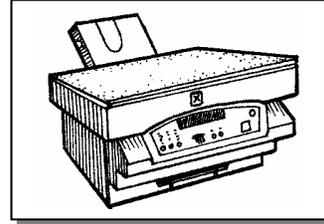


## XEROX XE-60 style (XE60/62/80/82/90fx...also Sharp AL800 series & FO2600 series) Knowing what we know now...

Back in August of 2000, I wrote an article on this series. We covered the status codes and also how to clear the drum count among other things.

Customers seem to be attached to these little guys, so it may be helpful to know a bit more about them... First we'll touch on a few of the "principals of operation" so as to gain an understanding of the machine. Then we'll fade into a few of the common problems and see what it takes to solve them.



These birds, as you probably already know, are digital. The original is scanned by an exposure lamp carriage and the image is mirrored down onto a lens which is actually an electronic reader (they call it the CCD or Charge Coupled Device). That CCD translates the image into an electronic signal (an analog signal actually)... which is relayed by a wiring harness down to the MCU Board (located on the right side of the machine). There the signal is processed and made into a digital signal (dot matrix) which is sent to the Laser Unit (sometimes called the Scanner Unit which is kind of annoying since they still call the exposure lamp the scanner). Meanwhile, the machine uses a charging brush inside the drum unit (Copy Cartridge) to create a strong negative charge on the drum's surface. Wherever the laser hits the drum, the negative charge is reduced / discharged. The mag roll of the toner cartridge has a weaker charge, so it creates a potential which allows the discharged areas of the drum to draw toner ... At the same time, the strong negative areas of the drum repel any toner on those surfaces. The result is that the areas which the laser hits become the black areas of the copy. This certainty is helpful in figuring out charge & writing related copy quality problems.

One very interesting thing about these machines, is that they have no cleaning blade... no toner reclaim. They rely on 100% transfer of the image (done by a PCR roller down in the base of the machine). Whatever little toner and paper dust is left on the drum after transfer, is first stirred around by the charge brush, and then any toner in the non image areas (not hit by the laser) is repelled because of the strong negative charge compared to the lower charge on the toner mag roll. This causes the toner to fly away from the drum and get gathered back up on the toner cartridge mag roll. During the "cleaning" cycle between copies, the charge on the drum continues and the charge on the mag roll is reversed to a positive which attracts toner and paper dust even stronger than during the copy cycle.

Because of the way that toner is reclaimed on the mag roll, it is crucial that your customer uses good quality paper... anything creating an abundance of paper dust will eventually cause problems with paper dust getting trapped under the metering blade of the toner cartridge (this results in toner starvation in narrow bands on the mag roll... so the image shows narrow deletion lines). That problem can be temporarily repaired by sliding a special tool (or a business card for that matter), between the mag roll and the metering blade. I've heard that customers with this machine who called into the OEM with complaints of this problem were sent a special tool for this purpose... so anytime the deletions showed up, they'd be instructed to pull the toner cartridge and slide the tool

across to clean the metering blade of debris. I'll bet they were also told to upgrade to a better quality paper.

You'll need to be able to get into diagnostic mode (handled the same as in the XC810 style and the XD100 style)... turn on the power and then within 4 seconds press the following sequence: 'Clear', 'Auto', 'Clear', 'Auto'. (use one finger and do it kind of quick)... when you get it right, the entire display will go totally blank. Then select the first part of the code you want to enter followed by 'Start', then the second part (after the dash) followed by 'Start' again. To exit diagnostic mode, press 'Clear' repeatedly or turn off the power.

Lets look at another weakness of this machine. The Paper tray is behind the machine slanted down into the works... so that if the customer is careless and leaves a staple or a paper clip on the platen cover... and then opens the cover, the object will fall in with the paper, and find it's way down to the Transfer Roller and the drum. The paper release lever is a large lever, which allows the paper feed rolls and clutch to be released so that the paper can be removed for jam clearance. It's a rather flimsy assembly and if it breaks (which it's known to do), the paper won't feed properly. Fortunately, that group of parts is relatively simple to replace. Problems with paper jams (E1, E2, E3, & P status codes) tend to be rather common. If the jam is cleared out and you turn the machine off and on... and the code persists, then an actuator is likely jammed up (or a sensor is bad). You'd need to run diagnostic code '30-1' ('30', 'Start', '1', 'Start') to test any of the paper path sensors. If you were to actuate and de-actuate the Paper Present Sensor, you'd see the Toner Cartridge lamp go on and off... if you flip the Paper Entry Sensor, you'll see the Paper Jam Lamp go on and off... the Paper Exit Sensor causes the Copy Cartridge Lamp to turn on and off.

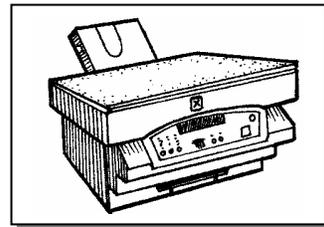
Another common thing which goes on are E7 codes... and there are a bunch of them, most of which relate to the way the light is read by the CCD and how the information is transferred from the CCD down to the MCU board (the main logic board). The manual recommends first looking for reasons that the light is not reaching the CCD properly. Run code '1-1' ('1', 'Start', '1', 'Start') to move the exposure carriage out ...and press the 'Stop' button once it reaches midway. Then you can remove the glass and check the mirrors for anything broken or out of place. If that checks out, then most likely, the problem is a bad connection or pinched wiring harness (between the CCD and the MCU board). Next in line would be the CCD board which could be failing. Keep in mind also on this machine (and with most machines with CCD's) that any light leaks causing light to come in at an odd angle can cause codes (don't try things with covers still off... reassemble the thing before you test your work).

For copy quality problems... you'll want to narrow things down a bit. A good place to start is to determine if the problem is from the optics / reading section (exposure lamp, mirrors, CCD) or from the writing section (laser unit)... or if it's a charge, developer bias, or transfer problem. Run a test pattern from the machine's memory (if the copy quality defect shows up, you can eliminate the optics and CCD). The test pattern is run using code '64-1'. It'll create a solid grey test pattern from the machine's memory. If the print looks good, then the problem is up above in the optics. Keep in mind the principals of operation we spoke of earlier. If there is something blocking the laser from getting to the drum, it'll result in deletion lines from lead edge to trail edge on the copy.

Another problem, which is cropping up a lot is CH codes (machine thinks there is no toner cartridge present). If the CH shows up with a new cartridge in place, then most likely, there is a problem with the Toner Sensor. Could also be a MCU board problem although that is less likely. Replacing the Toner Sensor, as is true for the feed tires, and fuser parts, can be an adventure... we'll cover the removal procedures for these pieces in the next installment of ENX magazine (December 2002).

## XEROX XE-60 style (XE60/62/80/82/90fx...also Sharp AL800 series & FO2600 series) Knowing what we know now...

Last month, we came approached the XE60 style copier / printers. We covered the Status Codes and some simple cures including how to clear codes from Diagnostics. The other part of this puzzle is the disassembly of the machine. It is time consuming the first few times but if you persevere and see more than one of these in a row... you'll find that like most things... it gets a lot easier once it's familiar. Knowing how involved a repair is will be critical in making estimates which are accurate... this way you won't get burned finding out that it takes over an hour to replace the Feed Roll or Fuser Lamp.



The first thing you need to do if you want to remove just about anything in this machine is to strip it naked. ... All the covers if you please. Once you've safely squirreled away the Toner Cartridge and the Copy Cartridge (drum cartridge), you'll want to start with the Rear Cover. Remove 3 screws and then lift up and off. For the Upper Front Cover, open the Front Door and then remove 2 screws and lift up and off. The Left and Right Covers require removing one screw and releasing a hook on the front end. There is a tab at the rear also to contend with. When you remove the Left Cover, make a habit of cleaning the white mylar sheet inside on the top. That is the white reference sheet for the Exposure reading. When you reassemble... make sure that Left Cover goes back on correctly. If the white mylar strip is dirty or the Left Cover is not properly seated, E7 codes can result.

Next you'll want to remove the Fan Motor Unit (from the right side of the machine). It's held on by 5 screws and there is a connector going to the fan to disconnect. Once the other covers are off, the Front Door Assembly can be removed. First disconnect the ribbon cable from the Control Console where it plugs into the Main Board on the right side of the machine. Be extremely careful with this and other ribbon cables in this machine (they're rather fragile and easily pinched in the covers on re-assembly so pay attention). Then you can remove the Front Door Assembly by releasing a hook on the right side. With the covers off, you can lift the Document Glass off.

If you need to get to the High Voltage Power Supply or the ICU Board... or the actuator for the Feed Sensor for that matter, you'll need to remove the Base Plate. With the other covers all off as well as the Doc Glass, flip the whole thing over and remove 8 screws from the bottom. Disconnect any connectors including one Ground Screw.

Mounted to that Base Plate you'll find the High Voltage Power Supply and if the machine is equipped with printer capabilities, you'll also find the ICU Board (serves as the interface for the computer cable). Take notice at this point as to how the Actuator for the Feed Sensor is positioned... it can be reinstalled backwards if you're not aware of it.

Whew! That was a mouth full already. Now you can get to the Paper Release Lever Kit (one shoulder screw holds the big lever and the smaller cam piece). The Paper Pressure Plate will also come off with one more screw.

Unfortunately... there are a few more items which need to come off before you can get to the other feed components, the Fuser Assembly, the Laser Assembly, or BTR roll.

The Main Board requires removal of 4 screws and a bunch of connectors. Then, you'll need to work it carefully out... push in the rear end a bit and then swing the front end out. Take the usual static precautions to avoid blowing the Main Board. There are 6 screws holding the Power Board onto the left side of the machine... once those are removed and the connectors are disconnected, the board swings out from the front and then pulls out towards the front.

The Scanner Unit requires removal of 7 screws... two from the front, two from the left, and three from the right side. Then the entire upper Scanner Unit can be pivoted up at the rear and lifted up and off.

The Laser Unit on which the Feed Roll is mounted (also called the upper frame or writing unit in the Service Manual) is kind of tricky till you get to know it. On the right side of the machine, there is a plate holding two gears in place which must first come off (4 screws). Then on the right side, there are 4 screws... two from the right side, and one from the top. From the left side, there are 3 screws... two from the top and one from the inside. With all that out... the Laser Unit will swing up towards the rear and can then be lifted up and out.

Once the Laser Unit is out, you can get to the Feed Roll, the Toner Sensor Board, and the Retard Rolls. The Feed Clutch is attached by a reverse screw (turn clockwise to release).

With the machine this far stripped... it is no longer a problem to get to the BTR Roll, and the Fuser Assembly. The BTR Roll is held in by a clip or anchor on the left side bushing which you need to pry in towards the center of the machine to release it. Take care not to lose the two springs (one at either end). The Fuser Assembly does not actually require removal of the Power Board although all the other stuff does need to come off. Two screws from the top and a few connectors will free it up. You'll need to move it up and then to the left, then up a little and then back to the right before it'll lift up and out.

Well, that was an adventure... hopefully it'll make it possible to repair some of these machines for those customers who value the machine enough to pay for your time.