

# EPIC–pn spare camera chain: status and prospects

Eckhard Kendziorra

Operations and Instrumentation

Leicester 06.03.2012

# Status

- EPEA, EPVC, EPCE are stored at Panter in Neuried
- Harness stored at Panter
- EPCH is stored at HLL
- EPDH and EGSE stored at IFCTR (I assume)

# What we need to properly operate EPIC-pn spare camera chain?

- Vacuum chamber for camera head
- X-ray source inside vacuum chamber
- Cooling system for CCD
- All other boxes could be operated outside of vacuum vessel

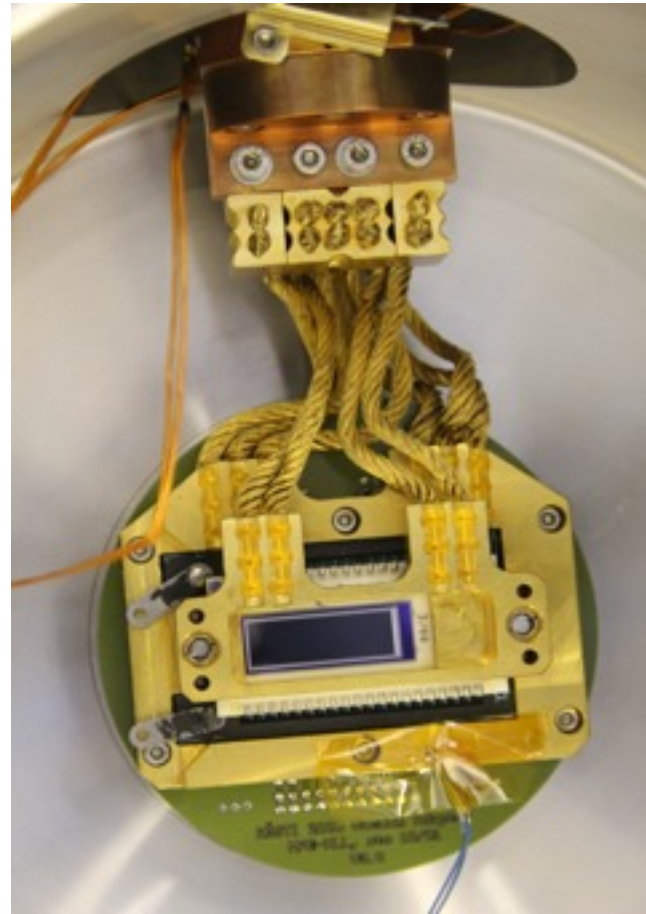
# Where could we integrate and operate EPIC-pn spare camera chain?

- MPE is totally busy with eROSITA
  - Panter and Rösti are not available
  - Other vacuum chambers are occupied
- IAAT could partially do the job
- Lab space (~20 m<sup>2</sup>) and personnel (E.Ke & TBD)
- BUT:
  - NO free vacuum chamber
  - NO free clean room, only clean benches
  - It does not make sense to operate EPCH at IAAT

# Heritage from last decade

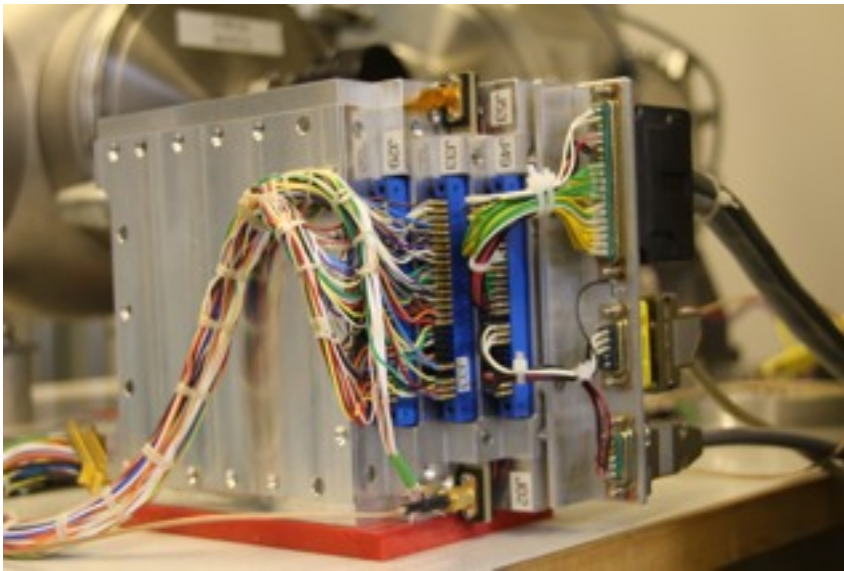


Vacuum chamber and cooling system for one pn-CCD



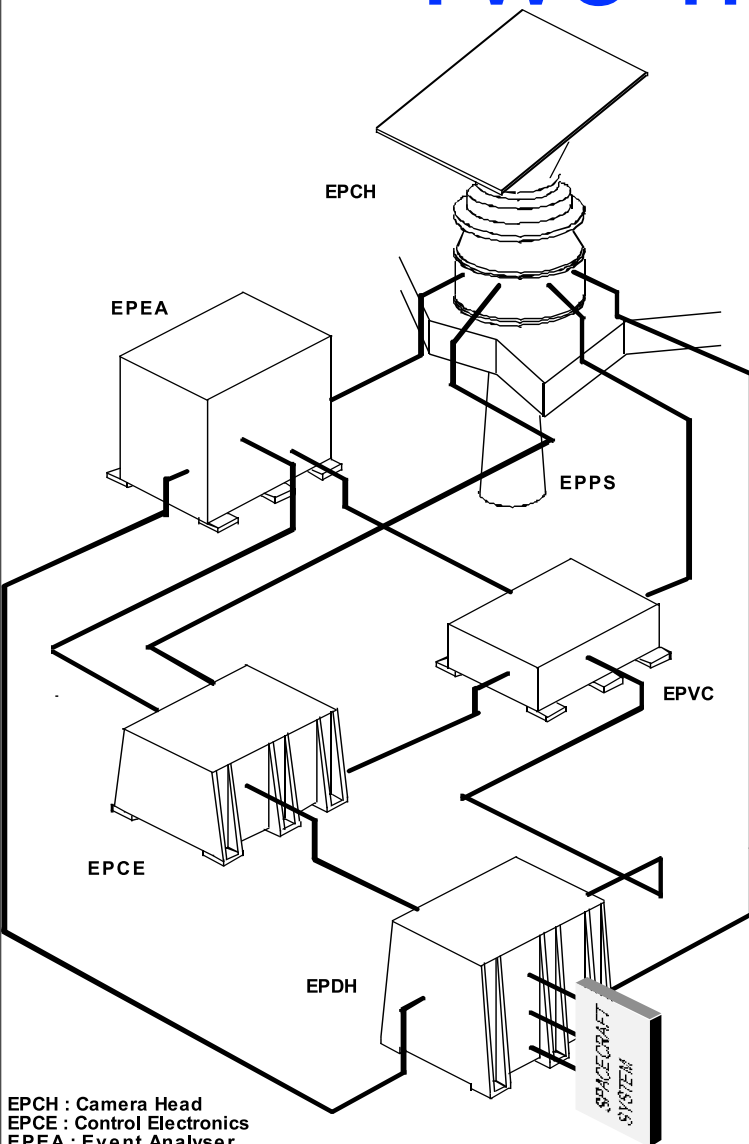
pn-CCD (64 x 200 pixels)

# Spare Quadrant Electronics (QE)

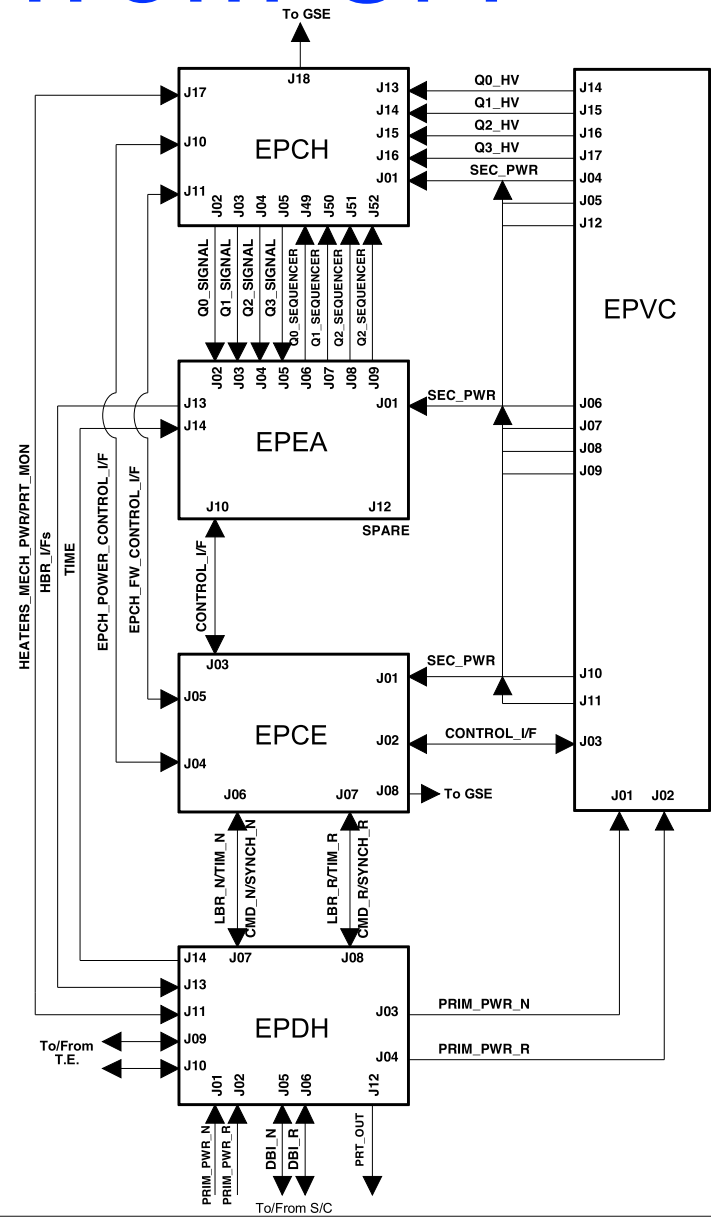


QE with original FS electronic boards, QE with connector for test CCD was used to operate pn-CCD

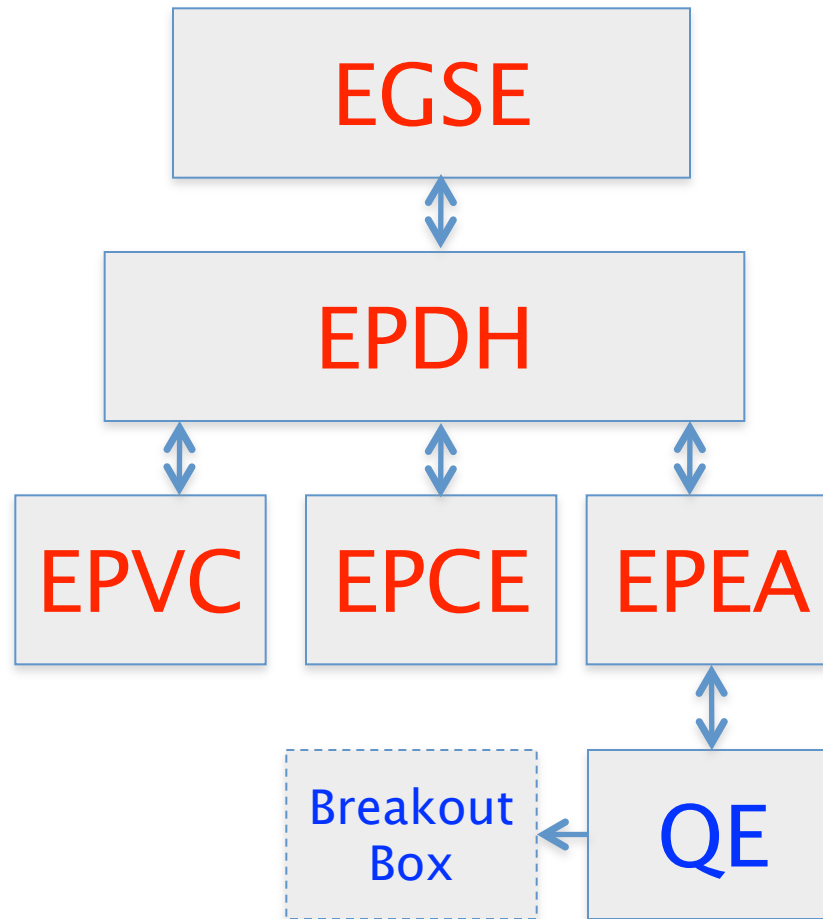
# Two figures from UM



EPCH : Camera Head  
 EPCE : Control Electronics  
 EPEA : Event Analyser  
 EPDH : Data Handling  
 EPVC : Voltage Converter  
 EPPS : Proton Shield



# Proposed set-up (simplified)





# What can be done with this set-up

- All commands and housekeeping (HK) to/from
  - EPDH, EPVC, EPCE and EPEA
  - Upload of new software
  - Download of test patterns
- Operation of one quadrant
  - Command and HK of all CAMEX and CCD quadrant voltages
  - Switch on and off of CCD quadrant
  - Commanding of all readout modes

# What can NOT be done

- NO operation of real CCD
  - No real event data
  - No calculation and download of offset/noise maps
  - No CCD temperature
  - No operation and status info of filter wheel

# Next steps

- Decide if we go ahead with this proposal (during this meeting)
- Compile list of commands and HK parameters which are not available (E.Ke)
- Agree on schedule
- Ship equipment to IAAT
- Get spare chain running