



HDD Recovery Notes

Things have changed

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HDD Recovery

- If you have a dead HDD and you want to get data from it, you have basically two options:
 - Send it to a service
 - Expensive
 - No guarantees
 - Do it yourself
 - Much cheaper
 - Less guarantees

Background

- I've managed to get data from more "dead" HDD units than I'd care to count over the years.
- This has been an occasional task since the late 1980s
- All of the units were 5.25" full height or newer units, nothing that involved 8" platters or larger.

Older Methods

- Adjust actuator arm set screws
- A strong whack for "sticktion" issues
- Freezing
- Platter transfer
- Controller board replacement

Results

- Surprisingly good, all things considered.
 - In pretty much every case, I managed to get data from the drives and keep them running long enough to pretty much get the most important stuff from the drive.
 - These were all "roll the dice" cases, nobody wanted to pay to recover data but wanted to at least try to get it back.

Abject Failures

- Crashed heads
- Polished platters
- Basically anything where the head got physically ripped off the armature or where the platter got damaged

Interesting Failures

- Did you know that some platters are made of glass?



Things have changed

- "Modern" HDD units (manufactured since sometime in 2009) are different.
- Pretty much none of the old methods work.
- There was a change in the manufacturing process

What Changed?

- Effectively, densities.
- Due to the density of the media, no two drives have the same characteristics or tracks even.
- All drives have an individual ROM for accessing the disk

How did I find this out?

- I was asked early this year to see if I could recover data from a 1TB HDD
- I hadn't done it in a while, so I thought it would be fun to try

Investigation

- I plugged the drive into an external USB dock
- No lights, nothing.
 - This is actually a good thing
 - No vibration, no seeking noise, no motor powering up probably means the electronics are fried rather than a disk crash
 - This is a much easier issue to fix

Investigation

- So start looking for an old drive of the same model to take the control board from
- While I was researching donor boards, I ran across references to the fact that swapping the controller electronics will not work.
- Checking into that showed that I need a control board from the same factory revision, not just the same model

More Reading

- Once I manage to find the correct board, I have to remove the ROM chip and transplant it to the donor board
 - After looking at a bunch of boards, I can see why they mention it has to be from the same hardware revision. The components keep changing

Testing

- I swapped the boards and hooked it up
 - Motor spins up
 - Connectivity light goes on
 - Check the device list, there is a disk attached

Checking the Disk

- Unrecognized format
 - That is kind of odd, I should be able to see something
 - No partition table
 - It told me I had a drive much larger than 1TB
 - Any guesses at how big?

Procedure

- Remove controller board from HDD
- Remove ROM chip from original board
- Remove ROM from donor board
- Place original ROM chip on donor board
- Solder in place
- Replace controller board
- Test

Did I mention...

- This is all surface mount now
- You need reflow tools or "field expedient" equivalents
 - I used a heat gun and a temperature controlled soldering iron
- Next time, I'll be using proper reflow tools

Pictures of the process



Pictures of the process



Pictures of the process



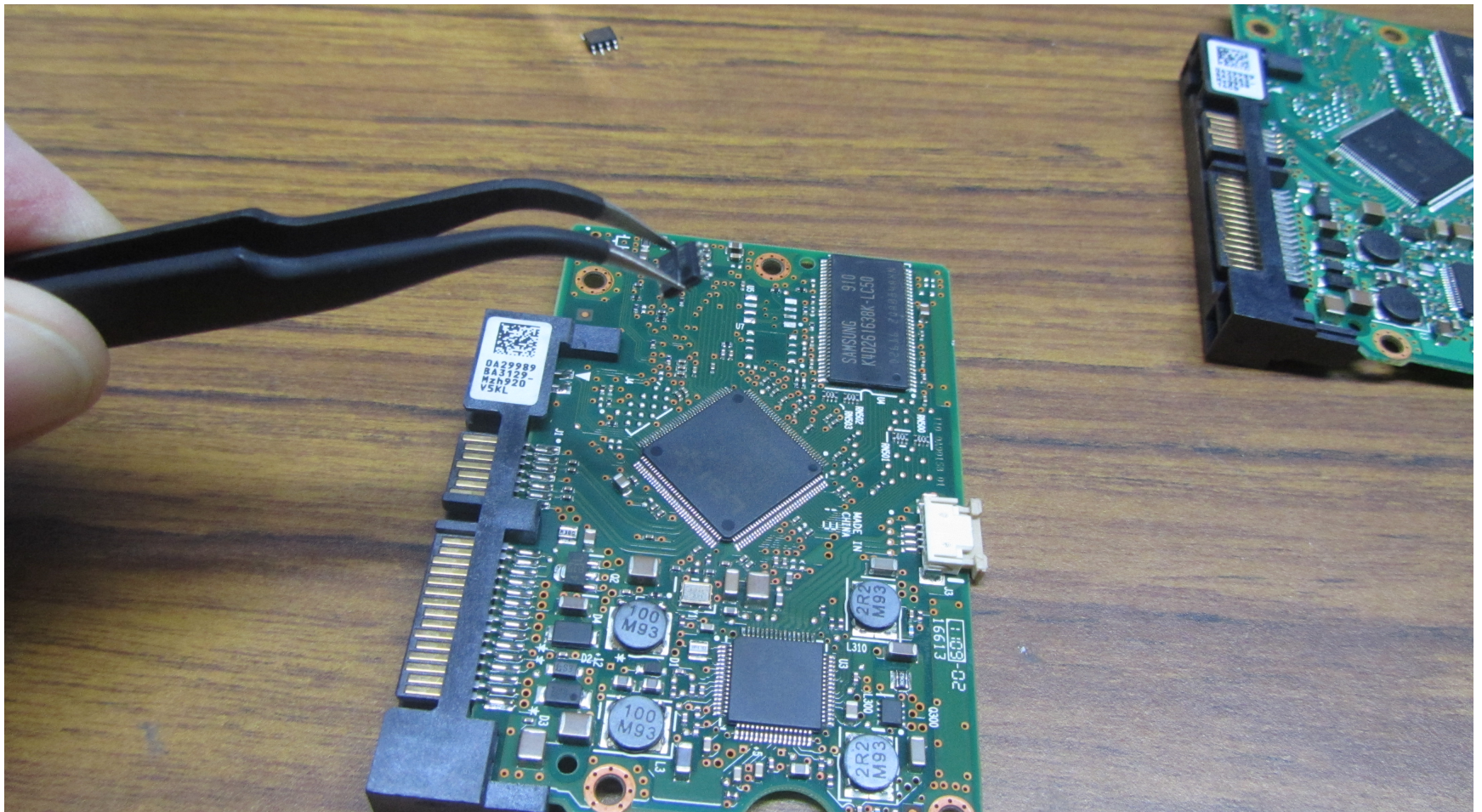
Pictures of the process



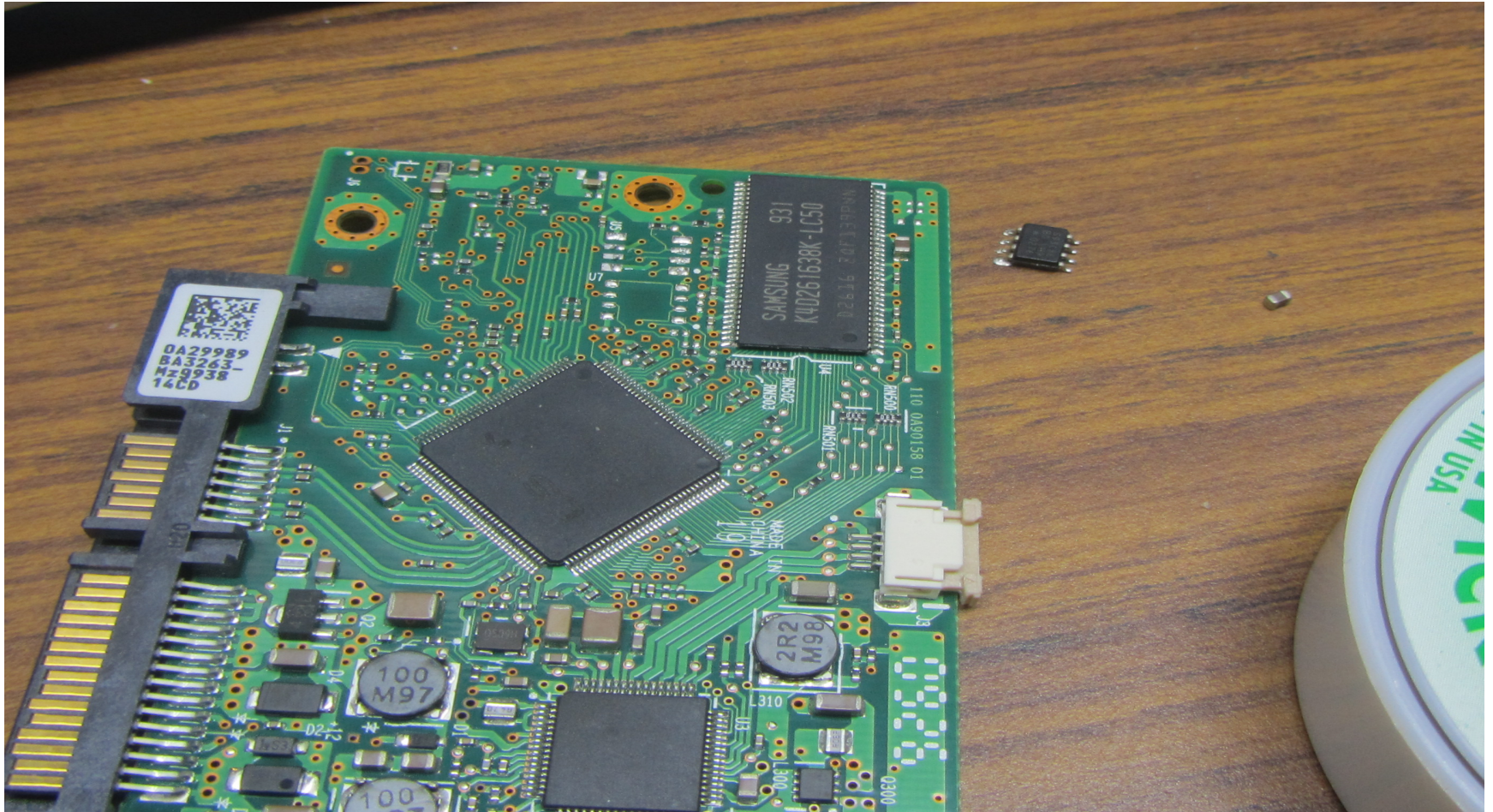
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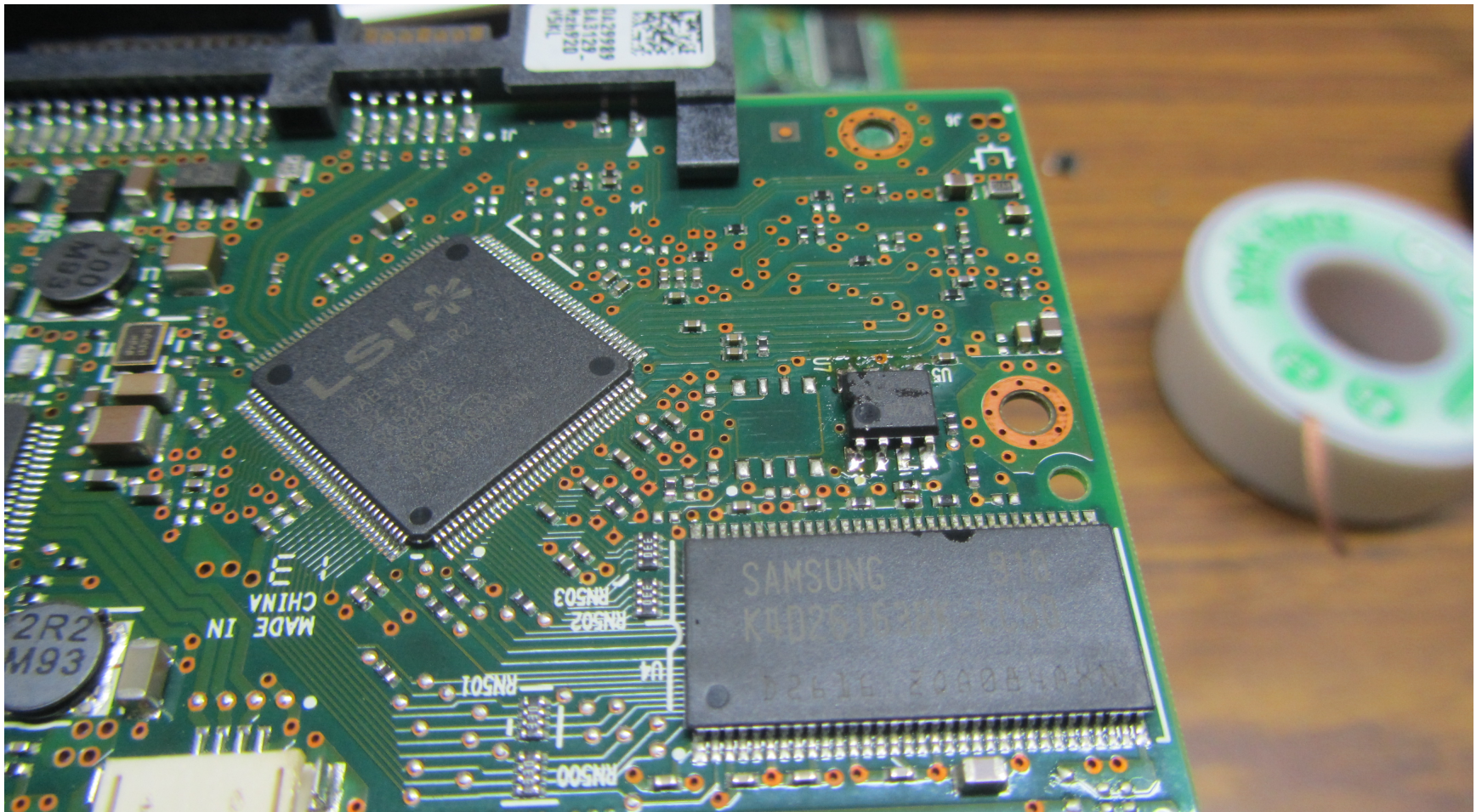
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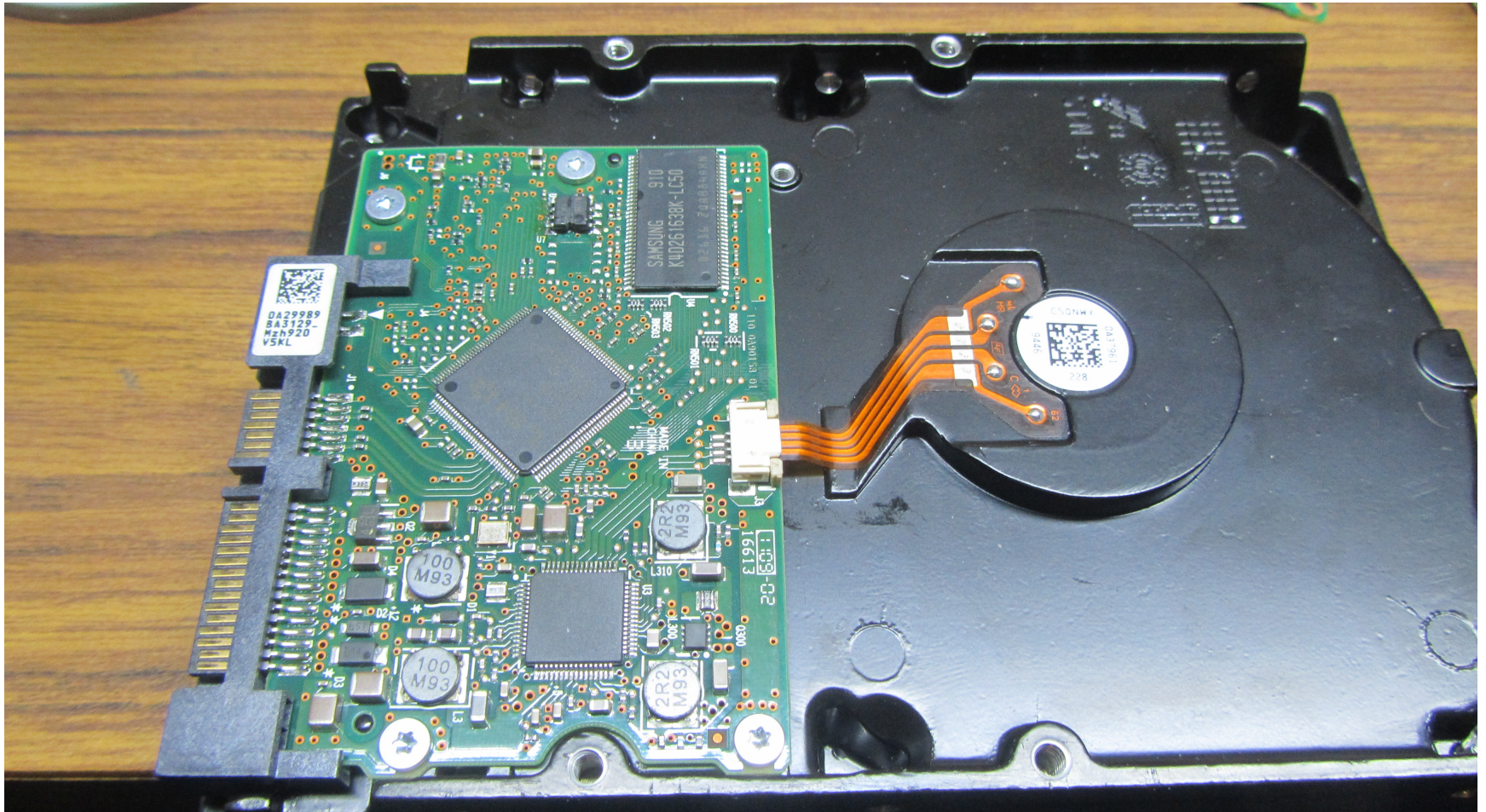
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