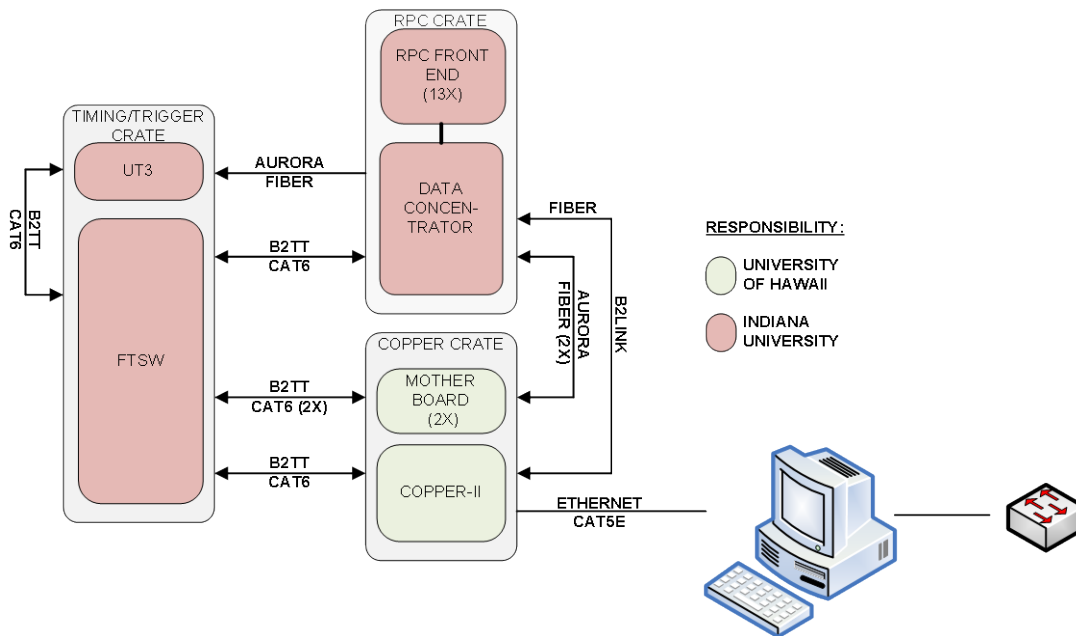# K-long-and-muon Detector
Integration Plan

1 Integration at Indiana University

1.1 Scope

This section describes the integration effort at Indiana University (IU). The KLM electronics will be integrated to the extent possible before a more complete effort at KEK. The IU effort will focus on a small number of connections between each integration item (a single octant). Only the electronics will be integrated; the actual scintillator and RPC detectors will not be used.

1.2 Integration Configuration

The integration items and connections are shown in the block diagram.

1.3 Integration Items and Method

Interface	Description	Method	Required Parties
TTD/B2TT	Clock and timing for all boards	Implement and b2tt in each connected FPGA.	IU, UH
Trigger	Data Concentrator to UT3 interface	Stream data to UT3 and use ChipScope to verify. Requires special 4 to 1 cable.	IU
DAQ/B2link	Data Concentrator to COPPER interface, run control, and data collection.	Stream run control data from binary file using low level COPPER utilities. Record DAQ data with low level COPPER utilities. Verify on HSLB with ChipScope.	IU, UH
Scintillator	Motherboard to Data Concentrator interface	Stream run-control data through Data Concentrator to Motherboard. Stream scintillator DAQ data through Data Concentrator. Verify with ChipScope. DAQ known data pattern can be generated by TARGET built-in-test or SCROD FPGA.	IU, UH
RPC	RPC Front End to Data Concentrator interface	Stream run-control data through Data Concentrator to RPC Front End. Stream RPC DAQ data through Data Concentrator. Verify with ChipScope. DAQ known data pattern can be generated by RPC Front End built-in-test or FPGA.	IU

1.4 Equipment List

Item No.	Qty.	Part No.	Description	Supplier
1	1		VME Crate, 6U, Timing and Trigger	IU
2	1	UT3	Universal Trigger Board	IU
3	1	FTSW	Front-End Timing Switch	IU
4	1		VME Crate, 6U, 21 Slot, RPC	IU
5	13	4020035	RPC Front End Board	IU
6	1	4020044	Data Concentrator Board	IU
7	1		VME Crate, 9U, COPPER	IU
8	2		Scintillator Motherboard	UH
9	1		COPPER-II	IU
10	1	HSLB	High-Speed Link Board	IU
11	8		SFP Fiber Module	IU
12	4		Duplex Fiber Optic Cable	IU
13	4		Network Cable, CAT6	IU
14	2		Network Cable, CAT5e	IU
15	1	CBX-STH008APQ-MXXN-UC2N-16.5	MPO Break-out Cable, Trigger	IU
16	1		Desktop Computer, Linux Operating System	IU

2 Integration at KEK

3 Appendix

3.1 Trigger Test Cable