GEM Front Tracker

As of September 2014

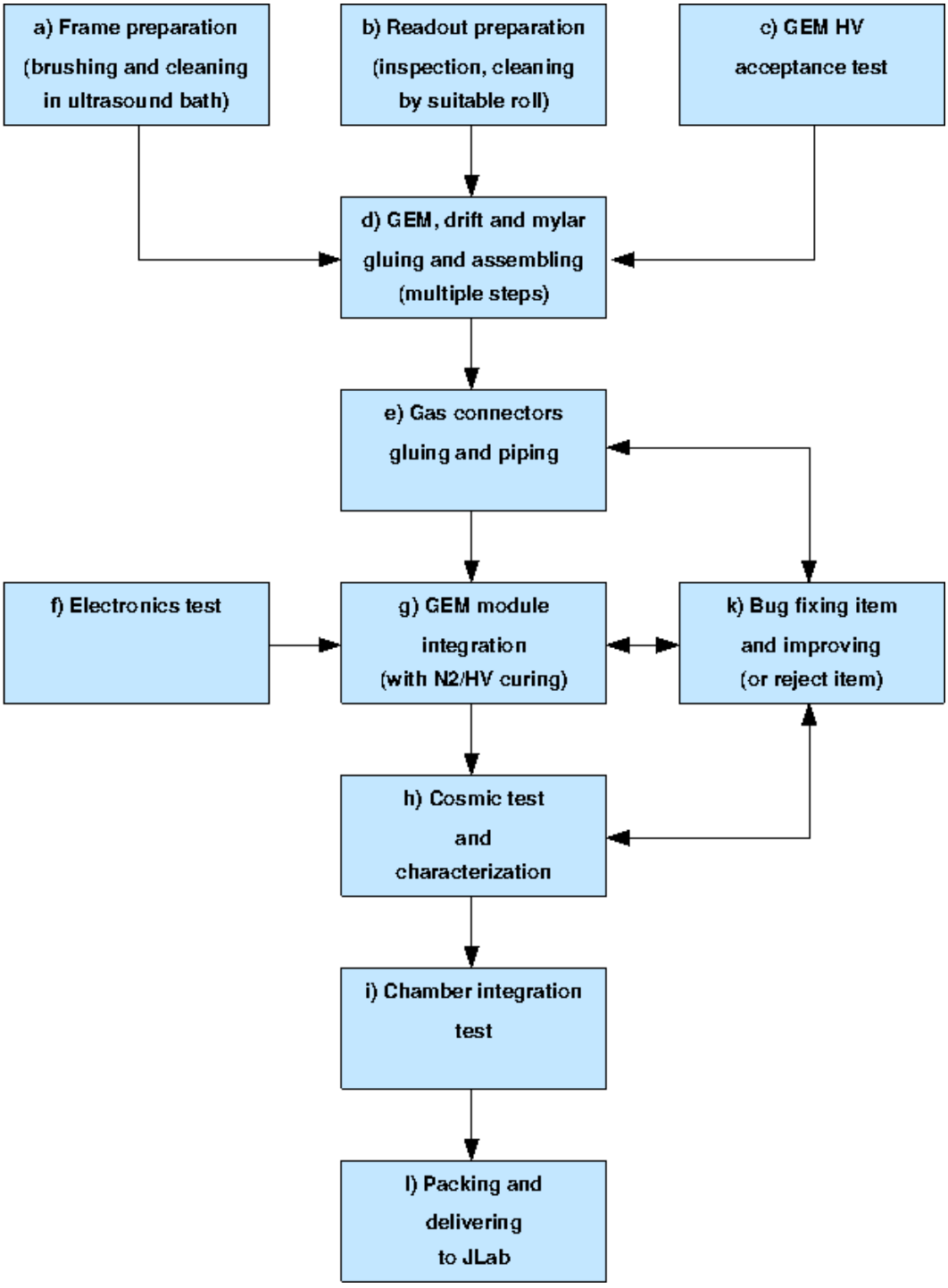
Workforce

INFN Group	Researcher	Student	Technician	Role
Bari	1			Gas system and module test and characterization
Catania	3	1	2 + 1*	GEM module assembling, mechanics, beam test, data analysis
Genova	1**			Electronics design and test
Rome/Sanità	1	1	3	Coordination, design, test, chamber integration, analysis, DAQ and reconstruction software
Total	5	2	6	

*) Technician with Physics master degree
**) Electronic Engineer

Construction work flow

The work flow of the production is summarized in the following flow diagram and detailed in the next subsections.



Tasks “a” to “e” are performed in Catania (mainly in clean rooms). Task “f” is partially performed in Genoa and part in Rome. Tasks “g” to “l” are currently performed in Rome. Task “k” is performed (as needed) in Catania, Genoa and Rome.

A time sheet of the activities is reported in the next table together with the type of human resource allocated to each task (T=technician, S=Student, R=Researcher). The schedule is relaxed (people are involved at about 50% of their time). Total expected module assembling time, with most of the activities in series, is about 24 days (including Saturday and Sunday not-working days).

We estimate 2 modules/3 months (this is the rate of the first 6 months of 2014) that includes summer vacation and national holidays; this rate is largely consistent with the current SBS plan. The testing and characterization on the completed module is expected to take about 15 days; it is performed in parallel to the assembling procedures. We added time for chamber integration test in Italy, before delivering to JLab, and packing time of 3 modules. Bug fixing and potential improvement activities run in parallel to the assembling and characterization. Delivery times (not included in the table) Catania-Rome and Rome-JLab are estimated to few days and 2 weeks respectively.

Module	Main task	Day 1	Day 2	Day 3	Day 4	Day 5	Sat	Sun	Day 8	Day 9	Day 10	Day 11	Day 12	Sat	Sun	Day 13	Day 14	Day 15	Day 16	Day 17	Sat	Sun	Day 18	Day 19	Day 20	Day 21	Day 22	Sat	Sun	Day 23	Day 24	Day 25
n	a) Frame Preparation	T	T																												
n	b) Readout Preparation	T	T																												
n	c) GEM HV acceptance tests																														
n	1st foil	S,R																													
n	2nd foil		S,R																												
n	3rd foil			S,R																											
n	d) GEM, drift and mylar gluing and assembling																														
n	1st foil				3*T	2*T																									
n	2nd foil								3*T	3*T																					
n	3rd foil										3*T	3*T																			
n	drift foil												3*T			3*T															
n	mylar window																3*T	3*T													
n	extra mylar window																		3*T	3*T			3*T								
n	e) Gas connectors and piping																														
n	pipe and tube gluing																							2*T	T						
n	gas leak test and fix																									2*T	T				
n	packing for delivery to Rome																													2*T	
n-1	f) Electronic Test																														
n-1	MPD module	R																													
n-1	FE Cards		R																												
n-1	Backplanes and patch panels		R																												
n-1	g) GEM module integration			2*T,R	2*T,R	2*T,R																									
n-1	h) Cosmic Test and Characterization								T,R	T,R	T	T	T			T	T	R	R	R											
n-3,n-2,n-1	i) Chamber integration test																						2*T	2*T	2*T	2*T					
n-3,n-2,n-1	l) Packing for delivering to Jlab																										2*T		2*T	2*T	
	k) Bug fixing, improving (or reject item)															R,T	R,T	R,T	R,T	R,T											