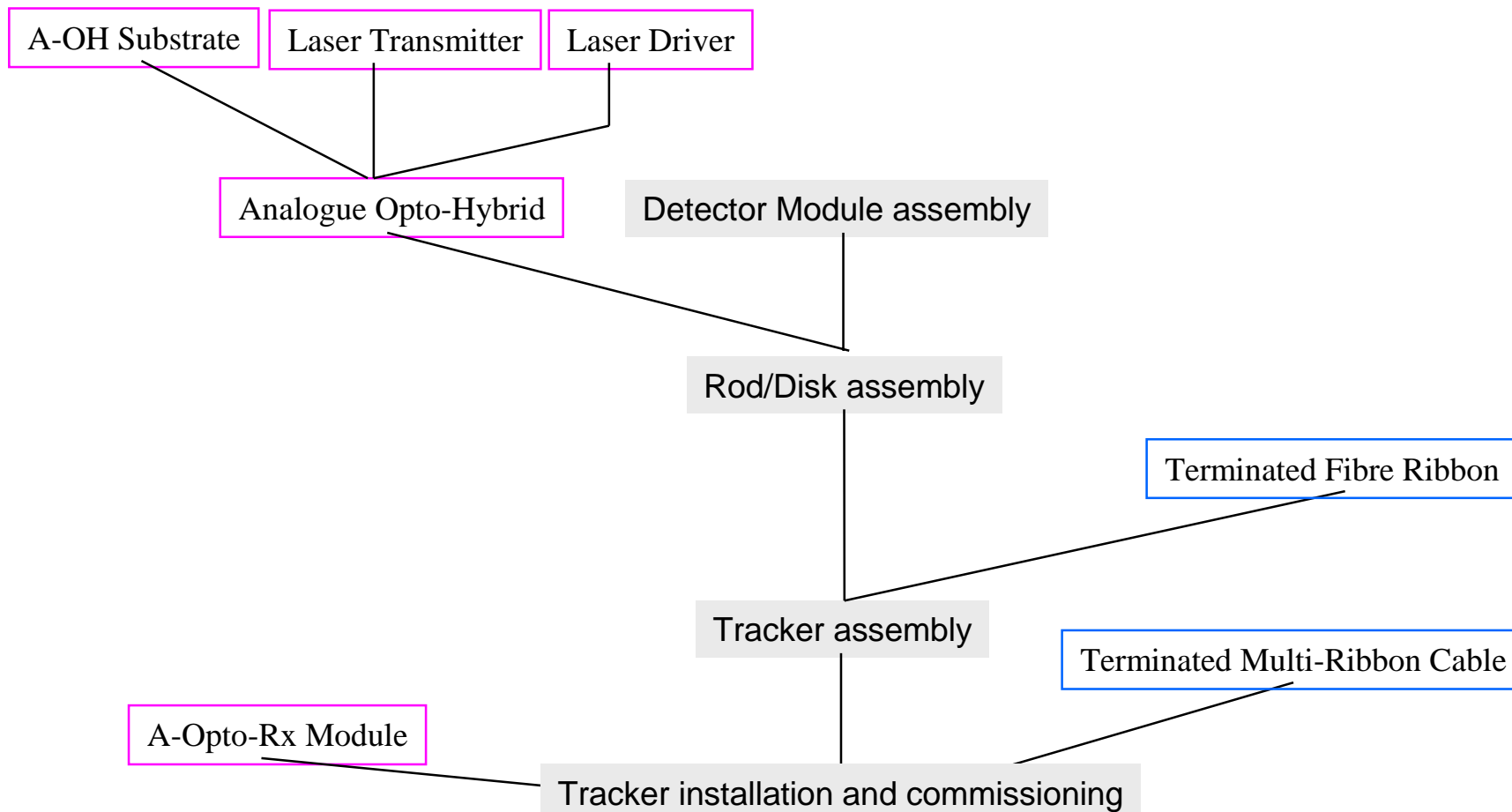


Quality Assurance

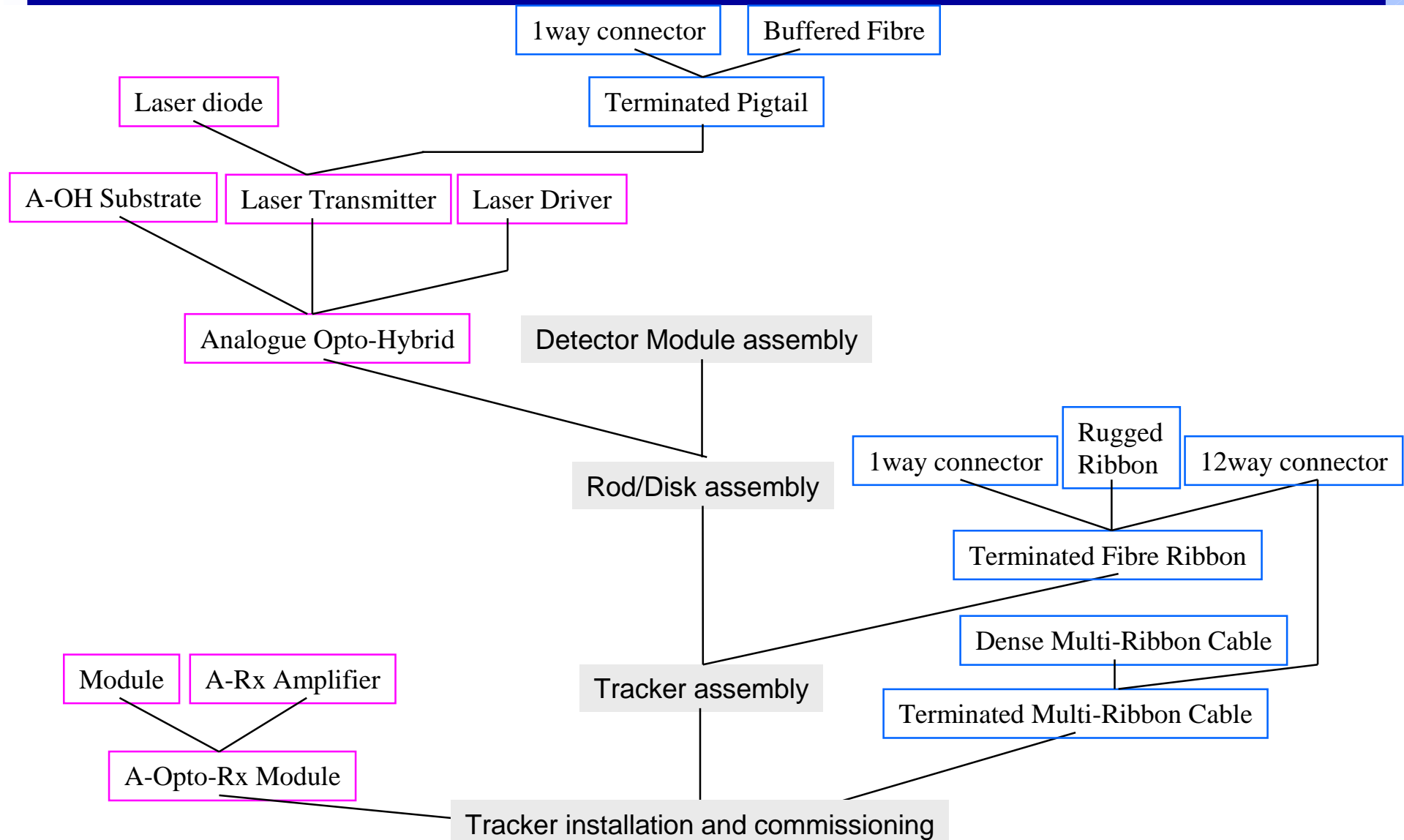
- Project Breakdown
- Specifications
- QA Procedures
- Laser Safety



Assembly Flow (1)



Assembly Flow (2)



Specifications

Analogue Readout	
Part 1	Analogue Readout System
Part 2	Analogue Opto-Hybrid
	2.1 Laser Driver
	2.2 Laser Transmitter
	2.2.1 Terminated Pigtail
	2.2.1.1 Buffered Fibre
	2.3 Analogue Optohybrid Substrate
	2.3.1 <i>Tracker Inner Barrel</i>
	2.3.2 <i>Tracker Inner Disks</i>
	2.3.3 <i>Tracker Outer Barrel</i>
	2.3.4 <i>Tracker End Cap</i>
	2.3.5 <i>Pixel Barrel</i>
	2.3.6 <i>Pixel End Cap</i>
Part 3	Terminated Fibre Ribbon
	3.1 Ruggedized Ribbon
Part 4	Terminated Multi-Ribbon Cable
	4.1 Dense Multi-Ribbon Cable
Part 5	Analogue Opto-Receiver Module
	5.1 Receiving Amplifier
Part 6	Distributed Patch Panel
Part 7	In-line Patch Panel
Part 8	Back-end Patch Panel

EDMS Project Breakdown

The screenshot shows a Netscape browser window titled "CMS Tracker Optical Links - Project Breakdown Structure - Netscape". The address bar displays "to.web.cern.ch/cms-tk-opto/pbs.html". The main content area shows a hierarchical list of project components:

- 1 Analogue Readout Optical Links
 - 1.1 Analogue Optohybrid
 - 1.1.1 Laser Driver
 - 1.1.2 Laser Transmitter
 - 1.1.2.1 *Terminated Pigtail*
 - 1.1.3 Analogue Optohybrid Substrate
 - 1.1.3.1 *Tracker Inner Barrel*
 - 1.1.3.2 *Tracker Inner Disks*
 - 1.1.3.3 *Tracker Outer Barrel*
 - 1.1.3.4 *Tracker End Cap*
 - 1.1.3.5 *Pixel Barrel*
 - 1.1.3.6 *Pixel End Cap*
 - 1.2 Readout Fibres
 - 1.2.1 Readout Ribbon
 - 1.2.2 Readout Cables
 - 1.3 Readout Patch Panels
 - 1.3.1 Distributed Readout Patch Panel
 - 1.3.2 In-line Readout Patch Panel
 - 1.3.3 Back-end Readout Patch Panel
 - 1.4 Analogue Opto-receiver Module
 - 1.4.1 Receiving Amplifier
- 2 Digital Control Optical Links

EDMS Project Breakdown

The screenshot shows a Netscape browser window with the title bar 'CMS Tracker Optical Links - Project Breakdown Structure - Netscape'. The address bar shows the URL 'to.web.cern.ch/cms-tk-opto/pbs.html'. The main content area displays a hierarchical tree structure of project components, organized into four main sections: 1 Analogue Readout Optical Links, 2 Digital Control Optical Links, 3 Optical Fibre Cables, and 4 Optical Patch Panels. Each section contains a list of sub-components with their respective IDs and names.

1 Analogue Readout Optical Links

- 1.1 Analogue Optohybrid
 - 1.1.1 Laser Driver
 - 1.1.2 Laser Transmitter
 - 1.1.2.1 Terminated Pigtail
 - 1.1.3 Analogue Optohybrid Substrate
 - 1.1.3.1 Tracker Inner Barrel
 - 1.1.3.2 Tracker Inner Disc
 - 1.1.3.3 Tracker Outer Barrel
 - 1.1.3.4 Tracker End Cap
 - 1.1.3.5 Pixel Barrel
 - 1.1.3.6 Pixel End Cap
- 1.2 Readout Fibres
 - 1.2.1 Readout Ribbon
 - 1.2.2 Readout Cables
- 1.3 Readout Patch Panels
 - 1.3.1 Distributed Readout Patch Panel
 - 1.3.2 In-line Readout Patch Panel
 - 1.3.3 Back-end Readout Patch Panel
- 1.4 Analogue Opto-receiver Module
 - 1.4.1 Receiving Amplifier

2 Digital Control Optical Links

3 Optical Fibre Cables

- 3.1 Terminated Pigtail
 - 3.1.1 Buffered Fibre
- 3.2 Terminated Ribbon
 - 3.2.1 Ruggedized Ribbon
 - 3.2.2 Readout Ribbon
 - 3.2.3 Control Ribbon
- 3.3 Terminated Multi-ribbon Cable
 - 3.3.1 Dense Multi-ribbon Cable
 - 3.3.2 Readout Cable
 - 3.3.3 Control Cable

4 Optical Patch Panels

- 4.1 Distributed Patch Panel
 - 4.1.1 Distributed Readout Patch Panel
 - 4.1.2 Distributed Control Patch Panel
- 4.2 In-line Patch Panel
 - 4.2.1 In-line Readout Patch Panel
 - 4.2.2 In-line Control Patch Panel
- 4.3 Back-end Patch Panel
 - 4.3.1 Back-end Readout Patch Panel
 - 4.3.2 Back-end Control Patch Panel

Quantities

Total Quantity		Including Contingency			
Component	Quantity	spares	Assembly yield	Dark fibre	Excess length
Buffered Fibre	50 km	10%	90% (connector assembly)	N/A	10%
Terminated Pigtail	50000	10%	100%	N/A	N/A
Laser Transmitter	50000	10%	90% (opto-hybrid assembly)	N/A	N/A
Pin Diode Receiver	500	10%	90% (opto-hybrid assembly)	N/A	N/A
Laser Driver	19000	10%	90% (opto-hybrid assembly)	N/A	N/A
D Rx Amplifier	250	10%	90% (opto-hybrid assembly)	N/A	N/A
Ruggedized Ribbon	30km	10%	90% (connector assembly)	10%	30%
Terminated Fibre Ribbon	4400	10%	100%	10%	N/A
Dense Multi-Ribbon Cable	45km	10%	90% (connector assembly)	15%	10%
Terminated Multi-Ribbon Cable	570	10%	100%	15%	N/A
A-Opto-Rx Module	4500	10%	95% (FED assembly)	20%	N/A
A-Rx Amplifier	5000	10%	95% (Module assembly)	20%	N/A