DES PMG Meeting

Front End Electronics Status

T. Shaw, D. Huffman, M. Kozlovsky, J. Olsen, W. Stuermer (FNAL)

T. Moore, V. Simaitis (UIUC)

M. Barceló, L. Cardiel (IFAE)

J. Castilla, J. DeVicente, G. Martinez (CIEMAT)

P. Moore, R. Schmidt (NOAO)

Monsoon at FNAL - 2006

DARK ENERGY SURVEY

Moonsoon Experience is improved in 2006!

Feb 2006

Delivery of two additional complete Monsoon Systems.

One was shipped to Barcelona

Mar 2006

With “short” cable run, we are able to achieve

~6.5e$^-$ noise at ~6us/pixel

April 2006

With a pre-amp located outside of dewar wall, we are able to achieve ~6.5e$^-$ noise at ~6us/pixel with a **long** cable

July 2006

Delivery of fourth Monsoon system for FNAL

August 2006

FNAL Director’s review recommends use of JFET source follower close to CCD video output

October 2006

Begin instrumenting the **M**ulti-**C**CD test **D**ewar (MCD)

November 2006

Simultaneous readout of two CCDs in MCD.

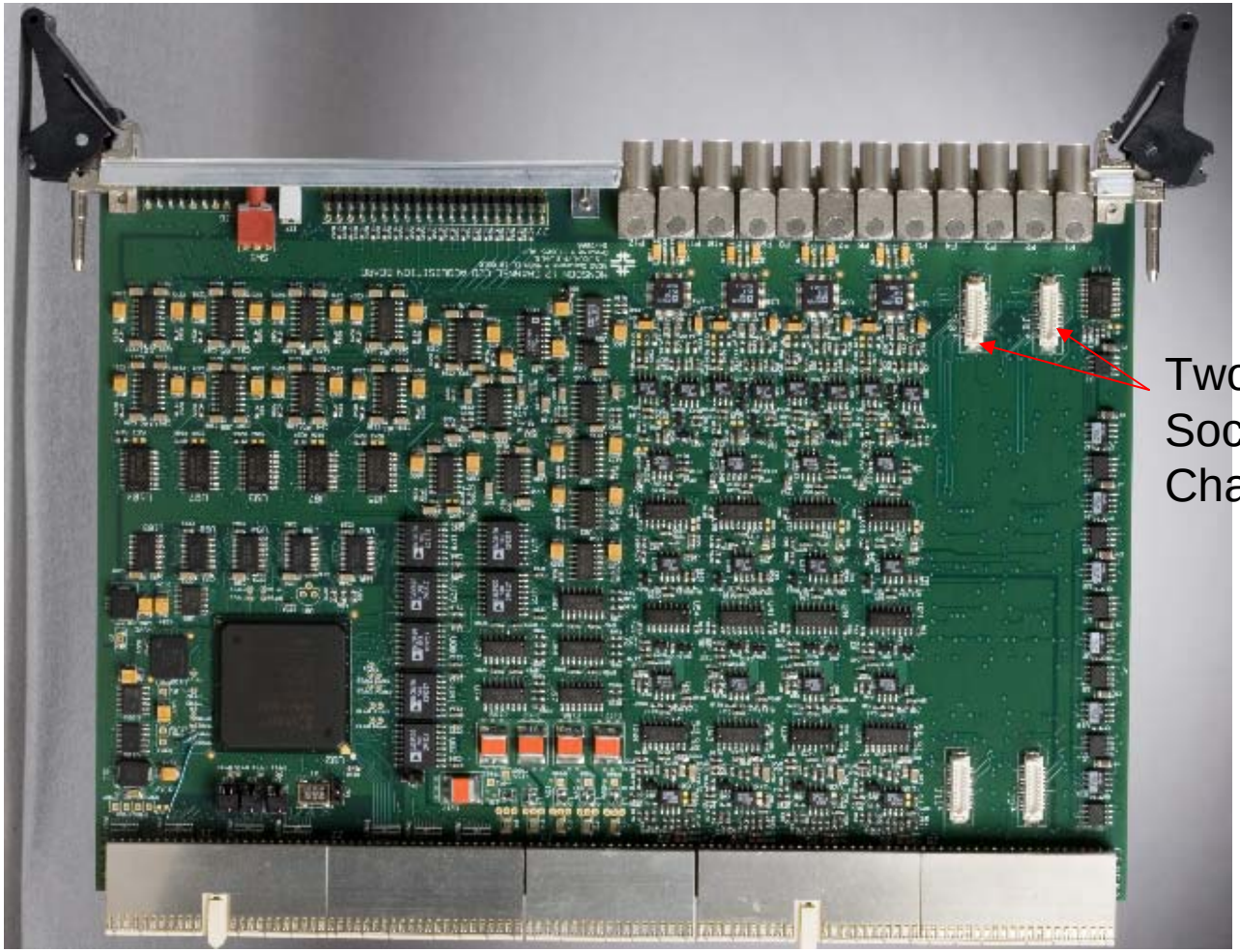
DES Changes to Monsoon

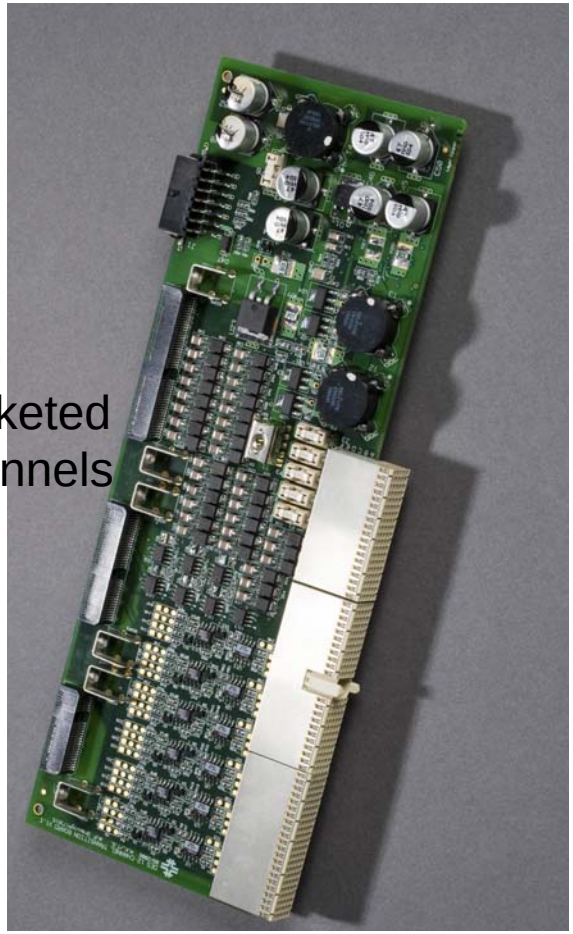
DARK ENERGY SURVEY

- To use the Monsoon System for Production DES Electronics, we will customize the boards for our specific application:
  - Build a 12 channel CCD Acq Module with Transition Module which will provide customized bias voltages, RTD readout, and Vsubstrate ramp control.
    - **Tested and working at the bench. Getting prepared to readout a CCD at SiDet.**
  - Build a customized Clock Board to better address our clocking needs; greater fanout ability to drive more clocks.
    - **Engineers from CIEMAT (Madrid) are doing the main Clock Module.**
    - **Engineers from IFAE (Barcelona) are doing the Transition Module.**
  - Slight modification to the Master Control Board to allow for switch to S-Link as the fiber optic link; also, look into multi-crate synchronization.
    - Engineers from IFAE are working on upgrading the Master Control Board
      - Goal to have a working example of the S-Link implementation within a couple of months.

12 Channel Acq. Board (Top View)

DARK ENERGY SURVEY

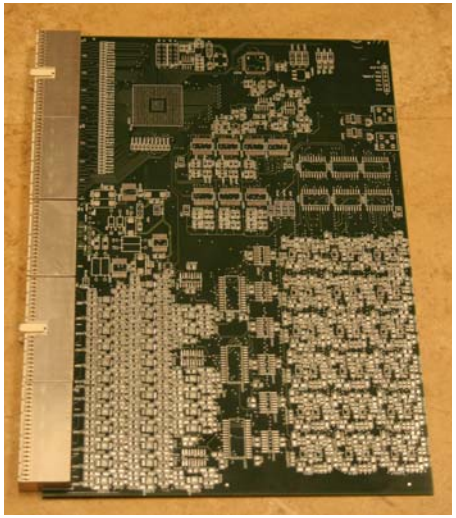




Clock board status

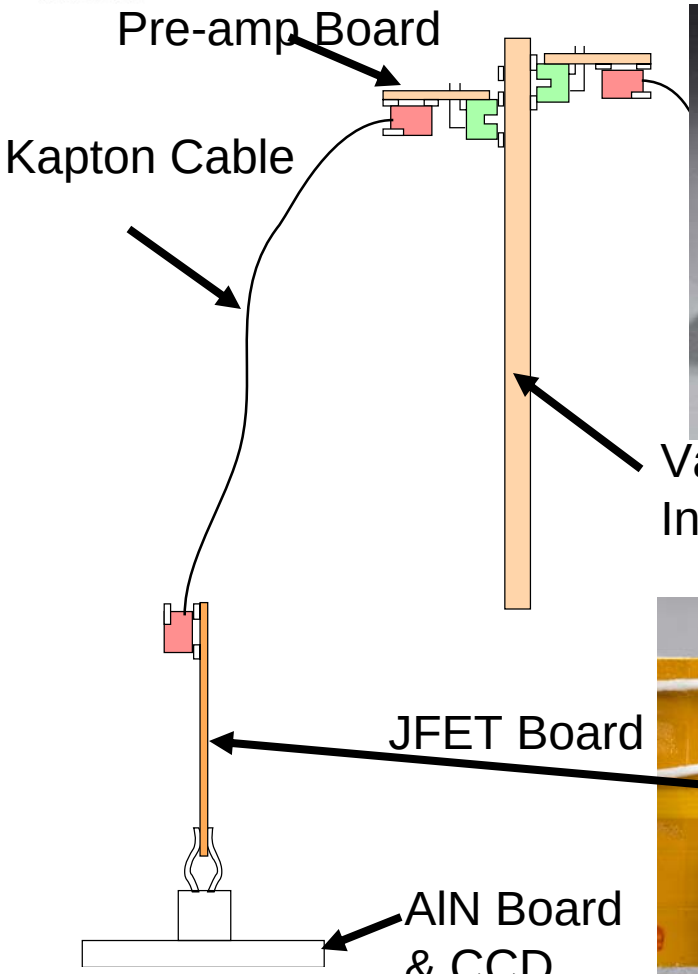
DARK ENERGY SURVEY

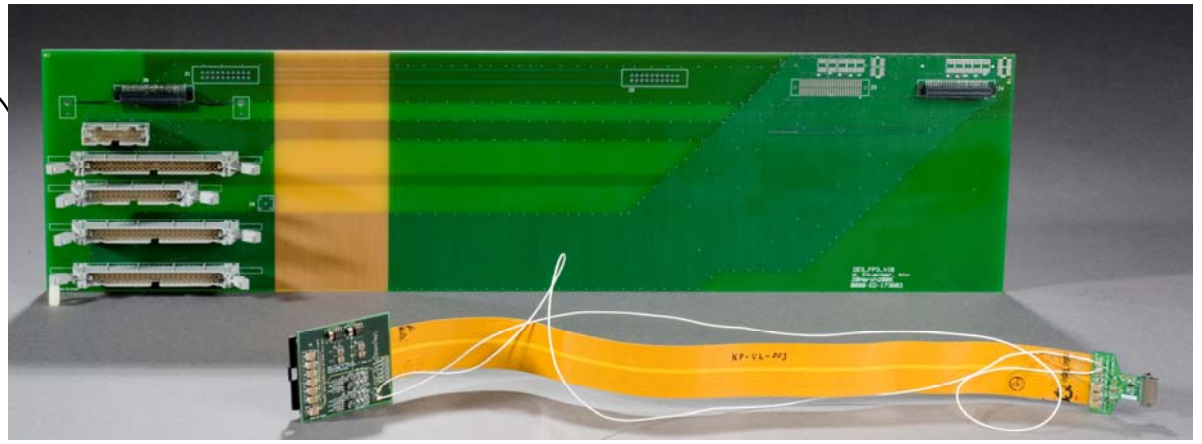
- New Clock Board is being designed by engineers at CIEMAT (Madrid) which will drive many more clock lines.
- The current NOAO board provides 32 clocks, the new board will provide 135, or enough for 9 CCDs.
- Status:
  - Board is being assembled
  - Firmware ready for testing
  - Monsoon station on order
- Future work:
  - CB testbench installation in Madrid (Monsoon based)
  - Prototype validation and characterization

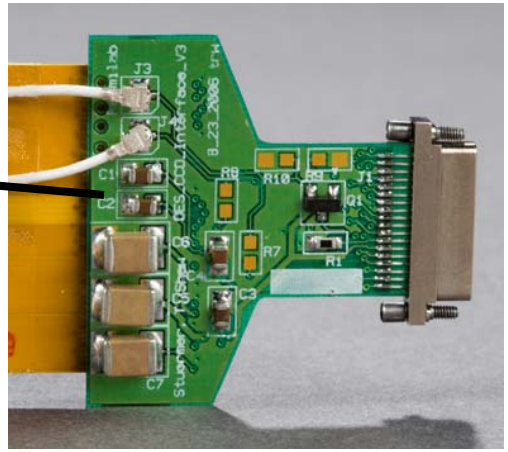


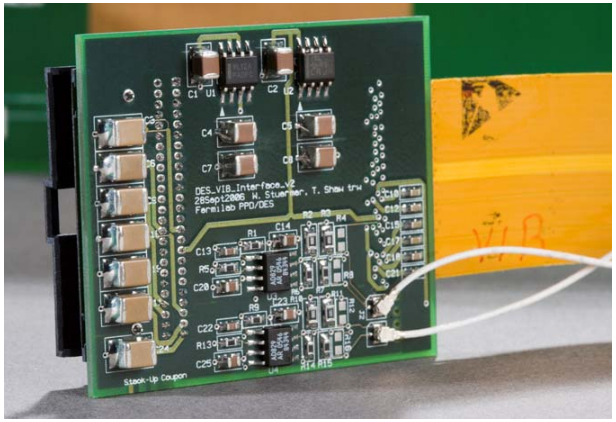
Camera Vessel Instrumentation

DARK ENERGY SURVEY









Pre-amp Board

DARK ENERGY SURVEY

R&D 07-08

- Continue work on developing power supply solution; UIUC is exploring use of Vicor switching power supplies; FNAL engineers will begin to look into this as well
- Test fanout of clock signals using the new Clock Board; current plan uses common clock rail settings to drive a group of three CCDs
- Complete transition from Systran to S-Link for Monsoon communication link
- Cabling noise studies with multi-CCD test vessel -> refine JFET, pre-amp placement and design; look into alternate channel designs; test a differential driver and pre-amp; finalize kapton cable design
- Development/test of V2 CCD pedestal package
- Complete system testing of 12-Channel Board and Clock Board
- Test multi-crate synchronization