These frames consist of one part, typically made of plastic, with actuators mounted directly below the finger plate. This way they can be relatively low cost and low profile.

The first example (tctct2-frame-open-mini.png) accomodates a 10x16 array of 160 pins in roughly the same finger plate area as the standard Optacon display. With a horizontal pitch of 1.5mm and a vertical pitch of 1.8mm, this layout is not really appropriate for Optacon-like reading use (vertical resolution is relatively low) but it may be an attractive alternative for the 'mobile' version proposed before. Smaller versions with lower vertical resolution (e.g. 10x10, 100 pins, just covering a fingertip) may be more suitable for low cost and low power applications.

Disadvantages of this first design are resolution and power limitations, and high precision manufacturing requirements due to the actuator packing density. Also, interconnect cost will be high because of the curved actuator array without a common node available, requiring two connections per actuator.

The next design (tctct2-frame-open-mini-wide.png) improves resolution by increasing width rather than height, intended for use with more than one finger at a time. The example in the image has the same pin pitch as before but has a less curved finger plate and is rotated 90 degrees. With 28x14 pins at 1.8x1.5mm it provides for 392 pins on a 48.6x19.5mm active area, usually enough for 3 fingertips.

This arrangement has several advantages besides an obvious higher overall resolution. Pin pitch is smaller in vertical direction now (like Optacon displays), and even though the density is lower than an Optacon display it covers a larger total area, all of which consists of the most sensitive part of fingertips. Because of this I expect this display to perform quite well at lower power and frequencies. Like the previous design, it still requires a high precision plastic part and interconnect cost will be high.

Cost (including precision and interconnect requirements) can be brought down by moving to a flat lower density display as shown in the third image (tctct2-frame-open-mini-flat.png). This example has a 24x10 array of 240 pins on a 46x18mm active area display similar to the previous one. The lower density allows for somewhat higher efficiency coils, mounted on a lower precision, more heat resistant plastic frame, which allows driving at high power. Also, with actuators mounted in a flat plane coil contacts can be made to fit a printed circuit board below to simplify assembly.