Silicon Preparation for 2020 / 2021 - Status Update

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COMPASS Technical Board Meeting
September 1st 2020
CERN
Goal of the 2020 Dry Run / Preparations

Full operational Silicons
About 2.5 years of storage requires a detailed testing and possible repairs of infrastructure.

- Testing of Cryogenic System:
  - Cryo-leaks challenging - repair time (~2 days)
  - Full test of vacuum equipment
  - Full setup of cooling system

- Readout System (partially done)
  - Basic tests already performed during 2019 (ADCs)
  - Test of APVs and infrastructure Repeater Cards

- Preparation for 2021 Run
  - Major work can be done in 2020 → not possible
  - Movement of equipment in final position for 2021

Maybe: Basic Test with single stations next to final position
   => full setup after target loading (20.4.2021)
Silicons at Target Location - 2016 / 2017
Silicons at Target Location - 2020 (ongoing)

- General Infrastructure
  - Valve Box and PLC in place \(\rightarrow\) Redo
  - Main LN\(_2\)-transferline prepared ✓
    - Currently connected to target ✓
  - Exhaust transferlines installed ✓
  - Station transferlines prepared Redo ✓
  - Scaffolding mounted ✓
  - Optical bench in place ✓
  - New power supply rack installed ✓

- Cabling (To Do)
  - ADC fibers from Saleve side
    - Refurbishment of fibres planned (ongoing)
  - ADC low-voltage from new rack ✓
  - APV low-voltage from new rack:
    - Requires CAEN from e-pool (before dry-run)
  - High-voltage from new rack
    - Items ready to be installed
List for Preparations and Testings (still to do)

- **Electronics Pool:**
  - 1x CAEN SY1527 with 8x A1518A Module (incl. 2x spares)

- **Vacuum Pumps (5 days):**
  - 3x (Silicons) + 1x Valve Box + 1x Station Transfer Lines + 1x Main Transfer Line
  - Maintaining of Vacuum Pumps (Exchange of Membrane and Fluid Reservoir)
  - Testing of Vacuum Pumps (6x + 4x Spares)

- **Vacuum Gauges (2 days):**
  - 13x Vacuum Sensors + 6x Replacement Cells
  - 3x (Silicons) + (3x backup cell), 1x Station Transfer Lines, 1x Valve Box, 1x Main Transfer line
  - Testing of Vacuum Sensors and Vacuum Cells

- **High Voltage Capacitors (1 day):**
  - 12x for Silicons (4x per Repeater Cards)

- **Vacuum Tests (5 days):**
  - Replacement of Window O-Rings and Vacuum Test
  - Vacuum Test of Stations
  - Vacuum Test of Station Transfer Lines

Testing and Preparation of all required components

Total: ~7-14 days

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List for Installation

☑ Preparation of Location (1 day):
  ☑ Concrete Blocks and Optical Bench in place, scaffolding, rack, PLC
  ☑ Power, LAN, nitrogen gas

☐ Valve Box and Cooling System (2-4 days):
  ☐ Installation by Saclay (Jean-Yves and his Team)
    ☐ Requires: Power and pressurised Air for Valves
    ☑ Connection: Input and Exhaust Pipe Transferline
    ☐ Connection: Pressure Sensors, Safety Valves
    ☑ Connection of Main Transfer Line (3-5 people required!)
    ☑ Nitrogen Circuit for Stations

* +2-4 days
* Reworked PLC System
* LD Testing check etc... required
* +1 week
Missing - Magnetic Shielding

- Not found yet 4x (stations + valve box):
  - Checked locations: Clean Area, 892 storage / room in basement, 888 barrack (Munich/SciFi)
  - Charly does not remember other places
  - Search/Rebuild/Alternative?

Drawings sent to Stefano - any news?
Summary

• **Goal of the test run 2020:**
  - Commissioning of readout system — only ADC tested in 2019
  - Commissioning of cooling system — No
  - Fully operational Silicon detectors ~1 week before dry run start (and operational during dry run)

• **Time scale:**
  - General preparations / testing: 7/14 days
  - Setting up Silicon detectors: 0/5 days
  - Commissioning of detectors and cooling system: 0/7-14 days

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• **Planning for data taking 2021:**
  - Think about smart movement and single steps to switch to beam position
  - Stations have to be completely disconnected (readout, cables, pipes)
  - Infrastructure removed (scaffolding, optical bench, concrete blocks)
  - Minimal time estimate for moving existing setup in target location: 1-2 weeks
  - On-call planning in case of emergency target-removal?