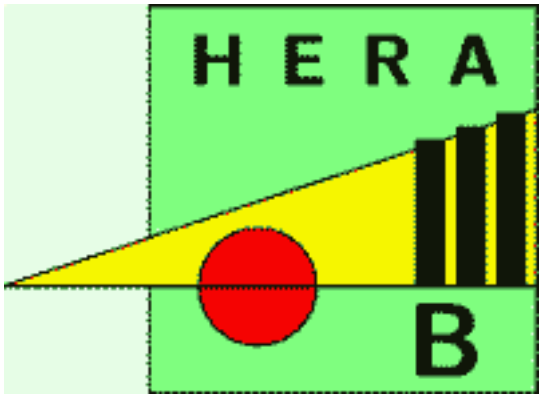


FLT

Status

Hardware / Software

Ekkehard K E Gerndt, DESY

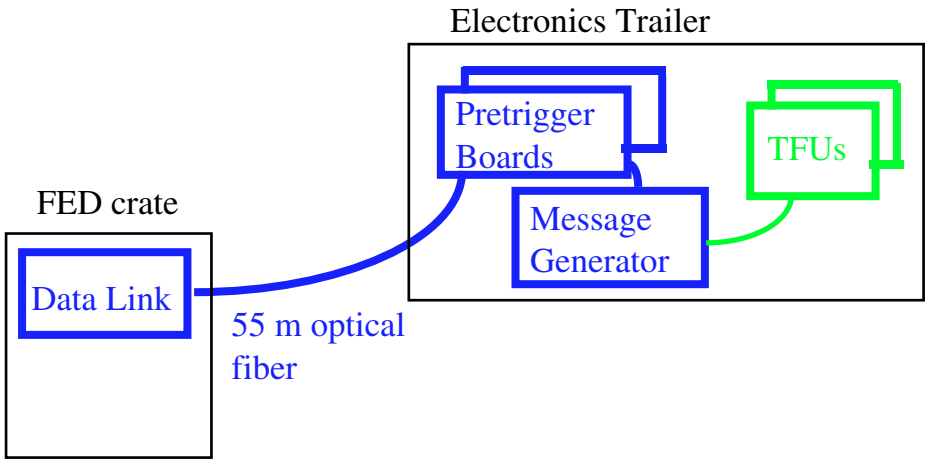
Commissioning Tests

Fedor Ratnikov, DESY

11 - May - 1999

High PT Pretrigger

PROTOTYPE-SERIES



Status:

board	production	board tests	available	system
test	✔ (5)	✔		inner+outer
link	✔ (5)	✔ (intrinsic)	3	48+28
pretrigger	✔ (2.9)	✔ (intrinsic)	5	26+14
PMG emu	✔	✔		
PMG	✔ (2 MUON + 1HIpT)	✔ (intrinsic)	1	4+4

+ ECAL inhibit distributor ready & awaiting tests

+ ~15 PECL to TTL adapters ready (for TFU interface)

➜ whole system as prototypes available ! ✔

➜ **HERA-B tests started**

➜ **ready for mass production BUT missing $$**

if $$ in Aug. ⇒ prod. start Oct. ⇒ system Feb. 00

MUON Pretrigger

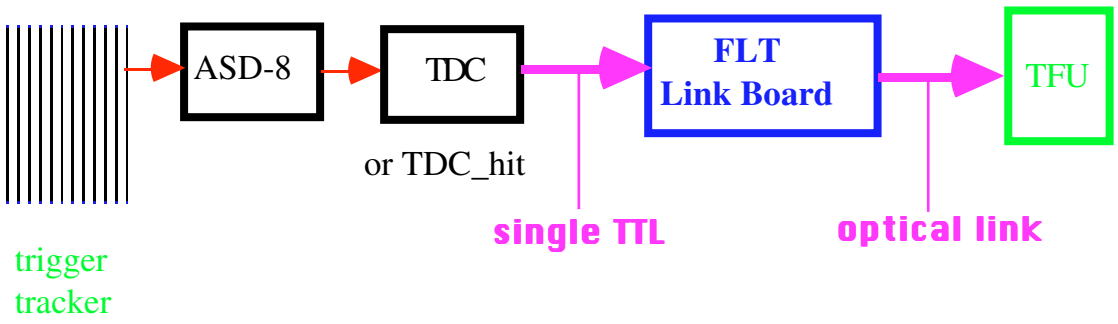
see separate talk by Carsten Cruse

ECAL Pretrigger

see separate talk by Marco Bruschi (??)

Data Link I

MUON & OTR Link Boards: ~ 200



TEST SERIES -- VERSION 1

(5 (7) boards survived testers)

➜ **Built by company**

➜ **bug board;** only 5-7 (8) links/board worked

TEST SERIES -- VERSION 2

(7 boards)

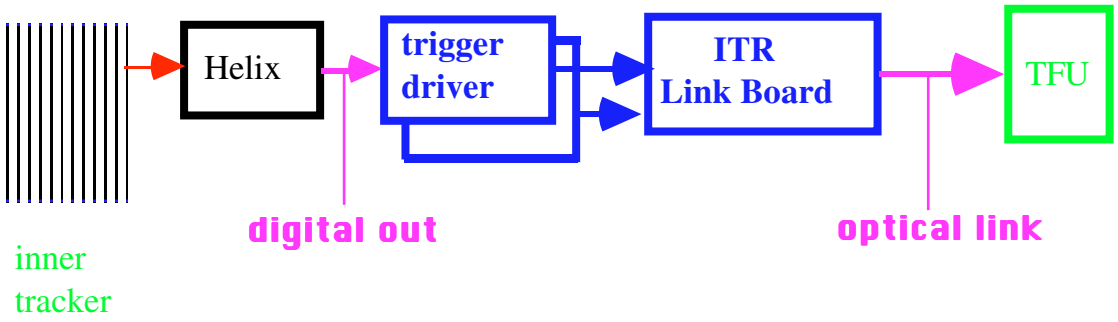
• several layout changes

➜ **Installed boards delayed, finally in April 99**

➜ **bug board II, i.e. unresolved problems despite 6 wks of intensive work @ NIKHEF**

heading for desaster

Data Link II



ITR Driver Boards: ~48

- series production finished ✔
- ~ 25% tested ✔
- 6 boards just transfered to HD ✔

ITR Link Boards: ~24

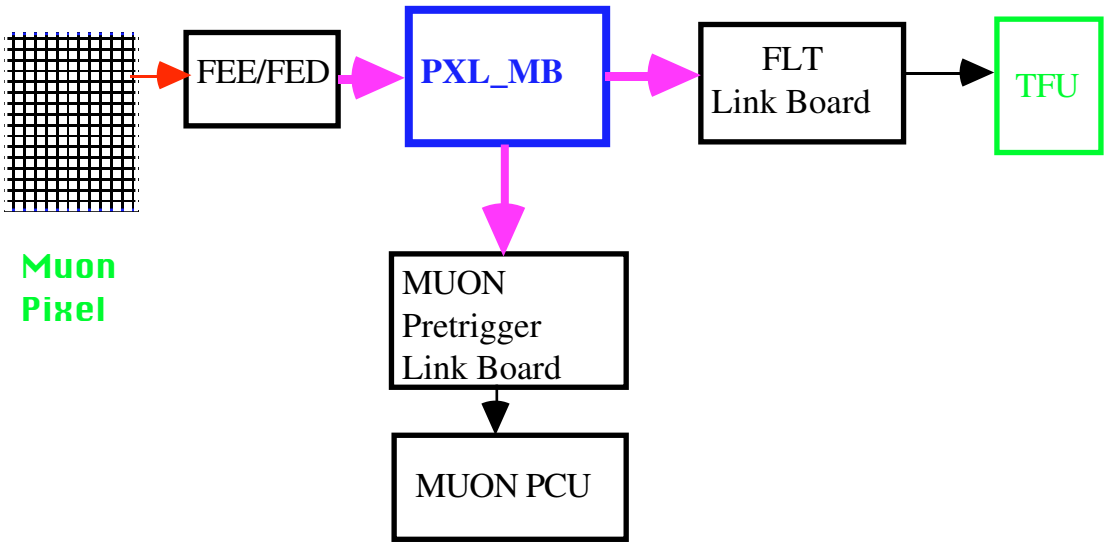
- all PCBs produced (V2.1) ✔
- new Xilinx ROM tested @ DESY (M8) ✔
- ~ 50% stuffed but not yet tested
- 1 (3) ITR_ FLT_LBs just tranfered to DESY

➜ 1 wk tests w/ MSGC's & TFU's completed

cruising…

Data Link III

MUON Pixel Mapping Board: ~16
(for pretrigger & TFU tracking)



- Industrial
- board development
- prototype production
- production

➜ Design to finish within next two weeks
➜ Layout generation another two weeks
➜ Finish of production by mid Oct.99 feasible

schedule slipped 2 months

tests of prototype boards will have to be done by MUON and MUON pretrigger groups quickly

FLT network I

Track Finding Unit (TFU): 75

- ∃ 2 prototypes TFU.V4; 1 @ DESY !!

➜ test series (8) initiated & order at company since mid March *hope* for TFUs mid June !

- manufactured PCBs useless twice

however...

➜ we need to require a successful HERA-B test before initiating series production

It is getting mighty tight !!

Track Parameter Unit (TPU): 4

- one TPU.V2 @ DESY ✔
- modified TPU used for RUN'98/'99 @ DESY ✔

- redesign of TPU.V2 ready

➜ initated order (4): 21 April 99 (2 mths slippage)

➜ fully stuffed TPUs: end June 99

➜ finish hardware commissioning: Sept./Oct. 99

slippage by ~ 2 months, not critical

FLT network II

Trigger Decision Unit (TDU): 1

➜ **Again 2 important milestones reached:**

- **production of main board finished** (twice)
- **first tests of reduced_TDU @ DESY (!!) commenced**

- **Production & testing of LUT subcards: now**

➜ **expect full TDU after shut down**

CAVEAT: **some bugs that need to be understood**
maybe only partial pair trigger…in July

cruising…

FLT Test Board (TB): 0

- **fall back solution in lieu of TDU was partially successful & used for ECAL triggered running in '98/'99** ✔
- **used to compensate for some system bugs** ✔
- **very low message rate (~ 5 kHz) led to unwanted long extra latency…sorry :-/**

FLT message system

Motivation:

- **larger number of maximum inputs than originally foreseen {MU4 , TC2 , inter TFU}**
- **larger cable lengths than specified**

Measures:

➜ **prototype of LVDS based system finished ✔**
➜ **small series (~20) maybe in Oct.99**

➜ **design of 4:1 PECL-PECL MMX finished ✔**
➜ **preparing to build 3 prototypes**
- ∃ **PECL-TTL converter**

System commissioning:

- ∃ 4 TFU-MB V3.1 + ~3 boards of older versions

➜ **15 TFU-MB V3.1 (TTL) ordered** (P.O. 12.3.99)
➜ **production delayed, but expected end June**
- could be used for MUON tracker in final system
- **no delay for summer commissioning**

CAVEAT: incompatibility

An unpleasant decision must be made !!

E. Gerndt, DESY, PRC talk 11.5.99

Infrastructure & Common Components

• delivery of **optical fibers** delayed
• followed by a **delivery desaster**
• lucky us due to enough **contingency**
➜ main installation in **May shut down** as planned

• delivery of **extra FLT crates** delayed
• due to enough **contingency**
➜ installation in **May shut down** as planned

• optical **transmitter & receiver**:
* about **90 pairs** produced at Uni DO ➔ dev. crews
* **test series** production: **ETR** (~**320 pairs**)
➔ mediocre quality, late
➜ initiate **new test series: MSC** (**100 pairs**)
➔ late (P.O. ~2.99)…waiting maybe **end May ?**
➜ **ordered diodes** for mass production
➜ initiate **test series III: CAD** (**100 transmitter**)

• ~ **10^2** transmitters reliably used in **HERA-B** ✔

potential for **a bottle neck**

cannot start administration for mass production

Software

Simulation:

- provided **simple simulation** for physics run
- **change for general simulation from ARTE01 → ARTE02 on its way** (LUT level FLTSIM) **& to be finished during May shut down**

Online:

- **stand alone system** (tcl/tk + C + trun) **developed since last fall and succesfully used** ✔
- **preparing switch to HERA-B daq compliant system** (easily integrated into HB_RUN_ctrl & talking rpm)

Data bases:

- **preparing our first HERA-B data base compliant data bases**

HERA-B First Level Trigger hardware key challenges!

FLT_LB

TFU series production

FLT Message system

Opto Link mass production

Software development is being attacked now, but there is still a humongous amount of work that needs to be done.

Commissioning Tests of the FLT is what's next……