

Acknowledgments:

L. Arnaudon

J. Betz

A. Dridi

A. Dworak

D. Glenat

M. Jaussi

D. Landre

R. Louwerse

A. Meoli

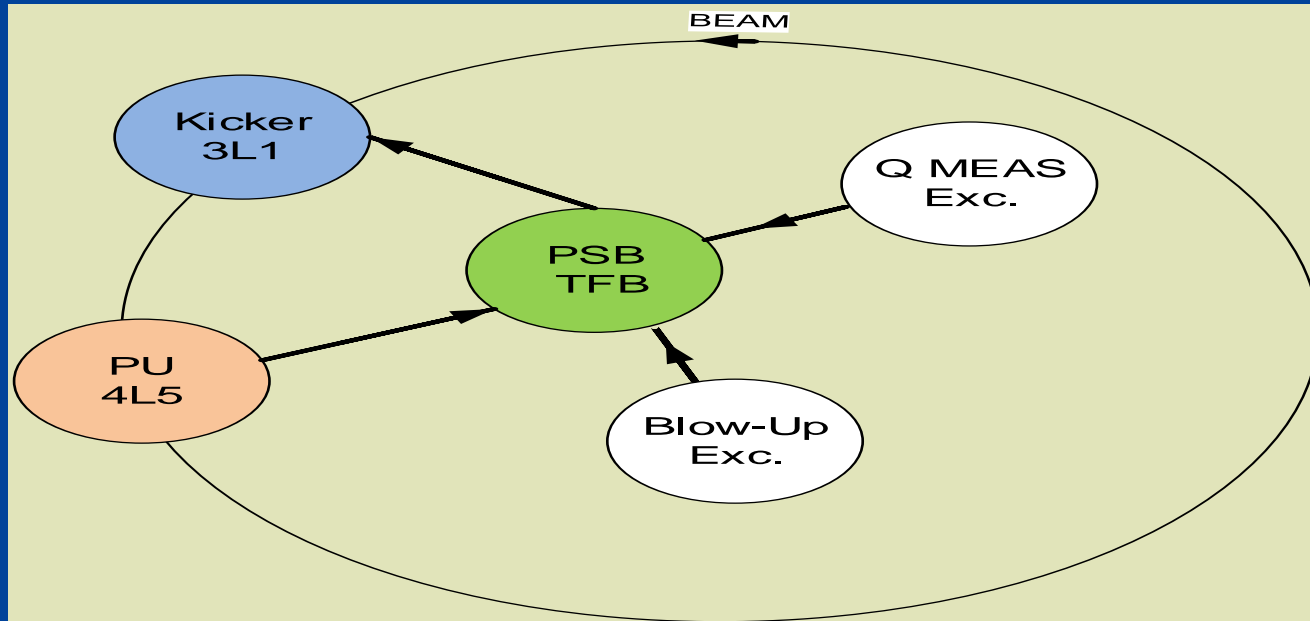
K. Marecaux

R. Necca

M. Paoluzzi

D. Perrelet

A. Radeva



PSB TFB PRESENT role =>

- Damping of transverse instabilities from 50 MeV to 1.4 GeV, with up to $1.1 \text{ E}13$ ppp and BW up to 13 MHz

PSB TFB FUTURE role =>

- Damping from 160 MeV to 2 GeV with up to $2.5 \text{ E}13$ ppp and BW up to 20 MHz
- Beam excitation for: blow-up, machine optics measurements and tune measurement

To fulfil the PSB **FUTURE** role only 2 upgrades are crucial :

- Increase of the **power amplifiers** from 100 W to 800 W
this implies:
 - new **power supplies**
 - new **power loads**
 - new **electrical mains distribution**
- Design and install new PU **head amplifiers**

Other approved upgrades:

- Install a **PLC control** system for the power parts and the water system
- Install a new **water cooling** system
- Install an **Oasis** system
- **Reshuffle all the 14 electronic racks** for an improved ergonomoy
- Upgrade the **CO crates**, modules and interface to the operation
- Design and install a new **digital loop processing** circuit
- New Fesa class and OP interface

To fulfil the PSB **FUTURE** role only 2 upgrades are crucial :

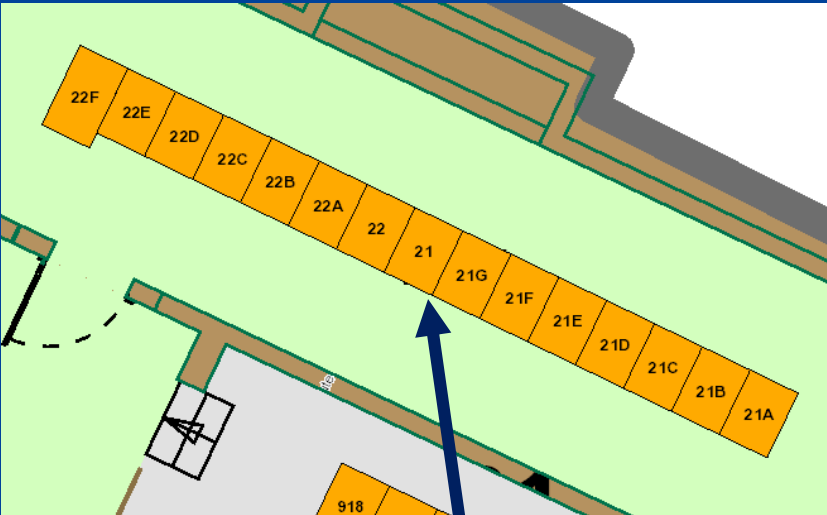
- Increase of the **power amplifiers** from 100 W to 800 W
this implies:
 - ~~new power supplies~~ ✓
 - ~~new power loads~~ ✓
 - ~~new electrical mains distribution~~ ✓

-> 07-2017 tbc
R. Louwerse, M. Paoluzzi and Team
- Design and install new PU **head amplifiers** -> 12-2016, A. Meoli
R. Necca and team

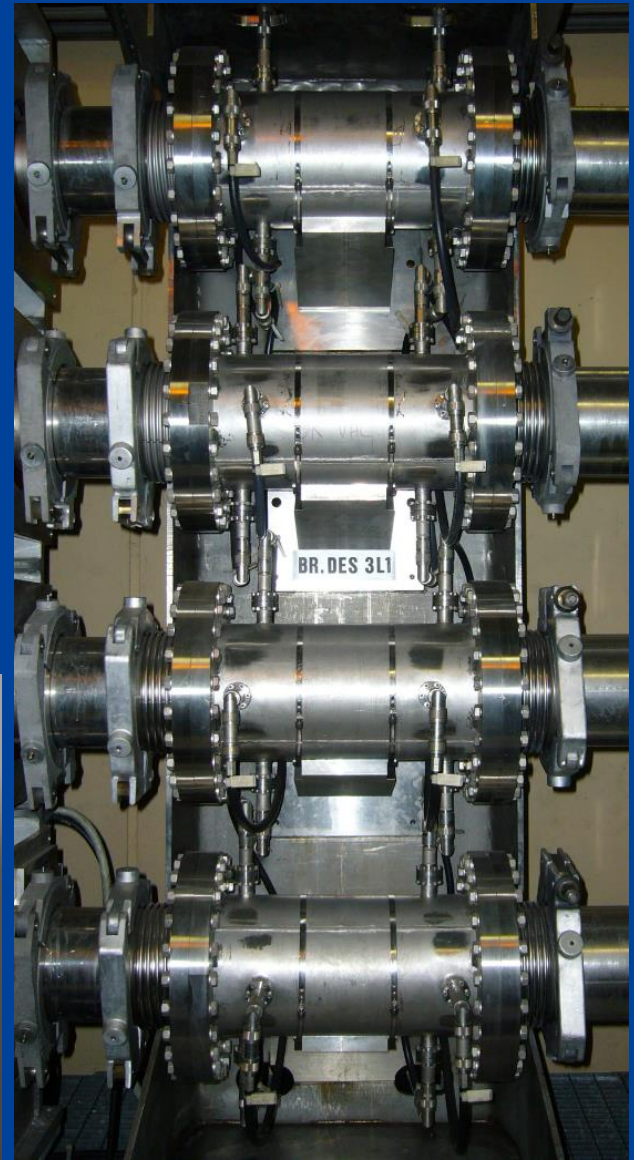
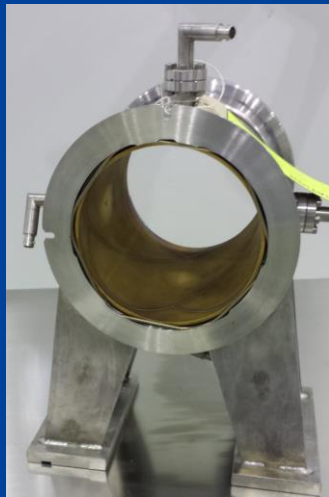
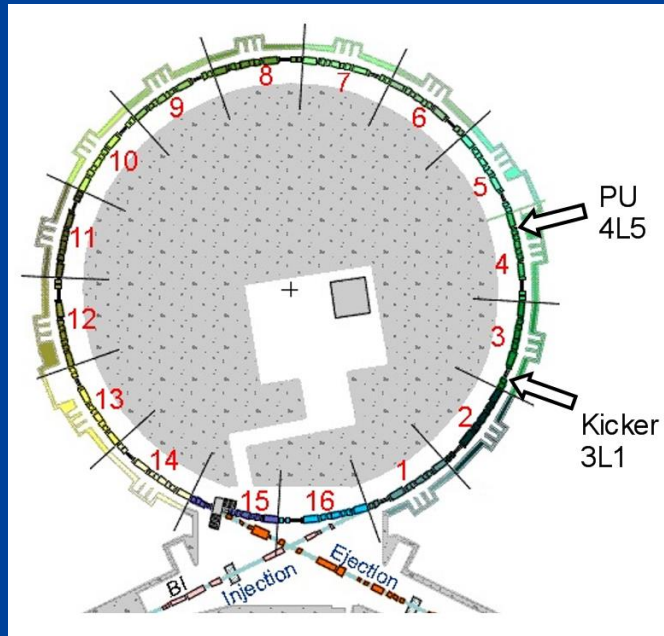
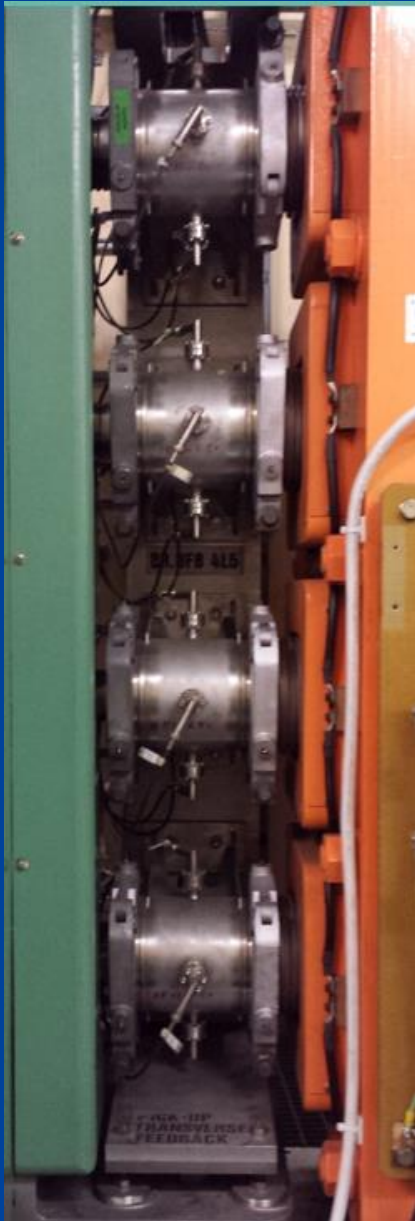
Other approved upgrades:

- ~~• Install a **PLC control** system for the power parts and the water system~~ ✓ L. Arnaudon and Team
- ~~• Install a new **water cooling** system~~ ✓ A. Dridi
- ~~• Install an **Oasis** system~~ ✓ A. Radeva and Team
- ~~• **Reshuffle all the 14 electronic racks** for an improved ergonomy~~ ✓ K. Marecaux and Team
- Upgrade the **CO crates**, modules and interface to the operation -> 06-2016, J. Betz, A. Dworak
- Design and install a new **digital loop processing** circuit 05-2016, A. Blas
- New Fesa class and OP interface -> 04-2016, M. Jaussi

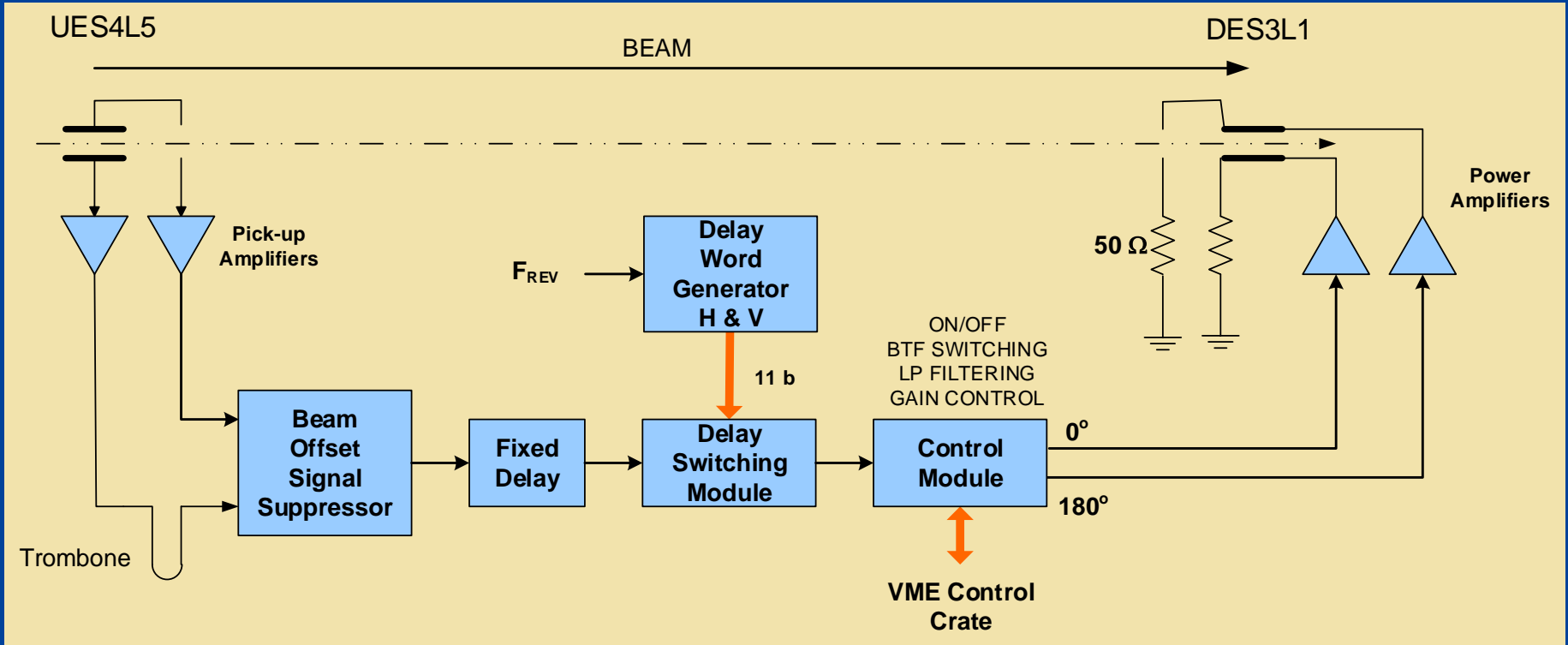
14 electronic racks in Building 361-1-211
(BAT)

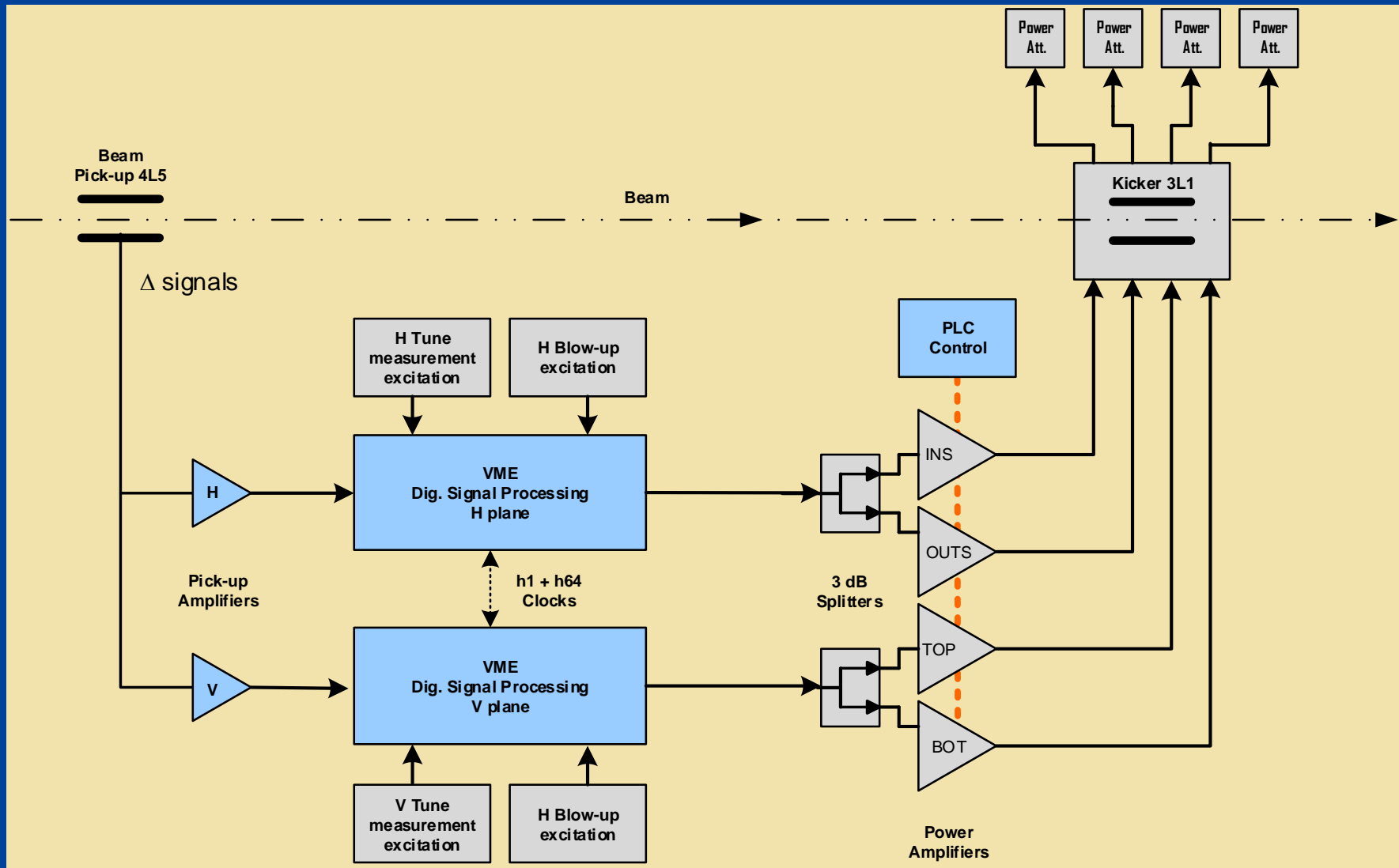


PSB TFB General layout

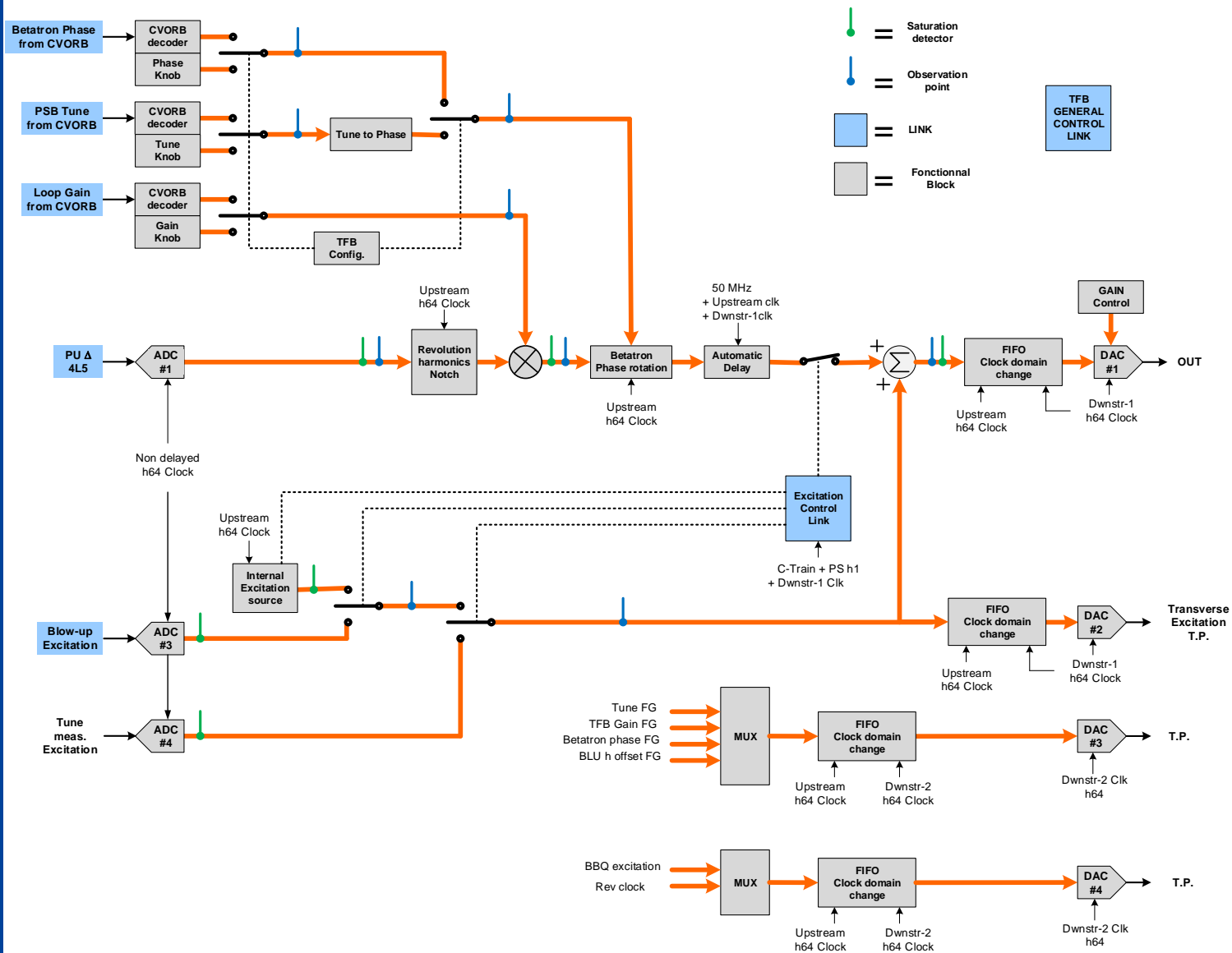


8 times the following circuit = 4 ring x 2 planes

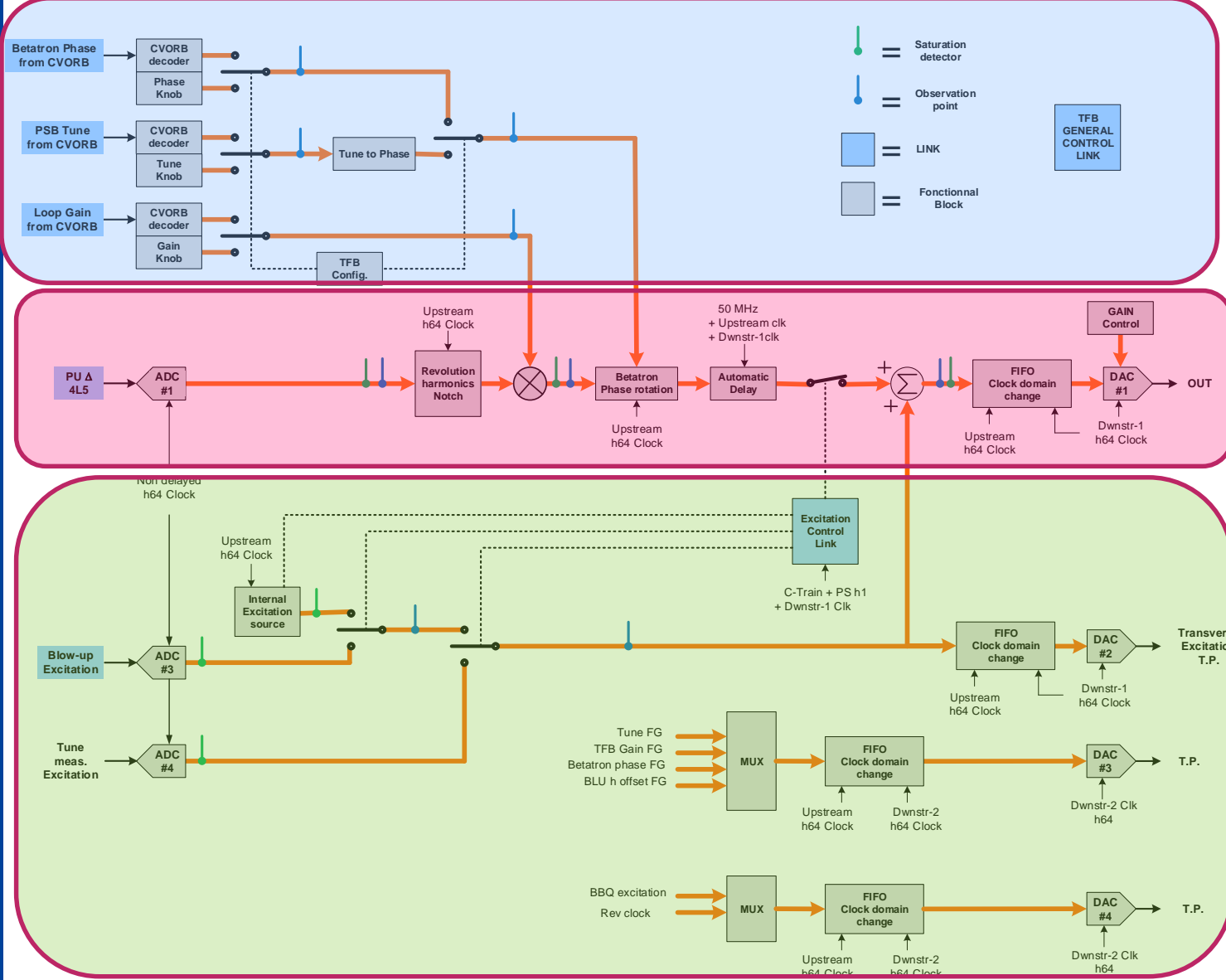




PSB TFB Digital Signal Processing



PSB TFB Digital Signal Processing

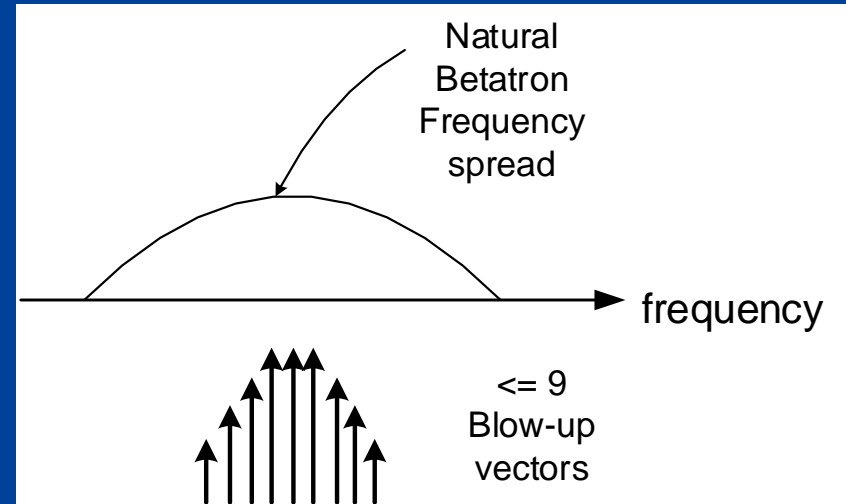
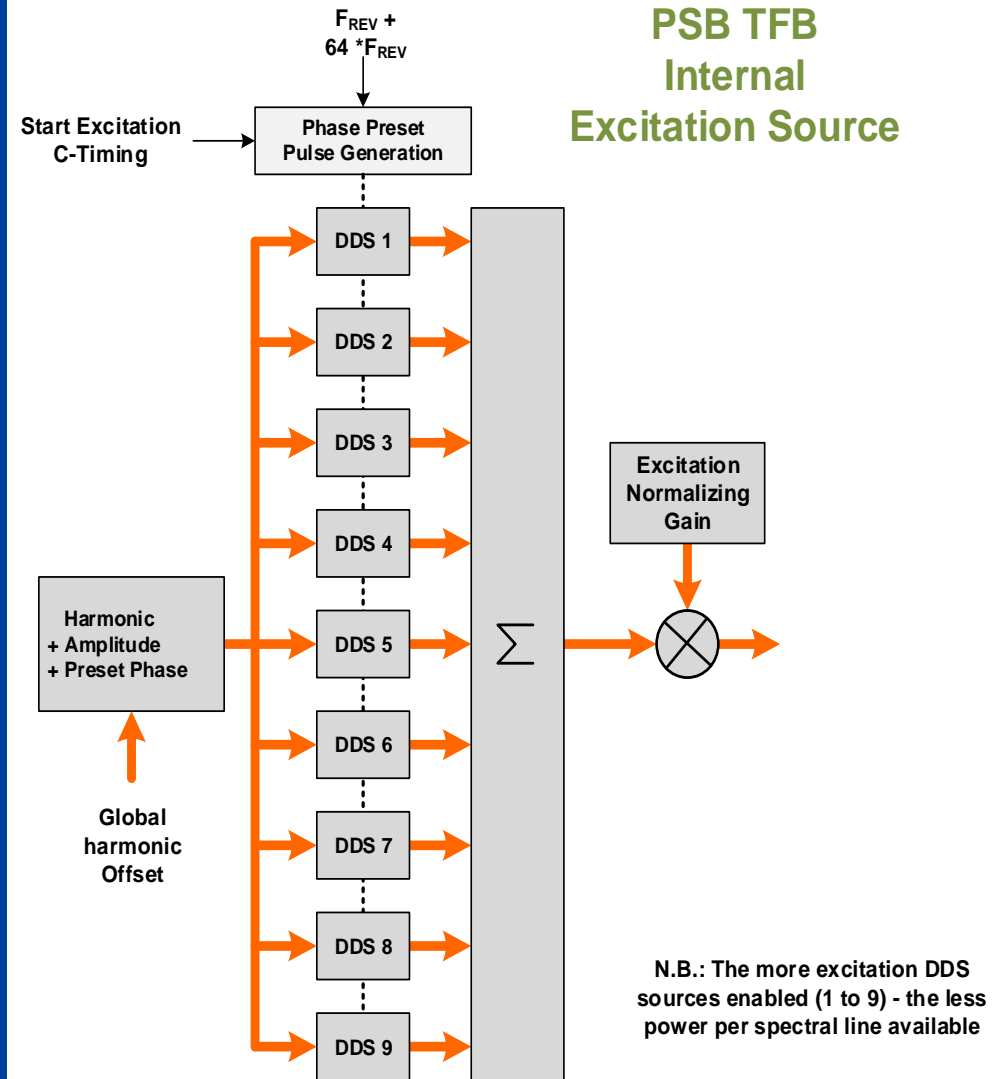


Gain and Phase Control

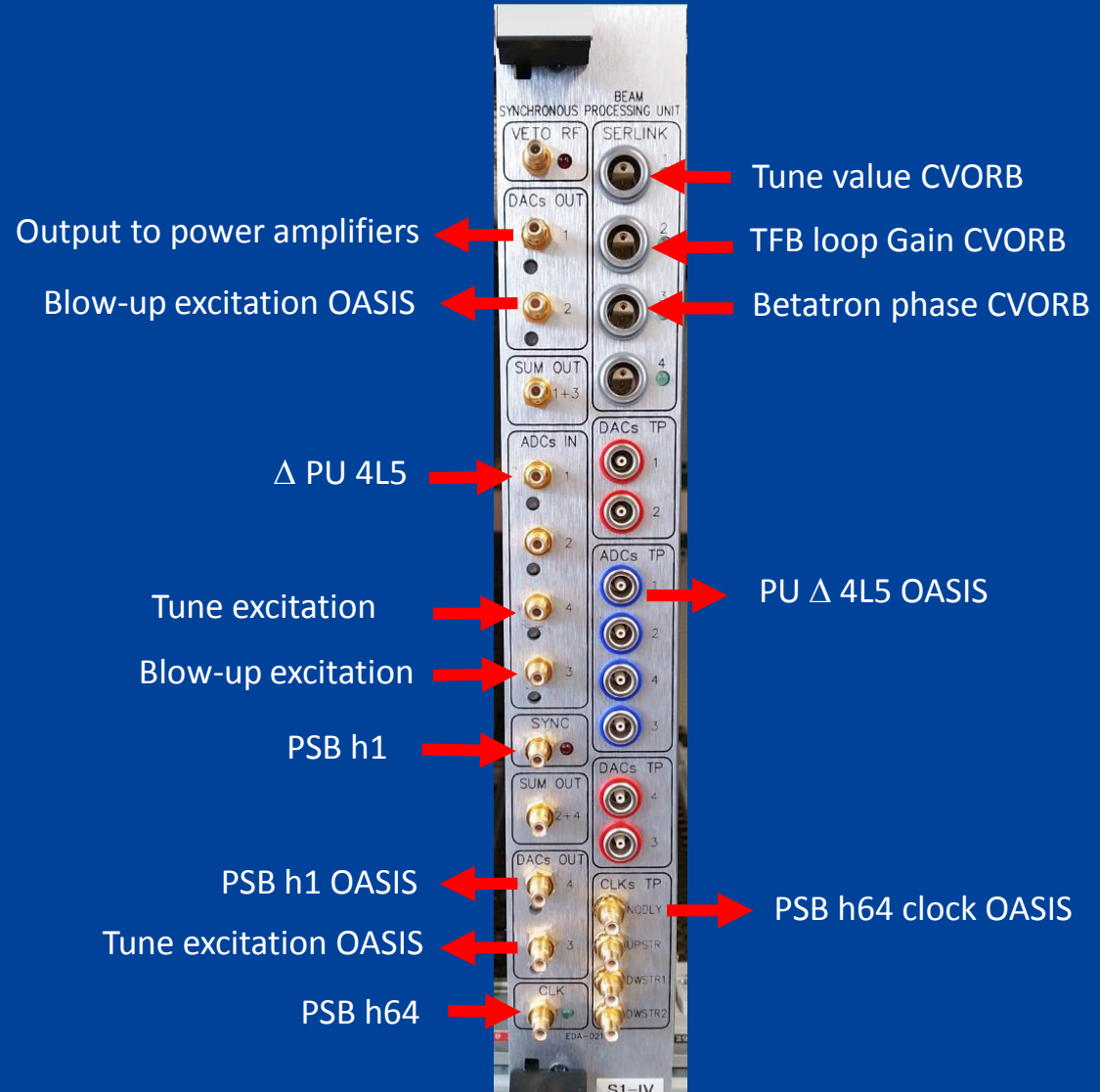
Loop processing

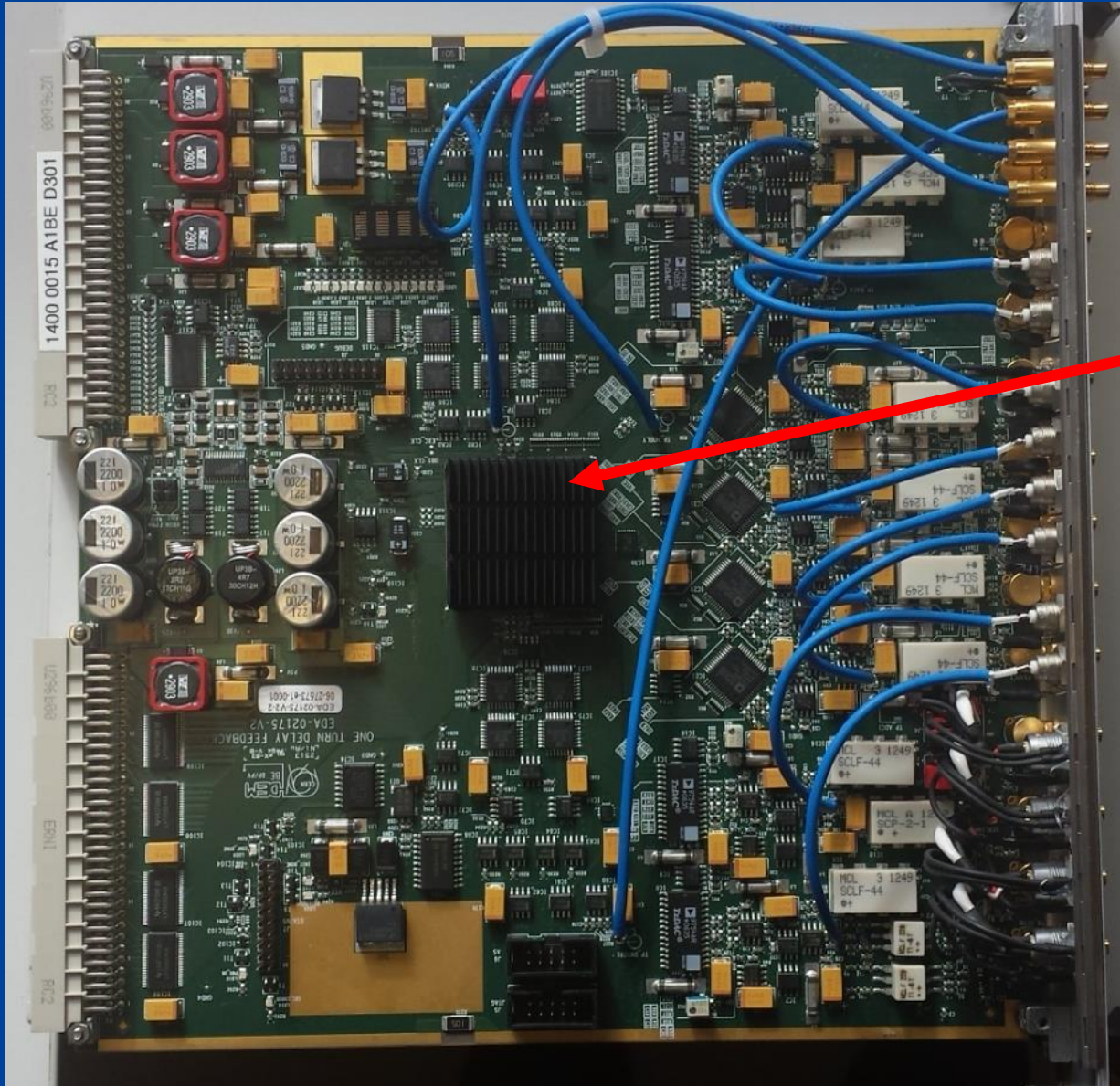
Excitation source + monitoring

PSB TFB Internal Excitation Source



The (up-to) 9 vectors can mimic a narrowband noise aimed at exciting one or a few Betatron lines with an amplitude distribution to be defined.





Board designed by D. Perrelet,

3rd iteration of a board initially designed by V. Rossi and first upgraded by M. Schokker

FPGA (Altera Stratix 2) to be programmed. 1020 pins

To be done:

- FESA CLASS!
- OP interface (inspector)
- Tests at 120 MHz
(ADCs specified at 105 MHz)

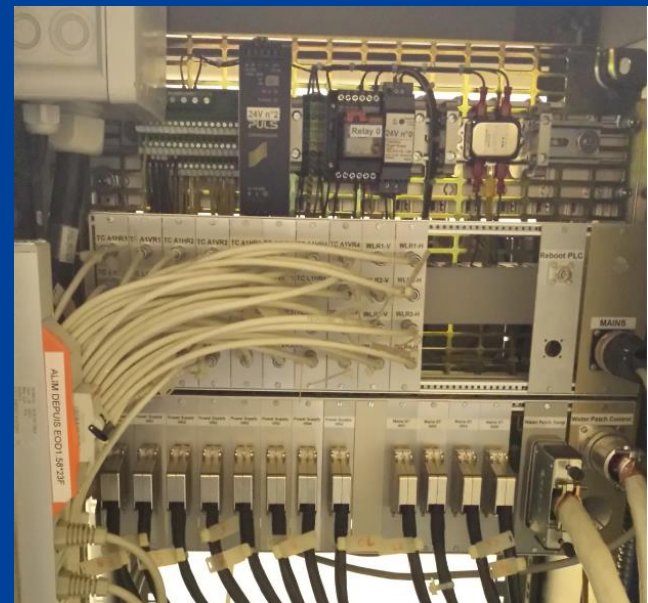
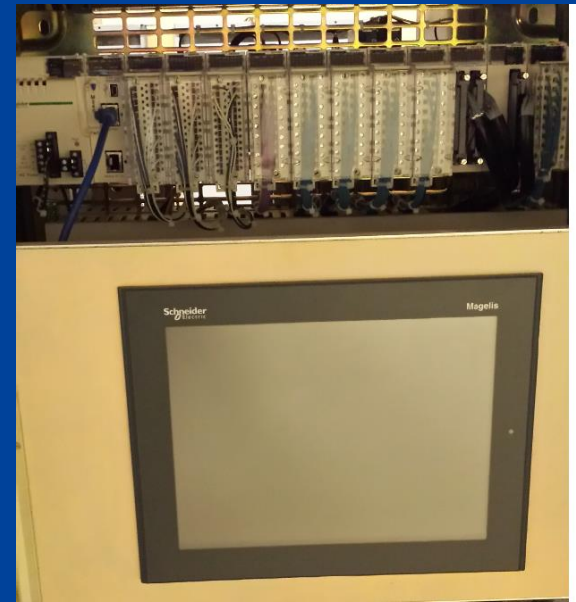
Availability: May 2016

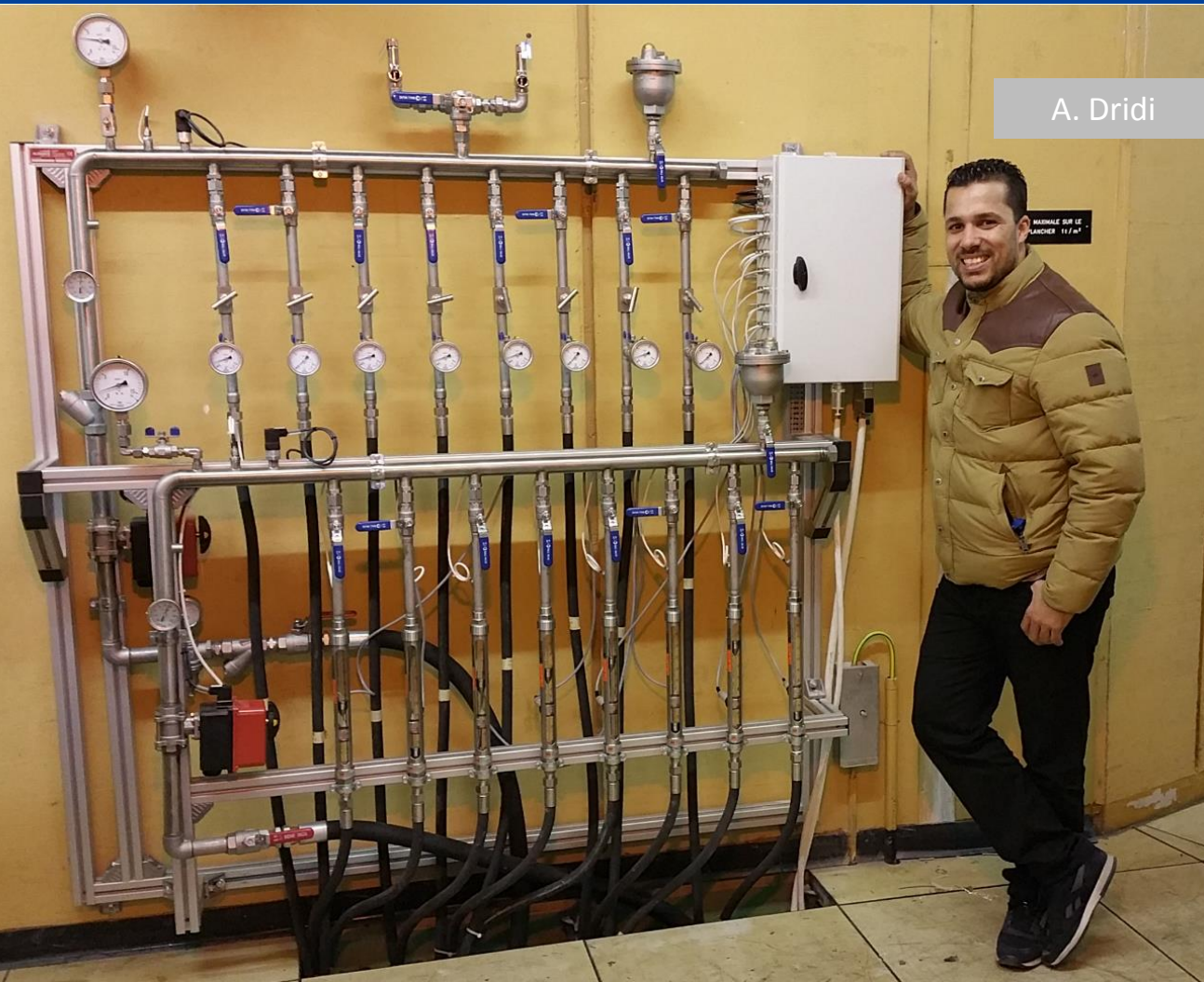


D. Landre
D. Glenat
L. Arnaudon

New PLC Power control System

for the safe remote
management of the
water cooling system,
power supplies and
power amplifiers.





A. Dridi

New water distribution
with leak detection,
auto-shutdown
electric valves
Sensors for pressure,
flow and temperature,
pressure limitation

R. Necca

New 3-phases
mains distribution.
Was under-floor and
single phase previously.

RACK 21E / RING 2

ALUM DEPUIS ERK17.14

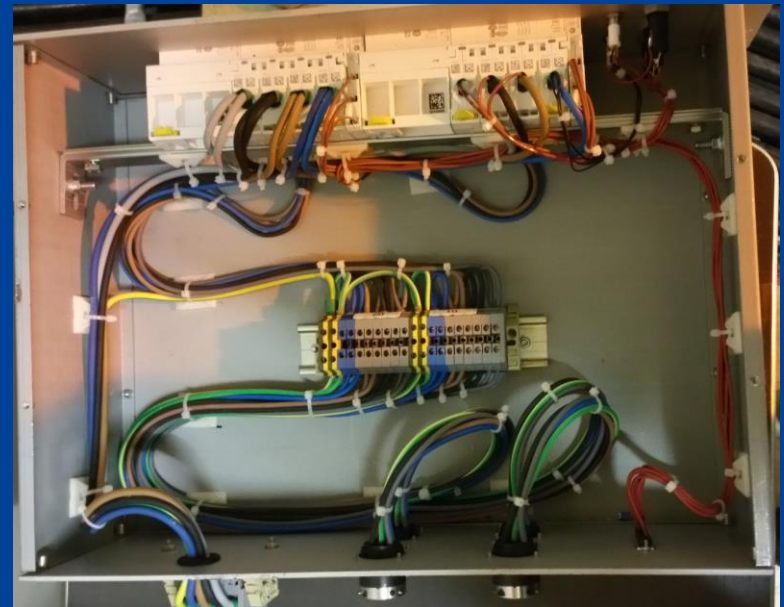
DEP.04

R

S

T

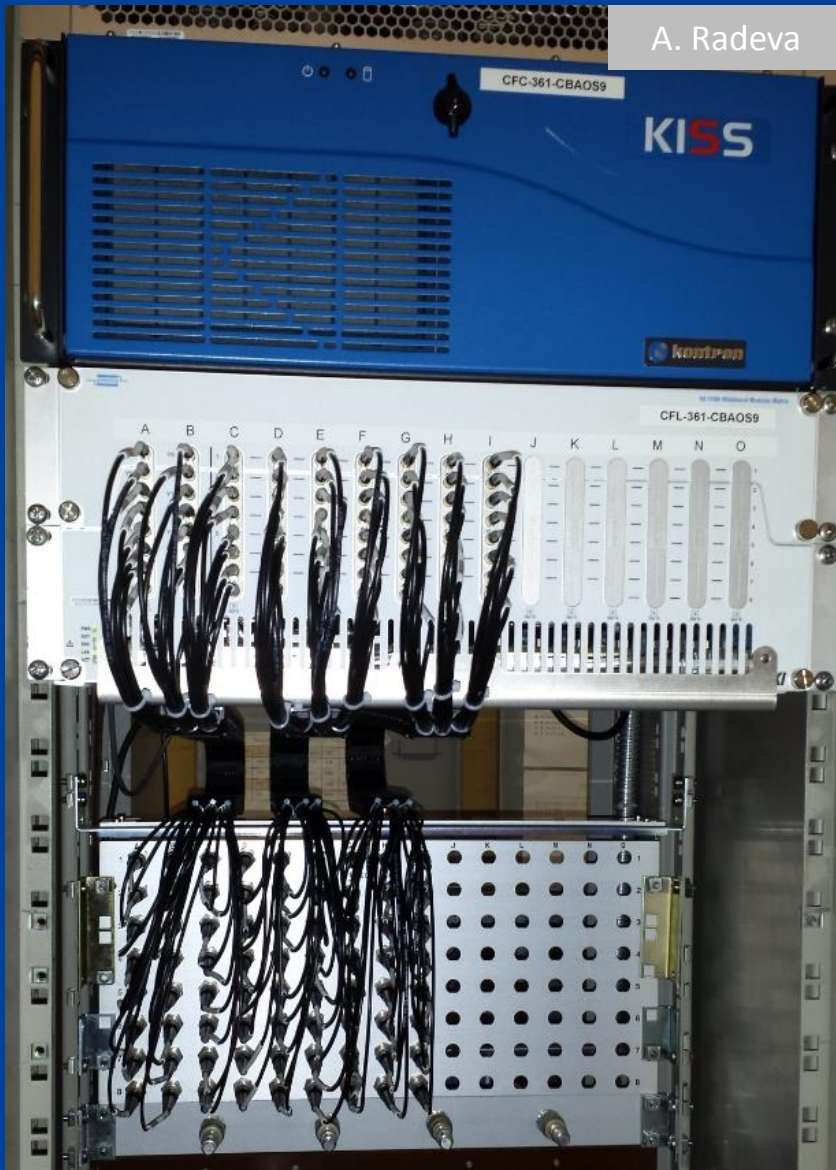
DELAY 16 _32ns





16 new power attenuators
and 8 new power supplies
for the 16 future 800 W amplifiers

A. Radeva



New Oasis system
with multi-triggering acquisition
for remote signal monitoring

Technical student in charge: A. Meoli

New design required:

- To cope with higher beam current (factor 2.3)
- To cope with higher radiation
- To have spare units with available components

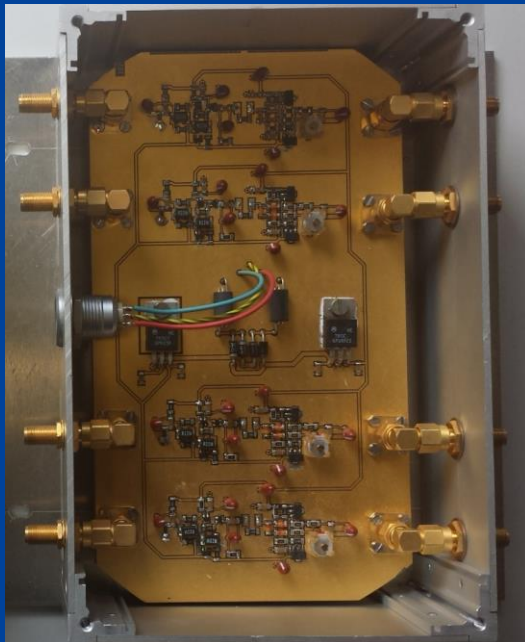
Cooperation with R2E team to estimate radiation dose and selecting components

Done:

- Simulations including the PU
- Components and circuit topology selected

To be done:

- Test of evaluation board with rad-hard Op Amp
- PCB design and test



Present PU head amplifier

Availability: end of 2016

In charge: R. Louwerse and M. Paoluzzi

New design required:

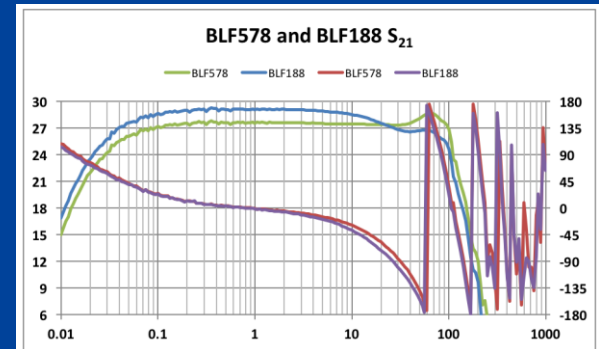
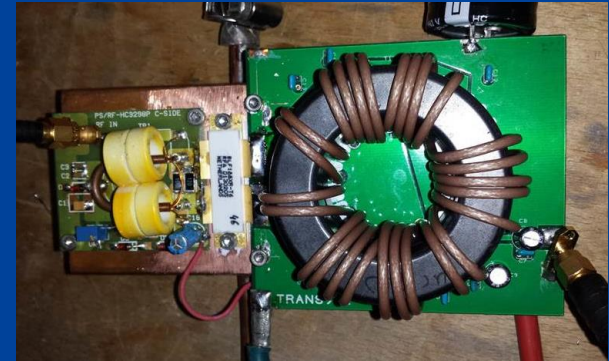
- To cope with high power demand – 800 W - for optics measurements
- To replace ageing unit with no spare parts

Done:

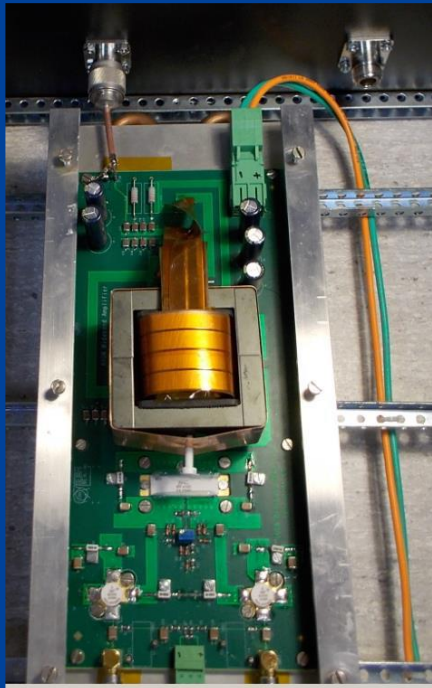
- Prototypes without full BW specs

To be done:

- Extend Mauro's board BW at LF
- PCB and chassis design, production (40 x 400W units) and test



Prototype - M. Paoluzzi



Prototype - R. Louwerse

Availability: 07/2017 to be confirmed by Mauro

Remains to be done:

- Design and construction of 20 x 800 W amplifier -> 07-2017 tbc
R. Louwerse, M. Paoluzzi and Team
- Design and install new PU **head amplifiers** -> 12-2016, A. Meoli
- Upgrade the **CO crates**, modules and OP interface (for the analogue TFB) -> 06-2016
J. Betz, A. Dworak
- Design and install a new **digital loop processing** circuit Firmware -> 05-2016, A. Blas
- New Fesa class and OP interface -> 04-2016, M. Jaussi

Worries:

- Availability of the RF-CS team for the creation of Fesa classes and OP interface (manpower should increase!)
- Availability of the RF-IS team for the design and construction of power amplifiers