CTF3 complex

Drive Beam Injector

Drive Beam Accelerator
16 structures - 3 GHz - 7 MV/m

X 2 Delay Loop

3.5 A - 1.4 μs
150 MeV

X 5 Combiner Ring

35 A - 140 ns
150 MeV

CLEX

30 GHz and Photo injector test area

10 m
**CLEX Building key numbers**

**CLEX-A (Accelerator housing)**
Inside dimensions L x W x H = 42.5 m x 8 m x 2.55-2.65 m, no pillars inside building!

**CLEX-G (Equipment Galery)**
Inside dimensions L x W x H = 22 m x 8 m x 3.45-3.54 m

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**Bottom line:** June 2007, Building with infrastructure ready for move-in!
**CLEX Glossary**

**CLEX**=CLIC EXperimental area

**TBTS**=Two Beam Test Stand
Testbed for 12 GHz RF tests of drive beam decelerating structures (PETS) and main beam accelerating structures.
Demonstration of two beam acceleration

**TBL**=Test Beam Line
Feasibility demonstration of CLIC drive beam decelerator

**CALIFES**=Concept d’Accélérateur Linéaire pour Faisceau d’Electrons Sonde
3 GHz probe beam injector to simulate main beam in TBTS

**TL’**
switchyard for drive beam and drive beam diagnostics

**ITB**=Instrumentation Test Beam
Option for 2nd beamline connected to CALIFES for development and test of beam diagnostic equipment
**Layout of CLEX-A (A=Accelerator housing) floor space**

**Space reservations**
- **CALIFES** 23.2 m from cathode manipulator arm to exit flange of spectrometer
- **TBTS** 16.6 m from output spectrometer to end of beam dump
- **TBL** 31.4 m from dogleg bend to end of beam dump
- **ITB** 16.0 m from 2nd dogleg magnet to end of beam dump
**Layout of CLEX-G (G=Galery) floor space**

Enough space for all power supplies, vacuum, controls and beam diagnostics racks needed for CLEX beamlines

Space for two S-band modulators and klystrons

Neighboring CTF2 gallery has space for one or two more modulators and klystrons and for more electronic racks (i.e. for 30 GHz receivers for two beam test stand and drive beam test beam line)

### Estimate of number of 19" racks required for CLEX equipment

<table>
<thead>
<tr>
<th>Equipment type</th>
<th>Number of racks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnet power supplies</td>
<td>30</td>
</tr>
<tr>
<td>Ion pump power supplies</td>
<td>5</td>
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<tr>
<td>Vacuum gauges, valves and interlock controls</td>
<td>4</td>
</tr>
<tr>
<td>Low power 3 GHz RF</td>
<td>4</td>
</tr>
<tr>
<td>Modulator mains distribution</td>
<td>2</td>
</tr>
<tr>
<td>Controls, beam diagnostics, timing</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total estimate</strong></td>
<td><strong>48</strong></td>
</tr>
<tr>
<td><strong>Total rack space available</strong></td>
<td><strong>63</strong></td>
</tr>
</tbody>
</table>
Positioning of CLEX-G relative to CLEX-A
Construction on schedule  
Equipment installation from May 2007,  
Beam foreseen from March 2008
**Floor and Beamline Heights**

Due to difference in construction technique, CLEX floor is approximately 50 cm lower than combiner ring building and DB Linac building.

Beam height above floor DB Linac, delay loop, TL1 and combiner ring 135 cm

135 cm + 50 cm = 185 cm *seems too much for CLEX G*

⇒ Vertical bends needed in TL2

⇒ All beamlines inside CLEX are at the same level but CLEX G floor has a 1.5% slope for water evacuation therefore beam height above floor varies from 1.25 to 1.35 m!
Footprint of beam-lines in CLEX building
Beam heights above floor

ventilation ducts

ITB
probe beam
drive beam
TBL
**TL2’**

- Transport from end TL2 to TBL or TBTS
- 11 quadrupole magnets.
  - Refurbished from TSL, LURE and some new QL3
- 2 dipole magnets either refurbished from LURE
- Beam diagnostics (~6 BPM, 1 BPR, 1 WCM, 2 OTR) to be provided by CERN
- BPM electronics LAPP?
- Vacuum systems to be provided by CERN (or RRCAT)
- Power supplies and cabling to be provided by CERN
- Mechanical design and supports to be provided by CERN
- Installation foreseen from October ’07 to March ’08
- Interface definition to TBTS *still* required!

![Optics design TL2’ (S. Döbert)](#)
Positioning of CALIFES and space for Two Beam Test Stand (TBTS)

Axis laser beam line hole has 580 mm transverse distance to CALIFES beam axis

Distance last flange of CALIFE - wall = 17.89m, 1.4 m needed for passage

TBTS including beam dump can use 16.59 m total length
Milestones and Summary

Building ready for installation of beamlines by mid 2007

TL2, TL2’ and TBTS to be ready for start-up spring 2008

CALIFES can be commissioned in parallel

First parts of TBL to be tested in 2008 but construction will happen in phases (see Steffens talk).

ITB is for time being an option for which we reserve floor space