Can't remember how much I've said about this already but I now have the installation complete - I've uploaded a video and the schematic to the 1127 files section.

Revised 9-11-10, added note about grounding the controller

Why upgrade:

1) The factory speed controller installation doesn't hold RPM all that well under load
2) It requires a ridiculous 4 finger solute on every start
3) It has no brake and it takes a long time for the chuck to spin down. This gets very tedioius if you're making a number of similar parts
4) If you accidentally switch from F to R (or vice versa) at high speed you will blow up the controller.

I chose the KB Electronics KBMG-212D controller. This is a "full wave - 4 quadrant" controller with 8 SCR's compared to the factory controller's 5. KB is the company that makes the controller that the Chinese have copied for the PM1127VF. The factory controller is NOT a KB product. I purchased the new controller from Galco in New Jersey - if memory serves it was only $115.

Specific advantages:

1) You cannot damage the controller shifting from F to R.
2) You can stop the motor with the speed control knob. Even with the 1127's belt in the high speed position you can run the lathe as slow as 50RPM - useful for deburring for example.
3) The controller has regenerative braking - it comes to full stop in a hurry. I often make multiple parts for which a single operation may only take a few seconds once the lathe is set up - the braking really improves productivity. But it is also an important safety feature.
4) The controller holds RPM extremely well under varying loads.

Installation Notes

I have documented my setup with a schematic that is posted in the files section. I've also placed a video there so you can see it in operation. If you can follow a schematic you can do this. Get yourself some hookup wire and insulated crimp

terminals before you start.

The factory controller is not capable of reversing current to the motor, therefore this is accomplished by the F/O/R switch. The new controller switches current itself, which simplifies the wiring considerably. The factory setup, in which passing through the "O" position on the F/O/R switch interrupts current flow and therefore unlatches the magnetic switch, requires choosing a direction and then using the magnetic switch to restart the lathe, each time. This is a giant pain in the ass. With my setup, you arm the lathe with the green switch and it then remains on until a) you hit the red button, b) you trip the chuck cover or gear cover safety switches (I hate these switches and have defeated them on my lathe - if you do so, do so at your own risk) or c) power is otherwise interrupted. Note that turning power OFF does defeat the regenerative braking system which requires power to function. If you hit the red switch the lathe won't stop nearly as fast as if you simply move the F/O/R switch to "O" or move the speed control to zero.

The KBMG chassis is anodized. It has a threaded hole for a ground screw but anodized aluminum is non-conductive. Be sure to scratch off the anodizing at that screw to ensure a proper ground. I used a wire brush in a dremel - I suppose sand paper would do the trick too.

KBMG-212D setup

Fortunately the factory defaults are correct so very little setup is required, with two exceptions:

1) The voltage jumpers (J1A and J1B) which come from the factory set for 220V operation must be set for 110V operation (assuming that's what you want!)

2) J3 - Armature voltage jumper must be set to "A90" - it comes from the factory set for "A180".

Armature current is set by the factory to 7.5A and I left it there. The controller has a 10A setting that requires an optional heat sink, and if you believe our motor is truly 1HP, it needs at least 10A. However I cannot confirm with QMT that it can truly handle this; and the factory controller definitely appears to be a copy of the KBIC-120 which won't do 10A either. Finally, the KBMG controller documentation says "the maximum output current is 150% of the [armature current setting jumper] J2

position" - which means in fact it is getting a lot of current. I can tell you the motor has ample torque for what I'm doing and I've been doing some fairly heavy hogging/boring. If I can ever get confirmation from the factory that it would be OK to run at the 10A setting I will buy the heat sink and probably install a cooling fan.

The factory setting was adequate for all other jumpers and adjustable pots.

The Tach Interface:

One difference between this controller and the factory one is that the factory controller supplies +/- 5V to the speed control potentiometer (called "variable resistor" on the wiring diagram) and the new controller supplies +/- 15V. For that reason I did not connect the "half speed" circuit, which also, somewhat inexplicably powers the tachometer (see next paragraph). The lathe runs very happily in reverse just as well as it does in forward.

So installing the new speed controller neuters the tachometer (read on for the solution). The great mystery of this lathe is the "filter board." I ended up taking it out and studying it a while. It does indeed filter the A/C voltage going to the controller - although I believe the new controller has plenty of filtering on board and probably doesn't need this. The filter board ALSO has a small DC power supply built into it, which should produce about 5V. This supply isn't used to source the voltage for the speed control pot, so one could only assume its only function is to power the tachometer and RPM sensor. However it is NOT used that way. It does not appear to be used at all! In the factory installation I got - the tach requires power coming from the speed controller. This makes no sense to me. However I discovered that by supplying my own 5VDC to the tach/sensor, I could get it to work. I had an old wall brick 5V supply from an old cell phone and used that.

If you install this controller, I recommend you wire it as shown but don't install the tach power supply yet. If your tach works, then the factory has fixed whatever was wrong with the filter board and you won't need a power supply.

I've had the setup working now for a few weeks and plenty of use - no problems.