The Human Connection - 1st Impression

[Inspired by Star Trek IV - The voyage Home]

**Prologue**

“Connected” is often a misunderstood and misused requirement in design.   Adding a network port to a machine does not make it connected.   That is like putting clothing on a monkey and calling it human.     True connection means adding pathways between independent system which allows the “network” to become truly more than the sum of its parts.  The independent systems in a “connected” project become more than what they could ever be alone because of the connection to the other.

As an example, Humans seek the internet as it allows connection.  Not because the internet can allow data traversal but because we are extended and transformed by pathways to other independent entities on the network.    It allows each of us, our knowledge, our thoughts, and emotions to be bridged.   While this connection is at still at a somewhat primitive state,   one can make connection with other information, personalities, thoughts and emotions that allow us to be more than what we were without.   I believe that this is what draws people to “the cloud”.    We have a connection to the world that we simply did not have before.

We currently stand on a precipice of fundamental human transformation.    We have the technology to extend our being into the universe to sense and understand to greater depths than what our biology allows. We have the ability micro-machine and micro-etch physical structures on that scales of billions of a meter.   We have the ability to program these items with abstract rulesets.   We have the ability to measure virtually all known physical quantities.    These technologies online are cheaper than ever and will allow virtually anyone to contribute.   Combine this fact with the capability of connecting human thought across a geographically dispersed area,  we now have the raw materials to make truly remarkable advances in the human condition.   With open platforms, we will be able to overcome biological limitations and push into both the world of the small and the universe at large.

The Human Connection :1st impression is an experiment in developing open technologies that leverage that latest in low cost, state of the art electronics to extend human connection and perception into the universe in which we coexist.   This concept can span many disciplines including biology, physics, acoustics, electronics, engineering, etc.    For the Hackaday prize this project we will look at extending human interaction with fluidic oscillations (AKA sound).

Please start by looking and the 8-pages of “conceptual” drawings for the 1st impression.   You will see that we will synthesize concepts in acoustics, electronics,  mathematics (signal processing) and embedded systems in this 1st experiment.    The ideas presented here will be the starting point.

The next step will be the video introduction and then the actual documentation of the design process.   The design process will be open to all.   All software, design drawings, schematics, etc. will be available via Github.  Instructional videos will be available on Youtube.  All of the electronics will use low cost development tools (i.e.  a $20 LPC-link or $35 FRDM-64F for high end signal processing, OSH Park for PCBs, etc) as much as possible.    Everything will be available for anyone to learn, hack and extend.

**Part 1 : What exactly is the Human Connection - 1st Impression?**

I always loved the Star Trek Movies.   The concepts of molecule size microprocessor (Star Trek I), planet forming (Star Trek II) and biological communication (Star Trek IV) are “big picture” concepts that keep people dreaming. There is a scene in Start Trek IV when Kirk & crew are approaching earth, hearing the signal from the alien probe for the 1st time.

SPOCK: *Most unusual. An unknown form of energy of great power and intelligence. Evidently unaware that its transmissions are disruptive. I find it illogical that its intentions could be hostile.*

McCOY: *Well, dammit? You think this is its way of saying 'Hi there' to the people of the Earth?*

SPOCK: *There are other forms on intelligence on Earth, Doctor. Only human arrogance would assume the message must be meant for man.*

KIRK: *You're suggesting the transmission is meant for lifeform other than man?*

SPOCK: *It is a possibility, Admiral. The President did say that it was directed at Earth's oceans*

KIRK: *Uhura, ...can you modify the Probe's signals accounting for density and temperature and salinity factors?*

UHURA: *I'll try, sir. ...I think I have it.*

KIRK: *And this is what it would sound like underwater?*

UHURA: *Yes sir.*

SPOCK: *Fascinating. If my suspicion is correct, there can be no response to this message.*

What if we could give humans the ability to sense sound and vibration beyond our normal biological limits?        What more could we understand about the world if we had some way of remapping fluidic disturbances in a manner that our brain could more easily process?  What about the inverse?  Map our speech spectral bands beyond human hearing?   We now have the technology to do this in real-time.   Some other questions:

* What if we could do non-linear remapping of entire bands.   I.e. move 30Khz-70Khz into a 3-4Khz Band?
* What about the opposite?   What about moving infrasonic in to the more sensitive bands of the ear?
* What about a DIRECT NEURAL connection of sound into the brain?
* What could the brain do with this new data?   We know that bats can make 2D “images” using synthetic aperture sonar.    What about our brain?
* What could the visual impaired do with this technology?
* What could the hearing impaired do?   Maybe we could remap the world into what their “hardware” can use?
* What would the oceans under the ice of Europa sound like?
* Can we communicate with other entities who use the ultrasonic or infrasonic bands?

This is truly more than “bat sensing”.   This task requires more than a simple mixer heterodyne receiver.  Advanced algorithms will be required.    We are talking about a fundamental transformation of human perception (and generation) of sound. What is remarkable is about this project is that we all fundamental understand sound.    Our ear to brain connection is fairly high bandwidth and is easily hack-able.   We can easily inject new signals into this pathway.    I feel that people of all demographics will gain an almost immediate intuition about what this project is simply by experiencing it.

So, that in a nutshell, is the Human Connection: Impression 1.   Why Impression 1?   Because there will always more of the human to hack….. and I like Emerson, Lake and Palmer ☺.  This is a start.    I hope you are able to follow the project and contribute ideas, comments, circuits, etc.   Over the next couple months more details will follow with plenty of schematics, code, etc.   Stay tuned!

Part 2:   The Algorithms

Stay tuned for videos!

Part 3:   The Hardware

Stay tuned!    It is coming!

a fundamental transformation of human perception (and generation) of sound inspired by Star Trek IV