

# CopyPro 5500 Autoloader Service Manual

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## Trouble Shooter

Typical problems and there solutions.

- 1) Picker goes down too far doesn't come back up when picking from input spindle

Check ribbon cable connections. Upgrade firmware/software. Lubricate vertical bar. Check vertical belt tension. Replace vertical belt.

- 2) Picker goes to pick CDs from park spindle rather than input spindle (Short spindle in front of drives)

Make sure it doesn't occur after cancelling out of an error condition. Restart system (cycle power completely off then turn back on) Upgrade to newer firmware/software. Do loose connection procedure.

- 3) Has trouble picking from last few CDs on Spindle

Determine firmware revision. Check ribbon cable connections on loader connections. Upgrade firmware software. Lubricate vertical bar. Check vertical belt tension. Replace vertical belt. Get taller spacers.

- 4) Output spindle full condition reported when it isn't

### Scenario #1

Observe sequence of outputting CDs. Notice how after the picker drops the CD onto the output spindle it goes down then goes back up. This is the picker doing a height check to see if the output spindle is full. If the output spindle is poorly aligned with the center of the CD when released this can cause an erroneous output spindle full condition because the outputted CD got hung up at the top of the output spindle. When the picker went to do the height check there was indeed a CD at the top. Usually this CD will either fall down the output spindle after the height check (too late) or be thrown off the output spindle completely (rare.) Align output spindle so release is more accurate.

### Scenario #2

On multi spindle machines, (600 and 1000 capacity autoloader), Input spindle 1 become output spindle 2. If the output spindle 1 becomes full before the input spindle 1 becomes empty then an output spindle full condition occurs because a spindle cannot be an output spindle and an input spindle at the same time. To avoid this condition do not fill input spindle 1 all the way to the top. Only load 175 CDs or so.

- 5) Com Err reported after Cdreplicator quits Usually quits after printing 20 or 30 discs from thermal printer

Static issue. Add static brushes. Start a print job of 15 or 20 CDs. Touch the output stack after 10 or 15 have printed. Did you feel a mild electric shock? If yes add static brush kit.

- 6) Black Squares in LCD display on stand alone system with powerpro printer.

Static issue. See #5 above.

- 7) Three blink error coming out of 'Status' LED on PowerPro II printer when it goes to print. See #22.

This error means there was no CD detected when the print file was sent to the printer. This is caused by the small black clamping pin not clamping the disc when the tray retracts into the printer. Either

- a) picker is not dropping the disc correctly into the printer
- b) The media has difficulty clamping, it 'pops out' of printer tray
- c) A malfunction of the clamp itself or sensor associated with it is causing an erroneous CD not clamped condition.

Try manually putting a CD in the tray, press 'start' button on printer, then 'print' button on printer. If it prints it is most likely a or maybe b.

- 8) Picker/loader behave erratically when moving CDs from one point to another. Was working fine for a few months then this started.

Probably ribbon cables have gotten loose or connection becomes unreliable when picker is at a certain point. Remedy is to reseal all ribbon cable connections. See checking connections section in procedure. Lubricate bars. Belt tension/replace.

- 9) Drops CDs in middle of loader when unloading.

Check for vacuum leaks, loose connections, inspect belt tension and pulleys.

- 10) Positioning errors reported in software.

Usually loose connection.

Sometimes caused by bad belt tension, especially in the orange belt. Sometimes an error condition doesn't clear properly causing this. See firmware software/upgrade

- 11) System doesn't power on

Either not plugged in, Overload issue, bad Power Supply, bad on/off button, or damaged motherboard.

**Overload Issue.** A power overload in the system is causing a protection circuit in the power supply to kick in and not power up the system. To remedy, unplug the system from the wall, press the on/off button a few times. Let the system remain unplugged from the wall for 5 to 10 minutes, then plug back in and attempt to power up. It should startup.

**Bad powersupply.** When repeated attempts at using the overload issue remedy fail it might be that the power supply itself has gone bad. Open the CPU/Drive box. Do you see a green LED turned on near the AGP slot on the motherboard?

If yes then try overload issue remedy. Do fans on CPU and Chipset turn a little when you first push the on button after plugging it back into the wall? If yes you probably still have the overload issue. If no then replace power supply with a new one 300W or greater ATX power supply. The more recorders you have the more watts you should provide. 300 watt OK for 4 drives or less. 350+ for 5 drives or more.

**Bad on/off button.** Either it has gotten physically disconnected from the motherboard or the button or lead wires are damaged. Disconnect the switch from the motherboard. Try shorting the switch leads briefly with a jumper. If it works with a jumper but not with the button you have a bad button. With button disconnected, put the leads of a multimeter on the silver tabs on the connector that goes to the motherboard. Push the button. Did resistance drop to nearly 0? If yes button is OK.

**Damaged motherboard.** If you have tried everything else and still get no indication of a system start in any way, then the motherboard itself might have sustained damage to the components and needs to be replaced. This is rare and should be considered last

12) Printer doesn't print or How do I adjust printer output

Take printer off 'auto' strobe setting and force a value like 35.

13) CD do not release from the picker immediately when they should then CDs get misplaced. OR Only two of the three suction cups let go.

If you hear the 'psst' from vacuum system releasing but the CD doesn't immediately drop from the picker you probably have sticky suction cups. The CD usually releases from two of the cups but hesitates releasing from the third.

To test for sticky suction cups, with system off, manually press a CD into the cups then let go. CD should fall cleanly off cups. If there is a delay in the release from any of the cups then you have sticky suction cups.

The remedy is to replace the cups but if you need a quick fix then rub some dust from the tip of your finger onto the bottom of the cups. You will have to repeat this process periodically because a little of the dust will get left on the disc with each pick and eventually they will get sticky again. This problem only occurs with certain types of media and in certain environmental conditions. You can clean the suction cups with soap and water.

Remove the suction cups by pulling them off by their upper hood. Don't yank on the springy part because you will damage them.

Another remedy is to put scotch tape on the tips of the suction cups. Remove them from the picker by gently pulling them off by the upper hood. Do not pull them off by the 'springy' part (the part that compresses when touching a CD.) Put a piece of scotch tape sticky side up. Push the 'springy' part into the tape. Cut the tape around the edges of the suction cup and poke a hole in the center where the air goes through.

14) Picker goes to pick from input spindle, Vacuum kicks on then it runs for 10 seconds or so, gives up, then goes to the home position even though all three suction cups were on the CD

Cause: If all three suction cups were touching CD and there aren't any leaks in the vacuum system then your vacuum pump sensor has failed.

To test vacuum pump sensor you will need a multimeter capable of displaying 0 to 5V DC. With system powered up stick positive lead of meter into middle wire of wiring harness coming out of J6 on 5500 controller board. Put black lead ground, (any unpainted surface on 5500 chassis.) Meter should display 5V DC. Issue a pick command. As the picker gets closer to attaining vacuum voltage from sensor should get closer to 0. If voltage remains unchanged your sensor is bad and needs to be replaced. You can also short the two wires together that connect to the sensor itself when it looks like a vacuum has been achieved. If system picks normally then further evidence of a bad sensor.

NOTE: If you aren't getting any voltage reading you might not have connectivity on the + or ground connection. Systems connected to a UPS or battery backup system seem to be more prone to this type of failure.

15) System loses memory / No autoloader detected on cdreplicator. Stand alone system prompts you to put in CD manually rather than using autoloader.

Loader needs to be reattached. The positions of the drives have been lost or corrupted in the internal memory.

16) Picker picks up CD then releases it at top of stack.

Either vertical homing error or CD recorder that was just loaded is not coming ready. If vertical homing error replace vertical belt and/or adjust belt tension. Do loose connection

procedure.

If recorder not coming ready replace drive or switch to newer better media.  
Make sure disc you are copying to are blank

17) My recorders keep dropping out during the record.

Several possible symptoms. First could be your media is not suited for recording to multiple recorders at the same time. Try running a test burn and if none of the recorders drop out in test mode but drop out during actual record try some different media. (Not Kodak gold.)

Second, is the computer can't handle that many data streams at once. Try slowing the record speed down or using fewer recorders  
An UDMA66 high drive spinning at 7200 RPM is the minimum requirement for an 8 drive system. Make sure your operating system has the proper IDE driver installed for ATA100 support. These drivers typically come on CD from the motherboard manufacturer.

Third, your SCSI cables might be too long or of a poor quality. Plextor recommends 1.5m or less overall cable length.

Fourth, you SCSI card might be attempting to force a higher speed transfer than desired. Go into the Bios of the SCSI card and set the Data transfer rate to 10MBPS, disable Wide Negotiation (if applicable) and enable disconnect. For 16X and higher drives transfer rate must be 13.3 MBPS.

Fifth is some computer have trouble recording and printing at the same time. Try using business card mode. It prints first and then records separately. If printing with a Signature Ink Jet make sure it is set to print directly to port under spooling options.

18) My master with the sticker label isn't recording well.

The sticker label upsets the balance of the CD usually slowing down extraction. Make image file from source CD and copy using image file job. Use a slow extraction speed when extracting the data.

19) What is "print process creation failure?" or "unable to load CdPainter.exe"

CdPainter was not able to be accessed along with the path to the label file. Make sure CdPainter is installed in  
C:\program files\copypro\cdpainter.

Redesign your label and save it in that directory. If saving into other folders is desired add C:\program files\copypro\cdpainter to the path. In win98 add Path=%path%;"c:\program files\copypro\CdPainter" to the autoexec.bat. In NT or 2000 add ;c:\program files\copypro\cdpainter to the path under environmental variables.

20) My label printed with the .bmp or .jpg. missing, corrupt, with errors.

The associated bmp or .jpg. was not along the same path it was when the CD label was first created. (i.e. brought over on a floppy then the floppy was removed.) Choose 'embed all pictures' in CdPainter prior to saving or put the .jpg files on the hard drive before you save.

21) The recording is good the printing is bad.

If thermal printing, change printer strobe setting. Most likely it is too high. Change the dithering to 'course' or 'error correction' in WIN9X. If using ink jet printing, make sure your media is ink jet printable. Also check printer alignment, (watch it load.) If CD doesn't load properly adjust alignment. Changing to a different type of media is often the answer.

If the black ribbon is installed make sure the color mode is grey scale or monochrome and the strobe setting is around 250.  
If the color ribbon is installed make sure color mode is selected and the strobe around 325.

22) I keep getting 'CD not clamped' on my PowerPro Thermal.

Check alignment of printer. CD is not getting properly seated in printer tray. Make sure CDs are not warped. If printer indicates CD not Clamped when it obviously is clamped printer might have mechanical problems.

Both Powerpro 1 and Powerpro 2 work the same way to determine if the CD is clamped or not. There is a mechanism that physically clamps the disc. That mechanism has a flag that can interrupt a photosensor. When the tray is retracted a predetermined distance, that sensor status is checked. If the beam is still being interrupted, the CD is not clamped. If the beam is not being interrupted, the CD is clamped.

On the PowerPro 1, the entire clamping mechanism can 'stretch' causing the CD to indicate not clamped. It is usually the L shaped clamping pin getting bent so the 'hook' no longer has a 90-degree bend. There is also a piece of sheet metal that transfers the force around the hole in the center of the tray. Remove the plate on the underside of the print tray to expose this piece. If this piece 'stretches' it can cause erroneous CD not clamped messages.

On PowerPro 2 the problem can have more causes. They can be, but not limited to:

- A. Clamping mechanism on tray defective.
- B. Loose set screws on pulleys that turn gear to advance tray in and out.
- C. Bad placement of the 'home' sensor.
- D. Defective photosensor at clamping position.

The above list is in order of likelihood.

23) My powerpro does not respond to print files from the computer.

Turn everything off and turn it back on. If problem persists call CopyPro tech support. Make sure Parallel port mode in computer bios is set to 'Normal' or 'SPP' or 'Output Only.' Some newer computer only work on the powerpro series printers with the Parallel port mode set to ECP in the computer BIOS.

24) How do I interface with the robot for diagnostics/ my own software/ etc?

The robot takes keyboard commands from the serial port. Establish 9600 baud connection to com1 with no flow control using a program like hyperterminal.

These are the commands for firmware version 1.xx, 2.xx, and 3.xx

'B': No Operation (5000 Compatible / ignored on 5500)  
'D': No Operation (5000 Compatible / ignored on 5500)  
'LxxE': Load CD in destination drive xx  
(00-07 drive, 12=Printer)  
'AxxE': Unload To output spindle from  
source drive xx (00-07, 12=Printer)  
'RxxE': Unload To reject spindle from source drive xx (00-07)  
'Mxx-yyE': Move CD from source drive xx to  
destination drive yy (00-07, 11=Temporary, 12=Printer)  
'C': Calibrate command (Initialize) needs execute.  
'K': Clear Last Error  
'E': Execute command (needed for M,L,A,R,C,W)  
'S': Get Status  
'Y': Get Printer Status  
'F': Finalize reject command  
'F': Print From Printer Memory  
'G': Close Printer Drawer  
'H': Open Printer Drawer  
'U': Refill Input Spindle  
'V': Report Version  
'T': Report Photocell Status  
'Q': Inquiry Command (not supported ver 3.xx)  
'Z': Reset Internal Counters  
'N': Report Physical Unit Positions  
'W': Enter Teach Physical Unit Positions Mode (5500 only)  
'O': Clear Input Spindle Empty Condition  
'P': Clear Output Spindle Full Condition  
'?': Test Mode , Does not release CD until prompted (waits  
above drive), drops CD when detects space  
bar, test mode used is used for drive / printer  
alignment  
<CTRL>Backspace: Clear NVRAM of all data (Not supported in version 3.XX)  
ESC : Abort command

Here are the commands for version 4.XX and above for both 5500 and Mini-Max. Note: Some commands not supported by Mini-Max.

## Standard Commands (Mode 0)

Instruction	Description	Parameter Range
GS [xx] CR	Get CD from Spindle # xx	Range [xx] is 00-05
GD [xx] CR	Get CD from Drive # xx	Range [xx] is 00-15 decimal
GT [xx] CR	Get CD from Temp	Range [xx] is 00
GP [xx] CR	Get CD from Printer # xx	Range [xx] is 00-03
PS [xx] CR	Put CD on Spindle # xx	Range [xx] is 00-05

PD[xx]CR	Put CD on Drive # xx	Range [xx] is 00-15 decimal
PT[xx]CR	Put CD on Temp	Range [xx] is 00
PP[xx]CR	Put CD on Printer # xx	Range [xx] is 00-03
PR[xx]CR	Put CD on Reject	Range [xx] is 00
SR[xx]CR	Report Status on xx	Range [xx] is 00-99
VR[xx]CR	Report Version	Range [xx] is 00-99
MD[xx]CR	Set Mode to xx	Range [xx] is 00-03
KL[xx]CR	Clear Status xx	Range [xx] is 00-99
LO[xx]CR	LPT xx Open	Range [xx] is 00-03
LC[xx]CR	LPT xx Close	Range [xx] is 00-03
LP[xx]CR	LPT xx Print	Range [xx] is 00-03
SO[xx]CR	Set Option	Range [xx] is 00-08
CO[xx]CR	Clear Option	Range [xx] is 00-08
CM[xx]CR	Calibrate Motors	Range [xx] is 00

## Interactive Commands (Mode 1)

Instruction	Description	Parameter Range
TM[xx]CR	Enter Teach Mode	Range [xx] is 00-99
AS[xx]CR	Align Spindle # xx	Range [xx] is 00-99
AD[xx]CR	Align Drive # xx	Range [xx] is 00-99
DC[xx]CR	Display Configuration	Range [xx] is 00-99
MD[xx]CR	Set Mode to xx	Range [xx] is 00-03

## Command & Response Examples

Command	Response	Action
GS[01]CR	GS[01]<00>CR	Get CD from Spindle 01 returned OK
GS[32]CR	GS[32]<22>CR	Returned BAD_PARAM error
S[00]CR	S[00]<21>CR	Returned BAD_COMMAND error
PD[00]CR	PD[00]<00>CR	Put CD on Drive 00 returned OK
SR[00]CR	SR[00]<00>CR	Report Autoloader Status
SR[10]CR	SR[10]{34}<00>CR	Report Printer 0 status
SR[01]CR	SR[01]{02}<00>CR	Report Number_Of_Drives
SR[02]CR	SR[02]{01}<00>CR	Report Number_Of_Columns
VR[00]CR	VR[00]{" CopyPro, Inc. Autoloader CDR-5500 V4.0"}<00>CR	Return Version String

25) My CdPainter settings don't save.

This can be remedied by manually saving the CdPainter registry settings once, rebooting, and merging those settings back into the registry.

This procedure need only be done once. **WARNING:** Changing the wrong registry settings can severely effect operating system!

The procedure for manually saving CdPainter registry settings is as follows:

First install the CdPainter application and reboot. If using NT log

on as Administrator. Launch the CdPainter application once then close it. Push Start then run. Type regedit in run dialog box. Click the plus next to My Computer, then HKEY\_Current\_User, then Software, then CopyPro. Highlight CdPainter under CopyPro. Choose 'Export registry file' under the 'registry' menu. You will be prompted for a destination and a name. Save it as 'cdpreg' onto the desktop or other location. Reboot the system. After rebooting, right click the 'cdpreg' file and select merge. You should receive a conformation that the procedure was completed successfully. Operation is complete. Copypro Software settings are user profile specific. Changes in settings for one user profile do not change another users profile. Give user administrative rights the the machine running the CopyPro software.

26) How do I disable Auto Insert Notification (autorun) in Windows NT, 2000, and XP.

This must be done manually in the registry. Log on as Administrator. Push the 'Start' button then select Run... type 'regedit' in the open dialogue box then press OK. Expand the pluses next to the following registry entries:  
My Computer\HKEY\_LOCAL\_MACHINE\SYSTEM\ControlSet001\Services\Cdrom  
Select that Cdrom entry then double click autorun. Change the 'value data' from a 1 to a 0  
Exit registry editor.  
Reboot immediately.

27) I get an 'ASPI services not available' message on CdReplicator startup

You must download and run the ASPI update utility for your SCSI card available from the SCSI card manufacturers web site. LSI logic version of ASPI will work well and not have any hardware requirements.

28) I get blue screen of death IRQ\_NOT\_LESS\_THAN\_OR\_EQUAL in Win2000.

Download latest version of WnASPI32 from Initio web site.

Try switching SCSI card to a different slot or disabling unnecessary hardware like sound card, USB, or Network Interface Card.

29) The PowerPro 1 Thermal printer prints about 3/4 of the disc then shows vert stepper error in the LCD and just makes noise.

The print file sent to the printer was intended for the Color ribbon and the monocolor ribbon is installed in the printer. Printer driver must be switched to monocolor.

In WINNT start/settings/printers then right click Powerpro and select Document defaults then select advanced. Set color mode to grey scale or monocolor. In WIN98 start/settings/printers right click the powerpro and choose properties. Click the graphics tab then click the Color button. Specify 'Print in Black and White only' then OK Apply OK. In WIN2000 Start/settings/printers, right click Powerpro and select printing preferences, click advanced button the select Monocolor as color mode under Document Options.

30) I'm attempting to install WINNT, Win98, or Win2000 on the computer that came integrated in the CopyPro and I'm getting Boot\_Device\_Inaccessible Blue Screen or no Hard drive detected.

The motherboard has dual IDE controllers. The ATA100 controller that the HD is attached to does not have support native to these OS's. User must physically attach HD to the other IDE controller, install the OS, install the promise ata100 driver from the Asus CD within the newly installed OS, then switch the IDE connection back. You will have to remove the cover to make the hardware change. This was only on the A7V133 motherboard from Asus.

31) My machine copies a certain number of cds then stops.

This could be from several different symptoms. The first is when certain pick errors occur when the robotics are picking or placing a disc. The robotics failed to pick up a disc when it was expected to. This most commonly halts the system when printing. Order firmware and software upgrade from Copypro. Second is a static buildup occurs when printing on certain types of media with the powerpro thermal printer. Eventually this static will discharge into the robot causing it to reset. If your powerpro has a LCD display the display will usually be effected in some strange way. To see if you have the static problem, run off 8-10 disc from print only mode. Touch the output stack with your finger. Did you get a mild electric shock? If yes then you have the static problem. Order an anti-static kit from copypro if not already equipped on your system.

32) I get cannot unload CD reported by the unit on com1

Variety of causes, one solution: Slow record speed down, 8X or less.

#### Mini-Max Frequently Asked Questions

#### **When recording I get the internal CD writer ejecting rather than the Mini-Max or I get invalid parameter error message when it starts the job.**

Usually this means that the software is detecting compatible drives other than the one physically mounted in the Mini-Max. From Windows Explorer, right-click each CD-Rom and determine the drive letter(s) of the recorder in the Mini Max. The loader considers the top drive in the Mini-Max as the first drive. Once you have determined the drive letters restart the Disc Copy Plus Software. At the first startup screen click Setup button. At the Drive Sequence window specify 'Manual' then enter the drive letters of the recorders in the Mini-Max starting with the top drive and working your way down.

**Tech Note:** Changing the drive letters in Disc Management doesn't bypass this step because Disc Copy Plus uses Host Adapter# and ID# to enumerate the drives. This info doesn't change when you change drive letters in Windows.

#### **I get 'CdPainter not found in default path' at startup.**

CdPainter is CopyPro's CD label design software.

Your choices are install CdPainter and specify the location to Disc Copy Plus or change the loader configuration to specify no printer.

Install CdPainter into the default directory from the CopyPro Installation CD. At startup of Disc Copy Plus specify the location of CdPainter using on screen prompts. It should be c:\program files\copypro\cdpainter .

#### **How do I change the Mini-Max configuration to add drives or alter the location of a drive or Add a printer etc.**

The Mini-Max uses a command and response interface from the Serial port. Text commands can be sent directly to the loader from either sercom.exe (a CopyPro utility) or HyperTerminal (built into windows). First close Disc Copy Plus or any other program that might be using the Serial port the CopyPro is attached to. Launch HyperTerminal. Establish a 9600 Bits Per second

connection to Com1 with 'Flow Control' set to 'none'.

At the flashing underscore type KL <enter> (<enter> means push enter key, what you see on the screen might not correspond exactly with what you typed. No hitting backspace.)

Then type TM <enter> to enter teach mode. There are a variety of options. Use 2 to add or remove drives or printers.

See CommandSetV4\_5.doc for more detail on manual control of the duplicator.

**I reboot or Startup and the Firewire drive in the Mini-Max has disappeared from Windows and the CopyPro software.**

Make sure it is not cable disconnected or the power not turned on, otherwise . . .

Shut Down the computer and power off. Turn off Mini-Max. Disconnect firewire cable from Mini-Max. Turn Mini-Max and the computer back on. After computer completely booted back up plug the firewire cable back in "Hot". Drive should reappear in my computer.

An alternate method that sometimes works is to not power down and disconnect but simply manually eject the recorder with the eject button, then hit F5 to refresh your Windows Explorer window.

**The PowerPro 2A Thermal printer doesn't print.**

If the active light comes on when sending a print file but printer doesn't print try changing the parallel port mode in the computer Bios. The settings that work are ECP and Normal (output only). EPP and ECP+EPP do not work. Some faster computers only seem to print in ECP mode. Also see PowerPro manual for additional setup tips.

## Procedures

- Alignment
- Reteaching Drive Positions
- Loose connections
- Firmware/software upgrade
- Belt Tension
- Vaccum pump system Leaks and sensor
- Static Brush upgrade

### Alignment of 5500 series duplicator

The process of aligning the recorders and printer is very important for autoloader to function properly. If cd are getting put in the wrong place, it will cause problems for the software trying to interpret what is going on.

The 5500 loader will drop the cds to a position within a 3 dimensional coordinate. The end user can only modify the vertical coordinate. IE: adding / removing drives switching to a different printer type.

You must align the hardware to the spot.

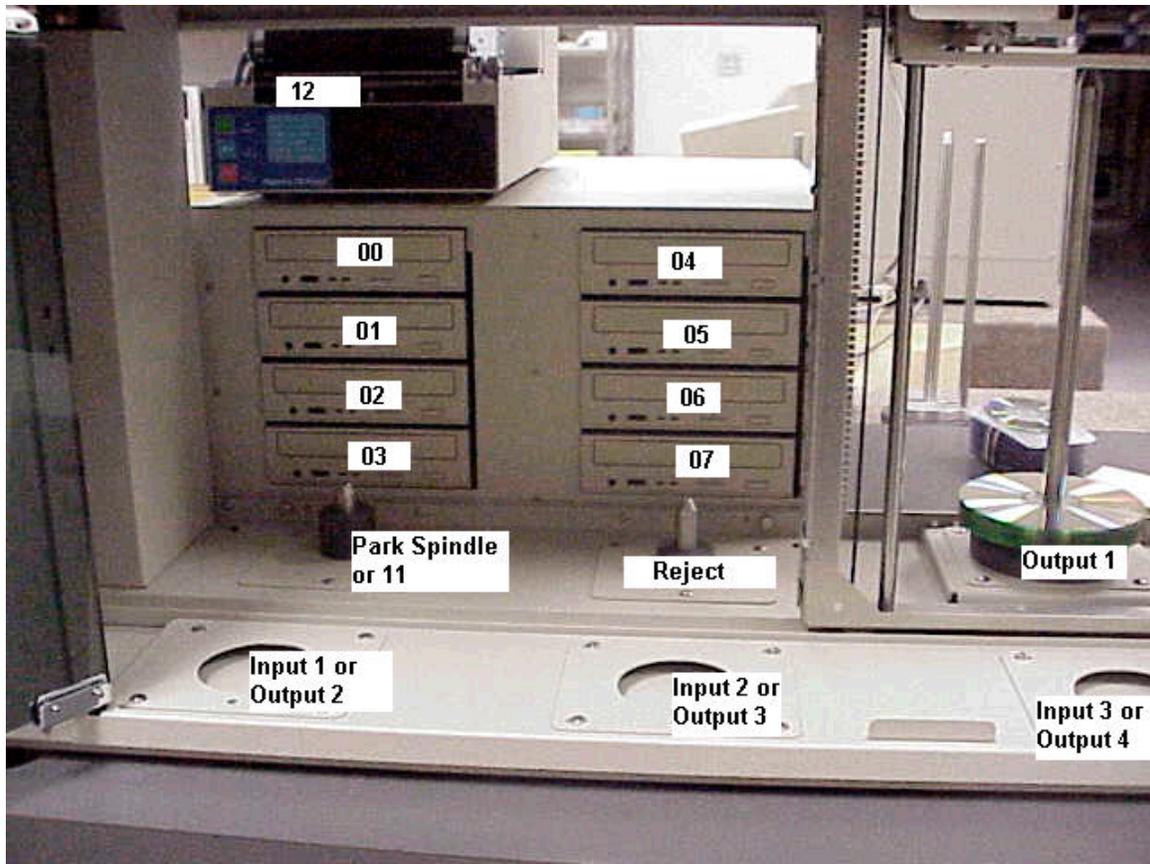
You have 3 ways of doing this. The first is to adjust the position of the spindles. The second is to adjust the position of the drive bays. The third is to adjust the position of the printer. Printer alignment is probably the most important because a poorly aligned printer will effect cd production the most adversely.

First make sure that the system is on a flat surface. Look at the drive box and the loader from the side. Where the two boxes meet is the gap between the two the same from top to bottom or is it a V shape. In other words does one machine lean into or away from the other. Use shims to put the two machines straight with one another.

The loader firmware offers some diagnostic tools to assist in the alignment process. To interface with the robotics you will need to open a terminal instance to the serial port the loader is connected to. This can be done one of two ways. The first is using a utility called sercom (on the master CD that ships with the standalone systems.) The second is to use the hyperterminal program in windows.

To use hyperterminal, close out any copypro software and launch hyperterminal (hypertrm.exe on some versions on windows). Specify your area code location if it asks. Say no to installing a modem now if it asks. Create a new connection called 5500. Connect directly to Com1 (assumes loader attached to com1). Set bits per second to 9600, data bits to 8, parity to none, stop bits to 1, and flow control to none. After an OK you should see a flashing underscore. Press the S key on the keyboard. The loader should respond with a 0 or other letter or number indicating status. V for version. If no response try turning everything off and back on and make a new connection checking port settings. If still no response try disconnecting the power cable and reconnecting it (grey cable with black connector) with hyperterminal running. If immediately goes into teach menu the internal memory has been determined to be invalid and needs to be reprogramed using the teaching process. See Reteaching positions.

Once a communication has been established between loader and computer you are ready to begin the actual adjustments. Different versions of the firmware have different commands. This will cover versions 2.XX and versions 3.XX. You can issue commands to load drive and printer positions(L00E then P then Q). There are also commands to move CDs from one position to another (M00-12E then space bar twice) and place CDs and the park spindle(M00-11E) or reject spindle (R00E). The physical positions of the drives are on the top right is unit 00 below that is 01. Depending how many drives the loader has be 'taught' it might go up to a total of 8 drives. The final drive being on the lower right. The printer on the left is considered drive 12 and the one of the right is 13. The park spindle is position 11.



To do a test load, put some CDs on a input spindle 1 and issue the command LxxE (xx being the destination drive ie: 00.) Once the CD has been picked from the input spindle it sits holding the CD above the spindle. Open the destination drive and hit a P. Picker goes to drive and releases CD. Hit Q to end sequence. Loader will respond with X is sequence completed successfully. It will issue E if there was an error. Hit S to determine error code.

This is the normal load sequence. It is mimicked exactly in the software. The normal load sequence releases the cd immediately upon arriving at the vertical position. This isn't ideal for aligning because you only have a split second to determine how accurate the placement is. To address this issue there is a **test mode**. The advantage of test mode is it will go to the position with a CD but not release it until you 'press any key' so you can make adjustment while the CD rests at the release position. To initiate test mode enter a '?'.

In version 2.xx of firmware you then repeat the load sequence. You must turn the power off then back on to return to normal mode.

In version 3.xx it will ask to specify a target drive and ask if you want to load from the input spindle or the park spindle. It will then return to normal mode once the sequence has completed. Hit ? to do another drive etc.

Additionally the version 3.xx give you the option to raise and lower the height of the picker during testing with the 8 and the 2 key on the keypad. You can use this feature to align the park spindle to the input spindle by loosening the screws on the park spindle and loading from the input spindle. Close all drive trays then hit 2 until the picker reaches the loosened park spindle. As the CD gets put onto the short spindle of the park spindle it will shift it into position. Raise it off the park spindle then tighten it down. Input spindle and park spindle are now aligned with each other.

Do testmode load from input spindle to drives. Then input spindle to printer. Then park spindle to printer (M11-12E then spacebar twice). Also go from printer to output spindle (A12E) to make sure the CD drops cleanly onto output spindle.

### Reteaching Drive Positions

Sometime the memory on the controller board gets corrupt or the user want to add more recorder drives so the memory of the drive positions needs to be reprogrammed. This process is commonly known as 'reteaching' the positions.

You will again need to interface with the robotics using one of the communication programs. The first is using a utility called sercom (on the master CD that shippes with the standalone systems.) The second is to use the hyperterminal program in windows.

To use hyperterminal, close out any copypro software and launch hyperterminal (hypertrm.exe is some versions on windows). Specify your area code location if it asks. Say no to installing a modem now if it asks. Create a new connection called 5500. Connect directly to Com1 (assumes loader attached to com1). Set bits per second to 9600, data bits to 8, parity to none, stop bits to 1, and flow control to none. After an OK you should see a flashing underscore.

There are two entry points to the reteaching process.

First is the data in memory is invalid so loader doesn't start normally. Sometimes if you power on and off again it will restore from a backup, but not always. If the data in memory is valid, when you first power the loader on the picker will go to the home position, drop down vertically a few inches, then go back up. If this doesn't happen enter. Launch hyperterminal or sercom and disconnect and reconnect the power. On your terminal screen it should appear something like 'invalid structure reinitializing' etc.

Second is the user initiates the teaching sequence (WE). Enter hyperterminal or sercom then press W then E.

Whatever entry point you use the firmware will prompt you to enter number of drives in a two digit number ie: 08 then enter. And number of columns of drives IE: 1 or 2 then enter. Don't hit backspace during these data entries. If you do, turn the power off then back on and start over. NOTE: in version 3.xx hit 3 for teach all drive positions.

After entering the # of drives it will ask you to individually open each drive tray and 'press any key'. Open drive 00 (the one on the top left) and place a CD in the tray. With the drive tray open 'press any key'. Picker should go down, touch the CD in the open tray, the return to the top. If the value is good press 1 to accept the value, or press 2 to do the vertical teaching of that drive position over. If you accept the value by pressing 1 it will prompt you to open the next drive 01. Close the drive 00 and open the drive immediately below it. Repeat the process for all recorders in the system.

After all recorder positions are set it will prompt for teaching the printer. Printer0 is the printer on the left. Printer1 is the printer on the right (assuming looking at it from the front.) If you have no printer at all you want to press 0 (zero) when prompted to teach printer position. If you have one printer you want to teach it as printer0. If it is a powerpro eject the tray and press any key. Picker should return to the left and touch the open printer tray. Like the recorders press 1 the accept the value or 2 to retry. If using the Signature series printers by primera the procedure is slightly different. The first time you press any key you want the tray to be closed. The reason is that the signature tary extends beyond center post of the loader mechanism so if you eject the tray while the mechanism is to the right there will be a collision. Just 'press any key' with the printer closed the first time and redo the value by pressing 2. Once you have aquired a good value press 1 to accept it. It will then ask to teach the position for printer1 (the second printer) press 0 (zero) for no printer1.

Once all drive and printer positions are taught it will ask to save all drive positions y/n. Press y (yes) to write all the positions to memory. After that it will say close all trays and restart system.. Part of this restart is to cycle the power to the machine. Either disconnect and reconnect the grey cable with the black connector or cycle the power to the machine entirely. Watch the picker mechanism after you turn the power back on. After a few moments it should go down a few inches and come back up indicating all self tests were successful and machine is in ready state.

If after powering back up after reteach picker fails to complete self test(picker drops a few inches and returns home) the teaching failed. Try reteaching again. If problem persists it is probably a problem on the controller board itself and part or all of the controller board should be replaced.

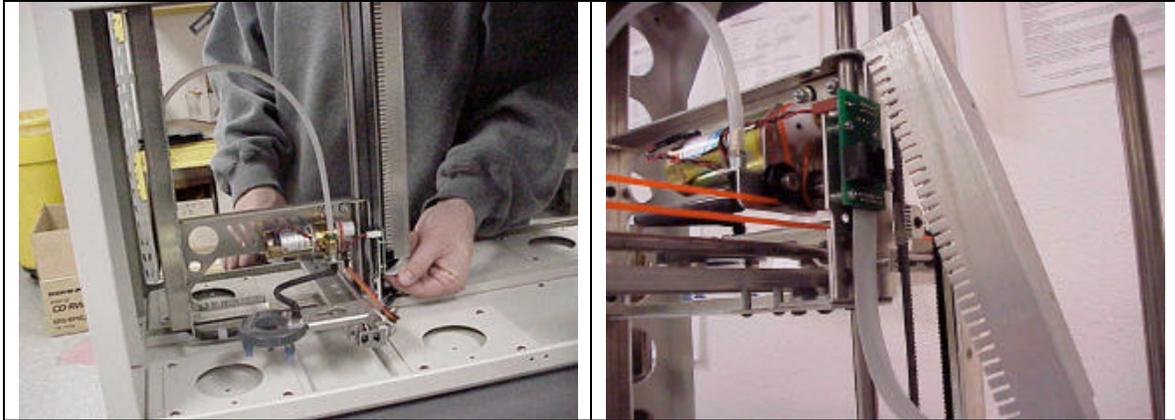
#### Loose connections

Periodically users experience intermittent loading and picking issues that seem to defy explanation. This is frequently attributed to improperly seated connections in the ribbon cables that run throughout the machine. It is easily remedied by reseating the connections. Many loader problems have been solved this way. It most frequently resolves the problem if the loader was working well for a period of time then say after 10000 disc or so started experiencing unusual intermittent picking and placing problems.

Procedure is to turn off the power. The connection you will be reseating are most easily accessed by working with the machine from the back.. Unscrew the thumbscrews connecting the loader to the drive box to give easier access to the back of the loader. Starting with the grey ribbon cable with the black connector push it gently into the green circuit board it connects with. Then push the white ribbon cable back into the board. Do with each connection. The last one is the connector that goes into mechanism that travels vertically. This is most easily taken care of by gently sliding the mechanism over and down to the bottom. Push the ribbon cable up from underneath. See illustrations



One of the connections. There are 2 such circuit boards mounted in the upper assembly.



Reseating the last white ribbon cable into it's board. (Left hand 1<sup>st</sup> finger pictured left. Pictured right, 'comb' removed, white ribbon cable plugs into bottom of board.)

After reseating all connector power system back up and retest for error.

#### Firmware/software upgrade

Periodically firmware and software upgrade are available from CopyPro. Generally the two are 'married' meaning usually one upgrade requires the other. The exact procedure is usually referenced in a readme file with the software but generally it is as follows. This is the procedure for version 4.83 of the software and version 3.12 of the eprom.

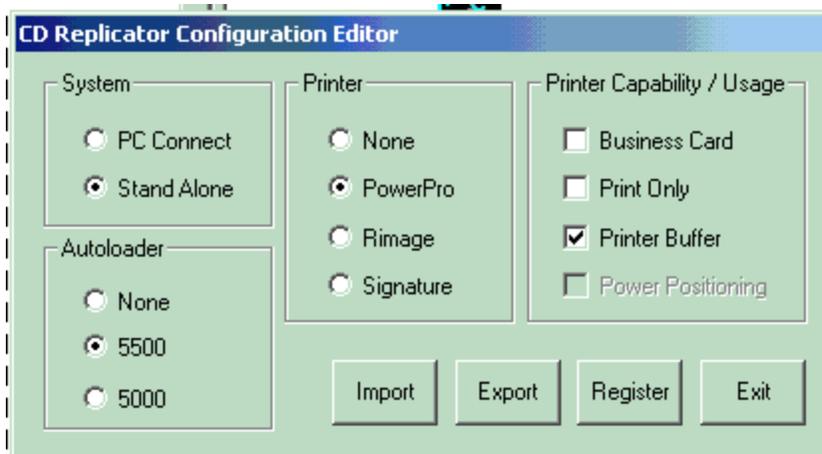
Take side panel off the loader and remove and replace the EPROM on the controller board with notch on chip facing up. See illustration under Vacuum pump system.

After firmware upgrade loader will generally need to be 'reteached.' See reteaching the machine.

#### PC Connect software upgrade

Perform an add/remove programs in control panel and remove the previous version of cdreplicator. Most shared dll's will be replaced with the new version but if in doubt don't remove them.

Run the setup.exe for the new version of CDReplicator. After install completes run the CDRCFG configuration utility, specify your configuration and click register.



### Stand Alone Software upgrade

There are two ways to upgrade the stand alone software. Manually and with the upgrade function. Upgrade functions is good but there might be certain issues if upgrading from specific versions to newer version.

### Manually upgrading software on stand alone

Backup the old version by copying cdr.exe from c:\CDR and CPPREP.dll from c:\WINNT\system32.

Copy them into any other directory than the ones they currently reside.

Then from the CopyPro update disc replace those files in those directories with the updated ones.

After files have been substituted launch cdrcfg and specify your configuration and click register.

### Upgrading stand alone software with the upgrade function.

The upgrade function essentially does the same thing as the manual but it does it through the software.

Start the CopyPro. Insert the upgrade disc into the floppy drive. Select menu/help button then use the up/down arrow key until Upgrade is displays. Press enter then follow on screen prompts. System will reboot. After it reboots run the upgrade function a second time. This write the configuration file to the registry when you run it a second time.

If you want to create a new configuration file launch the cdrcfg application specify your configuration and click export. The file name doesn't matter just make sure it has the correct extension.

## Belt Tension and motor replacement

Overtime the belts that control the movement can stretch. If there is a belt tension issues usually show themselves when picker doesn't go to the right spot when traveling horizontally. Picker doesn't finish a move from one side to another, usually accompanied by a humming sound when traveling to the vertical top or far right side. Belt replacement is recommended.

There are total of three belts. One vertical and two horizontal. One horizontal is orange or black and look like a rubber band. The other two are black, are a little thick and have teeth.

### Replacing the 'orange' belt

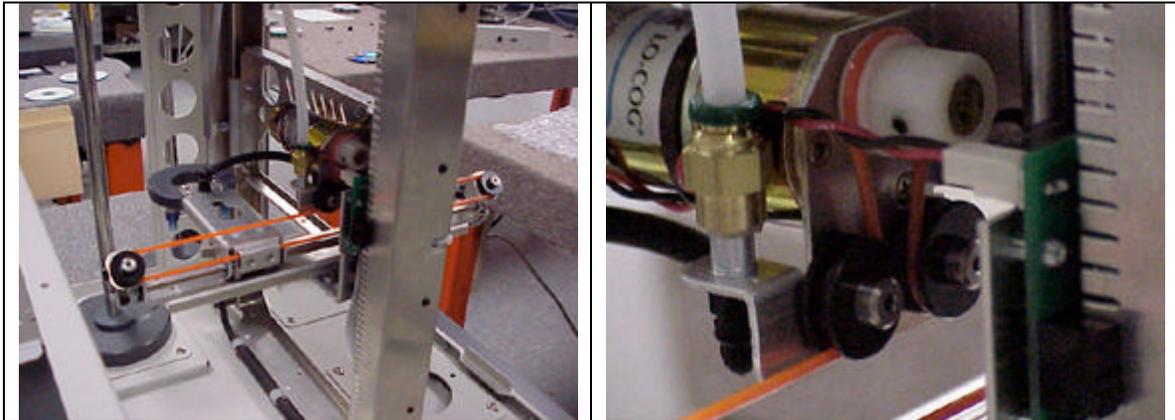
The orange belt is the most frequently replaced belt and it is also the easiest to replace. To determine if it is time to replace the orange belt watch the picker when it moves from front to back. If the motion seems to speed up and slow down during the movement, stop in the middle, or not move at all accompanied with a motor sound. Once again the work is most easily accomplished facing the machine from the back.

Shut off power and disconnect plug from wall. Drain any residual power by pressing the on button again with it not plugged in. Gently slide the mechanism over and down. Gently take the orange belt off one of the pulleys at either end. Unscrew the two phillips screws behind the picker to release belt clamp. Remove old belt.

Notice new belt has a seam in it. Put this seam behind the picker. Clamp the seam and make sure the belt is above the screws. Feed the new belt under over under around motor making sure the belt is in the groove of the white thing on the motor. Finally loop the belt over the pulleys at either end of the mechanism.

Also clean and lubricate the bar so the picker can move more freely back and forth.

The belt tension in the orange belt isn't adjustable. Replacement of the belt will make it tight. If no replacement is available you can move the white thing on the motor away from the motor by backing out the set screw and sliding the white thing away from the motor. This will increase the friction where the belt passes over the motor because the three pulleys are not in line. This will buy some time before belt replacement. Put the grooves back in line when installing the new belt.

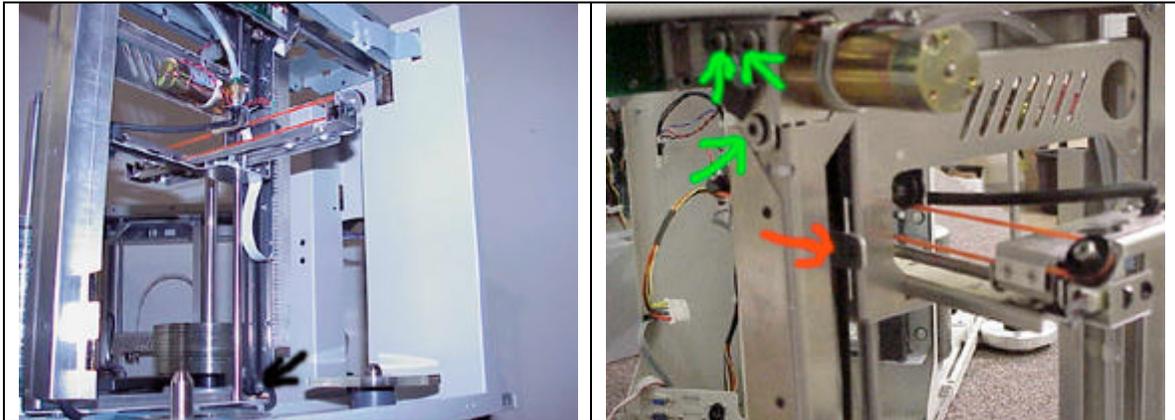


Replacing the 'vertical' belt and motor.

The vertical belt is replaced by unscrewing lower pulley bearing (black arrow) and unclipping the belt holder clip (red arrow). Make sure mechanism is at bottom when removing the clip or it will come crashing down when unclipped. Loop the new belt over the motor. Reattach lower bearing and reclip belt.

To replace vertical motor disconnect lower bearing to loosen belt. Put carrier at bottom. Disconnect wires running from back of motor the green circuit board with the wiring harness on the circuit board. Unscrew motor mount from carrier (green arrows). Replace motor. When tightening motor mount screws do not torque them hard. The tighter they are the more tension in the belt. Reattach lower pulley

Clean and lubricate vertical rod that runs parallel to the vertical belt.



## Replacing the 'horizontal' belt.

The horizontal belt runs along the top of machine. Power off and unplug all loader components. Turn machine over onto it's top and face it from the back.

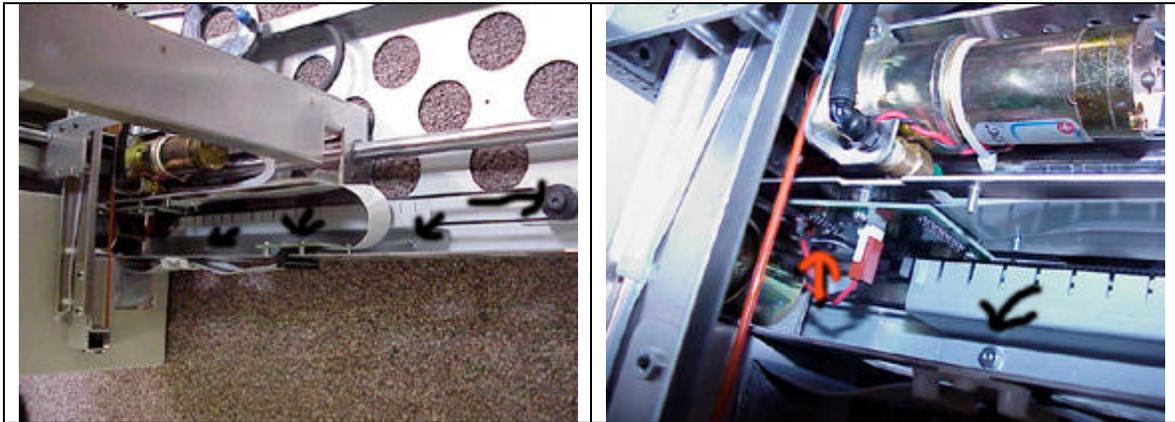
Remove the 'comb' (sheet metal with notches in it) for easier access to the belt. It is mounted with 3 or more nuts depending on loader model. Slide mechanism all the way to the new so not to damage the sensor that passes along comb. Once comb is removed gently slide mechanism over and remove screw that holds belt clip (red arrow). To remove belt unscrew the screw on the bearing on the other end from the motor. Remove belt.

Put new belt around motor. Loop around other black bearing and tighten black bearing. Secure belt clip back on belt. Replace comb. If your loader is the 600 or 1000 capacity model you will need to secure the clip before replacing the black bearing. The seam of the belt goes under the clip.

Clean and relubricate the ends of the bar that runs parallel to the belt you replaced.

If you have no replacement belt on the 600 or 1000 loader you can disconnect the clip and slice one notch off the belt and clip it back it. This might add to much tension to the belt so use as a last resort.

The tension is adjusted by tightening the motor mount screws. They are on the L bracket that the horizontal motor mounts to. You will have to take of the chassis cover for access. Look at the way the motor mounts above the controller board. How much compression the black spacers have. There is a washer on top of the black spacer then a nut. The nut should be tightened with very little torque. Then put a second nut over the first so they don't back out.



## Vacuum pump system Leaks and sensor

There are three common areas of vacuum system problems.

- 1) Bad vacuum pump sensor
- 2) Worn or damaged suction cups
- 3) Old or bad connector and orange belt motor.

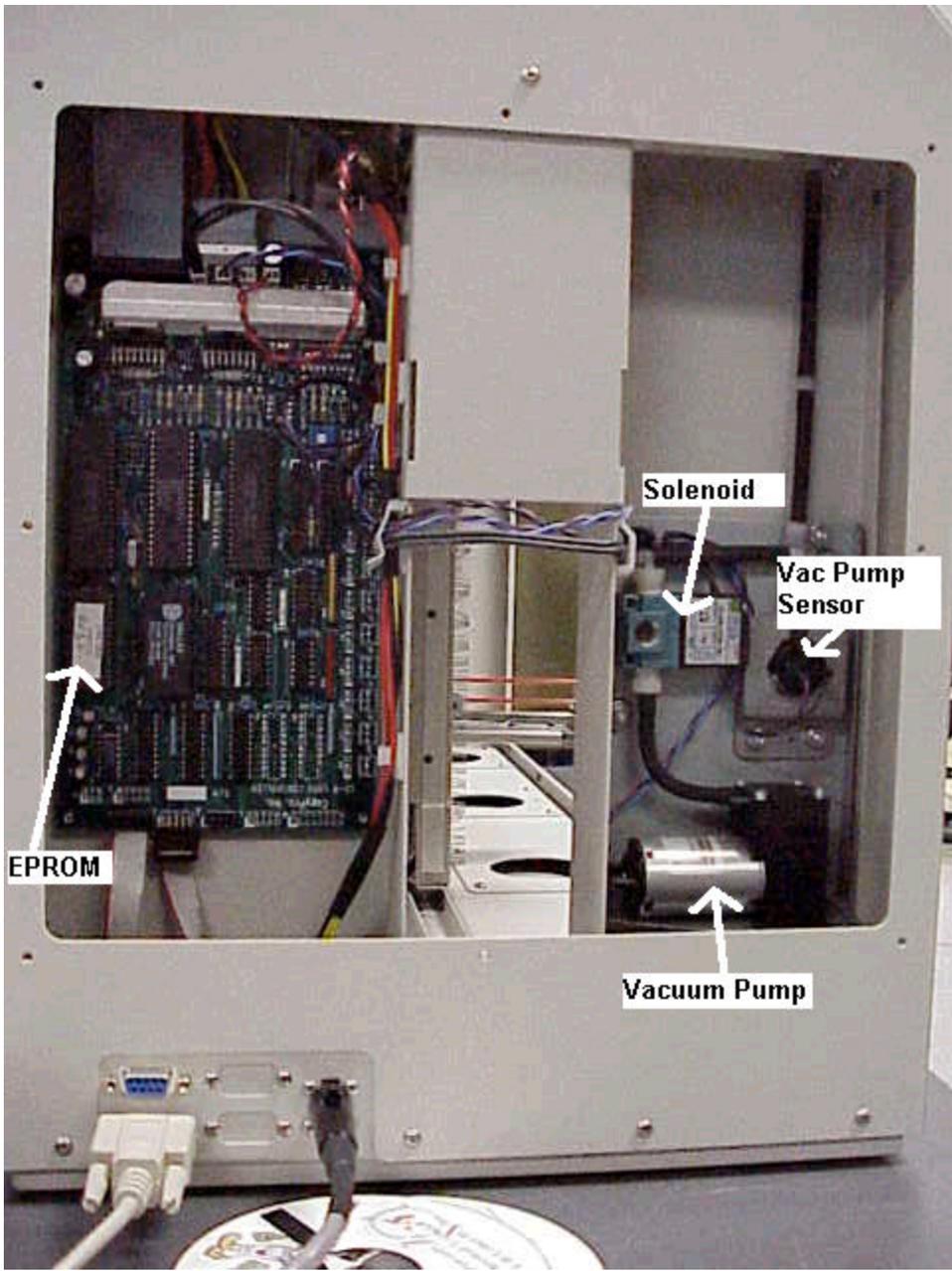
The vacuum system is leaking if you hear the pump kicking on and off while the disc is in transit. Many leaks can be blamed on the media but vacuum tube inspection is worthwhile. To determine how much leak you have pick a disc in test mode and see how long it is before you hear the vac system recharge. It averages about 15 seconds on a new loader.

The most common vacuum problem on a 600 or 1000 loader is the tube running along the top has gotten twisted and is getting pinched by the carrier as it passes about half way. Look at the black neoprene tube running along the top as the carrier moves back and forth to see if that tube is getting pinched. Is often a black residue in the bottom of the loader from the tube getting pinched repeatedly. Eventually you will need to replace the tube.

The vacuum pump sensor is a switch that is closed when vacuum is achieved. To test get a multimeter and set it to DC volts. Stick the positive lead in the purple(middle) wire on the connector coming from the sensor and going to the board at the board. Put the black lead to an unpainted surface on the loader. Meter should read 5 volts. Issue the pick command. When all three suction cups are touching the disc and pump is running the voltage should drop to 0 or ground. If it stays at 5 volts you need to replace vacuum pump sensor. You can try adjusting the sensitivity with the screw on the sensor. You can also bypass the sensor by shorting the two leads at the sensor together when it looks like it should be picking. If it still doesn't pick those wires might be bad or there is a bad leak in the tubing.

Worn or damaged suction cups would cause the vacuum to lose its grip so rapidly that the system wouldn't have time to recharge before the disc is dropped. Replace the suction cups.

Early models of the 5500 used a barb connector to attach the clear vacuum tube to the pick head L joint. This was found to leak over time. Newer model used a compression coupling. Look at the connector in replacing orange belt section to determine which one you have. If it is gold with a green circle on top you have the compression coupling.



EPROM

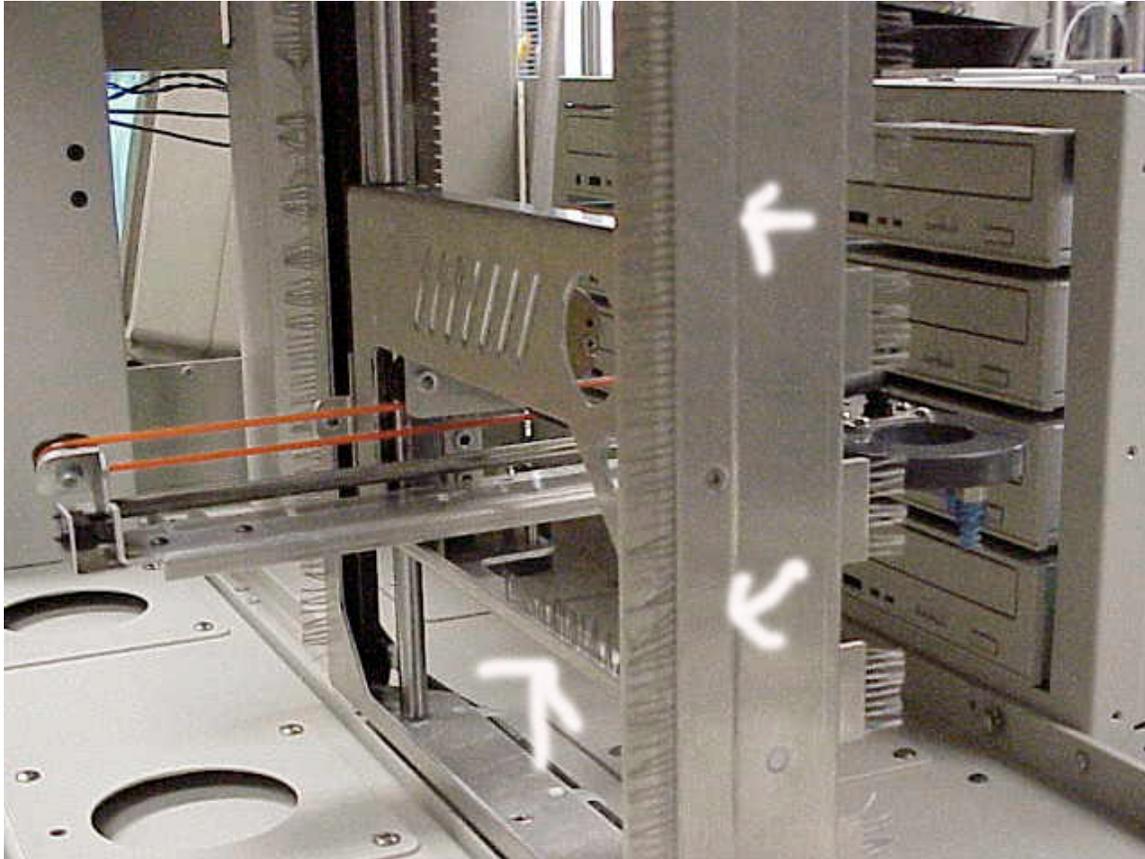
Solenoid

Vac Pump  
Sensor

Vacuum Pump

## Static Brush upgrade

Pictured is the brush arrangement for 600 and 1000. Static brushes are only needed when thermal printer is used on system. The white arrows point to the only brushes needed on the 200 capacity model.



The brushes have a conductive tape. After peeling off the white paper backing and sticking on the location, use a block of wood or plastic to force out any air bubbles in the tape. Most locations can be reinforced by the various assembly screws.