

How to measurement chopper signals

Before you vent you should have a look at some voltages inside the electronics box. See attached drawings.

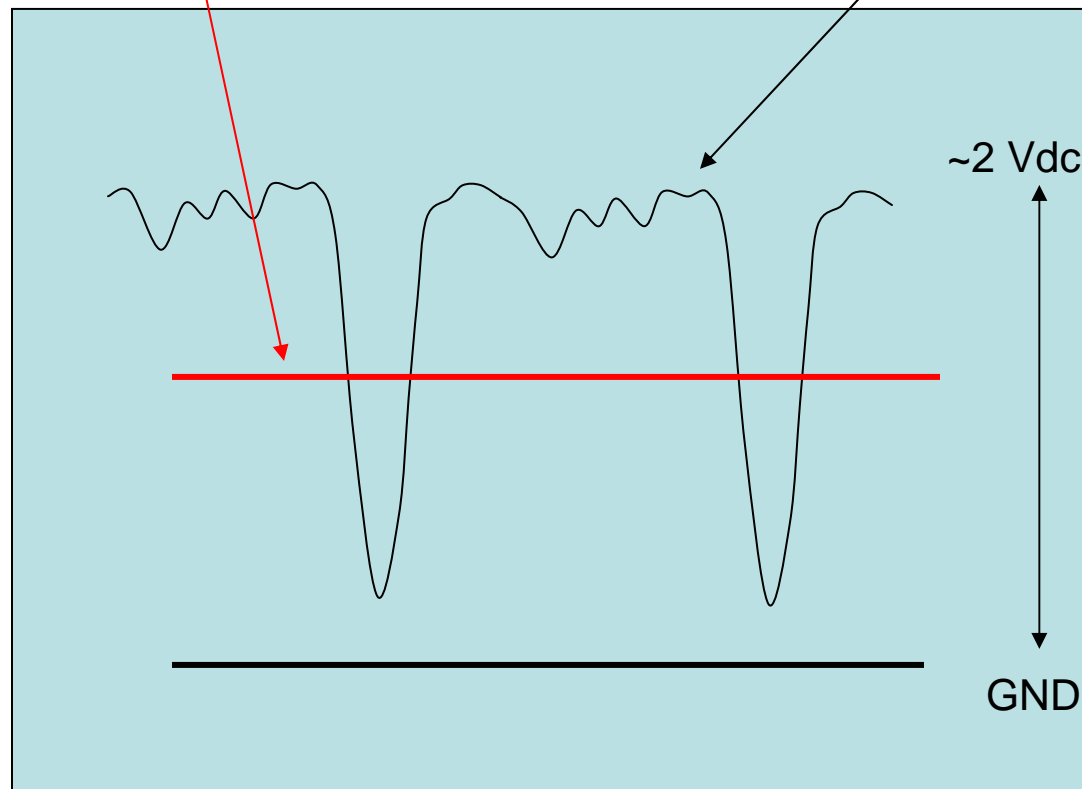
Its possible that the IR photodiode signal is still fine but that the comparator circuit needs to be retuned.

Open up the electronics box locate test point 1 (TP1) on the chopper board and measure the signal here with a scope. Then, look at TP2 on the second channel of the scope. This should be a DC level signal that is $\sim 1/2$ the pk-pk height of TP1 voltage level. If it is not, adjust R9 to make it be so. If this does not fix the problem then it may be that the IR reflective sensor is dead.

Schematic of raw photodiode chopper signal as would be observed on an oscilloscope

TP2 is V-reference for comparator circuit. Use R9 to adjust this level to $\sim 1/2$ pk-pk level.

TP1 – raw photodiode signal. Structure in base line is real from variable reflectivity of chopper wheel surface



Raw chopper photodiode signal is “cleaned” using an opamp/comparator. TP1 and TP2 are the inputs to the comparator. The output of the comparator is the chopper signal that the computer monitors.

Chopper circuit board in AMS Electronics Box

Chopper
signal output
to computer

Comparator
output from
LM324

TP1 - raw photodiode signal

TP2 – Comparator Vref level set by R9

