H. Edwards

FERMILAB
# ENGINEERING NOTE

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| Proton | Cryogenic Magnets | 76-0401 | |

SUBJECT: Low Current Superconducting Coil Test No. 1 (Racetrack Coil)

NAME: John Satti

| DATE | REVISION DATE |
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| 9/15/76 | 12/3/76 |

The first time we tested the coil, the power supply was driving and dominating the coil shortly after the quench. In the second test, we quench the coil with a heater after the power supply was turned off. This way we were able to see whatever induced voltages were generated during the quench. We also tested the coil with .040" spacers in the clamps to find out the effect on the quench with loose clamping.

Summary of Results

In the third cooling the coil did not train. The current went up to the critical short sample value of 360 amp in the first quench.

With the .040" loose clamping, the coil did train as expected and after 11 quenches a maximum current of 281 amp was reached. With .040" loose clamping 78% of the critical current was reached. This test gave us some feeling of how critical the clamping is on our porous coil configuration.

During the quench after the power supply was turned off, we did see about 5 volts built up between the strands.

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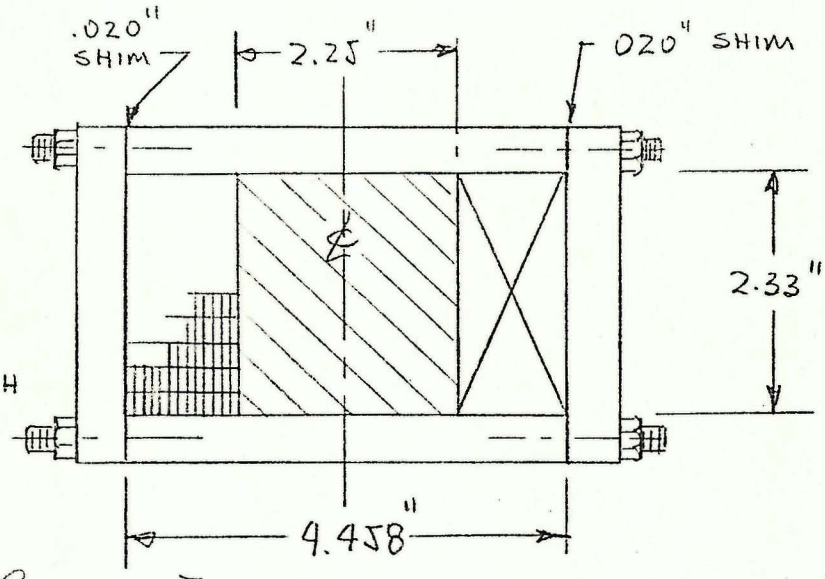
## RACETRACK COIL

.040" SUPER. COND. WIRE
4:1 Cu-NbTi RATIO
9 STRAND INSUL. CABLE
I = 360 AMP
$B_c$ = 44 KG (CALCULATED)
N = 864 TURNS
H = .17 HENRY
L = 8.58 IN. COIL LENGTH




WIRE
CRITICAL CURRENT $I_c$ = 335-360 Amp AT 40 KG
(MCA MEASURED)