

AGTA mode3 to GRETINA mode3

This is an update

Nothing much has happened since last time

So, mostly reminders of what we did

AGATA mezzanine card data readout:

- 7 mezzanine cards with 6 channels each
- **First card used for CC, with two gains (ignore rest)**
- **Next 6 cards used for the 36 segments**

Headers are easier to read compared to GRETINA (all 16 bit words)

Mezzanine header

0	Mezzanine ID = 0xda?n
1	Event number (2 words)
2	
3	Timestamp (3)
4	
5	
6	Number of samples in trace
7...15	Spare (used by long traces id=0xda5n)

Channel header

0	Channel ID
1	Energy low (ignored ?)
2	Energy high
3	Channel status
4... 7	Spare

Channel ID

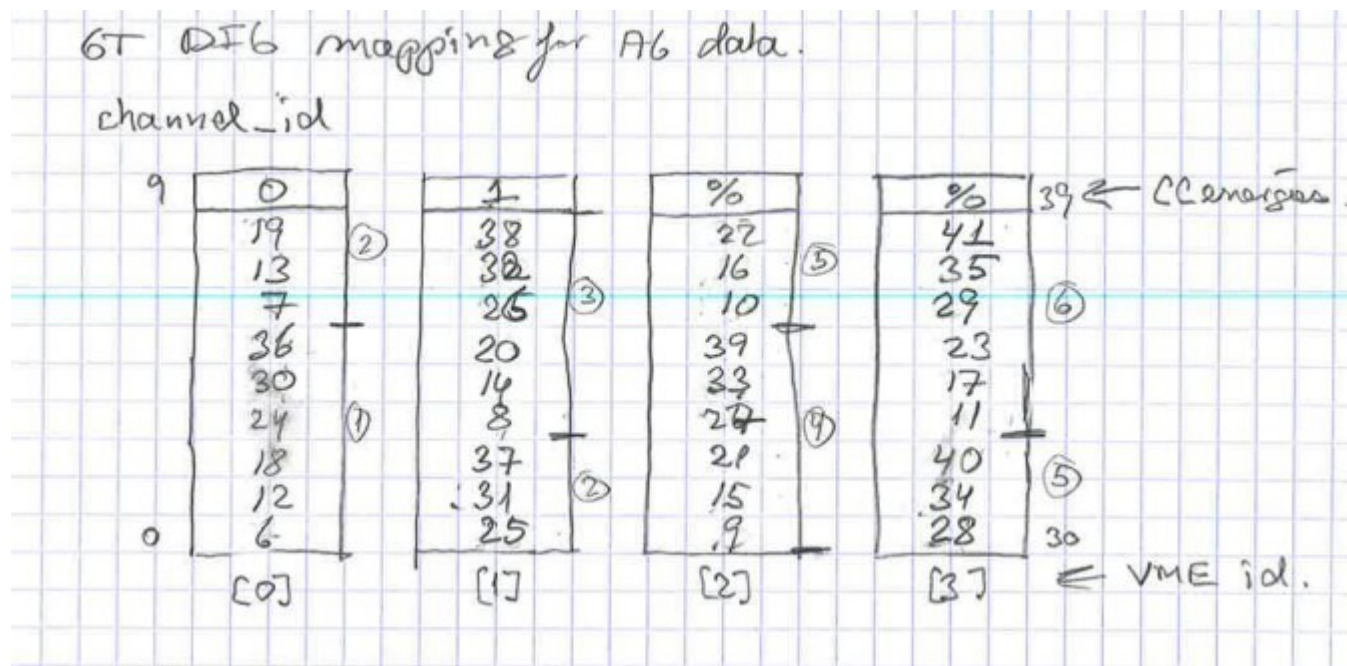
No byte swapping necessary

BUT, the trace that follows each channel header is compressed (factor ~0.35)
(Thanks to Jeremie and Olivier for an uncompression routine)

The readout order

In AGATA, the segments are read out from the front to the back

In GRETINA the data is read out by first reading the front segments, then go to the next layer and so on



Mapping of AG segment channels into the four GT digitizers

- There is also a difference in **clock and anti-clock wise readout convention** – which I was not aware about before further checks (Erbert S.), so Heather is taking care of that for now.
- Which one is the first segment?

GT Event header, my numbering indicated

Official doc here

My hdr numbering

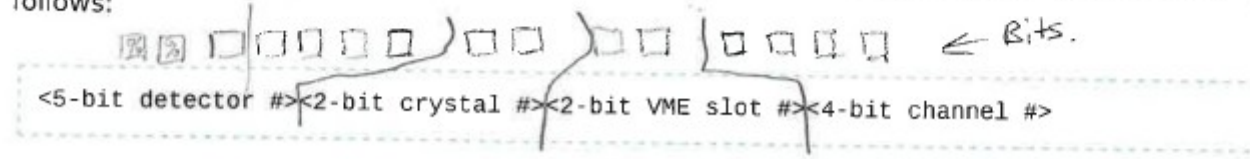
Official doc here

<http://gretina.lbl.gov/tools-etc/gebheaders>

In 32 bit words

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Board ID ¹														0	1	Packet Length (header included)										6A	
LED/external timestamp bits 0-15*														2	3	LED/external timestamp bits 16-31											
LED/external timestamp bits 32-48*														4	5	Energy bits 0 -15											
Energy bits 16-24				X	X	T	S	E	C	6	7	CFD timestamp bits 0-15															
CFD timestamp bits 16-31														8	9	CFD timestamp bits 32-47											
CFD point 1 bits 0-15														10	11	CFD point 1 bits 16-31											
CFD point 2 bits 0-15														12	13	CFD point 2 bits 16-31											
Raw data point 0 (sign extended)														Raw data point 1 (sign extended)													
Raw data point 2 (sign extended)														Raw data point 3 (sign extended)													
...														...													
...														...													
...														...													

The energy is a 24-bit 2's complement signed integer, and must be converted to a 32-bit signed integer before use. The detector ID is a compound word consisting of 4 bit-fields as follows:



A sample code to unpack this data is included in the [GEBHeaders.pdf](#) file.

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- The boad ID is a bit complicated
- The energies are written in a signed 24 bit two's complement format, Yikes!!!
- In GT the data is written in little endian, so we have to byte-swap all the AGATA translated data in the payload before we write it out. (Not the geb-header though.)

So far

We can translate the data
Still problems with which segment is first and
where it is located I think

First attempt to make a Basis was done

Spectra were not so nice...

Still ongoing