A Critique of the Portable, Battery-Operated Receipt Printer Typewriter

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I recently made a portable, battery-operated receipt printer typewriter. This object is inspired by a similar project executed by Robert Ochshorn, a quite interesting interface designer.

Ochshorn created the typewriter to produce newspapers without relying on computers at all. He had grown disillusioned with contemporary practices in which all editing and layout work is done on the computer on programs such as InDesign. Computer-based layout editing is not conducive to good team collaboration. Editing on computers often means working alone in an environment which does not have features that allow several editors to work on the same document concurrently.

Computer-based editing lacks many of the affordances working in a physical environment brings. Text printed on paper can be cut out, glued back together, and drawn on. Most importantly, many people can be on a text at the same time. In making the printer typewriter,

Ochshorn probably wanted to move the core layout work to a medium whose affordances are very conducive to collaboration.

It is clear from his post on the printer typewriter that the tool he made resulted in a much more collaborative newspaper production process. However, is this iteration of the printer typewriter most true to the aim of working collaboratively on text editing in a physical environment?

This design critique will analyse how the current printer typewriter design relates to other tools of expression, what makes this tool particularly valuable, and how interaction with the device could be improved. Additionally, I will suggest four ideas for future development of the printer typewriter concept.
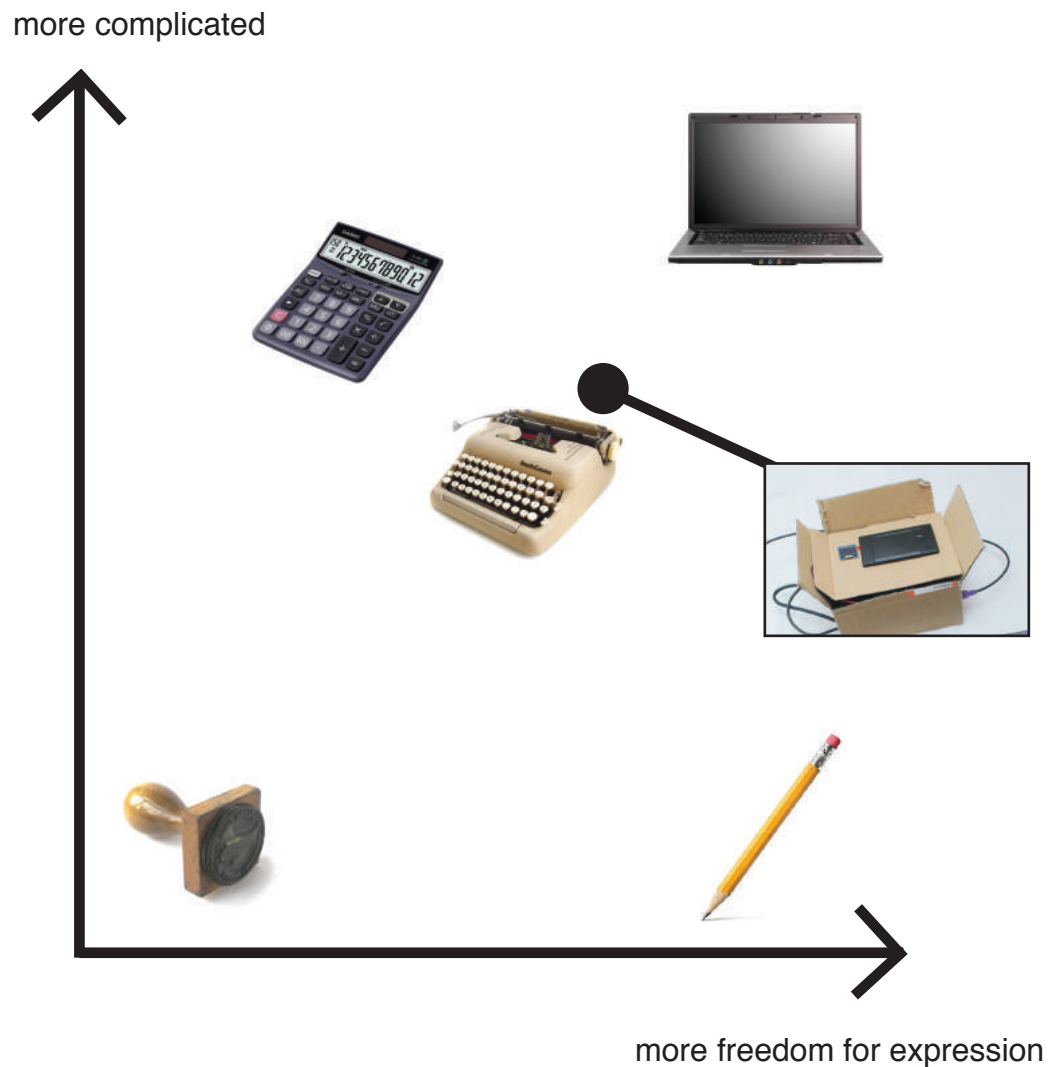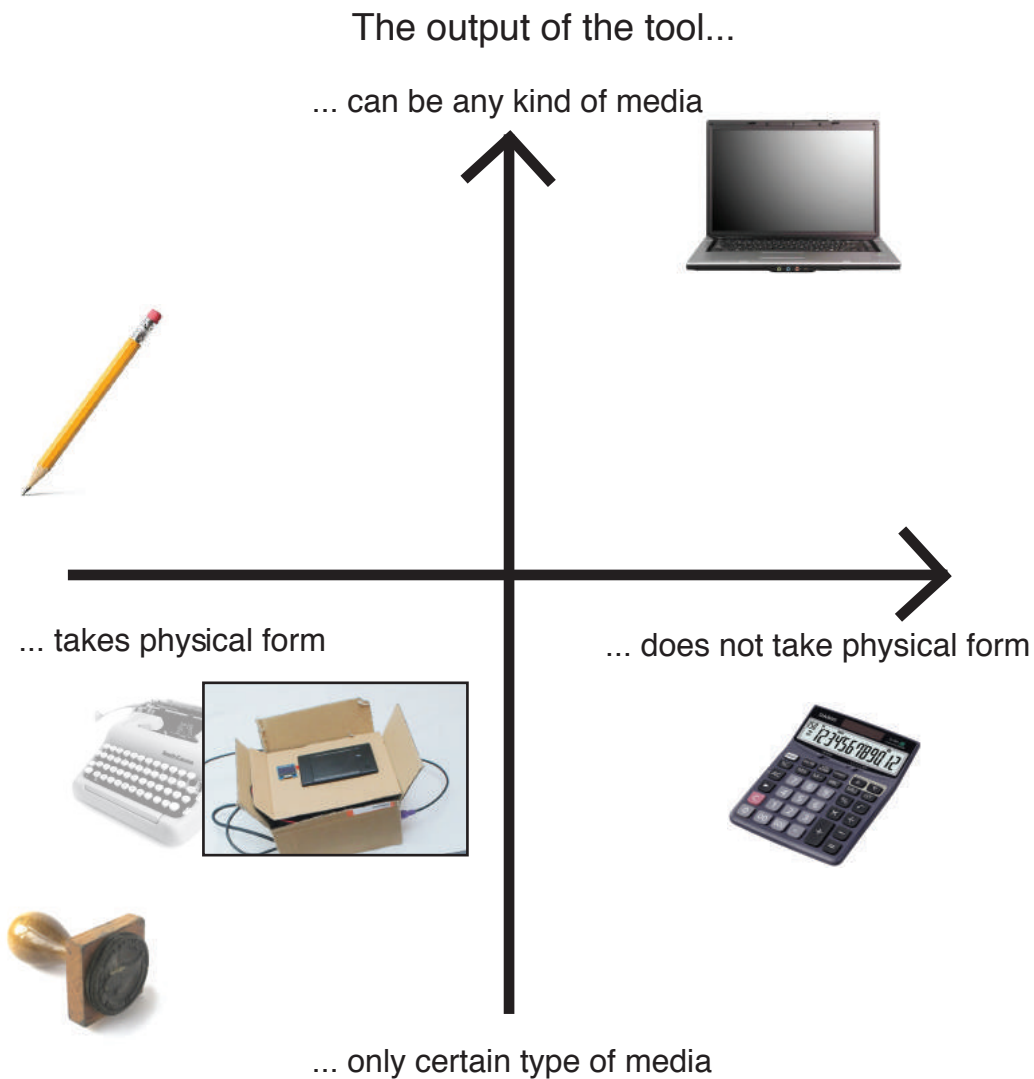
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The current design of the printer typewriter has three visible components; a keyboard which serves as the method of giving input to the system, a receipt printer which can print out the input messages, and a small OLED screen showing any input gained from the keyboard which is yet to be printed.

The printer typewriter belongs in a space of tools which enable expression. It is mostly used for manipulating and expressing ideas through words. You can see tools which are in a similar domain on the right. One can place it in a space with gradients going from knowledge tools of simple construction to ones of a complicated structure. One can also place it on an axis going from tools which allow for very limit- ed range of expression to ones which allow for a lot of freedom for expressing thoughts and ideas in different ways.

The printer typewriter is not just a new version of the typewriter tool; in some aspects, it is different in how it works and the affordances it has varies from the typewriter that we know. The printer typewriter is a more complicated tool in construction than a traditional typewriter because of the microprocessor used and the digital nature of the instrument. Partly because of the different construction, the printer typewriter allows for a more extensive range of expression. For example, the user can edit the sen- tence she is currently writing because the printer typewriter only prints out whole sentences at a time and the controls are implemented for editing text which has not yet been printed. The printer also allows for the same sentence to be printed out several times as defined by the user. These are functionalities which the typewriter does not have.

more complicated

more freedom for expression

The output of the tool...

... can be any kind of media

... takes physical form

... does not take physical form

... only certain type of media

Another dimension in which the printer typewriter is similar to a traditional typewriter, and different from how we usually work with text on the computer is how the printer typewriter produces the text on a paper as it is being typed. This happens when we write with a pencil or typewriter. However, computers have separated the act of producing text from the act of making text gain physi- cal and permanent form. The lack of physical form is part of why Ochshorn was tired of conventional ways of working with text. He thought too many valuable affordances were lost when editing in a digital environment. The printer typewriter relinks the act of writing with the act of making text gain physical form. With this tool, one cannot write without producing a physical artifact in the form of a paper con- taining the content of your writing.

Like the typewriter, the printer typewriter is a tool which has a more narrow range of intended functions than tools like the pencil or the computer, which are incredibly broad in their intended function. The printer typewriter's use is to materialise text; a function much more specific than the computer. The tool itself does not contain any distractions from the task (though the surrounding environment might do!) in the way that a personal computer does.

This object represents a vision in which people are collaborating on and editing written pieces in the physical world without screens. It seems very well aligned with the designer's idea of incentivising collaboration between the different individuals on the team. It does seem like some freedom is lost when this printer is used. It is hard to work with pictures or any dynamic media such as sound or video with this typewriter. Though aligned with the values of its creator it is clear that the printer typewriter has several fundamental usability issues:

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A <u>The screen currently does not allow the user to see the sentence which was printed before the one they are working on.</u> The screen does not show the sentence, and even though the sentence has been printed, it is hidden below the lid of the printer.

B <u>The enclosing case is too voluminous at the moment.</u> It is possible to carry the case around. However, it takes up too much space to reasonably go into a bag.
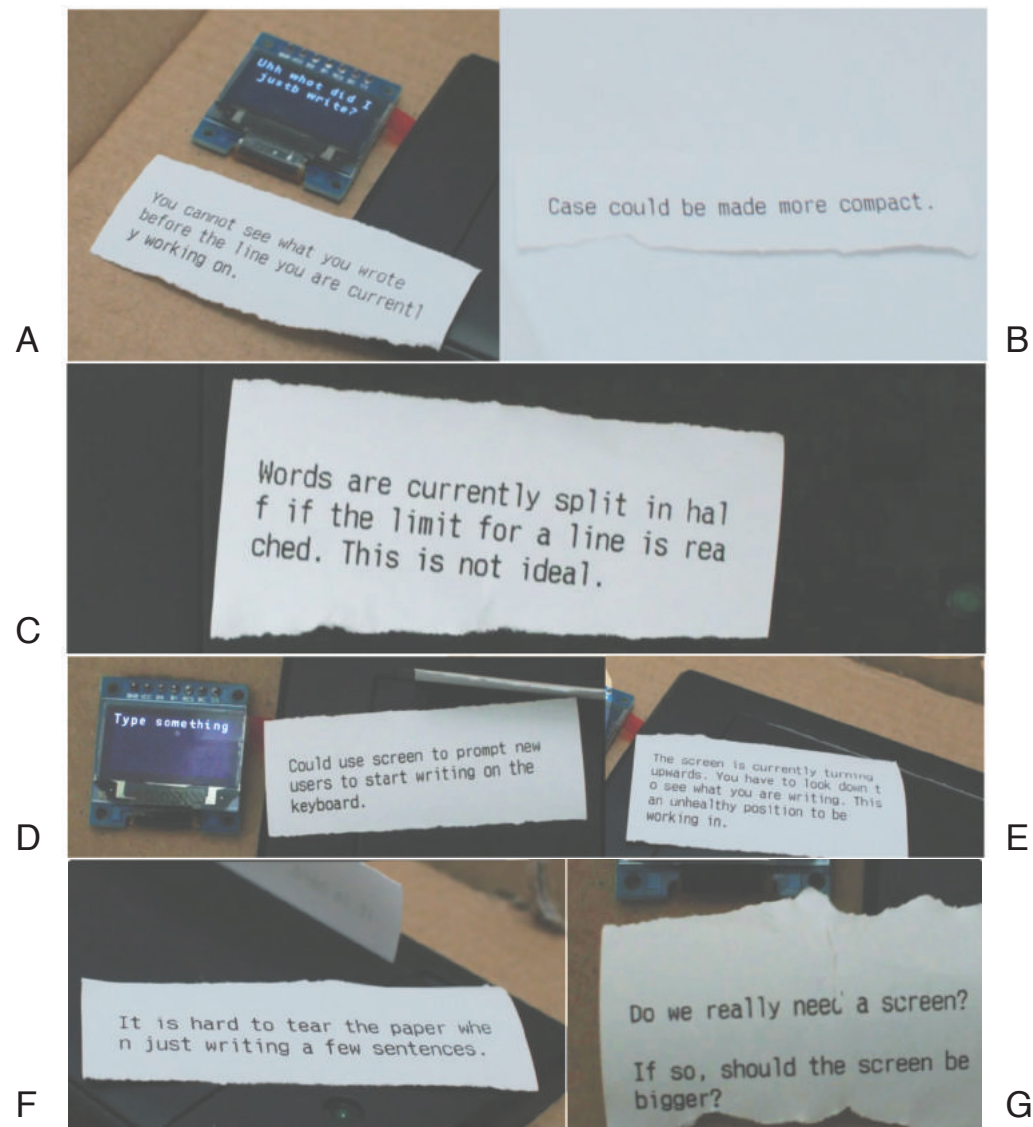
C <u>When writing long sentences the Arduino program currently splits up the words in ways which makes the sentence more illegible</u>. This can be fixed by adding some kind of processing of the text before it is printed.
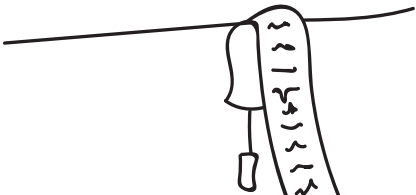
D <u>It is currently hard to see whether the device is turned on.</u> This could be addressed by making the screen display a message which prompts the user to start writing.

E <u>The screen is currently forcing the user to be in a bad position if they want to see what they type as they write.</u> If the screen in deemed essential, it should be moved in a way that makes it easy to inspect and glanceable.

F <u>The paper is hard to tear.</u> Ideally, some mechanism should tear the paper when the user wants to.

G <u>The little screen is going against the principle of not working with screens.</u> A person who is good at touch typing might not need the screen and it might make the tool more pure and simple.

A

You cannot see what you wrote before the line you are currentl y working on.

B

Case could be made more compact.

C

Words are currently split in hal f if the limit for a line is rea ched. This is not ideal.

D

Type something

Could use screen to prompt new users to start writing on the keyboard.

E

The screen is currently turning upwards. You have to look down t o see what you are writing. This an unhealthy position to be working in.

F

It is hard to tear the paper whe n just writing a few sentences.

G

Do we really need a screen?

If so, should the screen be bigger?

Based on the vision for the printer typewriter it could be developed some ways:

A2 Add a simple mechanism for the user to see what they are writing without having to bend their head or change their posture. A simple way of testing this is by attaching weight to the end of the paper and throwing the weight over a string. In that way, you would be able to see the paper grow as you write.

B2 Add a mechanism for cutting the paper. Having done some user testing, it is clear that users struggle with tearing the paper. If a good mechanism could be created it might also produce a better flow as the user won't have to cease writing to tear the paper.

C2 Remove the screen. This would make the device design easier, and the core functionality would still be there. One might argue that this design would be
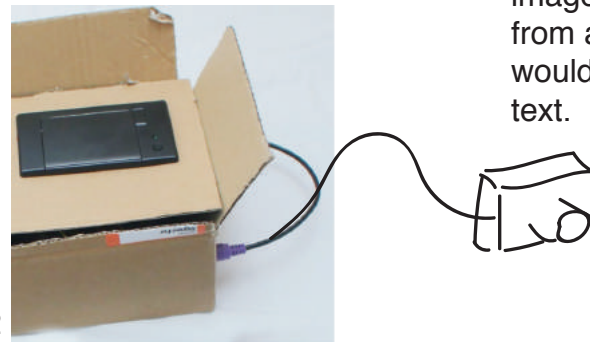
D2 Add camera input source. The printer typewriter can print certain image file formats. The challenge would be to convert an image file from a camera to the relevant file format by just using the Arduino. This would make the printer typewriter a tool for more mediums than just text.

A2

B2

C2

D2

References:

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