Date: 01 Feb 2012
In attendance: Tibi and Francois
Location: Tibi's house
Topic: building the joint-type transducer - the entire system

Contents

Other documents

- Joint transducer Fabrication
- 2012 Jan 30 Work Party Francois and Tibi - mini oven

Small problems to solve

How to cut a Plexiglas
http://www.youtube.com/watch?v=Evzq92HfNr8

Aligning the fibers

Using a V-groove

Ideas of fiber chocks from Thorlabs- used to hold the fiber in place during the shrinking process.
http://www.thorlabs.com/search/thorsearch.cfm?search=fiber%20chuck

Using a glass tube (advocated by Francois)

The optical fiber, and polymer tube and the lever are inserted within a glass capillary/tube. First, the lever is inserted in the polymer tube. they are both inserted in the glass capillary with the portion of the polymer tube sticking out, to receive the optical fiber in it. The optical fiber is pushed inside the polymer tube until it touches the lever. everything is pushed through the glass

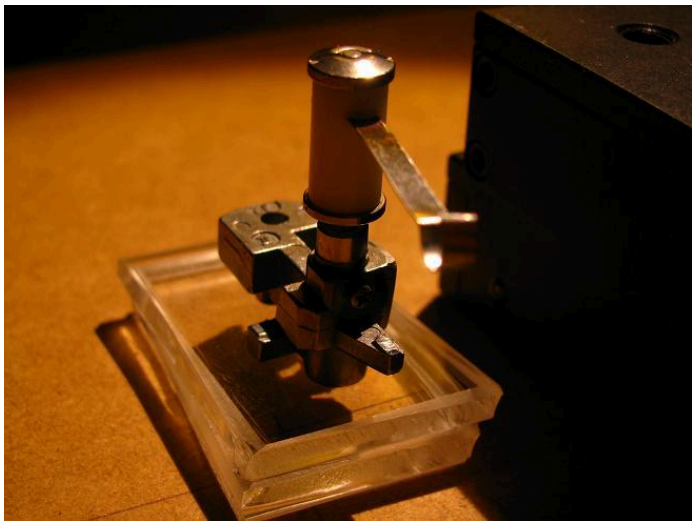
capillary until the lever exits at the other end. The lever must exit in order to clamp it during baking. The optical fiber is long enough to stick out on the other side, to be also clamped during baking. The capillary tube with everything inside is inserted inside the oven and centered. The baking process takes a few seconds. The capillary tube is pulled out of the oven and the sensitive part is positioned with respect of the end of the glass capillary and fixed in place with glue. The lever is trimmed if necessary. The optical fiber on the other side if cut to the measure, and inserted in the SC connector.
Like in this trial, Building the mini oven (2012 Jan 30 Work Party Francois and Tibi - mini oven) the advantage of this method proposed by Francois is that the same glass tube in which the fibers are aligned AND “baked” will be part of the device itself. Therefore a part of the assembly of the transducer will be made at this step.

Special tools fabrication

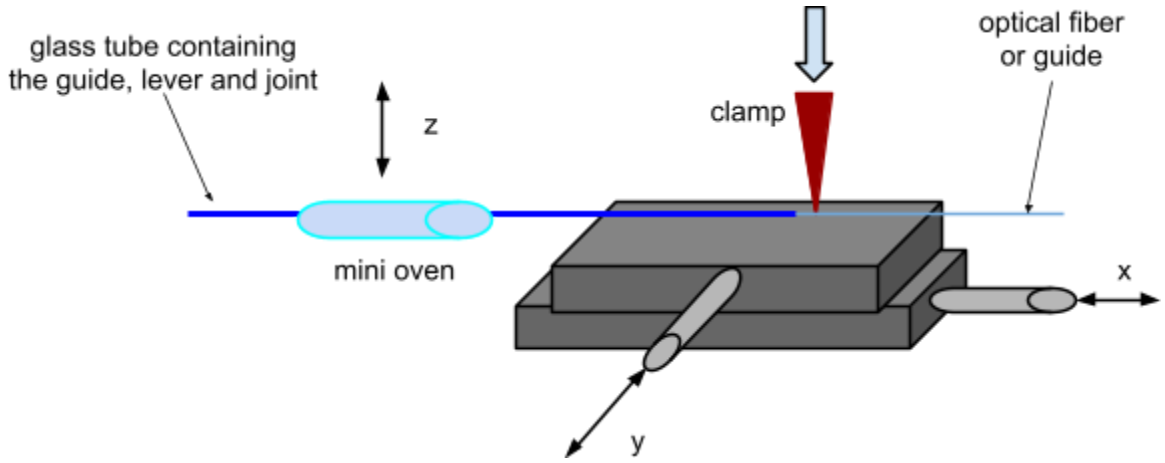
See polymorph casting, a polymer that softens at 65C in hot water and hardens like a rock at room temperature.

New design - Tibi Feb. 04 2011

The oven mounted on this device, which allows micron precision vertical alignment + rotation.



The entire device would look like this



I kept Francois' idea to use the glass tube (capillary), but modified/simplified the rest.
The lever (copper wire in this case) is simply attached at the left end of the glass tube (the capillary) instead of being clamped. On the right side of the glass tube the optical fiber goes outside, and it is clamped. The glass tube sits on a V-groove. The lever and the optical fiber (or the guide) must be attached/clamped in order to preserve the width of the gap between the guide and the lever, which is set with micron precision using the X axis micrometer.

The protocol in section Using glass tube must be modified now:

- First, the lever is inserted in the joint - the polymer tube. A small drop of glue fixes the polymer tube to the lever.
- They are both inserted in the glass capillary with the portion of the polymer tube sticking out, to receive the optical fiber in it.
- The optical fiber is pushed inside the polymer tube until it touches the lever.
- Everything is pushed through the glass capillary until the lever exits at the other end.
- The lever is fixed to the end of the tube using a cork, or other technique
- The optical fiber is long enough to stick out on the other side, to be also clamped during baking.
- The capillary tube with everything inside is placed on the XY stage in a V-groove
- The capillary is pushed through the mini oven.
- The capillary is centered inside the oven.
- The baking process takes a few seconds. The capillary tube is pulled out of the oven and the sensitive part is positioned with respect of the end of the glass capillary and fixed in place with glue. The lever is trimmed if necessary.
- We can also apply a drop a glue to the other side of the glue, to fix the fiber to the tube.
- The optical fiber on the other side is cut to the measure, and inserted in the SC connector.
- The SC connector is connected to the delivery fiber of the Mosquito.

The end product should look like this

See more pics here.