

Alignment Team - Organization and Planning

NSW Steering Group
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Alignment Team at CERN

Camila Pazos

Tatiana Azaryan (in training, full-time)

Christopher Armstrong (in training, full-time)

Guadalupe Duran (begins October 12th, full-time)

Split into two, 2-person teams for most tasks

→ 40 work-hours per week, per team = **80 work-hours available**

Alignment Tasks – Installations & Routings

- 1 sTGC wedge installation = **4 hours/day x 2 days**
 - **Two-day process!** Day 1: sTGC-platforms + Day 2: sTGC-photogrammetry
 - One at a time, limiting factors are jigs & installation plates
- 1 MM quad installation = **2 hours/day x 2 days**
 - **Two-day process!** Day 1: MM-platforms + Day 2: MM-photogrammetry
 - Two *different* quads at a time, limiting factors are jigs & installation plates
- 1 sTGC fiber routing = **4 hours**
 - One routing = one (pivot or confirm) wedge
- 1 MM fiber routing = **4 hours**
 - One routing = one side (A-IP or A-HO) of a double wedge

**Time estimates assume a trained 2-person team doing each task, and an efficiency factor, i.e. breaks, gathering tools, driving between buildings, etc.

To complete 2 sTGC wedges, and 2 MM DWs in one week:
72 work-hours

Alignment Tasks – Other Tasks

Installation Preparations

- CMM measurements of source platforms in b.180 (1 person) > **8 hours/week**
 - Cleaning, labeling, and measuring source plates
 - Updating and maintaining source plate database
- Preparation of alignment fibers for routing (1 person) > **4 hours/week**
 - Allows us to later complete fiber routings in 4 hours

b.191 Work & Preparations

- Alignment fiber routing on wheel (2 persons) > **8 hours/week**
 - Connecting and routing fibers from injectors to sectors
- Alignment bar preparation (2 persons) = **4 hours/bar**
 - Mounting BCAMs, labeling, testing electronics
 - Updating and maintaining alignment bar database
- Electronics installation, testing, commissioning (2 persons) > **8 hours/week**
 - Mostly needed for C-wheel repeaters, multiplexers, injectors
- Data acquisition, alignment reconstruction (Camila) > **8 hours/week**
 - 8 hours/week is the **minimum** for maintaining a functional system
 - > 20 hours/week for troubleshooting, improvements, & processing data

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**Necessary on
a weekly basis!**

Prototypical Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday	Total
morning (4 hours)	sTGC-platforms	sTGC-photogram	sTGC-platforms	sTGC-photogram	CMM measurements Fiber preparations	2 sTGC wedge installations
	MM-platforms (x2)	MM-photogram (x2)	MM-photogram (x2)	MM-photogram (x2)	MM-photogram (x2)	2 sTGC fiber routings 8 MM quad installations = 2 DWs
afternoon (4 hours)	sTGC-fibers	MM-fibers	MM-fibers	MM-fibers	MM-fibers	4 MM fiber routings = 2 DWs
	sTGC-fibers	MM-platforms (x2)	MM-platforms (x2)	MM-platforms (x2)	CMM measurements DAQ & reconstruction	CMM measurements Fiber preparations DAQ & reconstruction

- Feasible as of beginning of November (to have a fully trained team).
- Not enough time spent on CMM measurements or on b.191 work, but this won't cause a bottleneck unless we have 3+ consecutive weeks at this production rate.

Conclusions, Organizing, & Planning

- Integration of 2 sTGC wedges and 2 MM double wedges in one week is feasible for the alignment team!
- Communication is key! Each group should let us know the week before if they expect to have either 2 sTGC wedges or 4+ MM quads for integration the following week.
- sTGC-specific requests:
 - Flipping the wedge should happen before 14:00, otherwise the alignment installation may have to wait until the following day.
 - Labeling the wedge once it is flipped.
- MM-specific requests:
 - Label the quad with market as C-HO or C-IP once its in the alignment room! The Twiki cannot always keep up with the changing plans, and our technicians doing the installation may not be aware of any last-minute changes!