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LASER OPTOACOUSTIC SPECTROSCOPY PROJECT. ROUGH CALIBRATION OF PHASE I
HELMHOLTZ COIL SYSTEMS

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ENGINEERING NOTE				
SUBJECT Laser Optoacoustic Spectrometer Project Rough Calibration of Phase I Helmholtz Coil System		NAME D.H. Nelson		
		DATE March 19, 1982		

The "Helmholtz" coil design for the coil pair tested is described in MT 314. This note presents the preliminary tests and calibrations completed by Magnetic Measurements Engineering before we loaned the equipment to Shu-Shia Chen.

Figure 1 shows the hardware loaned to Shu-Hsia Chen for studies related to the Laser Optoacoustic Spectrometer Project. Table I lists specific equipment and some significant parameters.

After adjusting the Gaussmeter's zero and calibration controls, we collected the data summarized in Table II.

On March 17th, Dr. Shu-Hsia Chen reported successful operation of the hardware provided. She does not plan to operate at higher (than ~250 Gauss) fields as the coil temperature masks the effect of magnetic field.

Distribution

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SUBJECT

Laser Optoacoustic Spectrometer Project
Rough Calibration of Phase I Helmholtz Coil System

NAME

D.H. Nelson

DATE

March 19, 1982

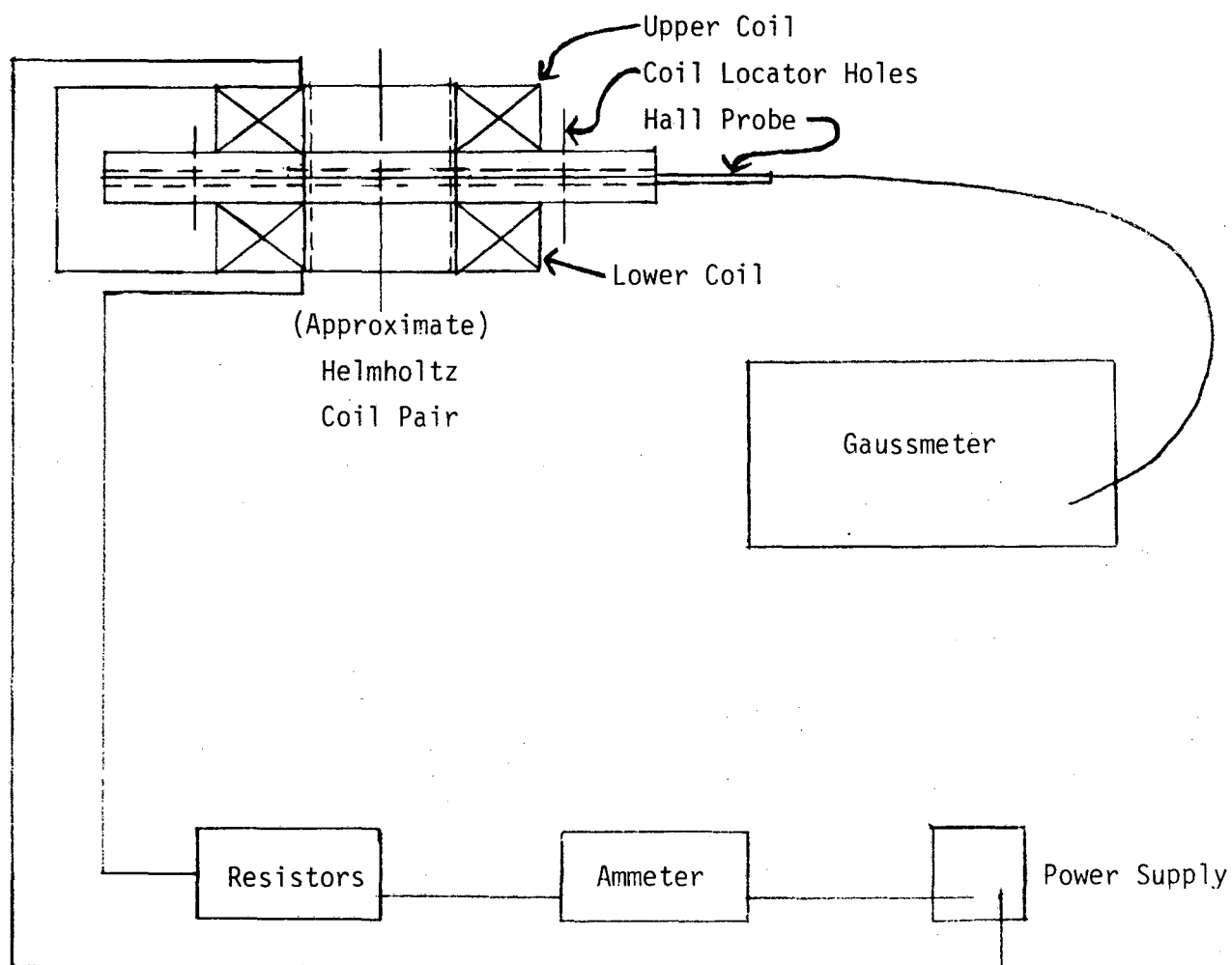


Figure 1 Circuit for Energizing Helmholtz Coil
and for Measuring Resultant Field

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Helmholtz Pair

Coil Form	MT 314, Figure 1		
Coils (2 each)	350 Turns AWG No. 24 Heavy Formvar Mean Radius, $a = 0.016$ m Room Temperature Resistance $\sim 7.0 \pm 0.3 \Omega$		
Locator Holes	4 - 3/16" D Holes (See MT 314, Figure 1)		
Resistors (Current Limiting)	None Required for Phase I		
Ammeter	Keithley Mod 172A	S/N 14098	
Power Supply	Lambda Mod LP520FM (5 A/10 V)	S/NB14168	
Gaussmeter	F.W. Bell Mod 620	AEC No. 501586	
	Probe Mod HTJ4-0608	S/N 150289	
	Shield Mod YA111	No S/N	

TABLE I Equipment List

Helmholtz Coil-Pair		Magnetic	Normalized
Series Current		Induction	Magnetic
I_o	E_{load}	$B_z(z = 0)$	Induction
(A)	(V)	(G)	B_z/I_o
			(G/A)
+1.0	6.8 ± 0.1	177	177
+1.5	>10	260	173
-1.0	7.1	177	177
-1.47	>10	256	174
(Measured Values $\sim 14\%$ Low @ 1.5 A)			
Design Estimate	1.53	300	196

TABLE II Rough Calibration of Helmholtz Coil Pair

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