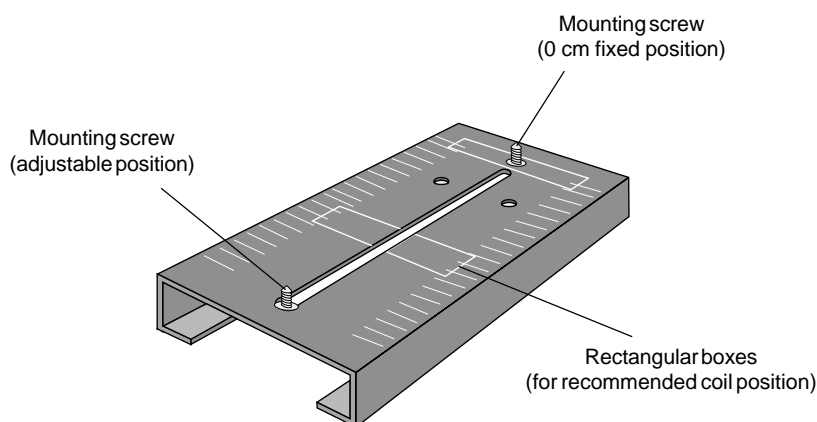


**Instruction Sheet
for the PASCO
Model EM-6715**

Helmholtz Coil Base



Introduction

The PASCO EM-6715 Helmholtz Coil Base allows you to mount and change the distance between the PASCO EM-6711 Field Coils and is used in studies of electromagnetism. The base has a slot that allows the coils to be separated at any distance from 3 to 20 cm. Two rectangular boxes are marked on the base to denote the recommended placement of the coils at a 10 cm separation distance.

Additional Equipment Required

PASCO Field Coils (EM-6711)

Additional Equipment Recommended

Magnetic Field Sensor (CI-6520A)
 Linear Motion Accessory (CI-6538)
 Rotary Motion Sensor (CI-6538)
 Power Supply (SE-9720)
 Large Base and Support Rod (ME-9355)
 ScienceWorkshop® Interface (500, 700 or 750)
 DataStudio™, version 1.5.2 or later

Specifications

Base: 11.071 x 5.35 x 1.5; aluminum with black finish; mounting holes 0.25 inch (0.635 cm)
 Cap screw: 1/4-20 x 3/4 in.
 Thumb screw: 1/4-20 x .540 in.
 Cap washer: 0.312 x 0.204 x 0.012 in.

Mounting the Helmholtz Coils on the Helmholtz Coil Base

1. Place the first coil over the rectangular slot on the end of the base (0 cm position). Use the provided cap screw to secure the mount firmly against the top surface of the base. (See Figure 1.)
2. Attach the second coil to the cap screw provided in the center slot on the base, and slide it to the desired position. Then secure the mount firmly against the top surface of the base. (See Figure 2.)

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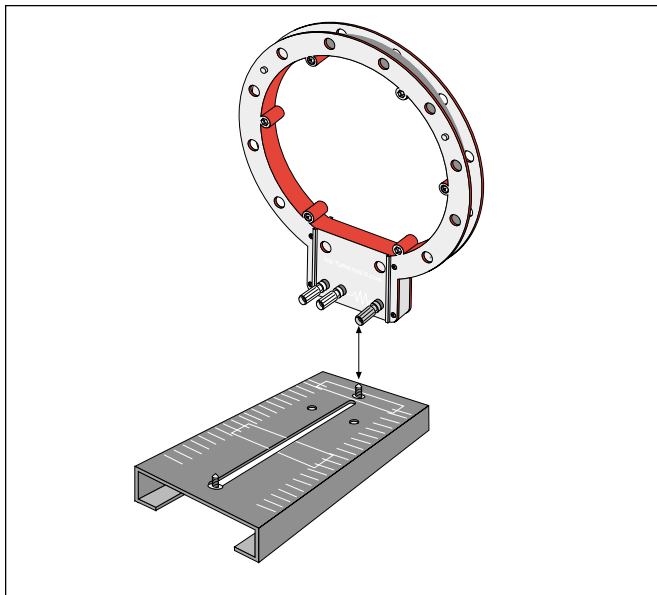


Figure 1: Attaching the fixed-position coil

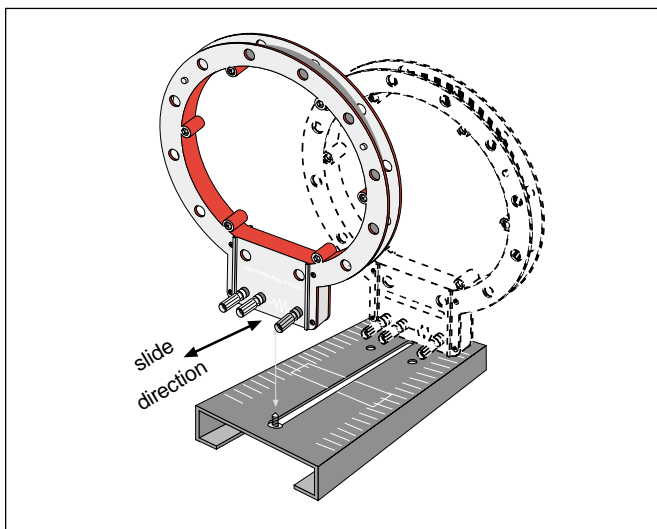


Figure 2: Attaching the adjustable coil

NOTE: The separation distance between the two rectangular boxes on the base is 10 cm and is equal to the radius of the PASCO Field Coils (See Figure 3). A uniform magnetic field can be generated between the coils when the two coils are placed 10 cm (1 radius) apart.

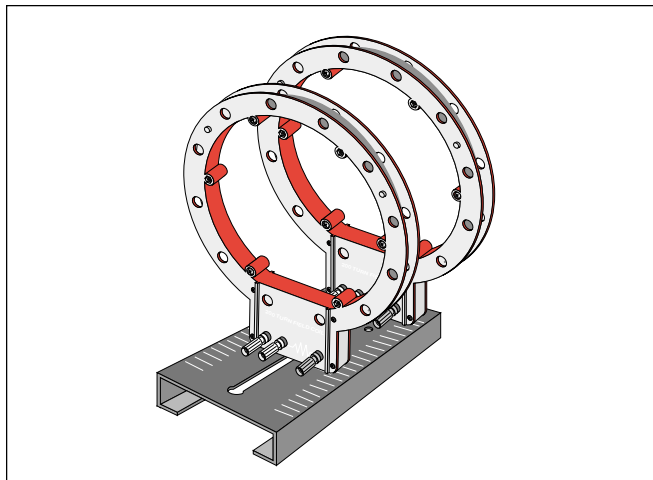


Figure 3: Coils Positioned in the Base

Recommended Experimental Setup

Use the Helmholtz Coils with the Rotary Motion Sensor and the Magnetic Field Sensor to determine the magnetic field strength for various positions both outside and inside the Field Coils. Set up the equipment as shown in Figure 4.

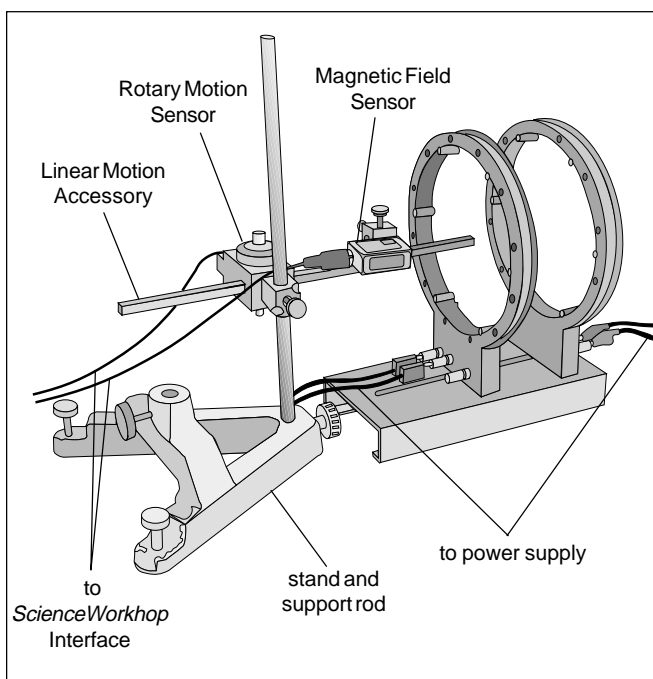
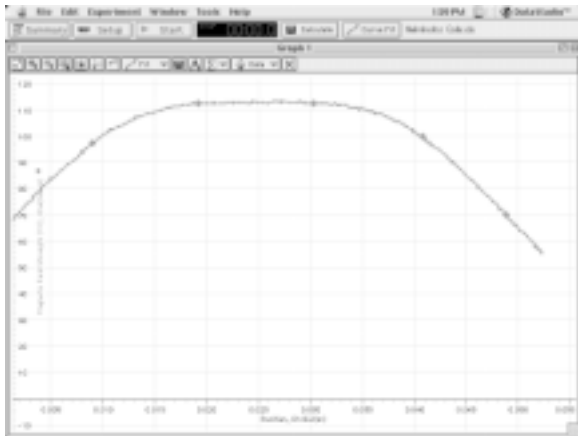


Figure 4: Recommended experiment setup

By rotating the pulley on the Rotary Motion Sensor, the Magnetic Field Sensor moves either toward or away from the Field Coils. Using DataStudio and a *ScienceWorkshop* interface, students can produce a graph of magnetic field strength vs. position.

There is no need to rotate the pulley at a constant rate as the Rotary Motion Sensor measures its position using an optical encoder.



This graph shows the increasing magnetic field as the sensor is moved toward the first coil, the uniform magnetic field in between the coils, and the decrease in magnetic field as the sensors moves beyond the second coil.

Limited Warranty

PASCO scientific warrants the product to be free from defects in materials and workmanship for a period of one year from the date of shipment to the customer. PASCO will repair or replace, at its option, any part of the product which is deemed to be defective in material or workmanship. The warranty does not cover damage to the product caused by abuse or improper use. Determination of whether a product failure is the result of a manufacturing defect or improper use by the customer shall be made solely by PASCO scientific. Responsibility for the return of equipment for warranty repair belongs to the customer. Equipment must be properly packed to prevent damage and shipped postage or freight prepaid. (Damage caused by improper packing of the equipment for return shipment will not be covered by the warranty.) Shipping costs for returning the equipment after repair will be paid by PASCO scientific.

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