

LEAI-47 Specific Charge of Electron Apparatus - Advanced Model

- Complete experiment apparatus, compact, stable, and affordable
- Demonstrates electron motion in electromagnetic field, and measures e/m and geomagnetic component



This LEAI-47 experiment apparatus is designed to determine the specific charge of an electron, or the electron charge/mass ratio (e/m), to demonstrate the motion properties of electron beam in electrical and magnetic fields, and to measure the geomagnetic component. It is an ideal teaching apparatus for physics laboratories in colleges and universities. This apparatus has the following advantages:

1. Three voltmeters for displaying various voltages independently.
2. All parts enclosed in a solid suitcase for convenient maintenance.
3. Three times of electron beam focusing, namely electron spiral motion $\geq 6\pi$.

Using this apparatus, the following experiments can be performed:

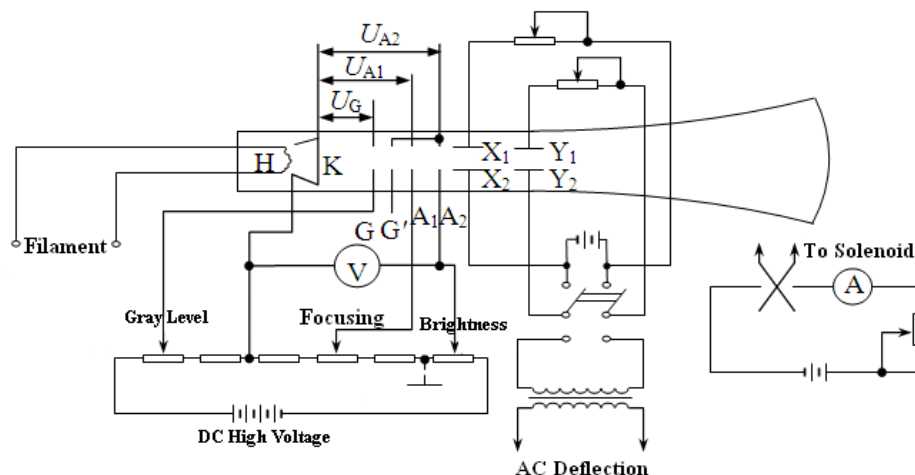
1. Quantitatively measure the rules of electron movement in both electric and magnetic field.
 - 1). Electrical deflection: electron + transversal electric field
 - 2). Electrical focusing: electron + longitudinal electric field
 - 3). Magnetic deflection: electron + transversal magnetic field
 - 4). Magnetic focusing: electron + longitudinal magnetic field
2. Determine e/m ratio of an electron and verify the polar coordinate equation of electron spiral motion.
3. Measure geomagnetic component.

Specifications

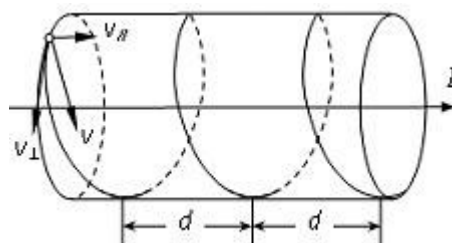
Filament	voltage 6.3 VAC; current 0.15 A
High voltage UA_2	600 ~ 1000 V
Deflecting voltage	-55 ~ +55 V
Grid voltage UA_1	0 ~ 240 V
Control grid voltage UG	0 ~ 50 V
magnetization current	0 - 2.4 A
Solenoid parameters	
Longitudinal coil (long)	length: 205 mm; inner dia: 90 mm; outer dia: 95 mm; number of turns: 1160
Transversal coil (small)	length: 20 mm; inner dia: 60 mm; outer dia: 65 mm; number of turns: 380
Digital meters	3-1/2 digits
Sensitivity of electrical deflection	Y: ≥ 0.38 mm/V; X: ≥ 0.25 mm/V
Sensitivity of magnetic deflection	Y: ≥ 0.08 mm/mA
e/m measurement error	$\leq 5.0\%$

Part List

Main Machine Unit	1
Oscilloscope Tube	1
Long Coil (solenoid coil)	1
Small Coil (deflection coil)	2
Division Screen	1
Wires	2
Instruction Manual	1



Schematic diagram of CRT



Spiral motion of electron in magnetic field