B8R06045 **Monkey and Hunter** **NFU 304**

Purpose:

This demonstration shows that a projectile fired horizontally and an object dropped vertically fall at the same rate.

Introduction:

A monkey hangs from a branch in a tree and looks down the barrel of a hunter's rifle. With "instant" reflexes should the monkey let go of the branch when the rifle is fired so that the bullet passes harmlessly overhead - after all, the barrel is pointing straight at the monkey and that's where the bullet should go. Or is it?

This apparatus allows a demonstration of the scenario to be enacted in the laboratory. The "rifle" is a spring - loaded device for projecting a safe "bullet" at a "monkey" with perfect reflexes! As the ping pong ball leaves the barrel, power to an electro-magnet supporting the monkey is cut so that the monkey falls at the instant the ball leaves the gun. No matter what the distance is between gun and monkey, the ball will always hit its target giving a dramatic demonstration of the fact that any projectile falls at the same rate regardless of its horizontal velocity.

Procedure:

Please read through carefully before use.

- Place the gun unit on a bench and, if possible, clamp into position with a G-clamp

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- Connect a low voltage power supply to the appropriate sockets and set the output to about 4V d.c. The current requirement is about 0.4A
- Support the electromagnet unit in the boss of a clamp stand placed about 2m distant and overhanging the end of a bench so that the monkey is level with the "gun" barrel and can fall to the floor
- Link the MONKEY sockets on the gun to the two sockets on the electromagnet using the long leads supplied
- Switch on the power supply and check that the monkey can be supported from the electromagnet. If it falls, increase the power supply voltage slightly but do not exceed 5V. The optimum value to use is that which just securely supports the monkey
- Line up the gun and monkey by adjusting each unit. When looking along the top of the barrel it should be aligned with the top of the monkey
- Ensure that students are out of the line fo fire and roll the ball into the barrel.
- Pull back into the "V" of the spring. Release the string and the gun will fire the ball with the monkey falling at the same instant. The ball should hit the monkey if it doesn't, check all the alignments and make suitable adjustments.
- The distance between target and gun can be varied the from very close - about Im - up to the maximum range possible i.e. when the ball and monkey meet just above the floor

Important Please Read Before Use.

The miniature solenoid used to hold and release the monkey can be damaged if used with the wrong electrical supply.

The solenoid is rated at 6V maximum and requires only 4V to easily support the weight of the monkey. If operated at 4V no overheating will occur. It is recommended that a smoothed D.C variable laboratory supply or battery to be used. The Retro Regulated PSU, B8R04367 is suitable for this application.

Before using the Monkey and Hunter apparatus please check it with the supply you intend to use. Connect the solenoid to the D.C. terminals of the supply and adjust the output to about 2V on the dial. Feed the pin on the monkey's head into the solenoid and check whether there is any slight buzzing sound and whether the pin is attracted. If there is a buzzing sound the supply is unsmoothed and should be disconnected. Try and alternative supply or use a 4.5V battery. Please contact our Technical Support Team for advice.

Warranty, repairs and spare parts:
The Monkey and Hunter apparatis is guaranteed for a period of one year from the date of delivery to the customer. This warranty does not apply to defects resulting from the action of a user such as misuse, improper wiring, any operations outside of its specification, improper maintenance or repair, or unauthorized modification.

Our liability is limited to repair or replacement of the product. Any failure during the warranty period should be referred to Customer Services.

Please contact Customer Services or techsupport@philipharris.co.uk for advice

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