Homemade focus motor for dual speed focusers

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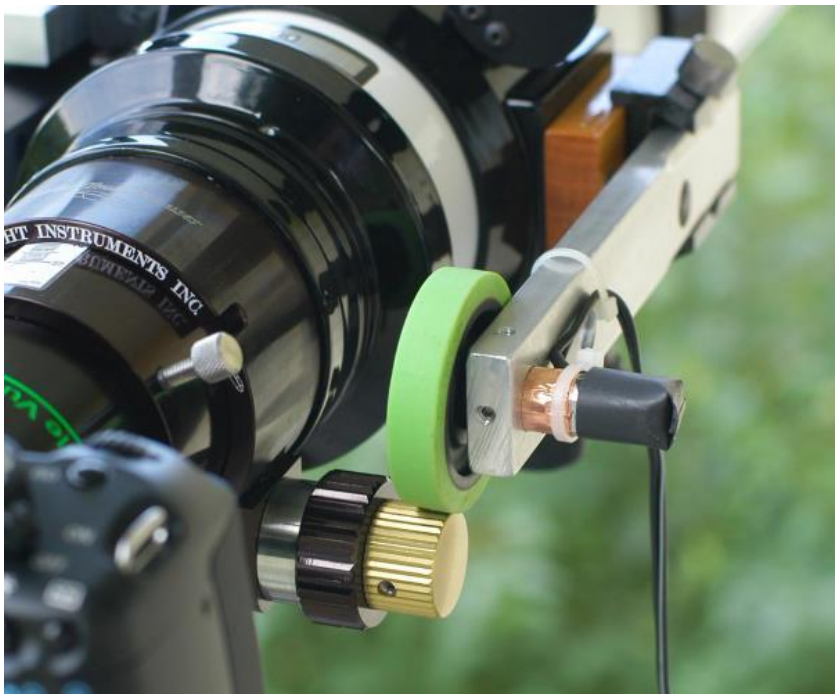
I needed an easily removable focus motor for my Stellarvue SV80S and came up with this design. It uses a 12 volt DC motor, wheel for building robots, 3/4" x 3/8" x 7" aluminum bar and Vixen / Orion style finder shoe. The wheel of the focus motor is pressed against the fine focus knob of the focuser. Pressure to the focuser is adjusted by moving the aluminum bar in the finder shoe.

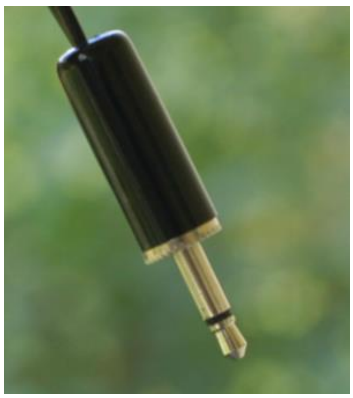
Support bar:
The top edges on one end of the bar were ground down using a bench grinder and file so it could fit in the dovetail shoe and be slid to adjust the wheel pressure to the focuser knob. A ½" hole was drilled at one end to fit the motor through. Two set screw holes were drilled and taped to hold the motor in place. Make sure the set screws are not over tightened or the motor gear box can become damaged. The other 2 holes in the bar are not needed and were already there from another project.

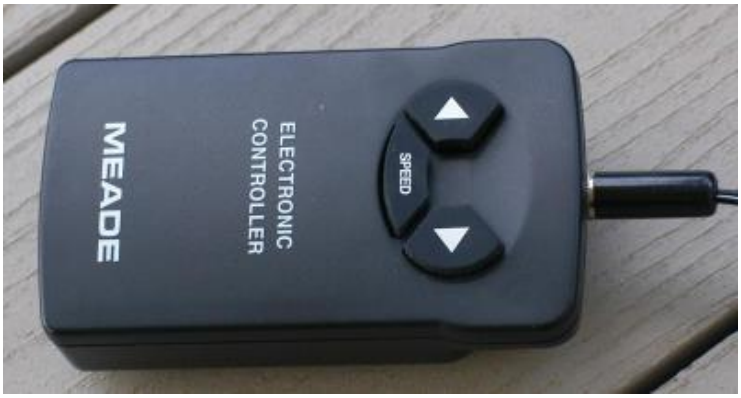
Motor & Wheel:
The motor is wired to a 3.5mm phone plug with the tip + and shield -. Since this is a 12V DC motor the connections only determine the direction the motor turns so it could be wired any way to the plug. A piece of heat shrink tubing is placed over the end of the motor where the wires are connected and covers the cable so it cannot be easily broken off. A cable tie holds the wire to the motor and the open end of the heat shrink tubing is cut and glued to form a cap. The motor is a Sayama #12SM-AT3 and is 58 RPM which I find a little fast.

The wheel and hub were purchased from banebots.com and attached to the motor shaft. I used a 1-7/8" wheel with ½" hex mount for my motor. The motor shaft is 2mm diameter and flat on one side so the wheel hub has some play in it that cause the wheel to run slightly off center. There is enough flexure in the wheel to compensate for this however. The wheels come in various hardness and I used the soft (green) wheel so it could be pressed against the focuser knob and have some flexibility in movement.



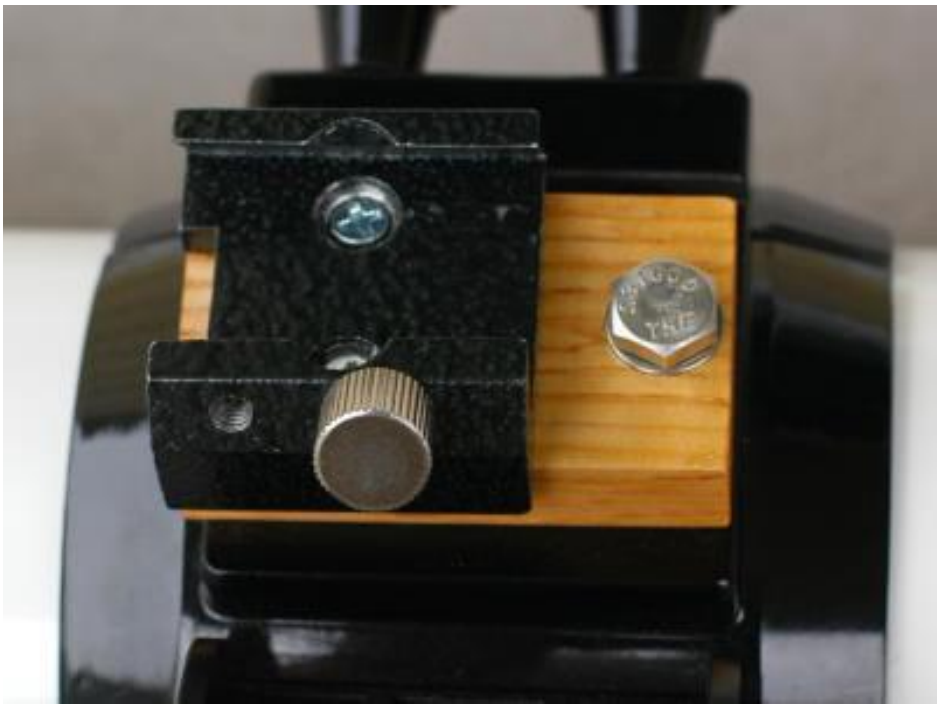
Motor has a 3.5mm phone plug that can be used with the Meade control box or any other 9 to 12 VDC power source that can reverse polarity such as the Astro-Physics GTO controllers.





Bracket shoe:

To mount the focus motor bracket to the telescope ring I had to make a riser block so the focus motor wheel would line up with the fine focus knob on the focuser. I used a piece of oak and attached it to the top of the clam shell ring and then attached the finder shoe to it. This worked out really well allowing me to also use a finder on the scope when I wanted. Also I don't need any extra parts to mount the focus motor.



How it actually worked:
I am able to control the focuser of my Stellarvue SV80S with the TeleVue TRF-2008 Reducer/Corrector attached via my AP 900 mount. The motor runs the focuser faster than the Meade 1209 microfocuser but I am able to adjust the focus with the Meade 1209 control box and AP hand controller. What works best is my AGF control box connected to a PC. With it I can do 'timed focus' so I can do very small movements. I use the AGF and ImagesPlus Camera Control software on my Laptop to set the focus and it works our really well.

AGF (AutoGuider Focuser) microprocessor controller.
http://agf.mltonhill.us