

Development of BPS amplifiers for TBL

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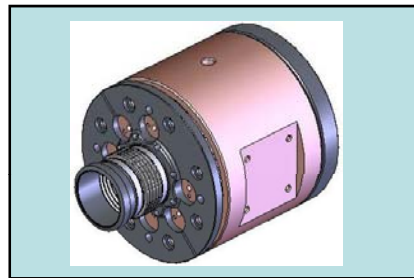


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Inductive pick-up

AFE:
Analog
Front-end
Electronics



H

V



AMPLIFIER



ΔH

ΔV

Σ

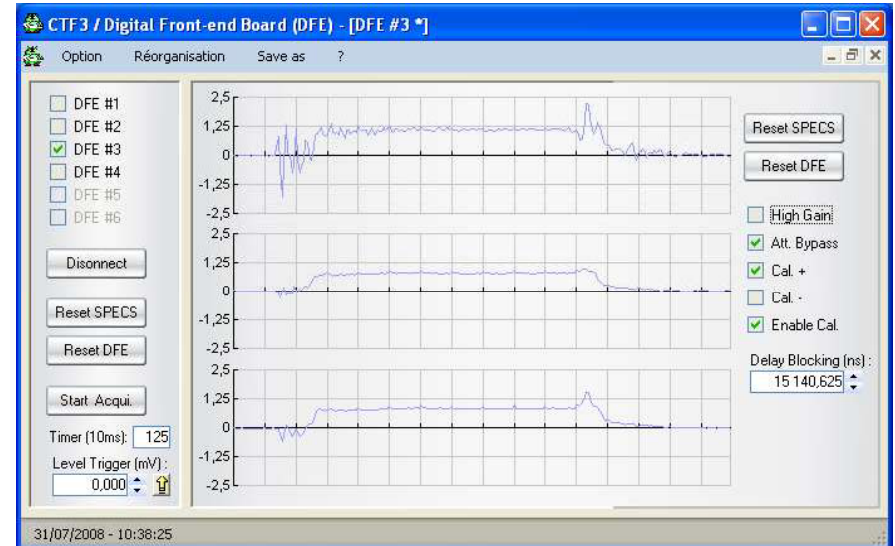
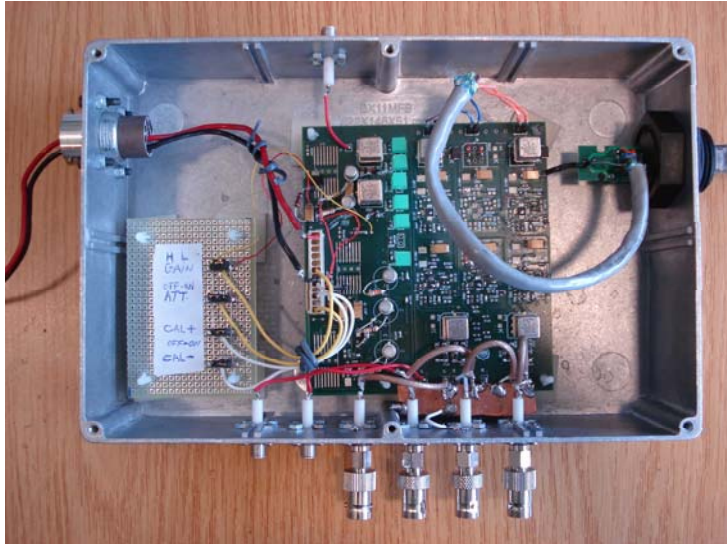
DIGITIZER



Most important amplifier specifications

- BPS-Amplifier interconnection: according to IFIC specifications and measurements (signal levels, droop compensation, ...).
- Amplifier-Digitizer interconnection: according to LAPP specifications (cable type, signal levels, differential signals, control signals, ...).
- 100 MHz BW (200 MHz if possible).
- Rad-hard tolerant components (100 Krads):
 - 1) wideband amplifier: TI THS4508.
 - 2) ST RHFL4913 positive regulator.

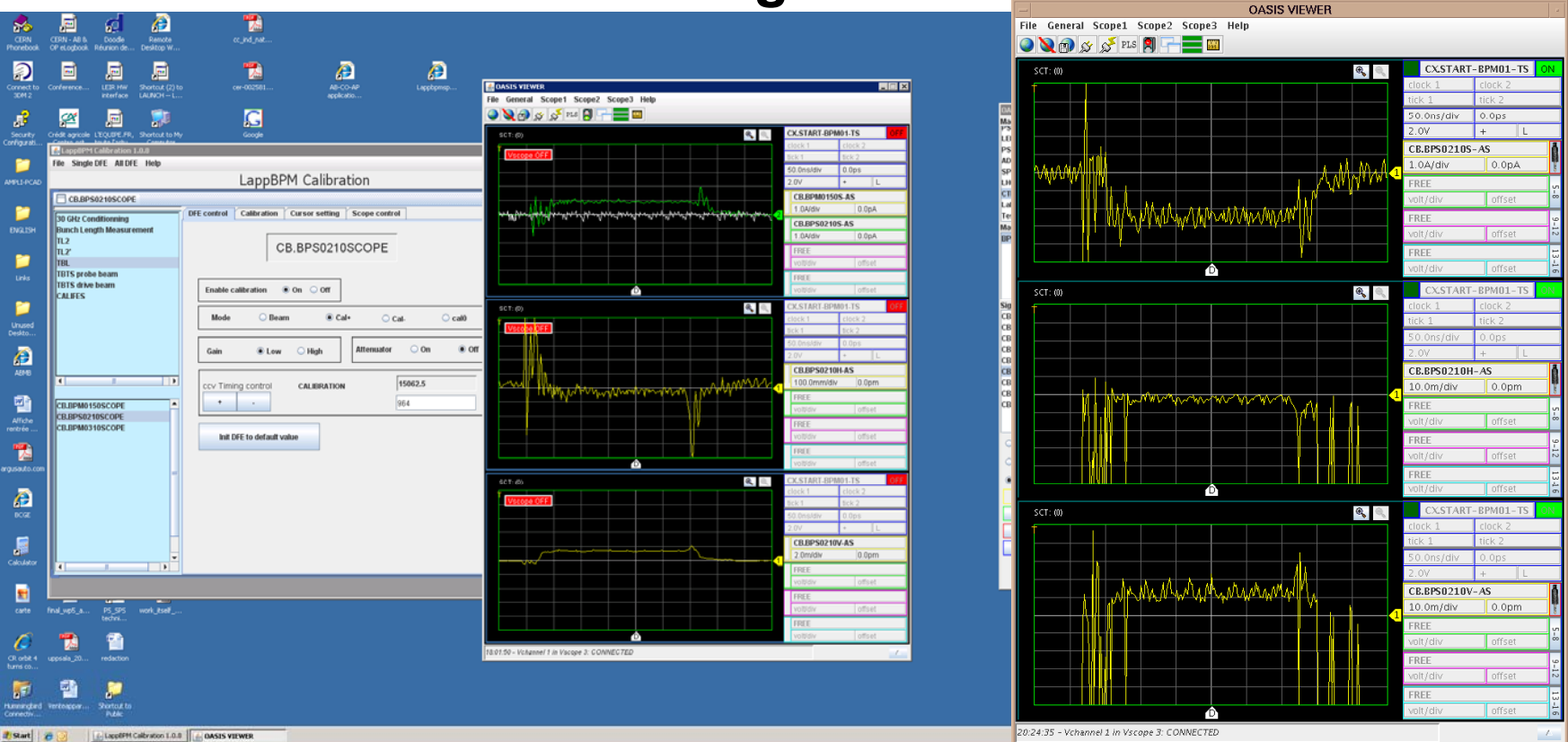
A prototype unit of BPS+amplifier was installed in TBL (on July 2008) and tested



Amplifier version-1 prototype
(as installed on July 2008)

Calibration test: It was detected a 'glitch' at the start and the end of the responses (Sum, deltaH, deltaV)

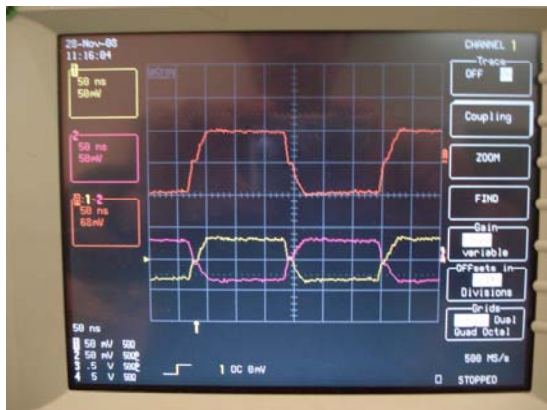
More testings: October-08 (left plot) and November-08 (right plot) testings show more mismatches and glitches



Calibration glitches were eliminated after doing some reworks (on Nov-08, in Lars Soby lab.)



DeltaH, high gain, Cal+ AFE output



DeltaV, high gain, Cal+ AFE output



DeltaV, low gain, Cal- AFE bypass
(the calibration signal don't goes inside the amplifier box)

A little glitch was still present at the begin and end of the Sigma response when the calibration signal (3 A) goes across the PCB



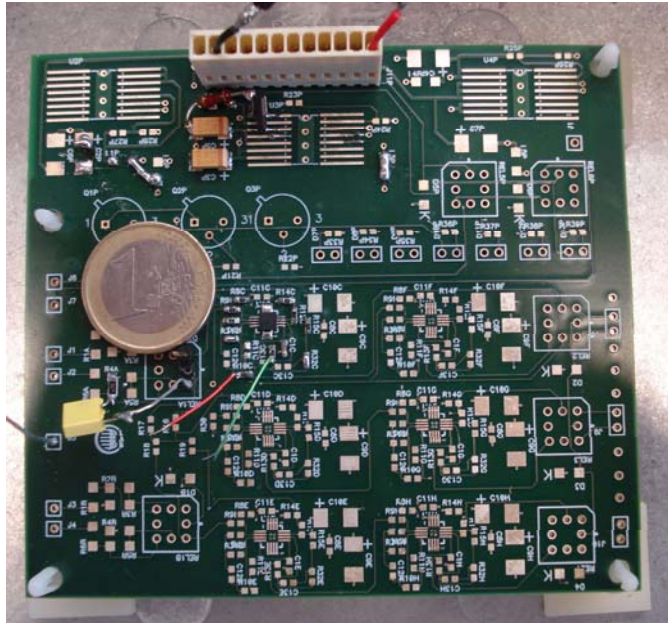
Sigma signal, Cal+ AFE output



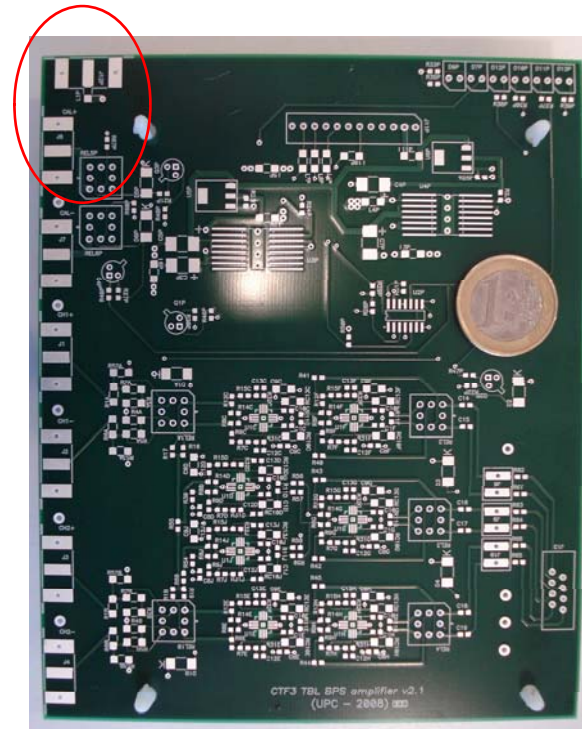
Sigma signal, Calibration AFE bypass (so, the calibration signal don't goes inside the amplifier box)

Steffen Doeberth did some **beam tests** and the obtained results show a Delta and Sigma signals **without ringing**

On Dec-08 was finished the PCB routing and manufacturing (18 units) of the version-2, incorporating some improvements

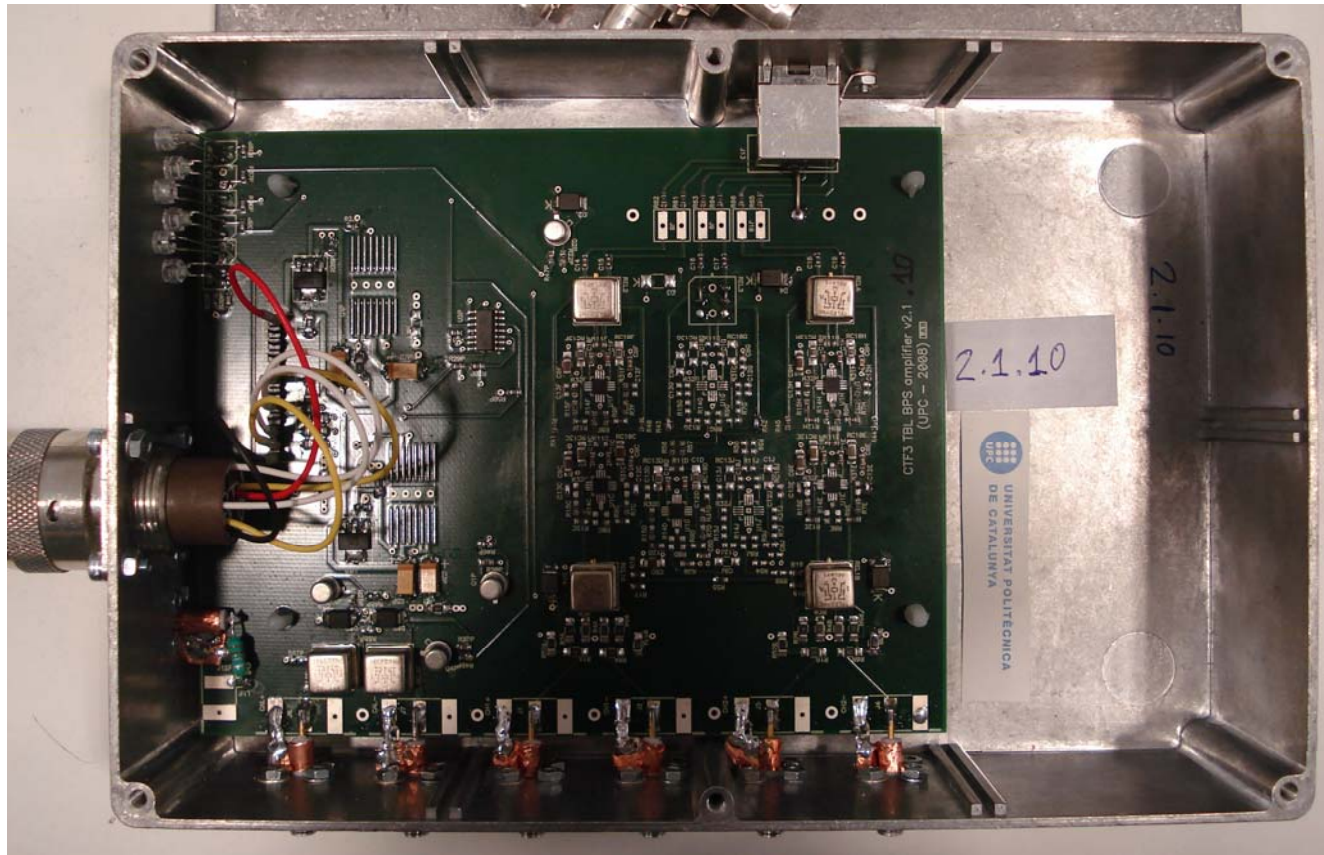


PCB version-1



PCB version-2: 'the red circle' shows the position of the input and output calibration connectors for eliminating the 'glitches source'.

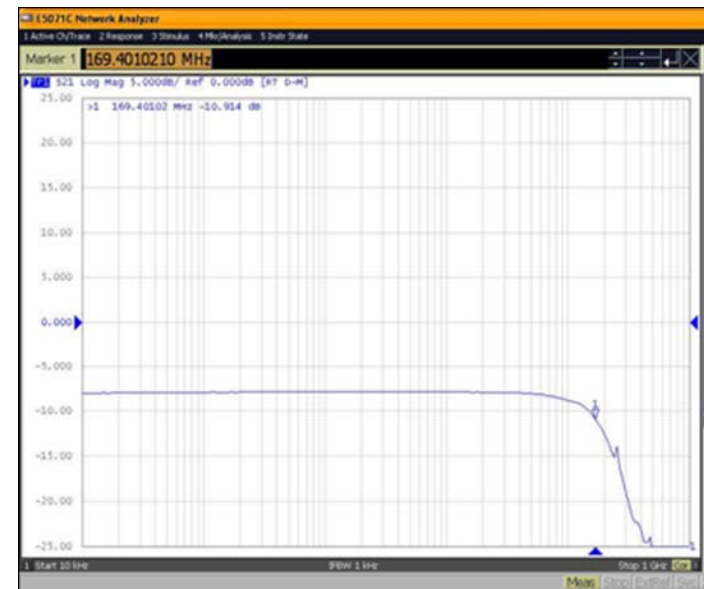
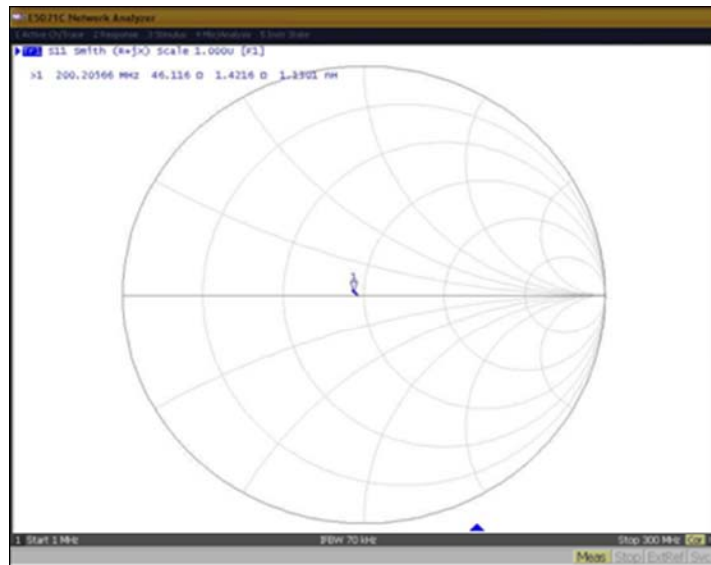
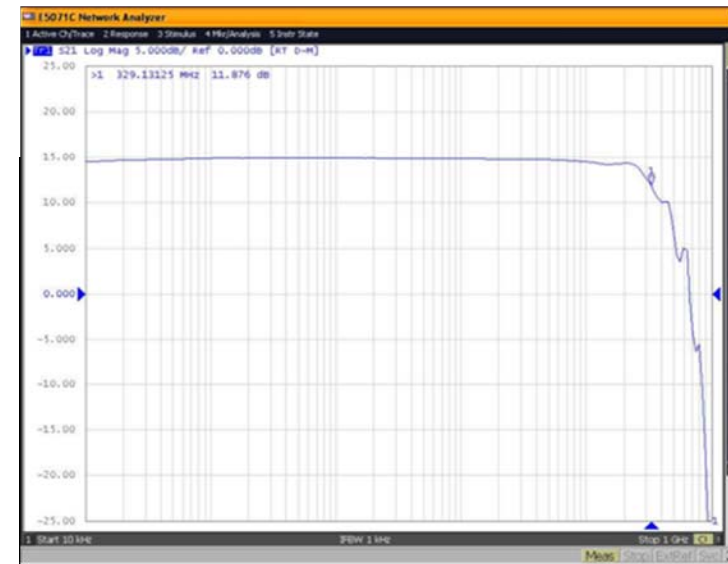
A prototype of the amplifier version-2 was build on January-09.



Amplifier version-2. Main improvement: direct connection of the connectors to the PCB.

Some testings:

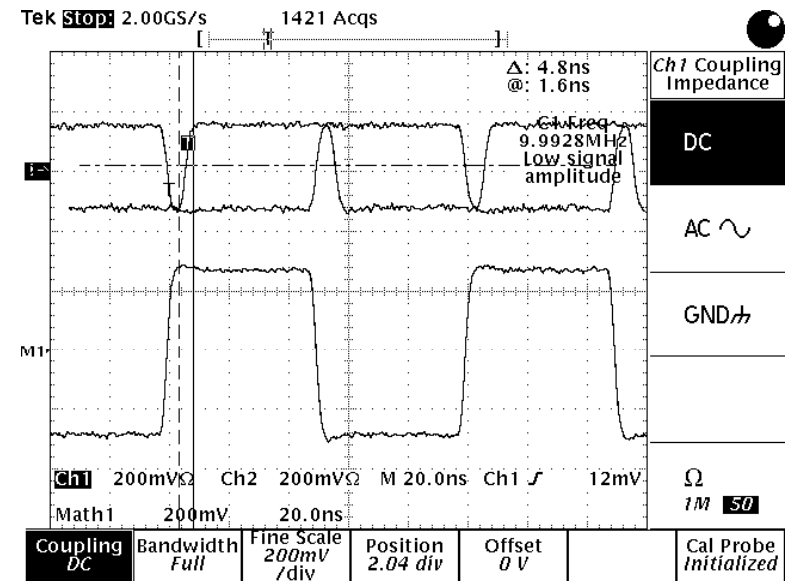
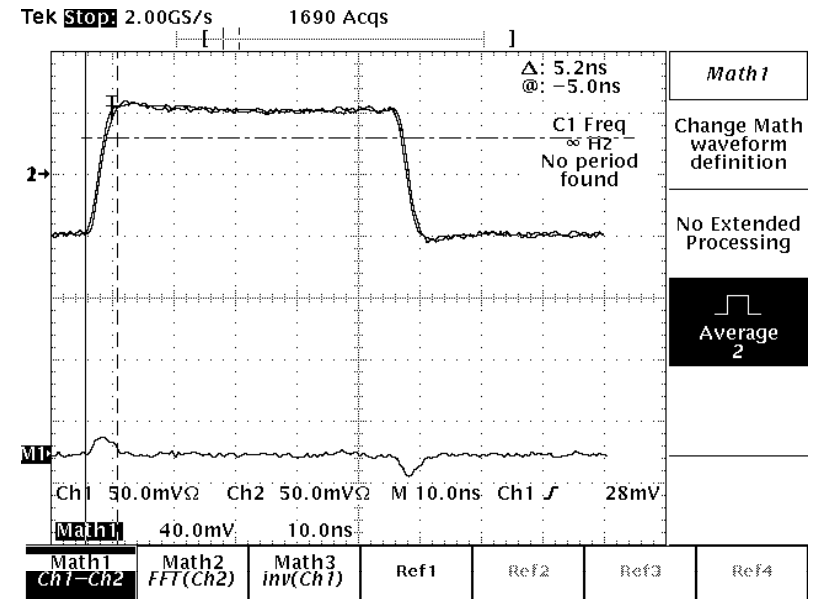
- Delta freq. response (top-right)
- Sigma freq. response (bottom-right)
- S11 parameter of one channel (bottom-left)



Pulse response: the rise time is at least below 5 ns

-pulses, as measured at the generator outputs (top)

-Delta output when only the V+ input excited (bottom)



About the amplifier series: the present

- 1 unit of the version-1 finished and tested: installed in TBL on 2008.
- 1 unit (prototype) finished and tested: remains in UPC for testing and improvements.
- 1 unit, finished and tested, was sent to IFIC in order to be used by IFIC people for testing the BPS series.
- 2 units finished and tested: installed in TBL (last April).

Amplifier series: the future

- 8 amplifier units will be simultaneously finished at the end of June (assembled and tested).
- ... 6 more to be finished on July.
(13 of this units must be installed in TBL).
- ... and the most important:
to test the 16 “amplifiers + BPS’s” with beam in TBL.

Thanks !

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