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| VIB Testing for ZTF |
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**Preliminary STA Controller Testing Results**

1.0, September 14, 2015

Caltech

# Introduction

Focal plane CCDs at Palomar are ubiquitous and need support electronics for biasing and image acquisition. It is advantageous to have the support electronics close to the CCD, and so the packaging of the controller electronics is an important aspect of the system. The performance of the astronomical instrument is directly related to the performance of the controller electronics. In this note, we describe the electrical specifications for the controller and the test procedures to confirm the electrical performance. This requirements and testing document applies to the single board controller unit which is the present anticipated design.

This document contains the preliminary results from testing the STA controller. This testing includes the ADC module noise, the clock card noise, and the DNL measurement for the ADC channel. Future tests will check the stability of the system by sending data from the controller to the host overnight.

# Grounded input test (noise)

Ground the inputs and take image data. Analyze for RMS noise. Could also use the black level clamp and leave both sides of the amplifier grounded.

# Differential Gain Of Preamplifier

Connect Tektronix function generator to VIB amplifier inputs and controller ADC channel inputs simultaneously. Convert data on two channels and simultaneously and calculate gain.

# Amplifier Output Range

# Crosstalk between analog channels

# Clock crosstalk to analog Channels

# Power Consumption

# Common mode rejection

# Power supply rejection

# Frequency Response (Bandwidth)

# Safe to Mate test

Check clock levels and bias levels. Ensure the clocks and biases are going to the correct pins ad have the correct voltages.

# Waveform Phase Test

This test, as part of the safe to mate, will identify the clocks and their relative phasing. We will begin by phasing the clocks according to the data sheet. Adjustments will follow to optimize the data output.

# Auxiliary Signals Test

Ensure the thermal sensors can be read. Ensure heat can be delivered to the focal plane and the VIB (if necessary).

# Window Heater HV Test

Ensure this 160V is reaching the window and heating to an acceptable temperature. Do we have feedback for this?