

**Planned LLRF systems
for
ACC456 and ACC23
for
September 9mA run**

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Plan for Hardware Installation ACC456 (Oct. 14, 2008)


- 10 x SIMCON-DSP (inst. in parallel to existing DSP system for 24 x (probe, forw., refl. Power))
- Downconverters from Cryoelectra (mezzanine boards for RTM in ATCA installed with adapter board in VME ?)
- LO options
 - present 250 kHz scheme
 - high IF (54 MHz) scheme

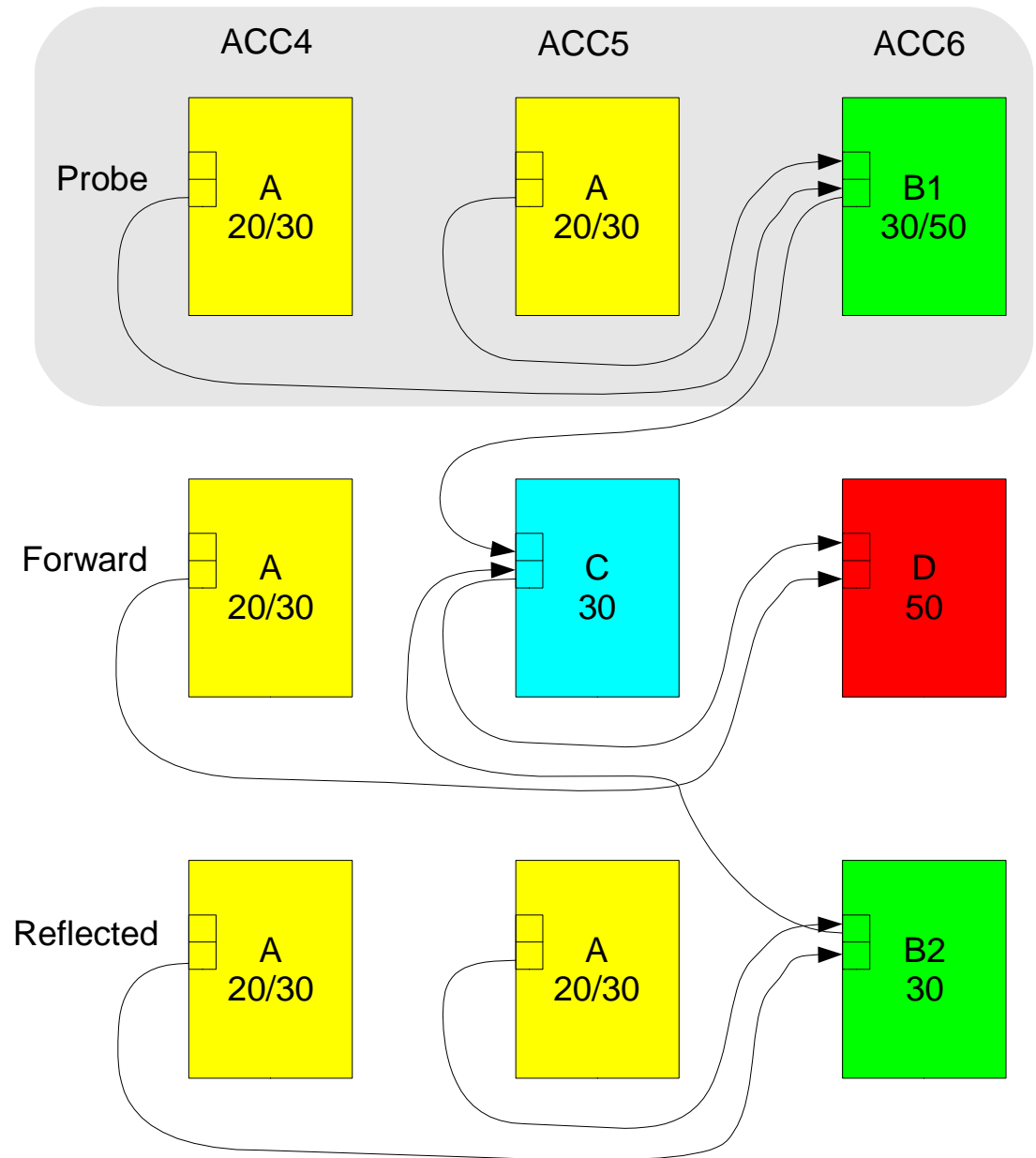
Options for Hardware Installation

ACC23 (Oct. 14, 2008)

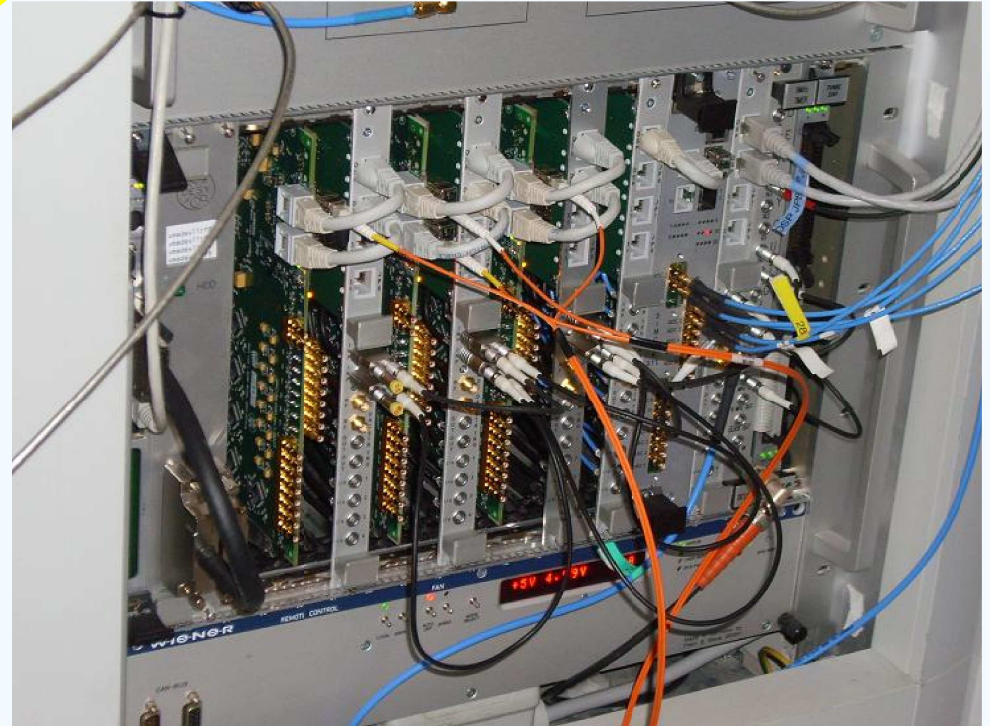
1. Installation similar to ACC456 but only probes connected (requires space and cabling to be done)
2. Temporary installation of SIMCON-DSP system instead of DSP system using IF signals from present system
3. Use installed DSP system with some possible software improvements

ACC456 controller (Simcon DSP based)

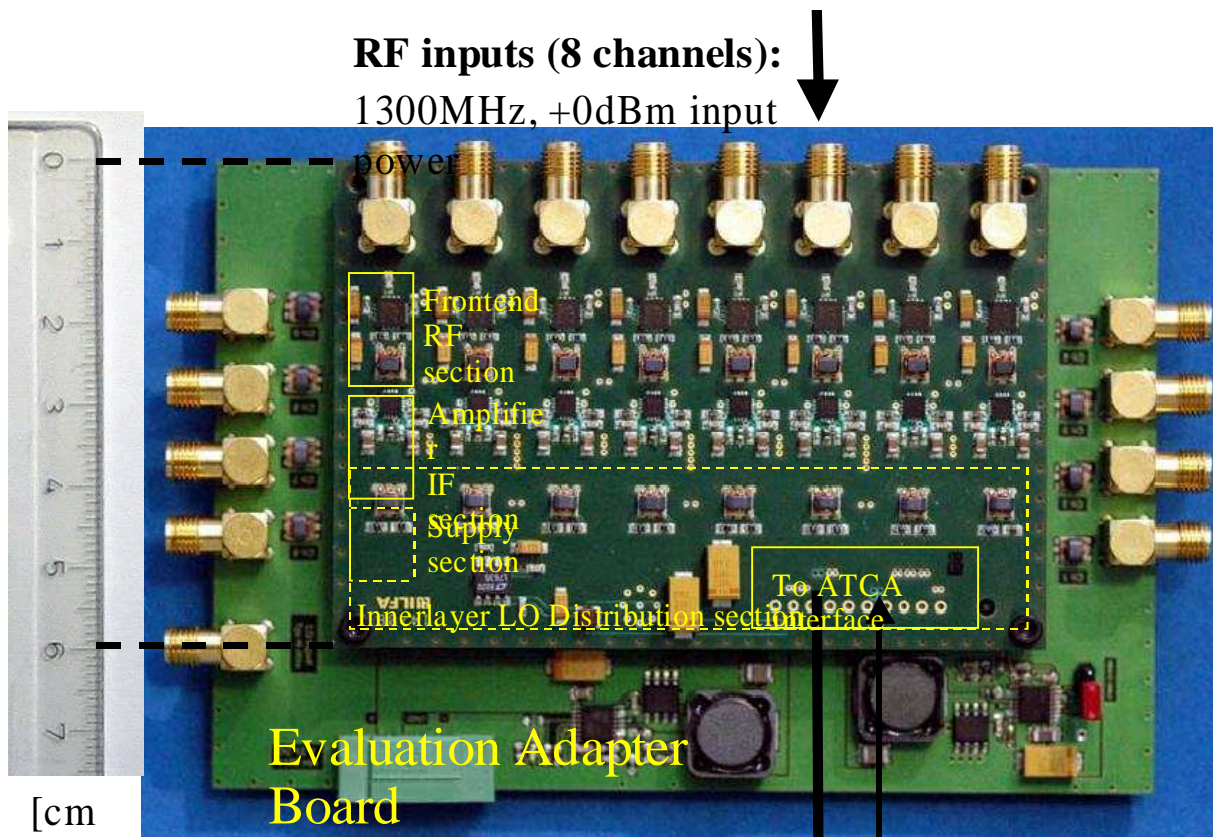
- A,Bx,C,D – type of firmware
- 20/30/50 – Virtex2Pro ...
-  optolink
- 2 VME crates needed



ACC456 controller – assembling (status for 9.01.2009)



New downconverter (obtained on 20.12.2008)



RF inputs (8 channels):
1300MHz, +0dBm input power

Cryoelectra

Gesellschaft für kryoelektrische Produkte mbH

[cm
]

Receiver Type:

LT5527 (Gilbert-Mixer)

RF: 1300MHz, <10dBm

LO: [1310MHz, 1350MHz], 10dBm

IF : [10MHz, 60MHz], diff. outputs

LO input:

[1310MHz,
1350MHz]

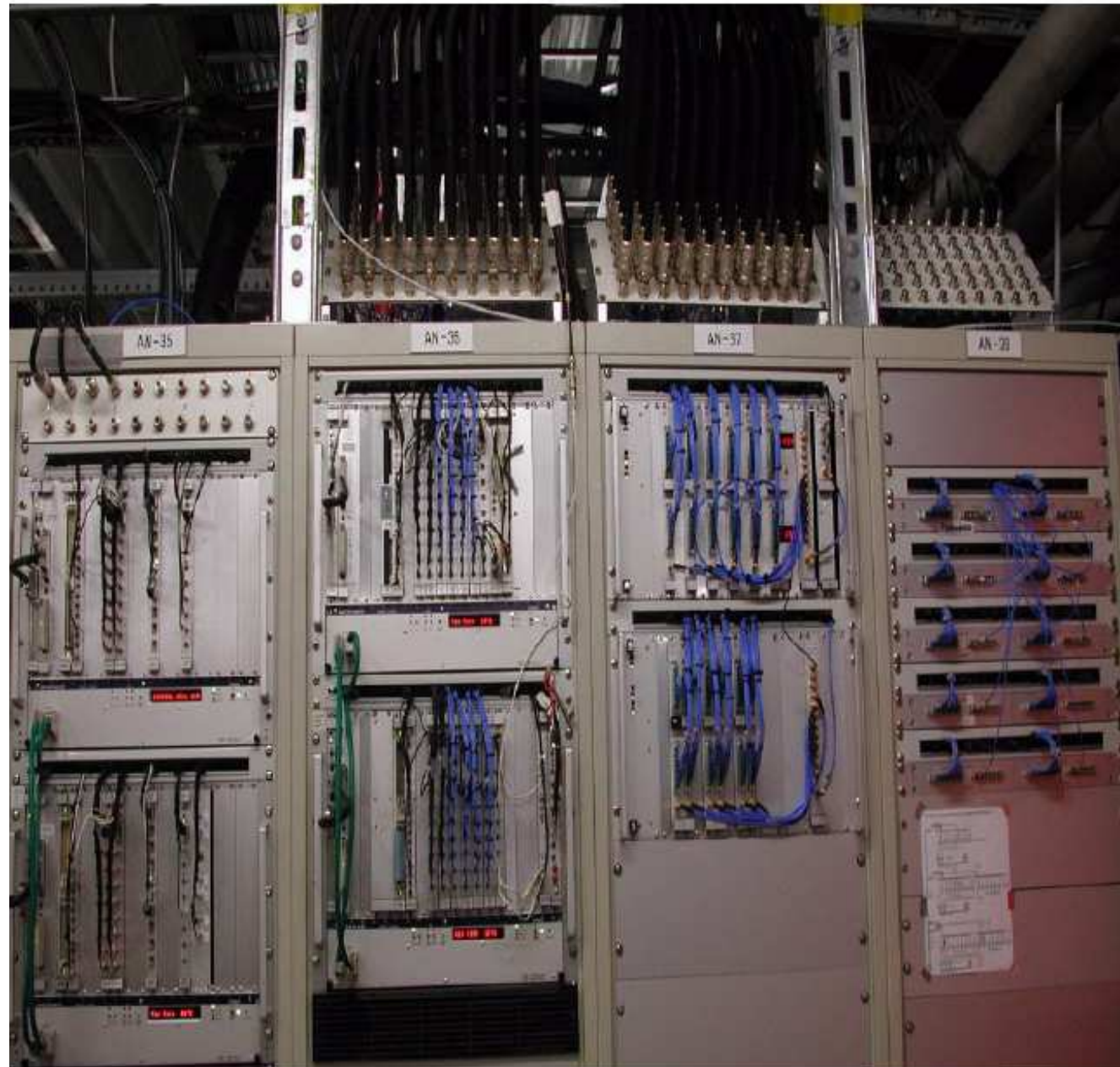
CHARACTERISTICS	RATING
IF Frequency, MHz	1 - 50
Conversion Loss, dB	-2 (typ)
Noise Figure (incl. the accessory card), dB	18 (typ)
IF Spurious Signals, dBc	<-60
IF Filter cut-off, MHz	60
IF Harmonic Distortion (IF < 15 MHz, RF input power < 0 dBm), %	1
IF Harmonic Distortion (IF > 30 MHz, RF input power < 9 dBm), %	0.25
Inter-Channel Crosstalk, dB	>65

LLRF hardware in FLASH

ACC23

&

ACC456



What has been / must be done? (Hardware)

- Installation of SimconDSP based LLRF system in ACC456 as parallel system
 - Cabling (splitting signals) – done
 - Crate with 9xSimconDSP – smaller system with 3 SimCon boards installed
 - Downconverter – obtained, installed and during tests
 - Communication between 9 SimconDSP boards – it was never tested before
 - Piezo control – temporary installation, permanent installation in progress

What has been / must be done? (Software)

- SimconDSP firmware – was tested in FLASH, but not with all required features
 - Beam loading compensation - never tested with high beam loading
 - Loaded Q and detuning measurements – Matlab scripts exist, DSP/FPGA implementation is under development
 - Quench detection - Matlab scripts exist, DSP/FPGA implementation is under development
- DOOCS server - version for simpler system ready
- Matlab scripts for HL algorithms (VS calibration, AFF, klystron linearization, etc.) - ready
- Exception handling (quench detection, klystron trips) – must be worked out