Minutes of ACTAR workshop held in Bordeaux on 16, 17 and 18 June 2008

Introduction

This workshop was attended 27 physicists and engineers from labs following CENBG (France), GANIL (France), GSI (Germany), DL (UK), IRFU (France), MSU (USA). RIKEN-RIBF (Japan, not present but involved in the project).
The goal of the workshop was to define a new general electronic for TPC, easily adaptable to other detectors or other dynamic ranges, to look at the manpower available from the laboratories, to define a time schedule, responsibilities and a budget for this project. The name of the project is **GET**, for **G**eneral **E**lectronics for **T**pc.

Organisation

1) General considerations

GET is not a multi-laboratories project but a multi-project built by multi-laboratories, which covers the frontend electronics (including spark protection) to data acquisition.
Basically, two classes are emerging: high density detectors (GANIL and CENBG) and low density detectors (MSU, GSI and RIKEN).

2) Product tree and responsibilities

7 main parts constitute this project:

- **ZAP** : Asic Protection. Leader F. Druillole (IRFU)
- **AGET** : Asic Get. Leader P. Baron (IRFU)
- **ASAD** : Asic Support Analog Digital conversion. Leader JL Pedroza (CENBG)
- **CoBo** : Concentration Board. Leader N. Usher (MSU)
- **InBo** : Integration Board. Leader G. Wittwer (GANIL)
- **MUTANT/BEM** : MUltiplicity Time ANd Trigger/BackEnd Module. Leader W. Mittig (MSU) & G. Wittwer (GANIL)
- **SOFT** :**Data flow/ Run control/ DAQ Slow control**. Leader Frederic Saillant (GANIL)

3) Work breakdown structure

A group composition is suggested for each product and for each the responsibilities are:

- Specification
- Scheduling
- Prototyping
- Manufacturing
- Test

4) Manpower

LAB	FTE Eng.	FTE Tech	FTE Physics	Date Eng.	Date start
RIKEN	0	0	2	?	Apr, 2012
CENBG (*)	4	2	2	Jan,2009	?
GANIL (**)	5	3	5	Jan,2005	Dec,2012
MSU	3	1.5	3	Oct,2008	Jun,2011
Saclay	2	1	2	Jun,2008	2013

(*) subject to acceptance by the cell project CENBG
(**) 8 FTE Eng and 4 FTE Tech needed – (at least) , need more staff

5) Cost Model and scheduling

Work package	2008	2009	2010	2011	2012
AGET	Saclay + GANIL 50k€ (subvention 1 ok)	50K€ (subvention 2 ok)	Production 80 k€		
Pream-high Gain		Prototype 32 channels 15k€			
ASAD low density	Specification	Test mid 2009. 5k€. 3 boards prototype			200 k€
ASAD high density		R&D 5k€	Test mid 2010. 5k€ 3 boards prototype	250 boards 150 k€	
ZAP	R&D	R&D 10k€	Production 10 k€		
Cobo	Specification	Kit Developments 5k€	Prototype mid 2010	Production 70 cards 100 k€	
InBo	Specification	R&D 5k€	Prototype End 2010 5k€		
MUTANT/BEM	Specification (BEM)	Specification mid 2009 (MUTANT) Start mid 2009 (BEM 5k€)	5k€ (MUTANT) 5k€ prototype mid 2010 (BEM)	Prototype mid 2011 (MUTANT 10 cards) 50 k€ (BEM 10 cards)	100 k€
SOFT		Specification mid 2009	Development 15 k€	Test	
Prevision budget hardware Software, 3 full systems	300 k€ : 100 k€ for 10 000 channels				
Budget working groups meetings		20 k€	20 k€	20 k€	20 k€
Budget collaboration meetings		30 k€	30 k€	30 k€	30 k€
TOTAL BUDGET		150 k€ 25 k€/project	175 k€ 26 k€/project	350 k€ (3 systems) 60 k€/project	350 k€ (3 systems) 60 k€/project

6) Funding sources

- ANR : Bordeaux, GANIL, Saclay : 800 k€ (4 years, demand 2009) including manpower
- SPIRAL2 related money :
  - Presentation at the IN2P3 Scientific Council

- Ask for money
- MSU :
  - NSF
  - DOE
- RIKEN ?

7) Tasks

Work package	Group *	Task	Animator
ZAP	**F. Druillole**	Circuit designed at IRFU Tested at GANIL (MAYA)	JL Pedroza
AGET	**P. Baron**	Must fit the specifications for: ACTAR/GANIL TPC/GLAD/R3B/FAIR TPC & Active target/MSU TPC/CENBG SAMURAÏ TPC/RIKEN	
ASAD	**JL Pedroza**	2 kinds of frontend cards to be designed: - Low density with FEC (T2K denomination) adaptation for prototype and low density card for MSU - High density card * a high dynamic frontend external ASIC (range 10^4) could be developed	
Cobo	**N. Usher**	2 architectures proposed: MSU & GANIL. Compatibility with the GANIL acquisition to check. GANIL "object" must be respected.	N. Usher
InBo	**G. Wittwer**	Main spec written no green light from the commitment of GANIL at this time. Industrial solution for the hardware, software could be developed else by GANIL	
MUTANT/BEM	**G. Wittwer**	Specification to write. Discussion on the trigger to continue	W. Mittig
Software	**F. Saillant**	Many parameters, data volume important. Rate 1Gbit/s	F. Saillant
Calibration			JE Ducret
Associated Instrumentation & Security	**?**		?
Review tasks	**P Coleman-Smith**		P Coleman-Smith

* Names to add…

Conclusion

The new project GET is emerging. All things are not fixed but we have a good vision of human and financial resources that are necessaries. The composition of each group must be refined. All the presentations of the workshop are available at:
http://groups.nscl.msu.edu/tpc/wiki/doku.php?id=actar_collaboration_meeting_bordeaux_june_16_-_18_2008
or :
http://indico.in2p3.fr/conferenceDisplay.py?confId=901
(access key actar_bx)

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Next workshop mid February, 2009.