



the USB EkaPad

EkaTetra

EkaPad discussion and design criteria

Modified 2008
Containing EkaPad benefits/features

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Here's where we were in March 2006

The EkaPad Product The core product of EkaTetra is the EkaPad a 12 key chording text and data entry device. 15 prototype EkaPads with a PDA & attachments, and complete training materials, have been user tested by 40 people. The USB EkaPad is in production. The EkaPad combines an elegant collection of one finger, two finger and three finger chords. All characters, functions and controls found within a standard operating system's qwerty keyboard are supported. The EkaPad works with Windows, Macintosh, and open source operating systems. With the easy entry EkaPad technology, single handed text entry is now a reality.

The EkaPad is a keyboard for one hand, designed for handheld and desktop computer use. It combines a 12 key keypad, embedded software and training material to make it easy to learn, and easy to use. It does everything a 104 computer keyboard does, and more.

The EkaPad incorporates 99 programmable registers for keyboard shortcuts, and another 99 storage registers with 250K total capacity - enough for multiple notes or a short story.

The EkaPad technology is a completely new approach to entering text (and all keyboard characters) into computers and digital devices of all kinds. It is no longer tied to a legacy technology nor is it an adaptation of a desktop keyboard. Think of it as your personal remote for any computer.

EkaPad: the future is in your hand – either hand.

Who's interested?

We've talked to lots of people over the past 5 years. The people we've talked to were mainly professional, technical or self employed - lawyers, marketing gurus, medical personnel, software engineers.

They either have pressing needs or are the early adopters within every segment - lots of people in total, but no concentrated niche. Each of these segments contain people with similar needs:

- they need to take notes unobtrusively;
- they have lost the use of a hand or have Repetitive Stress Injuries;
- they are performing a task that leaves only one hand available;
- they are reclaiming their desk surface; or
- they require a mobile office.

We believe the following niches are worth investigating for selection as a target niche: those who have lost the temporary or permanent use of one hand or other physical disability, police patrol officers accessing their in-car laptops, medical doctors updating electronic medical records, military personnel, road warriors keeping records current., workers with data tasks away from a desk top computer or who move between task location and computer, call center personnel who could dramatically increase productivity using mouse in one hand and EkaPad in the other, and field/service/sales mobile personnel.

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Who will buy the EkaPad?

People with one of the needs listed above. In particular, young people and technophiles looking for the latest and the best - EkaPad, it's cool.

There are about 100,000 people out there who can't wait to get their hand on this device. Yes, hand. You see, they only have one. Like the rest of us though, they still want to connect, communicate, take notes, send emails,... oh, and they want to work. Then there's another group, perhaps five times as many, who, through broken bones, sprains and strains, stroke, repetitive stress injuries, and such, are in a similar situation. And we haven't even begun to include the millions who, even though they have two hands, only have one available at the moment, when they still need to take notes, collect or reference data, communicate, or just connect.

Anyone who is tired:

- of being a slave to an awkward set of keys;
- of the pain of two hand typing;
- of flattening out an opposable thumb;
- of having to perform the unnatural act of two handed writing;
- of being reduced to single tasking with both hands;
- of being limited to a mechanical solution in a digital age;
- of wasting their valuable real estate – the top of their desk.

Writing with both hands is an unnatural act. Writing with either hand is a human act.

What market factors and working conditions influenced this design?

Current and past solutions: Lots of other people and companies seem to be trying to find a text entry solution which takes the keyboard off the desk, reduces carpal tunnel syndrome, is portable, or is small. During the last 15 years we know of somewhere around 25 small or portable keyboard technologies and about 15 reduced repetitive stress keyboards which have been active, attempted solutions. We find each of the competitive products has one or more serious deficiencies. Many of the products are still around, so someone must be buying them. That is, *there are needs*. Even poor or physically damaging solutions are being bought in desperation because people are trying to solve a problem which the EkaPad solves.

Properties of a Perfect Solution

What the competitive activity tells us is that there is a lot of interest in finding a really good solution which will:

- * bring the hand into a natural position and minimize stress;
- * be portable and needs no supporting surface;
- * be small (fits easily in one's pocket or bag);
- * encompass all the characters, functions and controls of a standard 104 key keyboard;
- * work with any operating system;
- * accommodate almost all different shapes and sizes of fingers and hands;
- * be learned easily;
- * work with desktop, laptop, tablet computers, and perfectly with ultra compact tablets, and a variety of handheld devices;
- * fit the form factor and keys of cell phones;

- * work with multiple languages and character sets;
- * be a device which can be used with only one hand (unlike a PDA which requires one hand for the PDA and another hand for the stylus).

In brief, people want

- * a *universal* device with which they can interact with all their digital hardware;
- * a *personal* device, which can store personal data and be their personal key;
- * a *unique* device, so they need only one for all their data-text entry needs.

USB EkaPad - The foundation for a solution

The design must be invisible to computers

After matching our original ideas to what the market told us, we realized our basic concept could become the firm foundation for a product which meets all the above criteria. Our goal has been to create a product which is "technically perfect"; i.e., it duplicates all the characters, functions, and controls of a standard keyboard and works on all common OS (Macintosh, Windows and open source). The EkaPad incorporates a 'no compromise' design that looks not backward to what we've had to endure because of mechanical constraints, but forward to what we can use in this new digital age. So we've secured a comprehensive patent on the EkaPad.

The design must be ergonomically sound

We decided to use the hand as the human tool for text entry. Where should we start? Let's design around a relaxed natural position of the hand. (Let's not ask one's hand to contort as it must for qwerty designs.)

So how to find a relaxed natural position?

- Put your hands at your side
- Raise one hand, as if you are going to shake someone's hand.
- Your hand is now in a very natural position; it's relaxed, with your thumb opposed.

This is where the EkaPad fits - in the palm of your hand. Four fingers on the keys with the thumb naturally relaxed, opposed and able to support the EkaPad. It's a natural.

The design must be easy to use and easy to learn

The EkaPad uses chords (pressing more than one key at a time) just as qwerty keyboards use shift, alt, option, etc. with another key. The EkaPad has a more extensive use of chords and the chords must be learned. We have developed and tested a training program which gets users knowing and using the alphabet, numbers, and punctuation in about two hours. (qwerty takes about 10 hours to attain the same speed and ability). We've designed downloadable desktop displays for our manuals and cheat sheets. The user will be able to attain satisfactory (to the user) typing speeds when composing (which is what most computer users do).

More than you ever thought you could do with two hands, and you can do now with one hand.

What are the main benefits of this one handed keypad?

Pocketable - portable The EkaPad's dimensions are 2.1 x 3.75 x 0.5 inches (5.4 x 9.8 x 1.4 cm). It's just slightly larger than a business card. With the EkaHand it weighs less than 2.5 ounces. It slips easily into a pocket or purse.

Mounts any where within reach The EkaHand, the EkaPad's way of attachment, can slide on a thumb or wrap to a gear shift. Using additional stick-on DualLock® tape on the mating device, the EkaPad can be fastened to the back of a tablet or compact computer. For a disabled person in a wheelchair, the EkaPad can easily be mounted on the chair itself.

Personal The EkaPad can store personal data you have entered – your data. It works with any computer, fits in your pocket, so you carry it around and plug it in wherever you need to. This keyboard no longer belongs to the computer, it belongs to you.

One handed Sliding the EkaHand on your thumb and attaching the EkaPad makes the combo a real one handed text and data entry unit. No flat surface is required, no second hand – you can even walk around while working on your computer.

Comfortable When using the EkaPad your hand is in a relaxed, natural position as if you were shaking someone's hand or holding a glass. The fingers curve around naturally and put no strain on your wrist as flat surface qwerty keyboards can.

Reduce repetitive stress Either hand can use the EkaPad. Many users have found it is surprisingly easy to use the EkaPad in both hands, changing between left and right hand periodically during the day.

Takes up minimal desk space The EkaPad's small footprint even in its desk stand is less than a 3x5 card. If you use a flat panel display with the EkaPad, your desk's top is now available for notes, manuals and printed materials.

A really good work environment This is how I like it: A mouse in one hand, the EkaPad in the other, and a clean desk with only a flat panel display. It's heaven.

Multi system / Platform Independent The EkaPad works with both Windows and Macintosh computers. Whichever system you are on, Windows or Macintosh, the same chord creates the same character or action. Just tell the EkaPad which system you are on with a simple chord sequence.

Able to be personalized The EkaPad contains special chords which allow the user to configure the EkaPad to make it fit their chording style.

Store personal and often used information in Keeps EkaPad has 99 storage registers and can store up to 50,000 characters of your own input. Keeps can be password protected.

Store keyboard ShortCuts EkaPad has 99 shortcut registers. Each can store a sequence of 5 chords.

It's sanitary Because the EkaPad is your own personal keyboard, no one else need touch it. And you don't need to touch a keyboard which may be public.

Faster editing of your work With the EkaPad in one hand and a mouse in the other, it's fast and easy to move the cursor around a work space, make selections and enter corrections – without taking your hands off either device, unlike moving between keyboard and mouse.

Faster data entry With the EkaPad in one hand and a mouse in the other, it's fast and easy to move the cursor around a data file and enter data – without taking your hands off either device, unlike moving between keyboard and mouse.

Easy learning The EkaPad has proven to be easy to start using. Following along in the EkaTetra Chording Book many people know the chords for the letters, numbers, and some punctuation in 2 to 3 hours. The EkaTetra Exercise Book has many fun exercises which can strengthen skills for particular characters or all the letters. The EkaTetra Cheat Sheet contains the chords for every character, command, and configuration; a printed version is supplied with every EkaPad and a screen display version can be downloaded. All the learning aids can be displayed on your computer screen.

Market environment today

How does the EkaPad concept fit in the market today? Some users have only one hand and can utilize the single handed EkaPad easily for standard text entry requirements. Others want efficient single handed text entry for mobile use. Compared with available alternatives (T9, thumbboards, and

Graffiti®), the EkaPad is a quantifiably better solution. Thumbboards, Graffiti and stylus technologies require both hands.

With the EkaPad's use of emergent standards like USB and Bluetooth, existing hardware recognizes the EkaPad as a traditional keyboard. Smart phones and PDAs would have increased usefulness if they were designed to incorporate a system that allowed for efficient text entry.

Competitive advantages/disadvantages There is no company with a non-qwerty keyboard that is a power in the market place. Most attempts to solve the hand held data input need are still qwerty based. It is frequently a small keyboard with tiny keys that are activated by thumbs or stylus. Users have found that these devices fill a need for portability in spite of the difficulty of entering data.

Competitive alternatives

Entrenched culture The qwerty keyboard has been a standard for 130 years, dominant in the market place; Qwerty keyboards are mature. There are a few hundred million throughout the world. They are priced from \$19.95 to \$350. Before 1996, some non-Qwerty keyboards came to market; none were accepted.

Portable qwerty At least three accessory companies are making fold up, stylus operated, or full size one piece keyboards for PDAs or hand held computers. Prices range from \$39.95 to over \$200. Some fold up keyboards appear to be fragile and all require a flat surface for operation; stylus models are no better than touch screen stylus systems available for PDAs now. The EkaPad could turn a fully functional hand held like H-P iPac into a fully functional *hand-held* computer.

Cell phone keypads The 12 key keypad used by phones and cell phones works well for numbers, but the repetitive tap-tap-tap required for letters is agonizing to use for anything but the shortest names or messages. The EkaPad gives the full alphanumeric input with its 12 keys.

Other chord keyboards During the early 90's, a number of alternative keyboards attempted to established themselves in the marketplace, and most are gone. Handikey Corporation makes a handheld with keys on the reverse side (similar to the EkaPad). The key locations are a linear layout of the alphabet. They don't use letter frequency data for their chord selection.

Other technologies Voice recognition has matured and been accepted. Voice works well for "Call Home" type commands, but one would probably not use voice when creating an important business memo in a restaurant or other public area, or even in an office cubicle. EkaTetra plans to incorporate some aspects of voice recognition into future designs.

Gestural techniques, like Graffiti (Palm), Jot (PocketPC) and handwriting: Gestural techniques are inherently slow and error-prone; Useful only while looking at the device. Graffiti® is a reasonably fast solution many people have forced themselves to learn; it was part of the Palm OS and is used by a number of mobile device manufacturers. People have only modest success to find software solutions that allow variable data input into cell phones or handheld wireless email devices; MessagEase is one such.

And finally...

None of these alternative, traditional or other technologies solves the existing problems of size or mobility combined with functionality. EkaPad is an almost perfect solution: it's small, pocketable, ergonomic, and with additional functions not found on any other keyboard.