



# *Phase I STTR Plans and Resources*

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# Phase I STTR Goals - UCB

## Objective -- Make a Sealed Tube Glass Package Device

### Where are we now?

- We have a ~ commissioned large sealed tube vacuum tank
- Verified deposition method for good 8"  $\text{Na}_2\text{KSb}$  cathodes
- Initial experience with indium groove seal is encouraging
- We have some package modeling that needs verification (or not)
- We have some glass package design inputs that need implementation
- MCP tests show we can get good performance in 8" format

### What do we need to do?

- Diagnostics on indium seal, try re-seal technique
- Implement glass package design modifications
- Make sidewalls and iterate the seal process
- Obtain all materials for tube construction
- Obtain and test MCPs for tube processes
- Review/make all the tooling needed to process a glass package



# Phase I STTR Shopping List

## 8" Glass Sidewalls and Windows for Seal Tests

- Latest design glass sidewalls, 5 to 10 ea
- Windows, edge ground, with corner detent, 5 to 10 ea

## 8" Sealed Tube Parts

### Glass Bases with anodes, and windows, 5 to 10 ea

- Glass bases with modified anodes and indium wells
- Windows edge ground, double polished with corner detent

### Internal parts

- Getters, spacers, etc, 5+ sets for stack up tests and tube assemblies

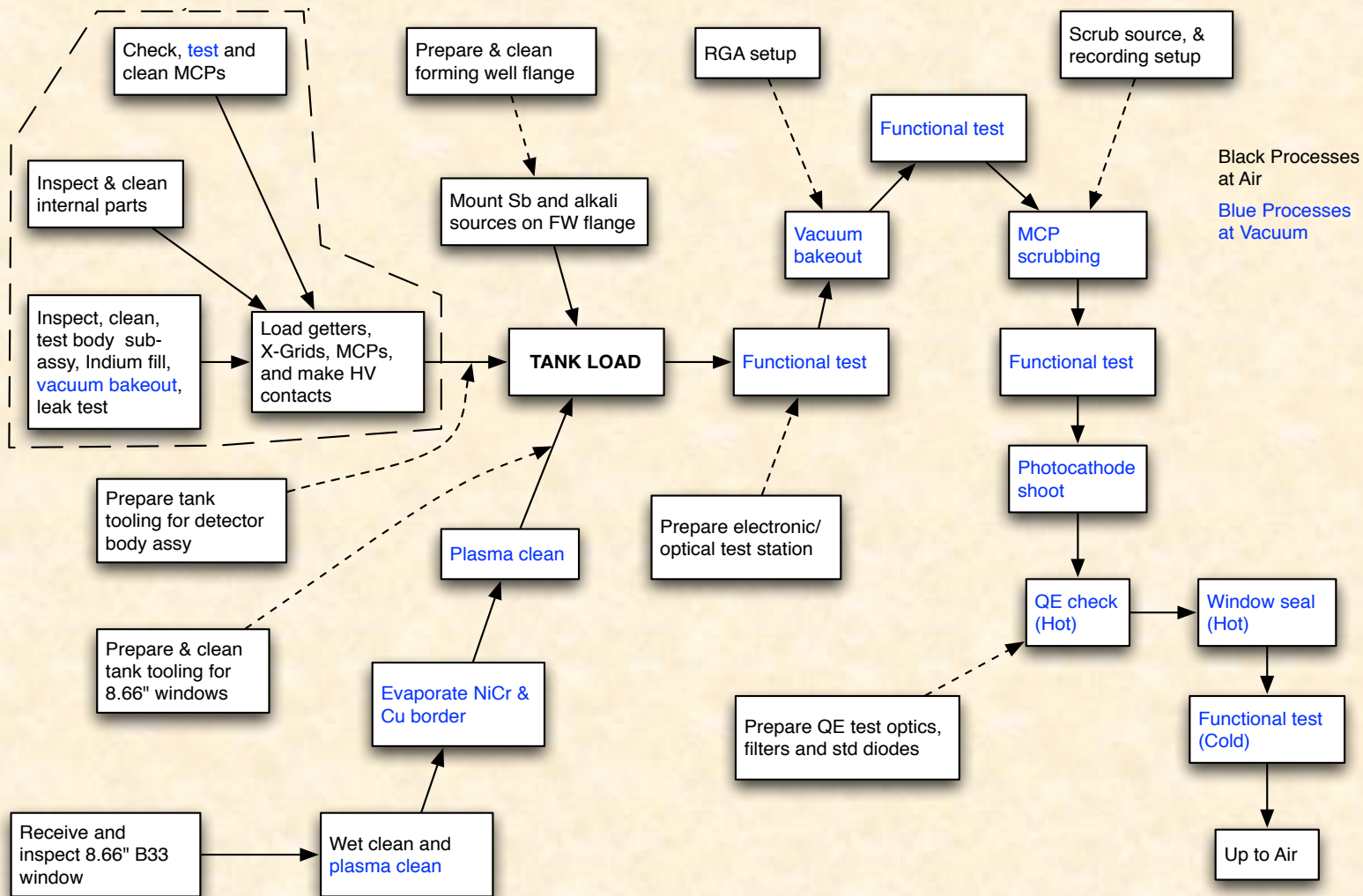
### Microchannel Plates

- 2 to 3 pairs. Upper MCP  $\text{Al}_2\text{O}_3$  with wide resistance tolerance. Lower MCP  $\text{MgO}$  with  $<15\text{M}\Omega$  for gain stability and throughput / recovery time.





# 8" Tube Process Flow





# Plans for Tube Process & Verification

- Practice indium seals with modified window/sidewall design
  - *Inconel/copper coat windows and sidewall wells*
  - *Sidewall Indium fill and bakeout*
  - *Load into seal test tank, vac bake and seal on cooldown*
  - *Post seal diagnostics - remedies*
- Practice preparing and assembling a sealed tube detector
  - *Completely prepare and assemble tube base including indium fill*
  - *Install available MCPs and test*
  - *Diagnostics and issues for remediation*
- Prepare and fabricate 8" sealed tubes
  - *Completely prepare and assemble tube bases including indium fill*
  - *Install pre-verified MCPs and test*
  - *Inconel/copper coat windows*
  - *Load into tank and follow process steps*
  - *Shoot cathode and seal*
  - *Unload and functional test*