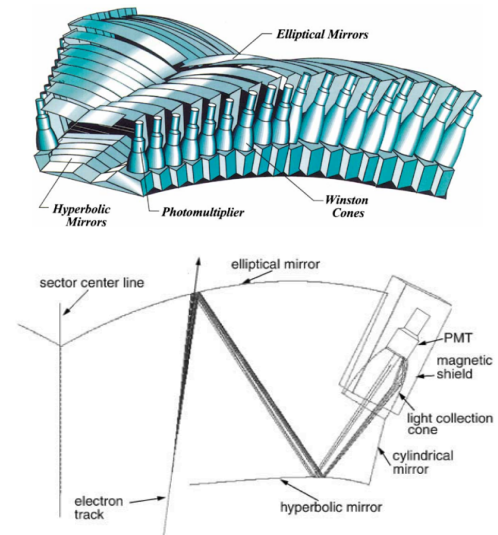


CLAS12 – Low Threshold Cerenkov Counter (LTCC)

The **LTCC** system is part of the forward CLAS12 detector and will be used for pion/kaon discrimination. The LTCC consists of 6 sectors of lightweight mirrors, light collecting cones, 5" PMTs, and magnetic shields. The sectors are filled with C_4F_{10} gas, providing pion/kaon discrimination from 3.5 to 9 GeV/c. Each sector contains:

- 108 lightweight mirrors
- 36 Winston Cones
- 36 5" PMT
- 36 Magnetic Shields

The LTCC is required to have excellent efficiency over the forward angular acceptance available to CLAS12.



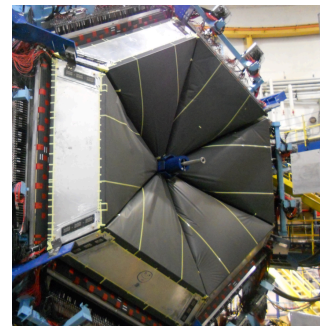
LTCC - TECHNICAL PARAMETERS

PARAMETER	DESIGN VALUE
Mirrors	
Support Structure	3 Kevlar layers sandwiched with vinyl foam
Elliptical	Length = 6" to 55", Width = 8" to 11"
Hyperbolic	Length = 12" to 30", Width = 8" to 9.25"
Mirror Coating	Al/MgF ₂
Reflectivity	90% from 250 to 650 nm
C₄F₁₀ Gas	
Refraction Index	1.00134
Transparency	100% above 220nm
Density	9.94 kg/m ³
Window Material	Tedlar/Mylar/Tedlar composite
PMTs	
200	Photonis XP 4500B
16	Photonis XP 4508 (Quartz Window)
Magnetic Shields	
Material	Eagle AAA: 80% Ni, 4.20% Mo, and 15% Fe
Field Attenuation Factor	85 Axial, 390 Transverse
PID:	
π/K Separation	3.5 to 9 GeV/c

- **Construction Strategy and Project Leadership:**
 - LTCC system Group Leader: Maurizio Ungaro. Tech Leader: David Anderson
 - Construction strategy, all at JLab:
 - Strip all sectors of PMTs, Mirrors, WC, and shielding
 - Remodel the LTCC Box according to CLAS12 design
 - Refurbish mirrors, PMTs, Box, WC and spine
 - Align mirrors for maximum charged pion efficiency

- **Significant Dates:**

- May 2013: All sectors stripped
- Feb 2014: Cylindrical mirrors coated
- Nov 2014: All PMTs, mirrors refurbished
- Aug 2015: First box completed
- Jan 2016: Last box completed
- May 2016: All sectors installed



- **Project Status:**

- Hardware:
 - Mirrors refurbished with new coating
 - PMTs coated with wavelength shifter
 - New spine, new window, new patch panel
 - New in-base divider
- Software:
 - Pre-gain matching completed
 - Ongoing calibration and reconstruction



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