

Agenda

- 0) - LHC schedule : 1st beam 2005, studies, physics
- our milestones : 09/00 → 01/01 + tech. decisio
- 1.) Simulation studies Frederic Roug
+ Geometry
- 2.) Si - optron
- prototypes delivery
 - mechanical design Frederic Roug
 - 1st signal from Si on Beetle Philipp Sievers
- 3.) 3GEM-optron studies Marcus Ziegler
- 4.) Electronics
- readout board Michael Schmelling
 - fan out Philipp Sievers

Discussion :

- Bellow at station 1
- Construction schedule → 2005/2006
- institutes & money responsibilities

IPHE

OUTLINE



IT software status

1) May 2000 status

2) Mechanical design

Layers, detectors and frames

3) Geometry

Realistic IT geometry implementation in GEANT

4) Digitization/clusterization

C++ IT algorithms in tracking software

Anton Polouektov

Frédéric Ronga

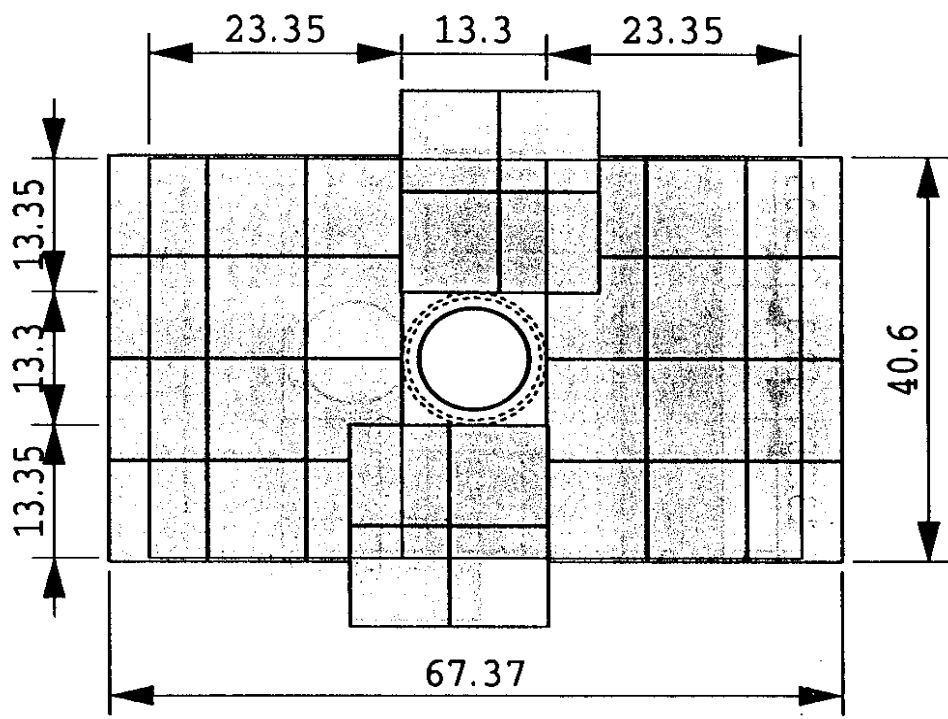
Olaf Steinkamp

IT DESIGN

Terminology:

11 stations
with 4 layers each ($x, u, v, y?$)
made of 2 *L-shape* planes

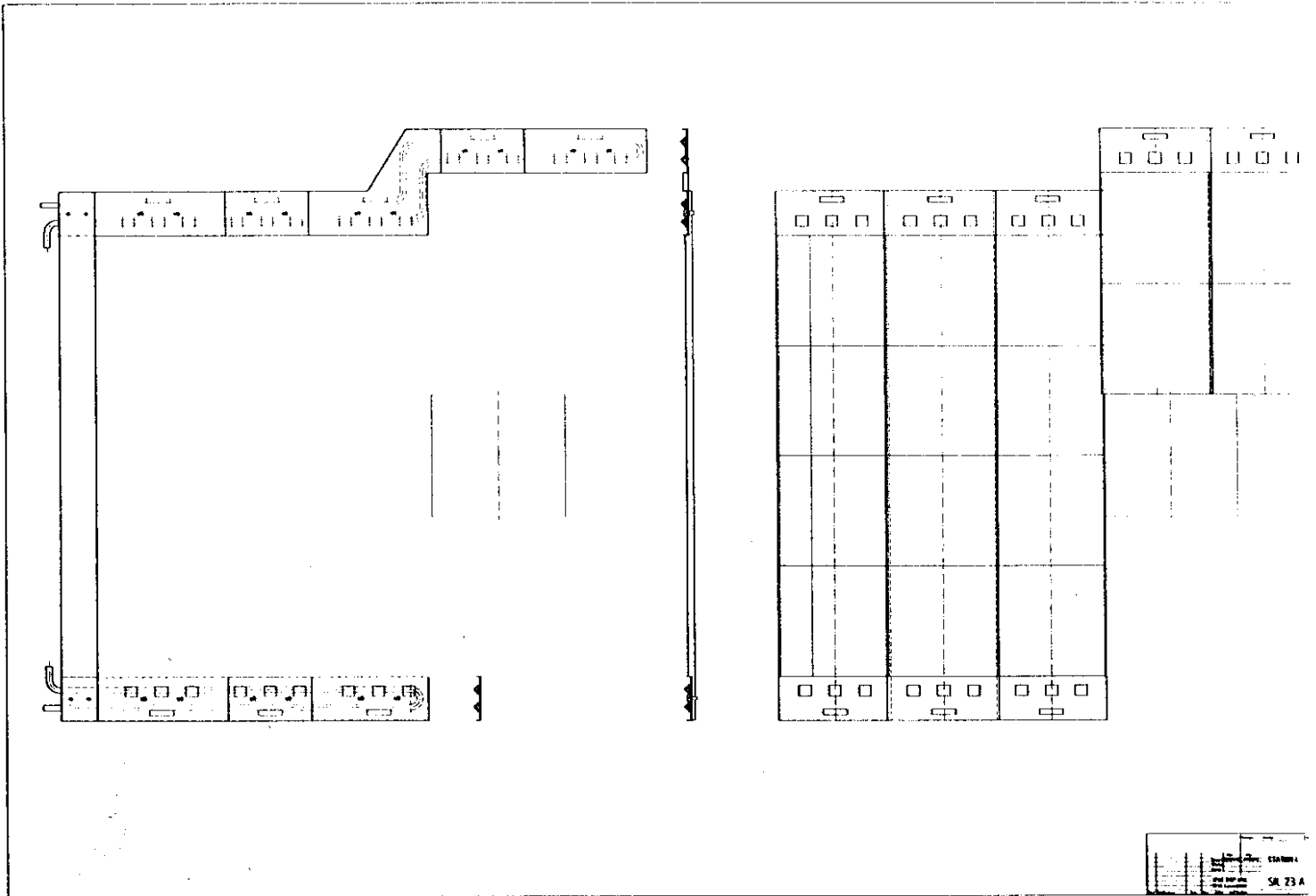
Sensitive silicon area:



Station 4 – courtesy O. Steinkamp

SILICON PLANES I

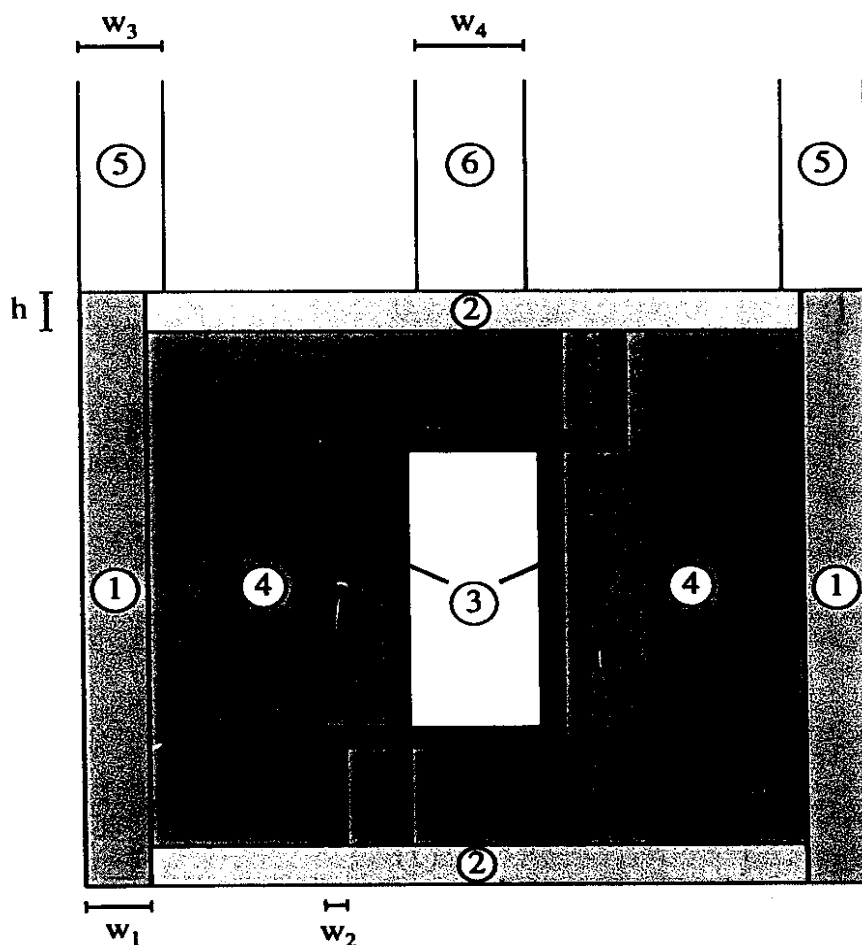
0° stereo angle (x layer)



Mechanical design – courtesy J.-P. Hertig

FRAMES – GEOMETRY

- 1 – side support frames and cable “feedthroughs”
- 2 – top cable support and cooling box
- 3 – inner side of cooling box + frames if gas
- 4 – cooling box
- 5 – top side support structure and cables
- 6 – top center support structure



Results and plans

All C++ base classes for digitization are made. Triple GEM simulation (1D readout, two L-like sectors per layer) is implemented. Cluster size and spacial resolution are in satisfactory agreement with experimental data.

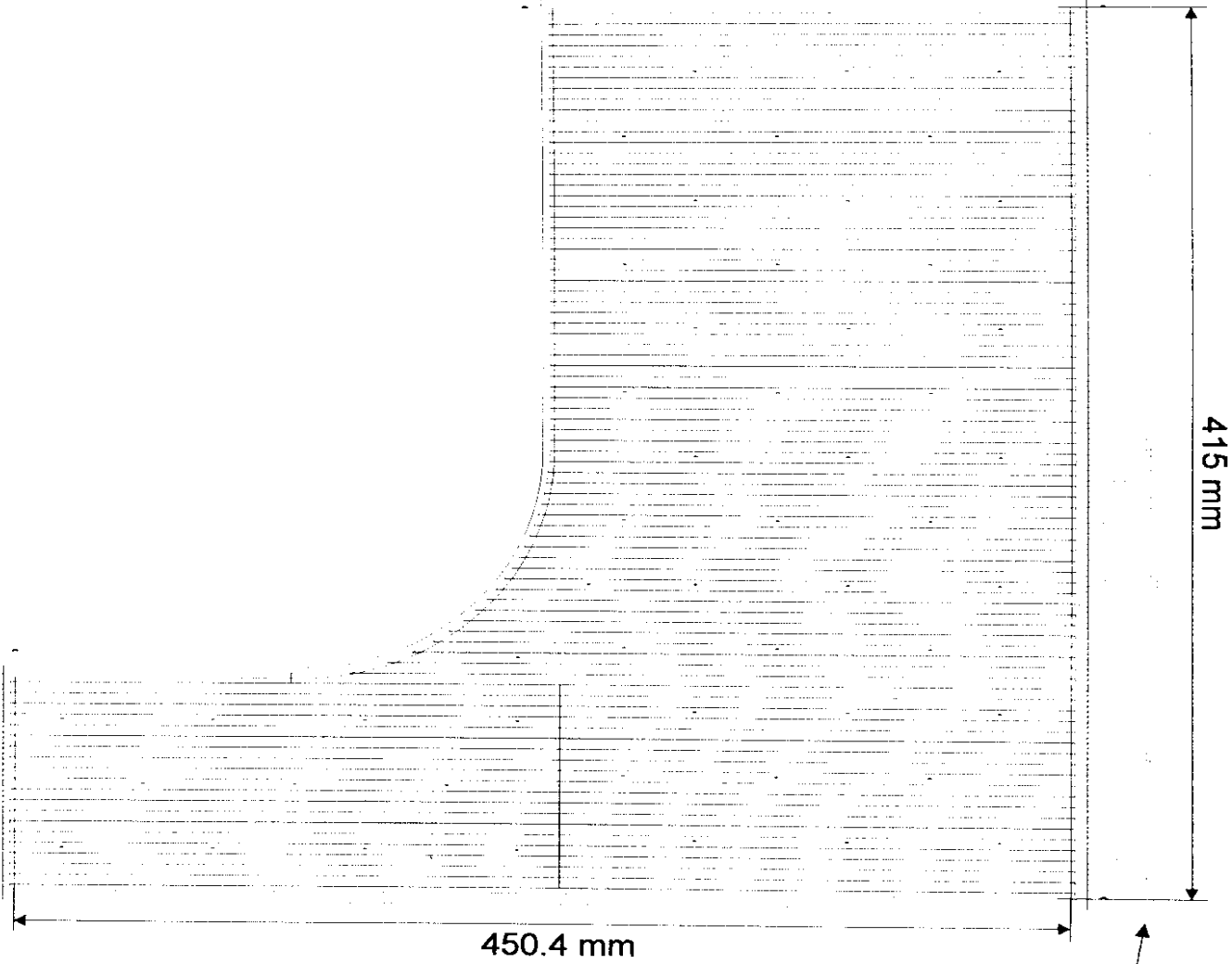
Simple clusterization procedure is done. The tracking software is shown to be able to work with new hits.

Very preliminary results on momentum resolution and track reconstruction efficiency are obtained. σ_p/p is much worse than in case of old IT digitization procedure ($\simeq 1.5\%$ compared to $0.7 - 1.0\%$). Reconstruction efficiency is quite poor in both cases ($\simeq 25\%$). This has to be studied more carefully.

To do:

- Debugging.
- Silicon option.
- More realistic GEM geometry, 2D readout.
- CDF geometry description.
- Obtain momentum resolution and reconstruction efficiency data to choose IT technology.

Layout for GEM segments



connection for HV resistors

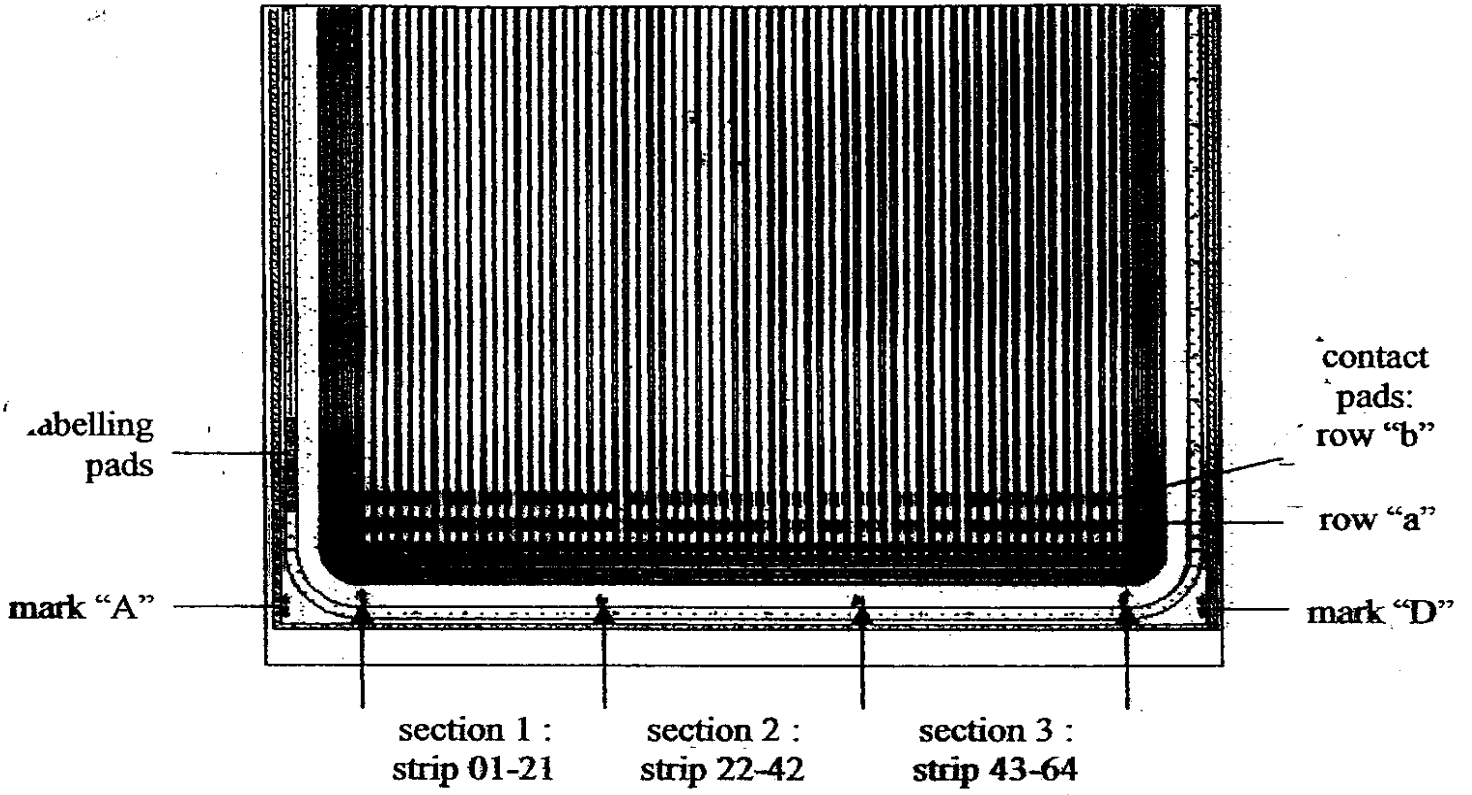
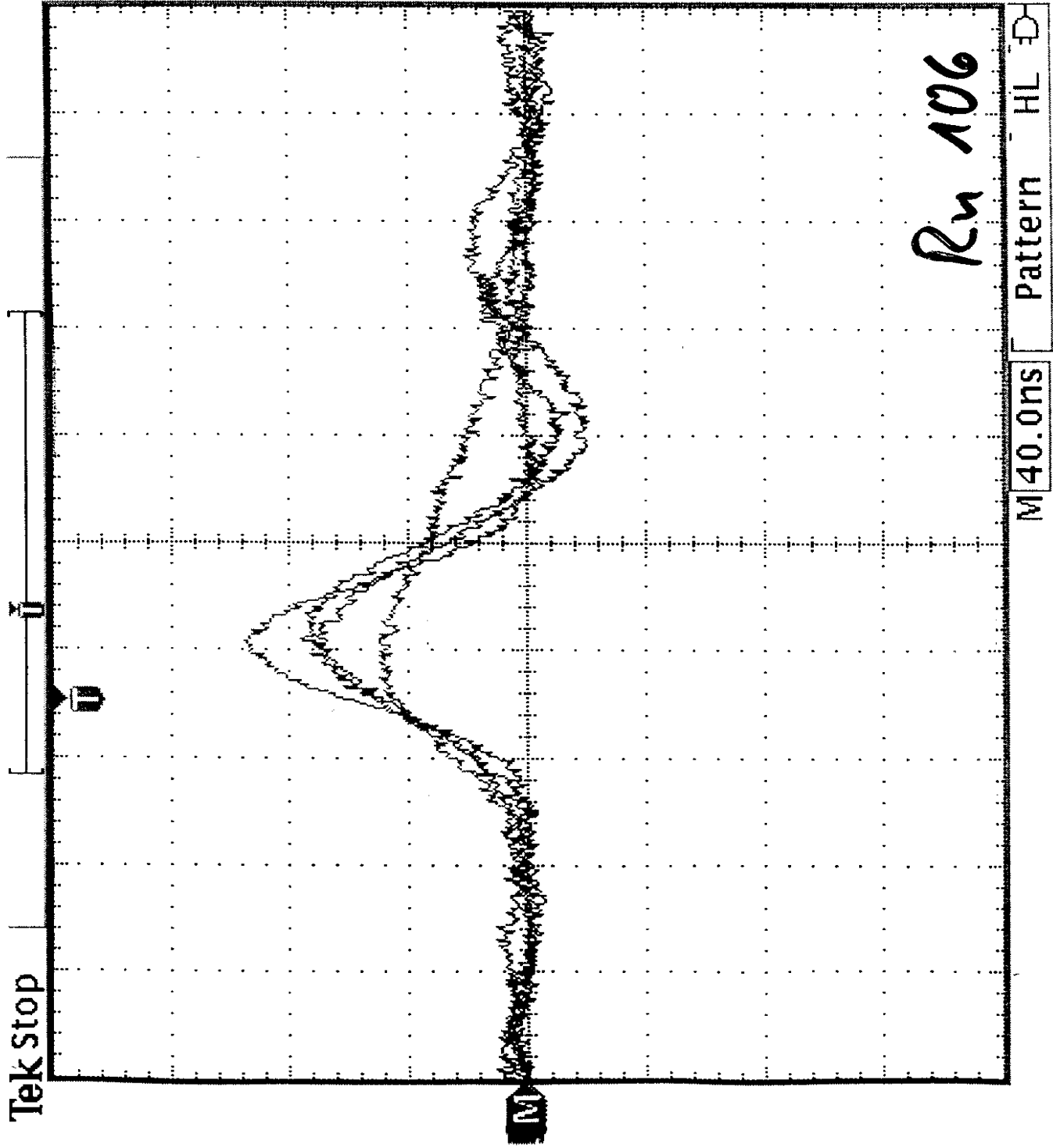


Fig. 02. Detector main view (bottom):
 section 1 – $W/p = 0.2$;
 section 2 – $W/p = 0.25$;
 section 3 – $W/p = 0.3$;
 "A", "D" – mounting marks.



- 4 channels connected together (noise subtraction)

- raise time ~ 30ns

- pulses with different shapes currents of beetle preamp

3.5 MeV -
0.5 MeV γ

20 Sep 2000
15:31:04



Planning for ITR-Frontend-Electronics

- delays in chip delivery
- delays in module production
- ... little progress so far

➔ next steps ...

- work on F/E-board starting
- Beetle1.0 repair October 12/13
 - ☞ perform tests
 - ☞ decide on HELIX vs Beetle board
- 1st board ready beginning of December
- bonding to prototype detector
- standalone readout
- 1st measurements (S/N etc.) until Cristmass
- connect to LHCb ODE in January