Visible Speech *

{ Visible Speech employs phonetic vocabularies and other oddities to visually reproduce conversations. Not only as a stand alone unit, but also as a part of a collective act when combined with other modules.
It communicates by using constructed and non-constructed languages, through alphabets read by both humans and machines. }
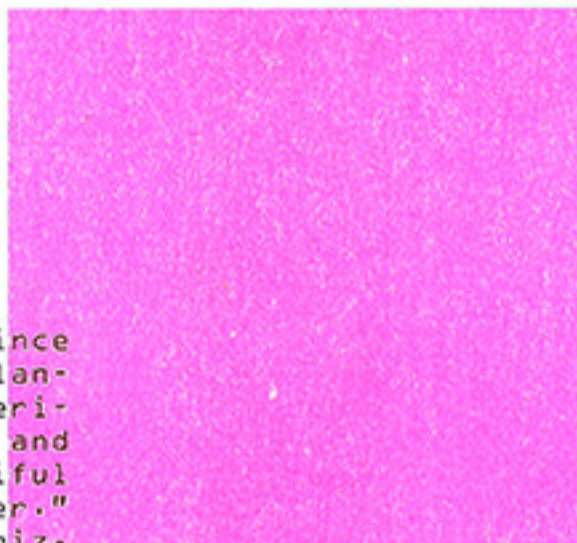
During the 17th century, Gottfried W. Leibniz – the German philosopher, famed as inventor of the modern binary number system and also for his exceptional optimism - started to dream about a universal language. He was trying to create a vocabulary able to rationalise universal concepts and numbers. A similar pattern to the machine language used in today's encoding systems based on binary arithmetics.
Today, four centuries after Leibniz's utopian system was theorised, we can ask to what degree his dream has been accomplished.

Are our machines speaking the ultimate Characteristica Universalis?

Leibniz's ideal language was conceived to be effectively expressive so as to become universal.
Today, by contrast, we perhaps face the opposite condition. We can see the proliferation of too many universal languages, aiming for the same result but differing at their cores.
The dream of a Characteristica Universalis seems stuck in the complexity arising from the duality of human languages and machine languages, caught between the aim for entirety and the impossibility of reducing plurality.
In a similar way machine languages of today can be really far removed from the user-friendliness that Leibniz theorised: "[...] a new language or script, that could be learned in one week or two".²
Unfortunately today's scenario presents itself as radically different. While anyone can use and interact with programmed technologies, the knowledge of their language is limited to a comparatively small group of people.
This language, whether it is the Characteristica Universalis we were supposed to reach, is trapped and carried by people everyday, as a blackbox filling our rooms and pockets.

The Visible Speech module comes from a fascination for constructed languages¹, phonetic translations of speech and the never ending human desire to elaborate an ideal universal language.
This leading interest has been translated towards the structure which sustains the module's technical core and interface; an instrument built and programmed with its own particular kind of widespread alphabet, human developed and machine-readable.

> "[...]learned men have long since thought of some kind of language or universal characteristic by which all concepts and things can be put in beautiful order."
> Gottfried W. Leibniz,
> On the General Characteristics
> [1679]

1. A constructed language is a language (also known as a conlang, glossopoeia, artificial language, auxiliary language, and ideal language) that has been consciously created by an individual or group.
2. Gottfried W. Leibniz, Letter to Johan Friedrich von Hannover [1679].

How to build the module*

Extract the module's printed circuit board from the master;

To prepare the vactrols place the heat shrink tube over the LDR and the LED. Heat the tube to keep them in place;
Place the vactrols on their assigned place on the back of the board. Make sure that the long leg of the LED is in the square hole before soldering them.
Place the female headers on the board and solder them on the back of the PCB. Solder the male headers to the back of the Arduino Nano. Insert them into the female headers;
Place and solder the resistors in their assigned place on the PCB;
Place and solder the ceramic capacitor in its assigned place on the PCB;
Place and solder mono jack outputs, push buttons, rotary potentiometers and the RCA plug in their assigned place on the PCB;
Place and solder the JP.

How to connect the module*

Power the module by connecting the Arduino with a power source;
Connect your screen with the RCA plug via a RCA cable;

To receive serial messages connect the serial input port with the serial output port of the other module via a mini jack cable;
To receive sound messages connect the analog input port with the sound output port of the other module via a mini jack cable.

How to interact with the module*

Rotary Potentiometers

Voice Quality Symbols [AnalogRead A1]
Use the knob to play with VoQS.

Push Buttons

Use the buttons to play with Pidgin's Visible Speech System and other translations.

Components*

*1x RCA plug (Lumberg Black Right Angle PCB Mount RCA Socket with Tin Plated Contacts, 2A);
*2x Rotary potentiometers;
*3x Push buttons OFF/(ON) 12.5x12.5 mm;
*1x Arduino Nano(equipped with male and female headers);
*2x5 Male Header (JP);
*3x LED;
*3x LDR;
*4x Mono jack outputs;
*3x 1kΩ Resistors;
*4x 10kΩ Resistors;
*1x 150Ω Resistor;
*1x 470Ω Resistor;
*2x 0Ω Resistors;
*1x ceramic capacitor;
*4x Heat shrink tube;
*1x Mini USB cable;
*Soldering equipment;

N.B. the module requires a screen equipped with a RCA connector.

Voice Quality Symbols (VoQS) are a set of phonetic symbols used to transcribe the "voice quality" of a speech.

Machine-Readable Speech [AnalogRead A2]
Use the knob to play with messages from other modules.

Pidgin's Visible Speech is a visual representation of speech conceive by the american author and inventor Charles F. Pidgin in 1917. He received a patent to allow this system to be added to (silent) motion pictures by means of "inflatable balloons being shown for carrying the words and for enabling them to be blown from the mouth of the characters."

Lingua Franca [DigitalRead D4]

IPA International Phonetic Chart [DigitalRead D3]
International Phonetic Alphabet is an alphabetic system of phonetic notation based primarily on the Latin alphabet. It is used in dictionaries to indicate the pronunciation of words. The IPA has often been used as a basis for creating new writing systems for previously unwritten languages.

Binary [DigitalRead D2]