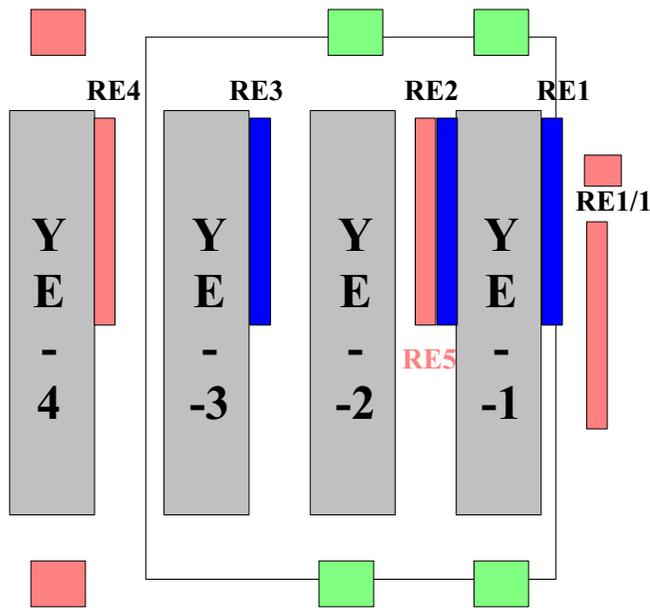
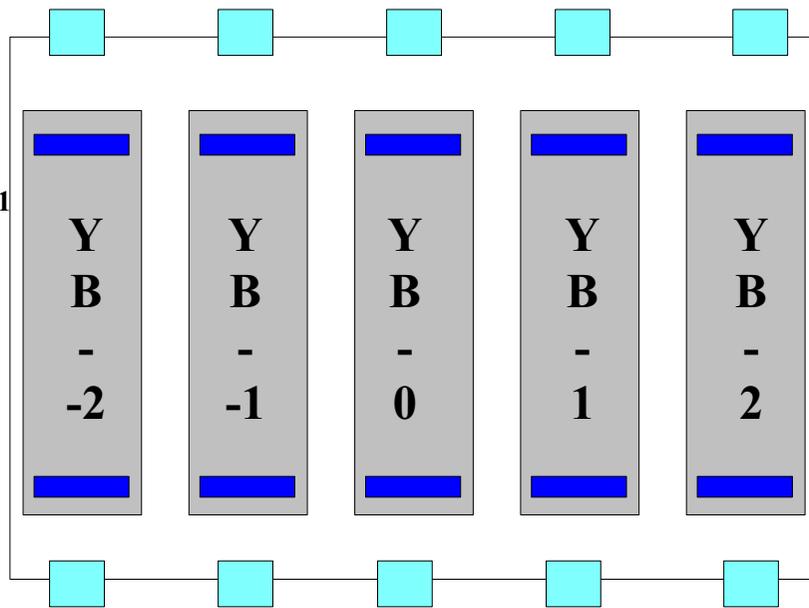


RPC Link Box Control

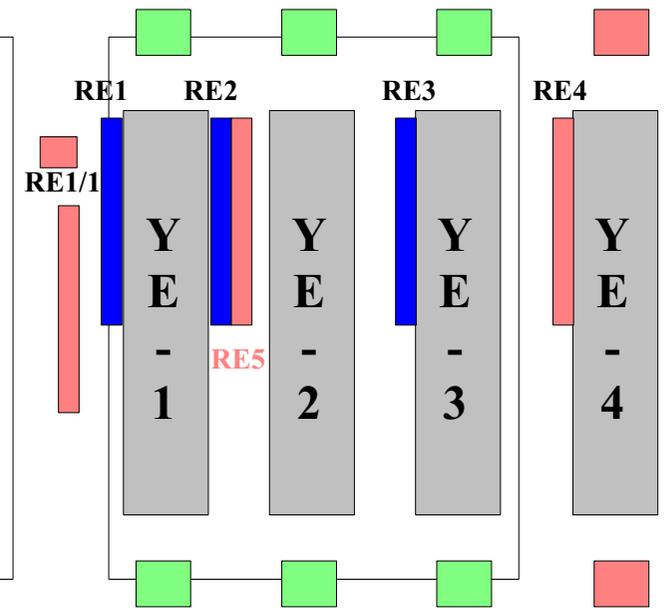
Endcap -



Barrel

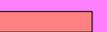


Endcap +

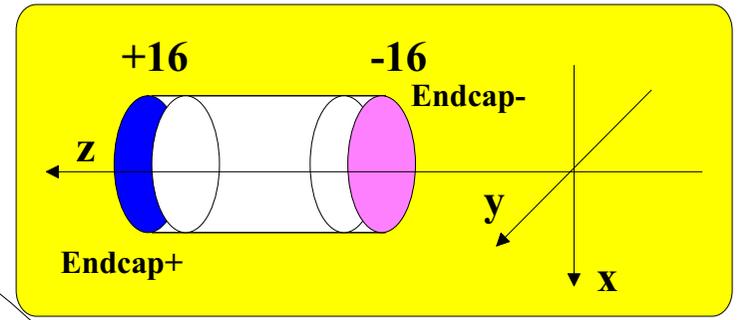
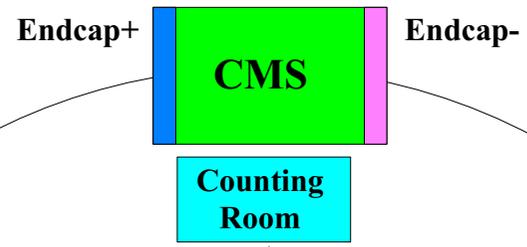
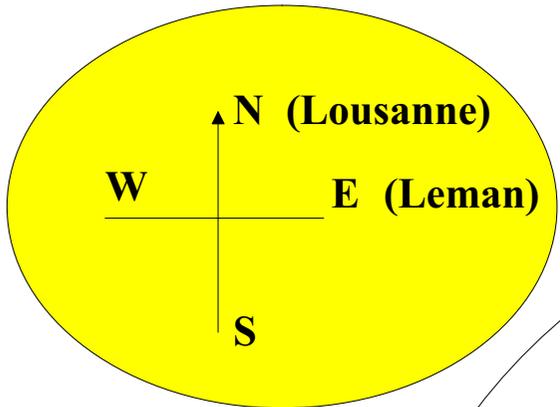


  VME Crates on the towers, patch panels on the bottom of the towers

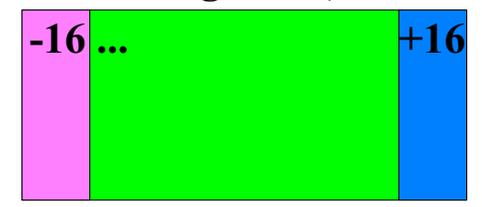
 RPC chambers constructed for phase 1 of CMS

  this parts will be not build in phase 1 of CMS

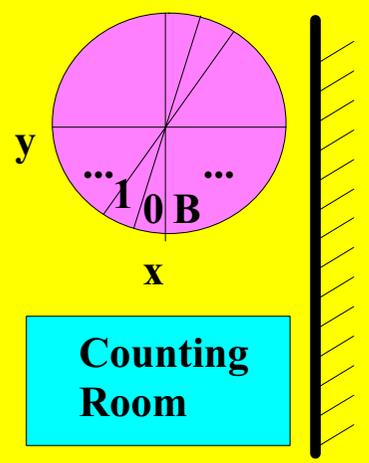
- **RPC Control links are built of elements of the tracker digital control system (DOHs, singlemode fibers, CCS), contains 24 redundant rings (from 6 to 12 CCU in ring) ;**
- **RPC Control links goes from Link Board boxes on UXC55 tower racks to the RPC DCS crate in USC55. Trigger fibers routing is preferable but not crucial.**
- **Control ring (redundant) consists of**
 - **2 DOH (+56 cm fibers),**
 - **MU- sMU adapter,**
 - **MU Fanout,**
 - **MFS adapter on the bottom UXC tower rack,**
 - **ribbon (12 fibers)**
 - **multiribbon cable between the patch panels in the UXC and USC (MPO connectors on USC55 side),**
 - **CCS Boards in USC55 (rack**



trigger towers
(see from Lousanne,
counting room)



wedge view
(see from Leman)



Space Coordinates: *(as described in CSC notes)*

CMS is north of centre of LHC; right handed system with origin in collision point
 x horizontal SOUTH points to centre of LHC, y vertical upwards,
 z horizontal pointing to WEST, parallel to beam, parallel to B-field.
 phi = 0° ... x-axis, phi = 90° ... y axis
 eta = 0 in xy-plane, eta > 0 ... positive z axis

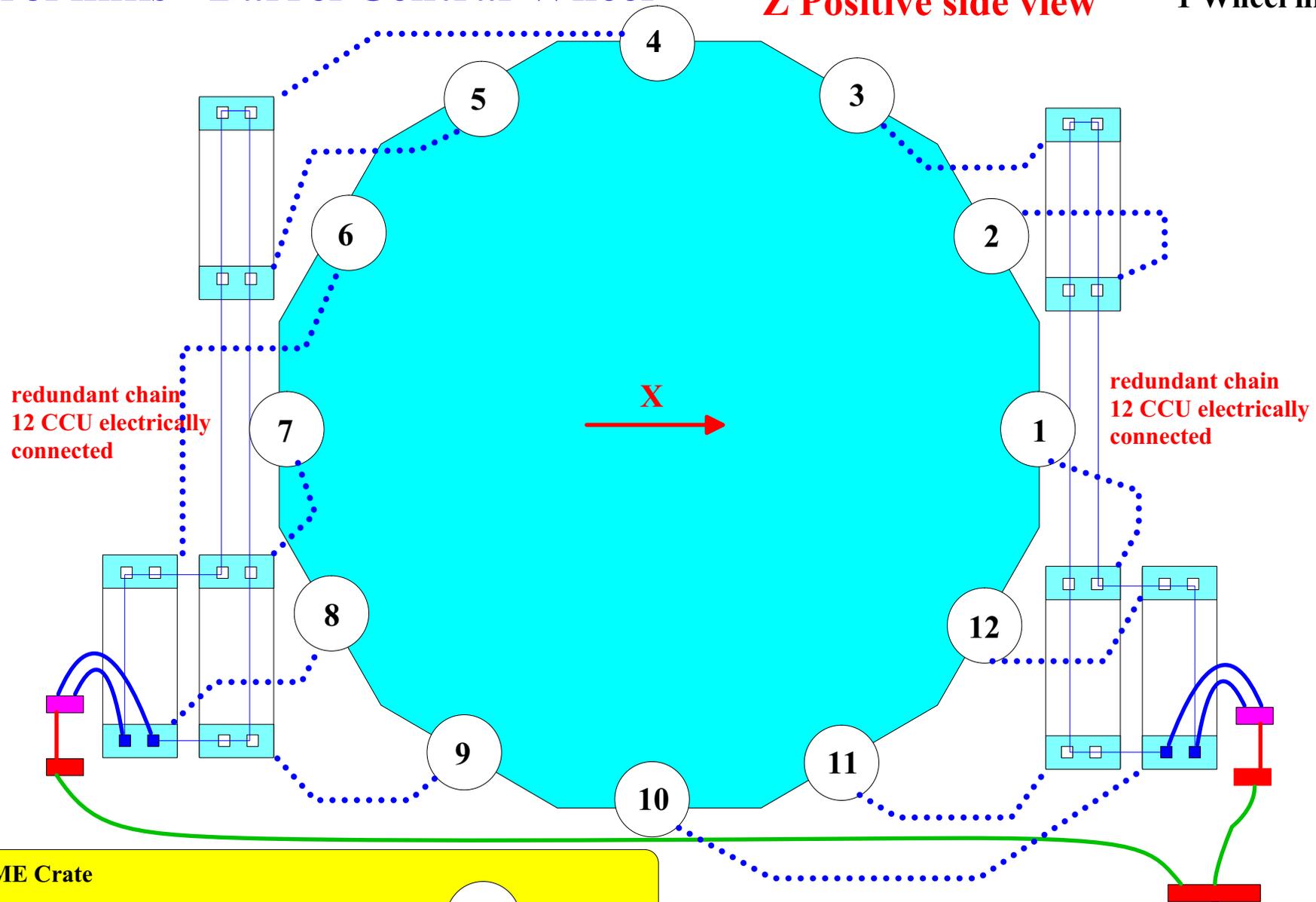
CERN

Control links - Barrel Central Wheel

Z Positive side view

1 Wheel like this

USC55 side



	VME Crate		RB stations
	Control board with CCU and DOH(+56cm fiber)		
	Control board with CCU only		
	MU-sMU adapter		MFS adapter
	MU fanout		4 fiber cable
	ribbon (12 fibers) cable		8 ribbon cable

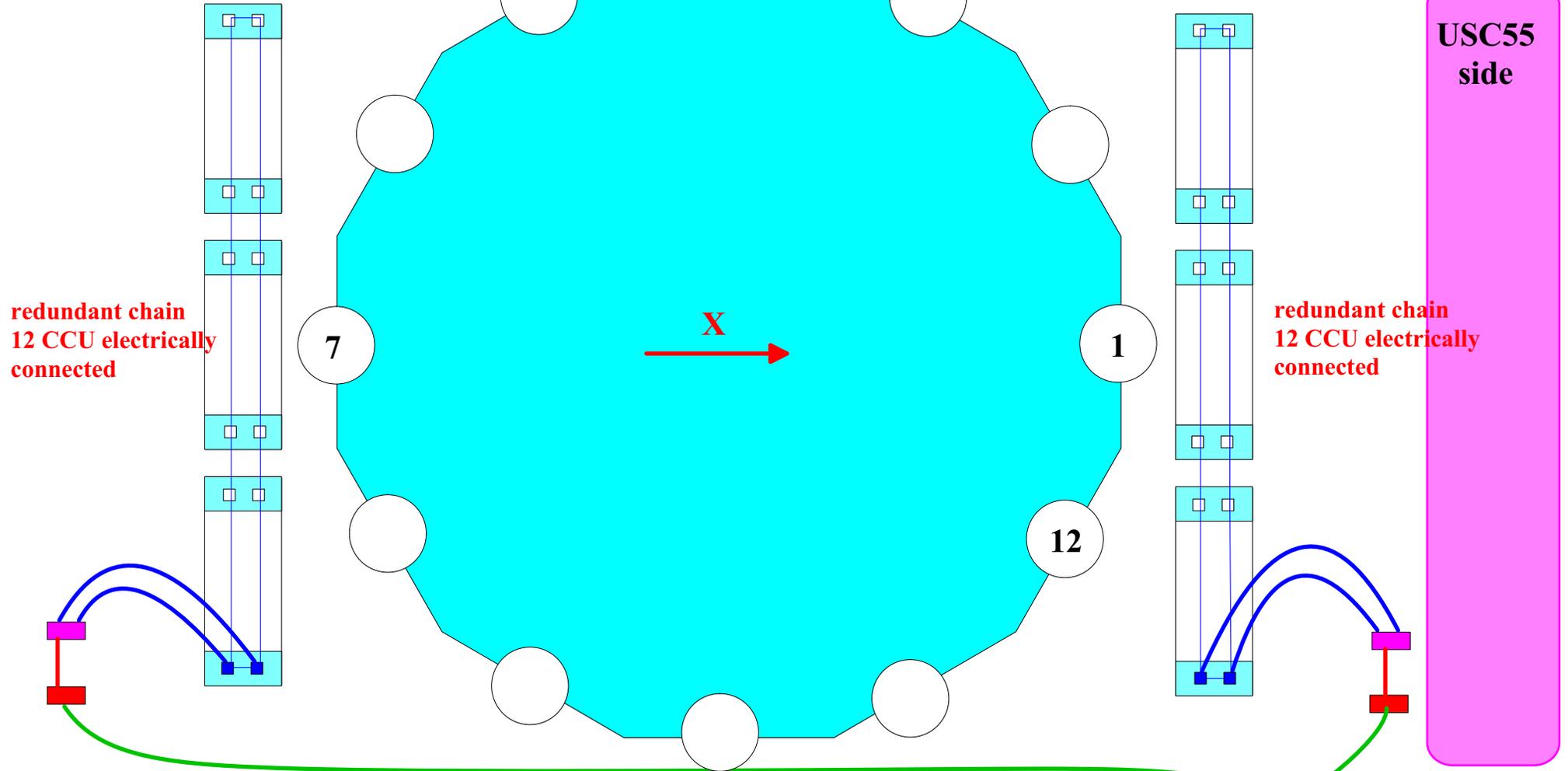
Multiribbon fiber cable

Control links - Barrel not Central Wheels

4 Wheels like this one

Z Positive side view

USC55 side



	VME Crate				
	Control board with CCU and DOH(+56cm fiber)				
	Control board with CCU only				
	MU-sMU adapter		MFS adapter		MU fanout
	4 fiber cable		ribbon (12 fibers) cable		8 ribbon cable

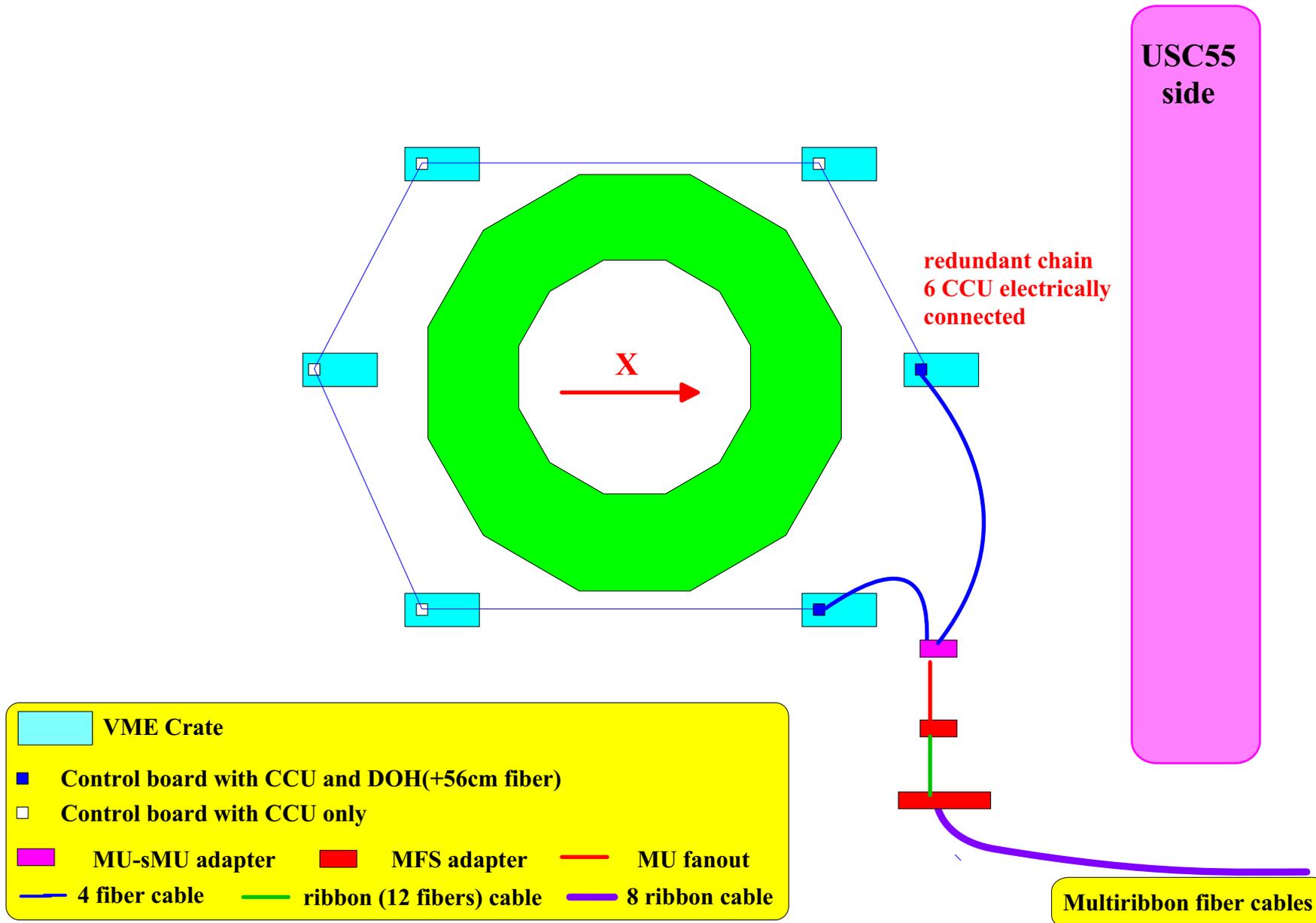
Multiribbon fiber cable

8 ribbons (4 spares)

Control links - Endcap RE1/1 "nose" (RE-1/1)

2 Locations like this one

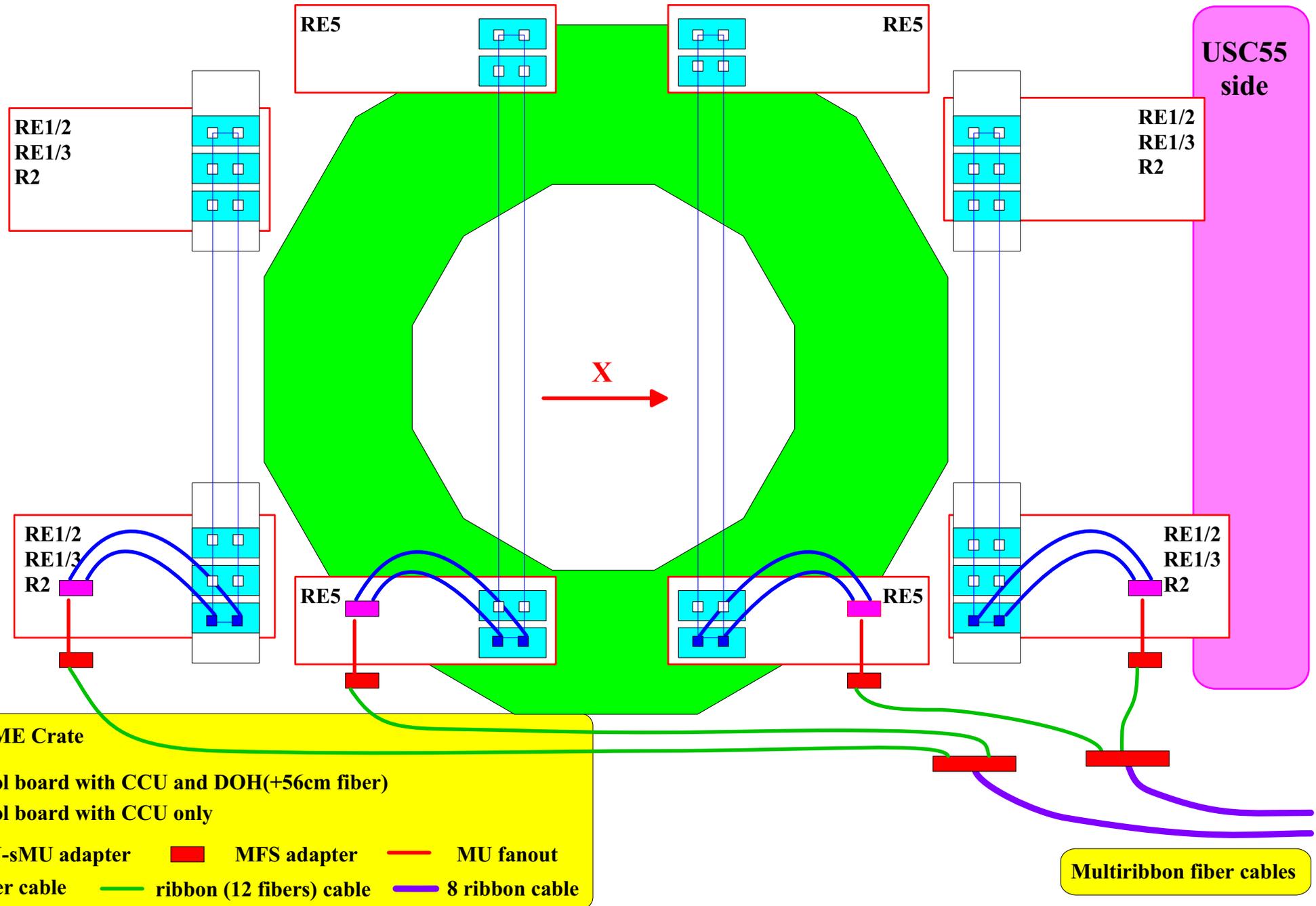
Z Positive side view



Control links - Endcap YE-1 (YE--1)

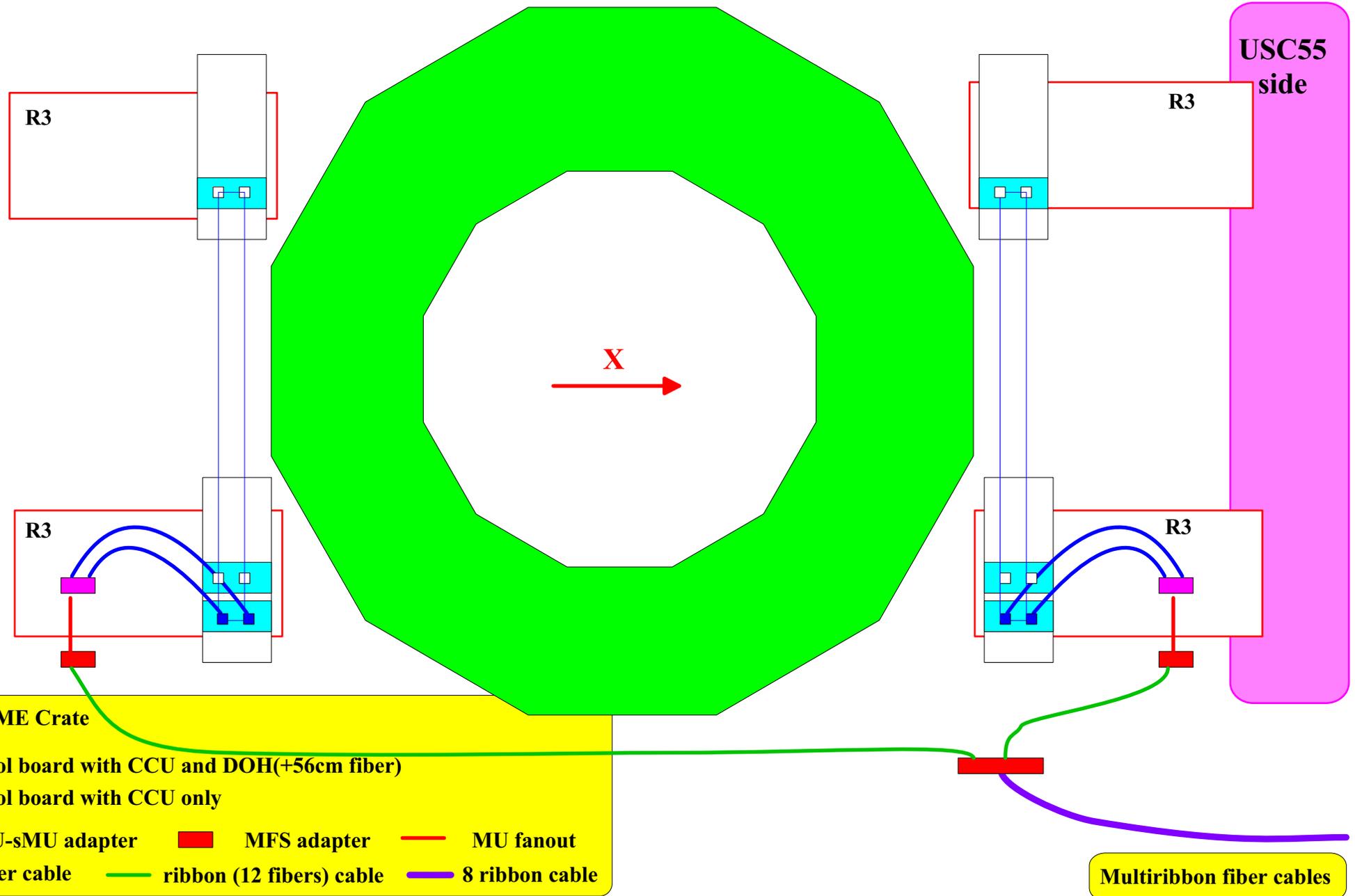
Z Positive side view

2 Disks like this one



Control links - Endcap YE-3 (YE--3)

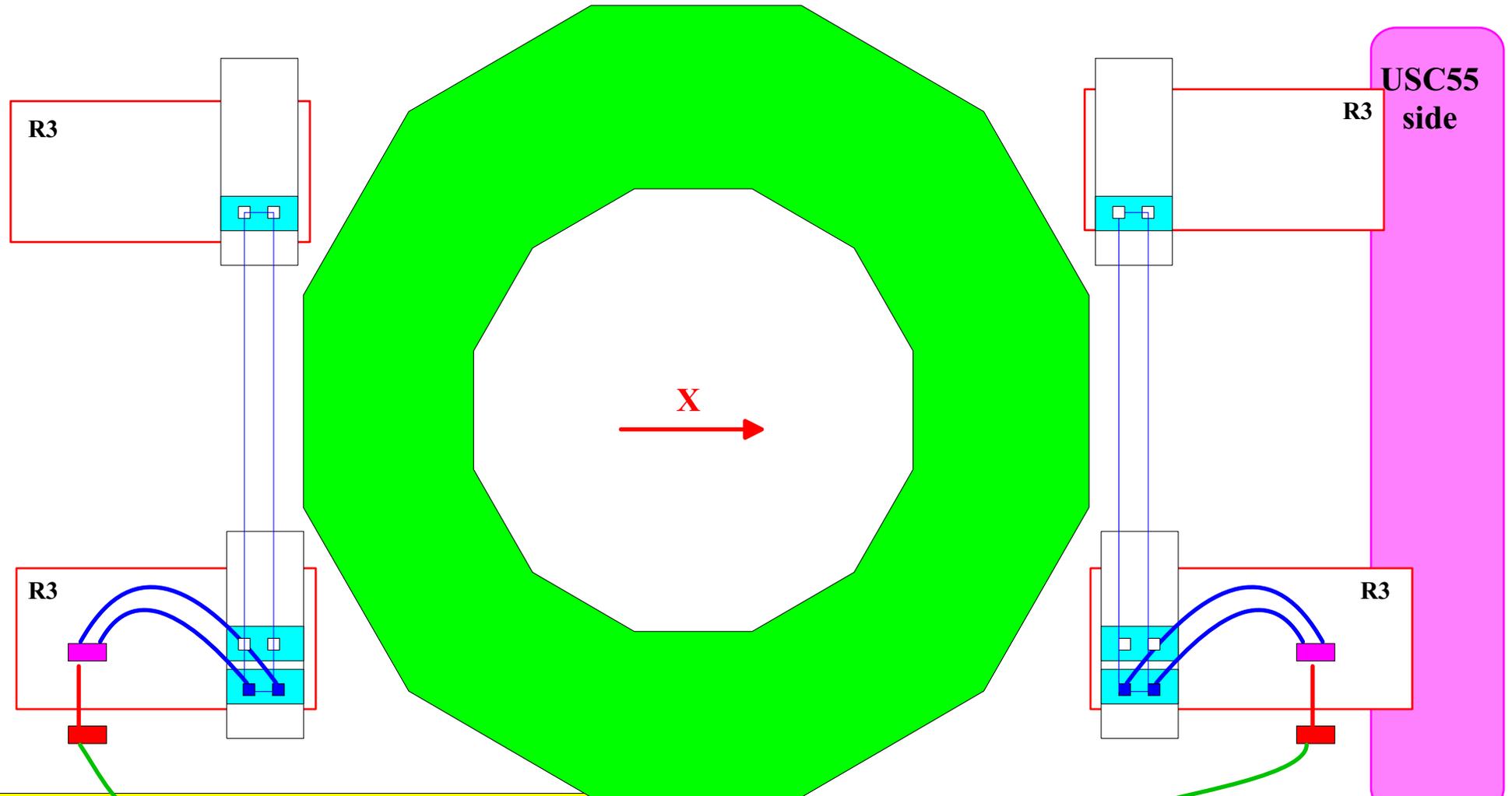
2 Disks like this one



USC55 side

Control links - Endcap YE-4 (YE--4)

2 Disks like this one



VME Crate

- Control board with CCU and DOH(+56cm fiber)
- Control board with CCU only
- MU-sMU adapter
- MFS adapter
- MU fanout
- 4 fiber cable
- ribbon (12 fibers) cable
- 8 ribbon cable

Multiribbon fiber cables

RPC Control link multiribbon fiber cables (~100m)

Barrel wheel	1
Barrel all wheels	5
Endcap YE1 (-1)	2
Endcap RE1/1 (-1)	1
Endcap YE3 (-3)	1
Endcap YE4 (-4)	1
Endcap all	10
All RPC	15

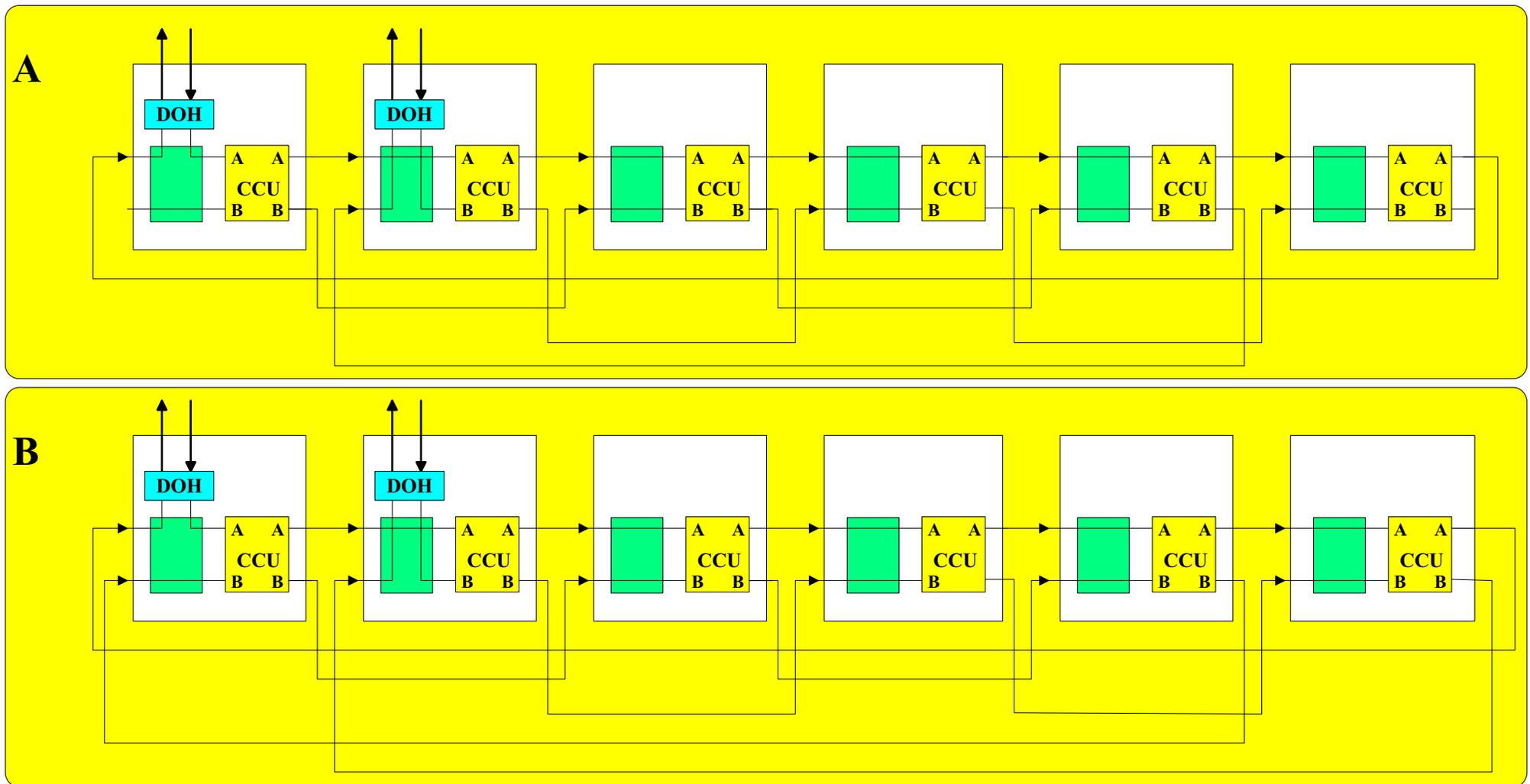
Spare ribbons in multiribbon cables, no spare multiribbon cables

RPC Control link all elements

RPC Control system contains 24 redundant rings

CCU	276
DOH	48
MU-sMU adapter (12 channel)	24
sMU Fanout	24
MFS adapters (4 channel)	24
ribbon cable with MFS connector (~20m)	24
96 fiber cable (8 x 12 fiber ribbons)*	15
CCS (8 FECs each)	3

***Long multiribbon fiber is placed between patch pannel on the bottom of the detector tower and CCS modules in USC55 (rack S1D05) (no patch panel needed on the USC side)**

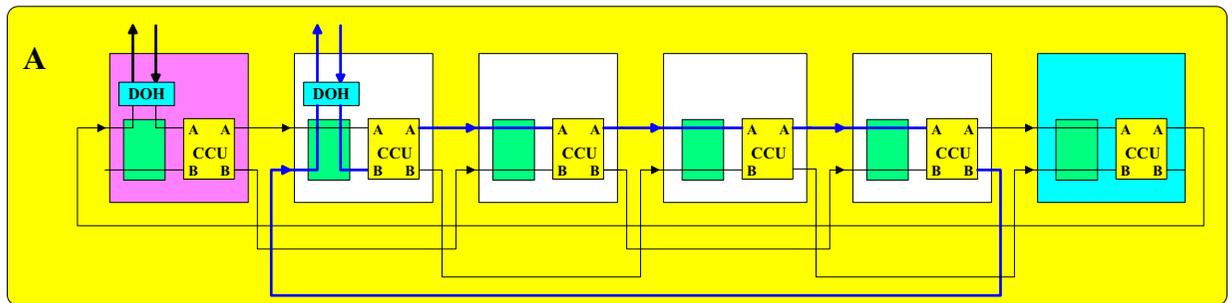


Only configuration A is presented in CCU docs and presentations

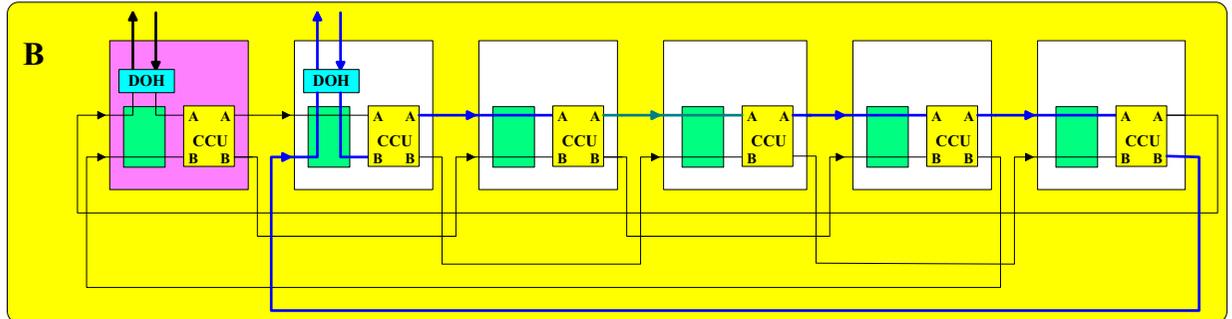
Question: is configuration B possible?

Advantage of configuration B is that in case when board 1 is faulty only node 1 is not available. When configuration A is used both node 1 and 6 are not available. See next page case 1 and 2.

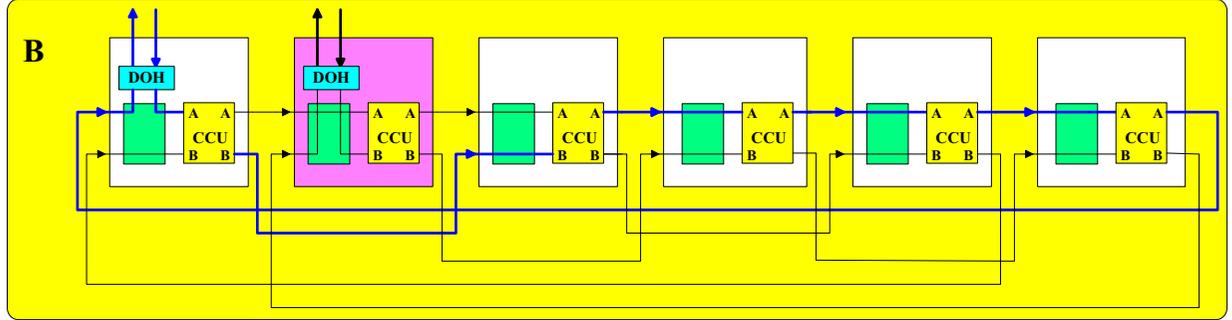
1



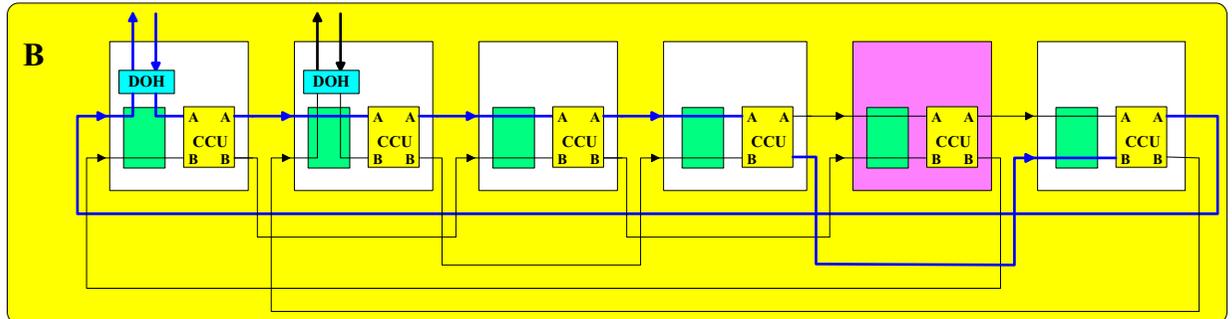
2



3



4



 **Faulty node**

 **not available node**