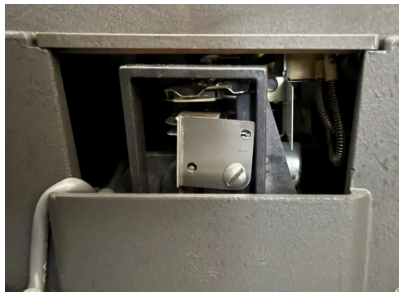


Bogner Systems DEC RL01/RL02 Bringup Procedure

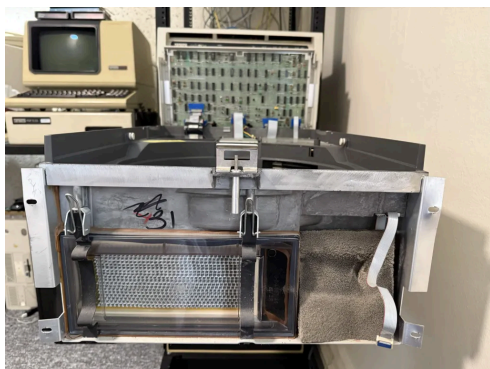
September 30, 2026

This is the procedure I followed to successfully bring up one of my RL01 drives on September 27, 2026. This is a combination of a lot of guidance from people of the DEC and Usagi Discord channels, various VCF forum posts, and the DEC technical manuals for the drives. Follow at your own risk, your mileage may vary as these drives are about 50 years old (the RL01 was introduced in '76, mine had manufacture tags from '78!). I highly recommend reading some of the DEC service manuals, refer to them for questions on removing parts, they are an excellent resource. They can be found on Bitsavers: https://bitsavers.org/pdf/dec/disc/rl01_rl02/

- Take the access panel off the right side of the drive (two screws) and pull the solenoid down to unlock the latch for the lid. Unlatch the lid and put the access panel back on. Check for a loaded pack, and if there is a pack, properly unload it from the drive. Move the little plate in front of the heads to lock them in place (loosen the screw, rotate 90 degrees in front of the heads, tighten screw).



- Take the front panel off- four screws to remove (two on each side) and one cable to unplug.
- Remove the pre filter and vacuum the front. The absolute filter is behind a clear cover, I ended up not touching it at all for fear of making it worse, and I knew I can't get a replacement for it, so it was best left alone. That might not be the best advice, but it did work for me on this drive. I have not replaced the pre filter yet and am currently running without one- if you aren't in a dusty environment, it isn't a big deal, since the pre filter is just for cooling the electronics, and does not flow air to the disk pack chamber.



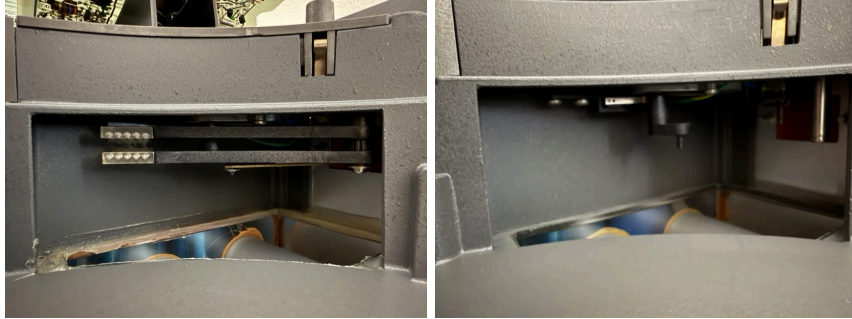
- Remove the lid assembly (four screws toward the back) and clean the back where the electronics are, as well as getting the area where the pack goes in clean. Note the back lid part has a little metal hook so it can sit vertically and hook on the back of the drive while you are servicing things, and you don't have to unplug it/remove it entirely.



- Remove the top PSU board (to the right of the head assembly, 4 screws) and inspect the PSU for damage. Make sure all screws on transistors, capacitors, and other components are snug.
- Replace the 115VAC fan on the back of the unit (this isn't necessary if yours is in good working order, but on one of my two drives, the fan would rattle when it was running, so it needed to be replaced).



- Permanently removed the platter cleaning brushes (RL01s had these brushes that swung out on arms to clean the disk surface, they were known to cause more problems than they solved, so I removed the arms and left the servo assembly so the electronics are happy).



- Reinstall brush assembly and PSU board.
- Remove the head control board (lifts up, be gentle because the cables that go to the heads are attached to it! 3 cables to disconnect- label them accordingly so you get them back in the right spots).



- Unplug the head servo disconnect wire- there is a wire with a connector in it that you can disconnect- on my drive it was red. It sits behind the head assembly.
- Reinstall head control board
- Verify spindle spins smoothly and belt on drive motor (back left) moves with the spindle
- Reinstall lid assembly, verify all things are plugged in properly
- Reinstall front panel
- Remove the bottom small cover (four screws, near the center of the bottom of the drive) and inspect the spindle grounding spring arm and contact. The contact under the spring arm should look similar to the photo below- if the smaller diameter part has completely worn off, the contact needs to be replaced. Vacuum and reinstall cover.



- Clean disk pack according to this website's instructions.

<https://users.glitchwrks.com/~glitch/2023/02/23/pack-cleaning>

I use Kimtech lint free wipes, the outside of a dismantled pen (wrapped the wipes around it for cleaning the pack), and 99% isopropyl alcohol. Inspect disk packs for crashes, NEVER LOAD A CRASHED PACK!



- Verify the drive is fully assembled. Make sure all buttons are disengaged (in the out position). Power on the drive with the lid shut without a pack installed. Check that all four lamps work- the LOAD indicator should come on after about 30 seconds, READY and FAULT should both come on if the drive is not connected to a host system/host system is not on, and WRITE PROT can be checked by pressing the switch. DO NOT press the load switch.



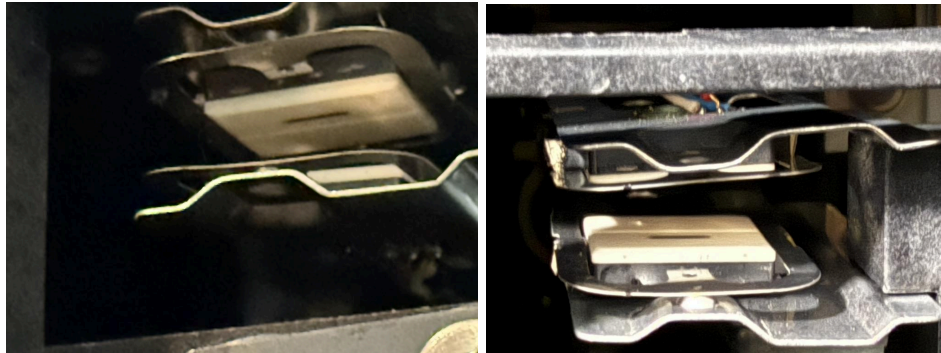
- Unlatch the lid and clean the inside of the pack chamber again- remove any dust/dirt that was missed on the first pass, the goal is to have it as clean as possible to give the drive the best chance of working.

- Close the lid, power down the drive, and connect the drive to a host system (don't forget your terminator!). My host system is a PDP-11/34 with RL11 Unibus controller. Power on the host system.

- Power the drive back on, wait for LOAD to light up. LOAD should be the only indicator that lights when the drive is connected to a host system and there is no pack in the drive- the other indicators not lighting means the drive is properly getting a clock signal from the host. Load a pack in the drive, close the lid, and press LOAD to spin the drive up. The load indicator should go out, the platter should spin up, and eventually the FAULT light will illuminate, since the heads are disconnected and the drive can't load the heads. Listen for any problems with the pack spinning- intense wobbling, drive not spinning, etc. If it seems to be fine, let the drive sit

spinning for a while to purge air- recommended time for this varies, I did it for 30 minutes to an hour on my first drive, since it seemed fairly clean.

- Once it has purged air for a while, press load again to spin down the platter. Wait for LOAD to light up, unlatch the lid, and remove the pack from the drive. Power down the drive and reconnect the head servo wire. **UNLOCK THE HEADS!** Inspect the heads for damage/filth from a crash. If all seems well, clean the heads with a lint free cloth and 99% isopropyl alcohol (there are more instructions/opinions on this online). The terrible quality photos below show how my drive's heads looked.



- After cleaning/inspecting the heads, make sure the disk pack chamber is clean again, close the lid, and power up the drive again. Now it is time to load a pack for real! Load a pack in the drive once the LOAD light comes on, press LOAD, and the light should go out. Listen for any bad sounds while the drive spins up and the heads load- if you hear anything concerning, press LOAD, and the drive will spin back down. All indicators should be off during the spin up stage (assuming WRITE PROT is off, if you have it on, that light should be on). Eventually the READY indicator should light- this means the drive got up to speed and the heads have loaded. The FAULT indicator should not illuminate. If the drive comes ready, that should mean success! If the pack is new to you, I would image the contents with PDP11GUI connected as the console on the serial port on the host PDP-11.

A video of my first RL01 startup is here for reference:

<https://youtu.be/qCIH6wT3IxY?si=cOLMchI4xfz-eiIl>

If you've made it to this stage and your drive is running, congrats! It is pretty awesome to be able to use a 50 year old hard drive and rewarding to see one running again, especially after the work it takes to bring one up. Please post photos for the community to see too, and archive the contents of your disks!

Please let me know if you notice any problems in this procedure, or have things to add! My contact information is at <http://bognersystems.com>.