriting in free space or on any surface. Input of letters is transmitted to the user's PDA or computer monitor, holographic or other spatial visual as writing.

Any suitable receiver system can be implemented. One example is an Orr Pad claimed system, similar to that of the naturally occurring dolphin reception of signals, which could calculate the precise spatiotemporal location of finger relationships or relationship of fingers to the wrist and thus keystroke input. On the end of each finger, or writing stylus, can be a reception array unit with offset receivers in relationship one to the other (like dolphin teeth) to allow the accurate perception of distances relative to the base even while the base might moving and changing dynamically, the relationship between fingers and the base remains constant.

1 CLAIM- SPACEKEYPAD: Claimed is a: (a) "spacekeypad" or "spacepad" or other name; whereby a user may merely type fingers in space and the location of the fingers breaks a signal emanating from a device, such as worn on the wrist, or other, to effect a keystroke and input.
A one-hand spacekeypad layout must permit each key to have a unique position relative to the fixed wrist so that which spacekey signal being broken is unambiguous. Querty cannot permit this. The Orr Pad AEIOU cross grid modified for spacepad use enables the one-hand spacepad. A layout may be pre-set or custom set according to the user.

To custom set the key positions of the spacepad layout, the user turns on the "layout setting" option and sets each layout key as follows: the user merely types in space the short alphabetical sequence for each finger; wherever the finger falls is where that key may be set. For example, the letters ABCD are assigned to the index finger, the user types ABCD vertically in space and where the fingers fall is where the spacekeys shall be once the user agrees to "set" the positions.

Example: The Spatial Domain of one Spacekey. The field broken is not a square, but a threshold, or region violated. The threshold can be modified to size, shape, or curvature as needed.

Spatial position of spacekeys may be set and reset according to the most natural position for the user's finger placement: For example: the vertical sequence of ABCD and EFGH may be fan shaped to match the fan action of the assigned index finger. Or U may be dropped lower than O to accommodate the shorter pinkie finger if the pinkie finger is assigned the letters U V W X Y Z.

NATURAL POSITION OF A FOUR-FINGER FALL IN A LEFT-HANDED ORIENTATION.

VERTICAL FINGER CHANNELING: Vertical channeling of alphabetical order significantly improves motor-memory and enables ease of use on a spacekeypad application. This is because each finger is assigned keys in alphabetical order making cognitive memory near instantaneous and motor-memory easier to acquire with applied practice. A spacepad could be blind if needed but would require practice and thus a motor-memory aid such as vertical alphabetical order to assist. This process is vital for the success of the user and the success of the product. With vertical alphabetical order the mind can more quickly memorize an index finger assignment of ABCD- EFGH than memorizing an index finger assignment of TYGHBN. Fingers naturally move up-and-down principally in vertical channels; rather like waving bye-bye. The best method to memorize letter assignments for is to maintain a vertical alphabetical order for each finger.

The spacekeypad claim includes other aspects: (b) A spacepad device which emanates a signal; such as from a claimed Orr Pad watchkeypad or other watch-like or even a claimed ring device worn on the finger or wrist or other body part or claimed signal device held into place by or as clothing or merely held in the hand or placed on a surface or emanating from an external support whereby a signal system may be cast forth that can be broken by the movement of fingers into a "space" designated for a particular key. The inventor claims the innovation of casting a keypad in a position relative to the wrist or in a ring.
device casting a signal of finger movement relative to each finger, or affixed by or embedded into the body or clothing which casts a pad arena relative the worn device such as cast from a waist device, eyeglasses, head wear or armhand, etc; thus, allowing the user to move their hand in space and whereever the wrist goes (or other relative position signal emanating device) so will the keypad follow.

The OrrPad preferred embodiment of the Spacepad introduces the innovations of: (c) Keypad signals emanating relative to the wrist so that the keypad moves where the hand moves. Since the fingers and hand have a fixed range of motion relative to the wrist any motion of the fingers is unambiguous relative to the wrist thus this innovation enables the one hand wrist front projection spacekeypad. (d) Alternatively, a Orr Pad wrist device may project a keypad, laser, holographic or other, below the wrist of one hand onto which the user may type with the other hand. This is called a Two Hand Wrist Projection method and would be the easiest to implement with today's technology. The inputted information could be read on a watch screen or transmitted to a larger screen (on either a one hand or two hand spacepad.) There may or may not be an image for the user to see. In principle an image is not necessary for operation, but may be necessary to appeal to the new user. Once users acquire motor-memory they could type blindly in space with confidence; yet a visible guide would always remain desirable.

(e) The breaking of signals or a signal relative position detection method may be used. (f) Thus, also claimed is movement detection relative to the other fingers rather than the movement of fingers relative to the wrist. Signals and thus relative position detection may be received and or transmitted by rings, embedded devices, special nail polish or other form of tracking changes in the relative position movements of fingers. (g) Orr Pad claims the optional innovation of: A three-dimensional spatial arena keypad that the signals create. The 3D innovation allows the fingers to find a discrete area designated for a particular key more readily than being limited to an emanated keypad with a flat surface. Emanating a keypad in three dimensions shapes allows maximum flexibility of the keypad to conform to where fingers most naturally fall. Whereas the two-hand spacepad could emanate a flat screen, the one-hand spacepad is likely to be curved to follow natural finger-fall positions. (h) Additionally, a 4th dimension of time can be introduced whereby the default of the spacepad allows only one key to be struck at a time.

(i) A custom 3-D Spatial Arena Grid is claimed whereby the user types his space keypad into this air and setting his grid dimensions in an Orr Pad, Qwerty, any custom manner or to his or her finger movements. OR:

(j) The device can emanate a fixed-design 3-D Spatial Arena Grid or a flat fixed qwerty suitable only for the one-hand spacepad.

There is currently a grid on the market that casts a fixed grid onto a surface; however the Orr Pad claims innovative features beyond their invention: (a) The casting of a signal from a watch-like device so that the keypad moves with the hand and thus the signal grid is relative to the user's wrist or other fixed position from where the signal emanates. A fixed relative position is essential in enabling a spacekeypad. The inventor exploits the fact that fingers always move precisely relative to the wrist. Thus a clean keypad grid may be cast form the wrist and the fingers may move in the spatial arena to type.

b) THE 3-D ASPECT is an innovation, so users may type in space more readily, if the shape and positional disposition of the spacekeys is variable in size, shape, position and curvature and size, etc. to accommodate the shape on the way their personal fingers naturally fall. This feature marks the key location boundary to be broken to fit where the fingers move, rather than on a surface; and is (b) a customizing feature of the Spacepad

A one-hand space keypad has (1) an arrangement of letters that allows the user to type in space, because each key assignment has a specific relationship to the whole of the other keys relative to the forearm, wrist fingers; or other point of reference where a field may be cast onto which one types. When the arm is moved, therefore the entire system is moved.

(1b) Whereas with qwerty, the keypad does not conform to the hand, the hand conforms to the keypad; moving the hand over the keypad as required, violating the relative position of keys located in relationship to the wrist, to strike keys.

(1c) The small Orr Pad layouts enables a one-hand spacekeypad because each individual person may type in space to set the position of each finger assignment, by breaking a field, to establish for each person, a unique location for each key relative to a unique position of each of the other keys.
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility-
Musical Instrument, Hospitals, Military, Calc, Direct 4 1/91 l, Spacepad, Sample Scripts.

A limitation of the Qwerty is that its arrangement of letters does not facilitate relative position typing in space. If the keypad moves with the wrist, it is difficult for qwerty cannot offer relative position as it is very wide, fingers cross signals spaces, the keys are offset one to the other, and the absence of mnemonic to the layout makes it more difficult for users to begin to memorize the position of the keys. The Qwerty however could be used, if desired on the one-hand spacepad emanating from the bottom of the wristpad. Even then, one would be tiring it with one hand and the cross navigatior, keypad would be preferable, but Qwerty could be used on the one-hand spacepad and is so claimed.

The Orr Pad enables a spacekeypad as the user is able to easily type in space the Orr Pad arrangement, break a field, and establish the key position for their hand. Each key location will be able to have a unique position relative to the whole that a user can memorize and execute. The above definition of the spacekeypad innovation and method is claimed as part of the domain of the Orr Pad. Some of Qwerty's limitations to enable a spacekeypad are as follows: Qwerty is too wide at ten keys across. An Orr Pad can offer 5 keys across. With ten keys, the hand would have to sweep significantly at the wrist to find a unique position relative to the fixed portion of the forearm. As it is, even an Orr Pad requires some lateral wrist motion, although minimal, to establish unique positions of each key relative to the forearm. It is on the forearm, just above the wrist, where on may wear, a watch or watch-like device, or bracelet or implant, etc.; or other device that casts a field: infrared, radio or other, that may be "broken" when the fingers "type" in space. This innovation is claimed whether the user employs an Orr Pad letter layout or not. A claim is made for any arrangement of keys that the user chooses in order to type in "space" into a field set by a device which moves when the arm moves; but not when the hand and fingers move in order to type. A distinction is made between the innovation of a laser infrared or other field cast such as in the field cast onto a flat table onto which one types and the Orr Pad innovation of having a field be cast from the wrist to enable the Orr Pad spacekeypad. Casting the field from the wrist area allows the user to "carry" the field wherever they move their arm. However, a second innovation required to go along with the field being cast from an arm device, is an arrangement of keys whereby each key has a relationship to the whole, no matter where one moves one's arm: the wrist, hand and fingers and hand can move freely across the cast field to break the field at the unique place of each letter or function relative to the whole of the cast field.

11. Mobile Police or Medical Emergency Dispatch One Pad Terminal: The Orr Pad system enables comfortable full-text typing on a small electronic device. Each police officer or emergency personnel in the field (or other field worker) could have a tiny hand-held computer communication device with them at all times or mounted in their car like a GPS navigation system. The user may type one-handed without looking at the keypad while still operating a vehicle or could remove and hold the unit in hand: for one thumb, two-thumb, one index finger or full one-hand operation. The small unit may have its own small screen, but when mounted, it could automatically be connected to larger screen. The Police (or Emergency personnel or other field worker) could take their OnePad back into the office (or home) containing their own information to be connected to a larger desktop monitor. Their One Pad can be continuously updated by the main police or emergency dispatch office and also serve as a phone for the men in the field.

12. A Yellow Pages Keypad, Direct Directory, Direct 411 or 911 Service by typing: The Orr Pad enables a small keypad suitable for placement not only on mobile phones, but also on phones manufactured for home or office use, which would allows 411 and 911 by typing requests of assistance, which may be provided by phone directory companies, or city emergency dispatch.

Claimed is a Direct Directory or Direct 411 or 911 whereby a user directly types requests and receives a direct reply to their request on the screen of their phone or other receiving device.

This would be of great economic value to phone directory companies as it would reduce the number of 411 live operators that were necessary and directory requests could be better controlled by the user and at less expense to the consumer.

The preferred embodiment of the Orr Pad allows easy one-hand dialing or one index finger or one thumb control as users presently employ on their current phones. The 5 key across Orr Pad can fit neatly on hand-held cordless phones or on the base of desk phones.

Direct 411 Directory is claimed for any keypad layout including Qwerty, etc. in any language on a phone or other device.
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility, Musical Instrument, Hospitals, Military, Calc, Direct 411/911, Spacepad, Sample Scripts.

Direct 411 for Male, Speech Impaired or those who speak a Foreign Language on phones would allow the hearing impaired or those speaking a foreign language to type 411 inquiries from any phone and access Yellow Pages and Directory Services without speaking or hearing.

13. Hotel & Hospitality Phone
An OrrPad enabled in-house phone system in hotels and other businesses can provide typing capability to allow guests to order room service, receive messages, direct questions to the frontdesk or concierge and type 411 Directory requests. If web-connected, guests could get restaurant or tourist info, or check email.

14. GPS Units: The one handed capability of Orr Pad makes it far better suited than Qwerty for use while operating an auto, aircraft, or sea-craft. The vertical ABC allows immediate memorization of letter assignments for each finger. Exceptional multi-language capability allows users, such as in auto rental, to conveniently change language to suit the changing customer. There were $14 billion sales of GPS units in year 2003.

15. TV Remote: An OrrPad enabled combination Remote + Keyboard + Mouse would allow one hand or one thumb input into a remote control in order to communicate with the TV. One could directly type the name of a movie, search the TV or cable guide, search the Help section, order a pay-per-view film, etc. Or, if connected to the web, make Twitter and Facebook comments, or surf the web, or check email, all with the remote contro and TV as monitor. The OrrPad layout allows users to type letters while keeping eyes on the monitor. By year 2000, there were over 1 billion televisions worldwide.

16. Combined-use Applications: Orr Pad claims the innovation of the combined use of any Orr Pad system innovation with any non-OrrPad product such as, but not limited to: cell phones, pagers, land phones, navigation systems such as GPS, any remote control device, personal digital assistants (PDAs), translators, information devices, communications devices, internet devices, photo or video devices, computer keyboards, keypads in general, mouse (mice?), security systems, ATM machines, information kiosks, musical and music playing devices; or any other product, invented or not yet invented, in combination with any Orr Pad system innovation. The above are some example products, but not limited to, that are potential licensees of Orr Pad innovations. (See Drawings for pictures)
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility-
Musical Instrument, Hospitals, Military, Calc, Direct 4 1 1 1, Spacepad, Sample Scripts.

16. Any Orr Pad feature is claimed on any device or APPLICATION
1- Yellow Pages / 4 1 1 Directory or 9 1 1 for Phone, PC, PDA, etc.
2- Phones of any kind: Home, public, office, computer, mobile, PDA, 3G, etc.
3- MouseKeyPads and one-hand keypads
4- CD/Mp3 players, Radio Tuners; or any other media players.
5- Navigation systems, GPS or any other
6- ATM machines
7- TV, TV Remote, web TV remote and Convergence TV keypad applications
8- Musical application using Orr keypad features
9- Games
10- Alphabet or Typing Tutor teaching tools
11- Cameras
12- Alarms or Security Systems
13- Inventory Input systems or Sales Registers
14- Language Translators and Transliterators
15- Calculators
16- Electronic Wallets, Currency or Smart Cards
17- Machines for stenography, court reporter, shorthand, phonetic phonography, etc.
18- Any Remote input or control device

19- Onboard: Auto/Truck/Plane/Spacecraft/Boats/Subs/Taxis or other vehicles.
20- Any Size Monitor, Desk, Notebook, Laptop, Phone, Hand-held, Hip-top, Watch, etc.
21- Micro or mini Watch or Pen-sized computers, phones, GPS, or PDA’s
22- Police or Emergency or Medical or Dispatch Terminals, or Morse code applications.
23- Braille and Speech or Hearing impaired Keypad applications
24- Para or Quadriplegic, Cerebral Palsy or other disability enabling applications.
25- Cyborgs, robots, virtual reality keypads or artificial brains
26- 3G or other convergence technology
27- Neural implant information input applications.
28- Touch Screen Pad, Point and click keypad.
29- Any non-electronic presentation of the keypad arrangements, such as an image
30- Credit Cards
31- Any electronic device or computer; and any other present, past or future technology or application that employs a keypad.
(See Drawings for sample images of potential combined-use applications)
4a-c. All-Euro OrrPad: Roman-Greek-Cyrillic
The All Euro OrrPad combines Roman, Greek, and Cyrillic scripts, to represent the major languages of Europe claimed in either 5x6 or 6x5 orientation. Each Euro Orr Pad writes in over 100 languages. In the All Euro Orr Pad, Roman, Greek and Cyrillic letters are all in native alphabetical order. Vowels are clustered in a block for all languages. Consonants are also blocked for all languages. It is most mnemonic as an AEIOU cross. Vertical alphabet channeling allows instant knowledge of typing assignments for each finger.

<table>
<thead>
<tr>
<th>4a. ALL EURO PAD- ROMAN:</th>
<th>4a. ALL EURO PAD- GREEK 5X6: (4b is a 5x5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Greek and Cyrillic as alternates. 5x5 piggied.</td>
<td>Piggied Cyrillic can easily be expanded fully</td>
</tr>
<tr>
<td>* Roman vowels (red) Consonants (black)</td>
<td>* Greek (5x6 pad) is found on lower left (in blue)</td>
</tr>
<tr>
<td>* Includes 115 Roman accents (green)</td>
<td>* Cyrillic (5x5) on lower right (pink) Semi-piggied</td>
</tr>
<tr>
<td>* Greek (5x6 pad) is found on lower left (in blue)</td>
<td>* The BJFPV row can accommodate punctuation</td>
</tr>
<tr>
<td>* Cyrillic (5x5) on lower right (pink) Semi-piggied</td>
<td>* Piggied 5x5 or full Cyrillic 5x6 or 6x5 is claimed</td>
</tr>
<tr>
<td>* The expression Piggied is short for piggybacked, where more than one character is found on a key.</td>
<td>(See 4c for expanded Cyrillic)</td>
</tr>
<tr>
<td>In this version, letters 序 + 當 + Ε are piggied on Roman Ε + Π + E. However, Ε can be de-piggied and placed on the Roman Ε key to the right and still remain in a blocked Cyrillic proxy alphabetical order; as Φ is free, since Cyrillic E is piggied with Roman E.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4b and c. ALL EURO PAD- GREEK 5X5, 5X6, 6X5:</th>
<th>4e. ALL EURO PAD- CYRILLIC 5X6:</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Cyrillic and Roman as alternate. 5x5 piggied.</td>
<td>Also claimed when rotated to become a 6x5, This OrrPad shows full Cyrillic on keyfaces with Roman and Greek as alternate scripts.</td>
</tr>
<tr>
<td>* Greek (red &amp; black)</td>
<td>This Euro OrrPad writes over 100 languages</td>
</tr>
<tr>
<td>* Roman on upper left (blue)</td>
<td></td>
</tr>
<tr>
<td>* Cyrillic at upper right (pink)</td>
<td></td>
</tr>
</tbody>
</table>

4b and c. ALL EURO PAD- GREEK 5X5, 5X6, 6X5:
With Cyrillic and Roman as alternate. 5x5 piggied.

* Greek (red & black)
* Roman on upper left (blue)
* Cyrillic at upper right (pink)
This Euro OrrPad writes over 100 languages

Alternate writing scripts, accented and special letters, are found using varied methods for change, such as shift, accent, option keys, or a menu for a few letters, and locked for writing scripts if needed

**NEXT document:** Chinese OrrPad
CHINESE ORR PAD: IDEOGRAPHY

Chinese ideograms offer written communication for the five major Chinese languages and numerous local Chinese dialects. Chinese writing is in everyday use in Japan, Korea and Southeast Asia where written Chinese is standard, mixed with their local phonetic.

CHINESE LANGUAGES: Mandarin (Beijing, et al) Jin, Wu, Hui, Xiang • Cantonese, Penghu, (Guandong) • Hakka, Kejia (HongKong) • Wu (Shanghai) • Min, Fujian (Taiwan); plus an estimate of 8,000 local dialects. Additionally, Chinese is spoken by Chinese émigrés worldwide.

Map of Spoken Chinese LANGUAGE:

THE SINITIC LANGUAGES

- Mandarin - 616 million (estimated)
- Wu - 72 million
- Cantonese - 71 million (estimated)
- Min family (not included) - 52 million
- Jh (jia, jiou, and jiang mandarin) - 43 million
- Xiang (northeast Wu subbranch) - 36 million
- Yue - Haixia - 34 million (estimated)
- Wu - 33 million
- Yue - 32 million
- Pinghe (also known as Cantonese) - 7 million

Everyday Use of Chinese Writing by non-Chinese language speakers is found in Japan, Korea, plus select populations in Southeast Asia. Chinese Orr Pads are combined with Korean, Japanese and other character sets. In these non-Chinese nations, although the characters are Chinese, they are not read in spoken Chinese. Instead, the Chinese characters are read in the local language. The Japanese read the same Chinese characters Chinese speakers read, but in Japanese spoken language and the Koreans read Chinese characters in Korean spoken language. They do not read thinking or speaking Chinese language in Mandarin or Cantonese. They use Chinese characters but express that character in their native tongue. For example, the Chinese character, meaning woman, ห ร  would not be read by Japanese people in spoken Mandarin, but rather it would be read as the Japanese word for woman. Thus, Japanese, Korean and Chinese people read Chinese characters in their own language. The inventor reads the Chinese characters in English.

World Distribution of Chinese WRITING:

OrrPad can type in any form of Chinese writing:
- Mainland China: Taiwan/ HK: Korea/Japan
- Pinyin • Bopomofo • Hanzi
- Simplified • Traditional • Kanji
- Chinese Phonetic Language, etc.

OrrPad can adapt numerous input methods:
1. Phonetic Roman: Pinyin, Wade-Giles, Yale, Cantonese Pinyin, Penkyamp, and any other.
2. Phonetic Chinese: Zhiyuin Bopomofo, or other.
3. Morphological/Shape: Wubizixing, Simplified Cangjie, Cangjie, Q9, Four-Corner Method
5. Numeric Pad: Q9, Four-Corner Method or Five-Stroke Method.
CHINESE is written and spoken in its various forms by 1.3 billion people. Most languages use a phonetic system where letters represent sounds of the spoken language. However, Chinese does not have phonetic sound letters but characters representing ideas. For example, the Chinese characters meaning sun  and moon combined into a single character of means "bright" as this is a quality both the sun and moon share. Since ideas are expressed rather than sounds, Chinese ideographic text may be read across the myriad of different sounding spoken languages. Those who are literate in China, Japan, and Korea, and South Asia who have learned Chinese characters can read them, even though they speak different languages and pronounce the characters completely differently.

TRADITIONAL CHINESE is used mostly outside of China in Taiwan, Japan, Korea, etc. It is comprised of 50,000 or so characters: each representing individual ideas rather than sounds. The "ideas" are written as strokes of the pen; and when layered, these strokes create the stroke-layered ideogram characters of Chinese. Each addition of a stroke adds complexity of meaning. There are 12 types of strokes. Up to 33 such strokes can be layered into one character. Each character fits into a uniform rectangular shape. Strokes are layered in a specific order. Chinese was originally written vertically but may also be written horizontally. The ideas are organized by radicals which is a simple stroke character representing the simplest form of an idea such as A meaning "person". By adding strokes to the radical, one achieves greater differentiation of that concept such as "sales person" or "teacher person". Example below:

Sample Construction of a Chinese Character:

人 夫 俠
Person: Man: Chivalrous Knight:

MAINLAND CHINA: (1) Pinyin is the official phonetic system of Mandarin in Mainland China and is written with Roman letters. The Roman OrrPad serves PinYin plus its extra accent markings. It is included on all Chinese OrrPads. (2) Simplified Chinese is a stroke-simplified version of Traditional Chinese invented to increase literacy. Simplified Chinese OrrPad input methods include, but are not limited to: (a) Qwerty adaptation method. (b) Pinyin Translation method whereby Chinese is typed in phonetic Pinyin and software translates Pinyin into Chinese characters.

TAIWAN & HONG KONG: (2) Bopomofo Zhuyin is a phonetic form of Chinese taught in Taiwan, where the most complicated written Chinese form (3) Traditional Chinese is the standard. There are an estimated 56,000 Traditional Chinese characters. Bopomofo and Traditional Chinese, as a system, allows speakers of all ages, from lowest to highest levels of literacy to communicate. Children start with phonetic Bopomofo and gradually learn Traditional ideographic characters. The more characters someone knows, the more texts one can read. Adequate "newspaper" literacy is about 6,000 traditional characters. Bopomofo, which gives the phonetic sound of the word, is often written next to the traditional character in case the reader needs the extra help.

JAPAN & KOREA: (4) Kanji and Hanzi, are names given to the Traditional Chinese characters that are used in Japan and Korea. Japan has an official list of 2500 Kanji characters for use in Japan. OrrPad includes these Chinese methods:

1. Pinyin or other Roman Method OrrPads are input methods using Roman letters to phonetically write Chinese language according to the sound of the words, which is then transcribed automatically into Chinese characters by software. Pinyin OrrPad may be combined with other Chinese OrrPads. All Pinyin vowel accents are accommodated.

2. Cangjie Method OrrPad (仓颉输入法) sorts Chinese characters into four morphological groups based on radical shapes, which are the shapes that represent the simplest ideas from which more complex ideas and characters are constructed.

3. Wubi Method OrrPad (五笔字型 OrrPad) Wubi, short for Wubixing (五笔字型), is an input method based on stroke structure of characters rather than phonetic pronunciation or shape.

4a. Five Stroke Method OrrPad (五笔划) The Wubi Hua (五笔划), or Five Stroke method, is based on the stroke order of the actual writing of Chinese characters using the numerical keypad.

4b. Four Corner method (四角码) The Four corner method locates Chinese characters by depressing just four numerical digits that each represent a style of stroke used in Chinese writing to access all characters, however complex.

5. Bopomofo Method Orrpad is a phonetic Chinese writing method comprised of unique 35 characters, which reflect radicals used in Taiwan.

6. Other, including Qwerty remap to OrrPad grid.
Part Ia-g. ROMAN PHONETIC METHODS:

1a. Chinese Mandarin Pinyin (拼音): Pinyin is a system whereby Roman script is used to phonetically write Chinese languages. The 26 Roman letters with 26 vowel accents designed for Chinese language pronunciation is the official system for phonetic writing of Mandarin in Mainland China. Pinyin was approved in 1958, and in 1979, Mao Tse Tung decreed Pinyin as a replacement for the Wade-Giles phonetic system. The International Organization for Standardization (ISO) adopted pinyin as the international standard of Romanizing modern Mandarin Chinese. Pinyin was designed for Mandarin only, the largest Chinese spoken language; and it is not a perfect fit for other spoken Chinese languages. Thus, other forms of Pinyin and Romanization methods are used for Cantonese and other Chinese languages.

1ab/c. Pinyin Mandarin OrrPad with accents, AEIOU cross (a) vertical and (b) horizontal, and (c) OrrPad ABC squares, are claimed.

<table>
<thead>
<tr>
<th>Pinyin</th>
<th>Mandarin</th>
<th>OrrPad</th>
</tr>
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<tbody>
<tr>
<td>A</td>
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Diacritic Accents are accessed by an OrrPad accent access method to write the 26 accented vowels to convey the tones of Mandarin. Tone-accents are: 1 macron, 2acute, 3hacek, 4 grave.

Tones Numbers can be placed after vowels as an alternate means of conveying 4 Mandarin tones, which may be converted into the 4 vowel accents. For example: Adding a tone number, such as: "Ni3 hao3", it can automatically convert to "NI hao".

Input Method Editor (IME) software allows keyboards, including a Pinyin OrrPad, to produce thousands of Chinese characters from 26 Roman letters. You type Roman letters and then the IME software converts the text into Chinese characters.

OrrPad makes a claim when applied to any Roman phonetic methods such as: Wade-Giles Jyutping, Penkyamp, Meyer-Wempe and Yale.

1c. Wade-Giles is an early phonetic writing form of Chinese using the Roman (Latin) letters. It was the standard in older (pre 1979) texts. Wade-Giles was invented by the British in 1858, modified in 1912, but was superseded by Pinyin in 1979. Wade-Giles is still understood and used mostly by Chinese and foreigners outside of Mainland China. A Wade-Giles OrrPad writes using unique accents.

Comparison of Pinyin and Wade-Giles Mandarin: Example: the word Atjfc in Pinyin is Beijing, whereas the same word in Wade-Giles is Peking.

<table>
<thead>
<tr>
<th>Character</th>
<th>Pinyin</th>
<th>Wade-Giles</th>
</tr>
</thead>
<tbody>
<tr>
<td>北京</td>
<td>= Beijing = Peking</td>
<td></td>
</tr>
<tr>
<td>毛泽东/毛澤東</td>
<td>= Mao Zedong = Mao Tse-tung</td>
<td></td>
</tr>
<tr>
<td>台北</td>
<td>= Taipei = Tai-ppei</td>
<td></td>
</tr>
</tbody>
</table>

All Cantonese phonetic methods can use OrrPads:

1a. (d) Meyer-Wempe and (e) Yale Cantonese phonetic Roman methods are the most commonly used systems for Cantonese, and are both claimed when applied to an OrrPad grid.

If Penkyamp iy# ) Cantonese Pinyin OrrPad (*iy# li ) is a phonetic Roman method to transliterate Cantonese Chinese, which is spoken in south Mainland China, plus Hong Kong, Guangzhou, Kuala Lumpur, and U.S., etc. Since Mandarin and Cantonese are mutually unintelligible one to the other, phonetic Pinyin is not mutually understood. They each need their own Roman method and OrrPad can write both.

1g. Jyutping Cantonese Pinyin: is a recent form of a Roman system adopted by the Linguistic Society of Hong Kong, adoptable as an OrrPad.

OrrPad preserves both alphabet and character order as learned by native Chinese speakers. Qwerty keyboards do not preserve alphabet order, which means Qwerty is less user-friendly than an OrrPad. The alphabet song taught to children is the most powerful mnemonic for writing and typing. It is a musical mnemonic, and our first, and thus our most durable memory of ABCs. Children in the west learn their ABC’s to the songs Twinkle Twinkle Little Star or Baa Baa Black Sheep. However, children in China are taught a Pinyin Alphabet Song that is not either of those melodies. Although using a different melody (shown below), when Chinese children learn their ABCs they also learn the order of the OrrPad.

**Mandarin Pinyin Alphabet Song**

```plaintext
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
```

Part C - 4
Part 2a-c: MORPHOLOGICAL METHOD

2. Cangjie Method OrrPad (仓颉输入法) sorts Chinese characters into four morphological (shape) groups that represent ideas as radicals. A Roman letter represents each idea-shape, and from that anchor may the user find and construct all complicated characters. This provides a mnemonic method to find Chinese characters.

The Cangjie system, (仓颉), from which the OrrPad Cangjie is derived was invented as a computer input method in 1979 by Chu Bang Fu (朱邦復). He named it after Cangjie, the man attributed with inventing the first written Chinese.

Typewriting Chinese Characters using Cangjie: The Cangjie typing method is similar to how one learns Chinese character construction as a child. To type using the Cangjie method, the user chooses a mnemonic "anchor type" that represents an idea embodied as a radical Chinese character. The ideas are grouped as: Elements, Strokes, Body and Shapes, derived from a radical exactly similar to the process of character construction learned as a child. After selecting the leading anchor idea character, further logically derived ideas will stem from the anchor, to thus take the simplest Chinese character idea and then find or construct that idea into the most complex Chinese characters.

EXAMPLE: in order to write the character 車 meaning "vehicle", one would input 十 丄 + to construct the character 車.

Predictive text systems may be applied to Cangjie, but are not required to be able to use effectively.

Qwerty Cangjie: As a computer input-system each idea was represented by a Roman letter on Qwerty keyboards. Thus, Cangjie typing already exists on Qwerty with millions of people skilled in its use. OrrPad greatly improves the Cangjie system by applying it to the OrrPad, thereby maximizing the organizational intent of Cangjie.

Qwerty Cangjie jumbles alphabet and shape type:

A S D F G H J K L
E X C V B N M
手田水口丄卜山戈人心
日尸木火土竹十十大中
重難金女月弓入

The OrrPad form of Cangjie is far superior to the Qwerty version of Cangjie for these reasons:

The Cangjie OrrPad preserves both the order of the four Cangjie categories of Chinese character shapes and Roman alphabetical order. In contrast, a Qwerty version of Cangjie scrambles both the Roman alphabetical order, as well as scrambling the Cangjie morphological order. The Cangjie morphological organization combined with a mnemonic using the Roman alphabet order gave Cangjie its promise of ease of use. Since Qwerty is not in alphabetical order, it scrambles the order of the Roman alphabet and the mnemonic categories invented in Cangjie; thus, Qwerty Cangjie destroyed the mnemonic platform upon which the Cangjie system was conceived. In contrast, OrrPad delivers the Cangjie goal of providing mnemonic anchors as the OrrPad preserves alphabetical and Cangjie category order.

Additionally, OrrPad offers a vertically channeled mnemonic allowing users to write Cangjie one handed and promoting "blind" use whereby users need not look at the keypad.

OrrPad also enables a very small version of Cangjie that can fit on a mouse or touchscreen or watch, in an easier to use method with a more mnemonic layout for the many users who already employ the more difficult Qwerty Cangjie method.

CLAIM: OrrPad makes a claim for an improved Cangjie method by adapting it to the 5x6 base grid OrrPad system making a new use claim of Cangjie.

How Cangjie organizes character access:

Four Cangjie Morphological Shape Anchor Types: (Color Blocked for educational purposes)

Element Stroke Body Shape

Four Cangjie character shape anchors with subsets:

(1) Element Set: (letters A B C D E F G) Representing the elements.
(2) Stroke Set: (letters H I J K L M N) Representing the simple strokes.
(3) Body Set: (letters O P Q R) Representing parts of the human body.
(4) Shapes Set: (letters S T U V W Y) Representing the complex character shapes.

X and Z represents difficult and special characters.
Sample of ideogram construction from idea radical

**ELEMENT SET (A B C D E F G):**

- Sun: A 日 巴 柏 晶
- Moon: B 月 軍 藩 翔 蝶 平 羚 羊 貓 類
- Metal: C 金 弟 奢 分 真 匹 您
- Wood: D 木 杉 牙 中 口
- Water: E 水 山 泰 康 各 友 貝 肥 車
data missing
- Fire: F 火 方 光 半 火 不 少 火
data missing
- Earth: G 土 住 任 念 嘴 難

**STROKE SET (H I J K L M N):**

- Bamboo: H 竹 白 系 少 瓜 后 反
- Weapon: I 戈 長 寸 九 台 云 廟
- Ten: J 一 宗 空
- Big: K 大 左 右 美 文 稀 病
- Centre: L 中 印 斤 介 介 片 書 初
- One: M 一 手 與 永 原 石 面
- Hook: N 弓 前 子 角 島 飞 吃

**BODY SET (O P Q R):**

- Person: O 人 化 兵 年 今 家 久
- Heart: P 心 気 笑 像 老 宅 式
- Bond: Q 手 拍 青 生 夫 差 偉
- Mouth: R 口 吕 呂

**SHAPE SET (S T U V W Y):**

- Corpse: S 戸 巨 四 分 家 長
- Twenty: T 廿 草 戒 益 業 墟
- Mountain: U 山 迎 雄 凶 四 目 挑
- Woman: V 女 系 亡 收 齒 以 長
- Field: W 田 囲 曲 惱 母 母 田
- Fortune: Y 丘 虎 文 斗 雨 返

X & Z user-defined Shapes:
The character 造 meaning “user-defined” is sometimes placed on the letter Z along with 重, moved from letter X (leaving 難 on X). These changes can also be applied to an OrrPad.

2a/b/c. Conje OrrPad: Notice the order of the Conje shape-idea system, and order of the Roman alphabet are preserved. Both are claimed.

a. Conje 5x6 - Vertical alphabet.

<table>
<thead>
<tr>
<th>A</th>
<th>日</th>
<th>水</th>
<th>戈</th>
<th>人</th>
<th>山</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>月</td>
<td>火</td>
<td>十</td>
<td>心</td>
<td>女</td>
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<tr>
<td>C</td>
<td>金</td>
<td>土</td>
<td>大</td>
<td>手</td>
<td>田</td>
</tr>
<tr>
<td>D</td>
<td>木</td>
<td>竹</td>
<td>中</td>
<td>口</td>
<td>网</td>
</tr>
<tr>
<td>E</td>
<td>火</td>
<td>水</td>
<td>火</td>
<td>木</td>
<td>竹</td>
</tr>
<tr>
<td>F</td>
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<td>水</td>
<td>十</td>
<td>北</td>
<td>木</td>
</tr>
<tr>
<td>G</td>
<td>火</td>
<td>火</td>
<td>大</td>
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<td>木</td>
<td>木</td>
</tr>
</tbody>
</table>

b. Conje 6x5 - Horizontal alphabet.

<table>
<thead>
<tr>
<th>A</th>
<th>日</th>
<th>月</th>
<th>木</th>
<th>金</th>
<th>水</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>火</td>
<td>火</td>
<td>木</td>
<td>木</td>
<td>竹</td>
</tr>
<tr>
<td>C</td>
<td>金</td>
<td>木</td>
<td>木</td>
<td>木</td>
<td>木</td>
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<td>D</td>
<td>火</td>
<td>火</td>
<td>木</td>
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<td>E</td>
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<td>木</td>
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<td>木</td>
<td>木</td>
<td>木</td>
<td>木</td>
</tr>
</tbody>
</table>

Simplified Conje Method (簡易 or 速成) is claimed when converted to the 5x6-6x5 OrrPad rather than the 10x3 form. Conje is a Chinese input method in which the user enters only the first and last keystrokes of the Conje system. A list is displayed offering the Chinese characters with those two components. The user chooses a character from the list. Simplified Conje is suitable for users who are already familiar with Conje, as it is a shorthand form of regular Conje. Simplified Conje is one of the few input methods pre-installed on Chinese-capable personal computers. Simplified Conje is popular in both Taiwan and Hong Kong. Users in Hong Kong speak Cantonese rather than the Mandarin spoken in Taiwan and Mainland China. Thus, Hong Kongese will prefer Conje or Simplified Conje, as they cannot use either Pinyin or the Zuyin (Bopomofo) methods, which are based on the pronunciation of Mandarin.
Part 3 ab: STROKE STRUCTURE METHOD

3. Wubi Method OrrPad (五笔字型) Wubi is short for Wubizixing (五笔字型 pinyin wu3 bi3 zi4 xing2), is a computer input method for Chinese text, and is claimed if converted on the 5x6-6x5 platform instead of the 10x3 platform. The Wubi method is based on the stroke structure of characters rather than pronunciation or shape, making it possible to input unfamiliar characters, and not be limited to any spoken Chinese dialect; e.g. Software works for Simplified or Traditional. Wubi OrrPad includes Roman script for Pinyin.

How Wubi works:
Each GROUP is assigned a type of STROKE:
1: Horizontal (—)
2: Vertical (|)
3: Falling left (\)
4: Dots or Falling right (\)
5: Hook

Chinese characters are organized into these 5 types of strokes and divided on 4 or 5 keys as a GROUP. Characters are located by selecting the best stroke and further refining until the character is found.

Qwerty Wubi 10x3:
The use of numbers to convey tones was thought necessary because accents on the Qwerty-style typewriter were hard to achieve.

3a. Wubi 5x6 Chinese OrrPad: 5x6 Vertical
A preferred embodiment OrrPad

3b. Wubi 6x5 Chinese OrrPad: horizontal

3c. Wubi 5x6 OrrPad Horizontal – top vowels

Why OrrPad: Wubi is better than Qwerty Wubi

Comparison shows a Vertical Wubi OrrPad keeps alphabetical order in stroke groups, unlike Qwerty:

OrrPad Horizontal stroke= Letters ABCD+2Spaces
OrrPad Vertical stroke = Letters EFGHI+2Spaces
OrrPad Fall left stroke = Letters IJKLMN
OrrPad Dot/Fall-right stroke = Letters PQRST
OrrPad Hook stroke = Letters VWXY

Qwerty Horizontal stroke = Letters GFSDA
Qwerty Vertical stroke = Letters HKLM
Qwerty Fall left stroke = Letters TREWQ
Qwerty Dot/Fall-right stroke = Letters YUIOP
Qwerty Hook stroke = Letters NBVCX

CLAIM: The adaptation of the Wubi system to either a vertical or horizontal 5x6 or 6x5 OrrPad grid, or if enhanced by other OrrPad features.
Part 4a-c: CHINESE PHONETIC METHOD

4. Bopomofo (ㄅㄆㄇㄈ) Chinese OrrPad:
Zhuyin (注音) Zhuyin Fuhao (注音符号), or "The Notation of Annotated Sounds", abbreviated as Zhuyin, is also known as Bopomofo (ㄅㄆㄇㄈ). It is the official phonetic system of the Republic of China in Taiwan to teach Mandarin to children. It uses 37 symbols based on radicals to represent Mandarin sounds of 21 consonants and 16 vowels or accents in a one to one correspondence.

Qwerty Bopomofo is rare in that it already has a vertical orientation in alphabetical order with millions of happy users for those reasons. It fits well on Qwerty but 10x4 is wide for one hand use.

Bopomofo as taught to children in Taiwan shown horizontally, but also taught vertically:

Orrpad:

Column 1

Column 2

Column 3

Column 4

Column 5

Although the wide 12x4 Qwerty-style Bopomofo reflects the correct phonemes as learned, a "squirish" Bopomofo keypad better fits under one hand, or one thumb. A more square shape is achieved by combining two rows on one column (indicated by brackets). This preserves the mnemonics of Bofomofo order learnt as a child, yet fit beneath one hand, or stamp-sized under one thumb. Horizontal and vertical are both claimed. Though vowels run sidesaddle, vertical is also best for one hand or thumb typing in 4b and 4c.

4a. Bopomofo OrrPad in perfect phoneme order, yet just 5 keys wide, which is more square and thus better for one hand use than Qwerty at 8 wide.

4b+4c. Bopomofo Dialect Glyphs. cover local dialects with sounds v, ng, ny, which can fit in the three extra spaces, while diacritic marks can be accessed by an accent system. Extended Bopomofo can also be set on an Orrpad.
5a. Qwerty Remap Traditional Chinese OrrPad: The OrrPad must re-map Qwerty location of letters into an OrrPad layout. The following input method based on “character shape” demonstrates in the font called “Kai”, but any font can be used.

Here is a a 5x6 AEIOU cross-position traditional Chinese OrrPad. 6x5 is also claimed. Each of 24 keys contains 72 subordinate characters:

```
A a I i O o U u
B b F f H h J j K k L l M m N n R r S s T t W w X x Y y Z z
```

In this keyboard, Chinese is mapped to merely 24 keys with a Chinese character host corresponding to each of the alphabet keys (except X and Z) on a standard US (Qwerty) keyboard. When remapped to a 5x6-6x5 to and 5x8 grid, it is claimed as an OrrPad. Remapping to a 5x5 to 5x8 grid, when combined with is an OrrPad.

To type Chinese, one may select a character from the 24 host key characters showing on the face of each of the 24 keys. Each of these 24 host keys carries 72 “tenant” characters clustered within each host to total merely 96 characters for the user to learn to be able to type in Chinese. The user identifies which of the host character shapes is closest the desired Chinese character; and from that point of departure, is able to find the best character to use. Extra keys can be assigned characters or symbols deemed most useful.

In contrast, an isolated 5x6 grid keyboard does not qualify as launching a new worldwide system. OrrPad demonstrated how a 5x6 based keyboard can serve as a new standard for electronic input.
Part 6a: NUMERICAL METHODS adapted to OrrPad

6a. Five Stroke method (五笔划) The Wubi Hua (五笔划), or Five Stroke method, is a Chinese input method for writing text on computer devices. Wubi Hua is based on the "stroke order" of the actual writing of Chinese characters and is input using the numerical keypad.

Five Stroke Method is most often used in Mainland China to write Simplified Chinese characters, but can also input the for Traditional Chinese characters, which employs more strokes. Wubi Hua is easy to learn, if you know how to construct Chinese characters, rather than just to read them. The greatest potential weakness is that a Wubi Hua "number code" can result in a match of dozens (and occasionally hundreds) of characters. Although each character ultimately has a unique code, characters whose order of strokes is idiosyncratically rearranged in a peculiar way due to a person's unique writing style, means some characters may not be readily found, especially if writing Traditional Chinese.

How the Five Stroke Method works:
Keys numbered from 1 to 5 are assigned a type of stroke. On an OrrPad, keys numbered 1-5 or the vowel keys AEIOU may represent strokes:

- 1 or A: Horizontal Strokes
| 2 or E: Vertical Strokes,
| 3 or I: Downward Right-to-Left Strokes
A 4 or O: Dot Strokes or Downward Left-to-Right
? 5 or U: All Other strokes, such as Hooks.

To input any character, press the keys corresponding to the first four strokes of a character and then the key corresponding to the last stroke of a character. For characters that have four strokes or less, press 0 after the last stroke.

It is called Five Stroke Method not because of the five keys, but because in principle characters can be located in five strokes, even if the character takes more strokes to write with pen on paper.

Roman characters are written by strokes as well. A more intuitive way to use AEIOU is to have the morphology (shape) of the letters reflect the shape of a Chinese stroke as follows:

/ A: Downward Right-to-Left Strokes
- E: Horizontal Strokes
| I: Vertical Strokes
\ O: Dot Strokes or Downward Left-to-Right
? U: All Other strokes.

An alternate, more morphologically accurate, where the stroke-shape best matches the vowel-shape on a PinYin keypad:

Five Stroke (using Six Keys) AEIOU-V OrrPad:
/ A: Downward Right-to-Left Strokes
- E: Horizontal Strokes
| I: Vertical Strokes
\ O: Dot Strokes
? U: All Other strokes.
\ V: Downward Left-to-Right

CLAIM: A claim is made on any adaptation of the Five Stroke Wubi Hua system to the 5x6-6x5 grid or when reconfigured with other OrrPad features.

6b. Four Corner method, (四角码), encodes Chinese characters by selecting four numerical digits per character (in some cases, an additional digit is used). It began as a method of indexing Chinese characters in dictionaries, and was popular before the use of pinyin. It was later adapted as an input method for computers.

How the Four Corner Method works:
The four digits used to encode each character are chosen according to the "shape" of the four corners of each character, i.e. the upper left, upper right, lower left and lower right corners.

The shapes are memorized by this Chinese poem:
横一竖二三四点
又四插三角框
七角八八九是小
点下有横向零头

The number 1 represents a horizontal stroke, 2 a vertical or diagonal stroke, 3 a dot stroke, 4 two strokes in a cross shape, 5 three or more strokes in which one stroke intersects all others, 6 a box-shape, 7 where a stroke turns a corner, 8 the shape of the Chinese character 八 and its inverted form, and 9 is used for the shape of the Chinese character 小 and its inverted form. Zero is used where there is either nothing in a corner, or the part in a corner is already represented by a previous corner, or where a corner has a dot stroke followed by a horizontal stroke.

CLAIM: A claim is made for the redesign to adapt the Four Corner Method for use on any 5x6-6x5 form factor of OrrPad.

______________________________
Part 7a-c: OTHER CHINESE ORRPADS

7a. ORRPAD CHINESE STROKE METHODS: The Orr Pad Stroke Method of writing Chinese can be one character set option alone on a keypad or a character set writing option in combination with other character sets or Chinese Orr Pads. In the Orr Pad Stroke Method, Chinese characters may be input the old fashioned way: stroke-by-stroke. The stroke Orr Pad option provides the 12 basic stroke keys and with the help of predictive text users have the possibility of writing known characters in much faster time than possible absent predictive texting or Orr Pad advancements. The OrrPad Stroke Method uses predictive text in a new and novel way and is so claimed.

Sample Chart of Horizontal Stroke variants:

A list of the 50,000 possible Chinese characters does not need to be included to follow this patent.
JAPANESE ORR PAD SYLLABARY: 日本語
Japanese (Nihongo) is spoken by 110 million people. Japanese sentences are written with a mixture of four character scripts: their native phonetic Hiragana and Katakana, ideographic Kanji (Chinese characters), and Rōmaji (Roman) letters, plus Arabic numerals. Sentence example:
ラドクリフマラソン五輪代表に1万m出場にも含み
Katakana (green), Kanji (red), Hiragana (black), Roman letters and Arabic numerals (in blue).

Hiragana and Katakana are separate Japanese phonetic syllable scripts with identical linguistic organization. Each script represents the 48 syllable sounds of Japanese spoken language. The Katakana letter shapes were originally derived from abbreviated parts of Chinese characters. Katakana was a phonetic Japanese script used by men and Hiragana later evolved from it as a cursive floral form to be used as "women's writing." Today, everyone uses all four scripts.

Kanji is the Japanese word for Chinese characters. The Japanese government routinely maintains a list of Chinese Characters for General Use with 1,945 regular Chinese characters, plus 166 special characters. All government agencies must write Kanji (Chinese characters) only within this list, but Japanese citizens may use whichever Chinese characters they wish in their own writings.

Although most words can be written using any script, there is a convention of use obeyed for each script: The angular and masculine Katakana is used to write foreign words and names, common animals, objects and plants, emphasized words, and technical terminology. Whereas the feminine Hiragana is used to write inflectional endings of adjectives, verbs and particles and words that have no kanji representation, Kanji (Chinese) is used to write nouns, adjective stems and Japanese names. Rōmaji (Roman) letters are used for foreign terms, names and acronyms like NATO. Children learn Hiragana first, followed by Katakana, Kanji and Rōmaji. When an infrequently used Chinese character is written, furigana can be written beside it, which is a tiny Hiragana phonetic "translation". Traditionally, Japanese was written like Chinese in tategaki columns reading from top to bottom, with columns being read from right to left. After World War II, reading horizontally left-to-right became more popular while Chinese vertical columns still remain read vertically top to bottom. Both are seen today. Arabic numerals read left-to-right.

The Japanese Orr Pad can write all four of Hiragana, Katakana, Kanji and Rōmaji scripts.

OrrPad offers access according to vowel sounds in a vertical array: e.g. Ka, Sa, Ta, Na, etc., as well the familiar system of consonant sound clusters on single keys such as Ka, Ki, Ku as found on Japanese Qwerty-style and IME, modified for 5x6.

Hiragana and Katakana form the foundation of the Japanese Orr Pad. Both are organized linguistically ideally in a cross-navigational pattern of horizontal vowels with all syllables containing that vowel descending vertically from each host vowel. Typically, a key with: 半 or 全 toggles between Hiragana and Katakana. The key 収 converts Kana to Kanji. Kanji (Chinese characters) can also be typed by using one of the OrrPad methods of Chinese input, while Rōmaji script is standard on the Japanese OrrPad. Keys カ or ｶ will change input back to Hiragana.

The Hiragana or Katakana Orr Pad is a weave of 10 vertical and 12 horizontal mnemonic threads intersecting 120 times, whereby each sound has a predictable qualitative relationship to all others.

The Japanese Orr Pad is organized as follows:
1. The Japanese OrrPad is set on a 5x6-6x5 grid that can be expanded if needed to a 5x8-8x5 for access to all syllables with minimal shifting. If on a 5x9 of a touchscreen, no shift is needed. It can also be set horizontally, with vowels at the side.
2. The 5 Japanese vowels are found in the order as learned as a child. Each vowel leads a column or row containing all syllable sounds with that vowel.
3. Vowels are a frame of reference to find syllables. For example all "a" syllables follow the "a" vowel. Vertical arrangement of a mnemonic of syllables based on the vowel allows finger assignments to be easily memorized.
4. By applying a shift or option key to OrrPad, each key can represent 3 (or more) variants, which means that 30 keys can represent 90 characters.
5. The diacritic markings of やゆよ are used to modify the "i" sound of the Japanese vowel い. All possible combinations are Orr-phonologically found on the 2nd column under the vowel: い.

Diacritics やゆよ can be found on dedicated keys, or via Sequential Shift, Dedicated Accent Key, or as a list of Accented Options that can be Cycled. If a target letter is held-down its variants appear in a small pop-up box on the actual writing area. The accent keys can be selected by mouse or touch, or cycled until selected by release or an extra strike of another key.

6. Dkuen and Handkuen で音 diacritics modify syllables Ha, Hi, Fu, He, Ho into Ba Bi Bu Be, Bo, and Ma, Mi, Mu, Me, Mo, into Pa, Pi, Pu, Pe, Po, accessed via sequential strike, accent keys, as a vowel shift option, or Hold Select and/or Cycle.

7. Orr Pad Sequential Strike or simultaneous option/shift key allows access to key mates and to allow character set changes between the Japanese scripts of: Hiragana, Katakana, Romaji, and Kanji.

8. Kanji Chinese characters used by the Japanese can be accessed according to any of the Orr Pad methods for Chinese language input.


Chinese Derivation of Katakana-Kana OrrPad:

3. Hiragana OrrPad 5x8 or 6x6: A preferred embodiment. To create a 6x6, Japanese vowels are placed (out of line with its syllables) against the syllable block as row 1 instead of as column 1 or vice versa in any 6x6 orientation. The 8th column- row syllables would be piggied into their vowel sisters. The remaining key would serve diacritics.

<table>
<thead>
<tr>
<th>Hiragana</th>
<th>Katakana</th>
</tr>
</thead>
<tbody>
<tr>
<td>あ</td>
<td>ア</td>
</tr>
<tr>
<td>い</td>
<td>イ</td>
</tr>
<tr>
<td>ろ</td>
<td>ロ</td>
</tr>
<tr>
<td>な</td>
<td>ナ</td>
</tr>
<tr>
<td>か</td>
<td>カ</td>
</tr>
<tr>
<td>ひ</td>
<td>ヒ</td>
</tr>
<tr>
<td>ら</td>
<td>ラ</td>
</tr>
</tbody>
</table>

5. Katakana: mid-piggled +diacritic bottom row option

<table>
<thead>
<tr>
<th>Katakana</th>
</tr>
</thead>
<tbody>
<tr>
<td>カ</td>
</tr>
<tr>
<td>シ</td>
</tr>
<tr>
<td>マ</td>
</tr>
</tbody>
</table>

6. Katakana 5x8: DiacriticTop+4Bottom Piggies

<table>
<thead>
<tr>
<th>Katakana</th>
</tr>
</thead>
<tbody>
<tr>
<td>カ</td>
</tr>
<tr>
<td>さ</td>
</tr>
<tr>
<td>た</td>
</tr>
<tr>
<td>ひ</td>
</tr>
<tr>
<td>ら</td>
</tr>
</tbody>
</table>

7. Katakana 5x6 (shown with phonetic guide)

<table>
<thead>
<tr>
<th>Katakana</th>
</tr>
</thead>
<tbody>
<tr>
<td>ア</td>
</tr>
<tr>
<td>ウ</td>
</tr>
<tr>
<td>オ</td>
</tr>
</tbody>
</table>

8. Hiragana OrrPad 5x6 (shown with phonetic guide)

<table>
<thead>
<tr>
<th>Hiragana</th>
</tr>
</thead>
<tbody>
<tr>
<td>あ</td>
</tr>
<tr>
<td>い</td>
</tr>
<tr>
<td>ろ</td>
</tr>
<tr>
<td>な</td>
</tr>
</tbody>
</table>

Handwriting circle yi circle oy.

<table>
<thead>
<tr>
<th>Japanese</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>あ</td>
<td>a</td>
</tr>
<tr>
<td>い</td>
<td>i</td>
</tr>
<tr>
<td>ろ</td>
<td>ro</td>
</tr>
<tr>
<td>な</td>
<td>na</td>
</tr>
<tr>
<td>が</td>
<td>ga</td>
</tr>
<tr>
<td>ひ</td>
<td>hi</td>
</tr>
<tr>
<td>ら</td>
<td>ra</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Japanese</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>あ</td>
<td>a</td>
</tr>
<tr>
<td>い</td>
<td>i</td>
</tr>
<tr>
<td>ろ</td>
<td>ro</td>
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<tr>
<td>な</td>
<td>na</td>
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<tr>
<td>が</td>
<td>ga</td>
</tr>
<tr>
<td>ひ</td>
<td>hi</td>
</tr>
<tr>
<td>ら</td>
<td>ra</td>
</tr>
</tbody>
</table>

Handwriting circle yi circle oy.
9. Hiragana OrrPad 6x5: (Diacritic or alternate characters accessed via OrrPad accent or other system)

10. Hiragana 5x8: Diacritic Top+3Bottom Piggies

11. Hiragana Katakana 5x6 with phonetic guide:

12. Hiragana Katakana A preferred embodiment:

13. Hiragana 5x6 with full Diacritic row, shown without grid-lines:
The Japanese Double-thumb method can be applied to an OrrPad. OrrPad improves upon the idea of thumb shift keys by mnemonically organizing the Japanese letters on a 5x6 matrix to accommodate the 30 keys to allow one-hand typing, rather than the Qwerty 10x3 designed for the mechanical age.

Furthermore, the letters are organized on the OrrPad according to phonetic relationship rather than according to expected frequency of use.

The OrrPad belter accommodates shift keys struck by thumbs than Qwerty, which requires a specially made Qwerty with shift keys moved to where the space key lies at the center. A shift key depressed by a thumb, rather than a pinkie, is more comfortable for either Simultaneous Shift or Sequential Shift as on the typical English Qwerty keyboard. Furthermore, the shift keys of the OrrPad are Sequential Shift rather than Simultaneous Shift as found on the Qwerty version. Sequential Shift means that one does not need to hold the shift key while awkwardly simultaneously depressing the target letter. Finally, on the OrrPad, the Sequential Shift key can simply be struck once for the second choice, and twice (double-clicked) for the third choice before (or after, depending on how the software is set) striking the target key. If the shift key is not used at all, and only the target key struck, the first choice on the face of the key is selected. On a touch screen, it is possible for the keys can be subdivided so that no shift key is needed at all.

Prior Art:

![Keyboard Layout](image)

NEXT: Korean OrrPad
(a) Positional *blocking* without intersection:
Since the intersection of a vowel and consonant is inherent to Korean, information is best organized by a block pattern of vowels and consonants, in Korean alphabetical order, as a mnemonic aid. Blocking of information in a pattern rather than with single cross-keys is a technique to create a mnemonic and navigable matrix for Korean.

Korean Blocked Orr Pad grids: Claimed

All Horizontal Korean: Vertical Vowel Sidebar:

(c) Cross Blocking with or without intersection is when a block of information is set in one direction and the other block runs in the opposite direction. *Blocked* is when mnemonic blocks of information run in the same direction.

Cross-blocked example: Blocked example:
(Both are claimed OrrPads)

### Horizontal Vowels w/ Vertical Consonants:

<table>
<thead>
<tr>
<th>Vowel-Consonant</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>o</td>
<td>i</td>
<td>e</td>
<td>u</td>
<td>a</td>
<td>i</td>
<td>e</td>
<td>u</td>
</tr>
<tr>
<td>a</td>
<td>o</td>
<td>i</td>
<td>e</td>
<td>u</td>
<td>a</td>
<td>i</td>
<td>e</td>
<td>u</td>
</tr>
<tr>
<td>a</td>
<td>o</td>
<td>i</td>
<td>e</td>
<td>u</td>
<td>a</td>
<td>i</td>
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<td>u</td>
</tr>
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<td>i</td>
<td>e</td>
<td>u</td>
<td>a</td>
<td>i</td>
<td>e</td>
<td>u</td>
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<td>a</td>
<td>o</td>
<td>i</td>
<td>e</td>
<td>u</td>
<td>a</td>
<td>i</td>
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<td>u</td>
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<tr>
<td>a</td>
<td>o</td>
<td>i</td>
<td>e</td>
<td>u</td>
<td>a</td>
<td>i</td>
<td>e</td>
<td>u</td>
</tr>
<tr>
<td>a</td>
<td>o</td>
<td>i</td>
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<td>u</td>
<td>a</td>
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<td>e</td>
<td>u</td>
<td>a</td>
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<td>u</td>
</tr>
<tr>
<td>a</td>
<td>o</td>
<td>i</td>
<td>e</td>
<td>u</td>
<td>a</td>
<td>i</td>
<td>e</td>
<td>u</td>
</tr>
</tbody>
</table>

In Korean, the language the order of vowels and consonants is learned by rote in separate vowel or consonant sequences rather than in one consecutive sequence, thus only a blocked rather than intersected arrangement is possible, as there is no single sequence to cross.

If consonants were interspersed with vowels in one sequence, as found in the Roman, Greek and Cyrillic alphabets, intersection is possible. Also, if the keypad were very large, then Korean could be displayed cross-navigationally with all syllable sounds found where their component vowels and consonants intersect. (See table above) Since such a display is too large for small electronic units, the inventor has produced a blocked method, which is small, flexible, providing a mnemonic for the construction of Korean syllables, and also displays the Roman and Chinese Korean user requires.
Cross-blocking seems the most befitting of a world standard keypad that also reflects the native organization of the Korean language. The Korean cross-blocked matches the world matrix standard and the horizontal top display of Korean vowels is familiar and thus attractive to users. However it lacks the benefit of vertical order of letters that better enables memory of finger assignments and a space-keypad.

Cross blocking in a matrix seems to be the way to most closely comply to the logic of a a cross-navigational matrix, absent an intersecting nexus. However, not all versions of blocking are equal. The All Vertical Korean has blocked mnemonics, yet also has the benefit of offering vertical channeling feature ideal for space-keypads, where a user merely types in space.

Additionally, the vertical pairings are related to one another in shape and sound, while the horizontal vowel layout, though more familiar and more akin to the horizontal disposition of other language keypads, the horizontal breaks the vowel sound pairing between the 5th and 6th vowels while the vertical preserves this relationship in an extremely fast and tidy mnemonic; which still ends up reading left to right, and the vertical aspect is in keeping with the fact that Korean was originally written vertically and still is done so in applications that have remained in the vertical custom. Both are possible, and claimed.

The All-Vertical Korean is recommended as the fastest and easiest to use for Korean speakers in the long-term. It's only illusory disadvantage is the unfamiliar top row; but when the mnemonic pairing the top two rows is pointed out, the mnemonic infinitely speeds use over the dual horizontal absent cross navigational intersection as found in the other top horizontal vowel displays.

Korean Vowel Pairings 2x5: As it turns out, Orr Pad organization of the vertical vowel pairings create meme pair units running in a vertical-horizontal matrix of 5 pairs. (A meme is a block of related information memorized together as a unit.)

The Korean double vowel meme units, demonstrated graphically below, reveals the underlying linguistic organization that results in the inventor's optimal Korean keypad for electronic interface:

Korean Double Vowel Memes:

\[
\begin{array}{cccccc}
\hat{a} & \hat{d} & \hat{o} & \hat{u} & \hat{\ddot{u}} \\
\hat{ya} & \hat{yo} & \hat{yo} & \hat{yu} & \hat{y}\ddot{u} & \hat{\dddot{u}} \\
\end{array}
\]

The above row is in perfect Korean alphabetical order. One can now notice that the second vowel of each meme is “Y” variation of the first vowel:

\[
\begin{array}{cccc}
A(\hat{y}a) & \hat{O}(\hat{y}o) & \hat{O}(\hat{y}o) & \hat{U}(\hat{y}u) & \hat{U}(\hat{\dddot{u}}) \\
\end{array}
\]

Each leading vowel can be modified by one stroke change to add a Y sound to that vowel to make:

- A into YA
- O into YO
- U into YU
- Û into YÜ

Linguistically, Y and Û are interchangeable. Each 2nd vowel is a Y variation of the preceding.

On a keypad 5x5 or 5x6 an optimal Korean vowel mnemonic, weighing all factors, may be in a vertically paired, horizontally read graphic ordered as shown below. Notice the lower character with the Y sound is a slight sound (and shape) modification of the top phoneme character. The Y sound is achieved by the modification of one stroke change to the lead vowel. The mnemonic is now 5 units of a double meme (read vertically left to right) and easier to memorize than 10 individual keys of 5 each, in vertically offset pairings; thus, less related memes.

Optimal 5x5(6) Arrangement of Korean Vowels

\[
\begin{array}{cccccc}
\hat{a} & \hat{a} & \hat{d} & \hat{d} & \hat{o} & \hat{o} \\
\hat{ya} & \hat{ya} & \hat{y}o & \hat{y}o & \hat{yu} & \hat{yu} \\
\hat{\ddot{u}} & \hat{\ddot{u}} & \hat{\dddot{u}} & \hat{\dddot{u}} & \hat{i} & \hat{i} \\
\end{array}
\]

The order of the vowels may be reversed to run vertically reading right to left and is so claimed. Korean has a customary precedent whereby it can be written vertically and read right to left as well as written horizontally and read left to right. The Orr Pad can use all directions.
The preferred embodiment is the alphabetical order in which the characters were learned for the child. In the following manner below: however, the reverse order is also claimed reading right to left. Below is the preferred vowel embodiment direction because it reflects the left-to-right reading influence beginning with an "A" vowel, yet the original vowels of Korean are the strokes of (i) meaning "earth" and ^i(i) meaning "man". All other vowels were constructed by adding a dot representing "heaven" which became modified into the short dash we see today.

This charter of this patent is to produce a user-friendly interface for global electronic communication. The first obstacle to placing a keypad on the increasing array of small electronic communication devices is the width of the 10 key wide Qwerty. The two best Korean solutions are the adoption of either 2 horizontal rows of vowels with broken vowel meme pairs or the preferred embodiment below of 5 double vowel memes that preserves both traditional Korean order and the global Romanized position of "A" in the far left corner.

Thus, the embodiment below is the best solution for a 5 key wide keypad. It reads beautifully in both traditional Korean and Romanized alphabetical order: (i) in the traditional vertical order read right-to-left beginning with earth — and man ‘ ’; and (2) it simultaneously reads as double vertical memes in the Roman order of left-to-right beginning with ‘ ’ which is the vowel of "A". The vertical memes allows immediate memorization of finger assignments and any Korean speaker could easily learn to memorize the order of keys for each finger in just a moment. The vertical order means one learns only 5 memes not 10.

More Korean Preferred Embodiments: claimed

This spatial arrangement of vowels better displays (than Qwerty or any other pad) the original brilliant organization of Korean writing as first set in 1444 C.E. This Orr Pad arrangement of Hangul can interchange with Chinese or Roman alphabets and can be made-to-fit on the face of a phone or other small device to meet the needs of the global electronic age. The extra keys are available for the anticipated use of popular syllables, double vowels, special characters and punctuation, etc.

Korean Consonants:
The examples above are given as information-blocked Orr Pad with separated vowels and consonants still in perfect alphabetical without intersection of coordinates. In Korean, because consonants are written first, the inventor recommends keeping the vowel block above the consonant block below so that a consonant may be selected followed by a vowel with views of both selections thus unobstructed by fingers. However, the inventor does anticipate and claim a lower or side vowel block arrangements should it be preferred. Additionally, since the basic Korean alphabet uses only 24 key boxes, popularly used characters can be assembled on the many extra keys remaining on any one of these designs. This is anticipated and thus is so claimed in this patent.

Currently, Korean and other language keypads do not display information in linguistic blocks on a grid in this manner. The charter of the Orr Pad is to produce a global standard, motor-memory friendly, electronic interface communication tool. A blocked solution on a grid to help locate vowels and consonants, especially when display of intersection is not possible, produces an optimal layout and is so claimed.

Vowels are encircled and comprise two rows or columns. As in other Orr Pads, vowels, consonants, syllables or other linguistic values may be blocked vertically or horizontally or as a combination of vertical and horizontal. Blocking can place the vowel block (or other linguistic values such as diacritics) at the sides or bottom. Blocking is also claimed if a blocked arrangement of characters is placed on the Qwerty style keyboard hardware.

Preference in blocking should be given to alphabetical order, but in special instances, when weighing competing values, breaking order may be preferred and is also claimed when blocking on a keypad grid is employed.
In the Korean Orr Pad example below, the 10 vowels comprise the top two rows: with consonants below. The Roman, Greek, Cyrillic, and Japanese all have vowels arranged in the top row also— as one unifying organizing principle of world language electronic interface. However, it is possible to create Orr Pads with the vowels arranged at the side or foot of the pad, rather than the top in common with the other languages. As the Korean 140 unit syllabary can be displayed as a mere 24 unit alphabet, there are extra keys remaining to accommodate a selection of favorite Korean syllables just as the current Qwerty Korean keypad displays. Five keys on the 5x6 grid are thus available for the most frequently used Korean syllables as well as the employment of the standard shift key to access frequently used syllables. The final single free key can be dedicated to character set changing to Chinese or Roman. As Koreans speakers read and use Chinese characters mixed with their Korean syllables and sometimes write Roman letters; a solution for blending these three character sets on a small keypad is required for an optimal Korean keypad for small electronic devices. The preferred embodiment of the Korean Orr Pad includes Roman and Chinese characters. However, any combination of Orr Pad languages is possible.

The most basic Korean Orr Pad includes the following: (1) A 5x5 or 5x6 International standard Focus Field (2) Vertical Channeling in alphabetical order of separated consonants to aid motor-memory (3) Horizontal display of vowels in blocked alphabetical order on the preferred international Orr Pad vowel top rows, A Block Mnemonic, (not necessarily cross navigation), (4) Orr Pad Sequential Toggle Key for character set changing. (5) Korean, Chinese and Roman character sets.

6b. KOREAN ORR PAD, SAMPLE KEYFACES:

This preferred Korean Orr Pad reads vowels horizontally and consonants vertically. However, the all-vertical above is best for motor-skill, while the all horizontal may be superficially appealing to consumers, and are claimed as Orr Pads too.

A mnemonic ideal is part horizontal and part vertical in a pattern the brain recognizes. However, the general public, unaccustomed to vertical orientation, (or mixed orientation) may choose the horizontal version as their preferred version; without knowledge of the mnemonic advantages of both horizontal and vertical orientation, or just vertical. If an all horizontal orientation is selected, many Orr Pad features are still present, but it is a pad lacking vertical orientation, which loses the ideal for space-keypad; where one may merely type in space and easily memorize each finger’s letter assignments by merely memorizing the alphabetical order of the vertically-read consonants, with vowels easily memorized alphabetically as well. Vertical finger assignments are best for motor-skill and a space-keypad. In an all horizontal this finger assignment mnemonic advantage is not possible.

NEXT: Brahmi OrrPad
7a. ORR PAD BRAHMI SYLLABIC ALPHABET

Over 1.5 billion people speak 29 languages written in over 40 Brahmi scripts. Brahmi is the ancestral family script first devised in antiquity from which all modern Brahmi scripts are descended—branching into a myriad of unique scripts. Modern forms still carry the original linguistic organization of the ancient Brahmi. Orr Pad created a unified system of organizing these many disparate Brahmi languages onto one keypad by reaching back and employing this fundamental ancestral phonetic organization as the basis for the Brahmi OrrPad.

World Distribution of Brahmi derived Scripts:

BRAHMI SCRIPT originated in northeast India and became the ancestor to most of the scripts of South Asia, Southeast Asia, Tibet, Mongolia and Manchuria. The linguistic organization of Katakana of Japan shows Brahmi ancestry, even though the letter morphology is uniquely Japanese. Brahmi numerals are the ancestor of the Hindu-Arabic numerals, which are now used worldwide.

7c. ORR PAD BRAHMI LANGUAGES includes:

NORTH INDIA* Devanagari · Hindi · Sanskrit · Marathi · Mundari · Nepali · Gondi · Gujarati · Punjabi · Bengali · Assamese · Oriya · Tibetan · Manipuri etc.
SOUTH INDIA * Kannada · Tamil · Telugu · Sinhala. etc.
NORTH ASIA · Mongolian. SOUTHEAST ASIA* Burmese · Lao · Thai · Khmer · Javanese · Malayam PACIFIC* Balinese · Tagalog · Batak · Buginese, etc.

Roman script has been taught in the Indian sub-continent for five centuries: as India was the Jewel of the British Empire for 500 years. Roman script as an official script of India and should be included as an alternate on their keypads.

BRAHMI ORR PAD- BRAHMI is a mother term for Sanskrit-written Indie languages. There are two major branches of Indie languages: the northern Indo-European family of about 40 Indie languages and the southern family of 73 Dravidian languages and dialects. Both of these language families are quite different and their speech cannot be understood one to the other. However, the Brahmi script developed in the northeast was adopted by the south as well. Thus, they share the same ancient Brahmi script lineage for writing. Additionally, Brahmi script spread beyond India and was adopted as a writing system by many other language families all across north and south Asia from Java to Mongolia. Over a period of 2300 years, each of these language families has followed their own evolution of Brahmic writing resulting in each language having a unique writing script and system stemming from this common shared lineage of ancient Brahmi writing.

All Brahmi scripts are taught according to the place of articulation of the production of the sound of each phonetic, with a one-to-one correspondence. (Each letter exactly represents each sound.) Like the OrrPad, the sounds of Brahmi are learned organized on a grid; thus, each single sound in Brahmi has a qualitative relationship to all other sounds, arrayed on the utility equivalent of xy coordinates. Qwerty-style 10x4 Brahmi keyboards jumble this order, while OrrPad embodies it into a one-handed input system for any Brahmi script. All keys are accessible with one thumb cupped under one hand, or expanded to two hands.
Hindi (Devanagari) is the most common Brahmī script, the flagship representing Brahmī on an OrrPad. Since all Brahmī scripts share the same underlying organization other Brahmī OrrPads will be akin to Hindi, with idiosyncrasies as required.

Vowels and consonants are combined, and often modified by diacritic marks, to write all sounds in Hindi (or any other Brahmī script) in a one-to-one correspondence of sound to exact written shape.

**Brahmi CONSONANT order in Hindi Script**

Brahmi Consonants are learned and organized by memorizing **five places of articulation** in the mouth, ordered as:

1- Guttural, 2- Palatal, 3- Cerebral, 4- Dental, and 5- Labial.

Each of these five places of articulation has five consonants learned in a mnemonic order, which serves as the alphabetical order for Brahmī consonants.

**Brahmi Consonants as Taught in School in vertical columns w/ approximate sound in English (Pattern A):**

<table>
<thead>
<tr>
<th>Brahmi Columns:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gutturals</td>
<td>k</td>
<td>ca</td>
<td>t</td>
<td>t'</td>
<td>pa</td>
</tr>
<tr>
<td>Palatais</td>
<td>kh</td>
<td>ch</td>
<td>th</td>
<td>th'</td>
<td>pha</td>
</tr>
<tr>
<td>Cerebrais</td>
<td>gh</td>
<td>jh</td>
<td>dh</td>
<td>dh'</td>
<td>bha</td>
</tr>
<tr>
<td>Dentals</td>
<td>gh</td>
<td>jh</td>
<td>Dh</td>
<td>thh</td>
<td>bha</td>
</tr>
<tr>
<td>Labials</td>
<td>ng</td>
<td>nga</td>
<td>na</td>
<td>ma</td>
<td></td>
</tr>
</tbody>
</table>

**On OrrPad Rows 5-6**

<table>
<thead>
<tr>
<th>Resonants:</th>
<th>ng</th>
<th>nga</th>
<th>na</th>
<th>ma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semivowels:</td>
<td>y</td>
<td>r</td>
<td>l</td>
<td>v</td>
</tr>
<tr>
<td>Sibilants:</td>
<td>s</td>
<td>s</td>
<td>h</td>
<td>h</td>
</tr>
</tbody>
</table>

**7a. Hindi OrrPad: Analytics of the Hindi OrrPad:**

Brahmi organization fits better on OrrPad than Qwerty. The Brahmī OrrPad offers several patterns of Brahmī consonant **place of articulation** mnemonic squares, in familiar shift-pairs. Primary vowels are laid according to order and morphology with variants accessed by construction via shift and diacritic keys, which can also be morphologically organized.

**The five places of articulation** (Gutturals, palatails, cerebrais and dentals) are presented in an arrangement that reflects Brahmī mnemonic order learnt as a child, which gives each key a qualitative relationship to all other consonants like a musical instrument, while Qwerty scrambles Brahmī mnemonics of consonant order. (OrrPad claims alternative patterns of Brahmī consonant mnemonics, shown below.)

<table>
<thead>
<tr>
<th>ा</th>
<th>ं</th>
<th>ः</th>
<th>ऄ</th>
<th>अ</th>
<th>इ</th>
<th>ई</th>
<th>उ</th>
<th>ऊ</th>
<th>ऋ</th>
<th>ऌ</th>
<th>ए</th>
<th>ऐ</th>
<th>ऒ</th>
<th>ओ</th>
<th>औ</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>i</td>
<td>u</td>
<td>F</td>
<td>A</td>
<td>I</td>
<td>U</td>
<td>F</td>
<td>A</td>
<td>I</td>
<td>U</td>
<td>F</td>
<td>A</td>
<td>I</td>
<td>U</td>
<td>F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ख</th>
<th>च</th>
<th>थ</th>
<th>ध</th>
<th>भ</th>
</tr>
</thead>
<tbody>
<tr>
<td>k</td>
<td>ch</td>
<td>th</td>
<td>dh</td>
<td>bh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ं</th>
<th>ं</th>
<th>ं</th>
<th>ं</th>
<th>ं</th>
<th>ं</th>
<th>ं</th>
<th>ं</th>
<th>ं</th>
<th>ं</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>i</td>
<td>u</td>
<td>F</td>
<td>A</td>
<td>I</td>
<td>U</td>
<td>F</td>
<td>A</td>
<td>I</td>
</tr>
</tbody>
</table>

7a. Rows 1 and 2 carry all common vowel pairs:

अ आ इ ई उ ऊ ऋ ऌ ए ऐ ऑ औ

The common vowel modifying diacritic marks:

� ई ऊ ऋ ए ऐ ऑ औ are accessed by the shift key, in the same pairs as found on Qwerty.

7a. Rows 3 and 4 carry the primary consonants in Brahmī order as a doubled-bar of the five places of articulation. The consonants are paired with a shift to a diacritic pair as found on Qwerty.

7a. Row 5 and 6 hosts all 5 resonant consonants:

इ ज ण न म

with less-used resonants shifted.

Row 5 and 6 also host all semivowels: य र ल व.

And, hosts all sibilants श स ह.
Row 5 of features the familiar horizontal five-key bar of: मन बल स found on Qwerty, for users who want the least deviation from Qwerty while gaining OrrPad advantages. Thus every key on this OrrPad features the face key found on Qwerty keyboards.

Qwerty five-key bar:

OrrPad 7a, five-key bar:

OrrPad improves keyspace efficiency over Qwerty by placing a sibilant छ and a resonant न on shift places on the bottom row left empty on Qwerty.

By observing Qwerty order on these 5 keys, the Brahmi order is slightly scrambled. (While OrrPad 7b. is an alternate that better preserves Brahmi order of resonants, semi-vowels and sibilants.)

Diacritic Marks are found on 6th row or column keys:
Hi-Accents (hats): Lo-Accents (shoes and socks)

7a. Row 6 also hosts special characters.

Conjunct Letters are formed by typing parts that auto-combine by software into unique compounds.

Note: Other Brahmi scripts would use their equivalent characters with the same OrrPad organization. Same organization: with a different morphology.

Hindi Numbers:

7a. Hindi OrrPad 5x6 - 6x5 with Hi-Lo diacritic keys

7a. Devanagari (Hindi) without phonetic guide:
The preferred embodiments are a vertical display of consonants in columns, or a horizontal consonant display in rows, also claimed.

Hindi 5x6:

Hindi 6x5

Prior Art: Qwerty style Hindi keyboards scramble the mnemonic order of letters learnt as a child: (Lower case followed by “shifted” Upper-case)
OrrPad – Language Script 7

7b. Devanagari (Hindi) OrrPad: 5x5 diacritic 6th is a construction method with half letters and a diacritic 6th row-column that reflects older typewriter organization. A diacritic row-column may alternatively be placed under or above vowels, or at the side of vowels if vowel are vertical. Variants at top in small print.

B. Below is the "B pattern" that any Brahmi OrrPad may alternatively organize consonants. Notice that although consonants appear as reoriented vertically, also note that the vowels can be placed above or at the side of this consonant scheme, providing a unique set of layouts, all claimed.

The resonant row is piggyed into the 4th row.

<table>
<thead>
<tr>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>O</td>
<td>U</td>
<td>E</td>
<td>O</td>
</tr>
<tr>
<td>I</td>
<td>E</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>I</td>
<td>Y</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>R</td>
<td>Y</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>L</td>
<td>Y</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Here are the places of articulation of the above are:

<table>
<thead>
<tr>
<th>Vertical Consonants in Columns:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columns: 1st</td>
</tr>
<tr>
<td>Gutturals</td>
</tr>
<tr>
<td>K</td>
</tr>
<tr>
<td>Kh</td>
</tr>
<tr>
<td>G</td>
</tr>
<tr>
<td>G</td>
</tr>
<tr>
<td>G</td>
</tr>
</tbody>
</table>

Shown next is how an OrrPad could look like if places of articulation hold to the 'B' pattern:

<table>
<thead>
<tr>
<th>Horizontal Consonants as Rows:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gutturals: K</td>
</tr>
<tr>
<td>Ch</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>P</td>
</tr>
</tbody>
</table>

Variants at top in small print, providing a unique set of layouts, all claimed.
The Brahmi 7c Orr Pad begins as follows:

Selection of a Focus Field grid according to device.

A Brahmi 5x5 with a 6th diacritic row (or column if reoriented) permits 5 dedicated vowel keys, 5 diacritic keys and 20 consonant keys featuring full faces of Brahmi gutturals, palatals, cerebrales, dentals, labials; with piggy-backed "n" and "m" letters, semi-vowels, sibilants and compound characters.

The 5x6-6x5 focus field allows the best organization of relative-position layouts of Hindi and other scripts; making it possible to access all letters with one hand or one thumb, being the best fit on small devices with expansion to two-handed versions possible.

Expanded Brahmi: Brahmi OrrPads must offer expanded versions of their 5x6-6x5 embodiments, provided as an essential user-option of the system, that when the 5x6-6x5 is expanded more syllables have their own dedicated keyface when required by users, or when a two-handed embodiment is needed, in: 5x7, 5x8, 5x9, 6x5, 6x6, 6x7, 6x8. The first inventive step is the same on expanded versions as 5x6-6x5 layouts.

OR: The 5x7 Brahmi Orr Pad is more commodious and accommodates 5 vowel keys, 5 diacritic keys and 25 consonant keys: all consonants showing on key faces; with only compound characters, sibilants and semi-vowels piggybacked.

OR: A 5x8 OrrPad is the second of the three top configurations recommended by OrrPad. (The first and third being 5x6 and 5x5). The 5x8 Brahmi still requires one row of piggybacking but is favored because a 5x8 best allows an international standard large size especially for Asian languages.

OR: A 5x9 Brahmi Orr Pad displays on the keyface all 5 vowel keys, 4-8 diacritic keys, all 25 basic consonant keys, the 8 semi-vowel sibilant keys, and 4-8 dedicated compound keys.

OR: A Brahmi 6x5, 6x6 or 6x7, 6x8 can also be configured with Orr Pad organizational logic.

On any Brahmi Orr Pad, other letters or punctuation may be found with predictive text, a scroll-select system, or as an option on number keys, etc. or on extra, dedicated rows or columns.

A Brahmi Orr Pad can be organized with two focus fields and used with two hands with side-by-side focus fields. (Qwerty is essentially two focus fields.) However, Qwerty hardware positions keys offset, one to the other, in uneven fashion, so it is not a very focused focus field. Additionally, Qwerty does not organize language mnemonically or in a neuro-physiologically motor or cognitively friendly manner. Orr Pad addresses and improves these aspects, both motor and cognitive, in an idealized; yet flexible, well-organized method which can be learned by others to improve keypad design now and in the future.

2. The mnemonic Brahmi layout arranges vowels and consonants in pattern variations of places of articulation, reflecting order speakers learn as a child.

3- Cross-blocked linguistic thread mnemonics (not x-y cross-navigation intersections such as in Roman, Cyrillic or Greek OrrPads) are found in Brahmi Orr Pads with Vowels in traditional Brahmi alphabetical order reading horizontally left to right (organized according to morphological construction.)

Here are the primary Hindi Brahmi vowels:

अ आ इ ई उ ऊ ए ऐ ओ औ + ऋ ॠ ऌ ॡ

Brahmi phonetic (alphabetical) order is observed in either vertical or horizontal orientation.

4- Ideally, consonants are organized alphabetically in vertical channels, which enhances mnemonics and access. The Brahmi OrrPad is woven with a mnemonic in both vertical and horizontal mnemonic threads. If a horizontal arrangement in selected, the Orr Pad linguistic organization is preserved even when the pad is turned sideways. Consonant letters may be read either horizontally or vertically in this Orr Pad pattern; while preserving organization of linguistic structural divisions and alphabetical order in a cross mnemonic and on a focus field.

5- Consonants can be organized according to the phonetic (sound) groupings of the Brahmi languages. These groupings are in the alphabetical order native speakers learnt as children. Thus, consonants are in both alphabetical and linguistic order. Brahmi OrrPad offers 74 mnemonic strings in alphabetical order.

Consonants are not only alphabetical, but also in the linguistic divisions according to the way Brahmi languages are taught to native speakers using groupings of: Vowels, Semi-vowels, Diacritics, and Consonants which are organized in Blocks comprising the traditional speech groupings of: Gutturals, Palatals, Cerebrales, Dentes, Labiales; plus piggybacked Sibilants and Compound structures. Rarely used letters can be piggybacked such as the many "n" characters. Variations of each character are also piggybacked according to morphology. The variations are created by combining a primary character with a modifying sound value; found in the diacritic row.

Variations of each consonant are secondary characters to be found on the related host. Rogue letters may be found on the nearest related letter according to sound or morphology as space allows.

Brahmi Diacritics are found in a horizontal dedicated diacritic row, preferably at the accent or diacritic foot of the Orr Pad, but diacritics can be placed at the top or side or piggy-backed as well.
7. Devanagari (Hindi) OrrPad: 5x5

Diacritic software exceptions can allow construction of all vowels (or consonants) without adding more keys to do so, by utilizing common diacritics for unique shapes such as found in हे. In order to reduce the number of keys occupied by unique vowels with unique “hat” diacritics, instead of dedicating a key to either the whole letter or the diacritic, which is only used on the vowel हे, the letter is constructed by typing in sequence a common diacritic after हे to modify the vowel, except that in this case, the shape of the hat diacritic changes, once composed. Thus by this diacritic formula we can construct हे:

हे + हे = हे ≠ हे

Note: no strike of + or =

A software capability of diacritic “exceptions to the default” is necessary because today’s software often allows that any diacritic accent can be placed on any letter. However, for example, the accented vowel हे does not exist in written Hindi, and other combinations, such as: अ + हे ≠ हे.

Composing Subordinal letters with Ordinals: Because of the vast number of diacritics that must be assigned a dedicated key, this OrrPad fits Hindi on a tiny pad, by giving keyface priority to ordinal letters, to reduce keyfaces occupied by subordinal letters that are composed of ordinal parts.

For example, Hindi keyboards can feature the subordinal vowel अ with a key dedicated to it accessed by the shift key. However, OrrPad composes अ by striking two ordinals in sequence: अ + त = अ (Note: no keystroke of + or =).

Composing subordinal अ with ordinals employs the same number of keystrokes (since no shift key is needed) as having a key dedicated to it that requires a shift. Instead, the key dedicated to त suffices, which is on any Hindi keyboard and is used to create modify many characters.

Other examples: subordinates: ओ औ ओ and औ औ are composed by striking in sequence:

ओ + औ + औ = ओ + औ = ओ + औ

And, to construct: ए users strike: ए + औ = ए.

Primary Brahmi Vowel couplets (row or column):

1st 2nd 3rd 4th 5th
अ आ ई उ ऊ ए ऐ ओ औ a a i u u e a i o o

Diacritic Marks, basic set:

- द ट द ट ध ध न न य र र ल ल ह ह

Hi-Lo morphological Organization:

Hi-Accent Diacritics (hats):

Lo-Accent Diacritics (shoes and socks)

Hindi OrrPad 5x6-6x5 with Hi-Lo diacritic keys:

Conjuncts: Compound and Double Letters are combinations of either consonants or vowels, into one uniquely shaped letter in its own right. They are not found on the Brahmi foundation chart of letters, but are listed and taught after the foundation is learnt. On electronics, when a user types two parts of a conjunct or double in sequence, software can automatically create the conjunct; thus, these uniquely shaped letters do not need to be displayed on the face of keys.

CONJUNCT EXAMPLES:

7 Dotted consonants:

Qa xa Ya za Ra Rha fa
क ख ग ज झ फ

Piggy characters: Sa va SaLa ya ha स व छ य ह
Other Brahmi Scripts:
Each Brahmi script language variant observe the same OrrPad organization, albeit with unique character shapes and solutions for unique differences and writing customs. Indo-European Northern Brahmi languages, each with a unique angular script, as well as the many Southern Brahmi Dravidian languages each written with unique curly styles of Brahmi script (such as Tamil) can be represented as an OrrPad.

Below is an example of Thai to show how it follows Brahmi place of articulation organization.

**Thai versus Hindi:**

<table>
<thead>
<tr>
<th>Thai</th>
<th>Hindi</th>
</tr>
</thead>
<tbody>
<tr>
<td>อ</td>
<td>ओ</td>
</tr>
<tr>
<td>เอม</td>
<td>ओम</td>
</tr>
<tr>
<td>ว</td>
<td>व</td>
</tr>
<tr>
<td>ส</td>
<td>च</td>
</tr>
<tr>
<td>ฮ</td>
<td>ङ</td>
</tr>
</tbody>
</table>

**Consonants**

Gutturals: ฅ ฅʰ ฅฬ ฅำ ฅร ฅส ฅษ ฅห ฅฮ
Palatals: ฃ ฃʰ ฅชำ ฅน ฅป ฅพ ฅฟ ฅผ ฅภ ฅ次の ฅษ ฅษʰ ฅฏ ฅฐ ฅฑ ฅฑʰ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑ寨 ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑฑ ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑฏ ฅฑฐ ฅฑ� ฅฑ protester

**Thai Sanskrit Vowels and Consonants**

(Thai is next to its Hindi equivalent)

The other Brahmi scripts, such as Thai shown above, are organized in the same system as Hindi. Although the overall organization is shared, the script morphology (shape) is not; plus nuances in pronunciation, and writing customs are not identical between Hindi and Thai, nor other Brahmi languages, however the OrrPad platform accommodates these differences between all Brahmi scripts.

The Brahmi OrrPad is a well-organized phonetic weave. There are multiple cross threads on each row and column which intersect 34 different linguistic threads in 34 different directions, all 34 of which follow the alphabetical order the native speaker learns as a child, with variants constructed by morphology.

The OrrPad platform serves all Brahmi scripts:
Over 1.5 billion people speak 29 languages written in over 40 scripts derived from 16 ordinal Brahmi scripts. All Brahmi scripts can be embodied as a keyboard applying the OrrPad platform and are so claimed.

--- North Brahmi Indic angular scripts ---

1. **DEVANAGARI**
   - Devanagari
   - 180 million use this script to write Hindi in India, plus millions writing Marathi, Nepali and about 18 other Prakrit languages

2. **BENGALI-ASSAMESE**
   - Bangla
   - 230 million people of India and Bangladesh to write Sanskrit, Bengali, and the Assamese languages.

3. **GURMUKHI**
   - Gurmukhi
   - The Brahmi Punjabi script is used by 100 million in India, Pakistan and “Bollywood”

4. **GUJARATI**
   - Gujarati
   - Used by 50 million in India and Pakistan

--- South Brahmi Indic curly scripts ---

5. **KANNADA**
   - Kannada
   - 40 mil in South India

6. **TAMIL**
   - Tamil
   - 55 million in Sri Lanka

7. **SINHALA**
   - Sinhala
   - 16 million in Sri Lanka

--- Sino-Tibetan Brahmi Scripts ---

8. **TIBETAN**
   - Tibetan
   - 1.3 million in the Himalayas

9. **BURMESE**
   - Burmese
   - 43 million in Burma

--- Austro-Asiatic Brahmi Scripts ---

10. **KHMER**
    - Khmer
    - 16 million in Cambodia

11. **LAO**
    - Lao
    - 20 million in Laos

12. **THAI**
    - Thai
    - 60 million in Thailand, etc.

13. **JAVANESE**
    - Javanese
    - 82 million in Indonesia

14. **BALINESE**
    - Balinese
    - 3 million in Indonesia

15. **MALAYAM**
    - Malayalam
    - 38 million in Malaysia

16. **TAGALOG**
    - Tagalog
    - 28 m. in the Philippines
The Places of Articulation for an English OrrPad:
(For comparison to Brahmi articulation)

<table>
<thead>
<tr>
<th>A Vowel</th>
<th>E Vowel</th>
<th>I Vowel</th>
<th>O Vowel</th>
<th>U Vowel</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Bilabial Stop</td>
<td>F Alveolar Fricative</td>
<td>J Alveopalatal Affricative</td>
<td>P Bilabial Stop</td>
<td>V Velar Stop</td>
</tr>
<tr>
<td>G Velar Stop</td>
<td>K Velar Stop</td>
<td>Q Velar Stop</td>
<td>W Semi-Vowel</td>
<td>CH Alveolar Fricative</td>
</tr>
<tr>
<td>D Velar Stop</td>
<td>H Glottal Fricative</td>
<td>L Alveolar Resonant</td>
<td>R Alveopalatal Resonant</td>
<td>X Velar Fricative</td>
</tr>
<tr>
<td>M Bilabial Nasal Stop</td>
<td>N Alveolar Nasal Stop</td>
<td>S Alveolar Fricative</td>
<td>T Alveolar Stop</td>
<td>Z Alveolar Fricative</td>
</tr>
<tr>
<td>NG Velar Nasal Stop</td>
<td>TH Alveopalatal Fricative</td>
<td>SH Alveopalatal Fricative</td>
<td>V Alveolar Stop</td>
<td>NGH Alveolar Fricative</td>
</tr>
</tbody>
</table>

We can see that English does not observe the same organization as Brahmi places of articulation patterns.

**English Places of Articulation:**

1. True Vowels (AEIOU) are adjacent on top rows.
2. All consonants are in lower rows.
3. Semi-Vowels (WY) are both at far right.
4. Resonant consonants (L R) are adjacent.
5. Nasal Stop consonants (MNS) are adjacent.
6. Stop Consonants (BCDTGKPQ) are all upper-half.
7. Fricative consonants are near letters they modify according to Grimm’s Law. B to F, P to V; and J to I according to rules of Spanish vs. German; and P to V and V to W according to modifying rules of English vs. German.

**NEXT:** ARABIC and HEBREW OrrPad
SEMITIC LANGUAGE SCRIPTS

8a. ORR Pad ARABIC ALPHABET

400 million people speak up to 27 languages using the Arabic script. Arabic is the principle language of this alphabet with 165 million native speakers.

World Distribution of Arabic script:

8b. ORR Pad ARABIC ALPHABET LANGUAGES

include, but are not limited to:

NEAR & SOUTH EAST ASIA • Arabic • Baluchi • Brahui • Persian/Farsi • Kashmiri • Kurdish • Malayalam • Malay • Panjabi • Pashto • Sindhi • Urdu

SOMETIMES • Tajik • Turkish • Kazakh • Kirghiz • Uzbek • Somali • Hausa • Fula • Swahili • Sudanese • Hebrew • Berber • Serbo-Croat

Arabic as the language of Islam, is used by

1.5 billion Muslims worldwide for religious studies.

Modern Standard Arabic is the main written and spoken language of government and the media throughout the Arabic-speaking world and acts as a pan-regional lingua franca. Classical written Arabic, which contains archaic vocabulary and structures, is the language of the Koran.

Each Arabic-speaking country or region also has its own variety of colloquial spoken Arabic. Colloquial varieties of Arabic include:

• Egyptian, spoken in Egypt and perhaps the most widely understood variety, thanks to the popularity of Egyptian-made films and TV shows
• Levantine - spoken in Lebanon, Syria and Jordan
• Gulf - spoken in Saudi Arabia, Oman, Kuwait, Yemen, Dubai and Qatar
• Maghrebi - spoken in Algeria, Tunisia and Libya
• Moroccan - spoken in Morocco.

Arabic script may serve alone or as a host to other scripts in 5x5, 5x6 or 6x5 in any orientation. Shown below is Arabic script with Roman script on a 5x6 to serve as a point of reference. However, Roman 6x5 is also claimed with Arabic, or Arabic with other scripts

8a. Arabic OrrPad - Alef in upper LEFT corner

In this preferred Orr Pad, the arrangement is a left-to-right vertical alphabetical order, and is claimed.

8b. Arabic OrrPad - Alef in upper RIGHT corner

This preferred embodiment Arabic keypad reads right-to-left in vertical alphabetical order, showing letter variants, and diacritics.

The Arabic Orr Pad Showing Meme Groupings:

The unique languages such as Farsi, Urdu and other languages which use Arabic script, also follow the same overall organization as Arabic, accommodating their idiosyncrasies, such as extra or omitted letters, different diacritic marks and construction elements.
9. HEBREW Script OrrPad

Hebrew is the ancient language of the Jewish people and is now an official language of the state of Israel. After the 3rd century BCE, Hebrew was replaced with Aramaic as the everyday spoken language of the Jews. For centuries Hebrew was to be found only in written or liturgical form; however, it was taught for religious ritual to Jewish adherents worldwide.

Spoken Hebrew: In the last century, Hebrew was revived from being dead to an everyday language and is now spoken by 7 million people in Israel with smaller communities speaking Hebrew worldwide. Limited Hebrew recitation is taught for religious rites to as many as 13 million persons worldwide.

Yiddish: Hebrew script is also used to write the Yiddish language, which is non-Semitic in origin, linguistically analyzed as a Turkic-Slavic blend of Central Asian and Southeast European derivation, with many German loan words, as the language of the Ashkenazim, who now abandon it. There are far many more texts in Yiddish, written with Hebrew letters, than texts penned by ancient Hebrew people.

World Distribution of Spoken Hebrew today:

**Linguistic Family:** Hebrew is a Canaanite language of the Semitic language family. Hebrew's cousin, Arabic, is the largest of the Semitic languages. Semitic language is one of seven families of the Afro-Asiatic Group, the others being: Berber, Chadic, Egyptian, Cushitic, Beja and Omotic. Together, they comprise 375 related, but separate languages.

**World Jewish Population and Written Hebrew**

The flawed Hebrew 10x3 standard keyboard assigns each Hebrew letter to a key hosting a Roman letter with a similar sound. This causes the Hebrew 3x10 keyboard to fail to reflect any logic inherent to Hebrew. All Hebrew OrrPads preserve Hebrew logic.

**HEBREW OrrPad preferred embodiments:**

**Hebrew #1:** Although 5x6 is standard, preferred embodiments in 5x5 are possible in Hebrew.

**Vertical ABG:** commencing right-to-left.
Hebrew may sit alone or with other language scripts in 5x5, 5x6 or 6x5 in any orientation. Shown below is Hebrew with Roman on a 5x6 to serve as a point of reference. 6x5 is also claimed or with any other script

Hebrew #1 of GROUP A (reads RIGHT to left) 5x5
Clapping Vowel Block are "weak consonants"

An OrrPad preferred HEBREW embodiment:

Pros: (1) Hebrew alphabet reads left-to-right: as is the Hebrew custom. (2) All characters are in exact Hebrew alphabetical order arranged vertically so that finger assignments may be memorized instantly and "blind" skill is optimized. (3) Motor-skill and finger assignment memory-friendly vertical order in this pad observes exact Hebrew alphabetical order. (4) Weak consonants are in a blocked pattern (in pink and circled) (5) Numbers 1-10 are in a neutral vertical right block (shaded yellow). However, the right number block is preferred as it establishes correct numerical order throughout the number sequence. (6) This keypad is the best for left hand use, which frees the right hand for exclusive mouse work. (7) Blocked diacritic diamonds can handle all Hebrew diacritic "point" marking which identifies Hebraic vowel sounds. Diacritic "points" can also be found by the Orr sequential shift or by accent system software. (8) Lower 6th row may be used for other options. Cons: (1) Numerical order reads right to left: which is not their custom (or anybody else's). However, Hebrew writers are likely to use the regular number pad for normal numerical input. Users may still choose Hebrew number expression with Hebrew characters on this keypad. So, this negative is a nonissue. (2) Non-mnemonic top row numbers: 100-60-20-6-1.

Hebrew #2 of GROUP A (reads RIGHT to left) 5x6
Clapping Vowel: Open final form consonants: kaf ꞌ, mem ꞌ, nun ꞌ, and peh ꞌ.

The 5x6 Hebrew # 2 is the same base as 5x5 Hebrew #1 group A (also reading RIGHT to Left) except this one extends to a 5x6 row keypad by "opening" 5 letters with two forms so that each letter may be accessed separately. Assigning separate keys to the final form of the 5 consonants is necessary only when auto-correction software cannot be made available—or if users prefer this version. Opening the doubled consonants pushes the keypad to be a 5x6 pad. This keypad should be considered as an extended version of its parent: Hebrew #1 group A RIGHT to Left.

Hebrew #3 GROUP A (reading LEFT to right) 5x5
Clapping Vowel Blocks ("weak consonants")
Pros: (1) Keypad #3 is the best for right hand use as weak consonants and diacritics sit under the index finger. (2) Hebraic alphabetical order is consistent with Roman and the general international order of left to right. (3) All characters are in exact Hebraic alphabetical order arranged vertically so that finger assignments may be memorized instantly and “blind” skill is optimized. (4) Weak consonants are in a blocked pattern: in pink and circled (5) Numbers 1-10 are in a vertical left block (yellow). (6) Numbers count left to right as is the Hebrew custom. (7) Numbers 100, 200, 300, 400 is a vertical right block. (8) Blocked diacritic diamonds can handle all Hebrew diacritic “point” marking which identifies Hebraic vowel sounds. Diacritic “points” can also be found by the Orr sequential shift or by accent system software. (9) Lower 6\(^{th}\) row may be used for other options. Cons: Alphabetical order reads left to right, which is not Hebraic custom. Although a big plus is that this allows the numbers to read in correct order. Finger assignments memory-friendly vertical order in this pad observes exact Hebrew alphabetical order. (2) Non-mnemonic top row numbers: 1-6-20-50-90.

Hebrew #5 of GROUP B (reads RIGHT to left) 5x5
An OrrPad preferred HEBREW embodiment:

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</thead>
<tbody>
<tr>
<td>kaf</td>
<td>mem</td>
<td>nun</td>
<td>resh</td>
<td>gaf</td>
<td>shin</td>
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<tr>
<td>mem</td>
<td>lamed</td>
<td>mem</td>
<td>lamed</td>
<td>mem</td>
<td>shin</td>
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<td>yod</td>
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<tr>
<td>tav</td>
<td>peh</td>
<td>mem</td>
<td>peh</td>
<td>mem</td>
<td>shin</td>
</tr>
</tbody>
</table>

The Hebrew OrrPad #4 above is the same base as the parent pad called Hebrew #3 of group A (reading LEFT to RIGHT) except this one extends to a 5x6 row keypad by “opening” 5 letters with two forms so that each letter may be accessed separately.
Hebrew #7 of GROUP B ABG
ABC (Alef, Bet, Gimel) Horizontal (reads LEFT to right) 5x5. This is a HEBREW OrrPad preferred embodiment: This keypad can be oriented to read ABG right-to-left or to read ABG vertically either Left-to-right or Right-to-left and are also claimed (see Hebrew #1 and #2). If preferred letters and may be relocated to the other side of their row.

Hebrew #8 of GROUP B (reads LEFT to right) 5x6
ABC Horizontal (reads LEFT to right) 5x6

Hebrew #9 GROUP C (read RIGHT to Left)
An OrrPad preferred HEBREW embodiment:
Cluster Vowels in 5x5 Horizontal. ABG reads in Hebraic right to left. No vertical alphabetical order.

Pros: (1) Hebraic alphabetical order is preserved. (2) Reads Right-to-left as is the Hebrew custom. (3) Top row numbers form an excellent mnemonic: 100, 50, 10, 5, 1. Or in the Hebrew order: 1, 5, 10, 50, 100. (6) Rows descend mnemonically across the head row of 100, 50, 10, 5, 1 Descended AS FOLLOWS: 100, 200, 300, 400. Followed by: 50, 60, 70, 80, 90. Then: 10, 20, 30, 40. And: 5, 6, 7, 8, 9. And of course: 1, 2, 3, 4. (4) Alef-Bet-Gimel order is vertical allowing users to memorize finger assignments in a mnemonic string instantly. (5) Semi-vowels are clustered. (6) There is no left or right hand preference. Either left hand or right are equally usable as the 5th row is balanced with the three diacritical keys evenly distributed and the Semi-vowel cluster is just as easily accessed with the three fingers of the right hand as with the index finger-lan of the left hand. Cons: Numerals 1-10 are not in a rectangular block as in Hebrew #1etc. Not important.
**Hebrew #10** expands piggybacked letters, if needed when software lacks automatic final form correction.

**Hebrew #11** GROUP C (read LEFT to right) 5x5
Cluster Vowels

**Hebrew #12** GROUP C (read LEFT to right) 5x6
Cluster Vowels. Open consonants Cc, Mm, Nn, Pp.

**Hebrew #13** GROUP C variation (LEFT to R) 5x5:

**Hebrew #14** GROUP C variation (RIGHT to L) 5x5

The flawed Hebrew 10x3 standard keyboard scheme assigns Hebrew letters to a key that hosts a Roman letter with a similar sound when possible. Following the ad hoc Qwerty layout causes the Hebrew 3x10 layout to disorganize the inherent logic of Hebrew.

Besides, Qwerty has no logic to emulate. A rumor that Qwerty divided frequently used pairs in English is false, as letters E and R is the most frequent pair. All Hebrew OmPads preserve Hebrew logic, each in a unique way, and adaptable to 5x5, 5x6 or 6x5 format.
ACCENTS OF ROMAN SCRIPT LANGUAGES

There are about 80+ languages that use the Roman (Latin) script alphabet. Some languages require extra characters while others are absent the need for some letters. OrrPad accommodates cases of extra or absent letters. Accents, or diaritic marks, refine the vowel sounds that then shape consonant differences in language. Accents are required by the about half of the speakers of Roman script languages for written communication to be understood. About 40 Roman script languages do not require accents.

1. **ENGLISH**, which uses an unaccented Roman Latin layout, is the flagship language of the Roman script and of the International OrrPad. English is the most used language in the world, spoken by 500 million native speakers with an additional 1 billion secondary speakers. More books, articles, ads, and papers are printed in English than any other language. It is the official language of the USA, UK, Australia and New Zealand, and an official language of Canada, India, the UN, and other nations. English derives from a North Germanic Indo-European base, modified by 60% Latin and French. English has no accents itself, but when combined with an OrrPad accent package, it can write about 85+ Roman script languages by accessing 115+ accents, plus special letters.

### ENGLISH 5x6 (no accents)

<table>
<thead>
<tr>
<th>A</th>
<th>E</th>
<th>I</th>
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<th>U</th>
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<td>C</td>
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</tbody>
</table>

### ENGLISH 6x5 (no accents)

<table>
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<tr>
<th>A</th>
<th>B</th>
<th>C</th>
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</table>

OrrPad offers several accent access methods. The preferred (and OrrPad claimed) accent access is a dedicated accent key that is struck after a letter to mimic the handwritten method of adding accents after a letter is written. After striking a target letter, if the accent key is struck accent choices will rotate in a queue and show on the document or in a popup. In most cases, only one or two strikes are needed to add accents of a given language and rarely four or more. If the dedicated accent key is held down, all accent choices for the target letter will show. Multiple accent keys dedicated to specific accents may be preferred for languages with many accents. The OrrPad claimed Sequential Shift may be utilized. Accent methods in the prior art can also be used, such as: depressing an option key and target simultaneously, or holding down the target letter to expose and select from a pop-up queue, which may require a mouse absent a touchscreen.

### ACCENTED ROMAN 5x6 ORR PAD

<table>
<thead>
<tr>
<th>A:</th>
<th>B:</th>
<th>C:</th>
<th>D:</th>
<th>E:</th>
<th>F:</th>
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</tbody>
</table>

Row 2 (or Col 2) of accented Roman OrrPads have no accents, just one special letter, freeing the row (or column) as a zone for other options, symbols or punctuation and is claimed for such use. A 6x6 or other orientation is also claimed.

### ACCENTED ROMAN 6x5 ORR PAD

<table>
<thead>
<tr>
<th>A:</th>
<th>B:</th>
<th>C:</th>
<th>D:</th>
<th>E:</th>
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</table>
**AN ACCENTED ROMAN ORRRPAD CAN WRITE 80+ LANGUAGES WITH ACCENTS OR SPECIAL LETTERS:**


Many languages are at risk of becoming extinct due to the modernization of traditional communities. OrrPad nurtures the world's linguistic cultures via their native language and or writing system giving them access to participate in the world community, while also preserving their distinct cultural diversity to avoid a monoculture, which risks erasing the wealth of independent cultures.

**ROMAN LANGUAGE SET DEMOGRAPHICS**

Few people in the world have the knowledge to be able to design a global keyboard. Absent world language viability, it was impossible to adopt any new layout or one-handed platform. OrrPad alone teaches and demonstrates the viability of the 5x6-6x5 as a global platform, proving it can be globally adopted for one-handed devices and more.

**LANGUAGE TEACHING MODULES in the OrrPad method and platform provide an introduction to the geo-linguistic demographics of languages with accent modules to make better decisions about which accents and languages to provide and how to do so; useful for UX and operating system engineers, app and software developers, hardware device engineers and manufacturers. Without the organization of accents according to geo-linguistic markets and numbers of potential speakers, manufacturers cannot make the best informed decisions about which accents to provide and how to organize them for users to add or omit on a user interface. Each developer needs to provide accent access, and each user needs to refine accents needed. Having all accent and character options pop-up for users can offer too many or too few options. OrrPad teaching modules introduce which accent kits to enable.**

Currently, in the standard keyboard platform is the two-hand 10x3 keyboard with the layout as a variant from Qwerty. In France the layout is the Azerty, while in Germany the layout is the QwertZ, etc. OrrPad offers the first viable one-hand writing tool in the world’s writing systems. OrrPad standardizes Roman access and provides needed accents and extra characters. Every 5x6-6x5 layout is made more viable by the entire OrrPad platform, as duly improved. One essential way OrrPad proves the very viability of any and all 5x6-6x5 one-handed typing instruments is by teaching methods of how accents are accommodated on the 5x6-6x5. Any 5x6-6x5 layout is made more viable as a general-purpose writing tool by OrrPad and is so-claimed. The Otey patent vaguely refers to languages but failed to teach how accents or other languages are achieved on the 6x5. The Accent Access system is claimed on OrrPads, and also if arranged on any other keyboard including any other 5x6-6x5 layouts, Qwerty, Azerty, Dvorak, or small focus fields. OrrPad accent systems can be used for other scripts, and on all various focus fields and layouts, including Qwerty, and is so claimed. Roman script languages are claimed under Orrpad in any language in any orientation including: 4x5, 5x5, 5x6, 6x5, 5x8, 6x7, or 6x8.
ROMAN LANGUAGE – ACCENTED ORRPADS:

2. ALBANIAN: Shqip

ALBANIAN is its own branch of the Indo-European family with no close relatives. It may be written using these scripts: Latin, Greek, Arabic, Elbasan, and Beitha Kukju.

SPOKEN BY 6.5 million in Montenegro, Macedonia, Albania, Kosovo, Greece, Bulgaria, Ukraine, Italy.

ALBANIAN ACCENTS: Ąā Ėē Ėć Ėk

3 ACCENTS: circumflex-cedilla-umlaut on AE+C

ACCENT ACCESS: Just one accent key is needed, by a strike after the letter is entered, which imitates the more natural handwritten method of adding an accent after a letter is written. An option key struck simultaneously can also be used to access an accented letter.

ALBANIAN Shqip 5x6

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

ALBANIAN Shqip 6x5

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

ALBANIAN PRONUNCIATION KEY: Accents are required:

- U, V, W, X, Y, Z

3. BASQUE - Euskara

SPOKEN BY: 600,000 people in Spain and France in the Basque region of Euskal Herria.

BASQUE ACCENTS: Ñ

ACCENT SYMBOL: 1 (tilde) on N

ACCENT ACCESS: One or no accent key is needed. Just an option key to access the tilde.

BASQUE Euskara 5x6

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

BASQUE Euskara 6x5

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

BASQUE PRONUNCIATION KEY:

- Aa Ba Ce De Ee Ff Gg Hh Ii Ji Ka
- Ll Mm Nn Oo Pp Qq Rr Ss
- Ti Tz Uu Vv Ww Xx Yy Zz
4. BRAILLE ORRPAD

For those with sight-deficits, an OrrPad is particularly helpful as OrrPad layouts can be memorized without the benefit of sight.

The OrrPad mnemonics are easily memorized at first use, and like a musical instrument the brain recognizes that each letter has a qualitative relationship to the whole and can predict the location of each letters in a spatial relationship to the whole. Furthermore, the keypad can sit under one hand.

The Braille OrrPad is claimed in 5x6 or 6x5 orientation in English and Roman character language variants, but is also claimed for other focus fields and character sets with different Braille patterns. Braille OrrPad devices can offer sound verification stating aloud which letter or function has just been struck.

5. BRETON - Brezhoneg

Spoken by about 350,000 in Brittany, France. BRETON belongs to the Brythonic branch of the Celtic language family.

ACENTS: 4 Å É Î Ù Ó Ù Ñ AUSENT: '˚'

An accent key can be struck twice to add the accent to AEI or N. It can be struck 4 times to cycle through the full queue of options for U.

BRETON Brezhoneg 5x6

A^ E^ I^ O^ .. 'U'
B F J P V
C G K Q W
D H L R X
M S Y
N~ T Z

BRETON Brezhoneg 6x5

A^ B C D
E^ F G H
E^ J K L M N
O^ P Q R S T
.. 'U^ V W X Y Z

The Celtic languages are Indo-European in origin. They died out on continental Europe by the late 5th century, but are still spoken in Brittany and the British Isles. Celtic Gaulish of France is now dead, but still found on ancient inscriptions. Living Insular Celtic is divided into two branches: Goidelic includes: Irish Gaelic, Scottish Gaelic and Manx; and Brythonic, which includes Breton. Cornish and Welsh (listed below under W and see "Gaelic" below to find Irish and Scottish Gaelic.)

Many presume the Celts spoke a common language, but they are as different as French is to English or German with their own adaptation of the Roman alphabet. Below is a comparison of the Celtic languages using the phrase 'I live in Cornwall':

- Cornish - Trigys ov yn Kernow
- Breton - E Kernev-Veur emaan o chom
- Welsh - Dw i'n byw yng Nghyffiniau
- Irish - Tá mé i mo chónaí i gCorn na Breataine
- Scots Gaelic - Tha mi a' fhuireach anns a' Chòrn
- Manx - Ta mee cùmmal ayns y Chorn
6. **CATALAN** - Catalán

CATALAN was originally a Gaulish dialect. No influence of Iberian, Germanic or Arabic. **SPOKEN** by 10 million in Spain in the provinces of Girona, Lleida, Valencia, Alacant, Barcelona, Castella de la Plana, Tarragona, and the Balearic Islands; in France, in the Pyrenees; Andorra, and in parts of Cuba and Argentina. **ACCENT SYMBOLS**: 3

**ACCENT ACCESS**: Just one accent key need be struck once or twice to add either accent to A or E, and only one strike to add the accent to C. A sustained-depress followed by a popup menu, or the Sequential Shift/Option can also be utilized.

**ACCENTS**: 10 Ą́ Ą̂ ÉÉ ÉÈ ÇÇ (acute-grave-cedilla) on AE +C

CATALÀN Català

A ` E Í Ó Ù
B F J P V
C ˚ G K Q W
D H L R X
M S Y
N T Z

CATALÀN Català

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

**CATALÀN PRONUNCIATION KEY**: Accents are required:

<table>
<thead>
<tr>
<th>Arabic</th>
<th>English</th>
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</thead>
<tbody>
<tr>
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7. **CORNISH** - Kernwek

CORNISH, a sister language of Breton, is nearly extinct. **SPOKEN** by a few thousand speakers in Cornwall, with 300 fluently, due to a revival effort in process.

Old Cornish dates from 800 to 1250 AD when it was essentially the same as Breton. Medieval Cornish lasted until 1540 when many Cornishmen were killed in the Prayer Book Rebellion when their books were required by law to be written in English, not Latin or Cornish. Many English re-located to Cornwall, which had seaports for English merchants and English colonists travelling to America. Cornishmen were prominent in the Scientific Revolution. A Cornish scientist invented the first electric light (Davy's), his assistant Faraday, discovered electromagnetism, and Cornish steam engineers led the British industrial steam engine and locomotive revolution, which flooded more non-Cornish speakers into Cornwall. The Cornish language drew its last breath at the end of the 19th century after the demand for Cornish engineering led to the diaspora of the Cornish engineering captains abroad with his work team (and often much of the close-knit village) wherever Cornish engineering, steam engine, locomotive and mining expertise, or seamen and merchants were in demand. The last native-born fluent speaker of the Cornish language died in 1891.

**CORNISH** Kernwek 5x6

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

**CORNISH** Kernwek 6x5

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
8. CROATIAN - hrvatski jezik
SPOKEN BY: 18.5 million in Serbia, Croatia, Bosnia, and Montenegro, the USA and Turkey. CROATIAN is a South Slavonic language known collectively as Serbo-Croat. SERBO-CROAT is one spoken language, which sounds the same, but it is written in three different scripts. The Serbs adopted the Cyrillic alphabet while the Croats adopted the Latin alphabet. After Turkey conquered Serbia and Bosnia, Islam spread to Bosnia and so Arabic script is also used.
ACCENT SYMBOLS: 3 (acute-wedge-eth) on CDSZ (C-wd, C-ac, D-wd, S-wd, Z-wd)
ACCENT ACCESS: Just one accent key strike is needed to add the first accent to CDS or Z and two strikes to add the second accent for C or D. Alternatively, a sustained press and popup menu; or the use of the Sequential Shift/Option.

CROATIAN Hrvatski jezik

A E I O U
B F J P V
'C' G K Q W
'D' H L R X
M S Y
N T Z

CROATIAN Hrvatski jezik

A B 'C' 'D'

CROATIAN PRONUNCIATION KEY: Croatian requires accents to understand written communication:
10. **DANISH - Dansk**

**SPOKEN BY:** 6 million in Denmark, Greenland, urban Norway, southern Sweden, and Schleswig Germany where it holds minority language status. Also, found in Danish communities in the USA.

**ACCENT SYMBOLS:** 3 Ææ Åå Øø

**DANISH** is a North Germanic language largely mutually intelligible with Norwegian and Swedish. Danish is a descendant of Old Norse, their common language during the Viking Era.

**ACCENT ACCESS:** Just one accent key is needed to modify A or O. Alternatively just use the Sequential Shift/Option feature, or hold-popup.

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**DANISH Dansk 5x6**

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11. **DUTCH, FLEMISH, AFRIKAANS - Nederlands.**

**SPOKEN BY:** 25 million in Holland (Netherlands), the Belgian Flanders provinces (Ghent, Brabant, Antwerp, Limburg) and the Dutch colonies of Surinam and Indonesia.

**AFRIKAANS** is the Dutch dialect of the Dutch Boer colony, now in South Africa. With slight differences, the same language is called Dutch in the Netherlands is called Flemish in Belgium.

**ACCENT SYMBOLS:** 20 across AEIOU and Y is sometimes accented

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**ACCENT ACCESS:** If just one accent key is available, the user would strike as many as four times to access all four accents. However, four accent keys can be made available if preferred. (They can occupy the four free keys). Or use a pop-up menu, or Sequential Shift/Options.

| ^ 'A' .. ^ 'E' .. ^ 'I' .. ^ 'O' .. ^ 'U' .. |
|-----|-----|-----|-----|-----|
| B   | F   | J   | P   | V   |
| C   | G   | K   | Q   | W   |
| D   | H   | L   | R   | X   |
| '   | M   | S   | Y   |
| ^   | N   | T   | Z   |

**DUTCH, FLEMISH, AFRIKAANS**

**Nederlands, Vlaams 5x6**

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**DUTCH ALPHABET:** The Dutch-Flemish alphabet requires accents to be understood when written.

Aå Aä Aâ Bb Cc Dd Éé Èé Éé Ëë Ff Gg Hh Ii Íí Íí Jj Kk Li Mm Nn Ôô Ôô Ôô Õõ Õõ Õõ Õõ Pp Qq Rr Ss Tt Uu Üü Ùù Ùù Ùù Ùù Vv Ww Xx Yy Zz
### English

1. **English** is the flagship language of the Roman OrrPad as the most common language in the world. English is accent free, but its plain alphabet serves as a base to host about 100 or more accented languages.

The English OrrPad is found at top of this list. It can host all accents, no accents, or a selection of accents or any special letters needed to accommodate any other Latin script based writing systems.

**Accent Access:** Many English language speakers occasionally use French loan words or other loan words from other European languages. Thus for English users, just one accent key, a pop-up, or other lightweight accent system is needed to offer a set of accents an English user might need.

### Esperanto

**Absent:** Q W Y

**Number of Accents:** None

**Special Letters:** Cx Gx Hx Sx

### Esperanto 5x6

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### Esperanto 6x5

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### Estonian

#### Estonian - Eesti

Estonian is a Finno-Ugrian language related to Finnish. The difference between the two is that Finnish has loan words from Swedish, while Estonian contains words of German origin, plus words from Russian, Latin, Greek and English.

**Spoken By:** 1.1 million people in Estonia

**Accents:** Ää Öö Õõ Üü Č Īī

**Accent Access:** Just one accent key is needed. The accent key is struck after the letter to place an accent as is done in handwriting. Just one strike is needed to add the first accent choice on ACOUSZ, and two strikes to add the tilde accent on A or O. Or use a depress-pop-up, or Sequential Shift/Option accent features.

### Estonian - Eesti

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</table>

**Estonian Pronunciation Key:** Estonian requires its accents to understand written communication:

| Aa | Bb | Cc | Čč | ĎĎ | Ĝĝ | Hh | Ii | Jj | [+] | [e] | [e] | [э] | [э] | [э] | [э] | [э] | [э] | [э] | [э] | [э] | [э] | [э] |
|----|----|----|----|----|----|----|----|----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Kk | Ll | Mm | Nn | Oo | Pp | Qq | Rr | Ss | Să | Să | Zz | []+ | [+] | [+] | [+] | [+] | [+] | [+] | [+] | [+] | [+] | [+] |
| Ĺķ | Ťť | Ùù | Vv | Ww | Öö | Ėē | Ŕĕ | Ŭū | Ėē | ŕē | ŭū | [+] | [+] | [+] | [+] | [+] | [+] | [+] | [+] | [+] | [+] | [+] |

**Notes:**

- OrrPad – Part C
- Accent System – 40+ Roman Languages
- Part C
- WO 2014/146140
- PCT/IB2014/002239
- 79
14. **FINNISH - Suomi**

**SPOKEN BY:** 5 million in Finland, Sweden, Norway, Estonia, Canada and Russia. Finnish is a Finno-Ugric language related to Estonian

**FINNISH ACCENTS:** 2 Åä Öö

**ACCENT SYMBOLS:** 1 (umlaut) on A O

**ACCENT ACCESS:** Just one accent key is needed or the Sequential Shift/Option accent features

**FINNISH Suomi**

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

**FINNISH Pronunciation Key**

Aa Bah Cht Dth Et Fth Gh Ih Yh Jh Kuh Luh Mn Nuh

Oo Pp Qh Rth St Ti Uh Vh Wh Xh Yh Zh Åå Öö

15. **FRENCH - Français**

**FRENCH** is a Romance language directly descended from popular Latin combined with Gaulish Celtic, written since at least 800 AD. It is related to Spanish and Italian, which was popular Latin combined with regional dialects.

**SPOKEN BY:** 70 million people in France, Belgium, Canada, Monaco, Switzerland, Italy, the USA, Africa, the Caribbean and some Pacific islands.

**FRENCH ACCENTS** 13 and 1 LIGATURE ÒE: Åä Éê Èê Êê Ôô Òô Ôô Òô Ùû Ùû Çç

**ACCENT SYMBOLS:** 5 (acute-grave-circumflex-umlaut-cedilla) to total 12 accents on AEIOU+C

**ACCENT ACCESS:** One to four accent keys can be used, or a pop-up menu or queue as Sequential Shift/Options

**FRENCH Français**

ÀÀ `À`É` .. ÀI .. ÀÔÊ ÀU`
B F J P V
C G K Q W
D H L R X
M S Y
N T Z

**FRENCH Pronunciation Key**

French requires its accents for readers to understand written communication:

ÀÀ `À`É` .. ÀI .. ÀÔÊ ÀU`
16. GERMAN — Deutsch

Spoken by: 120 million in Austria, Germany, and Switzerland. Germany recently proposed a method of re-spelling that eliminates the need for the ümlaut. However, all previously published work still carries the ümlaut and support for accents has improved.

German accents: Ää Öö Üü Extra: ß

Accent symbol: ü (ümlaut) on AOU

Accent access: Just one accent key is needed or the sequential Shift/Option accent features

**German Deutsch**

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

Aa Ää Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Öö Pp Qq Rr Ss Tt Uu Ùù Vv Ww Xx Yy Zz

German once required the ümlaut to understand written German. Recently, German was adapted for the Internet by respelling all German without the ümlaut. For example, ümlaut can now be spelled as “uumlaut”. With only one accent, this respelling was considered feasible; however, even this one change (on three letters) offers limited success in eliminating accents. Any existing published work cannot comply. OrfPad makes the re-spelling of languages unnecessary with its accent support.

The Germanic branch of Indo-European is a centum language including: Flemish, English, Faroese, Frisian, High German, Low German, Gutnish, Icelandic, Norwegian and Swedish. The linguistic cradle of the Germanic languages was in Sweden, Norway, Denmark, and the lower Elbe. After 1000 BC, the isolation of a unique mix of families, which included an Indo-European language resulted in Germanic languages being about 20% Indo-European. Grimm's Law describes this phonetic shift from ancient Indo-European values to modern Germanic values; in a formula whereby the Indo-European p, t, k becomes the Germanic f, th, h; the Indo-European b, d, g become Germanic p, t, k; and Indo-European bh, dh, gh became Germanic b, d, g. (The Grimm brothers are best known as the collectors of Grimm's Fairy Tales.)

17. GAELIC, IRISH — Gaeilge

**Irish Gaelic** is a Celtic language closely related to Manx Gaelic and Scottish Gaelic. Irish Gaelic was written in the Ogham script until Christianity was introduced. Medieval Irish scribes are credited with preserving numerous written works of Western Civilization that were destroyed elsewhere during the Protestant Reformation and civil wars. Since most Irish now also speak English, the full Roman alphabet should be made available to the Irish. The Irish also have an Irish-style Latin script used since the Middle Ages and still seen in print and on signs today. Dotted consonants appear in Irish script font.

**Spoken by:** 80,000 people who use Irish as their everyday language. About 1 million people claim knowledge of the language in Ireland, the UK, USA, Canada and Australia.

**Accent symbols:** J K Q V W X Y Z Extra 7

**Accents:** ÀÈìò Ù Lowercase i has no dot.

Consonants can be dotted, including:

| `Bb Æc Ðd Æf Æg Æh Æm Æn Æp Æs Æt` |

Usually seen when using a Gaelic style font.

**Irish Gaelic** Gaeilge

| 'A A 'B B 'C C 'D D 'E E 'F F 'G G 'H H 'I I 'J J 'K K 'L L 'M M 'N N 'O O 'P P 'Q Q 'R R 'S S 'T T 'U U 'V V 'W W 'X X 'Y Y 'Z Z |

AA Bb Æc Ðd Æf Æg Æh Æm Æn Æp Æs Æt LL Mm Ñn Oo Æp Ær Æs Æt Æu |
18. **Gaelic, Scottish - Gàidhlig**

**Spoken by:** 60,000 (about 1% of the population) in Scotland, mostly in the Outer Hebrides, Highlands, Strathclyde regions, and in Cape Breton, Canada. 10% of Scottish Gaelic speakers live in Glasgow. A Norse-Gaelic form of Gaelic is found in coastal Scotland. Most urban Scotch speak English and thus the full Latin alphabet should also be available.

**Scottish Gaelic** belongs to the *Goidelic* branch of the Celtic languages. The alphabet is called *Beth Lein Nuit* after the first three letters BLN of the Ogham alphabet that was once by Celtic peoples until Christianity arrived. In the 15th century due to the incursion of English peoples into Scotland, Scottish Gaelic and Irish Gaelic diverged to become more substantially distinct languages one from the other.

**Absent Letters:** J K Q V W X Y Z

**Accents:** À Á È É Í Í Ò Ó Ù Ù

**Scottish Gaelic Gàidhlig**

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**Scottish Gaelic Gàidhlig**

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**Other Celtic:** Breton is listed above with Cornish and Manx. Welsh is alphabetically listed below.

19. **Hungarian - Magyar**

**Hungarian:** is a Uralic language not related to Slav, Latin, Germanic, or Baltic.

**Spoken by:** 15 million in Hungary, Romania and Slovakia

**Accents:** À Á Ë Ë Í Í Ó Ó Ó Ó Ó Ó Ú Ú Ú Ú

**Absent Letters:** Q W X Y

**Accent Access:** Just one accent key or the Sequential Shift/Option accent features

**Hungarian Magyar**

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</tbody>
</table>

**Hungarian Pronunciation Key:** Accents are required to understand written Hungarian:

<table>
<thead>
<tr>
<th>Aa</th>
<th>Æa</th>
<th>Bb</th>
<th>Cc</th>
<th>Ćć</th>
<th>Dę</th>
<th>Dż</th>
<th>Eë</th>
<th>Ëë</th>
<th>Ëë</th>
<th>Ff</th>
<th>Gg</th>
<th>Hh</th>
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<td>[c]</td>
<td>[ć]</td>
<td>[d]</td>
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<td>[h]</td>
<td>[i]</td>
<td>[j]</td>
<td>[k]</td>
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</tbody>
</table>

Other Celtic: Breton is listed above with Cornish and Manx. Welsh is alphabetically listed below.
20. **ICELANDIC AND FAROESE - Íslenska**

Icelandic is the contemporary language of Iceland, yet the most conservative descendent of Old Norse. Icelandic readers can still read Old Norse Sagas without much difficulty. Icelandic requires accents for written communication to be understood.

**SPOKEN BY:** 275,000 in Iceland and Faroese Islands

**ACCENTS:** Á Á É Ë Í Ï Ò Ó Ù Ú

**ICELANDIC EXTRA CHARACTERS:** Æ, Æ, Ö, Ö

**ACCENT ACCESS:** Just one accent key needed or the Sequential Shift/Option accent features

---

21. **ITALIAN - Italiano**

**SPOKEN BY:** 60 million in Italy, Eritrea, and Switzerland.

ITALIAN is a Romance language related to Spanish, French, Portuguese and Romanian. Italian, like the other Romance languages, is the direct offspring of Latin and of all the major Romance languages Italian retains the closest resemblance to Latin with a great number of ancient Oscan and Umbrian elements. Italian is considered a single language with numerous dialects, with the Tuscan dialect most dominating the Italian peninsula standard.

**ABSENT LETTERS:** K W Y

**ACCENTS:** 20

À À É È Ë Ë Ì Ì Ì Ö Ö Ò Ò Ù Ù Ù

**ACCENT MARKS:** 3: acute, grave, circumflex

**ACCENT ACCESS:** Just one accent key or the Sequential Shift/Option accent features

---

**ITALIAN**

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

---

**ITALIAN**

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

**ITALIAN PRONUNCIATION KEY:** Italian require accents for readers to understand written communication:
22. **LATIN** (Ancient):

Latin is the alphabet grandmother of the Roman OrrPad, but it is absent 8 letters of the modern Roman alphabet.

**THE ANCIENT LATIN ALPHABET** is descended from the Etruscan alphabet, which evolved from the Greek alphabet. The earliest known Latin inscriptions, date to the 6th century BC. Roman inscriptions are found throughout Europe and also in the Middle East and North Africa.

By 1500, about 70% of all books in the world had been written in classical Latin. Local vernacular forms of Latin accounted for the majority balance. Thus, by 1500 most books were written in Latin.

**ACCENTS**: None. There are no accents and there were no lower case letters. Only 23 uppercase letters. The letters J, U and W were added to the alphabet at a later stage to write languages other than Latin. J is a variant of I, U is a variant of V, and W was introduced as a 'double-v' to make a distinction between the sounds we know as 'v' and 'w' in non-Latin languages.

**ABSENT IN ANCIENT LATIN**: J U V W

Ł, Ż, Ś and Ź were used for words of Greek origin, preserving the Greek legacy of the Latin alphabet.

**LATIN (ANCIENT)**

<table>
<thead>
<tr>
<th>A</th>
<th>E</th>
<th>I</th>
<th>O</th>
<th>U</th>
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**LATIN PROPER**

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<td>U</td>
<td>V</td>
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**LATIN Pronunciation Key**: Accents are required to understand written Latinian:

- **Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, Ii, Jj, Kk, Ll, Mm, Nn, Oo, Pp, Rr, Ss, Tt, Uu, Vv, Ww, Xx, Yy, Zz**

**OLD LATIN** is suitable for an archaeological version of OrrPad for the scripts of the ancient world, whose layouts are also claimed by OrrPad.

23. **LATVIAN** - *Atviēšu valoda*

**LATVIAN** is a Baltic language related to Lithuanian and Old Prussian. **SPOKEN BY** 1.4 million in Latvia. Also, populations in USA, Russia, Australia, Canada, Germany, UK, Sweden, Lithuania, Ukraine, Estonia, Brazil, Belarus.

**ACCENTS**: 12

A-ä, Ē-ē, Ģ-ģ, Ķ-ķ, Ļ-ļ, R-ŗ, Š-š, U-ū, U-ū, Z-ž

**SYMBOLS**: 3 (hook-wedge-dot) on AEI U +

**LATVIAN** Atviešu valoda

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<th>U'</th>
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**LATVIAN Atviešu valoda**

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<td>U’</td>
<td>V</td>
<td>W</td>
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**LATVIAN Pronunciation Key**: Accents are required to understand written Latvianian:

- **Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, Ii, Jj, Kk, Ll, Mm, Nn, Oo, Pp, Rr, Ss, Tt, Uu, Vv, Ww, Xx, Yy, Zz**
24. Lithuanian – Lietuvių kalba

Lithuanian is a Baltic language related to Latvian and Old Prussian. It is considered the oldest surviving Indo-European language and thought to have retained Proto-Indo-European (PIE) features such as pitch-accent and a complex inflexion case system. Some words resemble Sanskrit and Latin.

Spoken by: 3.5 million in Lithuania. Also: Poland, USA, Brazil, Argentina, Canada, Uruguay and UK.


Aa Ea Ii Uu Cs Žž

Symbols: 3 (hook-wedge-dot) on AE IU+ CSZ

Absent: Q W X

Unique Order: Y

Accent Access: Just one accent key or the Sequential Shift/Option feature

Lithuanian Lietuvių kalba

A5 E5 I5 O U5
B F J P V
C G K Q W
D H L R X
M S Y
N T Z

Lithuanian Lietuvių kalba

A5 B C D
E5 F G H
I5 J K L M N
O P Q R S T
U5 V W X Y Z

Lithuanian Pronunciation Key: Accents are required to understand written Lithuanian:

25. Maltese – Malti

Spoken by: 350,000 people on the Mediterranean island of Malta.

Maltese Accents: Cc Gg Hh Žž
(c-dot, g-dot, h-dot, z-dot)

Accent Symbols: 2 (dot-dot) on C G H Z

Maltese developed directly from Arabic, but after 870 AD was re-shaped by heavy Italian influences.

Accent Access: Sequential Shift/Option feature

Maltese Malti

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

Maltese Malti

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

Maltese Pronunciation Key: Accents are required to understand written Maltese:

26. Manx – Yn Ghael

Manx began in the 5th century when the Isle of Man was first settled by Gaels and Norse. It became distinctly Manx after the Norse kingdom of Man ended in the 14th century. However, Manx too became extinct in spoken form with the emergence of the modern English era after 1800, but Manx is now taught on the Isle of Man to revive it.
28. **POLISH** - Język polski, polszczyzna

**POLISH** is a West Slavonic language related to Czech, Slovak and Serbian.

**SPOKEN BY:** 3.5 million people in Poland, Lithuania, Belarus, the UK, USA and Canada.

**POLISH ACCENT:** 9

A ą Ćę Ėę Ł ŁóÓ Ń́ ÑŚ ŚŚ Źź Źź
A-hk,C-ac, E-hk,L-slash, N-ac, O-ac, S-ac, Z-ac, Zdt

**ACCENT SYMBOLS:**
4 (hook-acute-slash-dot) on A E O + CL N S Z

**ABSENT:** Q V X

**ACCENT ACCESS:** Sequential Shift/Option feature

**POLISH Pronunciation Key:** Letters require accents for readers to understand written Polish:

<table>
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<tr>
<th>Aą</th>
<th>Bć</th>
<th>Cć</th>
<th>Dż</th>
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<tr>
<td>Eę</td>
<td>Fę</td>
<td>Gę</td>
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</table>

The prefix 'ż' indicates a voiceless palatal 'ź' sound.

**POLISH Examples:**

Aą Bć Cć Dż

**POLISH Words:**

Aą Bć Cć Dż

**POLISH Examples:**

Aą Bć Cć Dż
29. **PORTUGUESE** — Português

**Spoken by:** 155 million people in Portugal, Brazil, Mozambique, Angola, Guiné, Cape Verde. The closest linguistic root relatives are local Asturian (Bable), Galician, some Spanish, but reshaped under Arabic and Berber Sephardic influence.

**Accents:** 9

Ăă Ăă Ćć Ėê Ŗō Ŗō Ŗū Üü

**Accent Symbols:** 9 (titl-cedilla-circumflex-acute-topdash-umlaut) on AEOU + C a-tidle, a-cf, c-cedilla, e-cf, o-cf, o-ac, o-tidle, o-topdash, u-uml

**Accent Access:** Just one accent key or the Sequential Shift/Option accent features

**Portuguese Pronunciation Key:** Portuguese requires accents to understand written communication:

<table>
<thead>
<tr>
<th>Accent</th>
<th>Letter</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td><del>Ăă</del></td>
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**Romanian Pronunciation Key:** Accents are required to understand written Romanian:

<table>
<thead>
<tr>
<th>Accent</th>
<th>Letter</th>
<th>Pronunciation</th>
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31. SLOVAK — Slovensky

SLOVAK is a Western Slavonic language related to Czech, Polish, and Serbian.
SPOKEN BY: 5.5 million people in Slovakia.
ACCENT SYMBOLS: 4 (acute-umlaut-wedge-tilda) to create 16 accents on A C D E I O + L N R S T Y Z
Áá Ăă Éé Íí Óó Óô Úú Ćč
Ďď LĹ Ėď Šš Šš Ćć
(a-ac, a-um, c-wd, d-wd, e-ac, l-ac, L-ac, n-til, o-ac, o-wd, r-ac, s-wd, t-wd, u-ac, y-ac, z-wd)
ACCENT ACCESS: Just one accent key or the Sequential Shift/Option features

SLOVAK Slovensky
'A' 'E' 'I' 'O' 'U'
B F J P V
C' G K Q W
D' H L 'R' X
M 'S' 'Y'
N' T' Z'

SLOVAK Pronunciation Key: Slovaks require accents to understand written communication:

| Letter | Short | Long | Other
<table>
<thead>
<tr>
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<tbody>
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<td>Cc</td>
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<td>Dd</td>
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<td>Uu</td>
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32. SLOVENE — Slovenski

SLOVENE is a South Slavonic language related to Serbian, Croatian, Macedonian and Bulgarian.
SPOKEN BY: 2 million people in Slovenia, Austria, Hungary and Italy.
ACCENT SYMBOLS: 1 (wedge) on C S Z
ACCENT ACCESS: Just one accent key or the Sequential Shift/Option accent features

SLOVENE Slovenski
A E I O U
B F J P V
C' G K Q W
D' H L R X
M 'S' Y
N' T' Z'

SLOVENE Pronunciation Key: Slovene requires accents to understand written communication:

Oo Pp Qq Rr Ss Tt Uu Vv Ww Xx Yy Zz

SLOVENE Pronunciation Key: Slovene requires accents to understand written communication:

Aa Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Pp Qq Rr Ss Tt Uu Vv Ww Xx Yy Zz

Notes:
- 'a' ['a:']
- 'e' ['e']
- 'i' ['i']
- 'o' ['o']
- 'u' ['u']
- 'c' ['c']
- 'd' ['d']
- 'f' ['f']
- 'g' ['g']
- 'h' ['h']
- 'j' ['j']
- 'k' ['k']
- 'l' ['l']
- 'm' ['m']
- 'n' ['n']
- 'p' ['p']
- 'q' ['q']
- 'r' ['r']
- 's' ['s']
- 't' ['t']
- 'u' ['u']
- 'v' ['v']
- 'w' ['w']
- 'x' ['x']
- 'y' ['y']
- 'z' ['z']
33. **SPANISH - Español**  
**SPOKEN BY:** 330 million in Spain, Africa, the USA, Caribbean, South America (except Brazil), and the Philippines.  
**ABSENT:** K W  
**ACCENTS:** Áá Àà Éé Íí Óó Úú Üü Ññ  
**SYMBOLS:** 3 (acute-umlaut-tilde) on AEIOU + N
**SPANISH** is a Romance language related to Italian, Portuguese and French. The **Popular Latin** spoken by Roman armies formed the basis of the many Spanish dialects. The Castilian dialect generally became the Spanish standard.  
**ACCENT ACCESS:** Just one accent key struck once will produce the accent on EION. Two strikes will produce the second accent on A or U. Or use the sustained-held pop-up or Sequential Shift/Option accent access.

**SPANISH Españaol**

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**SPANISH Español**

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**SPANISH PRONUNCIATION KEY**: Spanish requires accents to understand written communication:

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34. **SWEDISH - Svenska**  
**SWEDISH** is a North Germanic language in the Scandinavian branch very closely related to Danish, Norwegian and Icelandic.  
**SPOKEN BY:** 10 million in Sweden, Finland, USA  
**SWEDISH ACCENTS:** Åå Ää Öö  
**ACCENTS SYMBOLS:** 2 (bolle-umlaut) on AO
**ACCENT ACCESS:** One accent key strike will add an accent to AOU. Or Sequential Shift/Option features

**SWEDISH - Svenska**

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**SWEDISH - Svenska**

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Swedish Alphabet: Aa Åå Ää Bb Cc Dd Ee Ec Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Òó Pp Qq Rr Ss Tt Uu Vv Ww Xx Yy Zz
35. **WELSH**—Cymraeg

**SPOKEN BY:** 650,000 people in Wales (Cymru) and a population in Patagonia Argentina.

**ACCENTS:** (no accents in Welsh)

**ABSENT:** JK Q V X Z

**WELSH** is related to Cornish and Breton, and more distantly to Irish, Manx and Scots Gaelic. Since nearly all Welsh speakers also speak and write English, the full set of letters needed for English should also be given to Welsh speakers.

### WELSH Cymraeg

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### WELSH Cymraeg

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### WELSH PRONUNCIATION KEY:

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### AFRICAN (ROMANIZED) CHARACTER SETS:

36. **AFRIKAANS**—Also see Dutch

Afrikaans is a Germanic language derived from Dutch with Malay and local African additions. Afrikaans has a base of Dutch brought to South Africa by Dutch colonists, blended with Malay and other local African languages. Afrikaans was spoken first by the Malay people on the Cape of Good Hope in the 17th century.

**SPOKEN BY:** 10 million as one of the 11 official languages of the Republic of South Africa.

**ACCENT ACCESS:** Strikes on the accent key will rotate a queue of 4 accent choices for AEIOUY. Since there are four choices, they can each have a dedicated accent key. Or use the sustained-hold pop-up or Sequential Shift/Option accent access.

### DUTCH, FLEMISH, AFRIKAANS

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### DUTCH, FLEMISH, AFRIKAANS

**Nederlands, Vlaams**

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37. **Swahili** - A Bantu African language

Swahili is a major language of the 1800 African languages and is one of the official languages of the African Union: along with Arabic, English, French and Portuguese. Swahili was written in Arabic in the 18th century, but is now customarily written with the Roman script.

**Spoken By:** Swahili is a Bantu family language spoken by about 5 million people as a first language in Tanzania, Burundi, Congo (Kinshasa) Kenya, Mayotte, Mozambique, Oman, Rwanda, Somalia, South Africa, Uganda, UAE and the USA. Swahili is an official language of Tanzania, Uganda and Kenya and is used as a lingua franca throughout East Africa as a second language to 30-60 million speakers.

**Accents:** G' Ng' Absent: Q U V X

However, the absent letters should be made available as many Swahili speakers also need the full Latin script.

**Accent Symbols:** I on the letter G as in ng'.

**Accent Access:** Sequential Shift/Opt feature

**Swahili** of Africa

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**Swahili** of Africa

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<td>X</td>
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**Swahili Pronunciation Key:**

- a e i o u o b c d dh f g h j k
- [a] [a] [a] [a] [a] [a] [a] [a] [a] [a]
- [i] [i] [i] [i] [i] [i] [i] [i] [i] [i]
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**Swahili Romanized Character Sets:**

38. **Azeri**

Azeri is a Turkic language spoken by 31 million people in two forms: North Azeri and South Azeri. **Spoken By:** 6 million in Azerbaijani, 23.5 million in Iran, 300,000 in Iraq, 285,000 in Georgia, 160,000 in Armenia, 530,000 in Turkey, 30,000 in Syria, 112,000 in Russia, and thousands in Afghanistan.

**Azeri is written in three scripts:** Arabic, Cyrillic and Latin. The Arabic script was adopted when Islam was introduced in the 7th century, but as a Turkic language and for political reasons the Arabic script was deemed ill suited. In 1939, Cyrillic was imposed for most of the 20th century under Soviet occupation. Several Roman character methods have been introduced in the theory that a Turkic language would work best in a Roman script, as is employed in Turkey. The Azerbaijan nation adopted new Latin alphabets successively. The Roman Azeri Oorpad incorporates the characters of the newest system, plus the letters still used by people under the older Latin regimes. A full Azeri Oorpad would include character-set options for Arabic, Cyrillic and Latin.

**Non-Roman Letters:** Э (schwa) Ƣ Б З Э

**Accents:** Ä Ö İ I Ü Ç Ĝ Ş Z

**Absent:** W (can be piggied under V)

**Accent Access:** One accent key or option shift

**Azeri 5×6**

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### Azeri

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<th>C, D əE</th>
<th>Eə</th>
<th>F G əQ</th>
<th>H X</th>
</tr>
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</table>

The Azeri order should be preserved. Schwa is the most commonly used letter in the current regime and can sit on a separate key and pigged on E. Absent letters are removed or pigged. W can be made available for those who need it under V. I can be pigged with B and CDE moved into the space if the corner needs to be utilized by an accent or option key or other letter or function. 5x5 and 6x5 is claimed.

### Indonesian

Indonesian is a Malay Austronesian language. Spoken by: 30 million people in Indonesia as a first language and a 140 million as a second language including 75 million native speakers of Javanese. Indonesian has three scripts. A unique native script, Arabic script after becoming the most populous Islamic nation in the world; and after Indonesia became a Dutch colony, the Latin script was also employed to write Indonesian.

**Accents:** Æ Ê Ë Ï

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<th>A““E““I..</th>
<th>O U</th>
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<td>E““F G H</td>
<td>B F J P V</td>
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<tr>
<td>L..</td>
<td>J K L M N</td>
<td>C G K Q W</td>
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<tr>
<td>O P Q R S T</td>
<td>D H L R X</td>
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<tr>
<td>U V W X Y Z</td>
<td>M S Y</td>
<td>N T Z</td>
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### Balinese

Balinese is an Austronesian language spoken by about 3 million people on the Indonesian island of Bali, the island of Lombok, and in Nusapenida, Java and Sulawesi. Balinese was first written in a curly Brahmi script. Religious texts date from the 11th century, that were copies of works written on palm leaves. Children learn both scripts, but favor Latin.

**Balinese**

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<td>I J K L M N</td>
<td>C G K Q W</td>
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<td>O P Q R S T</td>
<td>D H L R X</td>
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<td>U V W X Y Z</td>
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### Malay

Malay is an Austronesian language spoken by 18 million in Malaysia, Indonesia, Singapore, Brunei and Thailand. When Islam arrived in the 14th century, the Arabic script was adapted to write Malay. By the 17th century the Dutch and British, replaced the Arabic script with the Latin alphabet. The oldest Malay writings are 7th century inscriptions found in Sumatra written in a Brahmi Indian Srivijaya script.

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<td>I J K L M N</td>
<td>C G K Q W</td>
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<td>O P Q R S T</td>
<td>D H L R X</td>
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<td>U V W X Y Z</td>
<td>M S Y</td>
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<td>N T Z</td>
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42. **CHINESE PINYIN (拼音)**
(see Chinese for more detailed information)
**SPOKEN BY:** 1 billion Chinese speakers. Pinyin is not a spoken language, but is the official phonetic written form of Mandarin Chinese instituted by Mao Tse Tung in mainland the People's Republic of China. Mandarin is the main spoken Chinese language of PRC and Taiwan with over 600 million speakers. There is also a Cantonese system of Pinyin called Penyrcamp. Cantonese is a Chinese language in southern China and Hong Kong. Mandarin and Cantonese is unintelligible one to the other. However, written Chinese characters and can be written and read by both groups of speakers. While Pinyin letters can write a phonetic form of both Mandarin and Cantonese Chinese.

**ACCENTS:** 26 accents distributed across the 5 vowels
\[
\begin{array}{cccccc}
\text{ā} & \text{á} & \text{ē} & \text{é} & \text{ī} & \text{í} \\
\text{ō} & \text{ó} & \text{ū} & \text{ǔ} & \text{ū} & \text{ǔ} \\
\end{array}
\]

**PINYIN:** is used as a principle Chinese computer input system in the People's Republic of China. Users type the Mandarin or Cantonese word using Pinyin letters and then software translates the Pinyin into Chinese ideographic characters.

**CHINESE PINYIN 拼音 5x6**

\[
\begin{array}{cccccc}
A & E & I & O & U \\
B & F & J & P & V \\
C & G & K & Q & W \\
D & H & L & R & X \\
M & S & Y & N & T \\
\end{array}
\]

**CHINESE PINYIN 拼音 6x5**

\[
\begin{array}{cccccc}
A & B & C & D \\
E & F & G & H \\
I & J & K & L & M \\
O & P & Q & R & S \\
U & V & W & X & Y \\
\end{array}
\]

43. **ROMAJI** (see Japanese section)

The unaccented Roman alphabet serves as the Roman phonetic alphabet for Romaji to write Western words, as one of the four official Japanese scripts; along with their native scripts of Hiragana and Katakana Japanese, plus Kanji with 2500 Chinese characters.

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<td>B F J P V</td>
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<td>C G K Q W</td>
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<tr>
<td>O P Q R S T</td>
<td>D H L R X</td>
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<tr>
<td>U V W X Y Z</td>
<td>M S Y N T Z</td>
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44. **TAGALOG Filipino**

Tagalog (Filipino) is an Austronesian language of the Philippines, with a unique ancestral character set, but is commonly written using the Roman set.

**ACCENTS:** N~ EXTRA: NG

**TAGALOG Filipino**

\[
\begin{array}{cccccc}
A & E & I & O & U \\
B & F & J & P & V \\
C & G & K & Q & W \\
D & H & L & R & X \\
M & S & Y & N & T \\
\text{~Ng} & T & Z &   \\
\end{array}
\]

\[
\begin{array}{cccccc}
A & B & C & D \\
E & F & G & H \\
I & J & K & L & M & \text{~Ng} \\
O & P & Q & R & S & T \\
U & V & W & X & Y & Z \\
\end{array}
\]
45. **TURKISH** Türkçe

**SPOKEN BY:** 50 million speakers in Turkey and Northern Cyprus. It is a non-European language by a non-European people, but who use a European script.

**ACCENTS:** ş, ö, ü, ç, ğ, ss,

**ABSENT:** Q X W

**ACCENT SYMBOLS:** 4 (cedilla-wedge-umlaut) on ı ou + c g s

**ACCENT ACCESS:** An accent key or Sequential Shift/Option feature

**TURKISH Türkçe**

A E İ O.. U..
B F J P V
C, G' K Q W
D H L R X
M S, Y
N T Z

46. **VIETNAMESE** - Tiếng Việt

**SPOKEN BY:** 55 million people in Vietnam and a small population in the USA

**ACCENTS:** Ă Ą Ą D Đ Ė Ė Ô O O’ UU’

**ACCENT SYMBOLS:** dip-circumflex-eth-

**ABSENT:** F J W Z

**VIETNAMESE** is an Austro-Asiatic language originally written with a version of Chinese script known as Chu-nam or Nom until the 20th century. Today only quoc ngu a Latin orthography is used.

**ACCENT ACCESS:** An accent key or Sequential Shift/Option feature

**VIETNAMESE Tiếng Việt**

A E I O’ U’
B F J P V
C G K Q W
-D H L R X
M S Y
N T Z

**VIETNAMESE Tiếng Việt**

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

**TURKISH PRONUNCIATION KEY:** Letters require accents for readers to understand written Turkish:

Aa Bb Çç Dð E Ý Ff Gg Iı Jj Kk Ll Mı Nı Oo Ù Ù Uu Vv Ww Xx Yy Zz

**VIETNAMESE PRONUNCIATION KEY:** Accents are required to understand written Vietnamese:

Note: Çç a variant letter which makes sounds before i long
48. **NAVAHO - NAVAJO Diné bizaad**

Navaho is an Athabaskan language spoken by about 150,000 people in the American southwest. Navaho speakers served as code communicators in WWII. The full Latin letter-set should be available as Navaho live in the USA where English is needed.

**ACCENTS:** ÁÁÁ ÁÉÉ ÍÍÍ ÓÓÓ ÒÒ Ò

**ABSENT:** F P Q R V X Y Z

**NAVAHO Diné bizaad**

A', E', I', O', U
B F J P V
C G K Q W
D H /L R X
M S Y
N' T Z

**NAVAHO Diné bizaad**

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


49. **MORSE CODE** is the International telegraphic system, still in possible use today. In addition to tapping actual dots and dashes, any OrrPad can be typed normally, yet transmit dots and dashes. (S-O-S is three dots and 3 dashes)

**6x5**

<table>
<thead>
<tr>
<th>6x5</th>
<th>5x6</th>
</tr>
</thead>
<tbody>
<tr>
<td>A B C D</td>
<td>A E I O U</td>
</tr>
<tr>
<td>E F G H</td>
<td>B F J P V</td>
</tr>
<tr>
<td>I J K L M N</td>
<td>C G K Q W</td>
</tr>
<tr>
<td>O P Q R S T</td>
<td>D H L R X</td>
</tr>
<tr>
<td>U V W X Y Z</td>
<td>M S Y</td>
</tr>
<tr>
<td>N T Z</td>
<td></td>
</tr>
</tbody>
</table>
**OrrPad Accent Access** can be used on any other layout, including the OrrPad Roman focus fields below and other in the section on Focus Fields in this patent, plus other OrrPad layouts herein, and other platforms, such as Qwerty, Azerty, Dextr, Frog Pad, ABC grids, etc.

Roman OrrPad Focus Fields:

<table>
<thead>
<tr>
<th>5x6</th>
<th>6x5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>J</td>
<td>J</td>
</tr>
<tr>
<td>K</td>
<td>K</td>
</tr>
<tr>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Q</td>
<td>Q</td>
</tr>
<tr>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>U</td>
<td>U</td>
</tr>
<tr>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Z</td>
<td>Z</td>
</tr>
</tbody>
</table>

A Qwerty Accent OrrPad is the Qwerty layout with an accent access feature of OrrPad. OrrPad Accent Access features may be placed on any other platform, and is so claimed.

1 2 3 4 5 6 7 8 9 0

Q: W; E; R; T; Y; U; O; P

A: S; D; F; G; H; J; K; L

Z: X; C; V; B; N; M

Qwerty is not quite an international standard for Roman script. For example, the Azerty layout for the Dutch language is used in Belgium, while Qwerty, not Azerty, is used in Holland for the Dutch language, just a step across the border. Plus, accent access is inconsistent on the 10x3. OrrPad offers one standard to serve all language variants to enable an international standard applicable to one or two hand system.

Note: OrrPads can be set to allow any accent to be placed on any letter. Sometimes this means too many options are available users never use.

1. Fully accented Roman OrrPad

<table>
<thead>
<tr>
<th>A</th>
<th>E</th>
<th>I</th>
<th>O</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>F</td>
<td>J</td>
<td>P</td>
<td>V</td>
</tr>
<tr>
<td>C</td>
<td>G</td>
<td>H</td>
<td>I</td>
<td>K</td>
</tr>
<tr>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
</tr>
<tr>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
<td>Q</td>
</tr>
<tr>
<td>R</td>
<td>S</td>
<td>T</td>
<td>U</td>
<td>V</td>
</tr>
<tr>
<td>W</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td></td>
</tr>
</tbody>
</table>

2. Roman 5x6 Accents & Punctuated 2nd Row

<table>
<thead>
<tr>
<th>&quot;A&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;I&quot;</th>
<th>RD</th>
<th>&quot;O&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>F</td>
<td>J</td>
<td>P</td>
<td>V</td>
</tr>
<tr>
<td>C</td>
<td>G</td>
<td>H</td>
<td>I</td>
<td>K</td>
</tr>
<tr>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
</tr>
<tr>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
<td>Q</td>
</tr>
<tr>
<td>R</td>
<td>S</td>
<td>T</td>
<td>U</td>
<td>V</td>
</tr>
<tr>
<td>W</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td></td>
</tr>
</tbody>
</table>

3. Roman 6x5 “ABCD-AEIOU Cross”

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
</tr>
<tr>
<td>I</td>
<td>J</td>
<td>K</td>
<td>L</td>
</tr>
<tr>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
</tr>
<tr>
<td>Q</td>
<td>R</td>
<td>S</td>
<td>T</td>
</tr>
<tr>
<td>U</td>
<td>V</td>
<td>W</td>
<td>X</td>
</tr>
</tbody>
</table>

CON: The 6x5 is wider with 6 keys across. The 6x5 does not have finger assignments with a vertical mnemonic. All vowels are in one column and its free 2nd column (rather than row) for pigged special letters or punctuation possibly burdening the index. No four “free” keys in the corner for thumb toggles.

PRO: Finger load is mostly on upper four rows.
OTHER ACCENTED ORRPAD FOCUS FIELDS

(4ab) **ALL ACCENT ABC 5x6-6x5 SQUARE**. The ABC Square 5x6-6x5 is claimed by OrrPad in both horizontal or vertical alphabetical order. The ABC layout has Z row or column can host option keys dedicated to functions or punctuation. The ABC Square claims the repositioning on the letter Z to the right to free the lower left four keys may be used, as a function keys accent or punctuation.

(4a) **ALL ACCENT ABC 5x6 SQUARE, DROP Z**

```
-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
```

(4b) **ALL ACCENT ABC 6x5 SQUARE, HIGH Z**

```
-A- F |K P |U- Z-
B |G- /L- Q V 
|C- H |M R- W-
-D- I- N- S- X Op 1
-E- J -O- T Y Op 2
```

**PRO:** (a) It is a preferred embodiment option when users want the familiarity of ABC in an array without the four “free” keys in a corner. (b) The ABC Square 5x6 dedicates most keys of the 6th row to function or punctuation, while the 6x5 dedicates the 6th column to upper free keys for punctuation, and lower keys possibly to functions. (c) On the 6x5, the letters most used are in a tiny 4x5 grid under one hand in vertical alphabetical order.

**CON:** (a) This 5x5-6x5 does not have a clever mnemonic like the AEIOU cross. (b) A possible disadvantage of the ABC horizontal arrangement is the letter “E” with I and O are in the far upper right corner on a pad in horizontal alphabetical order, which is the least accessible as the pinkie finger is short. (The ring finger would be used). Yet, the letter “E” is the most used letter in the alphabet. The vertical is a better layout from that perspective, as “E” in the far lower left corner on a pad in vertical alphabetical order, with I and O distributed across the index and middle fingers.

(5) **ALL ACCENT ABC 5x6 SQUARE, LEFT Z**

```
-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
```

**PRO:** (a) Claimed in this keypad is the layout in 5x6-6x5, and the accent and punctuation system. (b) Claimed is the use of the extra keys on the bottom row as shift, option, function, accent, or punctuation keys.

**CON:** The Z is in the critical position for the thumb. The thumb is too valuable a digit to dedicate to the letter Z which is used in the English language only .1% of the time. The natural position for the thumb is precisely where the Z is placed on this pad. OrrPad suggests the AEIOU cross navigation pad or the repositioning of the letter Z to the right (or piggybacking any letter) to free the all-important lower left for thumb use.

(6) **ROMAN ALL ACCENT ABC 5x5 GRID** (PIGGY Z) and other horizontal ABC piggy variations. Z use is less than 1% of all strikes.

```
-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-
```

**PRO:** (a) The 5x5 piggy pad would be good as a Roman alternate when users want the familiarity of ABC and a smaller 5x5 keypad is desired. (b) The ABC piggy allows a full 6th row to be
dedicated to function, or punctuation. (c) It can easily be un-piggied by placing Z on the 6th row.
(d) Claimed is the layout plus use of 6 keys on the 6th (bottom) row for functions.

CON: (a) A disadvantage of this arrangement is the letter "E" is in the far upper right corner,
which is the least accessible. Yet, "E" is the most used letter in the alphabet. (b) The ABC
horizontal loses the mnemonic advantage of vertical alphabetical order for finger
assignments. (d) This horizontal ABC does not allow a dedicated piggy special letter 2nd row or
column like an AEIOU cross pad. (e) The 5x5
does not work as well accommodating language
character sets as a 5x6 or 6x5, which offers
more keys to accommodate other scripts.

(7) ACCENTED ROMAN ORRPAD WITH
PIGGIES: is suitable for those languages absent
letters of the Roman alphabet, such as Welsh
etc. This 5x5 has three piggies on the 2nd row.

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

Opt 1

Opt 2

Opt 3
```

(a) Imperfect AEIOU cross. (b) Not as
mnemonic, but affords a comfortable reach.

(9) HORIZONTAL ROMAN ALL ACCENT ABC
4X7 GRID: PRO: Vowels are almost grouped.
YZ on the right allows thumb toggling. YZ on
the left allows better access to Y.

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

Opt 1

Opt 2

Opt 3
```

Alternate: \(Y\) \(Z\)

CON: Too tall

(10) ANY and/or FANCIFUL: Any use of the
benefits of the OrRPad platform system is
claimed on any layout whatsoever. Plus, to avoid
adoption of suboptimal layouts, any 5x6-6x5
layout is claimed to benefit from the OrRPad
platform. To avoid suboptimal layouts, even
FANCIFUL variations of an AEIOU is claimed
such as:

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

Opt 1

Opt 2

Opt 3
```

Other scripts such as Cyrillic that also have
accents are claimed using OrRPad accent logic.
MASTER LIST OF ACCENTS OF THE ROMAN SCRIPT
At least 14 accent diaeresic marks modify 5 vowels and 12 consonants in Roman alphabet languages:

VOWELS:  A  E  I  O  U
1- ACUTE:  {'} Ą  Ė  ļ  Ő  Ū
2- GRAVE:  {'} Ă  Ė  ļ  Ő  Ū
3- CIRCUMFLEX:  {'} Ą  Ė  ļ  Ő  Ū
4- UMLAUT:  {'} Ą  Ė  ļ  Ő  Ū
5- BOLLE:  {'} Ă  Ė  ļ  Ő  Ū
6- SLASH:  (/)  Ø
7- TILDE:  {'} Ą  Ė  ļ  Ő  Ū
8- HOOK:  (.) Ą  Ė  ļ  Ő  Ū
9- DOT:  (·) Ą  Ė  ļ  Ő  Ū
10- BAR:  (-) Ą  Ė  ļ  Ő  Ū
11- CEDILLA:  (ç) Ą  Ė  ļ  Ő  Ū
12- WEDGE:  (•) Ą  Ė  ļ  Ő  Ū
13- DBLACUTE:  {'} Ą  Ė  ļ  Ő  Ū
14- DIP:  {'} Ą  Ė  ļ  Ő  Ū

LIGATURE:  Ć  Ė  Ĺ  Ŀ  Ő

CONSONANTS:  C  D  H  J  G  K  L  N  P  R  S  T  W  Y  Z
1-ACT:  {'} Č  Ğ  Ł  Ć  Ń  Ś  Ż
2-GR:  {'} Č  Ğ  Ł  Ć  Ń  Ś  Ż
3-C:  {'} Č  Ė  ļ  Ő  Ū
4-UM:  {'} Ć  Ė  ļ  Ő  Ū
5-BO:  {'} Ć  Ė  ļ  Ő  Ū
6-SL:  (/)  Ł
7-TL:  {'} Ć  Ė  ļ  Ő  Ū
8-HK:  (·) Ć  Ė  ļ  Ő  Ū
9-DT:  (·) Ć  Ė  ļ  Ő  Ū
10-BA:  (-) Ć  Ė  ļ  Ő  Ū
11-CE:  (ç) Ć  Ė  ļ  Ő  Ū
12-WD:  (•) Ć  Ė  ļ  Ő  Ū
13-DB:  {'} Ć  Ė  ļ  Ő  Ū
14-DR:  {'} Ć  Ė  ļ  Ő  Ū

REGIONAL ACCENT GROUPS FOR ROMAN SCRIPT
Latin Europe: (6)
North Europe: (3) Umlaut: Bolle: Slash: Thorn:
Slavic Europe: (5)
Hook: Wedge: Dot: Double: Acute: Dip:

Accents may be organized for access according to placement location such as upper-
lower or vowel-consonant, etc., morphology (shape), frequency of use, other custom, or
according to the linguistic divisions of Latin, Germanic or Slavic, etc.
CLAIM: OrrPad claims a dedicated accent key struck after a target letter, to produce a rotation of a queue of options on the application in use, (or popup), or claiming a new use of holding down the option key to reveal accents. Access is by striking the number of times needed, after, or while depressing a letter.

A Dedicated Accent Opt Key of one or more of the four empty keys in the lower left hand corner of the layout, or another key. The user may then accent any letter simply by striking the Accent Option key after striking the target letter. For example, Albanian only has one accent for each of four letters A, E, C or K. If any of these letters is struck, followed by the accent opt key, the accent for the target letter would appear. If there are multiple accents for a letter, the accent key may be struck until the correct accent appears, as variants rotate through a queue cycle. If the target or accent key is held down, all accent choices are exposed for that letter. Adding accents after the target is the fastest most natural way to input accents, and is especially useful for those languages that have much accenting such as French, Dutch, Hungarian, Italian or Pinyin. The four "free" keys in the lower left corner of the layout can easily be dedicated to individual accents, punctuation or thumb keys. If there are a great number of accents, they may be divided morphologically across more accent opt keys. For example: by shape, or upper versus lower accents, or other means of division, etc. However, most languages only have one or two accents per letter, which means the four free keys do not have to be fully dedicated to accents. Another method of accent access such as Sequential Shift or Sequential Option, described below.

Striking an accent key after the letter is faster and more natural, akin to handwriting, rather than holding down the letter to manually conjure and then select from a menu of choices, especially for people who must type accents all day in their language. However, an onscreen menu method may also be made available to access accents on an OrrPad, especially to access accents not in the default language of the user's device.

CLAIM: (2) Sequential Shift or Sequential Option: To reduce the number of keys on a keyboard, and permit one-thumb typing on a small keyboard, the common shift key must be made to be sequential, not simultaneous. This allow the shift to be struck in sequence to access a capital letter rather than struck simultaneously. Secondly, if this is the case, the shift or option key may also be utilized to add accents and special letters, especially if they are set in the Orr claimed Sequential Shift mode; whereby the shift key is set to work in sequence to achieve a change of case. Instead of depressing a shift or option simultaneously with another key to achieve change in case or an option, striking the shift should be in sequence without holding both keys simultaneously.

Additionally, accents may be found, if the shift or option key is held down for a critical time duration, the accent or special character options would appear as a queue for the previously typed letter, and be shown rotating through a queue if there are multiple options for that letter, until the desired variant appears. In order to achieve one-handed operation, the user may depress until releasing when the auto-queue presents the correct variant. Alternatively, the user may hold the shift or option key down to launch the queue, and then begin to strike the shift or option key as needed to rotate through the option queue one by one. Since most languages only have one or two accents for a given letter, users would usually only need to double-click to find an accent after the queue is launched. In exceptional cases, four accents exist for letters. In the post-mechanical typewriter era, there is no reason to hold down the shift key simultaneously to achieve a change of case. Change of case can be done in sequence today since there is no need to physically raise the typing cartridge manually as was necessary with the mechanical typewriter. If Sequential Shift is adopted, then holding down the shift or option key to queue through accent and special characters is possible. Accents or other special letters may also be queued with the target letter or punctuation option keys. For example, if the letter A is held down it will no longer type multiples of that letter, but instead will launch a menu queue, which the user may select; or after the queue is launched, the user may then begin
to rotate through the queue by striking the target letter, including the key-face variant until the correct choice is found. The letters may appear as a menu on the screen, or better yet, may appear on the document where the letter is being written, so the user can see what is being offered and stop the queue of accent options when the correct accent variant is in place on the document. On a touchscreen, a letter may be depressed, and held until the finger slides onto the accent with one-hand. If using a Qwerty keyboard for a laptop or desktop or tablet keyboard, the user may depress the desired key and then tap the option or shift key until the queue rotates on the document to the desired option, or the mouse may be used to select form a menu. If the OrrPad punctuation system is adopted, a key dedicated to special letters, may also provide a queue for the accents associated with the last letter depressed. Plus, accent access may be achieved by other methods, such as depressing for a menu. OrrPad accent methods can be adapted to Qwerty, or other layouts, and are so claimed.

ORR PAD ACCENT OR SYMBOL ACCESS METHOD: When the user strikes a letter followed after the letter as by the OrrPad Claimed DEDICATED ACCENT OPTION KEY, accent choices become available for the selected letter. With each successive click of the SEQUENTIAL SHIFT, or DEDICATED ACCENT OPTION KEY, a queue of choices is rotated until the needed accent is found by appearing preferably on the document, or in a menu.

If not by clicking multiple times: selection can be achieved by clicking with the mouse, scrolling until stopped, and or a highlighting method of selection from a list. The list of accents available may be the short list of those customarily placed on the selected letter to be accented, or any accent whatsoever in a fixed or custom order. Furthermore, the strike order may be programmed with the accent key preceding or following striking the letter to be accented.

Choices made available by the SEQUENTIAL SHIFT KEY or DEDICATED OPTION KEY is not limited to accents. It can offer any character, accent, punctuation mark etc, or mathematical functions in alphabetical order that one chooses to program on that letter. This is a more satisfying alternative to the current “Insert, Symbol, Select” method currently found on MS Word. SEQUENTIAL SHIFT KEY OR DEDICATED OPTION KEYS may be placed on any device: desktop, laptop computers, phones, etc using OrrPad layouts or Qwerty, Azerty or other keypads.

AN ACCENTED ROMAN ORRPAD CAN WRITE 80+ LANGUAGES WITH ACCENTS OR SPECIAL LETTERS:
MORPHOLOGICAL PUNCTUATION KEYS:

Claimed is the morphological organization of punctuation, which can be accessed by a system whereby marks are subdivided into morphological groupings to reduce the overall number of keys needed to access marks.

PUNCTUATION HOSTED BY NUMBERS may be matched to by morphological shape as much as is possible. For example: 1: 2, 3 $, 4 <, 5 >, 6 %, 7 #, 8 &. (is hosted on 9 and O hosts the right ).

If ONE key is provided, it opens a full panel with all choices organized according to morphology and frequency of use.

Or, if two keys available:

1. DOT. 2. COMMA.

Suggested morphological divisions for FOUR keys:

1. DOT. 2. COMMA. 3. SYMBOL. 4. DASH.

If there is only space for FIVE or SIX keys, frequency of use trumps morphology. However, morphology should be observed when possible:

1. DOT. 2. COMMA. 3. DASH. 4. SYMBOL and 5-6.

SLASH and/or QUESTION MARK. For example: DOT hosts colon, comma and semicolon, DASH hosts underscore, SYMBOL hosts asterisk.

Suggested morphological divisions of SEVEN or EIGHT keys would allow choosing according to frequency of use, which is not morphological, and following morphology where possible after considering frequency of use.

1. 1. DOT 2. COMMA. 3. DASH. 4. SYMBOL. 5. SLASH.

Any derivation of morphological punctuation division is claimed.

The minimum of two marks is hosted by each shape, which are located preferably on adjacent keys, with the total expected number of punctuation marks ranging from 16 - 60 to be determined by manufacturer or users.

1. The DOT KEY can host those punctuation marks that contain dot shapes, such as: period, colon, semicolon, exclamation mark, asterisk and bullet; as well as curved shapes that also feature a dot shape such as the question mark, which can also be queued on the CURVE key, as an example how, depending on the number of marks needed and key-faces available, that there is flexibility to the system.

2. The COMMA KEY or CURVED KEY can host those punctuation marks that possess a curved shape, such as: comma, semi-colon, apostrophe, quotation marks and left and right parentheses; as well as those punctuation marks which have both a curved shape and other morphology such as the question mark which possesses a curve in addition to its dot shape.

3. LINE SHAPES represented by the DASH KEY can host those punctuation marks which are composed of straight lines, such as the principally horizontal line marks of: dash, underscore and equal signs.

Subdivisions of LINE SHAPES can be organized as: horizontal lines, vertical lines, right slanted lines and left slanted lines.

4. SYMBOL. Symbols are represented on the face-key by the @ sign, since it is now used so frequently. And queued under the @ sign we would find other symbols such as: $, #, %, & etc.

Four Punctuation Keys on a MousekeyPad:

SYMBOL, COMMA, DOT, DASH (or $ SLASH)

5. SLASH. If there is no room for a dedicated vertical line key then the dash key may also host the marks with vertical lines such as: the plus sign, square brackets, and vertical line. The straight line family of marks containing a slanted diagonal line can be found on the dash key or on its own key dedicated to diagonal lines hosted by the SLASH KEY and include the right facing diagonal line marks of: the right slash, hashed pound mark, as well as the left facing diagonal line marks such as: the check mark, left slash, left or right arrow, greater than or equal to signs; or other mark containing a diagonal line can be place logically in this queue. Most of these marks are rarely used; so, in a pinch for space, if there is only an allotment for one key hosting LINEAR punctuation marks then the DASH KEY could host the horizontal, the vertical and the slanted line marks. If there is room for an extra key then there can be a dedicated SLASH KEY containing the slanted line punctuation and or a VERTICAL KEY hosting the vertical line marks.

TAP ACCESS: The most used punctuation marks can be accessed with one to three taps, which feels rather like double-clicking, and it is not annoying. However, people do still need occasional access to a greater range of lesser-used marks. Additionally, it is claimed that the lesser-used families of marks can be accessed via shift or alt keys to shorten the length of the rotating queue. For example, if there is only space for one DASH KEY for all line marks, the user could either tap through the queue of horizontal marks to eventually access the vertical marks later in the queue.
or the user could strike the shift (option, function or alt key or other key chosen to be so programmed) to skip the horizontal line marks and jump into the middle of the queue where the morphology changes to vertical lines and thereby lessen the time taken to tap through the queue.

Numbers may be piggied on punctuation keys (perhaps on very tight keyboards) as punctuation is more commonly used than numbers. A claim is made for punctuation as a first strike and numbers accessed via shift or opt keys. Qwerty features numbers as first strike characters, I claim the alternative where punctuation is the primary strike with numbers piggied and accessed by striking a shift, option or alt key. Alternatively, I claim the numbers be accessed not by the shift key but by an alt or option or dedicated number access key when numbers are secondary strike characters piggied on other keys.

I claim access to punctuation variants on a given key the method of the user striking the key through the queued marks until the desired punctuation choice appears on the user's text. The user thus need not look at the keys to hunt and peek for the desired mark, but rather the user could simply remember a few morphological shapes such as dot, dash, slash and curve or other shape and then tap that key until the desired variant appeared in the user's text.

The user could keep eyes on the screen, not on the keyboard; and by selecting and tapping the shape closest to the desired mark the user may locate any punctuation mark desired. The typist can see the morphological variants in the actual text rotate and stop tapping when the desired mark appears.

Should the user type too quickly and skip over the desired mark, the user may use the delete button to backspace to the desired mark or the user may continue to tap through the rotating queue of choices on that key until the desired mark reappears again. If the user needs multiple of any one mark such as three dots to create an ellipse, the user need only hold the key down to get multiple strikes of one mark. If the user needs multiple strikes of a mark deeper in the queue, for example in the third position; the user merely taps three times and holds the key down on the third tap to achieve multiple strikes of the third position mark. Morphological Punctuation queue keys can be on a dedicated punctuation row or column or mixed anywhere the manufacturer or user chooses punctuation to be found.

I also claim below the dedicated B, F, J, P, V punctuation row; or other row, column or block.

---

**ORR PAD 'B ROW' PUNCTUATION ROW:**

The most important punctuation ideally has dedicated keys, such as described by the Morphological Punctuation scheme or other method. Instead of assigning the rarely used characters such as J/ΔπV accessed via option key on the B Row (or column in a horizontal AEIOU cross) the B Row can carry many more useful characters. Since the number of special marks is quite large, the "B" Row can assume the burden of a selection of rarely used punctuation and symbols; however, it can bear any and all punctuation if needed.

The B row begins with the letter B on the AEIOU cross OrrPad with a task of shouldering the B rated marks and symbols.

Since the accents in Roman alphabet languages do not fall on the letters: B, F, J, P, V it is possible to assign that row to punctuation with use of accent or option keys. Additionally, the letters K, M, Q and X do not have accents in Roman languages. The OrrPad design can allow users to memorize the fact that most punctuation options can be located on the second row under all of the vowels. It is to be noted that it is already the habit of users of qwerty to strike the shift key to access most punctuation options on number keys. Rare exceptions may be accommodated as in the Greek pi symbol Π or the Icelandic -P option as well as % hosted on the letter P. Punctuation may also be found, as is custom on dedicated keys, on numerals and as select options.

The 'free' four-corner keys can handle punctuation or punctuation may be dropped to the function keys on lower rows if the pad allows space for more rows.

See in first pad, that the OrrPad with All Roman Accents leaves the 'B' row free for other work, while in the next pad, the B row, other keys are populated with all marks of the standard Qwerty:
PUNCTUATION 'B' ROW:

<table>
<thead>
<tr>
<th>Symbols</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>@</td>
<td>A</td>
</tr>
<tr>
<td>B*</td>
<td>&amp; =</td>
</tr>
<tr>
<td>C</td>
<td>G</td>
</tr>
<tr>
<td>D*S</td>
<td>-H</td>
</tr>
<tr>
<td>M</td>
<td>S</td>
</tr>
</tbody>
</table>

By making greater use of the "B" Row for punctuation users do not need to rely on number shifts for punctuation can be reserved numbers for numerical, phone and calculator use. The most commonly used punctuation such as period (.), comma, apostrophe, slash, dash and question mark are ideally on dedicated keys. The row below or above the letters may be so assigned or the four corner keys and the option keys then would be assigned below the four left-corner keys. In principle any punctuation can be assigned to any letter, such as a vertical bar hosted on the letter "i".

Mnemonics should be used if possible, such as J hosting the "jacket" brackets /{(J)}/. B can host ball shapes: "B* F. F can host flat entities like -F = P can host plus, percentage, poundsign, pi and other mathematical shapes starting with the letter: P: = P% #. While V can host: √<Y>^ which are all shaped like V. Brackets could be assigned to the letter "b" using the ORR PAD ALPHABETICAL HOST LOGIC versus Morphological logic, or the exclamation mark on "c". Or 'b' for ball shapes like bullets or brackets and "a" can alpha-logically host @. Alternatively, using the Orr Pad alpha neighbor rule, @ may be found just below "a" to also adhere to the 2nd row punctuation default rule. The # sign can be found on "p" or, as is custom, found with the phone number keys. All of the usual punctuation found clustered under the Qwerty keys can remain the same, but a better keypad would employ OrrPad mnemonics for an improved new use version. A claim is made for the assignment of punctuation to letters to the 2nd row (or 2nd column in a horizontal AEIOU cross OrrPad) and for assigning punctuation according to alphabetical order and shape, and letters not customary to other pads such as Qwerty. Additionally, punctuation may still be found on the numbers as in qwerty, etc. However, making use of the Orr Pad 2nd Row Punctuation innovation allows ample room for many punctuation options. The 2nd Row, with 5 keys, and one option key, can scroll a few options per key in a queue, to accommodate secondary lesser-used punctuation not on a keyface of its own. In fact, if pinched for space, even just one ORR PAD SEQUENTIAL STRIKE OPTION KEY can control the striking of all accents and any clustered punctuation.

The difference between an Orr Pad sequential strike shift or option key and the simultaneous strike shift and option keys of current pads is that they are generally employed in a manner whereby shift keys and selected keys are struck simultaneously allowing for only one alternative choice. However, with an Orr Pad sequential strike option key, one may click the option key numerous times until the desired choice is selected. The cluster host may be struck first followed by the Orr Pad sequential strike option key or vice versa, whereby the Orr Pad sequential strike option key is struck followed by the cluster host. The punctuation options may be displayed on the host keys or shown on the LCD, or other screen.

MATHEMATICAL FUNCTIONS can be found using Orr Pad host clustering. For example sine or square root is to be found clustered with the letter "S", etc. Math function option key(s) may be dedicated or any Orr Pad sequential option key used for accents or punctuation will allow access to mathematical functions. Alternatively, a display scroll method may be the tool to select mathematical functions.

Roman Punctuation examples, but not limited to:

<table>
<thead>
<tr>
<th>Symbols</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>@</td>
<td>*</td>
</tr>
<tr>
<td>$</td>
<td>€</td>
</tr>
</tbody>
</table>

Punctuation may remain on numerals as customary. Example below. However, Orr Pad suggests a preference be given to leave the numeral keys free of punctuation to allow them to be occupied with phone and calculator tasks exclusively, if possible.

<table>
<thead>
<tr>
<th>Symbols</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2@</td>
</tr>
</tbody>
</table>

Punctuation
OrrPad

Punctuation - Scientific Calculator

ORR PAD SCIENTIFIC CALCULATOR: The Orr calculator can have any of the options of a business or scientific calculator; but unlike other calculators, the Orr calculator features the following aids; all of which are helpful to the disabled in locating keys, as an underlying system of logic is given.

16.1 Alphabetical Function Location- Functions are listed as logically as possible with the first way being to look under the letter heading of the function according to alphabetical order. The name of the function can be matched to the letter of the key face. This feature makes it substantially easier to find functions. For example, "exponent" is found under the letter key E. "Cosine" is found under C. "Radians" is found under R. "Tangent" under T and so forth. Any function or symbol needed on a calculator can be organized in the Orr alpha-proximate locator system.

16.1.1 Piggybacking of Functions- If and when the target alphabetical order key already has an occupant function, secondary and additional functions under that same letter may be piggybacked and found with shift or option keys. Symbols for functions found by using shift and option keys may be shown on the face of the keys in the corner or may just be seen after striking the shift or option key.

16.1.2 Proximal Alphabetical Location of Functions- In addition to, or alternatively; functions may be located on adjacent keys laterally or diagonally in keeping with an approximate alphabetical order; so that functions are clustered adjacent in the environs of the alphabetical target. In the example below, D is already occupied by "decimal"; so an additional function, "degree", was located diagonally adjacent under G. This way, users can find most functions by looking for them alphabetically and then shifting or looking on adjacent keys.

16.1.3 Shape & Concept Location of Functions- In addition to looking in alphabetical order, including an alpha-proximate adjacent key search, and option or shift keys; the next locator mnemonics are ideas, shape or sound, etc. For example, letters O and U; which have been given in other arenas as symbols of universality may be used for more "universal" general functions such as + and sci. An example of a shape mnemonic is as follows: Q bears a visual resemblance to Θ and % are thus located clustered with Q.

16.2. Scientific & Business Functions given here are examples of how to apply the Orr method of combining an alphanumeric keypad with a calculator and the Orr method of function location. However, functions are not just restricted to the functions given in these examples. Any other function is claimed when employing the On method. Other functions deemed necessary by a user or manufacturer may be incorporated into a keypad by the Orr method.

16.2.2. Orr Calculator Specialized Layers may be changed with an option key; in the same way we change language character sets in order to access the specialized calculators such as: everyman calculator, tax, stock-market, loan, investment, actuary or other business calculators, a real estate calculator, engineering calculator, a graphing calculator, astronomical calculator, etc. Additional functions may be substituted, custom-programmed, or added by shifting and/or adding another change of character/function layer.

16.3 The Alphanumeric Typing Calculator. The idea of placing a scientific or business calculator on top on an alphanumeric keypad also provides for a keypad with which to type text. The Orr Scientific Calculator can type text of any usual purpose, and for accounting may type text headings, to identify a list of accounted items or more fully describe a mathematical problem.

16.3.1 Word Problems- The Orr Pad also enables the technology to read, write, understand and solve word problems, such as "What is 5% of 100?" just by typing in the text of the question, or with voice recognition, asking the question verbally. The Orr alphanumeric keypad claims these features. Can be compatible with existing word problem software such as Math Cad.
16.4 Languages: As English, Roman and Greek Letters are the current standards in the scientific community, the keypad complies with that standard. The Orr methods may also be adapted to other languages and are similarly so clamed. Any language keypad can be made to have an Orr scientific calculator and may be applied to other language keypads.

16.5 The Calculator Option: The Orr Scientific Calculator may be an option for any keypad. Selected by option keys or menus, similar to changing a language. Additionally, a computer can have a pop-up on-screen Orr calculator window that may be clicked on and off as needed.

16.6 Orr Calculator Examples: In these diagrams, markings seen as: “O” are placeholders for additional function keys

Example: 16.6.1
Average Exponent Inverse O±/- USci
Binary Fraction J Pi π V/√X
Cosine G Degree K Log Nat Q% W/1/X
Decimal Hyperbolic Log Radian X\(x^y\)
Modulo Sine YSD
NN! Tangent Z\(x^2\)

Example: 16.6.2
Orr Pad Scientific Calculator with Greek symbols:
\[\alpha = A_{\text{average}}, \beta = B_{\text{binary}}, \gamma = C_{\text{cosine}}, \delta = D_{\text{decimal}}, \epsilon = E_{\text{exponent}}, \zeta = Z_{\text{up}}, \eta = O_{\pm/-}, \theta = U_{\text{Sci}}, \pi = \pi, \nu = V/\sqrt{X}, \lambda = \log_{\text{rad}}, \xi = X^{(y)} \]

Example: 16.6.3 Orr Calculator on Standard QWERTY, AZERTY & ABC or other pads: The Orr calculator may be placed on any keypad. Examples: any ABC grid or the standard QWERTY are shown below. A claim is made if functions are indicated by the letter alphabetical order as a means of locating functions. Notice that degree is now located under J because it is adjacent diagonally to D in this specific layout in keeping with approximate order.

Example: 16.6.3a Math functions on QWERTY:
Q% W/1/X Exp Rad Tan Y-SD U-Sci Inv O±/- Pi π
Average Sine Dec Frac G Degree Hyp J K Log Nat Log
X\(x^2\) X\(x^y\) Y-SD C\(\cos\) V/√X B\(\sin\) NN! Mod

Example: 16.6.3b Scientific Calculator on an ABC Drop Z pad
Average B\(\text{binary}\) C\(\text{osine}\) D\(\text{ecimal}\) E\(\text{xponent}\)
Fraction G Hyperbolic J Inverse D\(\text{egree}\)
K Log Nat Log M\(\text{odulo}\) N\(\text{N!}\) O±/-
P\(\text{i}\) π Q% R\(\text{adian}\) S\(\text{ine}\) T\(\text{angent}\)
U-Sci V/√X W/1/X X\(x^y\) Y-SD Z\(x^2\)

Example: 16.6.4a Horizontal Orr Alpha-Numeric Scientific Calculator:
\[\text{Avg Exp Inv O±/- USci}\]
\[\text{Bin Frac J Pi π V/\sqrt{X} 7 8 9 ÷}\]
\[\text{Cos G Degree K LN Q% W/1/X 4 5 6 x}\]
\[\text{Dec Hyp Log Rad X\(x^y\) 1 2 3 -}\]
\[\text{O O Mod Sine YSD • 0 = +}\]
\[\text{O O NN! Tan Z\(x^2\)}\]

Example: 16.6.4b Vertical Orr Alpha-Numeric Scientific Calculator:
\[\text{Avg Exponent Inverse O±/- USci}\]
\[\text{Binary Fraction J Pi π V/√X}\]
\[\text{Cosine G Degree LN Q% W/1/X}\]
\[\text{Decimal Hyperbolic Log Rad X\(x^y\)}\]
\[\text{Mem R Mem C M\(\text{odulo}\) V/\text{Sine} Y\text{SD}}\]
\[\text{Mem + Mem + NN! Tan Z\(x^2\)}\]
\[\text{0 7 8 9 o}\]
\[\text{0 4 5 6 o}\]
\[\text{0 1 2 3 o}\]
\[\text{0 0 . = o}\]
MATHEMATICAL FUNCTIONS can be found using Orr Pad host clustering. For example, sine or square root is to be found clustered with the letter "S", etc. Math function option key(s) may be dedicated or any Orr Pad sequential option key used for accents or punctuation will allow access to mathematical functions. Alternatively, a display scroll method may be the tool to select mathematical functions.

Because Orr Pad introduces a common way to organize letters and functions, scientific symbols may be accessed as selectable text options found under each letter; accessed by the Sequential Shift, a Dedicated Accent or math function key. Additionally, when calculations are desired, one may access scientific functions in calculator mode and punctuation or accents when in text mode.

**SAMPLE TWO-HAND ALPHABETICAL SCIENTIFIC TYPING CALCULATORS**

<table>
<thead>
<tr>
<th>Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>O</td>
</tr>
<tr>
<td>0</td>
<td>O</td>
</tr>
<tr>
<td>0</td>
<td>O</td>
</tr>
<tr>
<td>0</td>
<td>O</td>
</tr>
<tr>
<td>Tab</td>
<td>Space-Bar</td>
</tr>
<tr>
<td>O</td>
<td>0</td>
</tr>
<tr>
<td>O</td>
<td>0</td>
</tr>
<tr>
<td>O</td>
<td>0</td>
</tr>
<tr>
<td>Mem-</td>
<td>Mem+</td>
</tr>
<tr>
<td>MemR</td>
<td>MemC</td>
</tr>
<tr>
<td>α</td>
<td>Average</td>
</tr>
<tr>
<td>^</td>
<td>Exponent</td>
</tr>
<tr>
<td>!</td>
<td>Inverse</td>
</tr>
<tr>
<td>O</td>
<td>/</td>
</tr>
<tr>
<td>/</td>
<td></td>
</tr>
<tr>
<td>?</td>
<td></td>
</tr>
</tbody>
</table>

7 8 9 \[ \div \]
4 5 6 \[ \times \]
1 2 3 \[ - \]
0 \[ = \]

\[ 7 8 9 \div \]
\[ 4 5 6 \times \]
\[ 1 2 3 - \]
\[ 0 = + \]

\[ 0 \div 7 8 9 \times \]
\[ 4 5 6 \times \]
\[ 1 2 3 - \]
\[ 0 = + \]

CE O ENTER SHIFT CTRL ALT 4 ARROW KEYS

---

**OrrPad Punctuation - Scientific Calculator**

**MATHEMATICAL FUNCTIONS** can be found using Orr Pad host clustering. For example, sine or square root is to be found clustered with the letter "S", etc. Math function option key(s) may be dedicated or any Orr Pad sequential option key used for accents or punctuation will allow access to mathematical functions. Alternatively, a display scroll method may be the tool to select mathematical functions.
CLAIMS

The new use of the 5x6-6x5 grid as the nucleus of a global keyboard platform and method, to solve the need of a one-hand keyboard as a general purpose writing tool, as an alternative or supplement to the current standard 10x3 grid global keyboard platform, which with its wide form-factor cannot offer best-mode one-hand use. There are a number of 5x6 or 6x5 layouts in the prior art but none could enjoy adoption by the computer industry absent a sufficiently developed system to prove the new form factor and its applicability to all languages.

The platform is comprised of the following classes of attributes below, from which combinations of elements of the attributes may be variably selected, and or its methods or teaching modules applied on a keyboard embodied for a given device, application, geo-linguistic market or purpose; as it is unlikely or only rarely that the entirety of all attributes of the global keyboard platform be embodied at once.

Global keyboard Platform Claim Summary:

I teach how to achieve a global keyboard platform with the 5x6-6x5 grid as host to replace or supplement the current 10x3 standard, which is also a global keyboard platform, because the proposed 5x6-6x5 platform offers improved one-hand use; not possible on the too-wide 10x3, and thus the proposed new platform offers the opportunity to invent new devices hampered by the 10x3.

The new platform must be the 5x6-6x5 nucleus, convert the major writing systems into a system of layout arrangements (ideally mnemonic), offer accent and punctuation access, and resolve the idiosyncrasies of specific languages as they are rolled out. Furthermore, it must offer function modifier keys chords to control a PC or other devices or applications, as needed; but not necessarily for all applications or devices, so it must be flexible. The prior art using a 5x6-6x5 grid does not show function keys sufficient to control a PC. Additionally, specific devices with this keyboard are claimed for that device, plus there are devices made possible by OrrPad. Plus, there are other OrrPad innovations, such as Morphological Punctuation, Sequential Shift, post letter Accent Access, specific device combinations, that are actually stand alone and are not required as part of the "platform" and need to be kept separate in the claims.

The platform claim is any 5x6-6x5 layout when combined with function keys sufficient to control a PC.

Attributes of a 5x6-6x5 global keyboard platform are:

A System of Layouts of the world's writing systems on the 5x6-6x5 grid sufficient to serve the majority of the world's population, including:

ROMAN, GREEK AND CYRILLIC:
A novel use of the AEIOU-consonant cross of the Roman (Latin) alphabet on a 5x6 grid, and a novel or new-use of the AEIOU-consonant cross on a 6x5 grid as the nucleus for a global keyboard platform.

Claimed are novel mnemonic layout arrangement with the cross position of consonants at the incident of vowels in alphabetical order. The AEIOU-consonant cross is claimed as a new-use of this technique to serve as a global keyboard platform for the writing systems of Roman (Latin), Greek, Cyrillic and their derivative languages, and so claimed. Some layouts may have piggybacked letters and or near alphabetical order. Also claimed is a calculator that offers Greek letters on a Roman layout to provide a writing tool as part of the calculator, and also organize mathematical functions alphabetically in Roman order, with Greek letters hosted on the Roman letters for scientific use.

CHINESE: of the Chinese OrrPad include a new-use of Chinese Canjie, Wubi, and Stroke methods by conversion to the 5x6-6x5 global keyboard platform.
JAPANESE: claims a new-use of the AEUIO Syllabic Order on the 5x6-6x5 global keyboard platform, syllabic system is converted in new and familiar ways to the 5x6-6x5 platform with options for smaller and expanded keyboards. Covered is Hiragana, Katakana and Romaji. (The 2500 Chinese character used in Japan is accessed using a Chinese OrrPad method.) The Japanese OrrPad offers expanded versions of their 5x6-6x5 embodiments in 5x8, 8x5 and 5x9, provided as a necessary part of the system, where the 5x6-6x5 organizational logic is the same, but users will require that the keyboard platform offer a layout version allowing more syllables to have their own dedicated key face, or as a two-handed version.

KOREAN: layouts are claimed by OrrPad using a technique of block positioning on a 5x5, 5x6 or 6x5 grid.

BRAHMl writing systems and their derivative scripts and languages are converted to compact mnemonic layouts claiming a new-use of the places of articulation to fit on a global keyboard platform.

The first inventive step of the Brahmi OrrPad method is to map the five places of articulation of the Brahmi consonants (1-Guttural, 2-Palatal, 3-Cerebral, 4-Dental, and 5-Labial) to five rows or columns in several mnemonic patterns, which is not possible on the 10x3 Qwerty platform. Each consonant shift is in familiar pairs. Primary vowels are laid according to a combination of order and morphology with variants of each shape accessed by construction with a diacritic shift and diacritic keys, which can also be morphologically organized.

The 5x5 diacritic 6th is a construction method which allows composition of characters by half letters and a diacritic 6th row or column, which may be placed furthest or adjacent to vowels.

The Brahmi OrrPad must offer expanded versions of their 5x6-6x5 embodiments, provided as an essential option for users of the system, so that when the 5x6-6x5 is expanded more syllables have their own dedicated keyface when required by users, or when a two-handed embodiment is needed, in: 5x7, 5x8, 5x9, 6x5, 6x6, 6x7, 6x8. Key inventive steps are the same on expanded embodiments as on the 5x6-6x5 layouts.

SEMITIC writing systems including and Hebrew, and Arabic script languages and their derivative languages are claimed when organized on a 5x5, 5x6 or 6x5 keyboard platform and or by using the OrrPad method and techniques.

In addition to the conversion of the world's writing systems to a common platform using numerous claimed techniques as a method, also claimed are methods of organizing other keys essential to writing purposes and operation of devices.

Other Keys necessary for a writing tool and input or control of a device, including: Accent access, punctuation production, and function keys:

(i) Accent Access methods of OrrPad.
(ii) Punctuation methods of OrrPad.
(iii) Function keys, sufficient to the purpose, and arranged in accessible function modifier chords needed for writing purposes or to control a PC or other device.

Teaching Modules convey an understanding of the world's writing systems, their demographics and construction to serve the OrrPad methods for creating keyboards for a new global keyboard platform. The science of motor-skill and tool use, methods of making mnemonic layouts, and geo-linguistic background is provided to teach how to add to the platform so that new languages, devices and purposes can be served.

NEW DEVICES enabled by OrrPad are described within and are also claimed.

METHOD AND TECHNIQUES of OrrPad are also claimed to create a global keyboard platform. This platform was hitherto unrecognized, even though parts of it are in the prior art, but not
combined as a whole sufficient for utility as a
global platform that can be adopted on a wide
scale basis, until now.
OrrPad Applications: MousekeyPad, MousekeyDrive, OnePad, Phones, Disabilities, Accessibility—Part D
Musical Instrument, Hospitals, Military, Calc, Direct 4 11/91 i. Spacepad, Sample Scripts.

The OrrPad system including but not limited to:

1. The OrrPad is a claimed invention of OrrPad: which is a combination one hand keypad and mouse. The OrrPad is claimed for any alphanumeric layout placed on a mouse, preferably one handed. Non-OrrPad layouts also claimed.

   The user may place the MousekeyPad on a desk or on a mouse with the same unit under one hand. MousekeyPads may also be used hand-held (one or two handed), operated remotely, or on a touchscreen, or Internet. A phone may be turned into a mouse-keypad.

   The mouse can be a classic rolling or infrared mouse, or alternatively a top mounted ball or toggle mouse, or any other mouse technology.

   The claim in this patent is the new use combination of the pairing of a small (preferably one handed capable) keypad on the top face of a mouse, small phone, music-player (e.g. iPod or Zune, etc.) PDA, (e.g. Blackberry, Palm) TV remote control, calculator or other small device to allow the user to use the device to type and mouse with one unit under one hand. Thus, users can use their mouse-keypad-enabled phone, PDA, mouse, etc. to communicate with another computer.

   A mouse-keypad can be omnimode meaning it may be one or more of the following: (1) handheld, (2) employed by one or two hands, (3) wearable or carry-able, (4) placed on a desk, a lap, or other generally horizontal surface, (5) mounted on a wall or other vertically inclined surface (6) mounted in a vehicle (7) mounted on or in an information or registration center, kiosk, computer, ATM, phone, or other information or communication device.

   The keypad layout of a mouse keypad can be Qwerty or other design. However, the 5 key across OrrPad layouts with vertical channeling of alphabetical order are best mode for the mouse-keypad as it provides maximum omnimode operation and mnemonic advantages to the user.

   The MOUSEKEYPAD was a solution to the problem of juggling a two handed keyboard as well as an independent mouse; a set-up that really requires three hands; as users must type then change units to the independent mouse: back and forth, back and forth.

2a. OrrPad enabled Desktop Mousekeypad:

2b. MousekeyPad or MousekeyDrive:
A combination MousekeyPad on a hard-drive.

2c. An iPhoie enabled as a Mousekeypad or:
3. MousekeyDrive: The camera can serve as infrared or laser source.

   The two units are combined into one single-handed unit to enable one-handed mouse-use and typing. The Mousekeypad was originally intended mostly for desktop use to eliminate the back-and-forth from the keyboard to separate mouse. It can also be integrated onto any device, laptop, PC, touchscreen or handheld.

   The MOUSEKEYPAD is an independent claim of the Orr Pad keypad system for a combination mouse with (any style) keypad.

3. MousekeyDrive is claimed as a combination keypad-and-mouse-in-one-hand combined with a portable bootable hard drive other storage media. The MousekeyDrive has a keypad and mouse on a hard drive allowing users to take their data and applications on the road and just plug into a monitor to view their personal hard drive. The MousekeyDrive allows users to retain all contents of their hard-drive on this device, which also can serve as mousekeypad, to access the contents, by interacting with a monitor, TV or a PC as a monitor only, without for security and portability. It can or need not have a phone.

3a. MousekeyDrive or MousekeyPad:

4. OnePad: is a keypad, mouse and hard-drive with a viewing monitor. It may include a phone, music player, camera, web browser and bootable PC hard-drive (or next generation "drive"). This unit allows individuals to carry everything with them: including their own hard drive, to just communicated with a monitor for full sized views, or use as a mini hand-held computer with its small built-in monitor when on the road. As the OrrPad layout was designed for the blind, typing can be one handed or one thumb; with practice, without looking at the keys. The OrrPad layouts enable a One Pad because of its motor-memory friendly 1 or 2 hand multi-language design. However, a claim is made for any keypad layout placed on a Mouse or hard drive to create a One Pad.
SUGGESTION / REQUEST:

No knowledge of the world’s languages or writing systems is required to understand this patent. This application offers teaching modules beginning with the needed geo-linguistic orientation and an introduction to how each writing system works and how this patent utilizes the inherent features of each language to create mnemonic layouts. Various layouts schemes are explained, however the language and writing system organization must be in color for an examiner to easily understand the features of each language, the inventive steps, the differences between each layout claim, differences between and within languages (and parts of languages) without an examiner having any prior knowledge of any of these languages. The layouts are not random, but are based on intrinsic properties of the language or writing system arranged in patterns analogous to a musical instrument where each key has a qualitative relationship to all other keys in a spatial pattern, that the brain will recognize. The images can be converted to grey scale when needed.
<p>|    | 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    |
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Note: The table contains Greek letters and alphabets.
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F-16 Fighter Jet Pilot Cockpit:

Before

Alter:
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 13/38 (2015.01)
CPC - G06F 13/385

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC (8) - G06F 13/38 (2015.01)
CPC - G06F 13/385

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 710/72, 400/488, 345/163, 348/360, 348/207.1, 348/505.024, 345/173, 341/22

Electronic data base consulted during the international search (name of data base and, where practically, search terms used)
Thomson Innovation; PatentBase; Google Scholar; Google Patents; Google.com; FreePatentOnline; ProQuest Dialog Search Terms: Keypad, keyboard, mouse, pointing device, layout, single hand, one hand, alphabet, alphanumeric, key, key, smartphone, mobile, portable, drive, hard drive, combo, combination, desktop, applications, camera, matrix, grid, it

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>Jabour. &quot;New keyboard layout easy as ABC.&quot; In: stuff.co.nz, November 07, 2012 [online] [retrieved on 11 February 2015 (11.02.2015)] Retrieved from the Internet &lt;URL: <a href="http://www.stuff.co.nz/technology/72595006/New-keyboard-layout-easy-as-ABC%3E">http://www.stuff.co.nz/technology/72595006/New-keyboard-layout-easy-as-ABC&gt;</a>, entire document, especially Page 1, image in page 1.</td>
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<td>US 2007/0147933 A1 (Zhang), 28 June 2007 (28.06.2007), entire document, especially Abstract; Figures 2-3; Para [0006]-[0007], [0021]</td>
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<td>CN 101952034 A (Yu et al.), 19 January 2011 (19.01.2011), entire document, especially Abstract; Figures 1-3</td>
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<td>US 2008/0120448 A1 (Shi et al.), 22 May 2008 (22.05.2008), entire document, especially Abstract, Para [0004]-[0005]</td>
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<td>US 2005/0057508 A1 (Kim), 17 March 2005 (17.03.2005), entire document, especially Abstract; Figure 1; Para [0011]</td>
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Further documents are listed in the continuation of Box C. □

Date of the actual completion of the international search
12 February 2015 (12.02.2015)

Date of mailing of the international search report
09 MAR 2015

Authorized officer: Lee W. Young

PCT Helpdesk: 571-272-4000
PCT OSP: 571-272-7770

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  "L" document which may throw doubts on priority claims(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  "O" document referring to an oral disclosure, use, exhibition or other means
  "P" document published prior to the international filing date but later than the priority date claimed
  "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
  "N" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
  "Y" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
  "X" document member of the same patent family
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