SC-3000 SURVIVORS TUTORIAL

Changing the Drive Belt on a 3" Floppy Drive [SEGA SF-7000]

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The 3" Floppy Drives in the SEGA SF-7000 Control Station are often found not working, which is not surprising considering they are now 20+ years old. There are a variety of faults that affect these drives, the most common of which are easy to fix with a little hands on. This tutorial series takes the step by step approach to how to fix these faults and get you back up and running.

Common faults are:

- **Drive Belt is worn** – This is the most common fault on the 3" drives, the rubber drive belts stretch over time, causing the symptom that the drive doesn't recognise a system disk is inserted and wont boot ["*disk not ready*" errors].
- **Drive Head is dirty –** When the drive head has an accumulation of dirt on it, this often has the same symptom as the worn drive belt but it's pretty obvious once you open the SF-7000 and can see the drive head, if it's dirty. This is also the most likely cause, if you have been loading disks fine, and then suddenly can't load any.
- **Drive shaft lubrication has dried out** - If the lubrication on the drive/guide shaft has dried out, this can cause a partial boot, or the symptom where you can load some programs on a disk, usually those stored first, and then cant load the rest.
- **Drive Stepper Motor is out of step** – This causes the drive not to be able to find track zero and thus can not boot a system disk. Fairly rare.
- **Faulty Disks** – Remember, the drives are 20+ years old, but so are the disks. If you have trouble with any disks, you may wish to manually slide open the disk door and examine both sides of the disk for signs of gouge damage, if found, the disk should probably be thrown out. You may also see mould & mildew spots, which can be carefully cleaned with a Q-Tip dipped in a very small amount of Isopropyl alcohol.

This tutorial guides you through opening your SF-7000, removing the 3" drive and replacing the drive belt. See our other tutorials in the series to fix other common issues.

Note – There are a variety of 3" drive models used in the SF-7000, this tutorial shows the Belt replacement on a EME-150 [ME25PB56] Matsushita Drive, but most of this is relevant to other models too.

> **DISCLAIMER –** *By carrying out the steps mentioned in this tutorial you accept full responsibility for any consequences or damages that may arise. The author & SC-3000 Survivors are NOT responsible for your actions.*

!! WARNING!!

MAINS VOLTAGES can be found inside the case!
Unplug the SF-7000 before undertaking any of these tutorials!

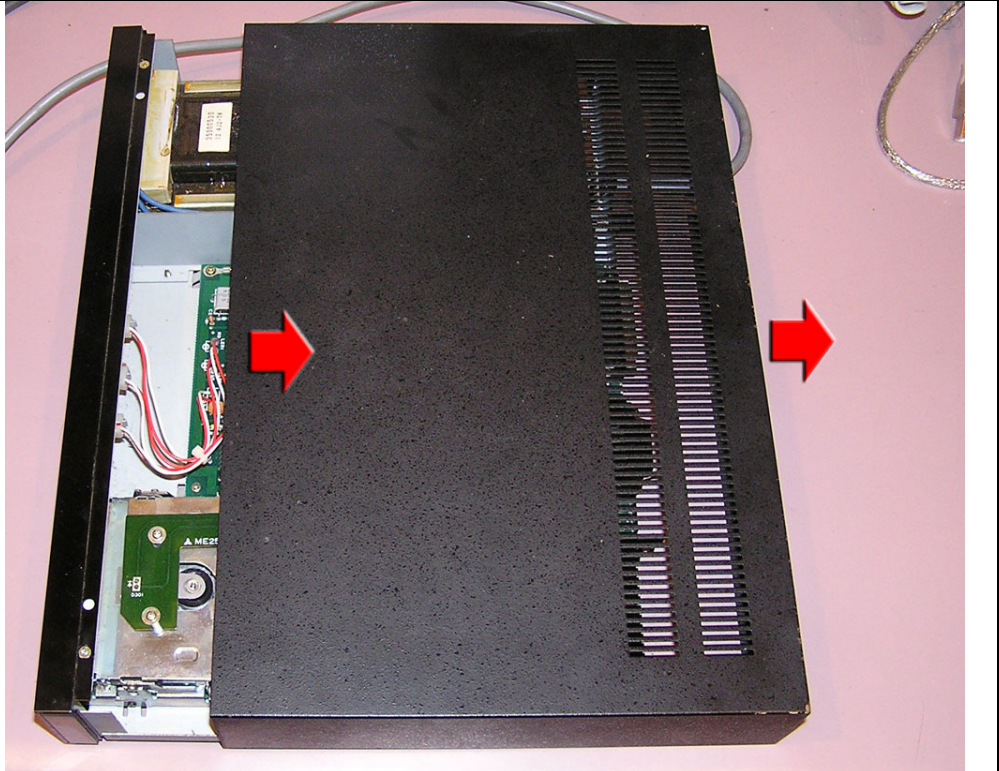**For this Tutorial you will need the following tools:**
- Small Phillips screwdriver
- Medium Phillips screwdriver
- Small Needle Nose Pliers (*optional*)
- Replacement rubber drive belt (70mm length x 3mm wide, square drive belt) - *Note that if you can't find this exact size, lengths between 65mm and 72mm have been tried and work fine, although probably wont last as long. There's even reports of standard rubber bands working, but I wouldn't recommend it.*
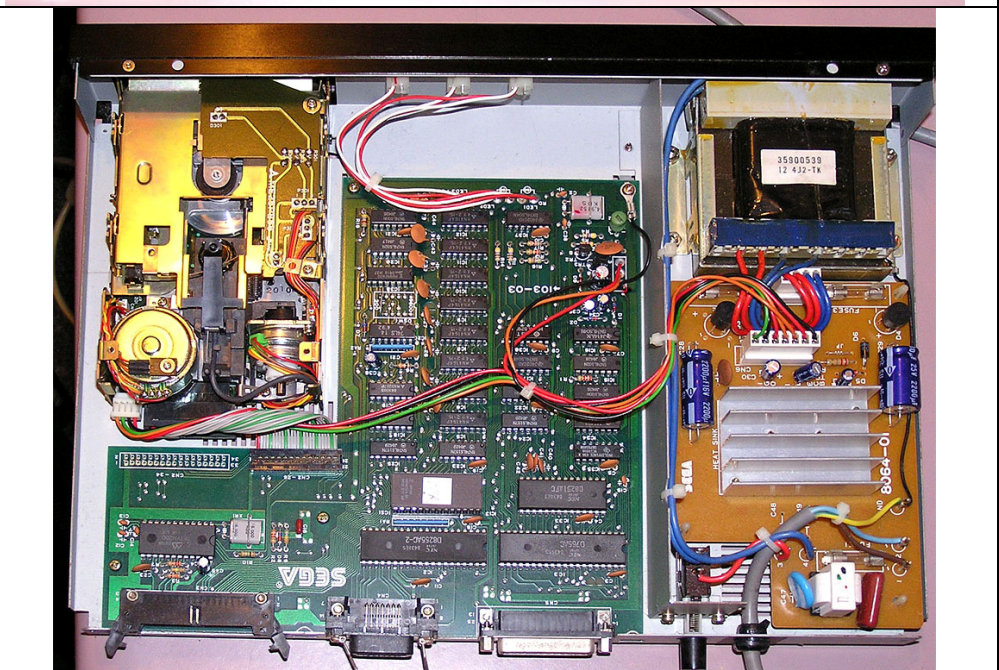
Part.1 – Opening the SF-7000:

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Unscrew the two screws on the back of the SF-7000.	
Gently slide the top case away from the front. Watch the power and the cables behind the transformer which can sometimes get caught.	
Now the SF-7000 main board, power board and 3" drive are exposed.	

Pt.2 - Removing the 3" drive:

First remove the Data and Power cables from the back of the drive.

Gently wiggle the data cable [RED Arrow] off towards the back of the SF-7000.

Then wiggle the power cable [BLUE Arrow] off the same way. Using Needle Nose pliers can make this easier.
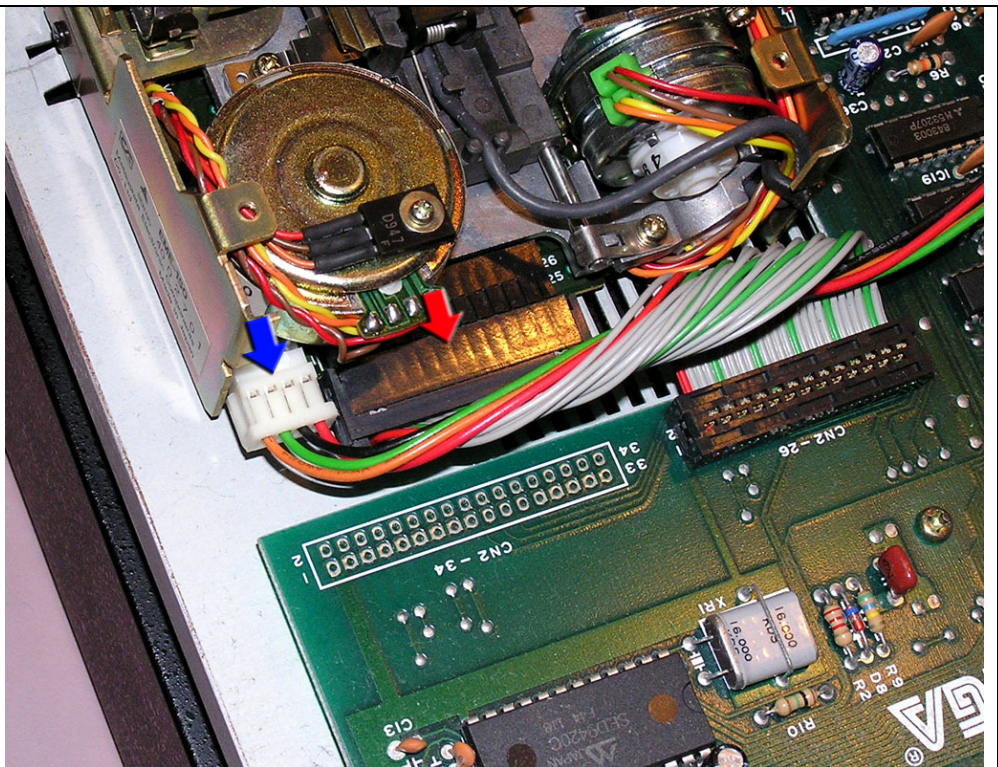
Turn the SF-7000 upside down and remove the 3 screws securing the 3" Drive to the SF-7000 casing.

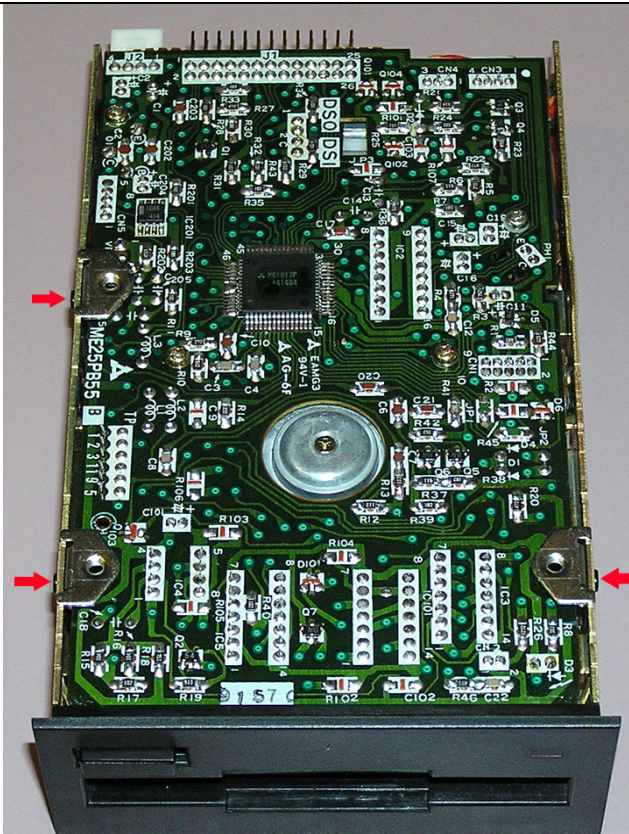The drive will drop once all the screws are removed, so make sure you hold it to stop it hitting the desk.

Slide the drive forward and out the slot in the front of the SF-7000 case.
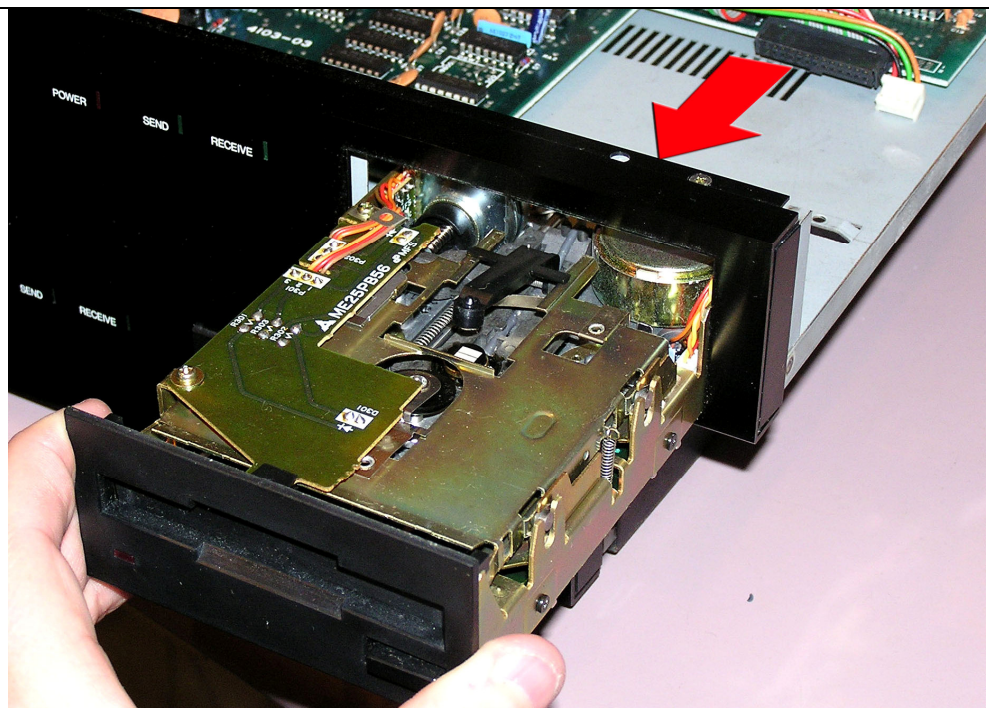
Pt.3 – Replacing the Drive Belt:

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Once the drive is removed, turn it upside down and remove the 3 small screws holding the base screw plates in place.	
Locate the 4 screws holding the Drive's main board down, and remove. Take note of where the screw with the small plastic washer is [CYAN Arrow], as it needs to be replaced back there.	
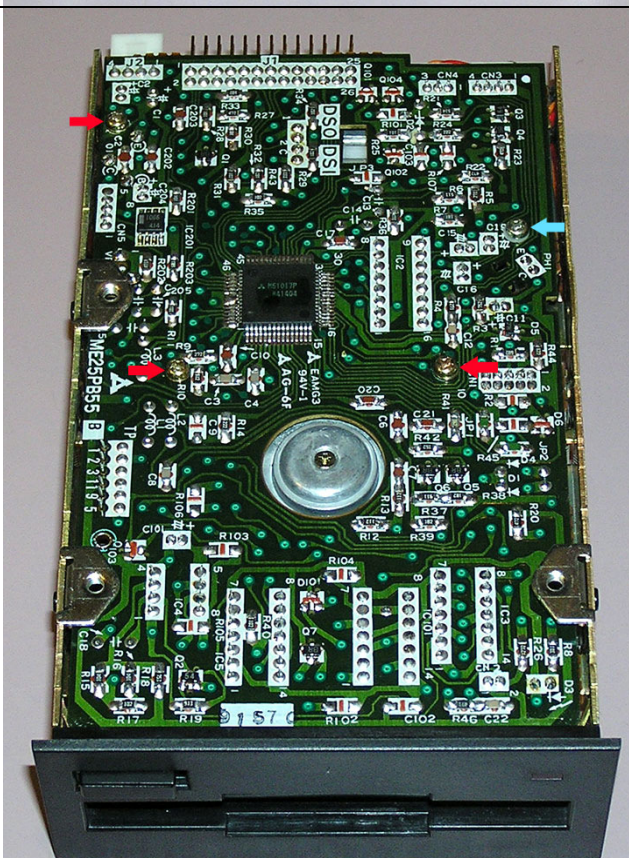
Looking from the back of the drive, remove the two small cables going to the main board from the Stepper Motor and Head.

Needle Nose Pliers make this task easier, but be careful not to damage the wires or plugs.
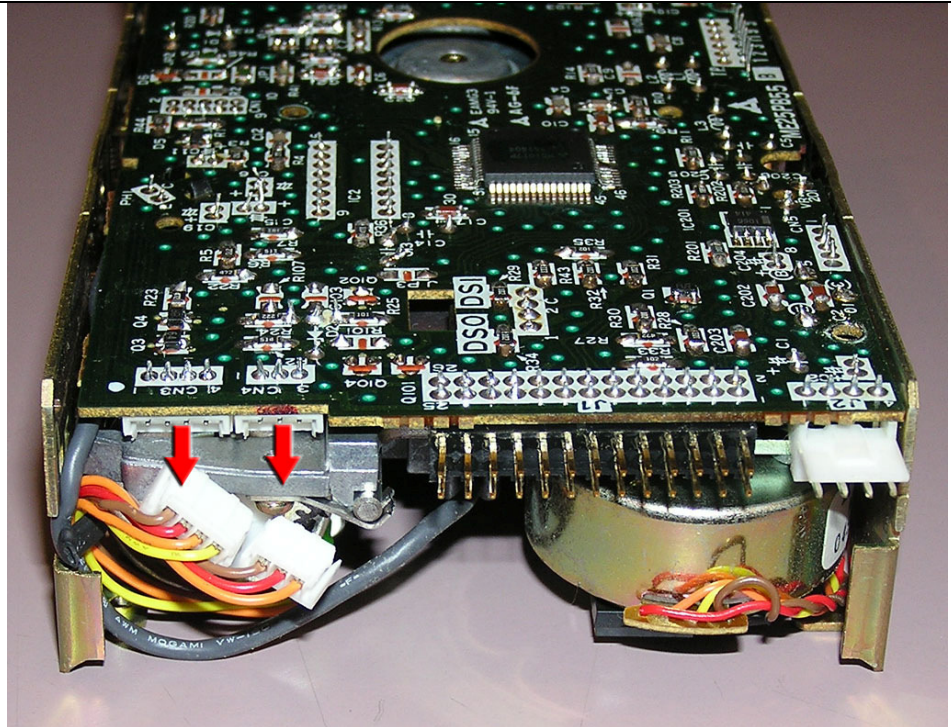

Turn the drive around so you are looking at the front of the drive, remove the small cable on the underside of the main board.

Needle Nose Pliers make this task easier, but be careful not to damage the wire or plug.
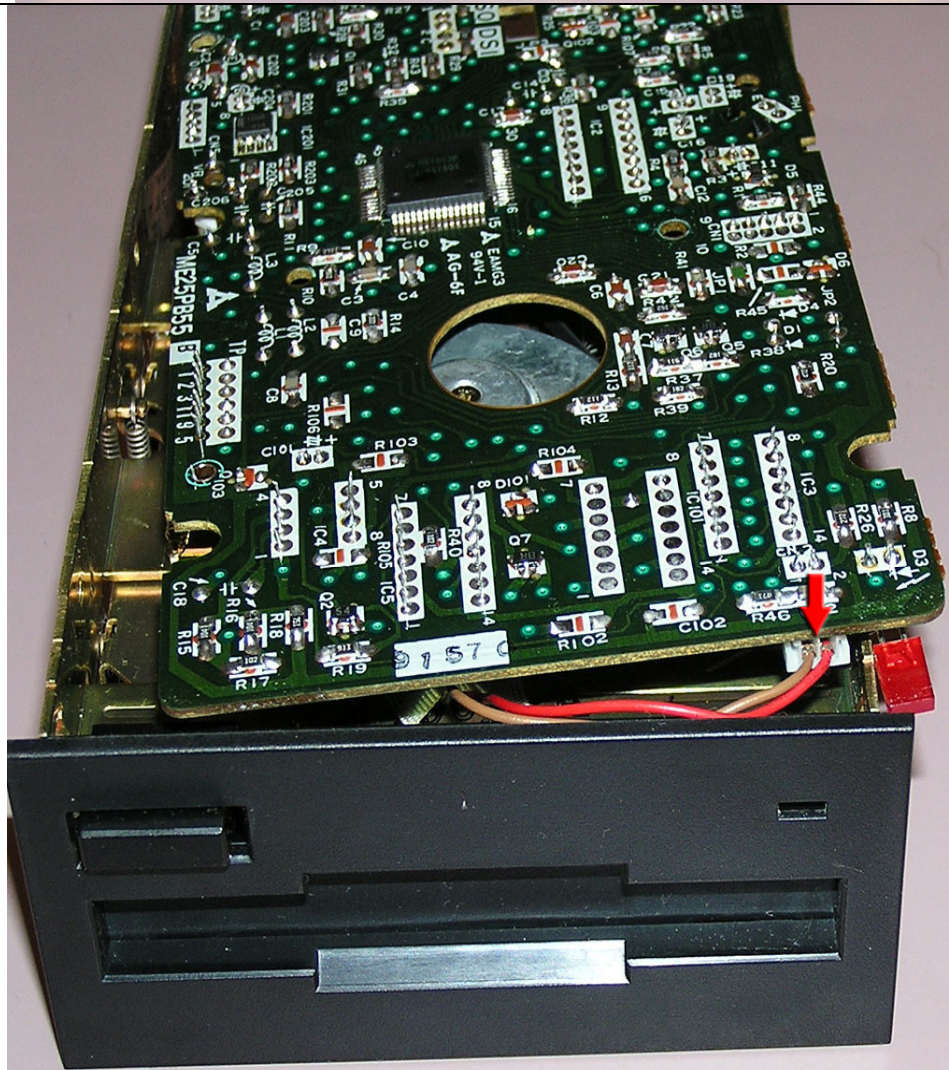
Now turn the drive around to the side (side closest to the LED) and remove the small cable on the underside of the main board.

Needle Nose Pliers make this task easier, but be careful not to damage the wire or plug.
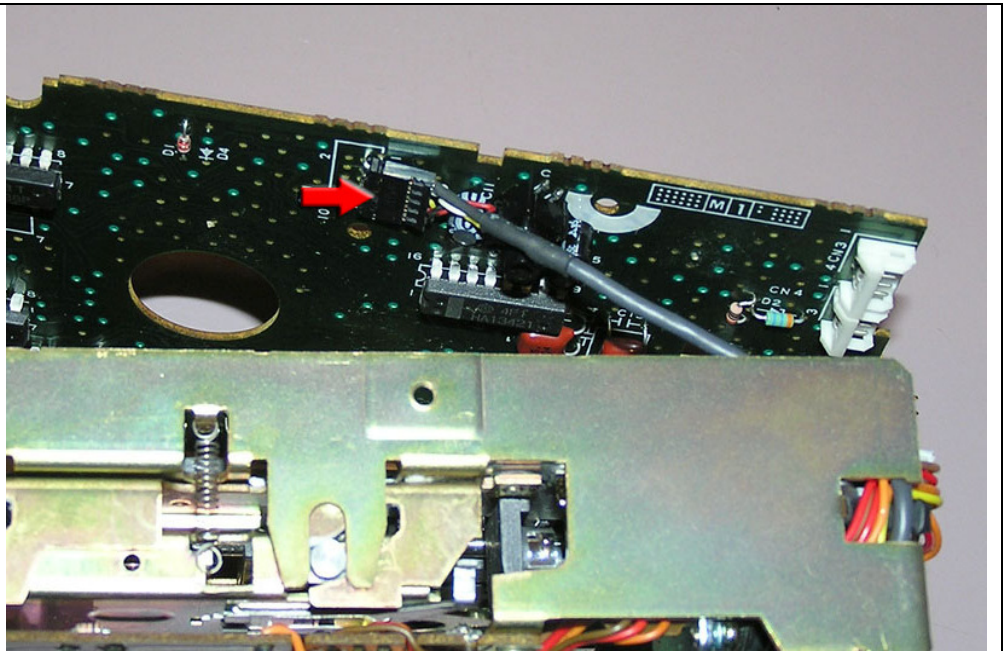
We can leave the remaining cables connected to the main board. As we can see the drive belt now. Remove the drive belt from the large wheel and then the small wheel, and place aside.

You should be able to see the difference between this old belt and the new belt, with the old one feeling quite smooth and hard.
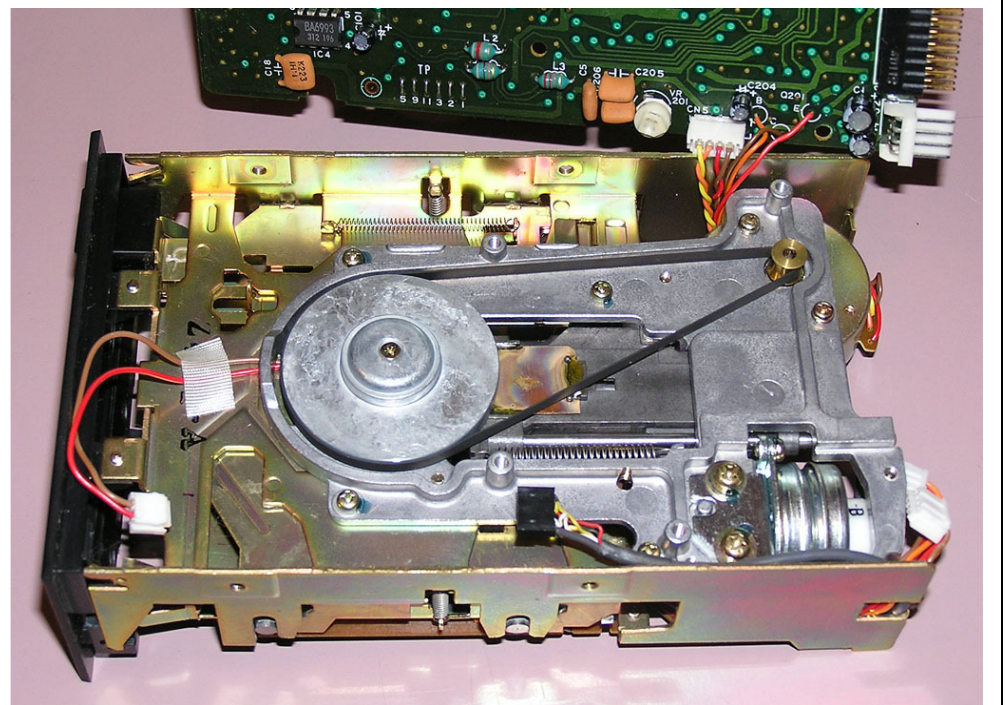
Okay, now we can put on the new drive belt.

Place it around the large wheel ensuring it's fully in the groove. Then stretch it out and over the smaller gold coloured wheel. Make sure not to twist the drive belt while doing this.

Manually turn the large wheel and watch the drive belt to make sure it's in place correctly and turns without scraping anything or falling off the wheels.

Once belt is in position, you can replace the the main board cables in reverse order to the removal instructions above [*Don't attempt to connect the SF-7000 Data & Power cables at this time*.]
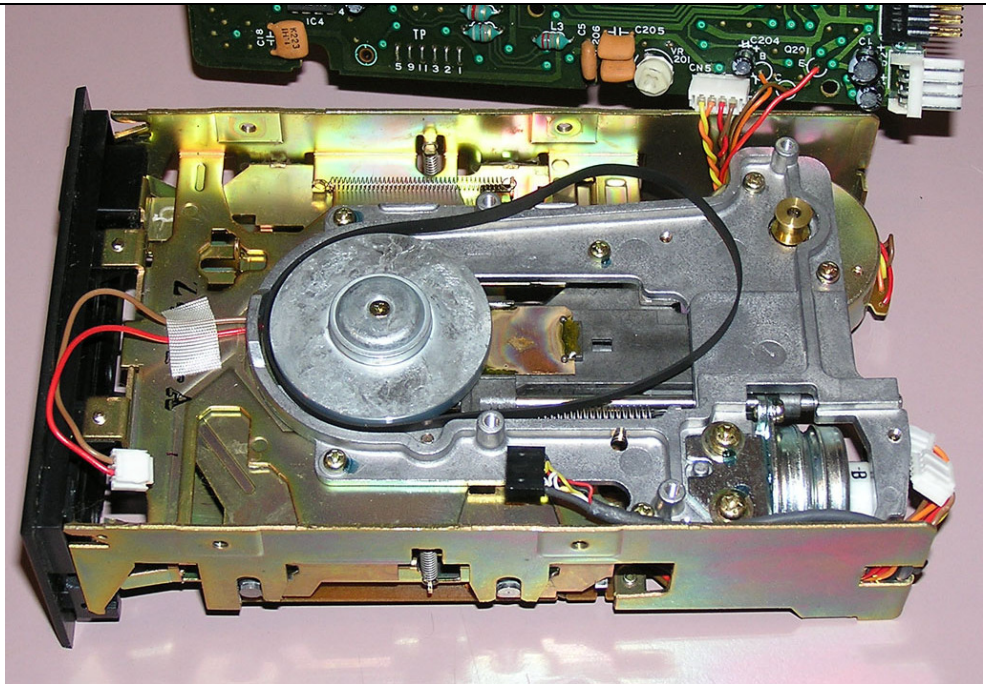

Once the cables are replaced, be careful when placing the main board back onto the chassis. Ensure line up the drive LED and slide it into the plastic slot on the reverse of the drive front plate as shown, or it may get bent or worse break off.

Now replace the 4 main board screws ensuring to replace the screw with the plastic washer in the correct place.
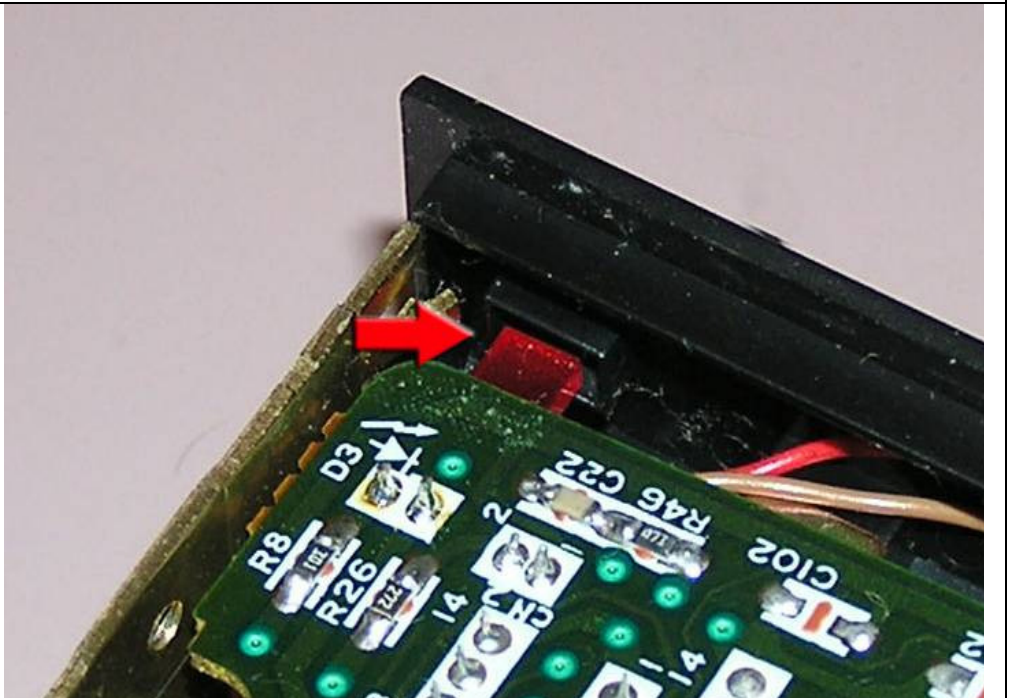
Now it's time to replace the base screw plates held in place by the 3 small black screws.

Easiest way to replace these is to hold one in place with the lip on top of the side of the drive as shown, and while holding, screw the screw in from the side.
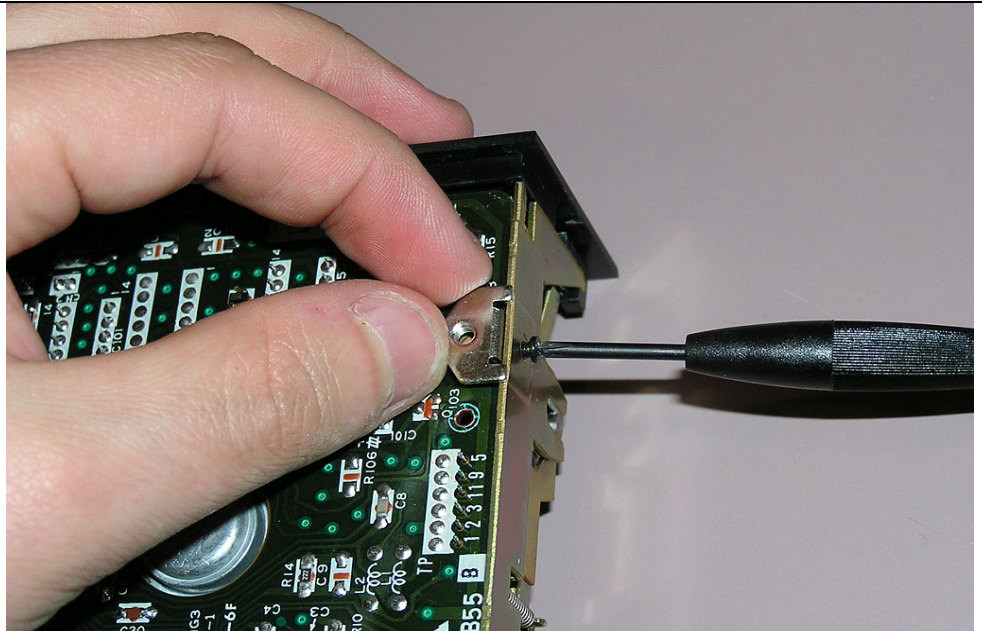

Now we need to test the results.

Slide the drive back in to the SF-7000 and hook up the Data and Power cables [*The reverse of above, Note that the red wire of the data cable connects closest to the power cable*].

Now you should screw the drive back down to the SF-7000 base and put the SF-7000's top back on, but I find it's easier to test with the top off in case there are any further issues that need dealing with.

⚠️ ⚡ **If you continue and test the SF-7000 with the top off, you do so at your own risk.**
LIVE MAINS VOLTAGE WARNING!! Yes it can KILL you!!!
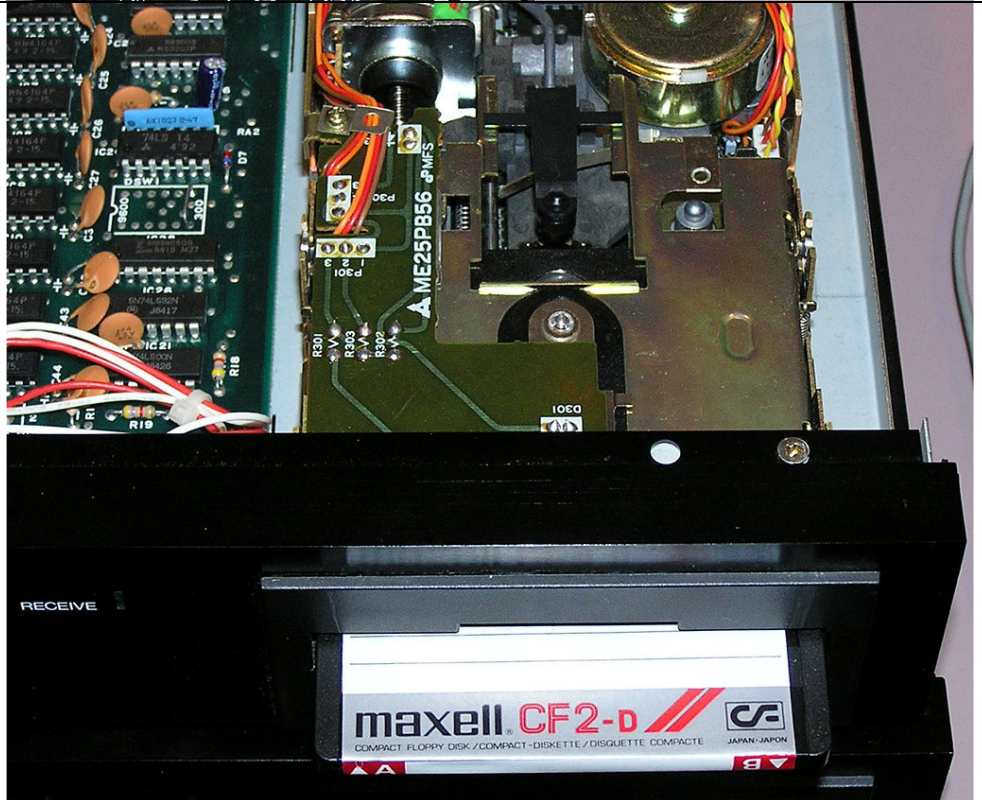
Pt.4 – Testing the fixed Drive:

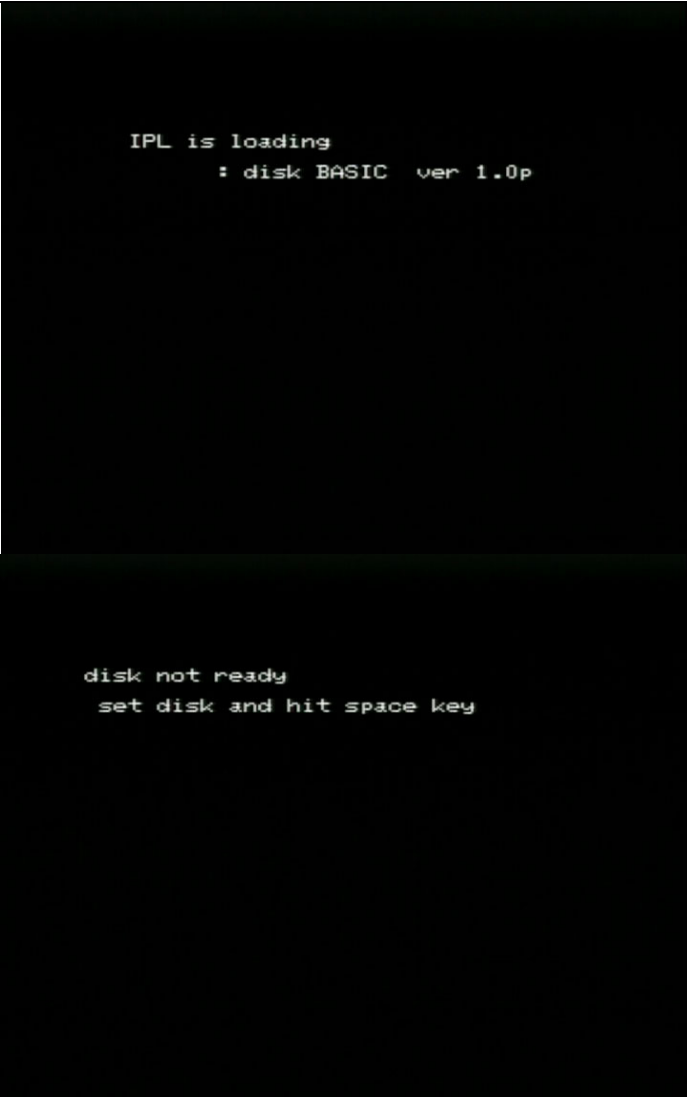If you are continuing with the top off, please DO NOT TOUCH any internals while it is plugged in, especially anywhere on the power board!

Okay , plug the SF-7000 in to the mains, and have the SC-3000 nearby with the Data Cartridge inserted and the data cable plugged into the back of the SF-7000.

Insert a System Boot disk and turn the SF-7000 on and then the SC-3000 on.

You should see the **IPL is loading** boot screen, if so, continue to the next step.

If you still see the **disk not ready** error screen, then try another boot disk. If still not working, you may have dirty heads if the drive attempts to seek the boot track [see cleaning tutorial], or a more serious fault if the drive head mechanism doesn't more at all.
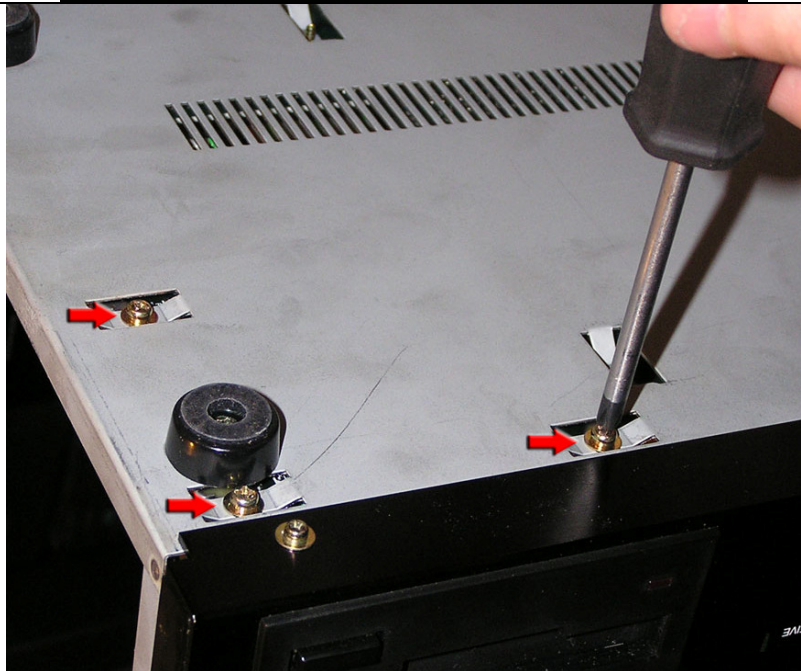

Okay, success!! I suggest giving the drive heads a clean while you have the top off, see our cleaning tutorial for info.

Once that's done, secure the Drive to the SF-3000's base again with the 3 screws.

Then slide the top of the SF-7000 case back along from back to front. Watch out for the Power cable that can get in the way, and also ensure that the Computer and Printer latches/clips are out of the way by pushing them in towards each other.	
Then screw in the two case screws on the back of the SF-7000. At this point it's best to test again that the drive can still boot Disk Basic. If it still tests okay, you are all done. Have fun!	