SCT Barrel Assembly

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1. Assembly Items
2. Barrel Assembly
3. Phase 4 Japanese Contribution
4. Infrastructures
5. Schedule

1. Assembly Items

Mechanical item

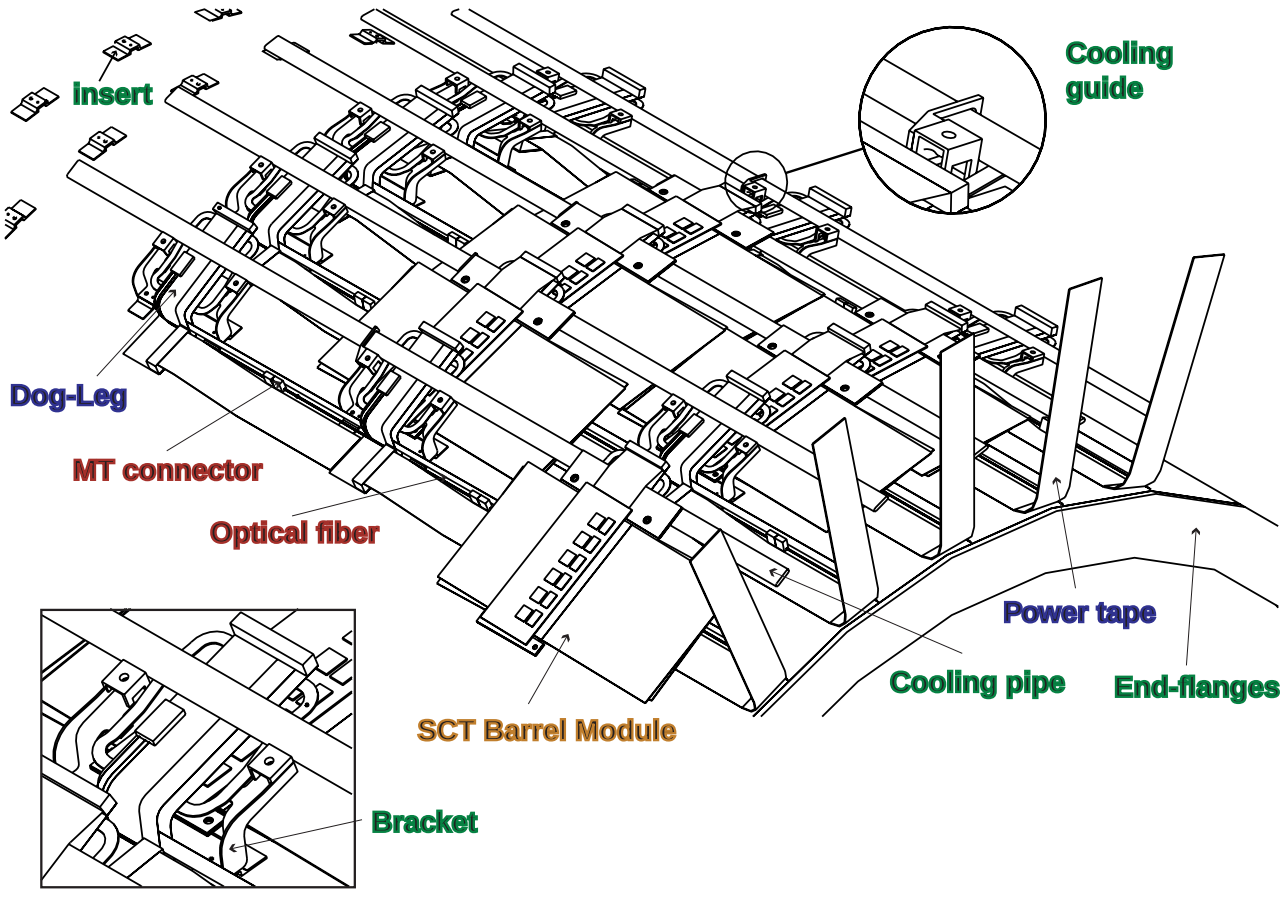
Bare cylinder (Geneva)
Cooling line (RAL)
Brackets (Geneva)
3rd mounting Points (Geneva)
Cooling guide (Geneva)
Braket insert (Geneva)
End-flanges (Geneva)

Electrical item

Power tape (RAL)
Dog-Leg (RAL)

Optical item

Optical fiber (KEK?)
MT connector (KEK?)



2. Barrel Assembly Procedure

Phase #1 Bare Cylinder Manufacture (Geneva,Oxford)

QA Test

Manufacture cylinder & End-flange
Thermal cycle
Stress test
Measurement of size

Ship to Geneva

Phase #2 Barrel Preparation (Geneva)

Geometrical Test

Interlink adjustment
Metrology
Mount brackets
Clearance check

Ship to RAL

Phase #3 Services Assembly (RAL)

Service System Test

Attach cylinder to alignment jig and jewels
Add cooling system
Thermal test
Measure propagation delay

Ship to Oxford KEK

Phase #4 Module Assembly (KEK,Oxford)

Add Modules & Barrel Test

Mount into assembly jig
Add harness
Check cooling, electrical and robot operation
Add modules
Barrel test
Gas conversion test(B4 only)
X-ray survey (B3 only)

Japanese Contribution

Ship to CERN

Phase #5 Assemble 4 Barrels Together (CERN)

Phase #6 Prepare SCT barrel installation into TRT (CERN)

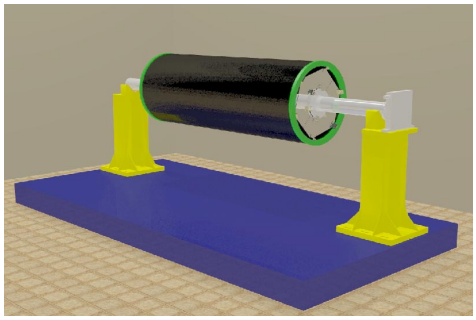
3. Phase 4 Japanese Contribution

Work
Check & Survey

P4.1 Unpack Cylinder

Remove cylinder from transport container
Visually inspection
Leave barrel new environment 1 week

P4.2 Mount into Assembly Jig



Mount into assembly jig
Add harness
Check the mount jig operation

P4.3 Pre-assembly Check

Attach cooling system
Check proper operation of cooling system and leak check
Survey thermal imaging of entire barrel
Resurvey when cooled
Survey 3% of barrel mounting pad with WIPM system when cooled
Check electrical performance
- Check HV, LV and delay check for the 10 % harness set

Check optical performance
- Check fiber line for the 10 % harness set

Check robot operation
Attach to 1% dummy module
Check the DCS system

P4.4 Add Modules

Check the modules
- Visualy inspection
- Attach the cooling system
- Survey thermal imaging
- Electrical check (HV, LV and noise)

Place the modules on barrel with robot
Add 24 modules as abobe, (2 line of 12)
Check and survey the barrel
- Survey thermal imaging
- Survey using WIPM

Cool enviroment
- Resurvey

Turn on the cooling system
- Resurvey

Check electrical functionarity (HV, noise)

P4.5 Barrel Test

Attach a complete set of DCS system
Check DCS operation
Cool barrel
Survey each barrel row
- Using WIPM system
- Using thermal imaging system

Power ON
Resurvey
Power up
Monitor thermal & mechanical stability
Check electrical performance of all powered row
Test for co-operative phenomena

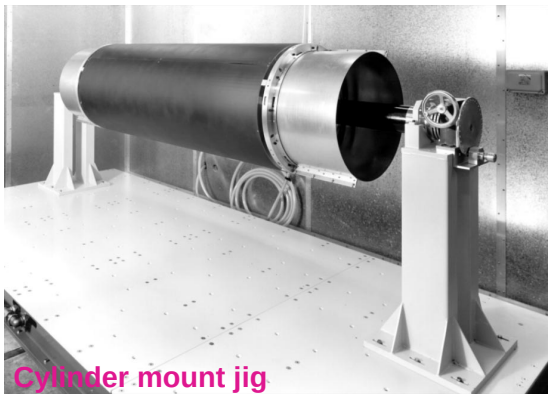
P4.6 Pack Cylinder into Container

Pack complete barrel in container
Ship to assembly area at CERN

4. Infrastructure

Mechanical Jig

- Cylinder mount jig
- Module mount robot
- Container for shipment


Cylinder mount jig

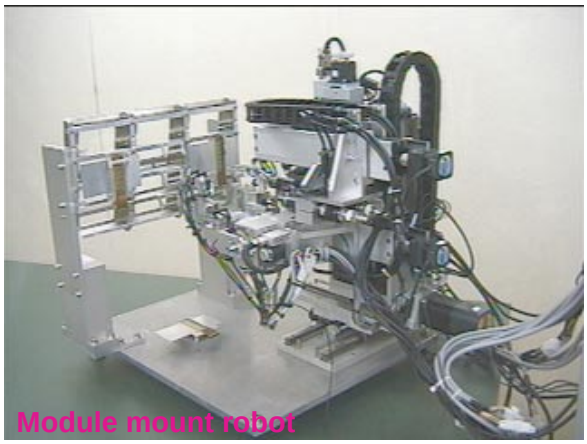
Cooling

- Cold room
- Cold table
- Bench cooling system


Cold room and Cold table

Survey System

- Thermal imaging system
- WIPM system

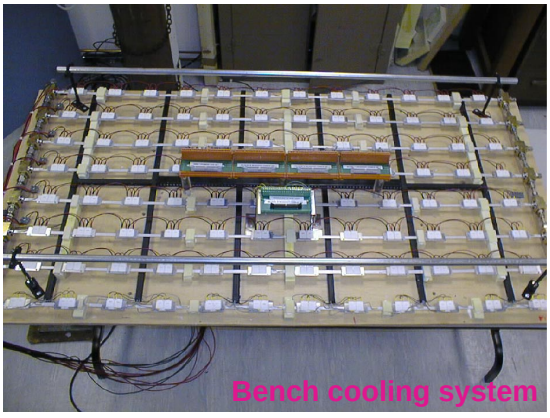

Module mount robot

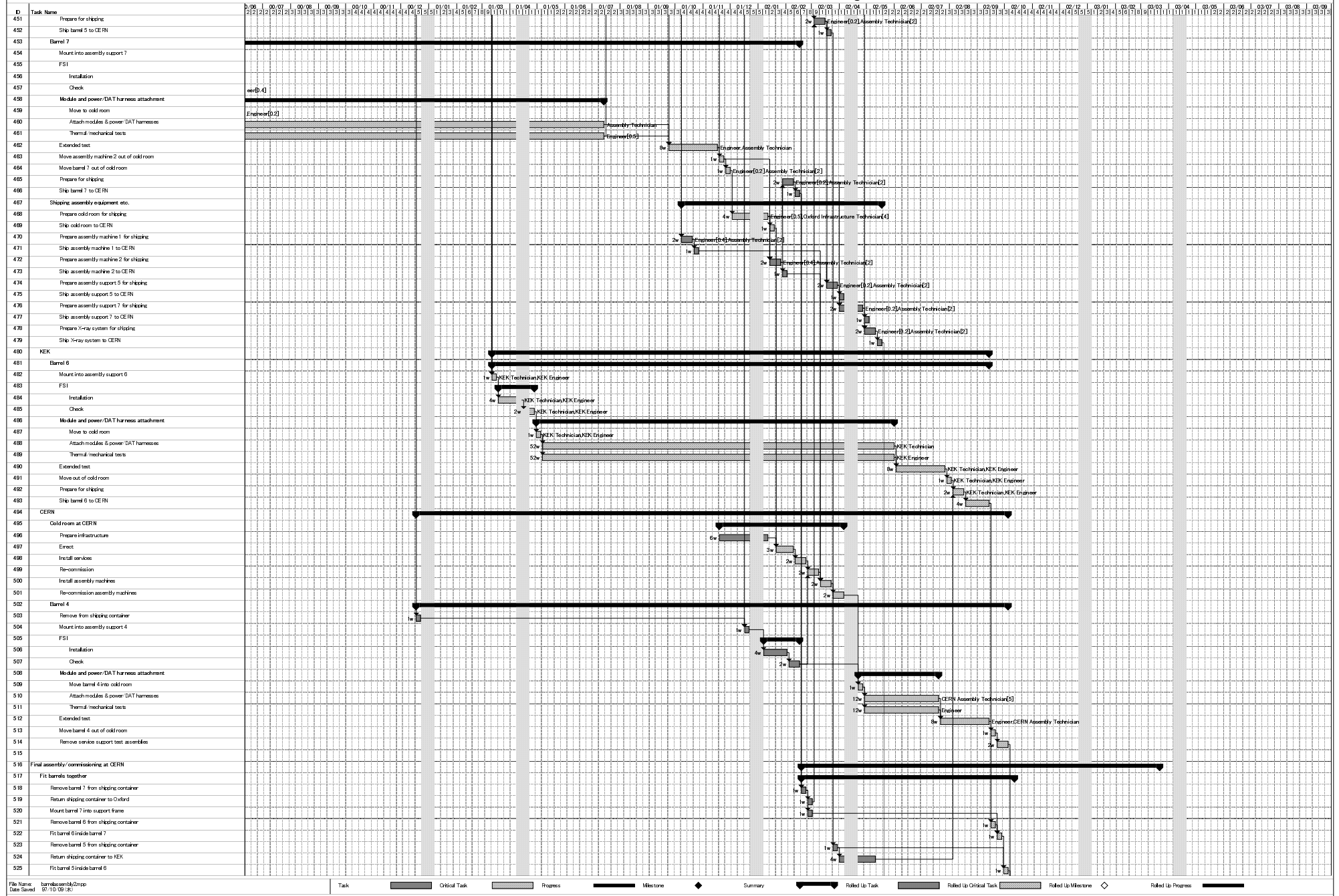
Electrical Bench System

- Barrel DCS system

Location

- Fuji B2 or Fuji B4 ?


Bench cooling system


ID
Task Name
451 Prepare for shipping
452 Ship barrel 5 to CERN
453 Barrel 7
454 Mount into assembly support 7
455 FSI
456 Installation
457 Check
458 Module and power/DAT harness attachment
459 Move to cold room
460 Attach modules & power/DAT harnesses
461 Thermal/mechanical tests
462 Extended test
463 Move assembly machine 2 out of cold room
464 Move barrel 7 out of cold room
465 Prepare for shipping
466 Ship barrel 7 to CERN
467 Shipping assembly equipment etc.
468 Prepare cold room for shipping
469 Ship cold room to CERN
470 Prepare assembly machine 1 for shipping
471 Ship assembly machine 1 to CERN
472 Prepare assembly machine 2 for shipping
473 Ship assembly machine 2 to CERN
474 Prepare assembly support 5 for shipping
475 Ship assembly support 5 to CERN
476 Prepare assembly support 7 for shipping
477 Ship assembly support 7 to CERN
478 Prepare X-ray system for shipping
479 Ship X-ray system to CERN
480 KEK
481 Barrel 6
482 Mount into assembly support 6
483 FSI
484 Installation
485 Check
486 Module and power/DAT harness attachment
487 Move to cold room
488 Attach modules & power/DAT harnesses
489 Thermal/mechanical tests
490 Extended test
491 Move out of cold room
492 Prepare for shipping
493 Ship barrel 6 to CERN
494 CERN
495 Cold room at CERN
496 Prepare infrastructure
497 Erect
498 Install services
499 Re-commission
500 Install assembly machines
501 Re-commission assembly machines
502 Barrel 4
503 Remove from shipping container
504 Mount into assembly support 4
505 FSI
506 Installation
507 Check
508 Module and power/DAT harness attachment
509 Move barrel 4 into cold room
510 Attach modules & power/DAT harnesses
511 Thermal/mechanical tests
512 Extended test
513 Move barrel 4 out of cold room
514 Remove service support test assemblies
515
516 Final assembly/commissioning at CERN
517 Fit barrels together
518 Remove barrel 7 from shipping container
519 Return shipping container to Oxford
520 Mount barrel 7 into support frame
521 Remove barrel 6 from shipping container
522 Fit barrel 6 inside barrel 7
523 Remove barrel 5 from shipping container
524 Return shipping container to KEK
525 Fit barrel 5 inside barrel 6
Engineer[0.2],Assembly Technician[2]
Assembly Technician
Engineer[0.2]
Engineer,Assembly Technician
Engineer[0.2],Assembly Technician[2]
Engineer[0.5],Oxford Infrastructure Technician[4]
Engineer[0.4],Assembly Technician[2]
KEK Technician,KEK Engineer
KEK Technician
KEK Engineer
CERN Assembly Technician[5]
Engineer
Engineer,CERN Assembly Technician
File Name: barrelassembly2mpp
Date Saved: 97/10/09(木)
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress