# Run 22: L-10177 [McBride]

See https://confluence.slac.stanford.edu/display/MEC/L-10034+Tear-Down for photographs of in-vacuum cables.

Also see "PR60 (EL 2/3) Stepper Motor Patch Panel" in 7.2. Rack map.

## Planned Schedule

Completed as of 8 April 2024:

- Target
- Beam Dump

9-11 April 2024:

- Monochromator Translation
  - use F_XRTS MICOS XYZ cabling
- Channel cut tip/tilt
  - **Assign Newport channels**
  - 4 motors
- Si (5 3 3 ) analyzers (H+V)
  - **Assign IMS channels**
  - 6 motors
- Epix100 translation stage (vt50)
  - **Assign IMS channels**
  - 2 motors
- Si (5 3 3) analyzer1 - Z axis (vt50)
  - **Assign IMS channel**
  - 1 motor

12 April 2024:

- LPL Drive Lenses
  - Using existing cabling
  - 6 motors - Newport
- VISAR Lens
  - Using existing cabling
  - 3 motors - Newport

## Newport Usage

| XPS | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 | Questar 1 H | Questar 1 V | Questar 2 H | Questar 2 V | BED 2 | BED 1 | ~~B_XRTS X~~ | ~~Zyla 500m~~ |
| 2 | | | ~~B_XRTS Y~~ | | | | | ~~B_XRTS Z~~ |
| 3 | East Z | East Y | East X | West Z | West Y | West X | Zyla 500m<br>IMS500PP - labeled "no connect" | ~~Zyla 500m~~ |
| 4 | Mono2_H (E) | Mono2_V (E) | | VISAR Z | ~~Diode Z~~<br>Mono1_V (W) | ~~Diode X~~<br>Mono1_H (W) | VISAR Y | VISAR X |

## PR60 (EL 2/3) Stepper Motor Patch Panel - Proposed and As Implemented Use

Green marks the patch panel connections I propose to use (or repurpose) for the 6 Analyzer H/V IMS channels. This will avoid time spent in routing directly into distant racks.

| | Left (1) | (2) | (3) | (4) | (5) | (6) | (7) | Right (8) |
|---|---|---|---|---|---|---|---|---|
| **Upper** | MEC:USR:MMS:17<br>**tgX** | MEC:TC1:MMS:26<br>**ePix100a backward** | MEC:TC1:MMS:22<br>**ePix100a forward** | MEC:USR:MMS:20<br>**Filter Wheel**<br>Analyzer1_V | MEC:USR:MMS:21<br>**Analyze_Z** | MEC:USR:MMS:22<br>**IMA Lens** | MEC:USR:MMS:23<br>Not Used<br>Analyzer1_H | MEC:USR:MMS:24<br>Not Used<br>BAD! |
| **Lower** | MEC:USR:MMS:25<br>Talbot Y<br>Analyzer2_H | MEC:TC1:MMS:25<br>**Turning Mirror L-R** | MEC:USR:CLZ:01<br>Zyla Focus<br>Analyzer2_V | MEC:USR:CLF:01<br>Zyla Vert<br>Analyzer3_V | N/A | N/A | MEC:TC1:MMS:29<br>**Turning Mirror U-D** | MEC:TC1:MMS:23<br>Zyla Scint<br>Analyzer3_H |

## Motor Checklist

| Purpose | Base PV | Connection | pmgr | python device | Cabled? | Verified /Homed? |
|---|---|---|---|---|---|---|
| **Standard Motors** | | | | | | |
| **LPL Drive Lenses** | | | | | | |
| East_Z | MEC: PPL: MMN:17 | T5/*1, XPS 3/1, ioc-mec-ppl-xps3 | Newport | east_z | Yes | Yes |
| East_Y | MEC: PPL: MMN:18 | T5/*2, XPS 3/2, ioc-mec-ppl-xps3 | Newport | east_y | Yes | Yes |
| East_X | MEC: PPL: MMN:19 | T5/*3, XPS 3/3, ioc-mec-ppl-xps3 | Newport | east_x | Yes | Yes |
| West_Z | MEC: PPL: MMN:20 | T5/*4, XPS 3/4, ioc-mec-ppl-xps3 | Newport | west_z | Yes | Yes |
| West_Y | MEC: PPL: MMN:21 | T5/*5, XPS 3/5, ioc-mec-ppl-xps3 | Newport | west_y | Yes | Yes |
| West_X | MEC: PPL: MMN:22 | T5/*6, XPS 3/6, ioc-mec-ppl-xps3 | Newport | west_x | Yes | Yes |
| **VISAR Lens** | | | | | | |
| VISAR_X | MEC: PPL: MMN:32 | VacCable 9, T6/DB25-1, AirCable "XPS DelayStage", XPS 4/8, ioc-mec-ppl-xps4 | Newport | visar_x | Yes | Yes |
| VISAR_Y | MEC: PPL: MMN:31 | VacCable 2, T6/DB25-2, AirCable "XPS2 #4", XPS 4/7, ioc-mec-ppl-xps4 | Newport | visar_y | Yes | Yes |
| VISAR_Z | MEC: PPL: MMN:28 | VacCable 10, T6/5, AirCable "XPS2 #3/XPS2 #1", XPS 4/3, ioc-mec-ppl-xps4 | Newport | visar_z | Yes | Yes |
| **Target** | | | | | | |
| TC_hexapod | IOC: MEC: HEX1 | B4/L8 | Hexapod | pending<br>ECS-4500 - Jira project doesn't exist or you don't have permission to view it. | Yes | Yes |
| Target_X | MEC: USR: MMS:17 | D2/D5<br><br>MF? moxa-mec-09:4001 (R62 E15), ioc-mec-usrppl-ims | PLS-85 Sample S | target_x | Yes | Yes |
| **Beam Dump** | | | | | | |
| Zyla_500mm | ~~MEC: PPL: MMN:08~~<br><br>~~MEC: PPL: MMN:24~~<br><br>~~MEC: PPL: MMN:23~~<br><br>Now back to<br><br>MEC: PPL: MMN:24 | in-air to beam dump, ~~XPS 1/8, ioc-mec-ppl-xps1~~<br><br>XPS 3/8, ioc-mec-ppl-xps3 | Newport | zyla_z | Yes | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| **JJ Slits**<br><br>**Not in questionnaire**<br><br>**4 motors** | | | | | | |
| JJ Slits | MEC:<br>TC1:<br>MMS:<br>[17,18]<br><br>MEC:<br>TC1:<br>MMS:<br>[01,02] | T5/2 and T5/8 | | | Yes | Yes |
| **Experiment Specific Motors** | | | | | | |
| **Fast Diode**<br><br>**Not in questionnaire**<br><br>**2 motors** | | | | | | |
| ~~Diode_Z~~ | ~~MEC:<br>PPL:<br>MMN:29~~ | ~~VacCable 5, T6/7, AirCable "XPS3 #7", XPS 4/5, ioc-mec-ppl-xps4~~ | ~~Newport~~ | ~~diode_z~~ | | |
| ~~Diode_Y~~ | ~~MEC:<br>PPL:<br>MMN:30~~ | ~~VacCable 11, Flange B5, port B2, AirCable "XPS1 #4", XPS 4/6, ioc-mec-ppl-xps4~~ | ~~Newport~~ | ~~diode_y~~ | | |
| **Monochromator Translation**<br><br>**From questionnaire: Mono_[XYZ]**<br><br>**3 motors: MECHome Spectrometer screen** | | | | | | |
| Mono Z<br><br>~~FXRTS_X~~ | MEC:<br>TC1:<br>MMS:09 | D2/D5<br><br>MF? digi-mec-07:2111 (R64A E19), ioc-mec-tc1-xuv-ims | XUV X | mono_z | Yes | Yes: to LLS and HLS. |
| Mono Y<br><br>~~FXRTS_Y~~ | MEC:<br>TC1:<br>MMS:08 | D2/D5<br><br>MF? digi-mec-07:2110 (R64A E19), ioc-mec-tc1-xuv-ims | XUV Y | mono_y | Yes | Yes: to LLS and HLS. |
| Mono X<br><br>~~FXRTS_Z~~ | MEC:<br>TC1:<br>MMS:07 | D2/D5<br><br>MF? digi-mec-07:2109 (R64A E19), ioc-mec-tc1-xuv-ims | XUV Z | mono_x | Yes | Yes: to LLS and HLS. |
| **Si (5 3 3) analyzers - Dumb Motors (H + V)**<br><br>**From questionnaire: Analyzer[123]_[HV]**<br><br>**6 motors** | | | | | | |
| Analyzer1_H | MEC:<br>USR:<br>MMS:23 | T6/#1<br><br>Analyzer Cable #1 | Original, **unused**: VT-50-100<br><br>New: Faulhber_SA_15_8_141 config (under MEC VT50) with encoders and limit switches disabled. | analyzer1_h | Yes | Yes |
| Analyzer1_V | MEC:<br>USR:<br>MMS:20 | T6/#1<br><br>Analyzer Cable #2 | Original, **unused**: Micronix_VT50<br><br>New: Faulhber_SA_15_8_141 config (under MEC VT50) with encoders and limit switches disabled. | analyzer1_v | Yes | Yes |
| Analyzer2_H | MEC:<br>USR:<br>MMS:25 | T6/#2<br><br>Analyzer Cable #3<br><br>Repurposed "Talbot Y" PR 60 patch panel connection. | Original: PLS85 In-Air<br><br>New: Faulhber_SA_15_8_141 config (under MEC VT50) with encoders and limit switches disabled. | analyzer2_h | Yes | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| Analyzer2_V | MEC: USR: CLZ:01 | T6/#2<br><br>Analyzer Cable #4<br><br>Repurposed "Zyla Focus" PR 60 patch panel connection. | Original: Optique Peter Focus<br><br>New: Faulhber_SA_15_8_141 config (under MEC VT50) with encoders and limit switches disabled. | analyzer2_v | Yes | Yes |
| Analyzer3_V | MEC: USR: CLF:01 | D2c/D5 (verify feedthru)<br><br>Analyzer Cable #5<br><br>Repurposed "Zyla Vert" PR 60 patch panel connection. | Original: Optique Peter Vertical<br><br>New: Faulhber_SA_15_8_141 config (under MEC VT50) with encoders and limit switches disabled. | analyzer3_v | Yes | Yes |
| Analyzer3_H | MEC: TC1: MMS:23 | D2c/D5 (verify feedthru)<br><br>Analyzer Cable #6<br><br>Repurposed "Zyla Scint" PR 60 patch panel connection. | Original: Crystal Y<br><br>New: Faulhber_SA_15_8_141 config (under MEC VT50) with encoders and limit switches disabled. | analyzer3_h | Yes | Yes |
| **Si (5 3 3) analyzer1 - Z axis (VT 50)**<br><br>**From questionnaire: Analyzer1_Z**<br><br>**1 motors** | | | | | | |
| Analyzer1_Z | MEC: USR: MMS:21 | VacCable 6, T5/6<br><br>~~MF? moxa-mec-09:4005 (R62-E15), ioc-mec-tc1-vt50-ims~~ | VT-50-100 | analyzer1_z | Yes | Yes |
| **Channel cut tip/tilt - Newport (H + V)**<br><br>**From questionnaire: Mono1_[HV], Mono2_[HV]**<br><br>**4 motors** | | | | | | |
| Mono1_H (W) | MEC: PPL: MMN:29 | B5/B2 Newport 4 Port 4 | | mono1_h (tip/tilt) | Yes | Yes |
| Mono1_V (W) | MEC: PPL: MMN:30 | B5/B3 Newport 4 Port 5 | | mono1_v (tip/tilt) | Yes | Yes |
| Mono2_H (E) | MEC: PPL: MMN:25 | B5/B4 Newport 4 Port 1 | | mono2_h (tip/tilt) | Yes | Yes |
| Mono2_V (E) | MEC: PPL: MMN:26 | B5/B5 Newport 4 Port 2 | | mono2_v (tip/tilt) | Yes | Yes |
| **ePix100 - Translation stage (VT50)**<br><br>**From questionnaire: Detector[12]_Z**<br><br>**2 motors** | | | | | | |
| Detector1_Z<br><br>(Forward) | MEC: TC1: MMS:22 | VacCable 5. T5/5<br><br>~~MF? moxa-mec-09:4005 (R62-E15), ioc-mec-tc1-vt50-ims~~ | VT-50-55 | epix100f_z | Yes | Test lims. |
| Detector2_Z<br><br>(Backward) | MEC: TC1: MMS:26 | VacCable 4, T5/4<br><br>~~MF? moxa-mec-09:4005 (R62-E15), ioc-mec-tc1-vt50-ims~~ | VT-50-55 | epix100b_z | Yes | Test lims. |

## Detectors Checklist (TBD)

| Detector | DAQ alias | Connection | Cabled? | In DAQ? |
|---|---|---|---|---|
| epix10k-540k | quad_0 | • Power: Quad 0 vac cable -> Flange B3, Q0 feedthru -> air cable "epix10k quad 0" -> MPOD quad outlet 0<br>  ◦ Note: vac cable labeled "PDU Cable Epix10k Q0" on quad side but "epix10k quad2" on flange side.<br>• Fiber: using "epix10k quad 0" vacuum and air fibers. Flange B2, feedthru pair 0 -> PR60 patch panel quad port 0 | Yes | Yes |

| | | | | |
|---|---|---|---|---|
| epix10k-540k | quad_1 | • Power:  TBD -> Flange B3, Q2 feedthru -> air cable "epix10k quad 2" -> MPOD quad outlet 1<br>• Fiber: using "epix10k quad 21 vacuum and air fibers. Flange B2, feedthru pair 2 -> PR60 patch panel quad port 2<br>• Note on vacuum power cables:<br>  ◦ Using cable "PDU Cable epix10k Q1": Minor alarm on DVDD when ON, HV error when failed to configure in the DAQ.<br>  ◦ There is a second cable from Phil "epix10k quad 0" that I have not tested. It is on the optical table. | Fiber only, no power. | No |
| epix10k-540k | quad_3 | • Power:  Quad 3 vac cable -> Flange B3, Q3 feedthru -> air cable "C01 April 2024" -> MPOD quad outlet 3<br>• Fiber: using "epix10k quad 3" vacuum and air fibers. Flange B2, feedthru pair 3 -> PR60 patch panel quad port 3 | Yes | Yes |
| ePix100 | SW Epix100a<br><br>"epix100a_f" | • Power: Flange B3, South feedthru -> power cable E1 -> MPOD outlet 1<br>• Fiber: using "epix100a epix 1" vacuum and air fibers. Flange D2 (left) -> PR60 patch panel epix port 1  MTP to daq-mec-cam01<br>• MECHome: "Epix 1"<br>• DAQ: "epix100a_1_bxrts" | Yes | Yes |
| ePix100 | NE Epix100a<br><br>"epix100a_b" | • Power: Flange B3, North feedthru -> power cable E0 -> MPOD outlet 2<br>• Fiber: using "epix100a epix 0" vacuum and air fibers. Flange D2 (upper) -> PR60 patch panel epix port 2  MTP to daq-mec-cam01<br>• MECHome: "Epix 2"<br>• DAQ: "epix100a_2_fxrts" | Yes | Yes |
| Andor Zyla | zyla | in-air<br><br>USB/Fiber extender to daq-mec-cam02 | Yes | Yes |
| VISAR 1 | visar_1 | Network connection with Windows PC ioc-mec-visar1 | Yes | Yes<br><br>Not tested right now since under regular use |
| VISAR_2 | visar_2 | Network connection with WIndows PC ioc-mec-visar2 | Yes | Yes<br><br>Not tested right now since under regular use |
| Diode /Wave8 | PVs are:<br>• ~~MEC:XT2-1:BMMON:*~~<br>• MEC:XT2-2:BMMON:*<br>• MEC:USR_DIO:) | TBD | Yes | Yes: see<br>ECS-5105 - Jira project doesn't exist or you don't have permission to view it.<br>. |
| Timing diode /QADC134 | PVs are:<br>• MEC:QADC:01:CH{0,1,2,3} | B3<br><br>ioc-mec-qadc.<br><br>Timing fiber connected.<br><br>Diode signal into A1 with SMA/Male - SSMC/Female Coaxial Jumper Cable and VLM-83-2W-S+ limiter. | Yes | Yes |
| XRT spectrometer | hxsss | N/A | N/A | |