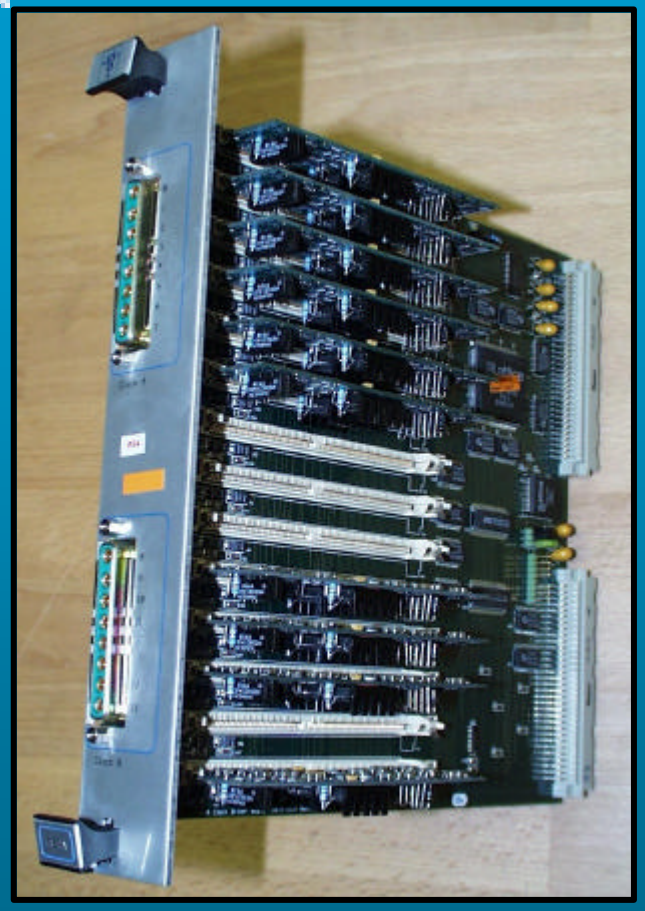
Upgrade of ESO's FIERA CCD Controller and PULPO Subsystem

People involved:

- Christoph Geimer
- Rolf Gerdes (EPO)
- Nicolas Haddad
- Gustavo Rahmer (now at NOAO/CTIO)
- Javier Reyes
- Dietrich Baade (Team Leader)

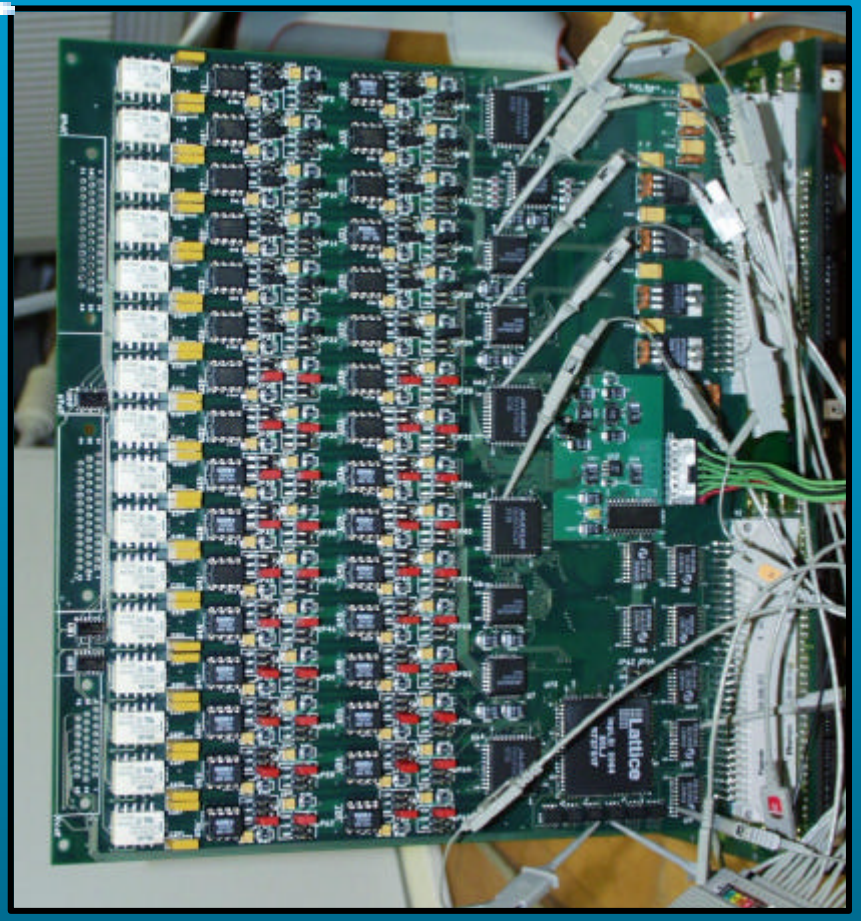
- At the time we needed to upgrade we already had almost 15 instruments deployed with FIERA (TC-1, TC-2, FORS-1, FORS-2, UVES-Red, UVES-Blue, CES, WFI, SUSI, HARPS, GIRAFFE, VIMOS-A, VIMOS-B, Emmi-Red…)
- Back-compatibility is an issue for us

FIERA CLOCK BOARD



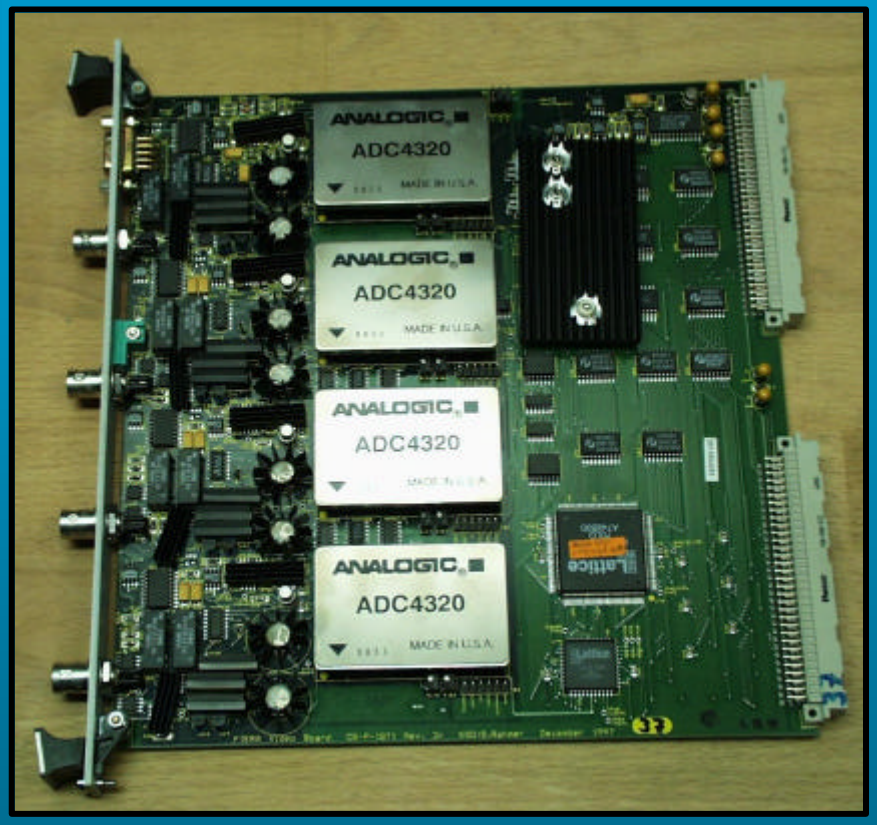
- 14 clock lines with +/- 14V swing and 25MHz clocking frequency
- Modular design:
  - Bilevel: Two clock level output
  - Multilevel: Programmable fine-tune clock transients
- Up to 4 boards in one Detector Electronics
- Output relays

FIERA BIAS BOARD



- 32 channels per board with -15 to +30V output range
- Voltages remotely controlled by software in steps of 2mV
- Output relays
- Up to 4 boards per Detector Electronics

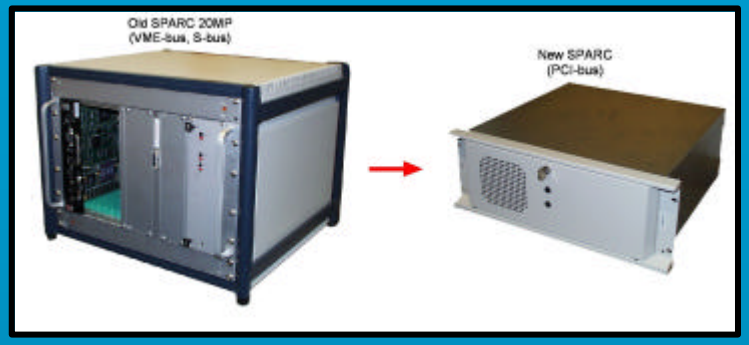
FIERA VIDEO BOARD

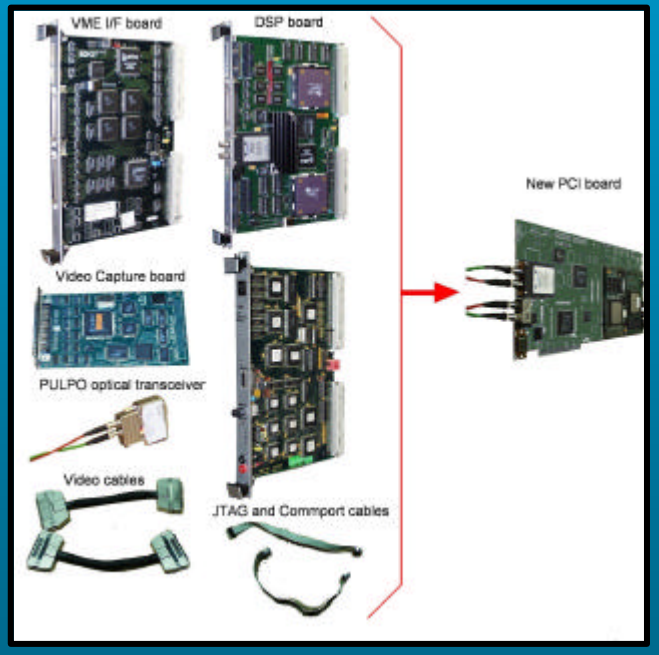


- Clamp-and-sample
- 16-bit resolution per pixel
- Up to 2MHz sampling rate
- Adjustable RC time constant
- 2 selectable gains
- Adjustable clamp offset
- Internal test video generation
- Up to 4 boards per Detector Electronics

- *The undergoing upgrade will feature a minimum of 8 channels per board*

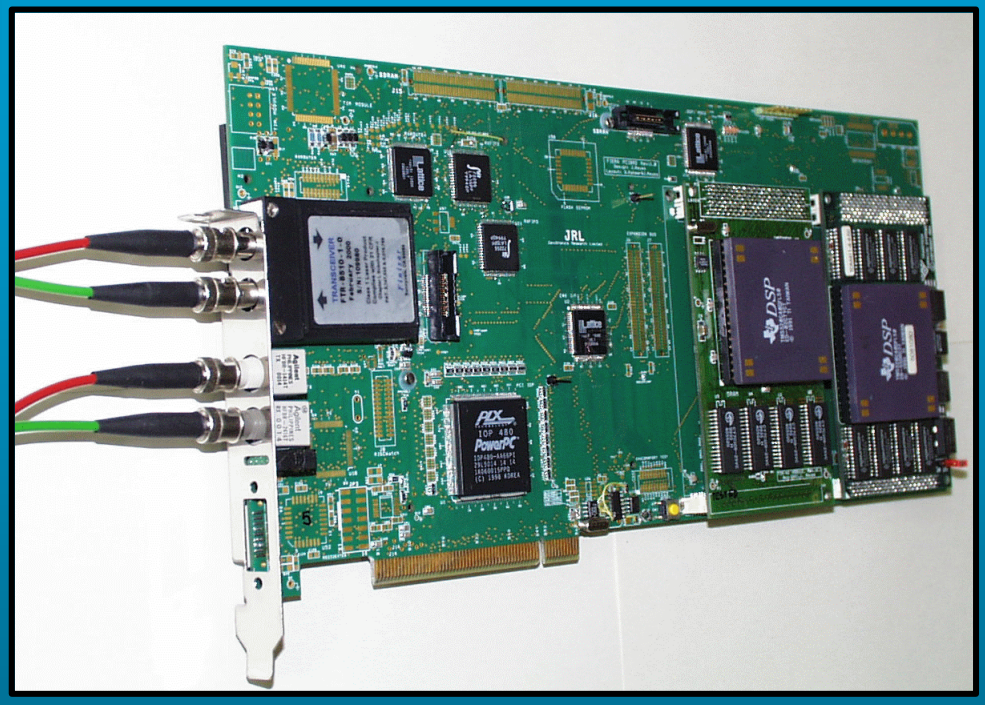
FIERA UPGRADE TO PCI





- PCI higher data throughput compared to S-Bus
- Significant SLCU cost reduction. Factor of five.
- System more compact. Volume reduction of 30%
- PCI: Platform independent
- Array of Detector Electronics with one SLCU
- Less cabling. Improved reliability

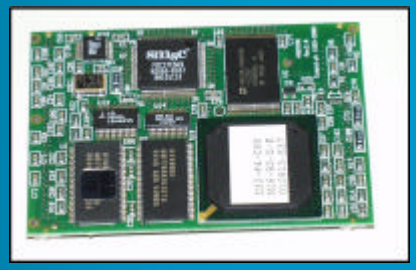
FIERA CONTROL INTERFACE BOARD (PCI BOARD)

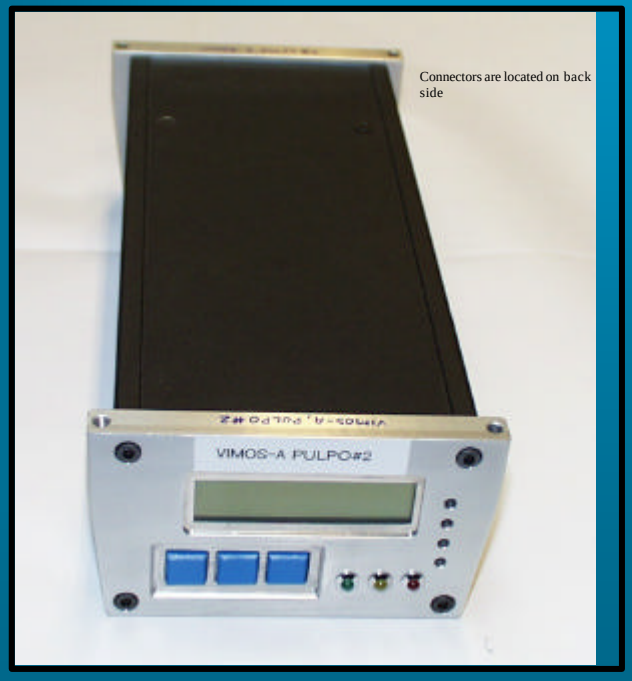


- Interface of DSP and SLCU via PCI
- Platform independent
- DMA engine integrated
- DSP real time controller
- Second DSP for on-the-fly video data processing
- Synchronisation lines for event triggering
- Integrated TIM (Absolute time bus reference at Paranal) for absolute time synchronisation
- Direct fiber connection to PULPO
- 32-bit interface to RTC (Real Time Computer)
- DSP module piggy-back eases the move to the C60 family of DSP

FIERA PULPO (cryostat housekeeping)

Embedded PC running Linux



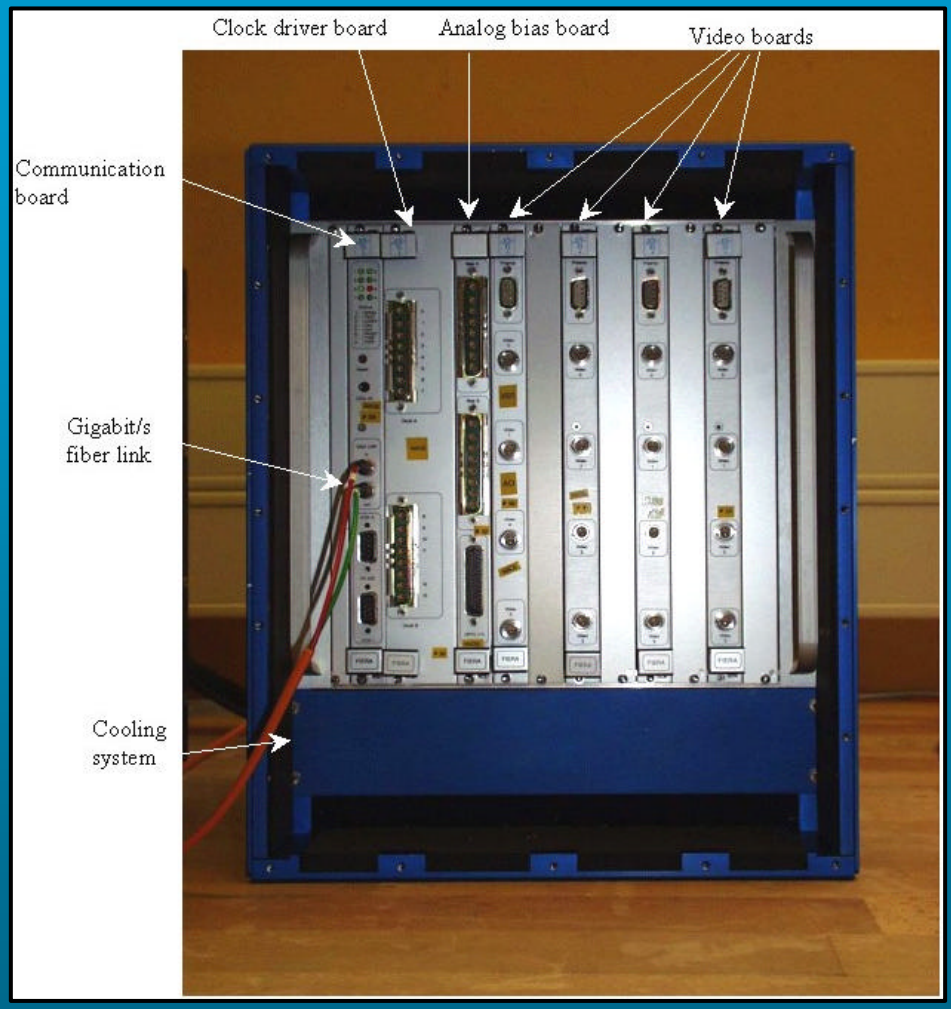


- 29 temperature sensing circuits (PT100)
- 8 heater control circuits
- Vacuum monitoring
- Flexible interface to a wide range of shutters
- Optical serial interface to the SLCU
- Data logging of parameters
- User interface based on an LCD-panel and keypad
- Able to communicate to other PULPOs

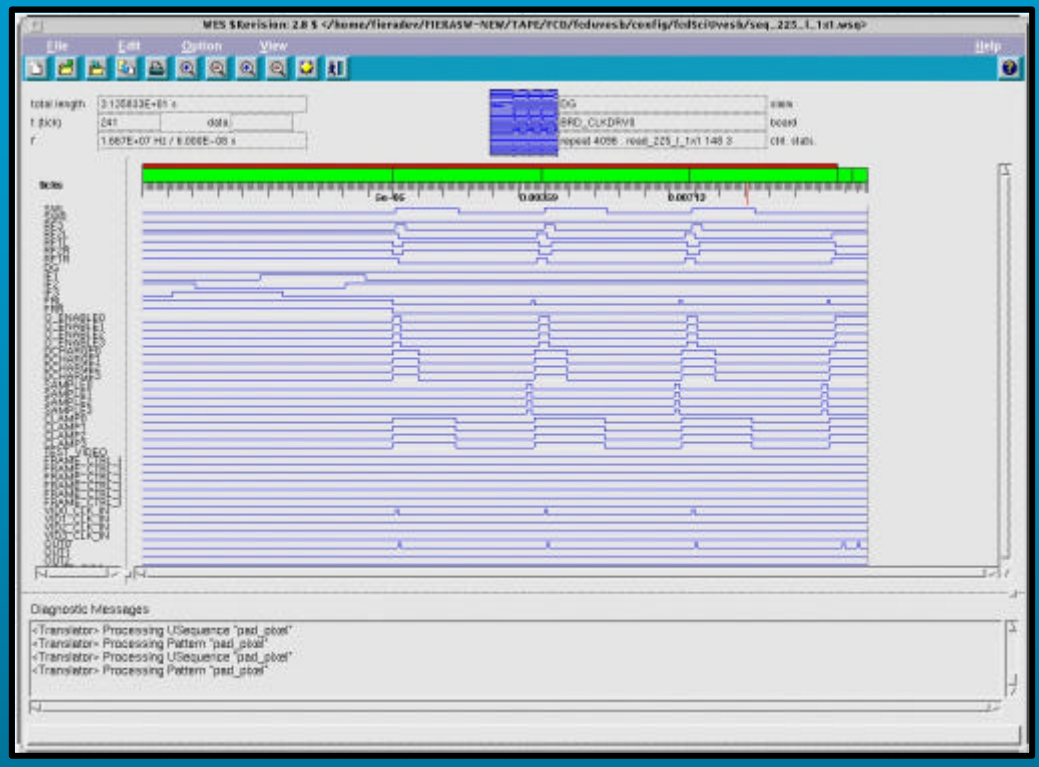
Optical Detector Team

Speaker: Javier Reyes

FIERA DETECTOR ELECTRONICS

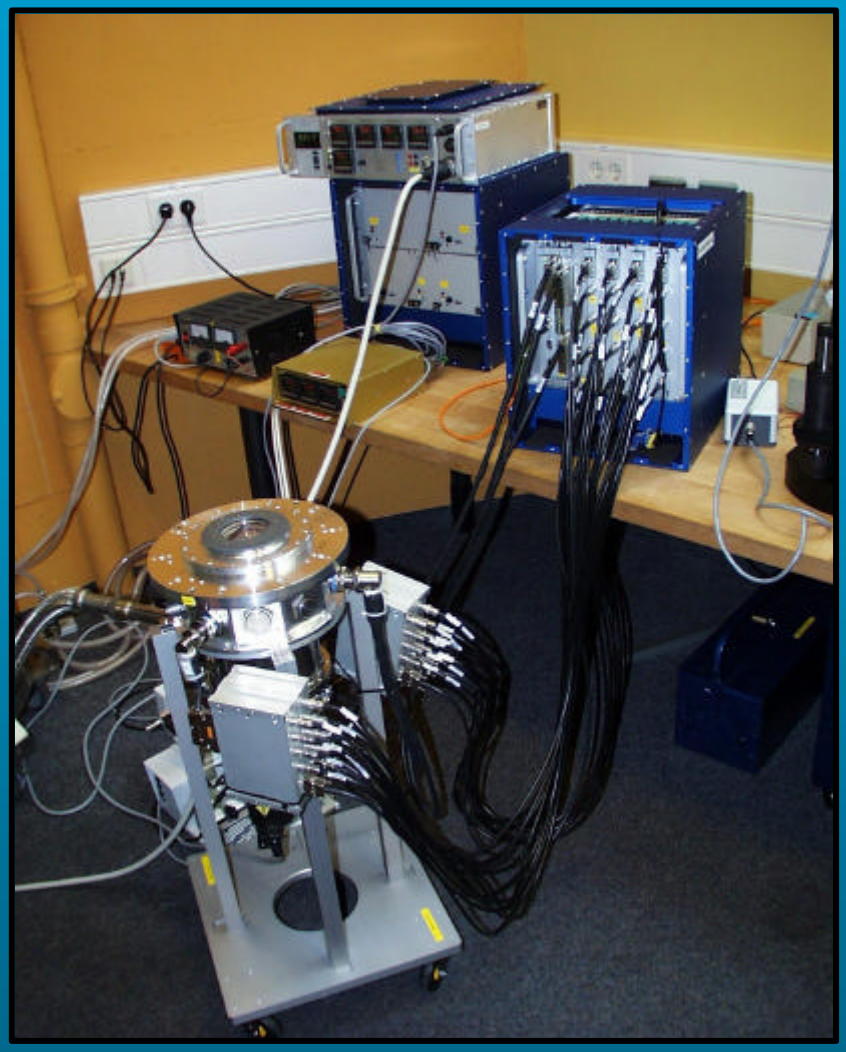


EXAMPLE OF FIERA SOFTWARE
WES (Waveform Editor Software)



Front-end user interface to create graphically patterns, micro-sequences and sequences

EXAMPLE OF A 16-CHANNEL FIERA



Visit poster #54 for more details