

Signal Feedthrough Progress Report

ATLAS LAr Week
8 Dec 1997

- New FEA Results on Pin Carriers
- Vacuum Cable Development in Canada
- Leak Test Station and Assembly Station in Victoria
- Integration Issues



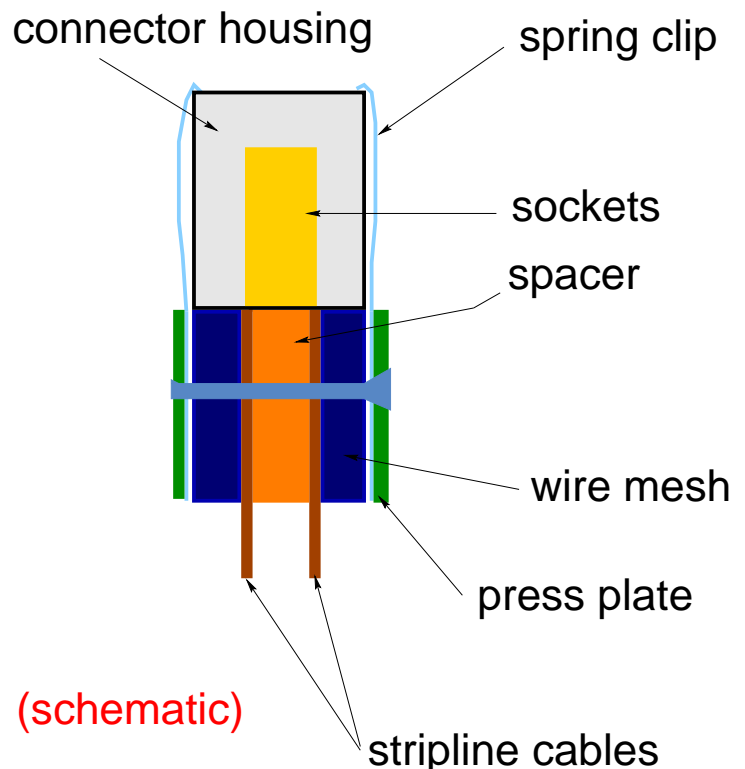
Terry Hodges
TRIUMF and University of Victoria
British Columbia, Canada

Vacuum Cable Development in Canada

Signal Cables

- **All-Flex design**: rigid part of the connector is no longer an integral part of the microstrip cable
- Aim at **simpler** and **cheaper** design
- Design work:
 - E. Neuheimer (CRPP Carleton)
 - G. Hoeppel (Strataflex, Toronto)
- We visited Strataflex 24 Nov 97
- Order of prototype signal strip lines placed in **Dec 97**
- Two connector designs will be tried:
 - **wire mesh** (BNL/CRPP design)
 - **plated plastic** (Strataflex proposition)
- Expect first complete cable prototypes **late January 98**

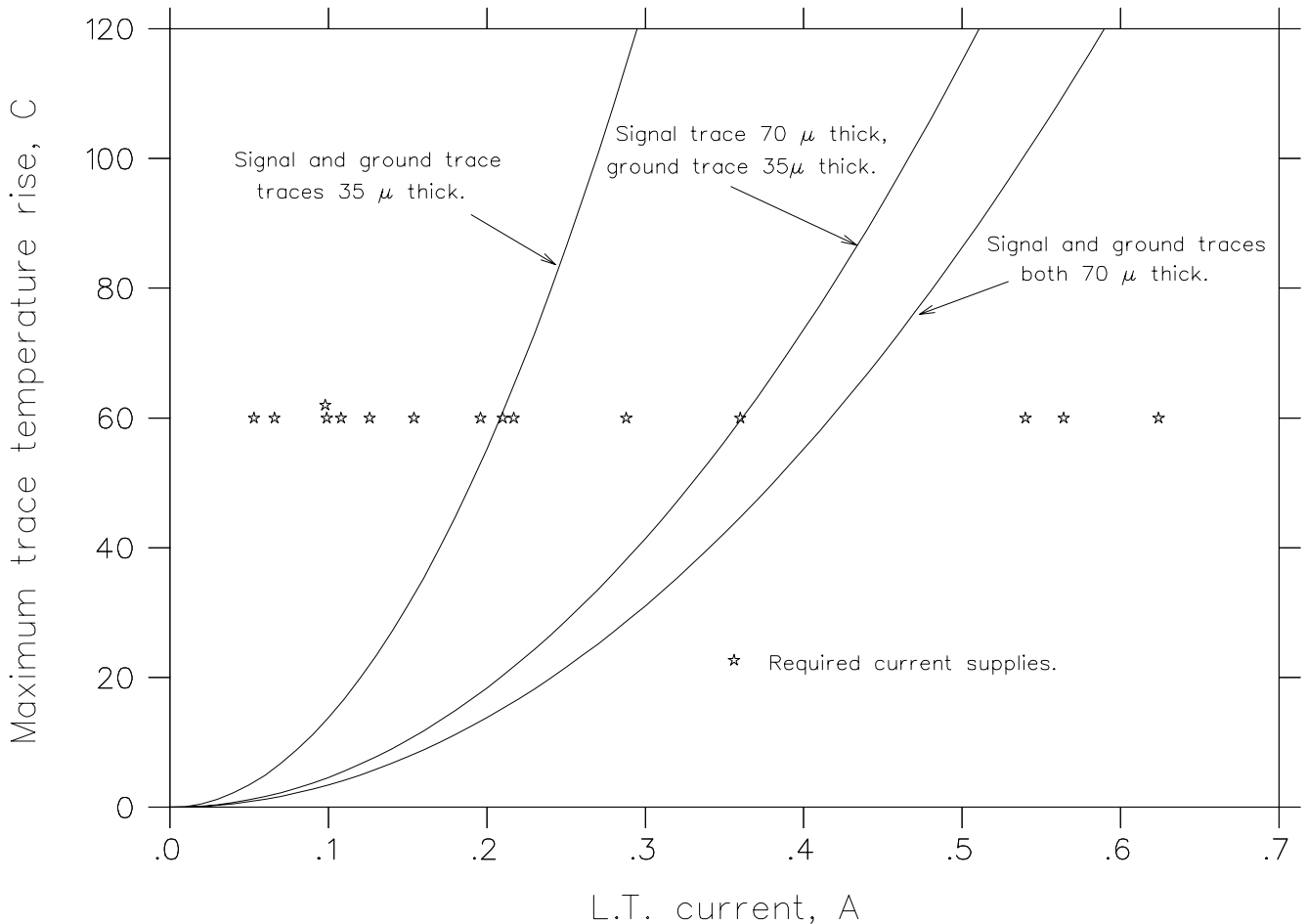
ALL-FLEX cable connector design



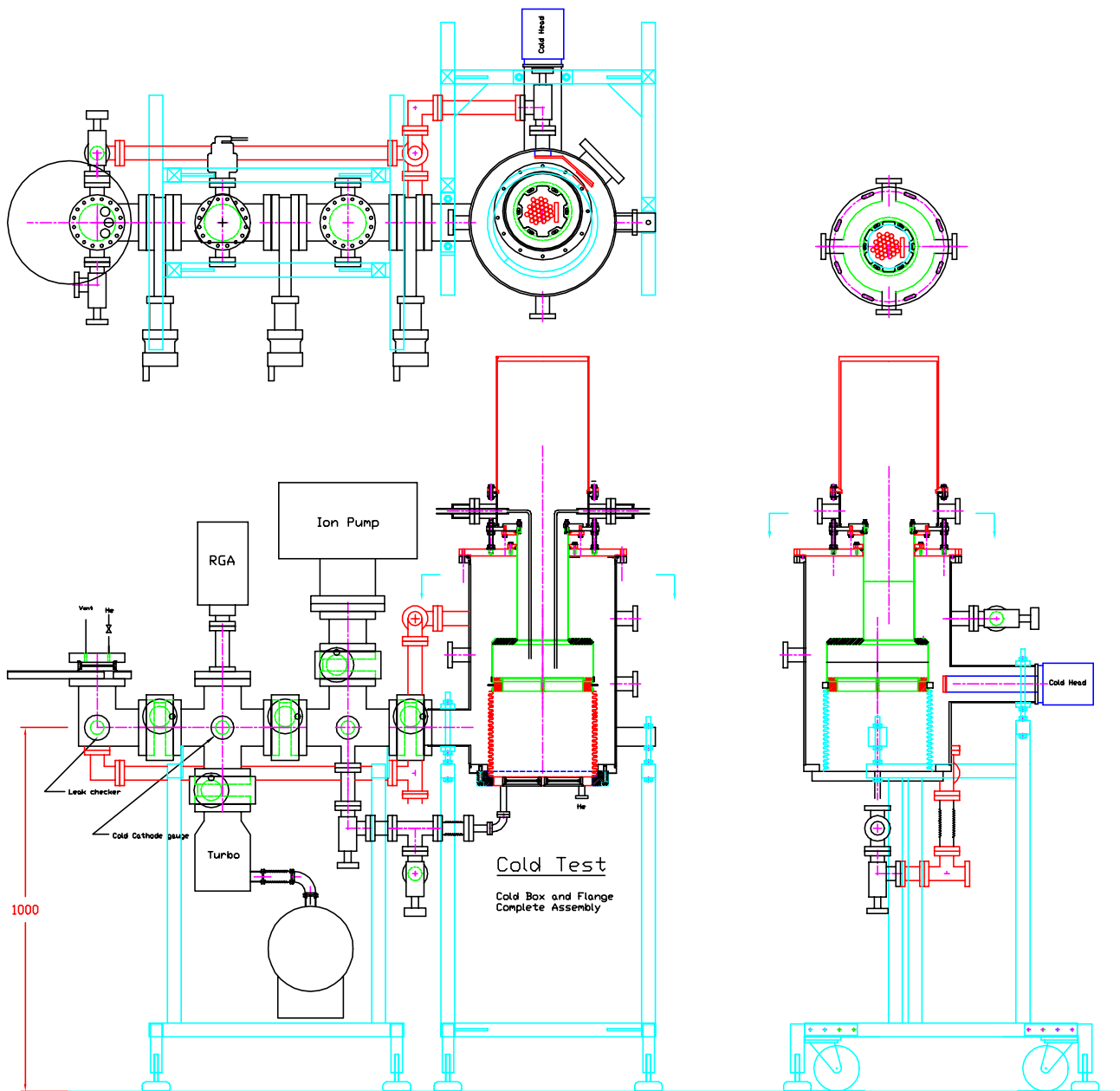
Vacuum Cable Development in Canada

HEC Low Voltage Cables

- HEC requires **special vacuum cables** for the low voltage
- Our current understanding:
 - one HEC feedthrough unit per quadrant
 - 8 modules per quadrant
 - 5 motherboards per module
 - 6 lines (3 LV and their returns) per mother boards
 - Total of 240 lines per quadrant
 - 6 X 64 = 384 pins are reserved per feedthrough unit
- Our baseline design uses 70 μ m ground and signal traces
- A 60 degrees rise corresponds to about 410mA
- **We need to know before end January 98 if this is what is needed**

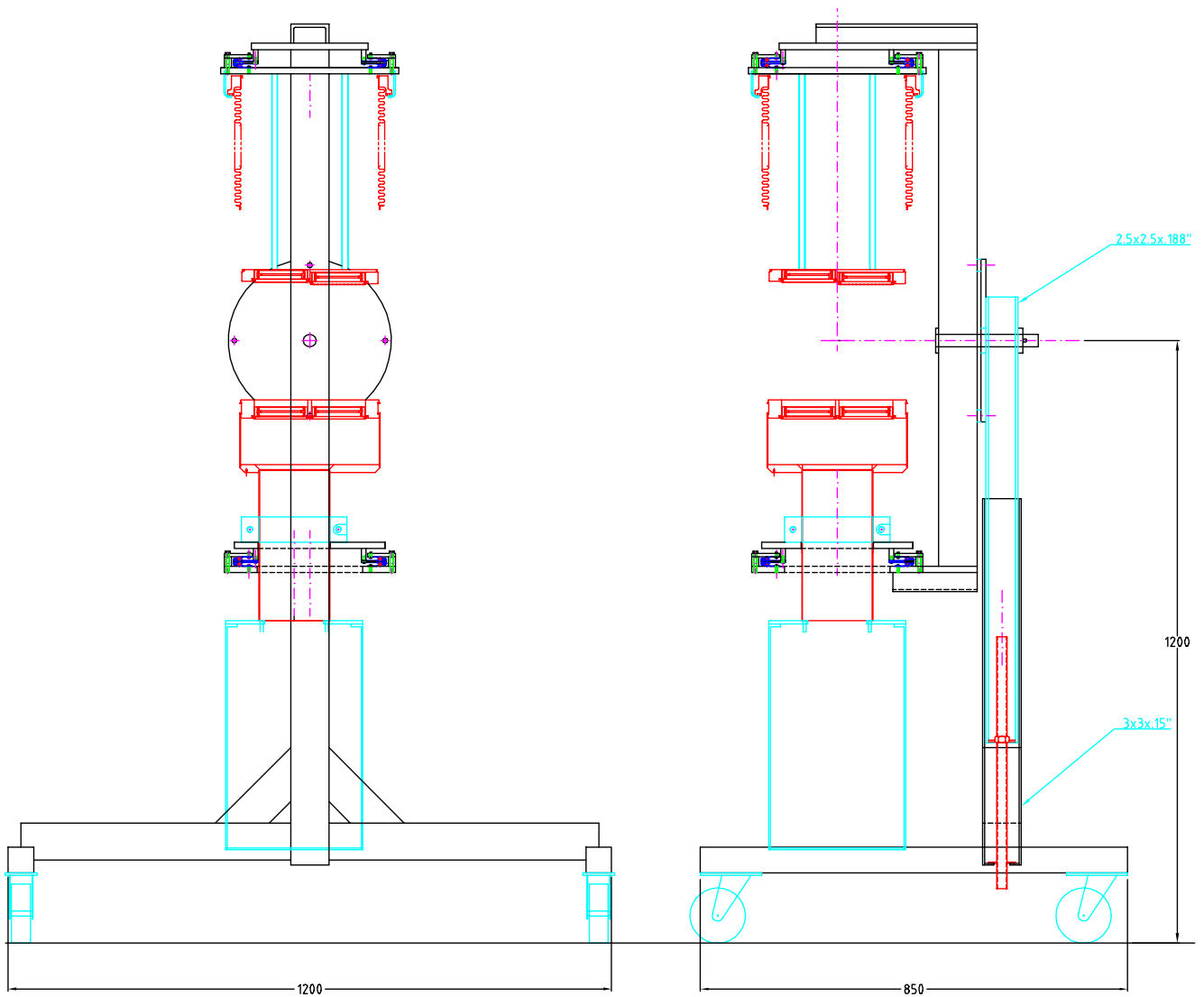


Leak Test Setup in Victoria



- Leak detection using He leak detector supported by an RGA
- Leak detector services warm and cold test stations
- Cooling by cryo-cooler or LN₂
- Parts ordered and received: He leak detector operational
- **Assembly started**

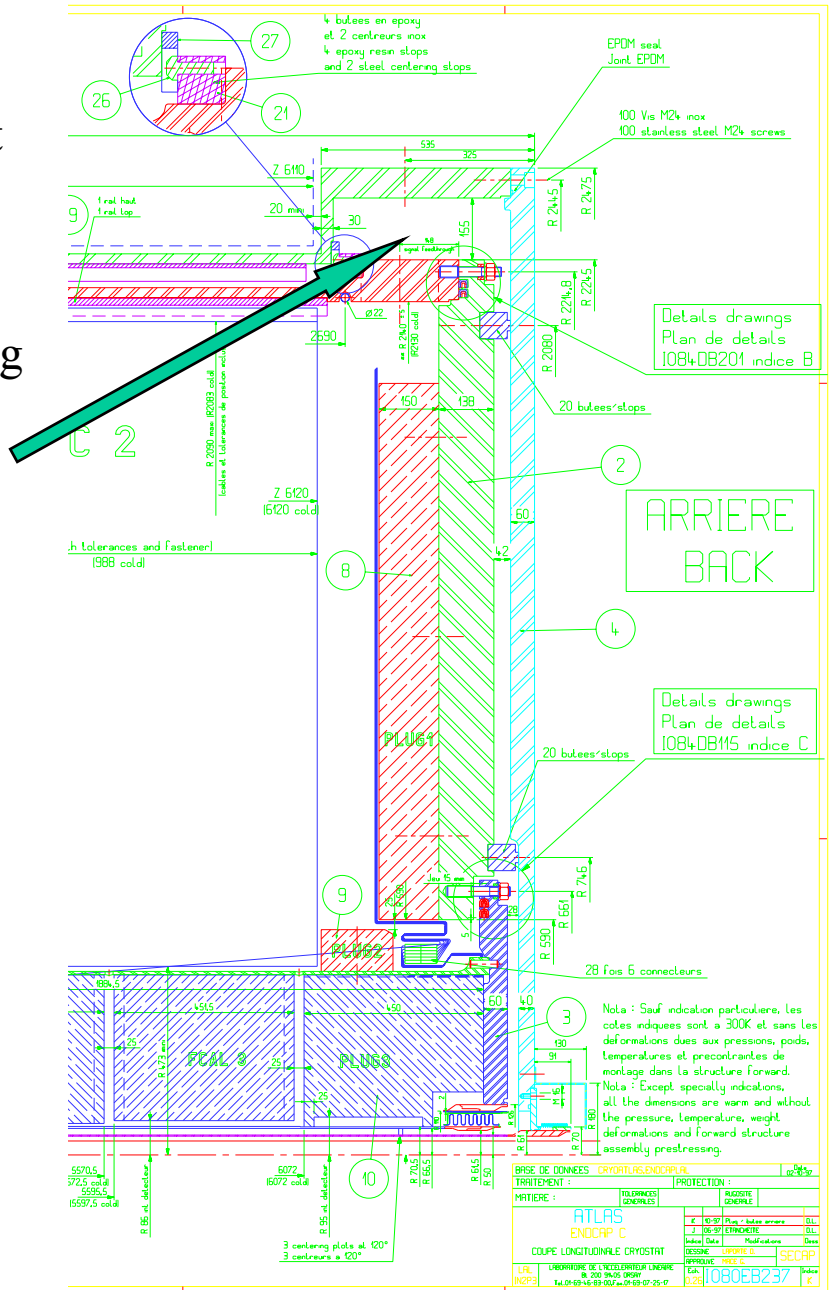
Assembly Jig in Victoria



- Rotation about horizontal and vertical axis possible
- Various assembly scenarios under study
- **Parts ordered**

Endcap Integration Issues

- Feedthrough assembly skirt
- Details of the bi-metallic junction used
 - dimensions need to be known to finalize tooling
- Detail drawing of the feedthrough region of the endcap cryostat



Endcap Signal Feedthrough Project

Canadian Responsibilities

- Design
- Fabrication
- Commissioning
- Transport
- Assistance during installation:
 - Assistance during welding on the cryostat
 - Assistance for leak testing during installation
 - DC Electrical tests during the installation
- Grey areas which require more discussion:
 - Heater power distribution
 - Flange temperature monitoring
 - Connection to vacuum manifolds

Endcap Signal Feedthrough Team

Paul Birney	Senior Technician, TRIUMF Leak test station Assembly tooling
Margret Fincke	Research Associate, Victoria Electric test station Vacuum cable development
Terry Hodges	Chief Engineer, TRIUMF Feedthrough unit design Finite element analysis
Richard Keeler	Faculty, Victoria Test stations Vacuum cable development
Roy Langstaff	Senior Draftsman, TRIUMF Feedthrough unit design Procurement issues
Michel Lefebvre	Faculty, Victoria Project leader
Mark Lenckowski	Draftsman, TRIUMF
Ernie Neuheimer	Research Scientist, CRPP Carleton Vacuum cable development
Paul Poffenberger	Research Associate, Victoria Leak test station Vacuum system
Randy Sobie	Faculty, Victoria DAQ

One technician to be hired in 1998 to work on the test stations, and the prototype assemblies.

Endcap Signal Feedthrough Project

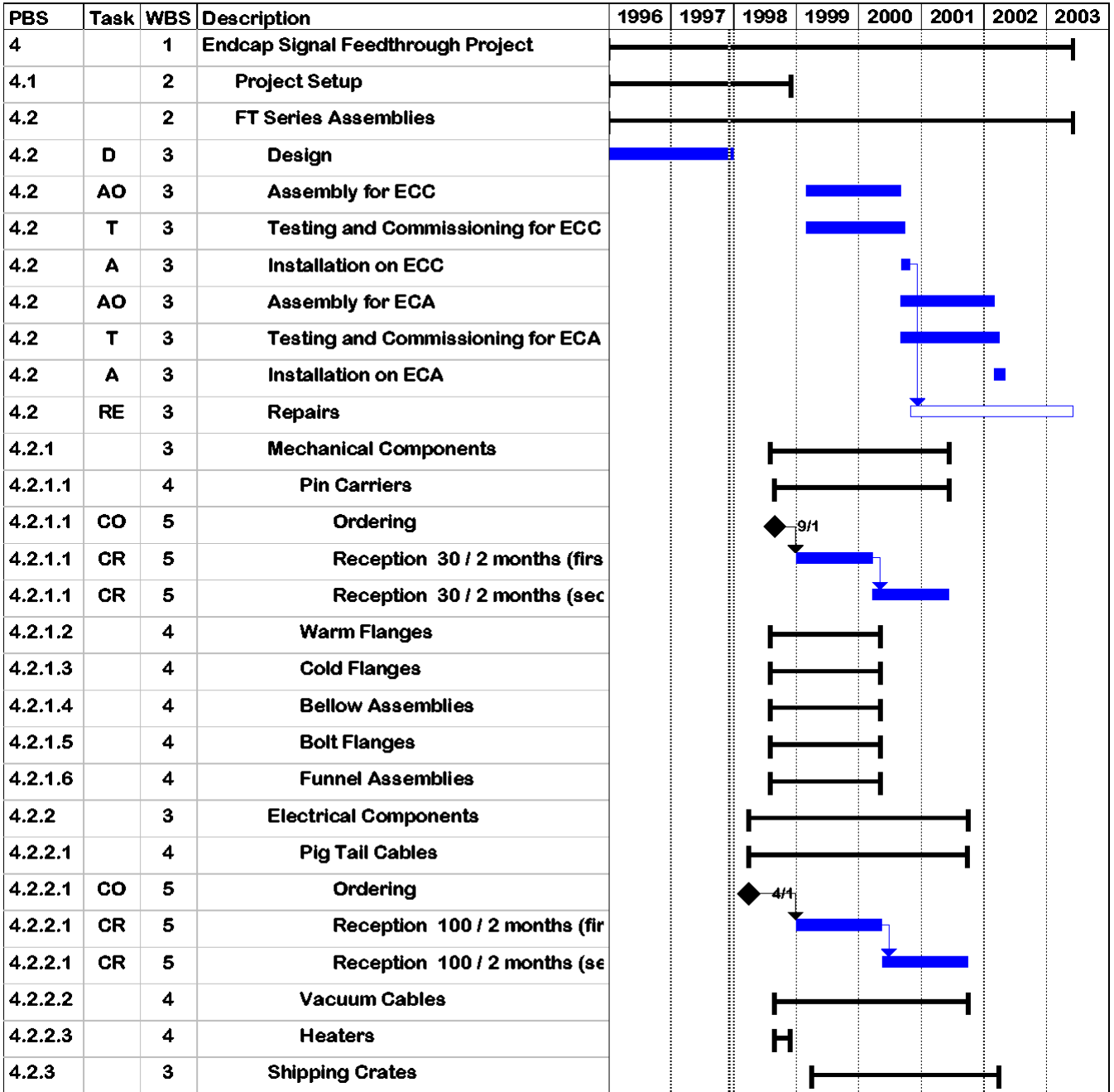
Top PBS Levels

PBS	Task	WBS	Description
4		1	Endcap Signal Feedthrough Project
4.1		2	Project Setup
4.1.1		3	Leak Test Setup
4.1.2		3	Electric Test Setup
4.1.3		3	Data Acquisition System
4.1.4		3	FT Assembly Tools
4.1.5		3	FT Prototypes
4.1.6		3	Management Tools
4.2		2	FT Series Assemblies
4.2	D	3	Design
4.2	AO	3	Assembly for ECC
4.2	T	3	Testing and Commissioning for ECC
4.2	A	3	Installation on ECC
4.2	AO	3	Assembly for ECA
4.2	T	3	Testing and Commissioning for ECA
4.2	A	3	Installation on ECA
4.2	RE	3	Repairs
4.2.1		3	Mechanical Components
4.2.1.1		4	Pin Carriers
4.2.1.2		4	Warm Flanges
4.2.1.3		4	Cold Flanges
4.2.1.4		4	Bellow Assemblies
4.2.1.5		4	Bolt Flanges
4.2.1.6		4	Funnel Assemblies
4.2.2		3	Electrical Components
4.2.2.1		4	Pig Tail Cables
4.2.2.2		4	Vacuum Cables
4.2.2.3		4	Heaters
4.2.3		3	Shipping Crates

4.n for ATLAS Canada corresponds to
4.2.2.1.n in the TDR

Endcap Signal Feedthrough Project

Series Assemblies Details



Endcap Signal Feedthrough Project

Project Setup Details

