

## Instrumentation for 40 mm Long Magnets

After some discussion among Wayne Koska, John Tompkins, Arnaud Devred, Jay Jayakumar, and myself, we have agreed that the following set of instrumentation will be put on the long 40 mm magnets built at Fermilab.

1) Voltage taps  
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Figure 1 (from drawing #102-MC-263900) shows the voltage tap arrangement. The taps in the middle of the pole turn (16J, 16K, 16L, 16M) will be put only on DC0304. John Tompkins has requested that the drawing be revised to show explicitly the distance between the end of the coil straight section and the tap 16H and the corresponding outer coil tap 20A.

2) Collar pack strain gages  
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Two gauge packs will be put on each magnet. DC0302 has already been collared with the gauge packs placed at the 1/3 and 2/3 points along the magnet. Beginning with DC0303 the two packs should be placed at the points where the inner coil size (sum of the four quadrants) is largest and smallest. Due to poorly specified measurement procedures, the precise location of each coil size measurement is poorly known for earlier coils (including those for DC0303). Bob Jensen is trying to understand the data well enough to make the gauge pack location assignment.

3) End ("bullet") gauges  
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Four "bullet" gauges will be used at the return end. At the lead end the coil will be loaded with uninstrumented set screws.

4) Thermometry  
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John Tompkins et al. have requested that we place a pair of carbon-glass (or equivalent) thermometers inside the yoke cooling channels at each end of the magnet. He will provide the thermometers and a detailed specification as to where they should be mounted.

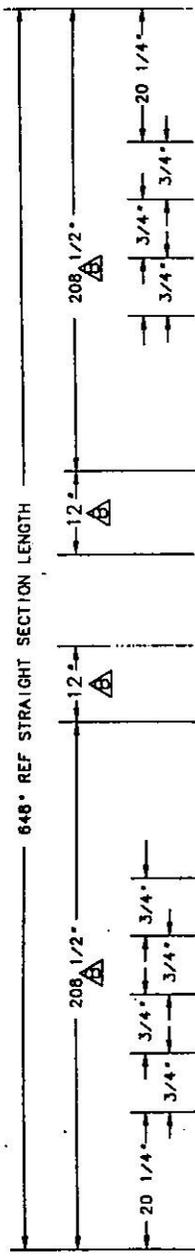
5) Shell gauges  
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Pairs of active gauges, (measuring axial and azimuthal strain), will be placed at the magnet center and at the following distances from the return end of the yoke: 5 cm, 20 cm, 50 cm, 75 cm, 100 cm, 180 cm. The gauges will be mounted approximately 22.5 degrees from the top of the magnet shell. The active pair may be either two gauges of a rosette or two individual gauges. Compensating gauges, mounted as in DD0026, will be placed adjacent to the active gauges at 5 cm, 75 cm and 180 cm from the return end and at the magnet center.

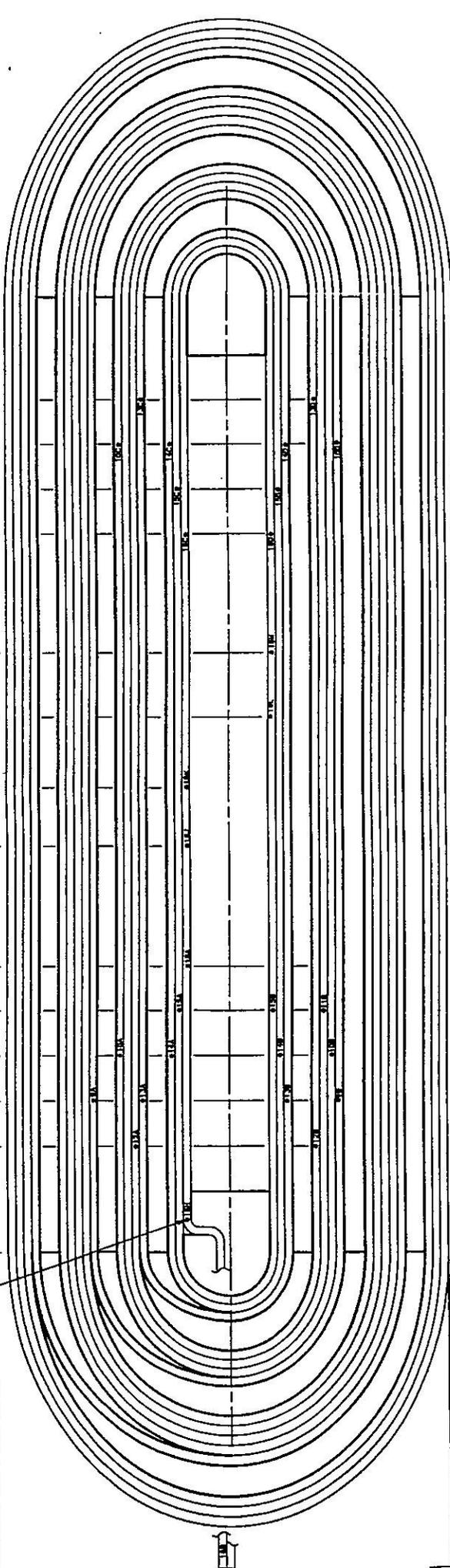
6) Spot heaters  
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Two spot heaters will be mounted on the mid-plane of the lower inner coil: 70 cm from the lead end of the coil straight section on the non-lead side and 23 cm from the return end on the lead side. DC0302 has no spot heaters but all subsequent magnets will include them.

A	C. ADDED 6 NEW VOLTAGE TAPS	
A	DELETED FOUR TAP LOCATIONS AND R. DIXON 10/8/71	
A	ADDED 2. ADDED 208 1/2" . 12" DIMS.	



TAP TO BE LOCATED AS CLOSE TO BEGINNING OF STRAIGHT SECTION AS POSSIBLE.



ITEM	PART NO.	DESCRIPTION OR SIZE	QTY
PARTS LIST			
UNLESS OTHERWISE SPECIFIED:		ORIGINATOR	STRAIT/KOSKA
1. ALL DIMENSIONS ARE IN MILLIMETERS		DRAWN	R. DIXON
2. TOLERANCES: 1. 1 mm.		CHECKED	
3. DIMENSIONS BASED UPON AS SHOWN ON DRAWING		APPROVED	
4. 1/8" DIMENSIONS ARE FOR REFERENCE ONLY		USED ON	
5. BREAK ALL SHARP EDGES.			
6. DO NOT SCALE DRAWING.			
7. MAX. ALL MACH. SURFACES			
8. DIMENSION IDENTIFICATION: MILLIMETER, MILLIMETER/INCH			
 <b>FERMI NATIONAL ACCELERATOR LABORATORY</b> UNITED STATES DEPARTMENT OF ENERGY <b>SSC</b>			
<b>VOLTAGE TAPS</b> <b>SSC LONG INNER COIL</b> <b>MOD 2</b>			
SCALE	FILMED	DRAWING NUMBER	
NONE		0102-MC-263900	
CREATED WITH I-DEAS 4.1		USER NAME: SPUD	

- E:
- VOLTAGE TAP WIRES FOR TAPS 0A, 16B, AND THE HALF COIL TAP ARE #22 AWG TEFLON INSULATED.
  - THE REMAINING VOLTAGE TAP WIRES ARE #32 AWG TEFLON INSULATED.
  - TAP WIRES WITH THE SAME NUMBER AT EACH END SHOULD FORM A TWISTED PAIR (A-B AND C-D).
  - VOLTAGE TAP WIRE SHOULD FOLLOW THE CABLE TO WHICH THEY ARE SOLDERED UNTIL THEY MEET AND ARE TWISTED WITH THEIR "MATE".
  - COIL AS VIEWED FROM INSIDE.