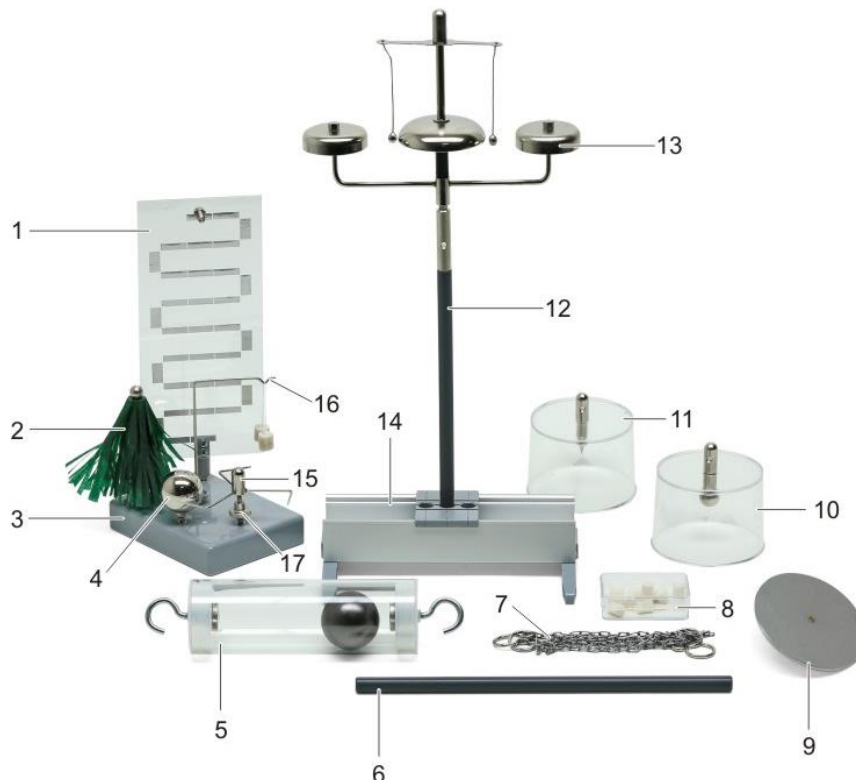


## Electrostatic Equipment Set 1000924

### Instruction sheet

11/15 ALF



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|--|--|
| 1 Luminous pane                                | 10 Box with spherical electrode                              |
| 2 Bundle of tissue paper strips on rod         | 11 Box with pointed electrode                                |
| 3 Storage stands                               | 12 Stand rod, insulated with retaining and connecting socket |
| 4 Conductor sphere 30 mm Ø, with connector pin | 13 Bell chimes   |
| 5 Rolling sphere race                          | 14 Stand base  |
| 6 Friction rod, plastic with 4 mm plug         | 15 Triskelion wheel  |
| 7 Connection chains (2 each)                   | 16 Hook stand for elder pith double pendulum                 |
| 8 Pieces of elder pith (10 in a box)           | 17 Needle bearing with connector pin                         |
| 9 Base plate with connecting pin               |  |

### 1. Safety instructions

- Discharge experimental equipment before touching.
- Discharge Wimshurst machine and Van der Graaf generator before touching.
- When using a Van der Graaf generator, attach the ground terminal to ground.
- Perform experiments only with high-voltage equipment whose short-circuit current is less than 15  $\mu\text{A}$ .

## 2. Description

This equipment set can be used in conjunction with an electrostatic generator such as a Wimshurst machine (e.g. 1002967) or a Van der Graaf generator (e.g. 1002964 @230 V; 1002963 @ 115 V) to perform a wide variety of experiments investigating electrostatic phenomena including some historic experiments.

The experiment components are equipped with 4-mm connector pins so that they may be quickly mounted on or removed from an insulated stand. Connection chains but experiment leads with 4 mm plugs can also be used.

We recommend using the Wimshurst machine 1002967 as the source of charge for these experiments.

## 3. Operation

The equipment only produces satisfactory experimental results if kept clean and dry.

- Discharge experiment components before use.

When the weather is damp, it is advisable to use a fan.

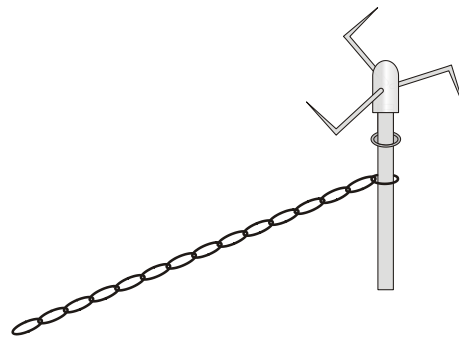
- Assemble the experiments on the stand and connect to the Wimshurst machine or Van der Graaf generator with connection chains or experiment leads.
- Observe safety advice.

## 4. Example experiments

### 4.1 Discharge from points

- Place the triskelion wheel (15) on the needle bearing (17) attached to the stand. Connect to the source of charge to charge up the wheel.

The triskelion wheel starts to turn because a jet of charge flows rapidly out of the points and propels the wheel. Increasing the charge causes the wheel to spin more quickly.



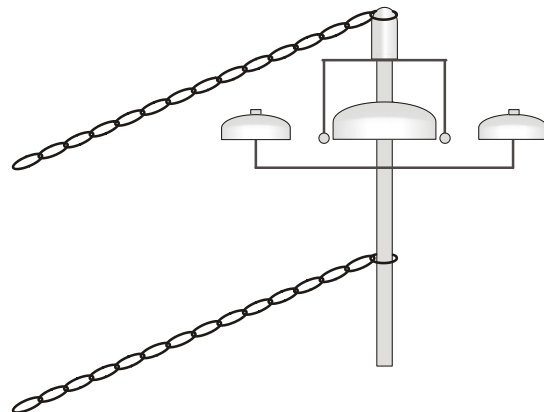
### 4.2 Bell chimes

- Attach the bell chimes (13) to the stand, connect to the source of charge and gradually increase the charge until the hammers strike the bells.

Be careful. Excessive charge can cause sparks between the mountings.

The supply of charge causes the hammers to charge up and be attracted or repelled by the bells.

When the hammers touch the bells, they discharge and swing back. The process starts again when they are loaded with the opposite charge.

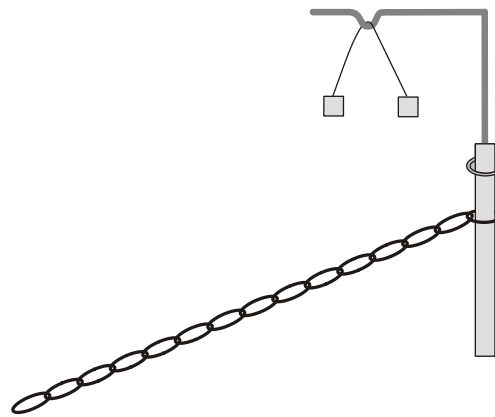


#### 4.3 Double pendulum

- A double pendulum made of elder pith (16) is attached to the hook stand. Connect to the source of charge to charge up the pendulum.

Since the pieces of elder pith assume the same charge, they repel one another.

The double pendulum is a simple electroscope.

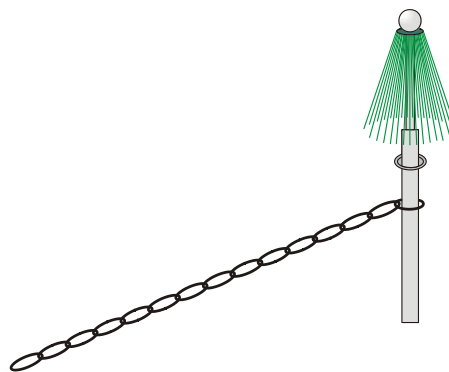


#### 4.4 Bundle of tissue paper

- Attach the bundle of tissue paper (2) to the stand, connect to the source of charge and gradually increase the charge.

The strips of paper all repel one another and spread out to all sides to look like an umbrella frame.

The bundle of tissue paper is also a simple electroscope.

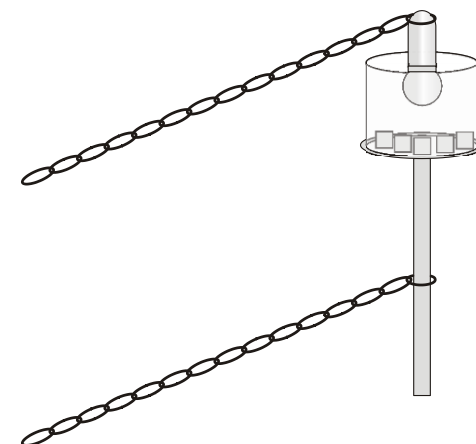


#### 4.5 Electrical dances

- Attach the base plate (9) to the stand, put 5-8 pieces of elder pith on it and place the box with the spherical electrode over the top.
- Connect to the source of charge and gradually increase the charge until the pieces of pith begin to dance.
- Stop charging and observe what happens.

Since the pieces are all charged to the same polarity as the base plate, they are repelled from it and either lose their charge or gain an opposite charge by coming close to the spherical electrode.

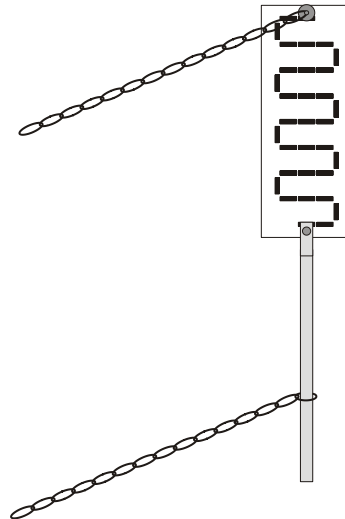
They then fall back and the process begins again even if the flow of charge entering the experiment is halted, since there will still be sufficient charge remaining.



#### 4.6 Luminous pane

- Attach the luminous plane (1) to the stand, connect to the source of charge and gradually increase the charge.

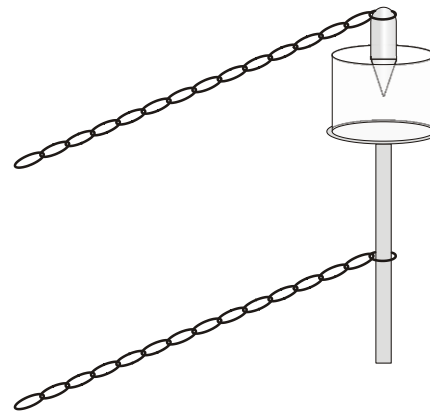
When the voltage is large sparks cross the spaces between the conductors of the pane.



#### 4.7 Smoke eater

- Attach the base plate (9) to the stand, place the box with the pointed electrode over the top and connect to the source of charge.
- Blow smoke from a cigarette or a smouldering candle into the box.
- Slowly charge up until the smoke is sucked downwards.
- Repeat the process.

The smoke particles are charged by the pointed electrode, repel one another and are attracted down to the base plate which has the opposite charge.



#### 4.8 Rolling sphere race

- Discharge the electrostatic generator by short-circuiting it.
- Suspend the ball run (5) between the generator's pair of balls in such a way that it is as horizontal as possible.
- Turn the crank of the generator to charge up the plate electrodes of the ball run.

Once the charge on the ball is large enough, it will be repelled by the electrode with the same polarity and attracted by the one of opposite polarity. The ball will then roll towards this electrode, where it will discharge and then start charging anew. The ball will then move from electrode to electrode, continuously charging and discharging as long as charge is being conveyed to the plate electrodes.

