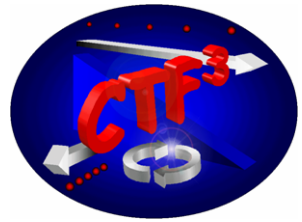


Status of CTF3

G.Geschonke
CERN

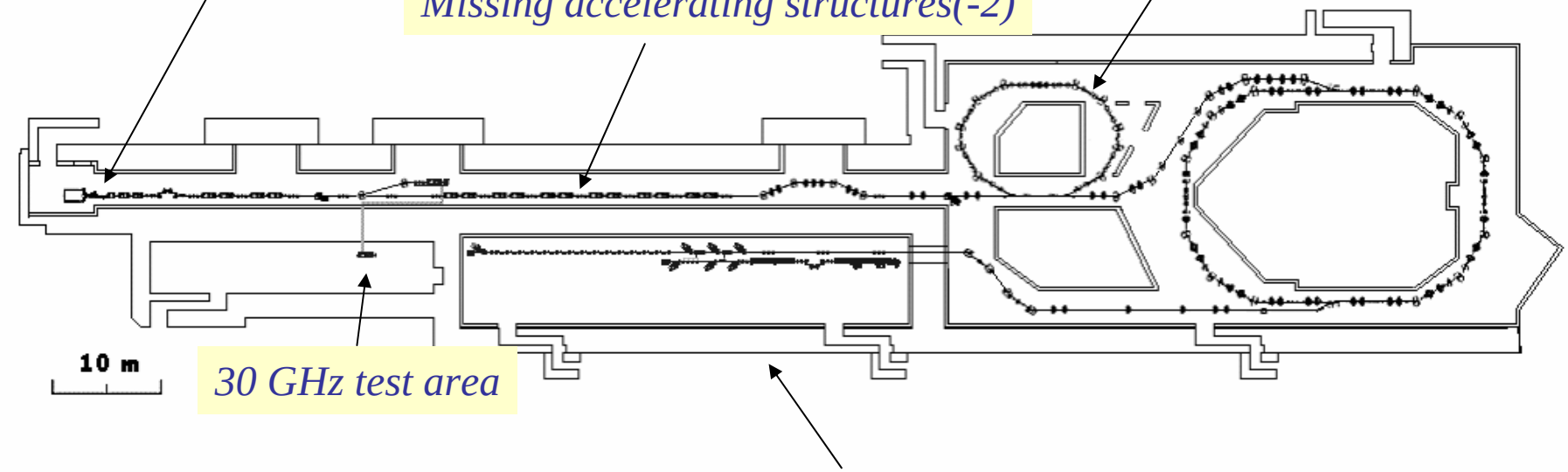
Plan for 2005

Install and commission:

Sub-harmonic bunching system
1.5 GHz

Delay Loop (INFN Frascati)
(Building modification done)

Missing accelerating structures(-2)

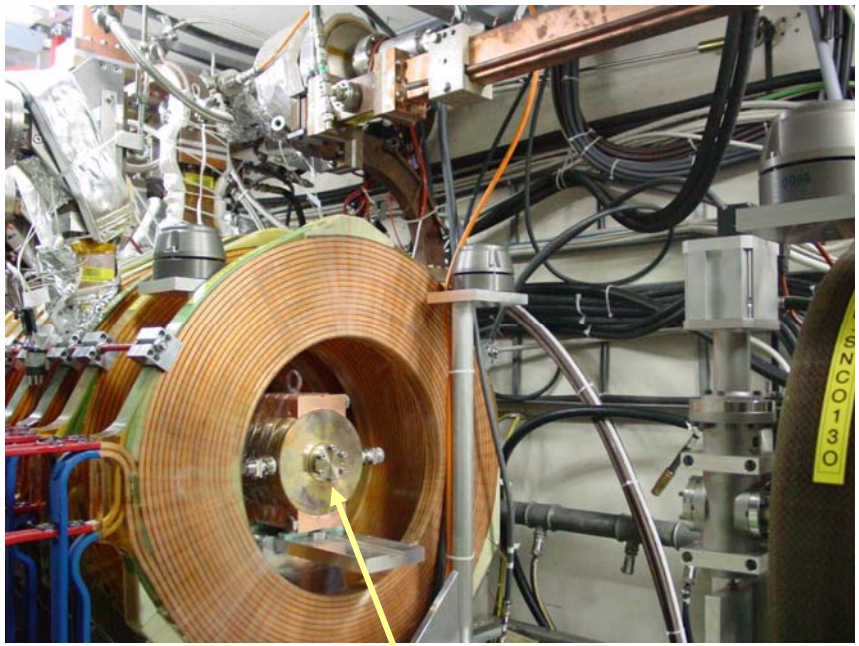


30 GHz test area

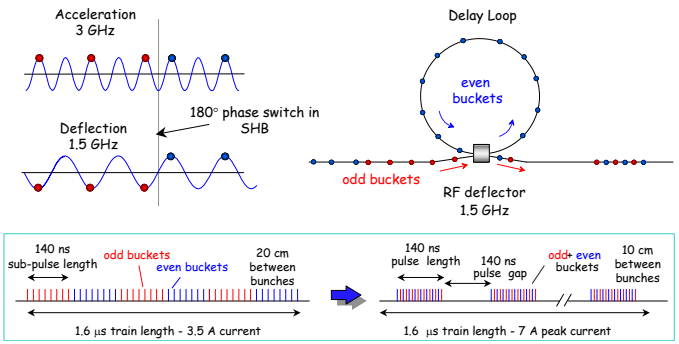
CLEX building

In addition:
add 2 accelerating structures in front of PETS
add collimator in PETS line

Sub - harmonic bunching system



one of three buncher cavities



☺ Three Sub-harmonic bunching cavities built and installed

☹ RF power source:
4 Travelling Wave Tubes purchased
1 failed (guarantee)
1 broke in transport

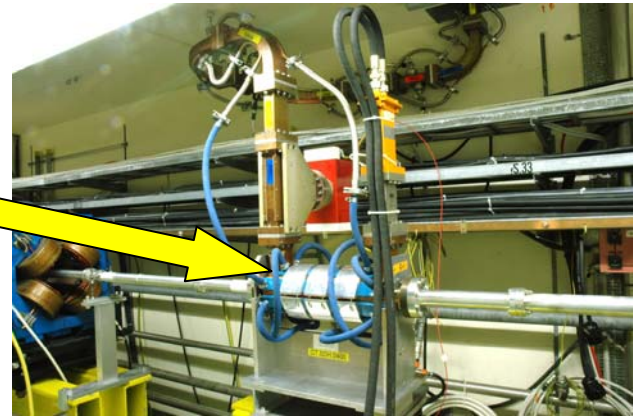
☹ ☹ HV supply: Manufacturer late delivery foreseen in August, still not received the first one hope to receive one before end of 2005

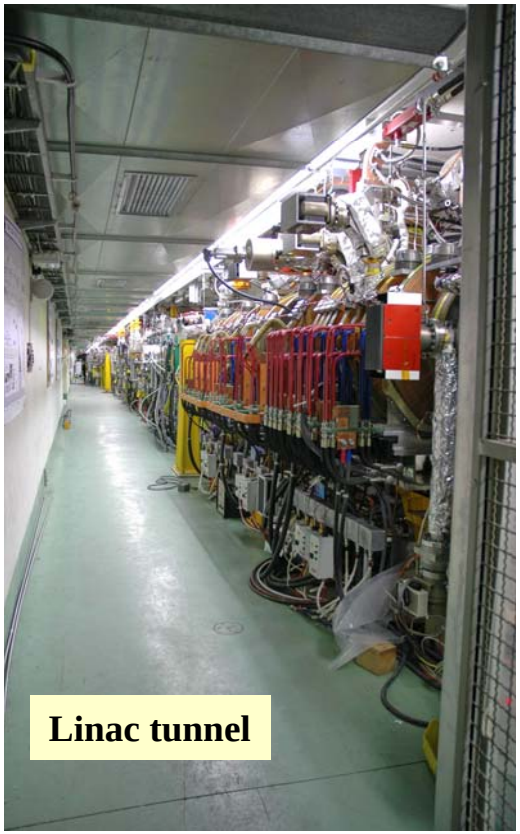
⇩

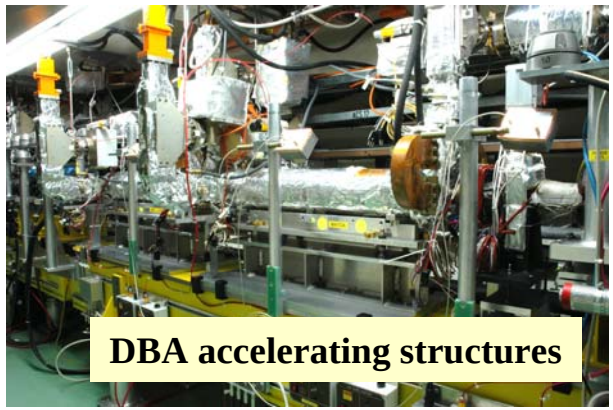
phase coding cold not be done.
everything else (low level RF) ready.

Install missing accelerating structures

☺ Accelerating Structures installed according to plan.
Total installed now:
2 in injector
14 in Drive Beam Linac
2 not installed, klystron used for RF deflector experiment





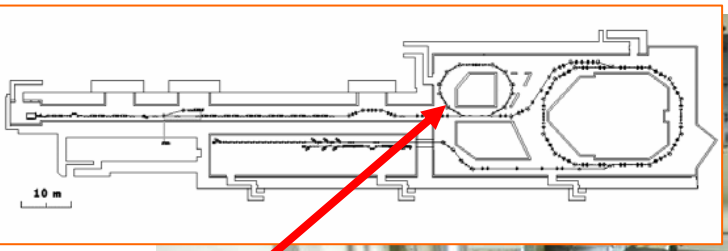


☺ Move 2 accelerating structures before PETS tank ➔ higher energy
☺ Change 3 GHz RF power distribution: All accelerating structures for 30 GHz power production can be powered with 50 Hz rep rate.

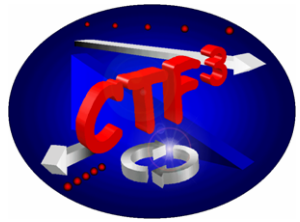
Delay Loop

One of the highlights of this year

Full responsibility of INFN Frascati → **talk by Andrea Ghigo**



Delay Loop



overall responsibility: INFN

INFN

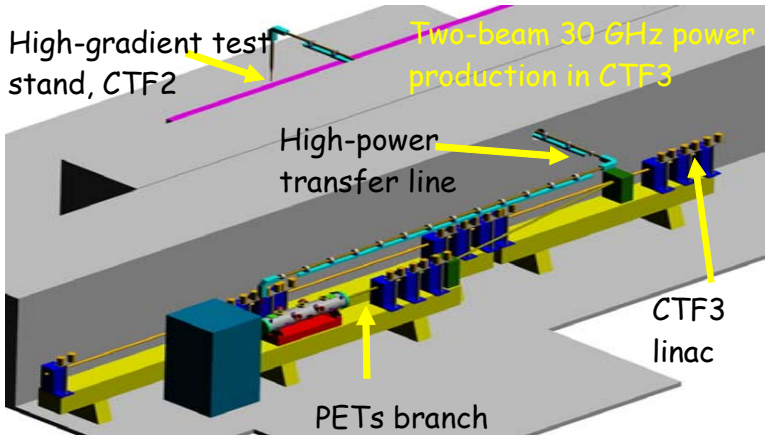
optics
vacuum system
beam diagnostics
sextupoles
wiggler
corrector magnets
1.5 GHz RF deflector
waveguides
installation

CERN

dipoles, quadrupoles, correctors
septa
power converters
controls
vacuum control, pumps
1.5 GHz klystron/modulator, low level RF
beam diagnostics (part)
alignment
infrastructure, cabling, installation support

Installation basically complete, a few beam position monitors missing
First Beam circulated on 24.11.
(without RF deflector so far)

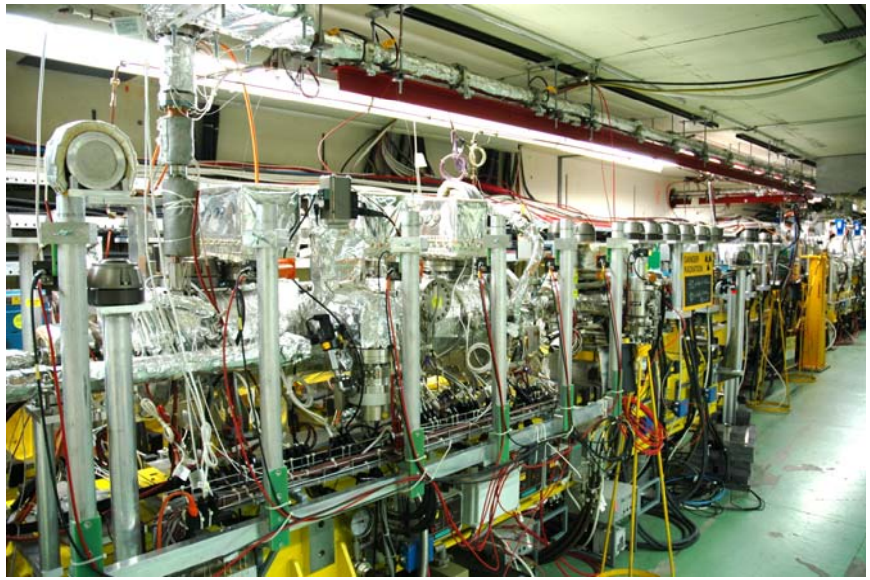
30 GHz test area



30 GHz power production now operational
for the CLIC accelerating structure programme.

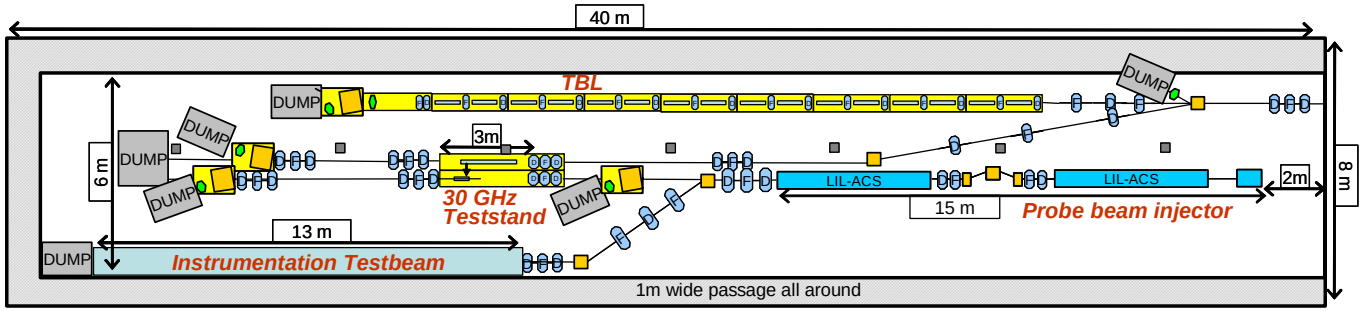
More than 90 MW produced from “PETS”

very promising results ➔ Walter Wünsch / Alberto Rodriguez

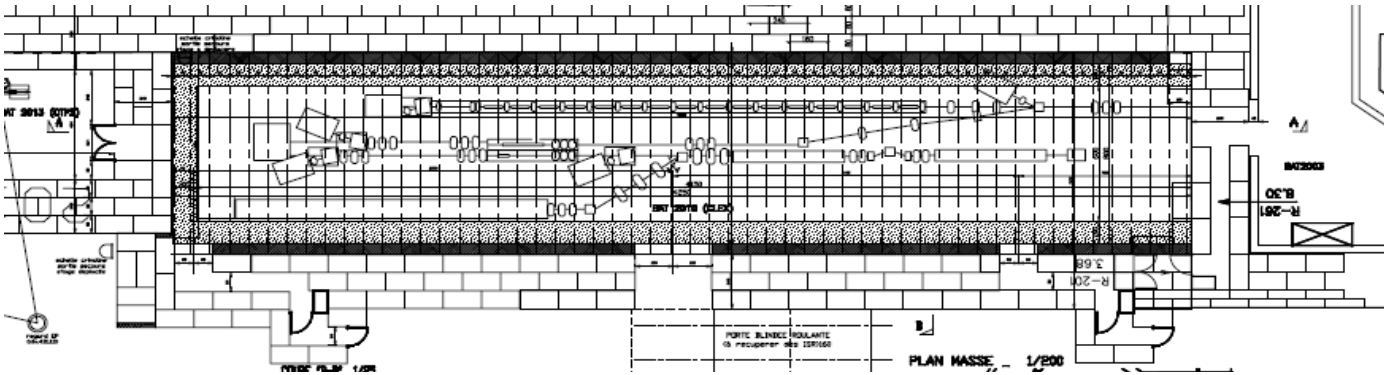


CLEX building

Very tentative layout for CLEX floor space



8 m wide, 40 m long partly covered by klystron gallery



Status:
Building layout defined
Design advancing, construction during 2006

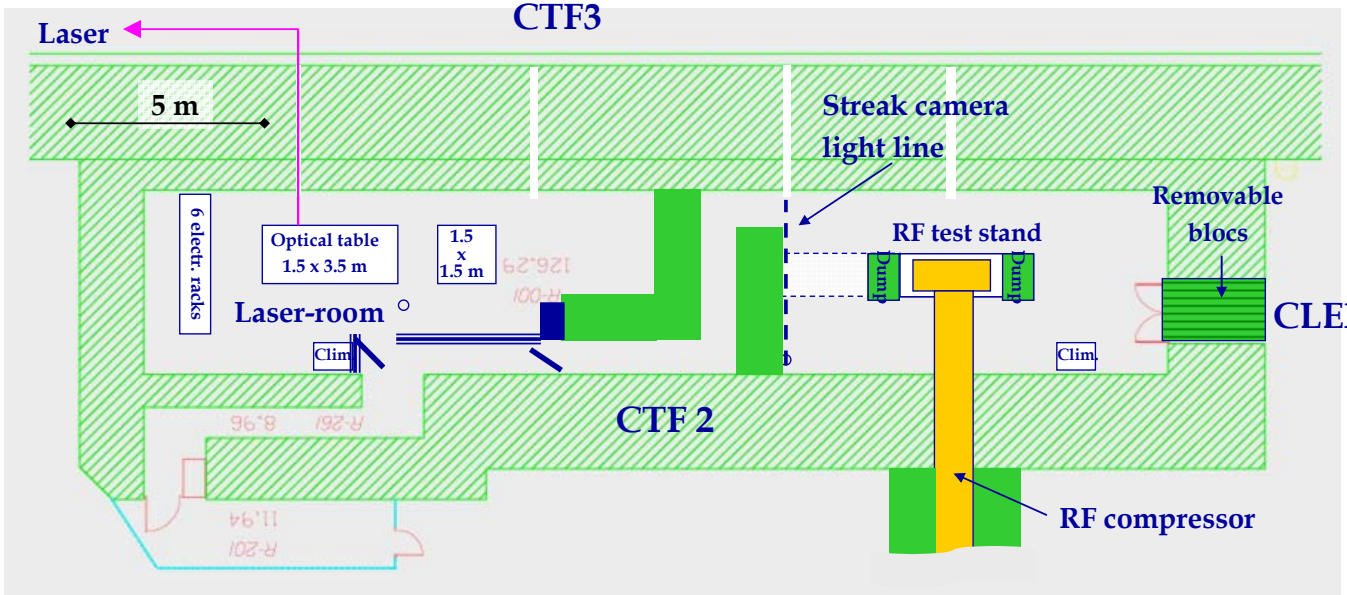
→ Hans Braun

Photo Injector

In parallel:
Development of Photo injector
Plan to install instead of Thermionic injector in 2007.

Financed largely by EU (PHIN)
Laser: RAL
RF gun: LAL
Photocathodes: CERN

Developments going on, tests scheduled to start mid 2006



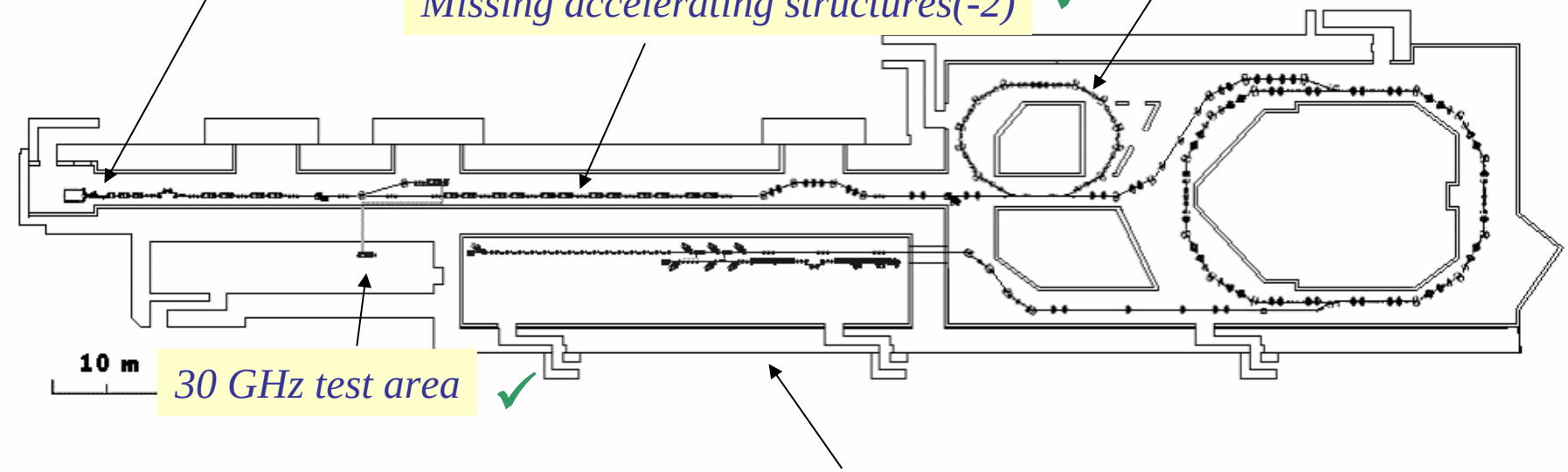
Done in 2005

✓ ***Install and commission:*** ?

Sub-harmonic bunching system 1.5 GHz ✓

Delay Loop (INFN Frascati) ✓
(Building modification done)

Missing accelerating structures(-2) ✓

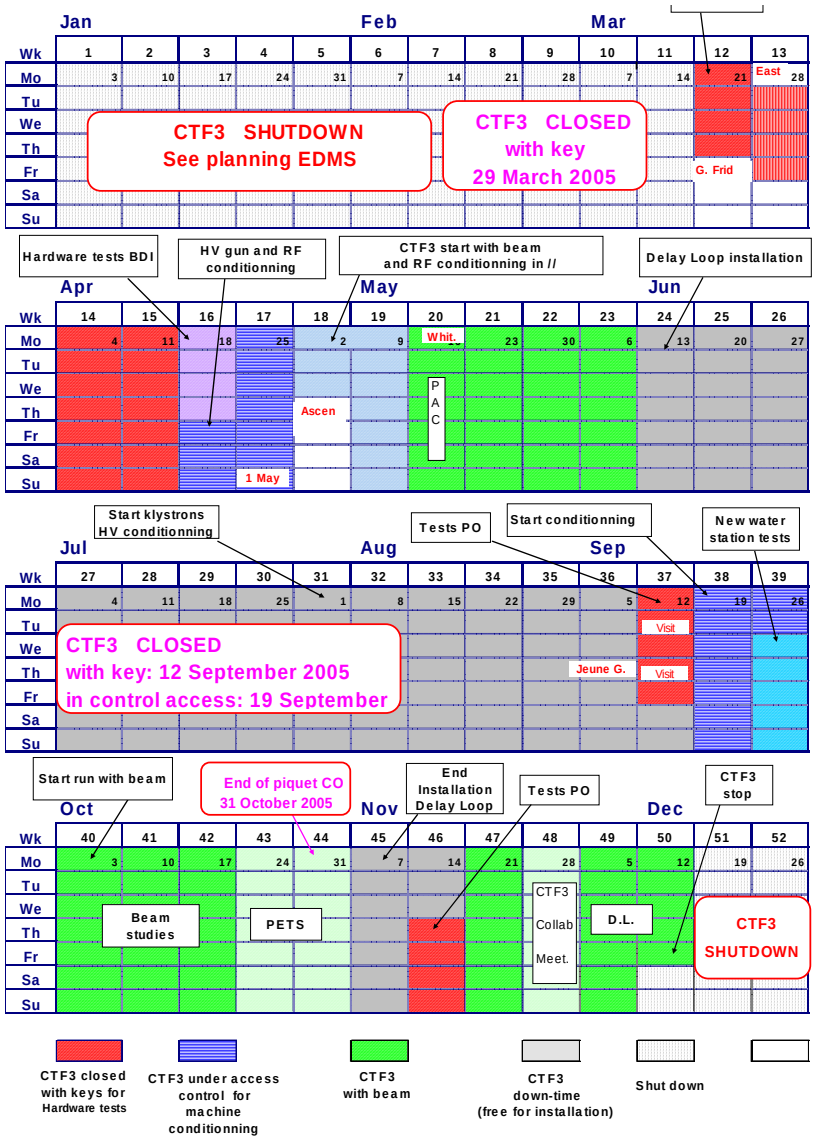


30 GHz test area ✓

CLEX building ✓

In addition:
add 2 accelerating structures in front of PETS ✓
add collimator in PETS line

Operation

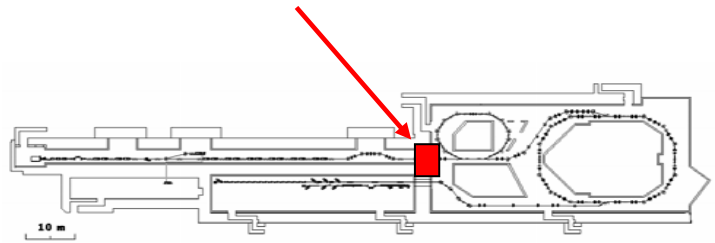


Very little time this year for operation: 13 weeks
Split between machine studies and 30 GHz operation

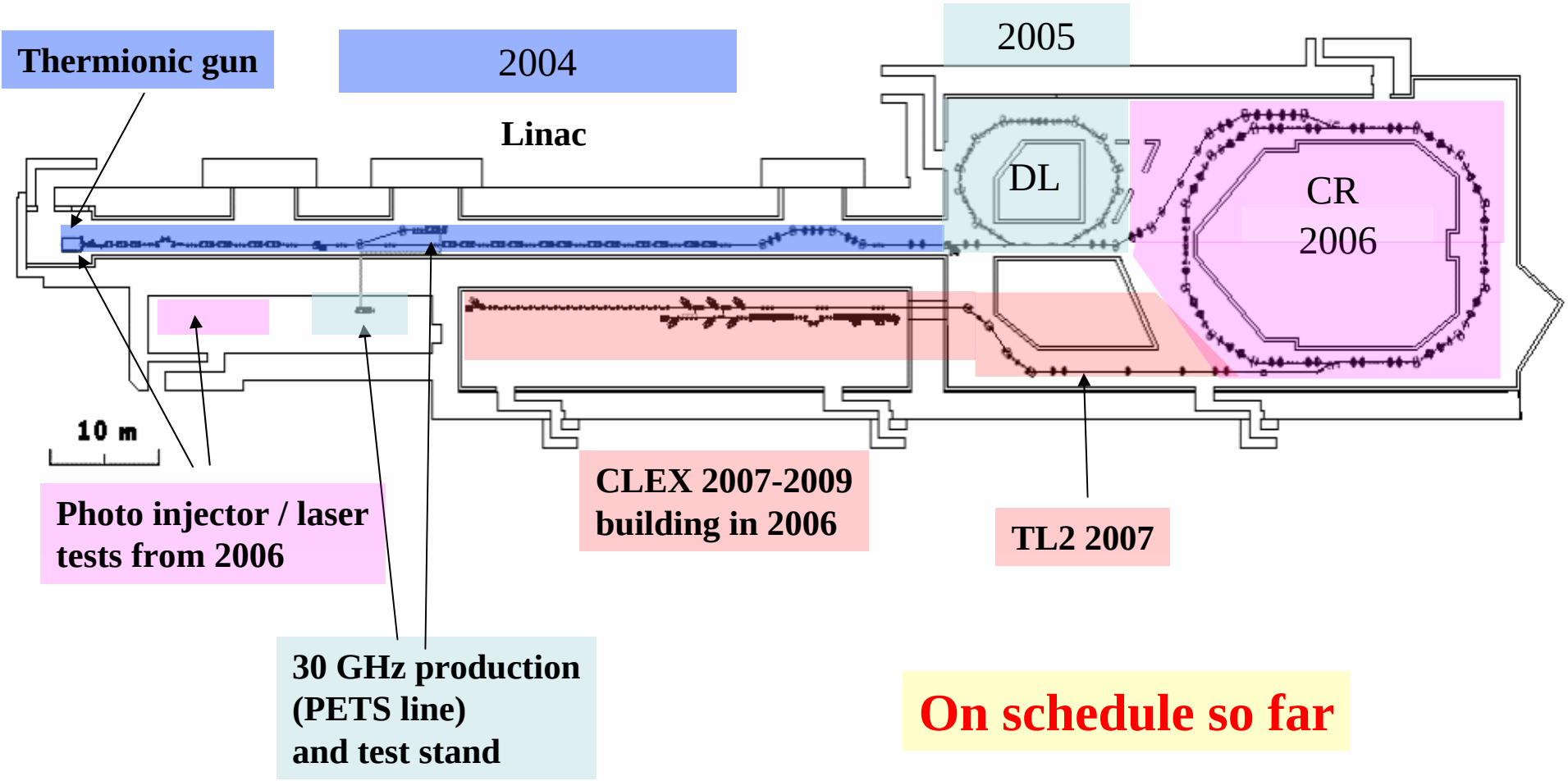
- **Consolidation of operation**
  many sources of jitter / instabilities removed
- **Achieved stable operation for 30 GHz conditioning**

Major results:
Beam into Delay Loop
very promising 30 GHz conditioning

Lessons:
- **Installation takes longer than foreseen**
- **Installation in summer cannot be avoided**
- **separate areas such that 30 GHz work can continue during installation**

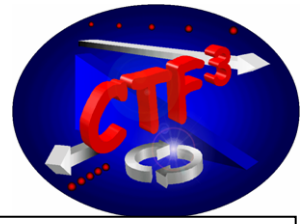


CTF3 programme



On schedule so far

Collaborations



- Finnish Industry: One person for CLIC/CTF3
- INFN: Bunch lengthening/compression Chicane,
  Complete responsibility for Delay Loop, Optics for Combiner Ring,
  Operations support, RF deflectors 3 GHz
- LAL: e-Gun for preliminary phase
  Gun electronics and HV, pre-bunchers
- Northwestern University Illinois: Drive Beam accelerator acc. structure,
  Beam loss monitoring
- RAL: Laser development
- SLAC: RF gun, Injector design and commissioning
- University Lausanne: PhD student
- Uppsala University: Operations support, Phase monitor
- Many CERN groups

Photo injector (partly funded by EU)

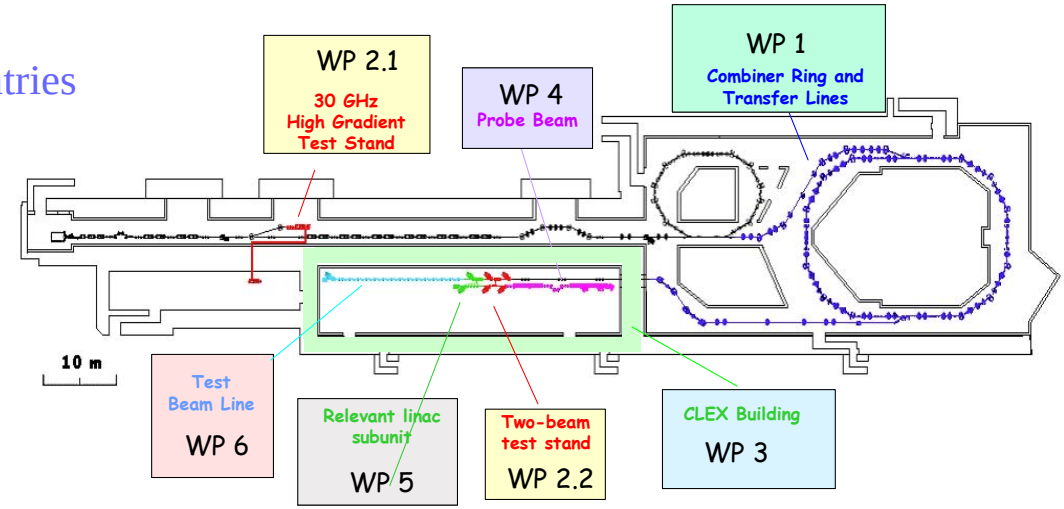
- LAL: RF gun
- RAL: Laser
- CERN: Photocathodes

Collaborations for Accelerated Programme

Two meetings at CERN:

19. May 2004 : present work packages
18 delegations from CERN and 11 countries

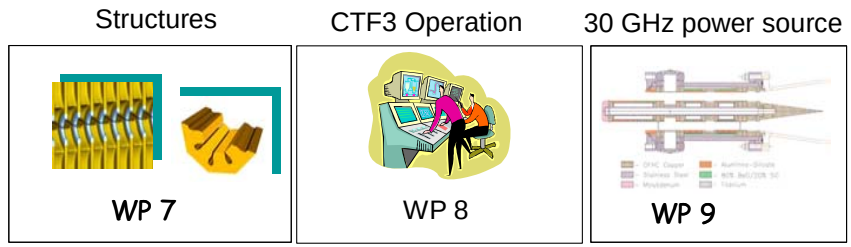
28. January 2005
expressions of interest



- Memorandum of Understanding drafted organisation like experiment

- Addendum of MoU signed so far by 8 partners,
- Draft proposal by 4 institutes.
- Discussions with 4 institutes

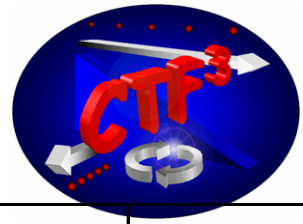
- First meeting of CTF3 Coordination Committee on **30. November 2005** with signature of MoU.



Collaboration status

		spent up to end 2004		pledged for 2005-2009	
		manpower my	cost kSFr	manpower my	cost kSFr
Addendum signed					
Helsinki Institute of Physics (HIP)	specialist in micro machining technologies for CLIC structure developments			3	
	industrial and academic partners				
Budker institute of Nuclear Physics (BINP)	11 quadrupoles, 26 sextupoles				270
	future: more magnets as required according to the same conditions.				
Northwestern University Illinois	one accelerating structure		100		
	beam loss monitor		100		50
	total manpower	2		1	
	RF pick-up for bunch length				100
CERN	existing facilities		40'000		
	new equipment		16'000		
	total manpower	100			
	power converters				860
	waveguides				100
	CLEX				2'500
	technical services				2'500
	project management				
	TL1 and CR				600
	magnets for CR				330
	vacuum equipment for CR				200
	installation TL1 and CR				1'600
	Controls CR				100
	CTF3 commissioning, testing				
	accelerating and PETS development				4'000
	total manpower			125	
Ankara University	manpower for CTF3 operation	0.25		5.00	
IAP	30 GHz power source				1'024
	Manpower and material , ISTC 227k$ included				
SLAC	electron gun triode (long term loan)		320		
	injector design and commissioning	3			
JINR Dubna	Manpower for automatic conditioning		114		

Collaboration status



Draft addendum					
France	electron guns and pre-bunchers (LAL)	13	100		
	BPM electronics IN2P3 LAPP			2	150
	Probe Beam Linac CEA			30	1'950
	Probe Beam photo injector IN2P3 LAL			2	248
CERN	Probe beam linac				2'000
	30 GHz power source(ISTC contribution)				75
INFN	Delay Loop	25	4'000		
	vacuum chamber TL1 and CR			4	900
Spain	15 qadrupoles for TBL + precision tables				
	2 Septa for CR				
	Extraction kicker for CR				
	HV pulser for kicker				
	32 corrector magnets for CR				
	PETS design				
	Contribution to BPM design for TBL			4	2'000

Under discussion

India	TL2 design, Alu vac chambers for TL2
Sweden	Two Beam test stand
UK	Beam Instrumentation line, Studies
RAL	Laser for photo injector

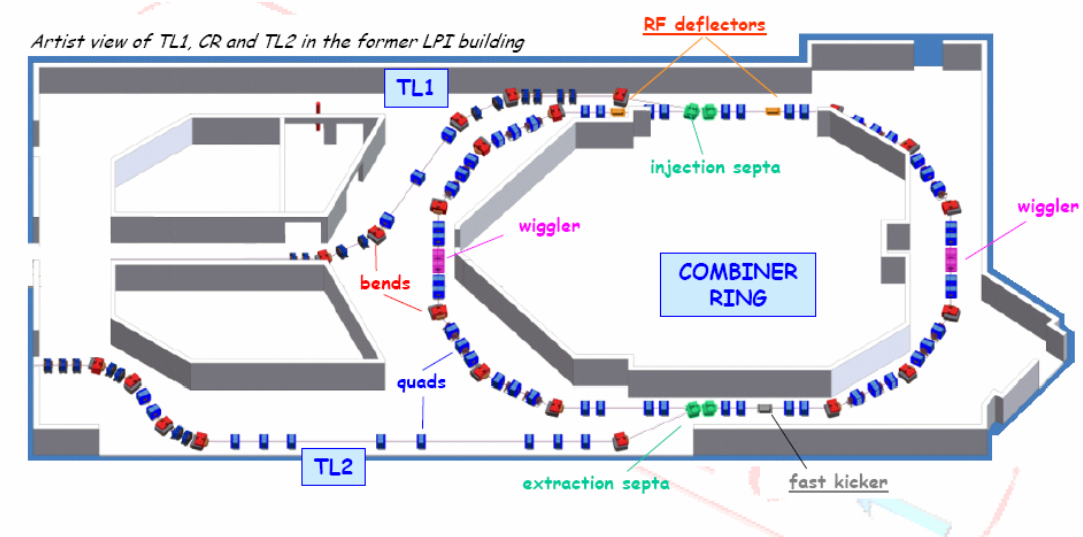
Next steps: 2006

- Fully commission Delay Loop ✓
- Separate Linac from rest of machine ✓
- 30 GHz power testing ✓
- Construction of CLEX building ✓
- Install and commission Combiner Ring

→ Louis Rinolfi

Combiner Ring and TL1:

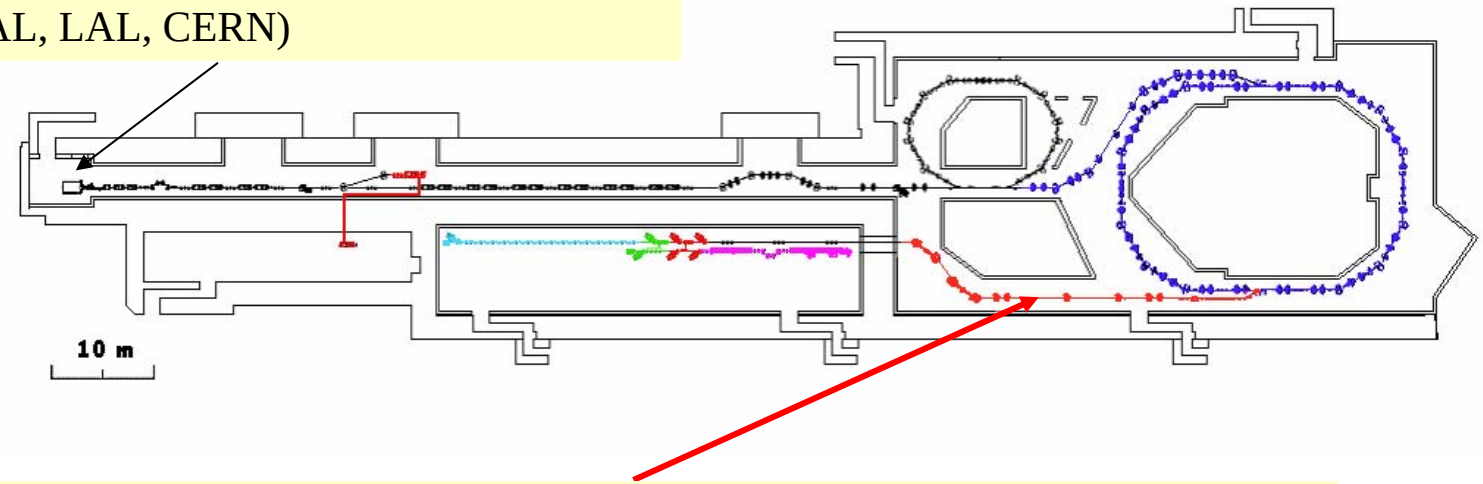
Optics: INFN ✓
Magnets: BINP/CERN/Lure/CIEMAT/ INFN ✓
Power supplies: CERN ✓
RF deflectors: INFN ✓
Septa: CIEMAT MoU not signed yet
Kicker: CIEMAT/CERN ✓
pulser: CIEMAT/CERN ✓
3 GHz source: CERN ✓
Controls: CERN ✓
BPM electronics: LAPP / CERN ✓
Vacuum chamber + BPM: INFN MoU not signed yet



If the expected contributions will be provided, the Combiner Ring will be built to schedule

Next steps: 2007

replace Thermionic e-gun by photo injector ✓
(EU, RAL, LAL, CERN)

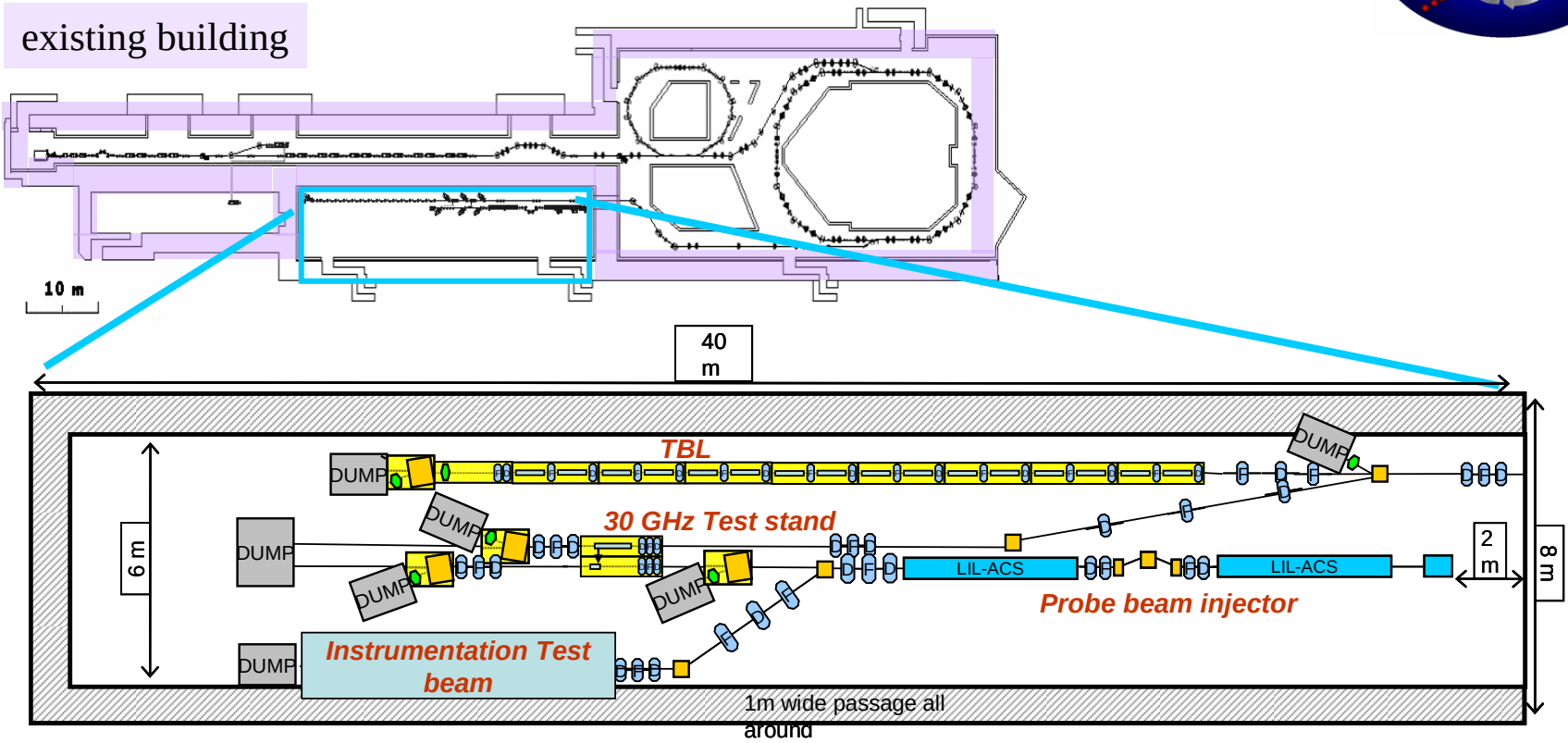


TL2 (2007)

Optics India ?
Magnets: CERN, Celsius, CIEMAT, 6 dipoles
Vacuum system: India ? 50 m alu chamber, shielded bellows + pump ports, BPM pick-ups
Vacuum pumps and control →
Power supplies: CERN ✓
BPM electronics : LAPP ?

Next steps: CLEX

existing building

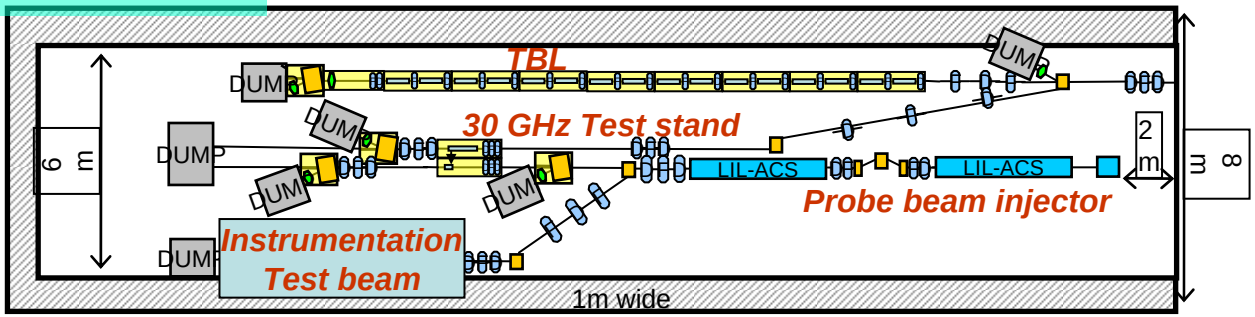


Construction during 2006
installation of equipment from
2007 - 2009

Project status CLEX

TBL
Design: CERN, ????
Benchmarking experiments : CERN, ????
Magnets CIEMAT, ????
Power supplies CERN ???
Beam diagnostics Spain ????
vacuum system ????

Building: CERN



Instrumentation Test Beam
(not presently in base-line project)
Great Britain ?

30 GHz Test stand:
Uppsala University ?
CERN

Probe Beam
Dapnia / LAPP / LAL
CERN ?

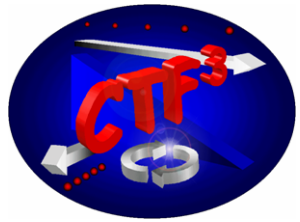
Operation

WP 8

CTF3 Operation

Missing about 25 man-years for continuous operation

Conclusion



- **Programme basically on schedule:**
  Installation on time
  Commissioning of existing hardware still to be finished
- **Combiner Ring and TL1 assured, provided that expected (drafted) MoUs become reality**
- **TL2 not yet fully assured**
- **CLEX : some collaborations, some still missing**
- **Operations team required**

Very ambitious programme, but completion within time scale possible with more collaborations

Highly motivated team,
excellent collaboration between all partners