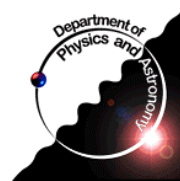
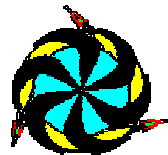


ATLAS Endcap Signal Feedthrough Project

ATLAS LAr week
18 November 2002

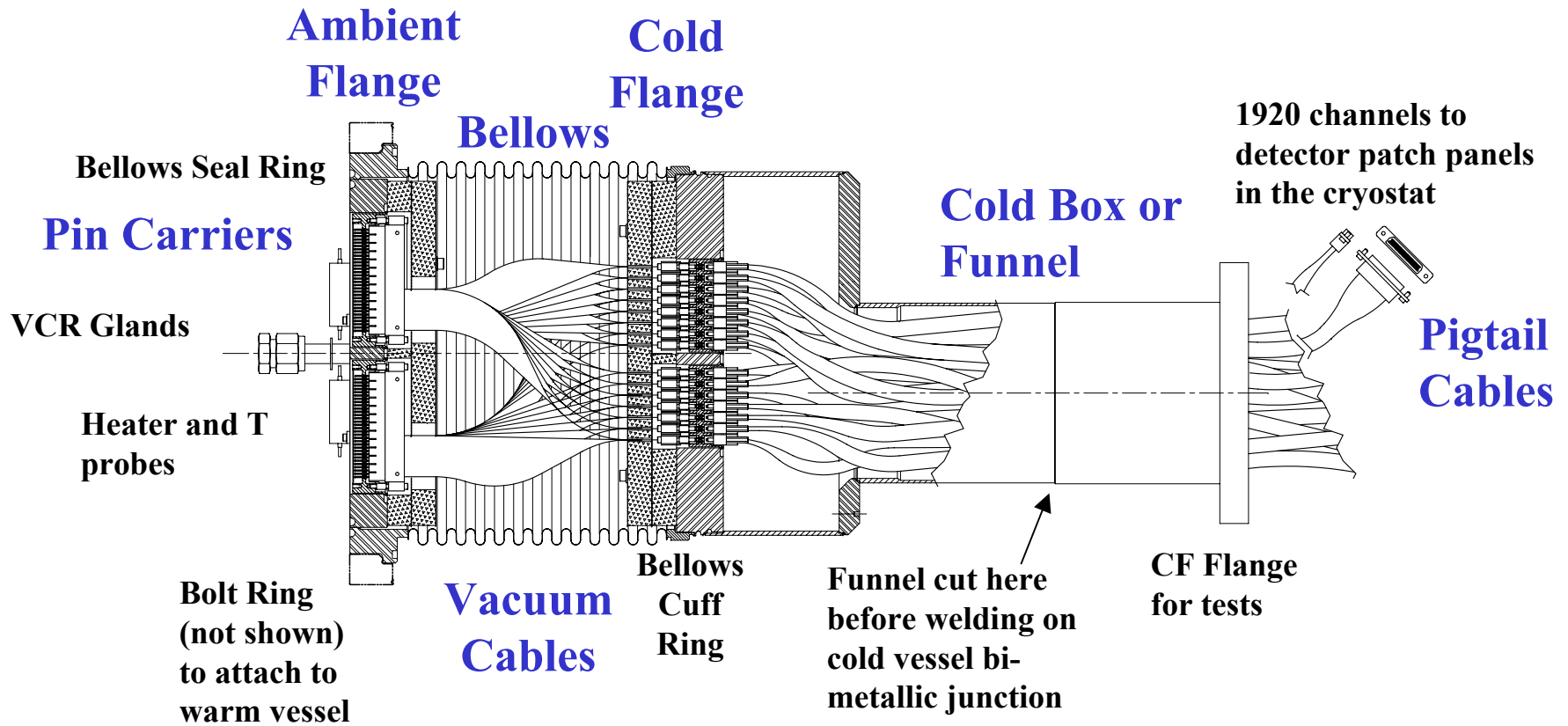
■ Status Report

- Pin carrier Procurement Summary
- Feedthrough Production
- QA/QC
- Shipment to CERN
- Reception Tests at CERN
- Feedthrough Installation



Michel Lefebvre
University of Victoria
Physics and Astronomy

Overview



Seal ring OD = 326.4 mm

Total height = 699.9 mm

Responsibilities

- Design
- Fabrication
 - ◆ Signal Pigtails purchased from Orsay
- Commissioning
- Transport
- Reception
 - ◆ Electrical and ambient vacuum testing
 - ◆ Leak tester provided by ATLAS CERN
- Electrical tests after installation
- Assistance during installation
 - ◆ Assistance during welding on the cryostat
 - ◆ Manpower to connect warm cables to ambient flange

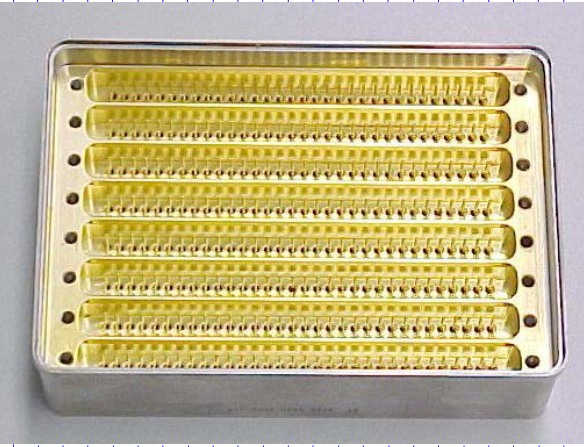
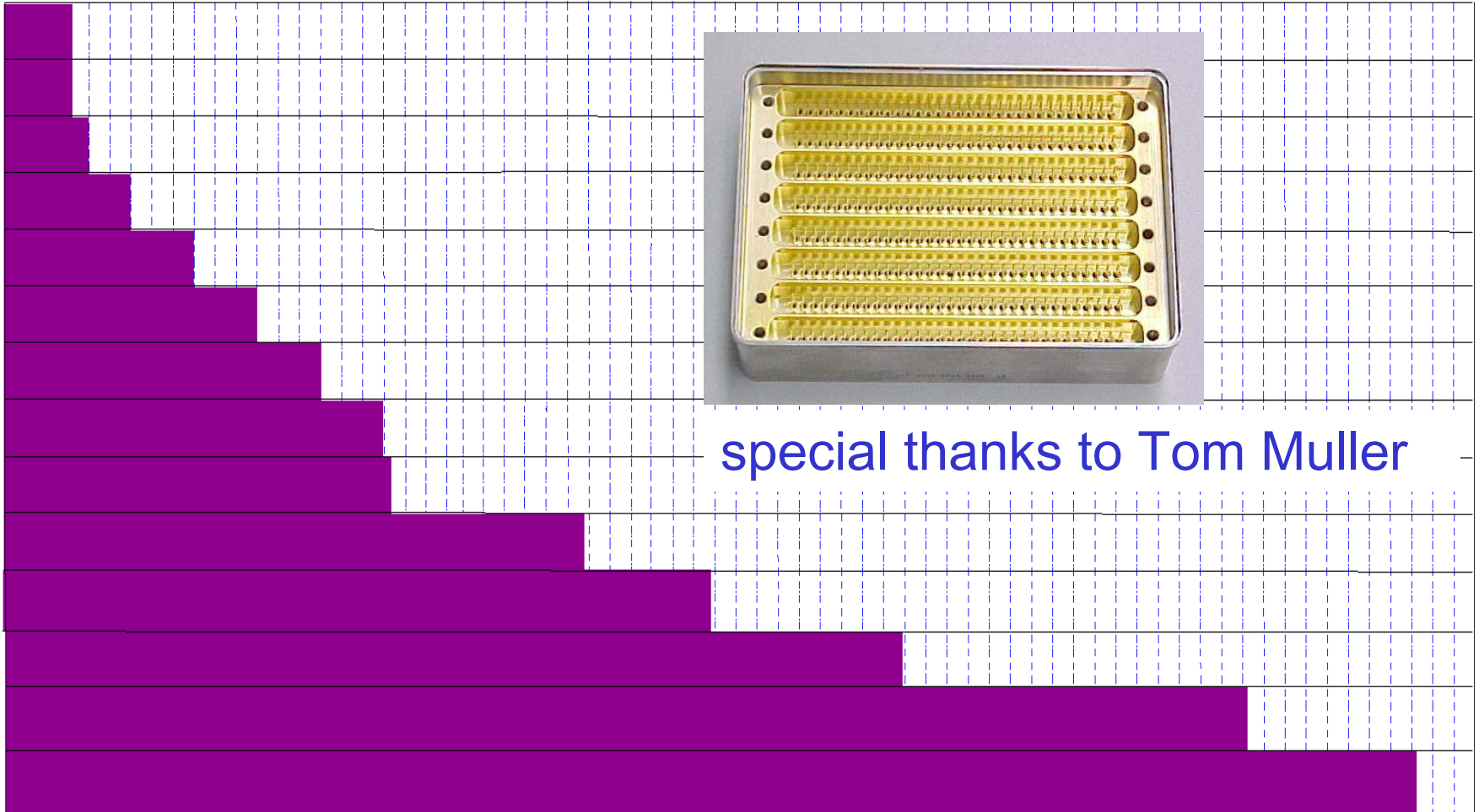
Pin Carrier Procurement Summary

pin carriers (8)

40 (5) 80 (10) 120 (15) 160 (20) 200 (25) 240 (30) 280 (35) 320 (40) 360 (45) 400 (50) 440 (55) 480 (60) 520 (65) 560 (70)

JAN01

Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Oct 01
Nov 01
Dec 01
Jan 02
FEB02



special thanks to Tom Muller

Feedthrough Production

Production at the University of Victoria

All 55 feedthrough units produced (last on 25 Oct 2002)



Feedthrough Production

Production at the University of Victoria

All 55 feedthrough units produced (last on 25 Oct 2002)



last welds

last dye penetrant tests



last
cold
test



Feedthrough Production

Last feedthrough produced at UVic on Oct 25 2002

in Dec 01 we predicted 15 Oct 2002 !!

radiation tests on last pigtails took place Nov 7-8. Awaiting results.

The successful production of the endcap signal feedthroughs would not have been possible without the help of many.....

TRIUMF (Chris, Alan, ...)

Orsay (Daniel, Laurent, Aboud, Pierre, Christophe, ...)

BNL (Howard, David, Dave**2, Tom, Bob, Ken, ...)

CERN (Pierre, Allain, Patrick, Martin, ...)

UBC (Dave, electronics shop)

UVic (Physics and Astronomy Dept, machine and electronics shops)

Quality Assurance / Quality Control

QA/QC was critical to the success of the project

Very detailed document available (QA/QC version 5, Mar 02)

All information stored in a purpose-built database

- material traceability
- production and reception test results
- available on the web:

<http://particle.phys.uvic.ca/~web-atlas/atlas/feedthroughs/status/>

Quality Assurance / Quality Control

production status summary

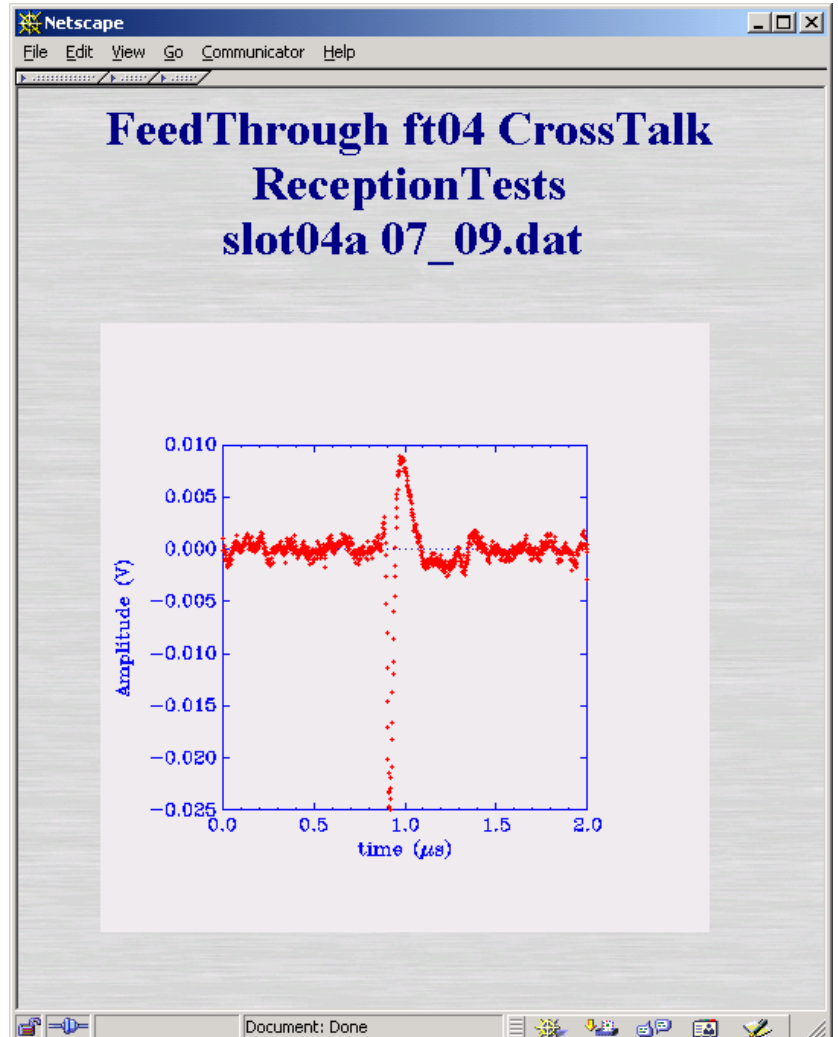
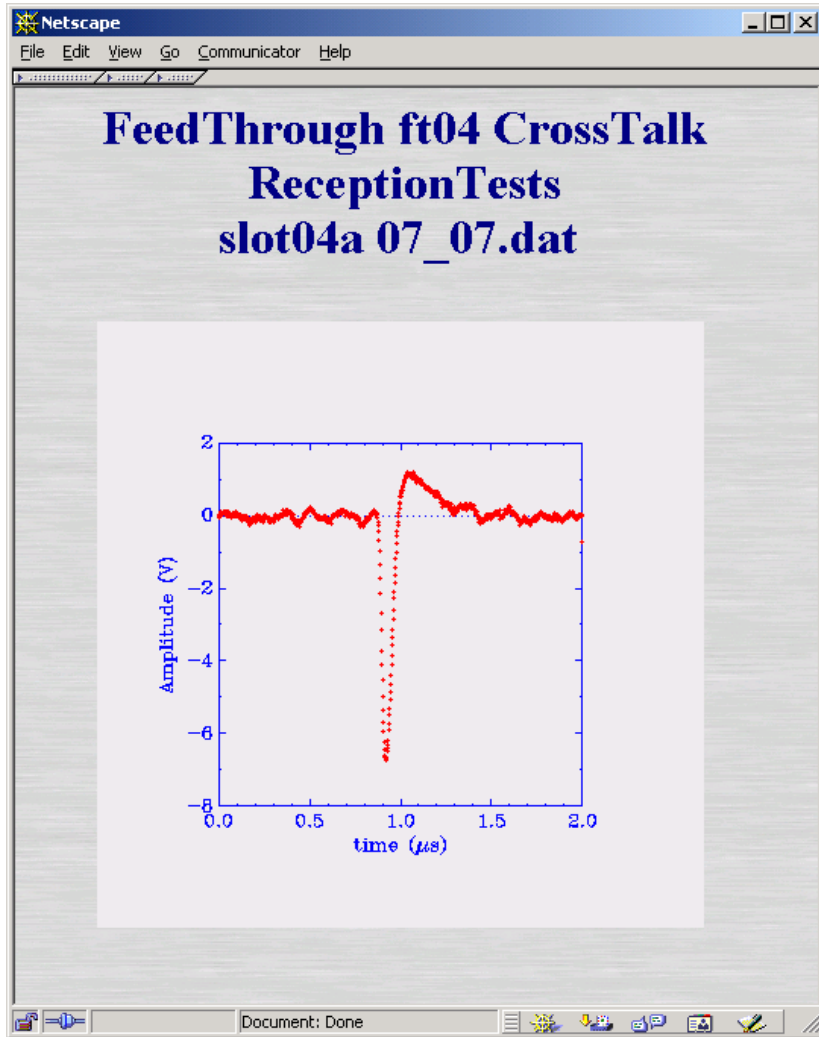
Return to [ATLAS Endcap Signal Feedthroughs](#)

EndCap Signal FeedThrough Production Status

ser #	type	started	completed	shipped	reception tests	officially received	installed position
ft00	Standard	6 Jul 00	13 Oct 00	28 Sep 01	23 Oct 01	15 Mar 02	-
ft01	Standard	27 Sep 00	11 Sep 01	28 Sep 01	25 Oct 01	15 Mar 02	-
ft02	Standard	11 Oct 00	15 Dec 00	28 Sep 01	27 Oct 01	15 Mar 02	-
ft03	Standard	27 Mar 01	20 Apr 01	28 Sep 01	29 Oct 01	15 Mar 02	-
ft04	Standard	25 Apr 01	10 May 01	16 Oct 01	12 Nov 01	15 Mar 02	-
ft05	Standard	7 May 01	24 May 01	16 Oct 01	8 Nov 01	15 Mar 02	-
ft06	Standard	23 May 01	5 Jun 01	16 Oct 01	8 Nov 01	15 Mar 02	-
ft07	Standard	25 May 01	14 Jun 01	16 Oct 01	12 Nov 01	15 Mar 02	-
ft08	Standard	30 May 01	11 Jun 01	16 Oct 01	15 Nov 01	15 Mar 02	-
ft09	HEC	26 Jun 01	25 Jul 01	2 Nov 01	29 Nov 01	15 Mar 02	-
ft10	Special	29 Jun 01	19 Jul 01	16 Oct 01	12 Mar 02	18 Mar 02	-
ft11	HEC	12 Jul 01	1 Aug 01	2 Nov 01	4 Dec 01	18 Mar 02	-

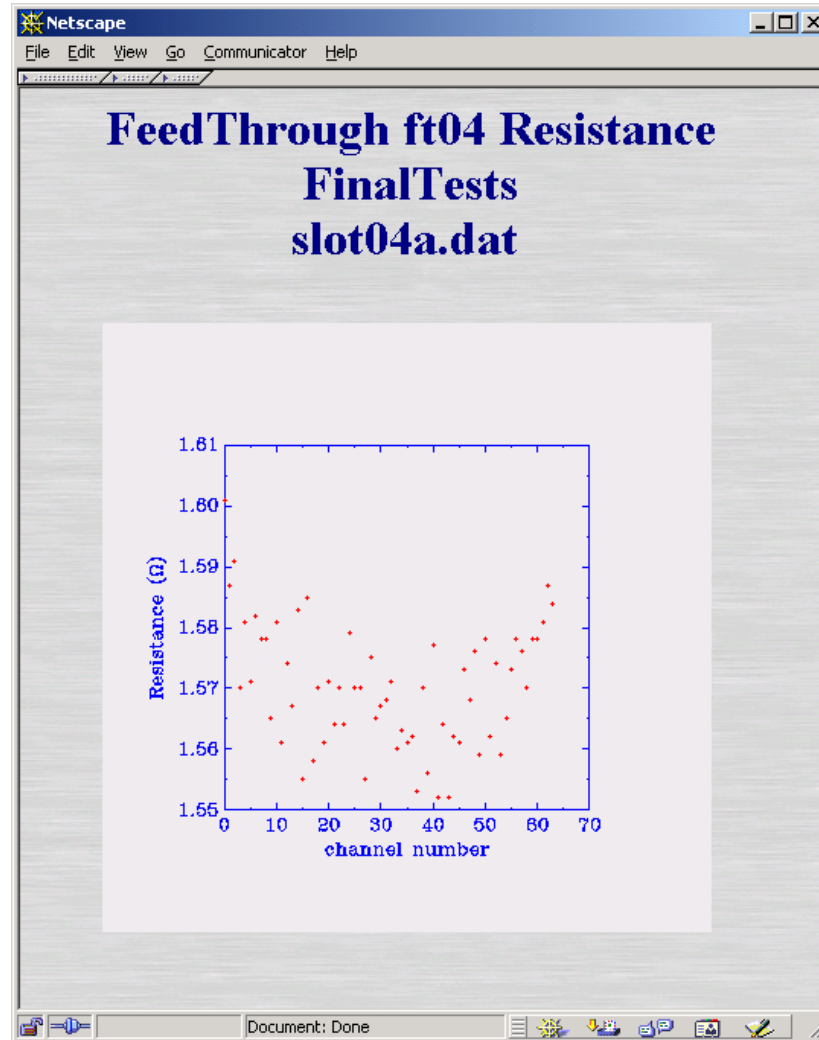
Quality Assurance / Quality Control

cross talk measurements at UVic and at CERN



Quality Assurance / Quality Control

resistance measurements at UVic



Shipment to CERN



crated feedthroughs

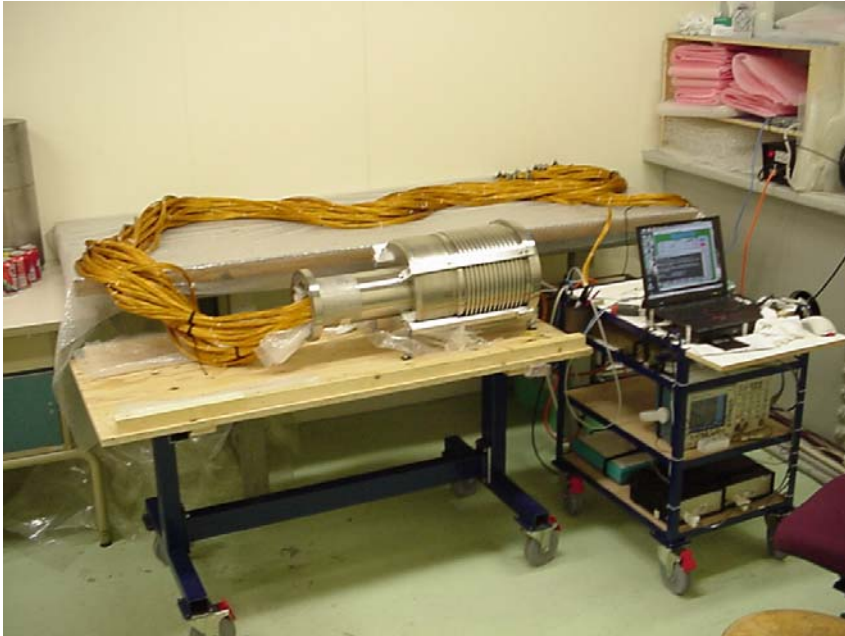


last produced feedthrough in
crate (Oct 2002)

Each feedthrough has its own crate
4 feedthrough crates are then crated together for shipment
50 feedthrough units now at CERN

remaining 5 to be shipped as soon as new pigtail connector material has
passed irradiation pollution tests

Reception Tests at CERN



Feedthrough units are tested upon reception at CERN:

- visual inspection
- leak test (ambient temperature)
- electrical test (cross-talk)

The electrical testing equipment will also be used on the cryostat after feedthrough installation



46 units tested at CERN, the rest to be tested soon

Feedthrough Installation

The endcap signal feedthrough are very important and expensive components of the LAr system

ECC: 16 standard, 4 special, 4 HEC, 1 FCAL = 25

ECA: 16 standard, 4 special, 4 HEC, 1 FCAL = 25

Others: 3 standard, 1 special, 1 HEC = 5

They are handed to ATLAS tested and clean

There are 4 types of endcap feedthroughs. There are very few spares and very few spare parts (except pin carriers). We only have 3 spare FCAL pigtails.

One damaged pigtail = a feedthrough to rebuild at UVic

More than 3 damaged FCAL pigtails = 6 months delay for LAr

We now have less resources to build feedthroughs.

Feedthrough Installation

Two persons at CERN for assistance during installation

- foresee 1.5 months for installation on ECC
- foresee 1.5 months installation on ECA
- about 1.5 months for warm cable installation and final electrical tests

Special testing equipment has been developed for the warm cable insertion

- bent pin indicator (to give early warning of bent pins while installing a warm cable)
- a short-to-ground indicator
- a cross-channel-short indicator (to check for cross-channel shorts in the warm cable after installation)
- a pigtail ATI / baseplane interface for use during the post-installation cross talk tests (BNL was using a warm cable for their TDR test interface, which caused problems since the warm cables are not designed to stand up to many plugins)