Existing fabrication facilities for PC's for imaging MCP detectors

Dr. O.H.W. Siegmund
Experimental Astrophysics Group
Space Sciences Laboratory
University of California at Berkeley
MCP Image Tube Processing Facilities

• Industrial
  • Photonis - up to 50mm / night vision
  • Photek - custom to 150mm
  • Proxitronics - custom to 40mm
  • Hamamatsu - mostly small format
  • ITT - night vision
  • American Electro-Optics - night vision
  • Northrup Grumman - night vision

• Academic
  • UC Berkeley - Siegmund (>120mm)
  • National Lab capabilities ??
  • Other ??
- Night vision companies are essentially geared up for one product and currently very busy.
- European smaller companies have varying capabilities, Photek has most experience with larger tubes.
- Hamamatsu has small MCP tubes & normally avoids devices that are not commercially viable.
- Photonis has processing facilities in Lancaster PA (Planacon) capable of large tubes, mostly smaller (~40mm) devices in Roden & Brive.
UC Berkeley / Siegmund

- Facilities for development and fabrication of detector systems, both open face & sealed tube
  - Photocathode development and testing
  - Microchannel plate testing
  - Readout anode design and test
  - Electronics development
  - Sealed tube production
  - Environmental testing
UCB - Facilities and Resources

- Many steps are needed to prepare, process and seal MCP image tubes
- Of necessity this demands a series of facilities to prepare the correct materials

- TIG welding
- Vacuum and N₂ storage
- Hi-pot, & vacuum baking stations
- Precision component cleaning station
- Plasma cleaning
- Metal electroding evaporation station
- Leak checker
- Class 100 assembly stations
UHV Tube Processing Stations
Transfer type facilities with detector test capabilities

For processing and sealing multalkali cathodes in MCP tubes
For processing and measuring II-V cathodes with monochromator
Tube Processing Facilities

Leak Checker

Tube facilities and oven
Detector Imaging Electronics and Diagnostics Test Equipment
UV/X-Ray-Visible Calibration Tank

UV hollow cathode lamp / X-ray source/ visible lamps
V-UV monochromator
Large Sealed Tube Processing Station

Sealed tubes with up to 5” format have been processed with multialkali photocathodes MCPs and delay line readout
Large format Detectors

GALEX 65mm sealed tube with cross delay line readout

“PLANACON” type with strip anode