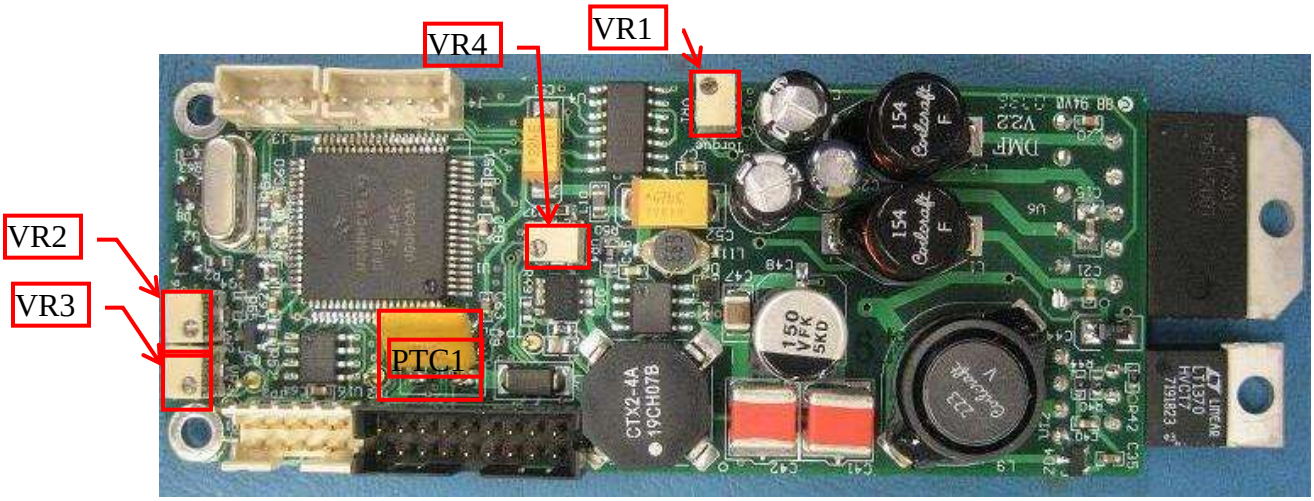
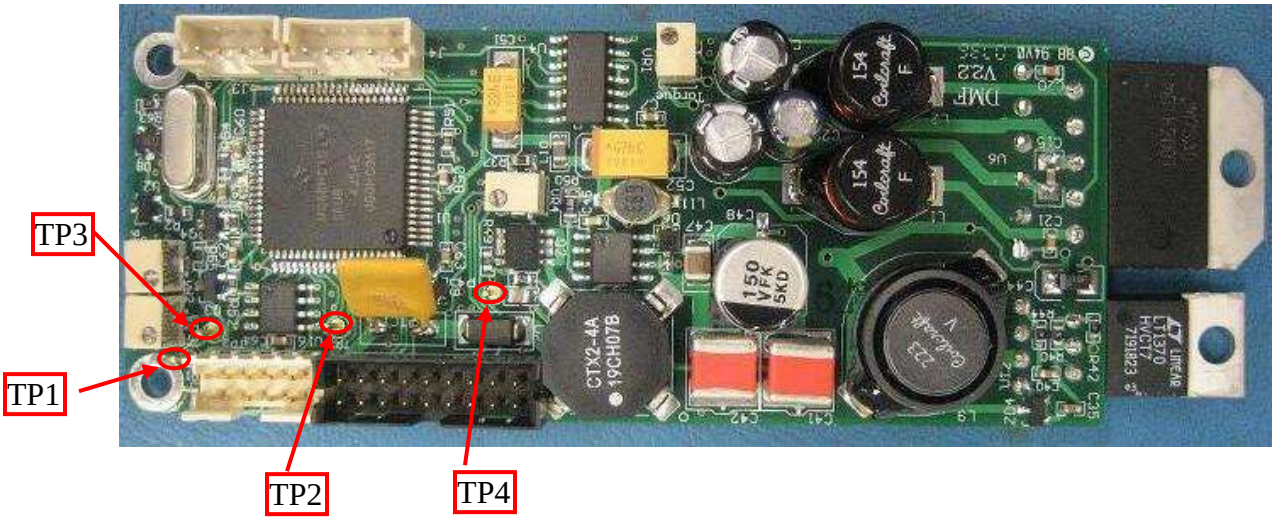
Calibration Procedure

Null Adjustments

The following procedures are used to eliminate r motor creeping when operating pressure is not applied to the joystick. The procedure has three parts: null adjustment for **joystick offset**, **digital motor offset**, and **analog mode offset**. The null adjustment for the joystick must always be performed first.
A digital voltmeter with 0.1mV resolution is required. Use small "grabber hooks" to make contact with the test pins.

1. Apply power using a "Y" cable for connection to a digital motor.
2. Turn the maximum speed control clockwise to "10" - for maximum sensitivity.
3. With nothing contacting the red joystick knob, measure the voltage between test points 3 and 4. Adjust VR2 to make the reading less than 0.10mV. This completes the **joystick offset adjustment**.
4. Check for **joystick hysteresis** by momentarily applying pressure to the red knob in one direction and then releasing. After allowing 10 - 20s for the meter reading to stabilize, the reading should return to less than 1 mV. Repeat this but with pressure applied in the opposite direction. Again confirm that the reading is less than 1 mV. Excessive hysterisis can be caused by the joystick receiving a large mechanical shock.
5. The next step is for adjusting the **digital motor offset**. Use a "Y" motor cable to power the DMF but don't connect the digital motor.
6. Press and hold simultaneously buttons **Set** and **Lens Cal**. This will put the bargraph display in special mode that displays Digital Offset. Adjust VR3 that the bargraph shows only one to two bars. You can observe the effect of the joystick hysteresis on this offset adjustment. In any case, after 10-20 s, the bargraph reading should come back to 1 to 10 bars in either of the directions. This completes the **digital motor offset** adjustment.
7. *DMF1 board only: DMF1 boards do not have the special display mode. Use the joystick to position the motor roughly in the center of its rotation range using the bargraph. This will allow the motor to rotate freely without hitting either limit. Connect the Voltemeter between TP1 and TP2. Rotate the sensitivity control to maximum – "10". Adjust VR3 until the motor just begins to creep. Write down the voltage reading. Now adjust VR3 in the opposite direction, while counting the number of turns, until the motor just begins to creep in the opposite direction. Find the difference between the two readings and use VR3 to make the voltage exactly halfway between the two readings and use VR3 to set the correct voltage. Alternatively, if a meter isn't available, VR3 can be adjusted halfway.
8. The last step is for adjustment of the **analog mode offset**. Connect the control to a Video lens or the FIZ unit using an appropriate cable. Be sure that the sensitivity control is set to minimum ('0"). Using the Micro Force testing box, measure the voltage between V_{ref} and Z-CMD. Adjust VR4 until the voltage difference is less than 0.10mV. This completes the **Analog mode offset** adjustment


VR4
VR1
VR2
VR3
PTC1


TP3
TP1
TP2
TP4