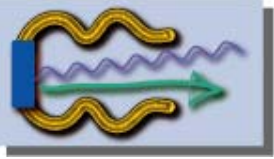


Status of the CTF3 photo-injector under the auspices of Brussels

L. Rinolfi



Some terminology

FP6 = Sixth Framework Programme (from 2004 to 2008)

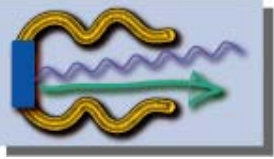
ESGARD = European Steering Group for Accelerators R&D

CARE = Coordinated Activities Research in Europe

NA = Network Activity (NA1, NA2, ...)

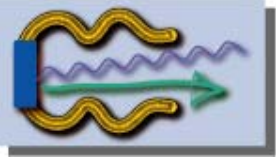
JRA = Joint Research Activity (JRA1, JRA2, JRA3,...)

PHIN = PHoto-Injector project = JRA3 (today)



Contents

1. JRA3 into CARE
2. Planning and budgets for JRA3
3. CTF3 into JRA3
4. Milestones, planning and budget for CERN
5. Conclusion



JRA3 into CARE

Title: Charge production with Photo-injectors

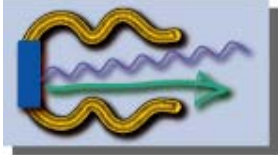
Acronym: PHIN

Coordinator: A. Ghigo (INFN-LNF)

Deputy: L. Rinolfi (CERN)

Main Objectives: Perform Research and Development on charge-production by interaction of laser pulse with material within RF field and improve or extend the existing infrastructures in order to fulfil the objectives. Coordinate the efforts done at various Institutes on photo-injectors.

Web site : <http://esgard.lal.in2p3.fr/>



**CARE
Central Management**

Steering Committee

**JRA3: PHIN
External Scientific
Advisory
Committee**

**JRA3: PHIN
Coordinator : A. Ghigo
Deputy : L. Rinolfi**

**Work Package
Level**

**WP1: M&C
Leader:
A. Ghigo**

**WP2: CP
Leader:
J. Teichert**

**WP3: LAS
Leader:
I. N. Ross**

**WP4: GUN
Leader:
G. Biennu**

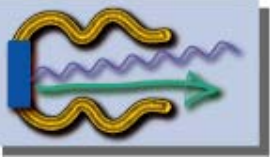
**Task/Topic
Level**

- Steering Committee meetings
- Reviewing and Reporting
- Dissemination

- Equipments Photocathode preparation
- Photocathode High Charge
- Photocathode SC RF gun
- Mono-energetic electron beam

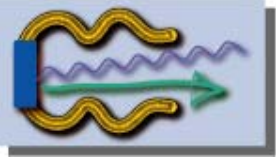
- High Power Oscillator
- Amplifiers Realisation
- UV conversion
- Feedbacks development
- Pulse shapers test
- Timing

- SC RF gun Technology
- SC RF gun Realisation
- 3 GHz RF gun Realisation
- 3 GHz RF gun Commissioning
- Spectrometer.

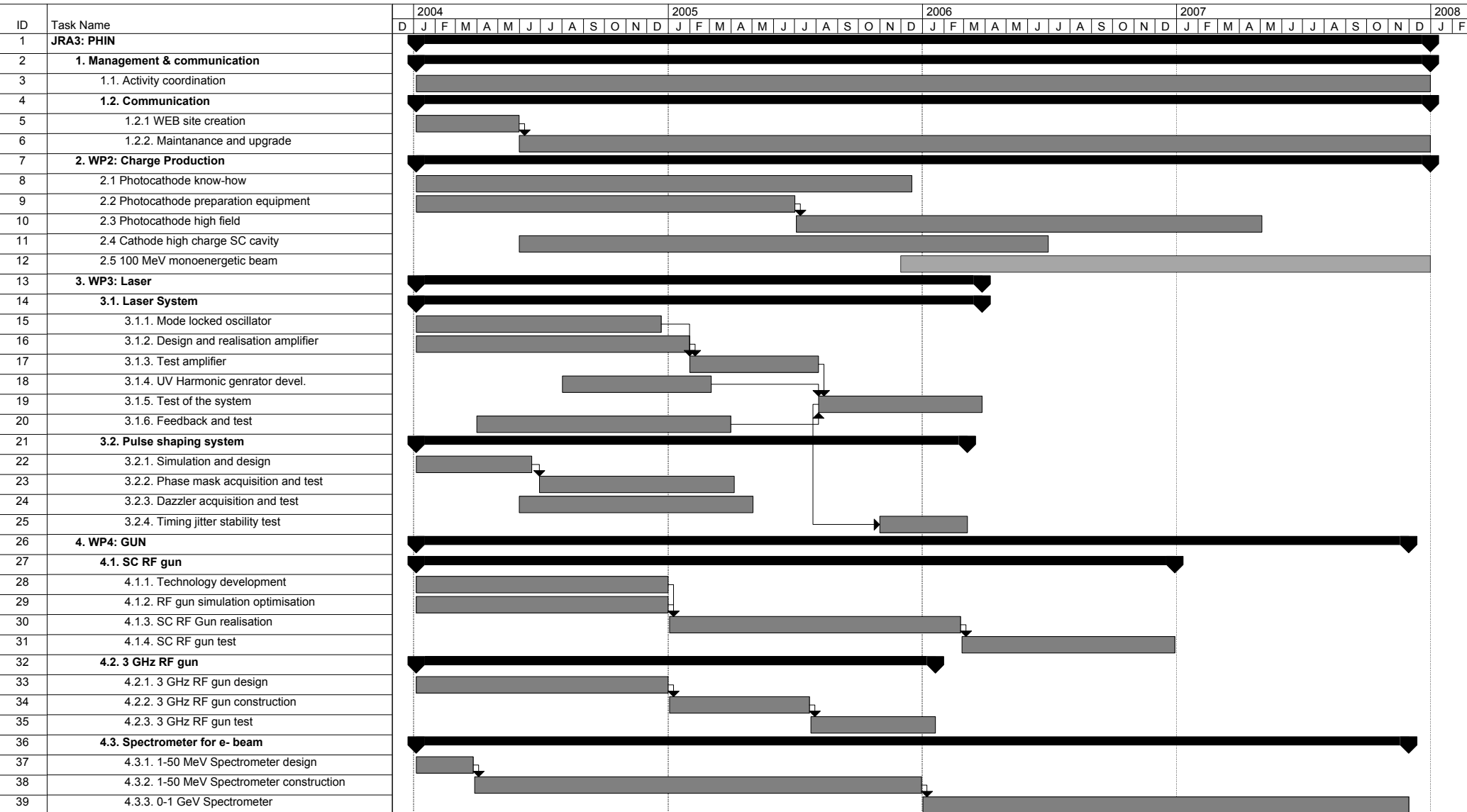


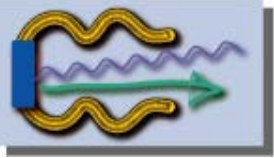
Eight participating institutes

Institute	Acronym	Country	Coordinator	PHIN Scientific Contact	Associated to
CCLRC Rutheford Appleton	CCRLC-RAL	UK	P. Norton	I.N. Ross	
CERN Geneva	CERN	CH	H. Haseroth	G. Suberlucq	
CNRS-IN2P3 Orsay	CNRS-Orsay	F	T. Garvey	G. Biennvenu	CNRS
CNRS Lab. Optique Appl. Palaiseau	CNRS-LOA	F	T. Garvey	V. Malka	CNRS
ForschungsZentrum ELBE	FZR-ELBE	D	J. Teichert	J. Teichert	
INFN-Lab. Nazionali di Frascati	INFN-LNF	I	S. Guiducci	A. Ghigo	INFN
INFN- Milan	INFN-MI	I	S. Guiducci	I. Boscolo	INFN
Twente University- Enschede	TEU	NL	A. den Ouden	J. Verschuur	



PHIN Multi-annual implementation plan





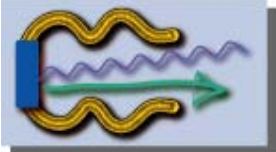
Referees report and conclusion from Brussels

Evaluation summary report

For the JR3, the Charge Production with Photo injectors, the **focus** on higher intensity and higher brightness is **right**. This supports a whole set of ongoing major initiatives for large research facilities. It includes some **very innovative aspects that are important for existing facilities** and will help to support future facilities. Spin offs of this activity into other fields are expected, e.g. synchrotron radiation sources, electron linacs and high brightness / high intensity beam applications. The activity seems heavy on management and travel/meetings. **The resources for this activity are adequate.**

Conclusions

Generally all evaluators were **very impressed with the quality** of the proposal and support it. As regards resources the following recommendation are made: for the networking activities 30%, for the combined JRA 1+2 65%, for the **JRA3 and JRA4 90%** and JRA5 at 25%.



Budgets expected and requested from EU

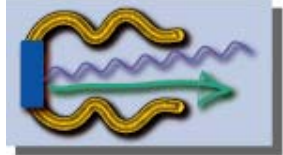
After Brussels referees recommendations and agreement from the 8 Institutes

k€

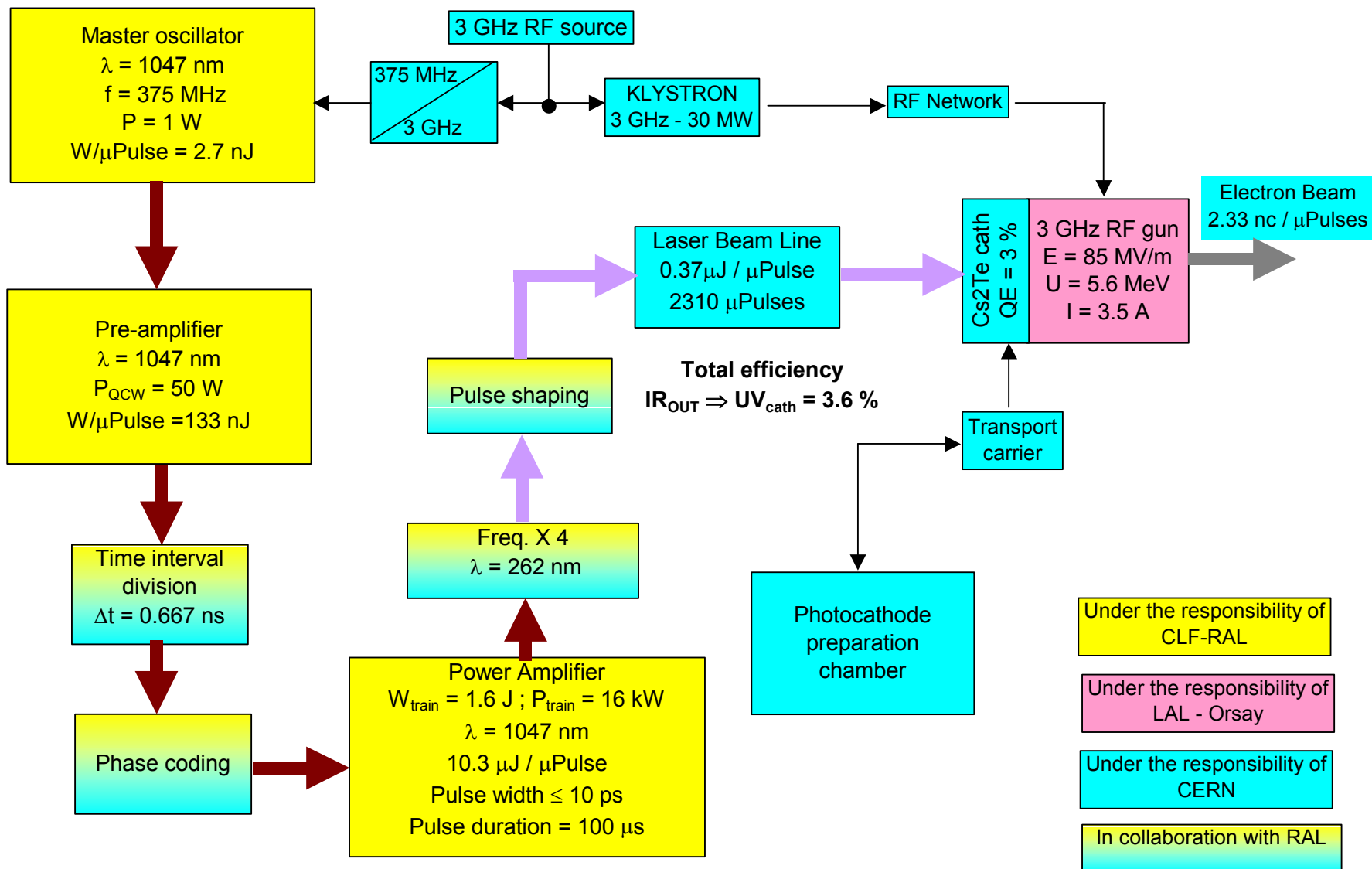
Institute	Cost Model	WP1: M&C		WP2: CP		WP3: LAS		WP4: GUN		Total	
		Exp. Cost	Req. Cost	Exp. Cost	Req. Cost	Exp. Cost	Req. Cost	Exp. Cost	Req. Cost	Exp. Cost	Req. Cost
CCRLC-RAL	FC	15	10	0	0	262	100	0	0	277	110
CERN	AC	15	10	55	45	970	942	200	165	1240	1162
CNRS-Orsay	FC	40	5	330	210	427	225	1163	305	1960	745
CNRS-LOA	FC	0	0	0	0	0	0	975	425	975	425
FZR-ELBE	AC	15	5	265	240	0	0	130	120	410	365
INFN-LNF	AC	60	25	0	0	70	60	180	180	310	265
INFN-MI	AC	0	0	0	0	260	215	0	0	260	215
TEU	FC	0	0	290	255	0	0	0	0	290	255
Total		145	55	940	750	1989	1542	2648	1195	5722	3542

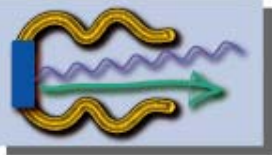
FC = Full Cost

AC = Additional Cost



CTF3 photo-injector synoptic (G. Suberlucq)

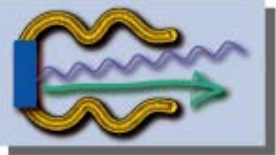




Milestones for CTF3 photo-injector

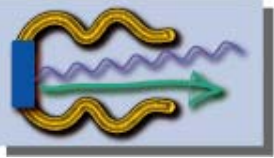
No	Date	Tasks or sub-tasks to be completed by milestone date
1	30/06/2004	Report on photo-cathode studies
		Report on laser oscillator design
2	01/12/2004	Report on 3 GHz RF gun design
		Laser oscillator test results
3	31/03/2005	Report on laser amplifier design
		Report on UV conversion crystal comparison
5	30/09/2005	Amplifier test results
		3 GHz RF gun test result and delivery to CERN
7	31/03/2006	Laser system test results and delivery at CERN
9	01/12/2006	Report on 3 GHz RF gun commissioning at CERN
		Report on new photocathode materials tests

The CTF3 photo-injector should be operational in 2007



JRA3 (PHIN) budget in 2003

	Total Cost	Requested EU funding
JRA3 April	5.520 M€	3.980 M€
JRA3 August	5.520 M€	3.582 M€ (10% cut)
JRA3 September	5.722 M€ (CNRS-Orsay update)	3.542 M€ (+ NA2 contribution)
CERN September	1.448 M€	1.162 M€



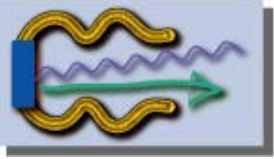
Resources from CERN for CTF3 photo-injector

- E.U. funding for CERN by work package and over JRA3 duration (k€)

WP1 : M&C	WP2 : CP	WP3 : LAS	WP4 : GUN	TOTAL
10	45	942	165	1162

2004	2005	2006	2007	Total
650	280	190	42	1162

- During the same period (2004 - 2007) the CERN contribution to the Photo-injector (including commissioning) will be : 1448 k€ (= 2172 kFS)
 - Material : 170 k€ (= 255 kFS)
 - Personnel : 1200 k€ (= 1800 kFS) => 4 man-years over 3 years
 - Cut 10% + NA2 contribution: 78 k€ (= 117 kFS)
 - + Civil engineering
 - +



Conclusions

- The PHIN project (JRA3) is now funded by EU with 90% of the requested budget. Funds available at the beginning of 2004.
- CERN should evaluate carefully the **complementary resources** and should be prepared to **report to Brussels** according to the defined milestones.
- The photo-injector option for CTF3 is possible in **collaboration** with CNRS-Orsay and CCLRC-RAL based on a consistent list of parameters with a specific objective
- CTF3 objective is to develop, to built and to install a photo-injector in a time scale **of 3 years** and for a **CARE budget of 1162 k€**
- A CTF3 photo-injector operational in 2007 becomes realistic.
Now we should do it !!!!