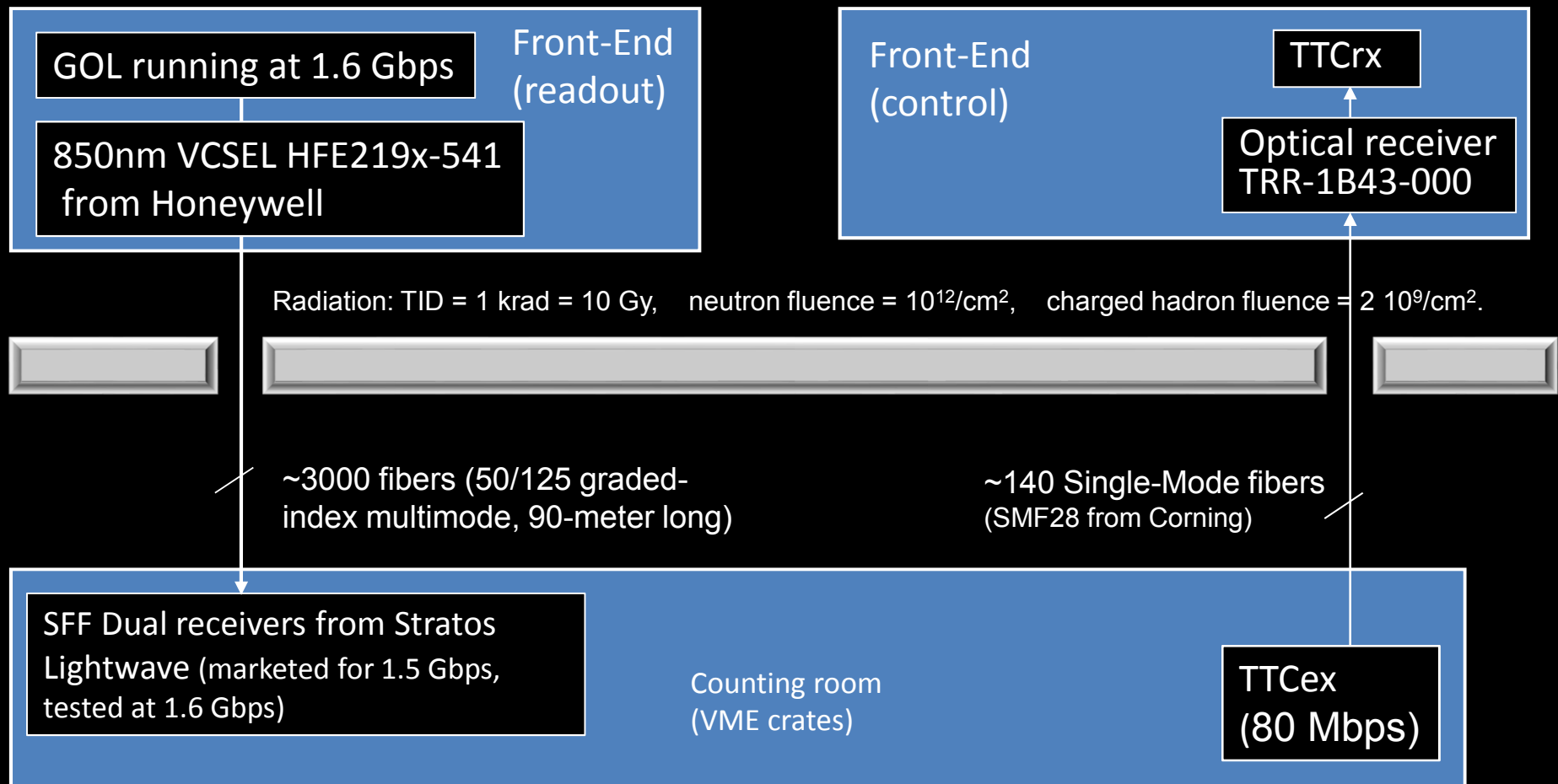


CMS HCAL optical links

Eric Hazen (BU), Tullio Grassi (UMD)

OptoWG - 28 Sept 2011

Existing system (production ~2004)



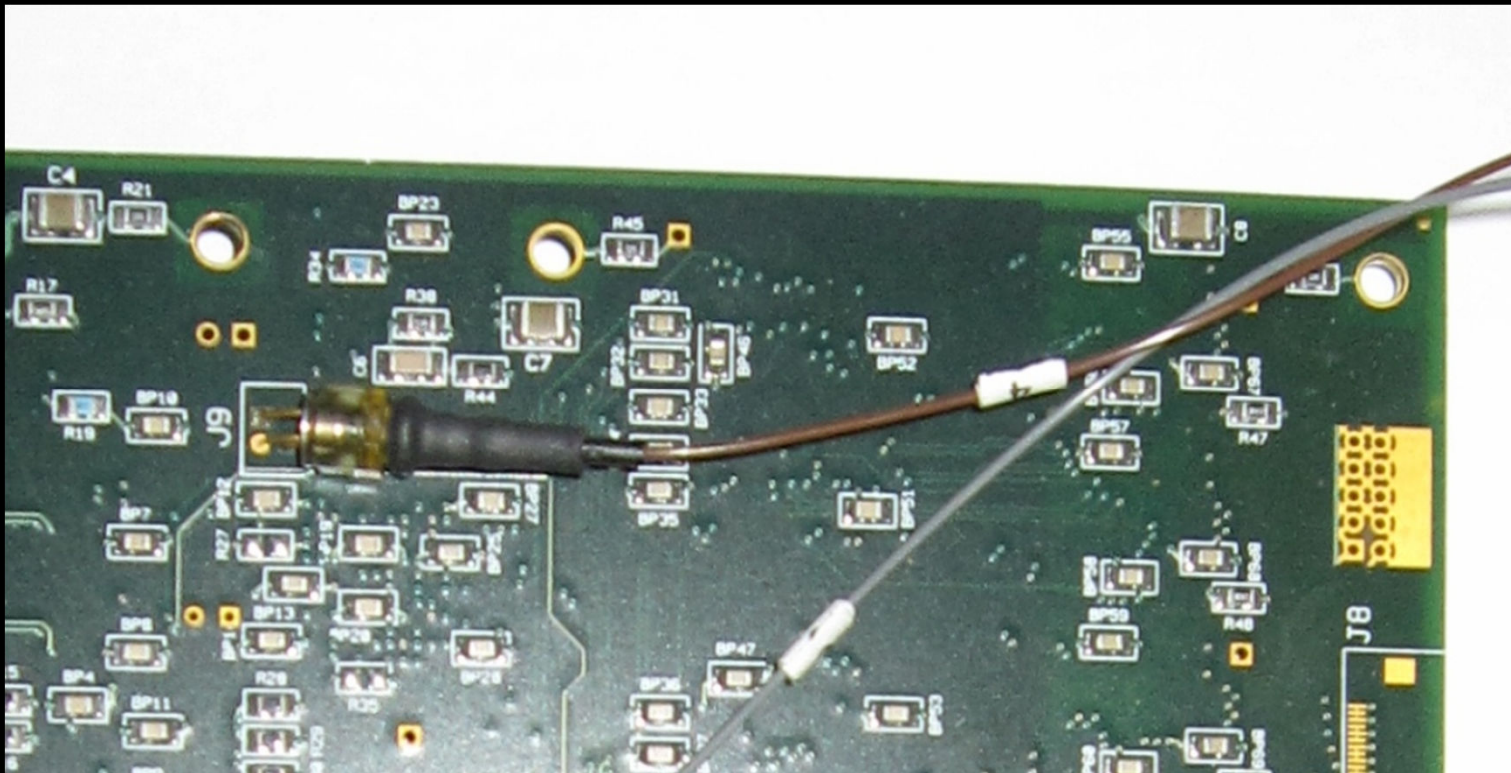
No issues with fiber reliability and performance. Not all installed fibers were good, but none have measurably degraded in service.

No failures of Vcsel transmitters. No failures of TTC optical receivers (TRR-1B43-000).

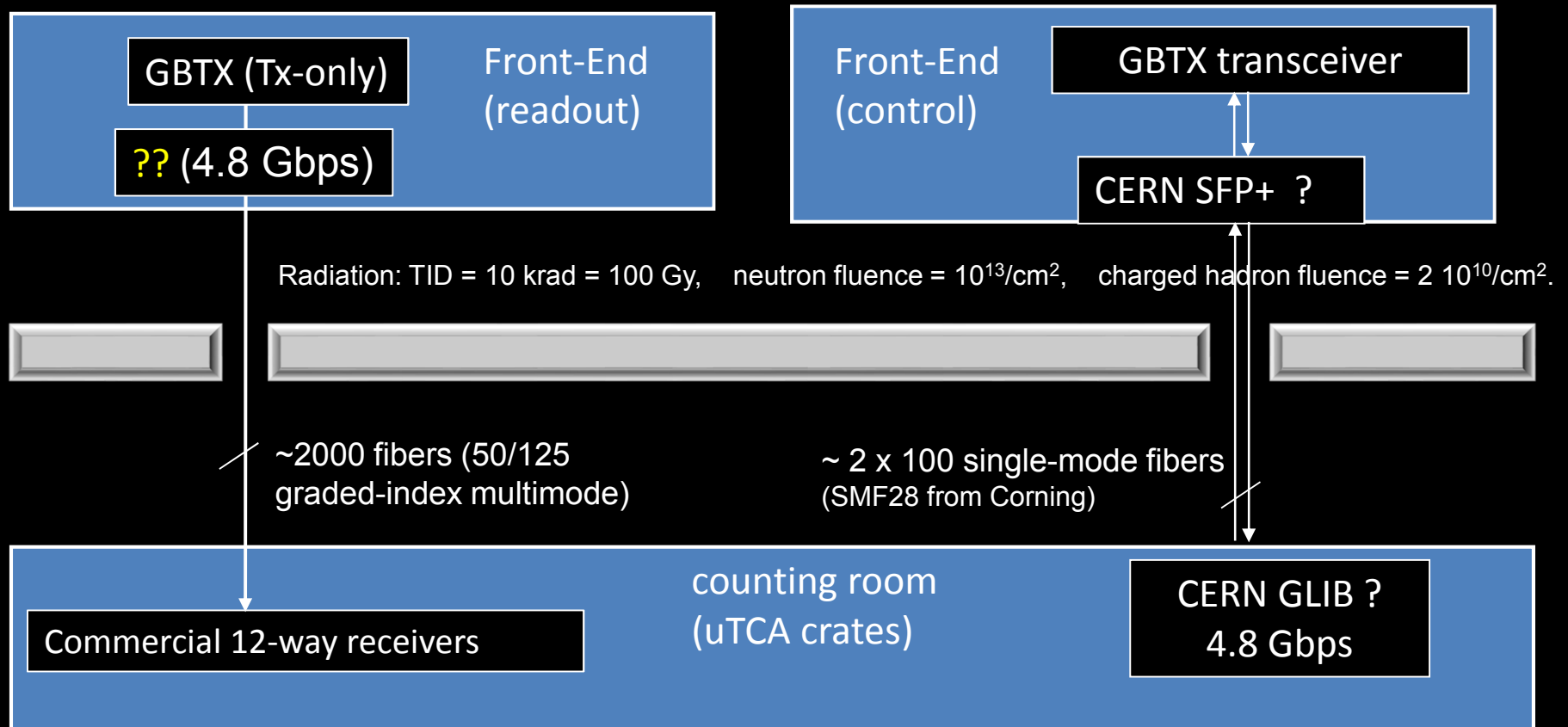
We lose ~3 Stratos receivers/year with 3000 fibers in service → “easy” to swap them.

Rear-side of a Front-end readout card: connection of individual fibers to the VCSEL

A heat shrinking tube holds the fiber in place → limited volume.
No major problems has been observed in the existing readout electronics.



Upgrade of (part of) CMS HCAL. Installation in ~2016



We plan to keep the existing fibers, preferably add a few. Upgrade only the (opto-)electronics parts.
Major issue: find a transmitter with small volume for the readout modules (based on current understanding, there is no space for SFP+ transceivers on the barrel and encap).

CMS HCAL Schedule



GBT, QIE10

Full Prototype	Testing	TB/Eval	R	Production & QC
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 Same schedule for both. QIE10 submission 8/2011, GBT prototype received 5/2012 for testing

HF CCM

R&D	Prototype	TB	Sys tests w GBT	RR	Prod/QC
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HF FE

System & rad testing	R	Production & Assembly	QC, Burn-in	Inst all
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HF PMT

QC	Burn-in & Prep	Install
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HF Splitters

1/3

HF BE

uTCA prototype R&D & Install	Verify sw/fw parasitic	R uTCA Prod, QC, Burn-in	Full I&C w/ legacy FE	Full Operation uTCA w legacy FE, verification
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HBHE CCM

R&D	Prototype (904)	R Production
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HBHE FE

RM validation	System & rad Tests w/GBT	TB/eval	R Production & assembly	QC Inst all
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HBHE Splitters

Install slice	Verify fw/sw w oRCT	Install 1/3
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HBHE BE

I&C 1/3	uTCA Production Verify fw/sw pt5	Full I&C parasitic
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SiPM

Baseline vendor demonstrator	Continue R&D (eval vendors)	10% Procurement, Assembly, Test	R Production, Assembly, Test (Full)
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LV Power Supply

Requirements	Prototype	Procurement	QC/Burn-in/Testing (hw & sw)	Inst
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We need opto-electronics parts no later than the GBTX (preferably a few months before).