

Television

Television

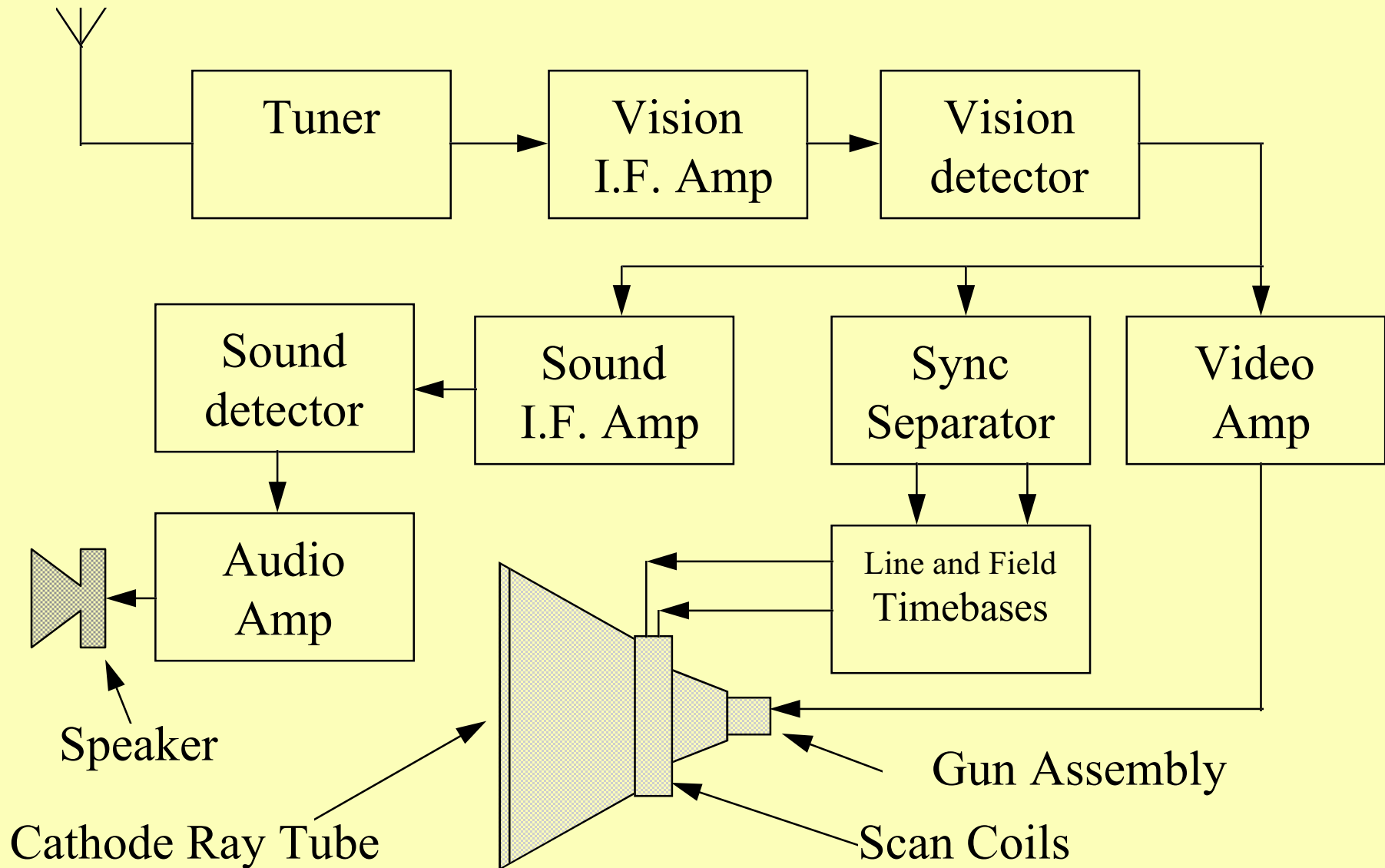
or

**The Haunted
Goldfish bowl.**

Introduction.

- Basic Sub Assembly Block Diagram.
- The Television Tube.
- Picture Presentation methods.
- Transmission Signals.

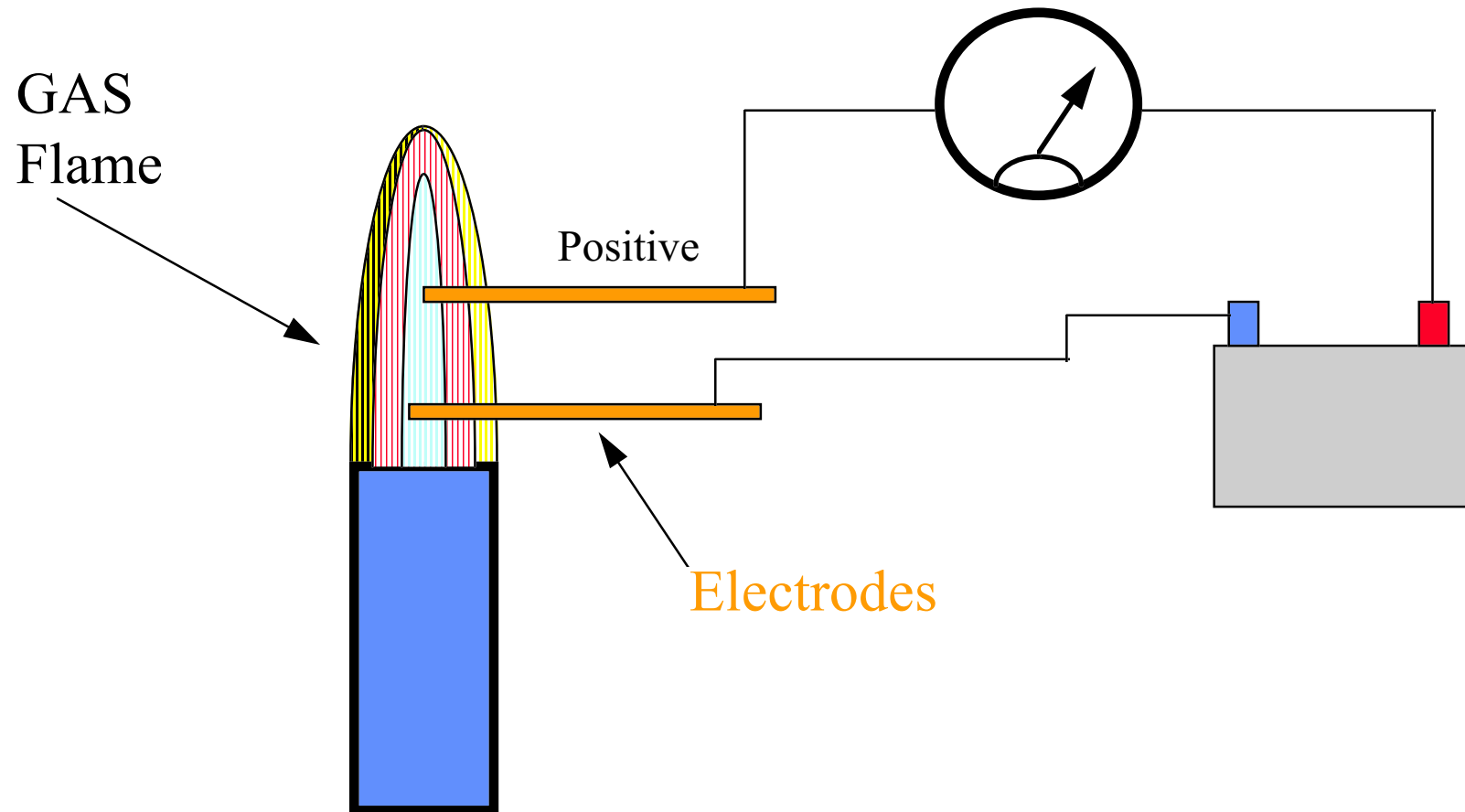
The Basic Television Block Diagram.



The Vacuum Tube (Valves).

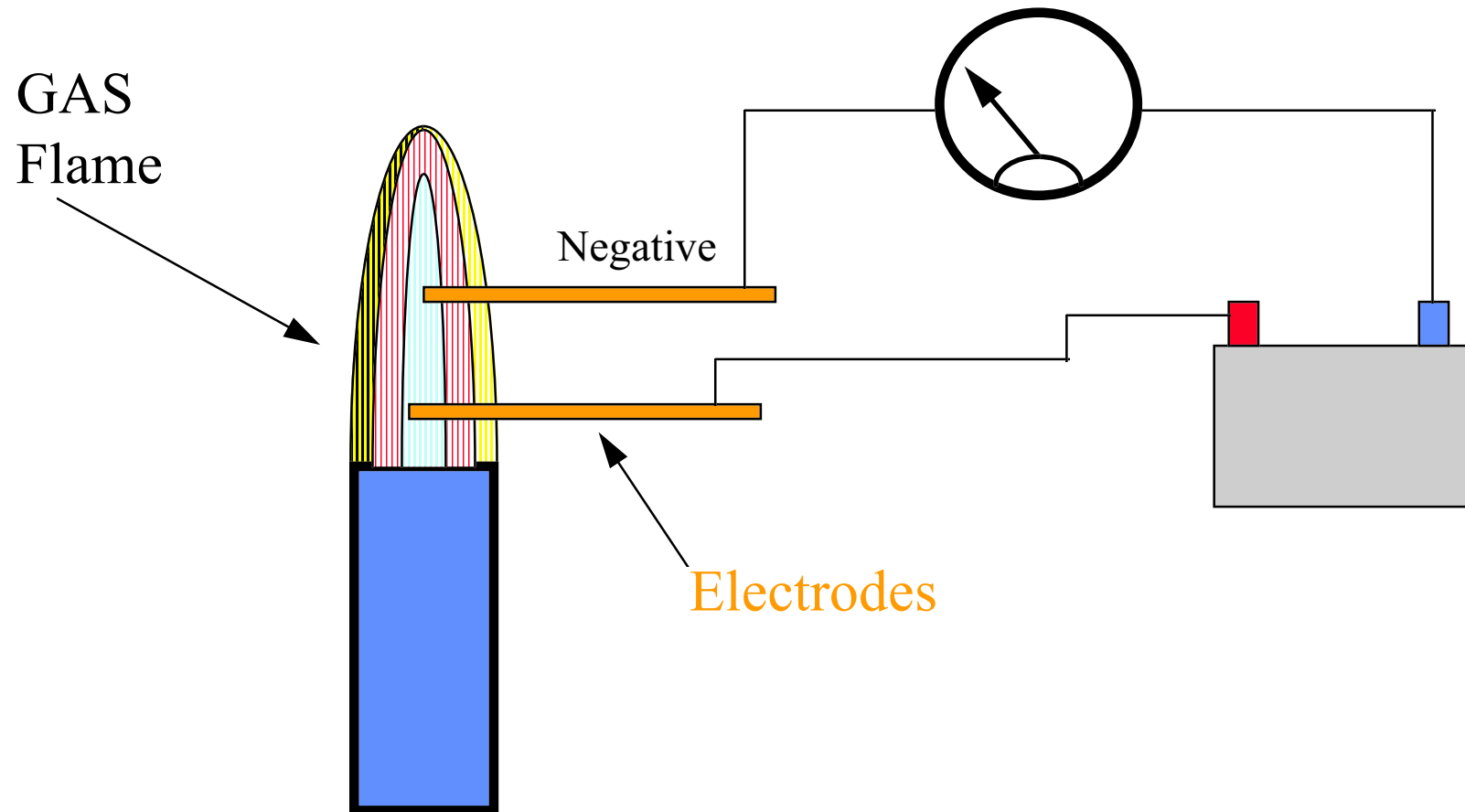
- A Bit of History
- One of the initial experiments that was performed was to place two electrodes in a gas flame and it gave the following results:-

The Vacuum Tube (Valves).



An early day Experiment.

The Vacuum Tube (Valves).



An early day Experiment.

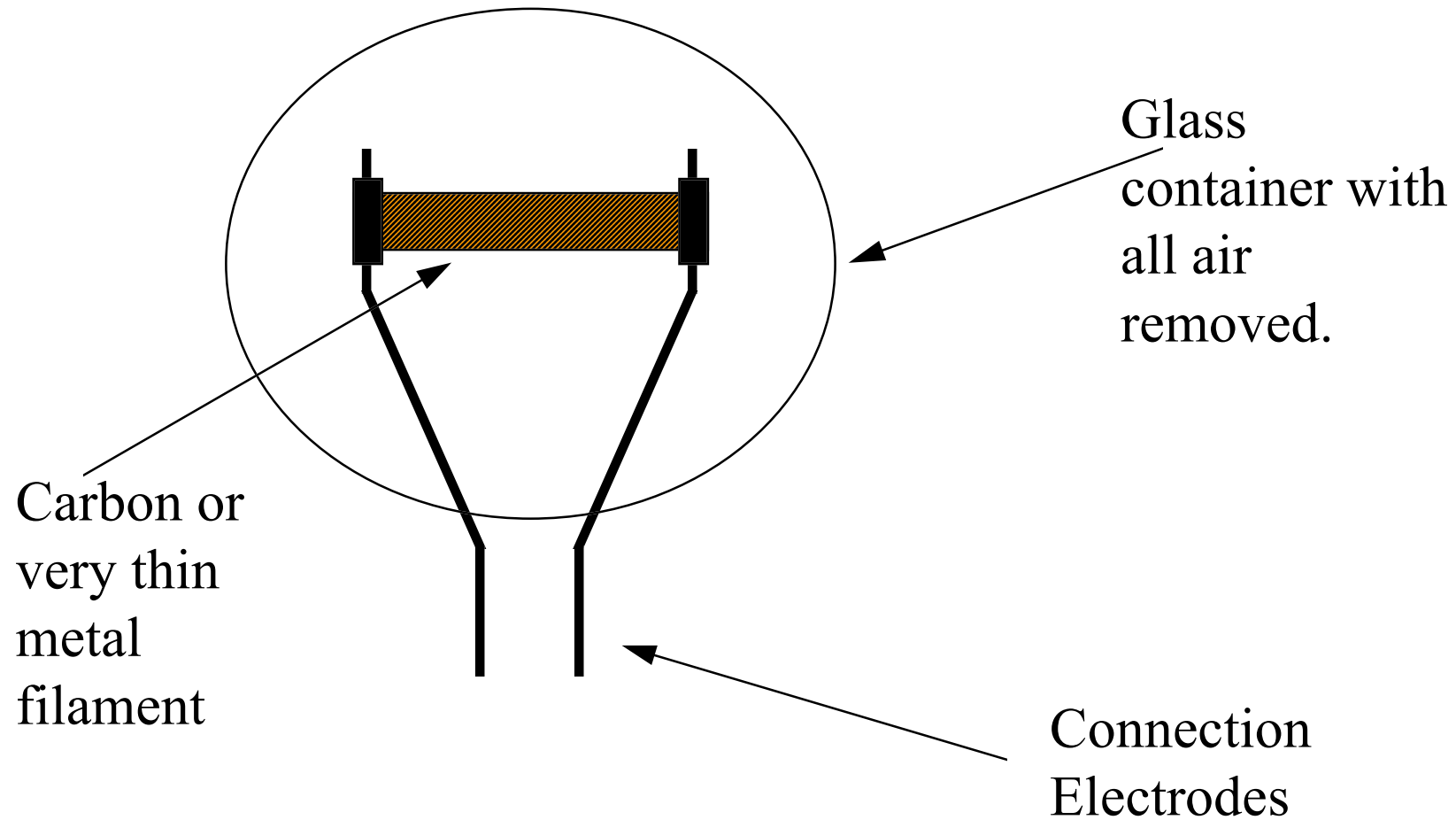
The Vacuum Tube (Valves).

What did you conclude ?

The Vacuum Tube (Valves).

- A Bit of History
- One of the initial experiments that was performed was to place two electrodes in a gas flame.
- This specific experiment did not lead to any particular device however its effect was interesting (Why did the current flow ?).
- The next stage in the development sequence was the electric lamp.

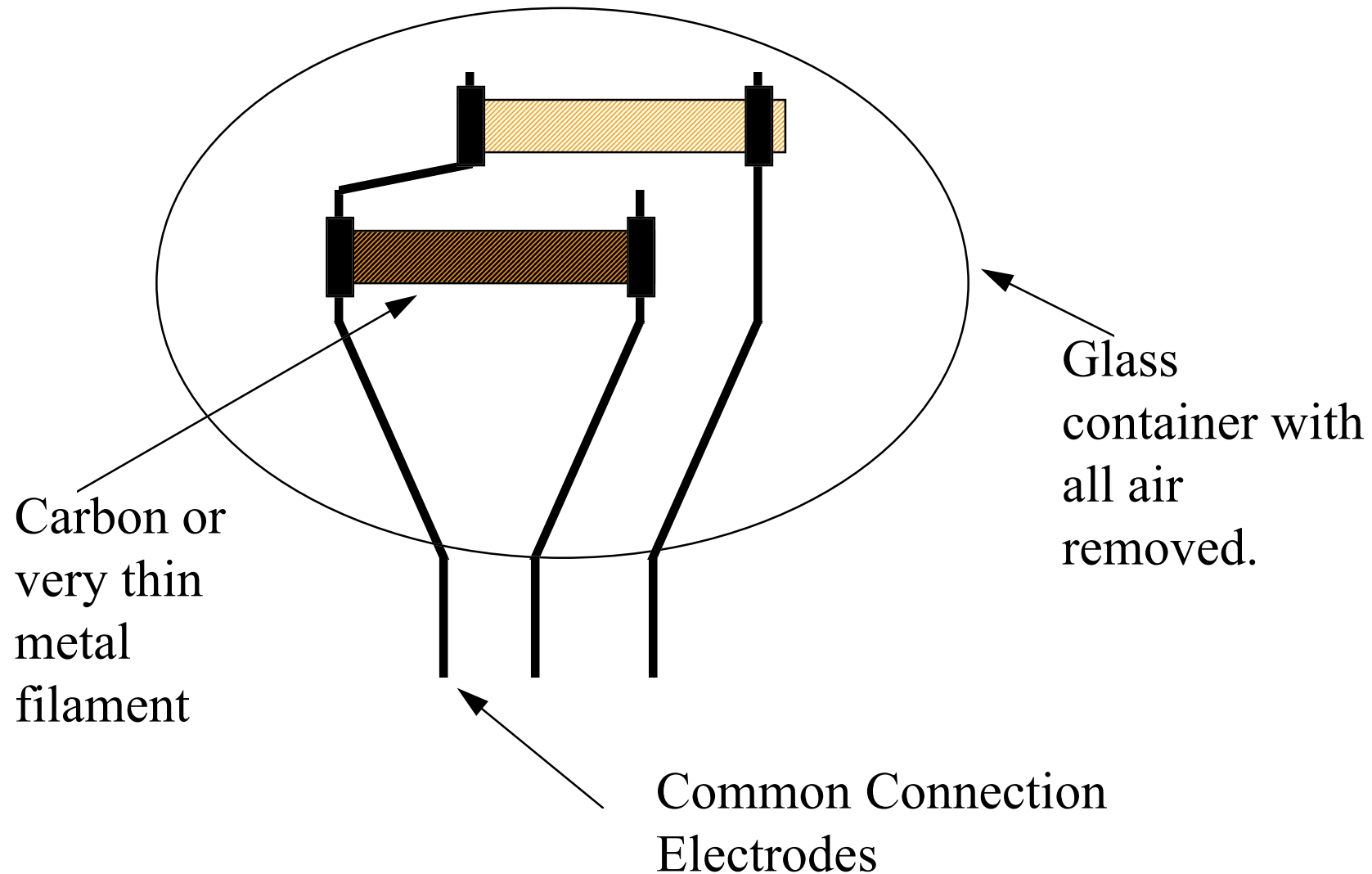
The Vacuum Tube (Valves).



The Vacuum Tube (Valves).

- The next stage in the development sequence was the electric lamp.
- These lamps were rather unreliable so the long life lamp was developed which had two filaments.

The Vacuum Tube (Valves).



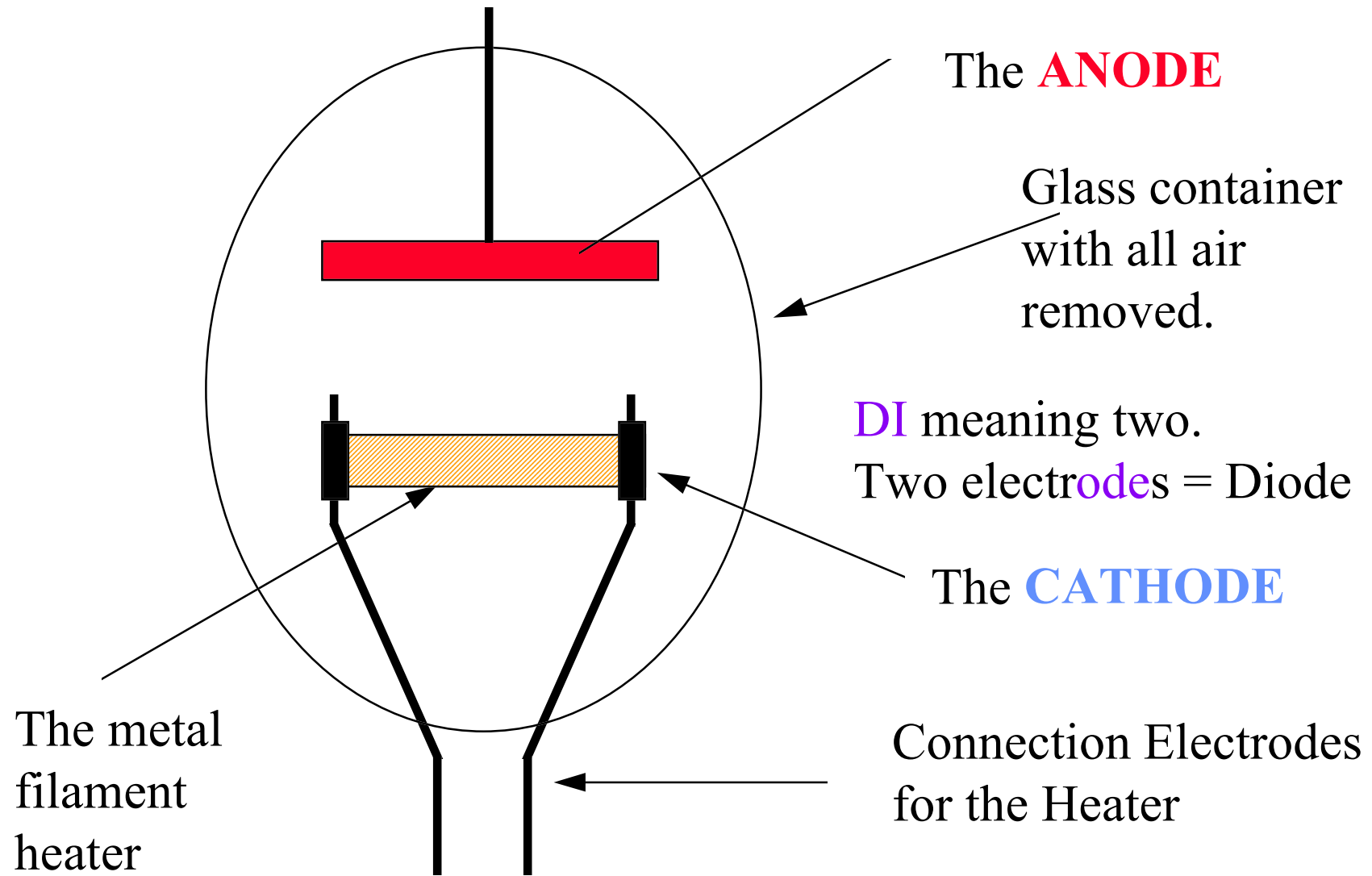
The Vacuum Tube (Valves).

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- The lamps were successful however it was noticed that a voltage appeared across the unused filament terminal.

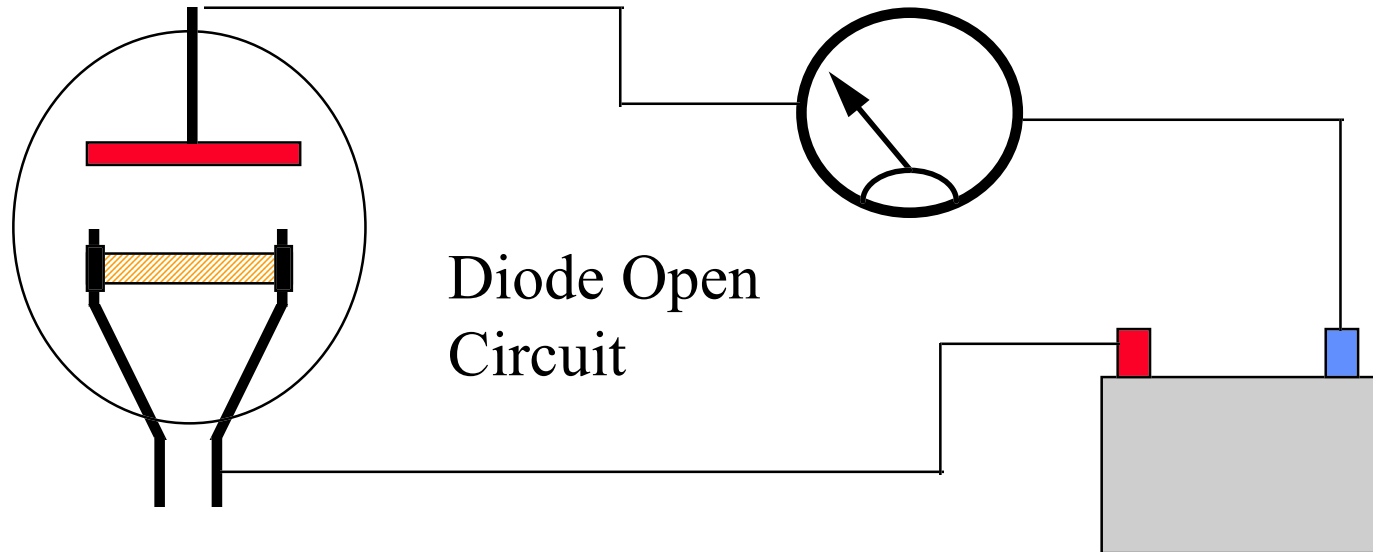
The Vacuum Tube (Valves).

- The next stage in the development sequence was the electric lamp.
- These lamps were rather unreliable so the long life lamp was developed which had two filaments.
- The lamps were successful however it was noticed that a voltage appeared across the unused filament terminal.
- More experiments are performed and this leads to the development of the Diode Valve.

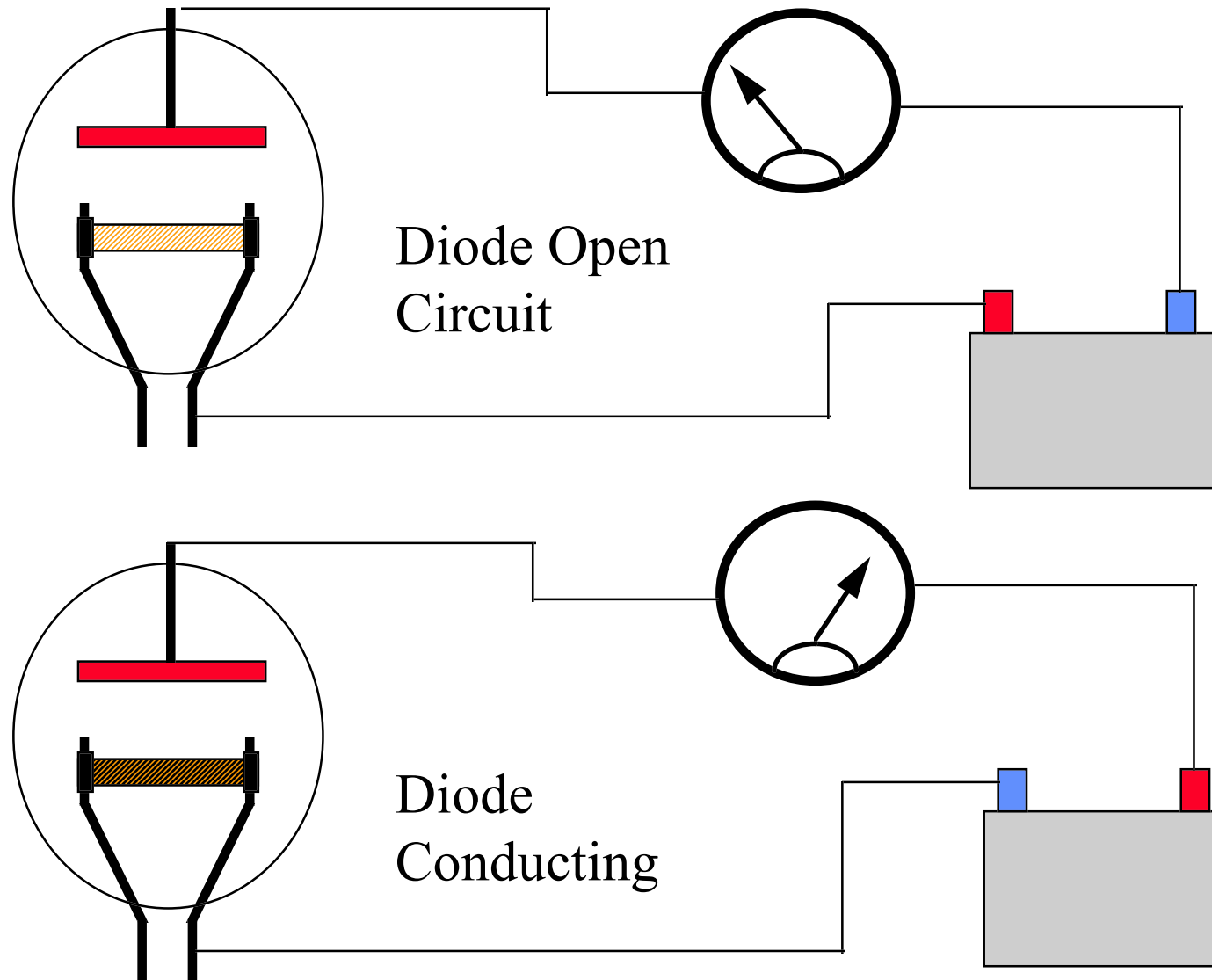
The Vacuum Tube (Valves).



The Vacuum Tube (Valves).



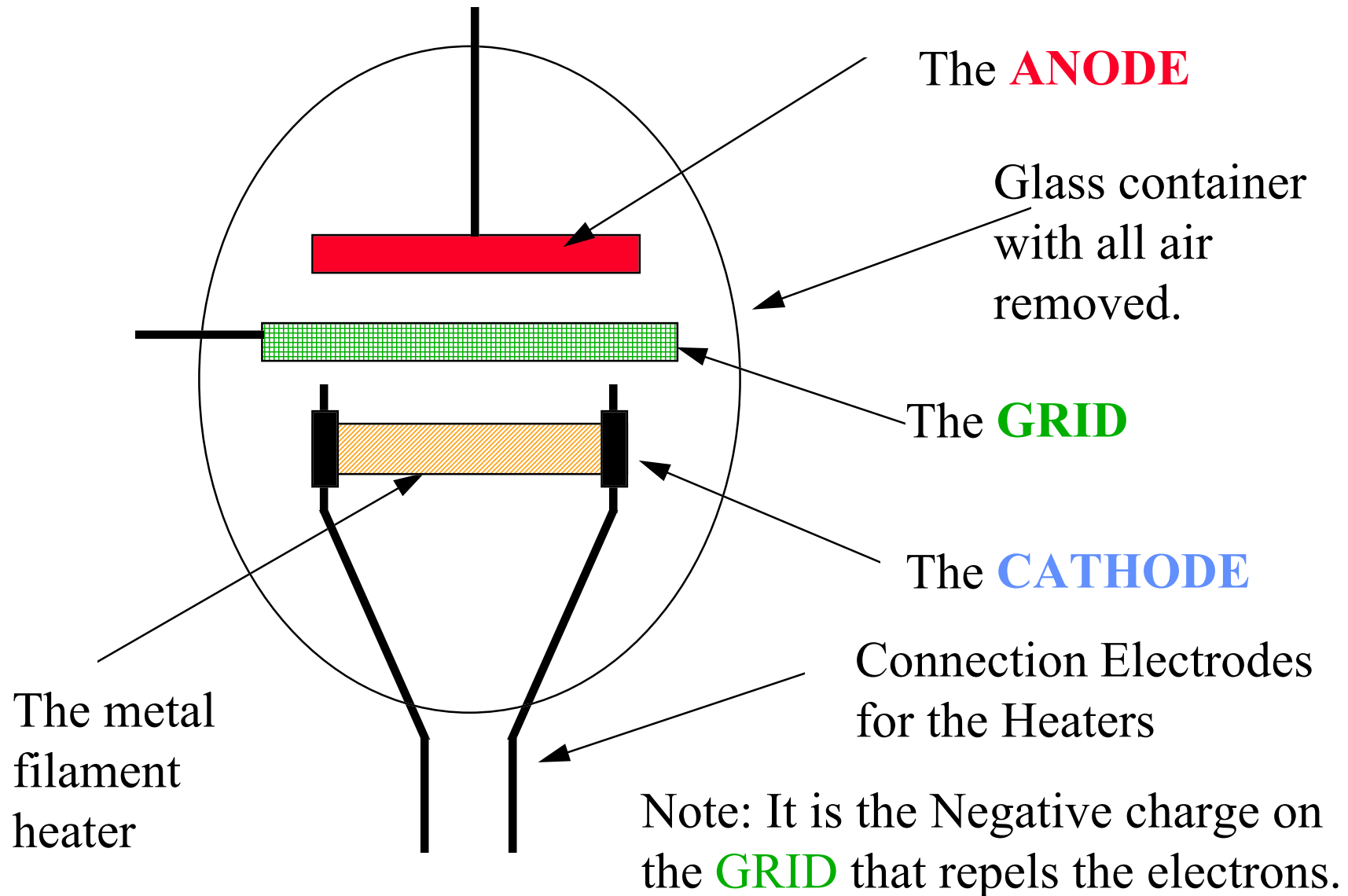
The Vacuum Tube (Valves).



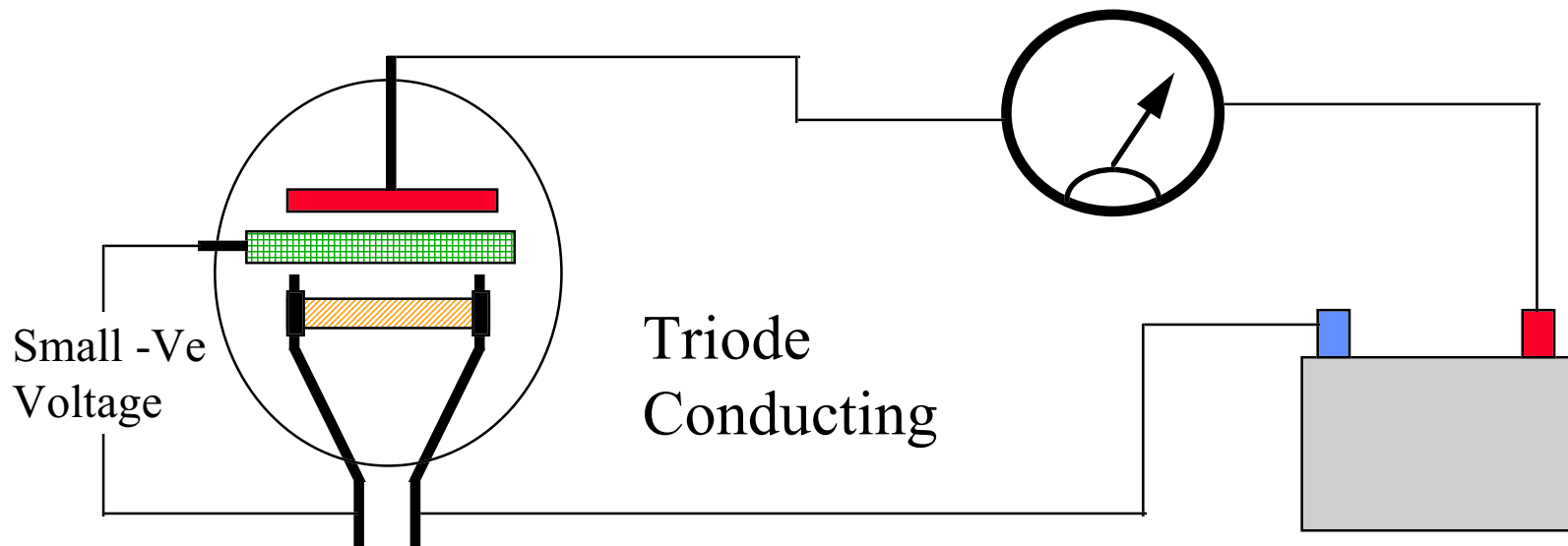
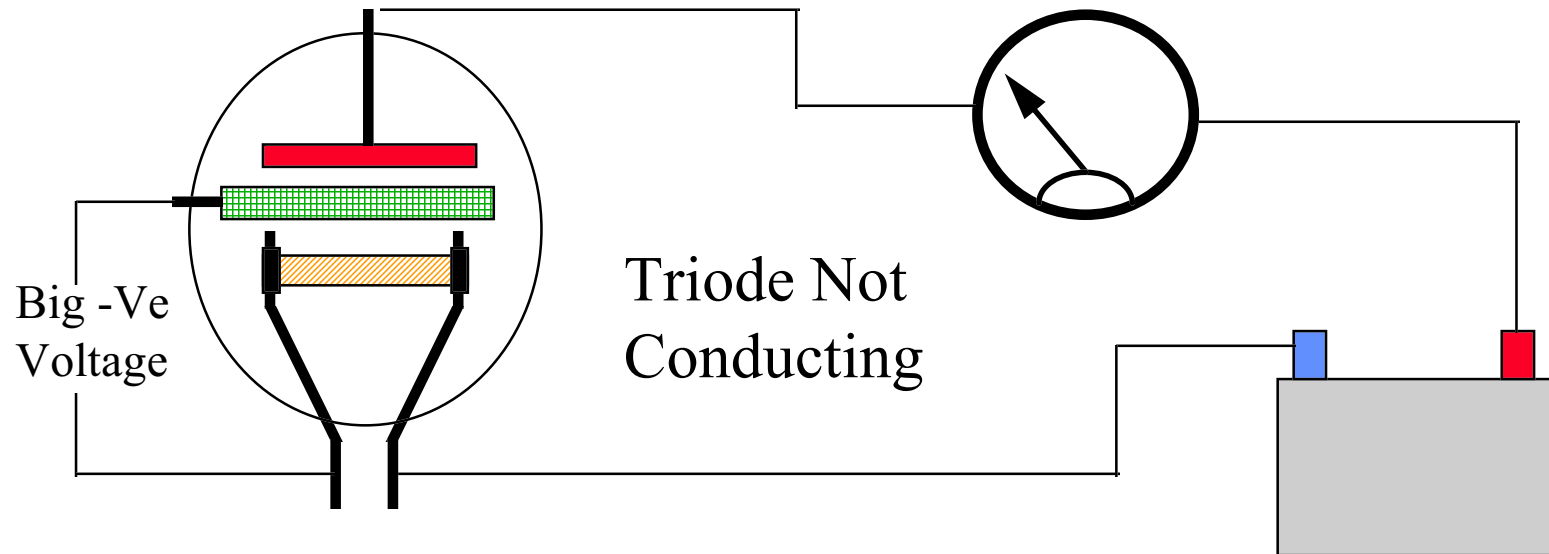
The Vacuum Tube (Valves).

- The next development needed was the ability to control the current flow in the valve and this was implemented by including an additional structure called the **GRID**. The GRID is a fine mesh that is placed between the Anode and the Cathode.
- This device was called the Triode (because there are three (**Tri**) electrodes).

The Vacuum Tube (Valves).

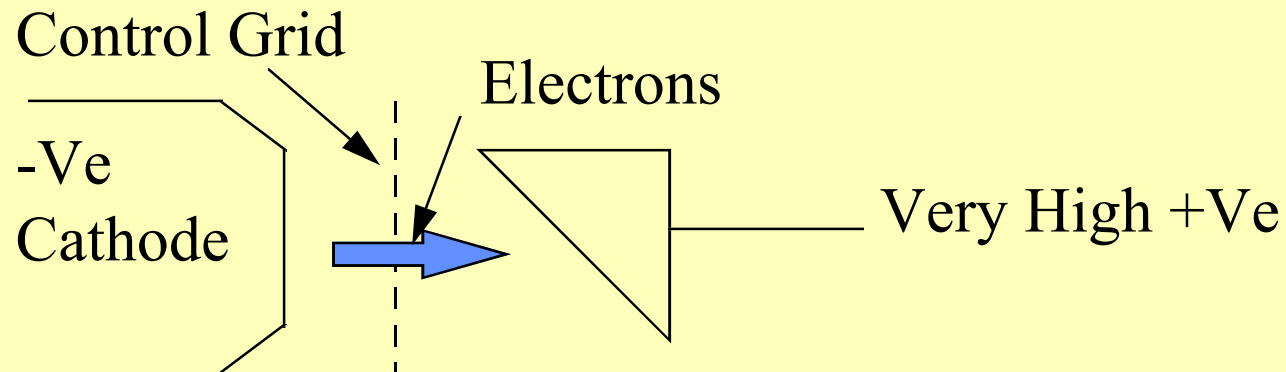


The Vacuum Tube (Valves).



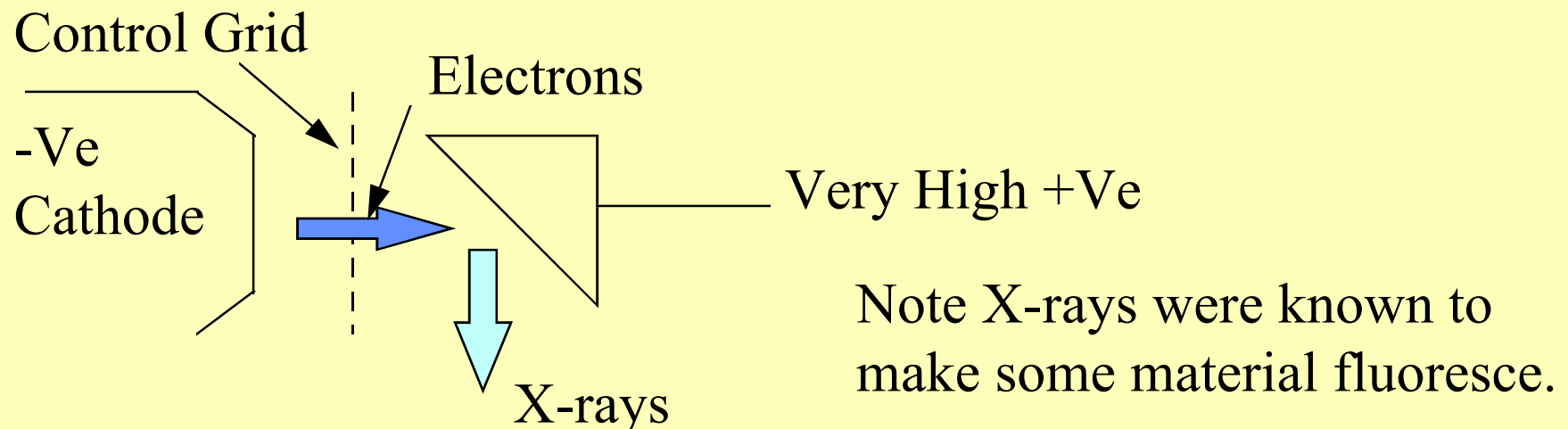
The Vacuum Tube (Valves).

- At this stage we almost have all the features we need for a CRT (Cathode Ray Tube).
- It was observed that if the ANODE was sloped and a sufficient Voltage was applied to the Anode then we can get the device to emit X-RAYS.



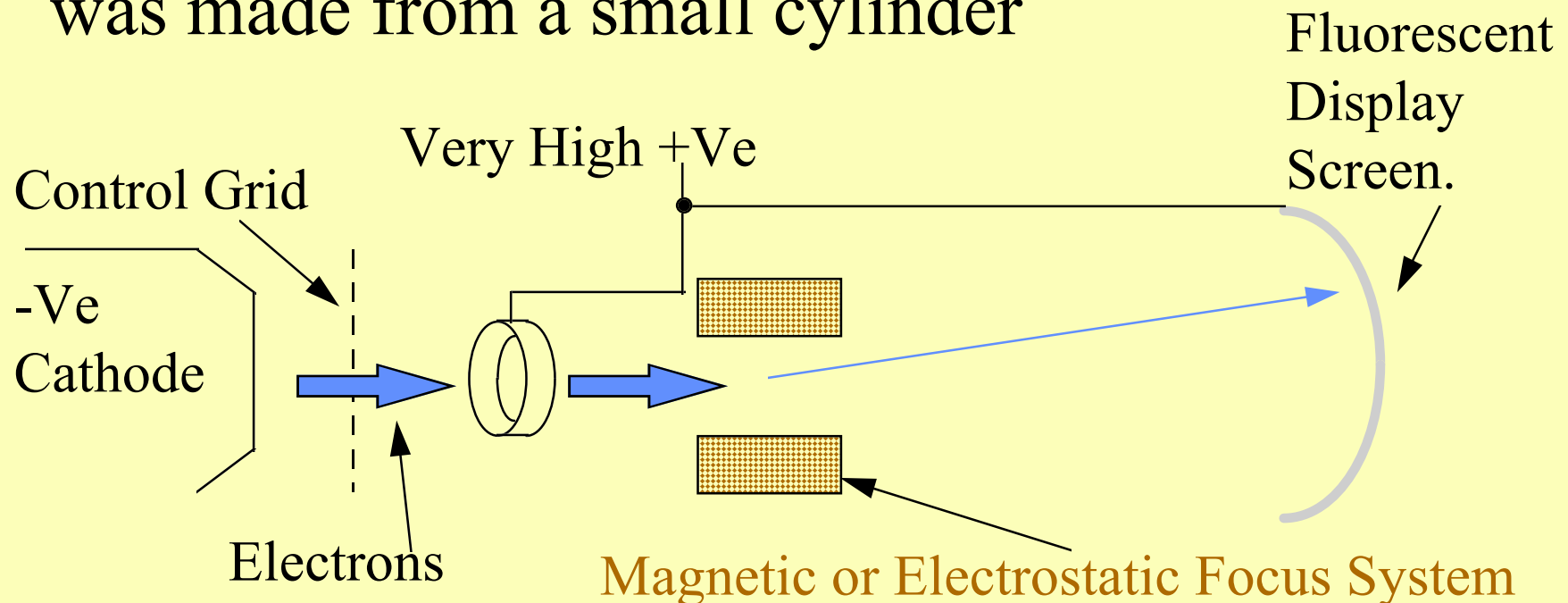
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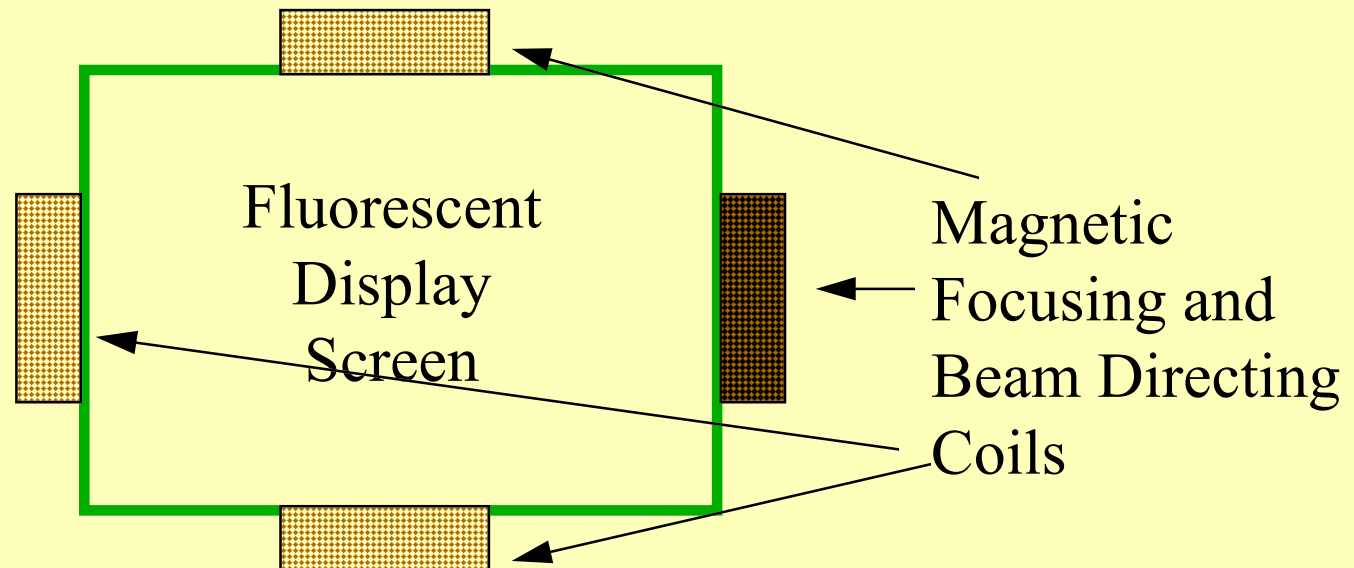
The Vacuum Tube (Valves).

- It was observed that if some materials were struck with sufficient energy from an Electron beam they would fluoresce.
- The beam was created by using an ANODE that was made from a small cylinder



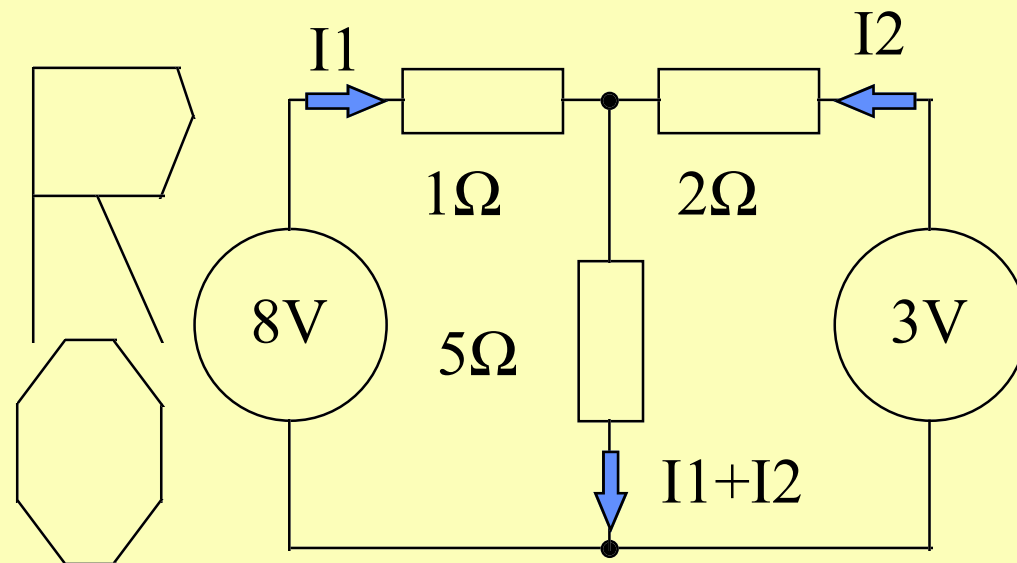
The Vacuum Tube (Valves).

- By applying the appropriate voltages to the coils the electron beam can be directed to any part of the screen.
- With this capability there are two distinct types of display writing that could be used.



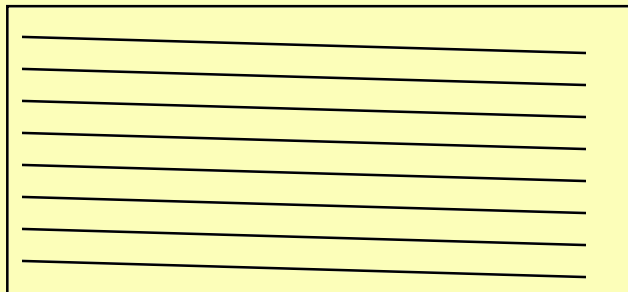
Picture Presentation Methods.

- **Vector Graphics.** The display presentation is made up from a series of lines.
- The main advantage with this type of display is that the detail is fully scaleable to any display size. Often used in Radar Displays, Oscilloscopes etc.



Picture Presentation Methods.

- **Raster Graphics.** The display presentation is made up from a series of horizontal lines.
- Each line can be sub-divided into Pixels (Picture Elements).
- The main advantage with this type of display is that it is a compromise format and is suitable for most applications.



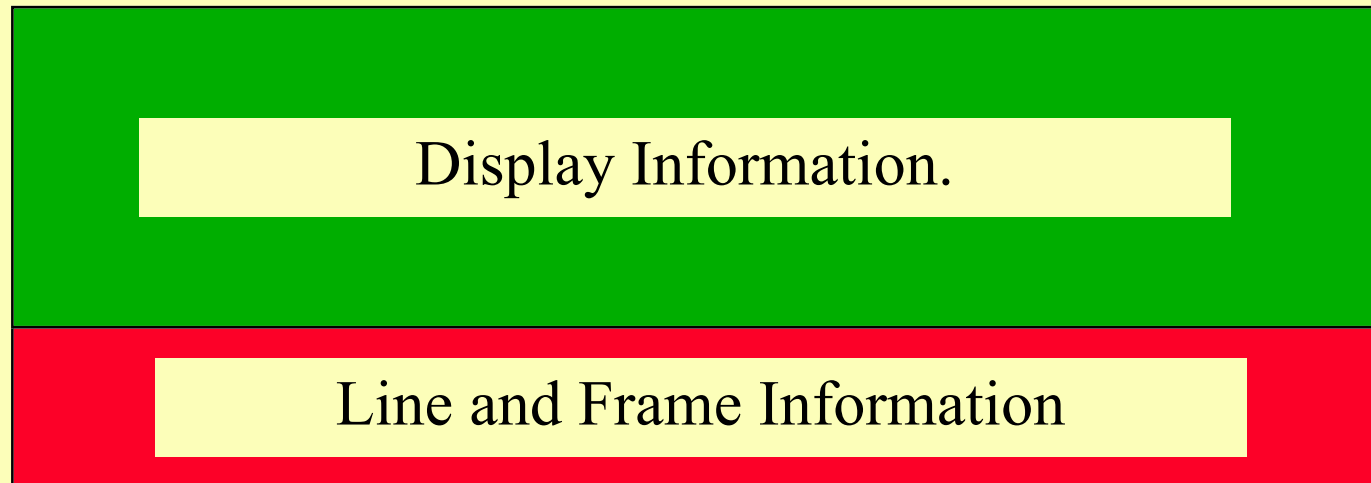
See Raster.Exe
Demonstration

Picture Presentation Methods.

- **Raster Graphics.** As we are dealing with a display format that is constructed of Lines and frames.
- The Transmission format can be quite complex.
- The signal is normally amplitude modulated where :-
 - part of the signal hold the intelligence.
 - part of the signal identifies where the lines and frames begin and end.

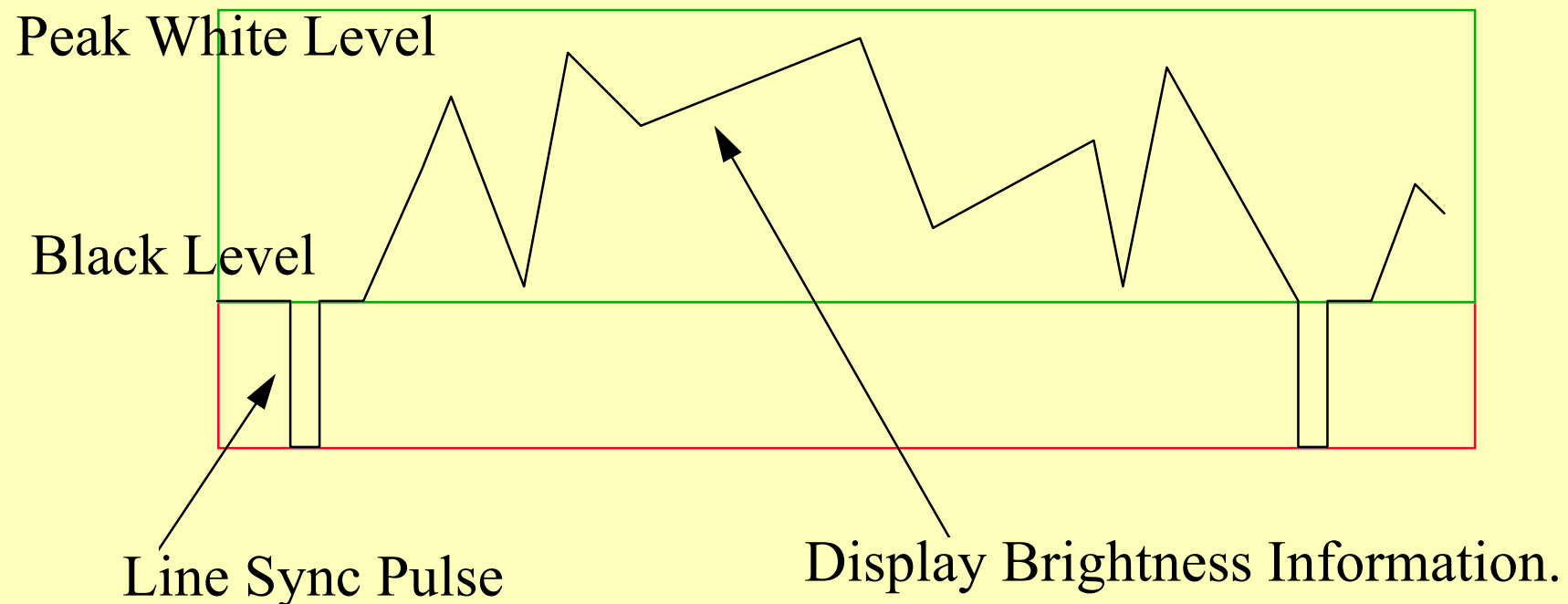
Transmission Signals.

- A typical Line of information would appear as follows :-
- The relative amplitudes of the signals are $1/3$ and $2/3$ of the peak signal.



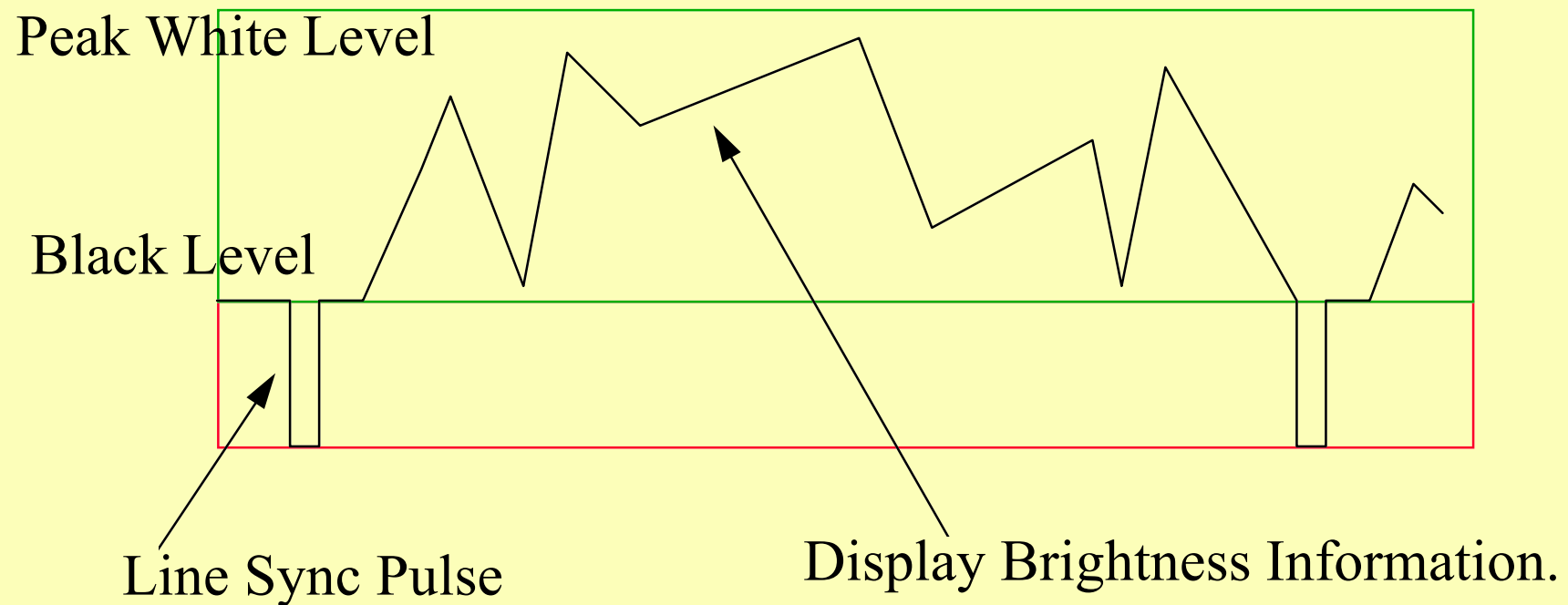
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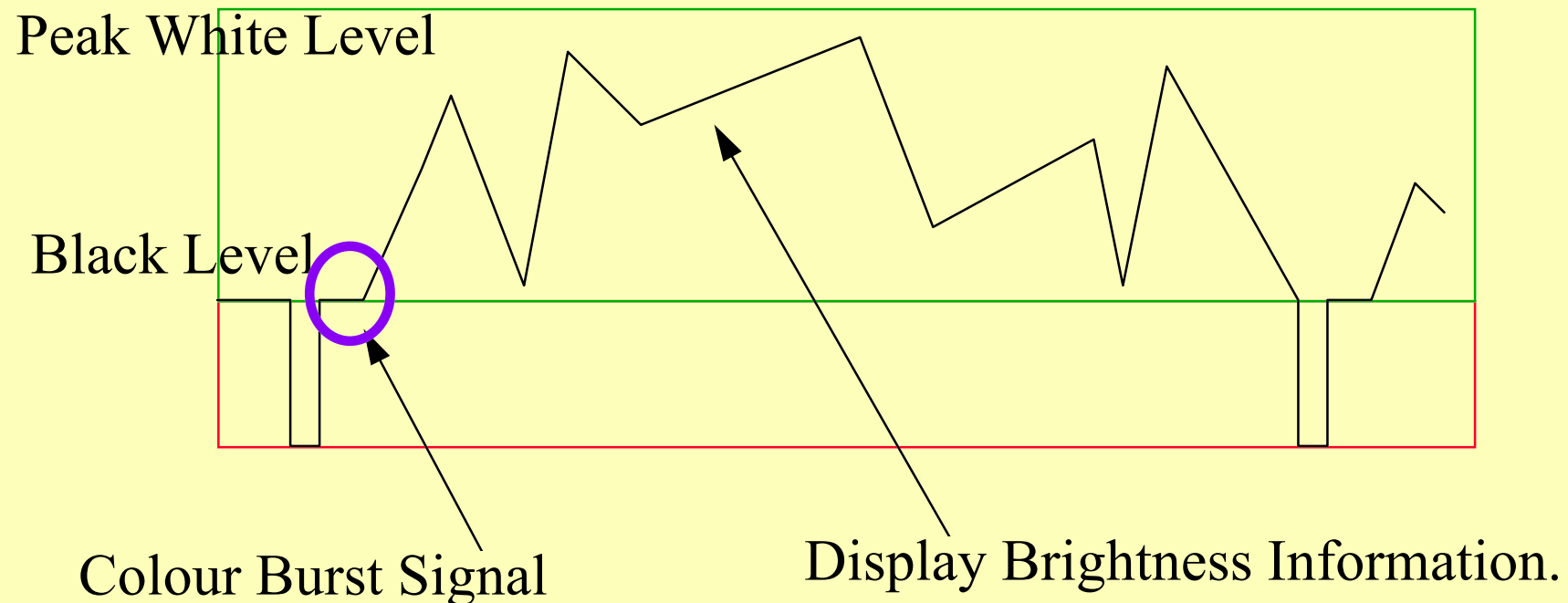
Transmission Signals.

- Where does the colour come from ?



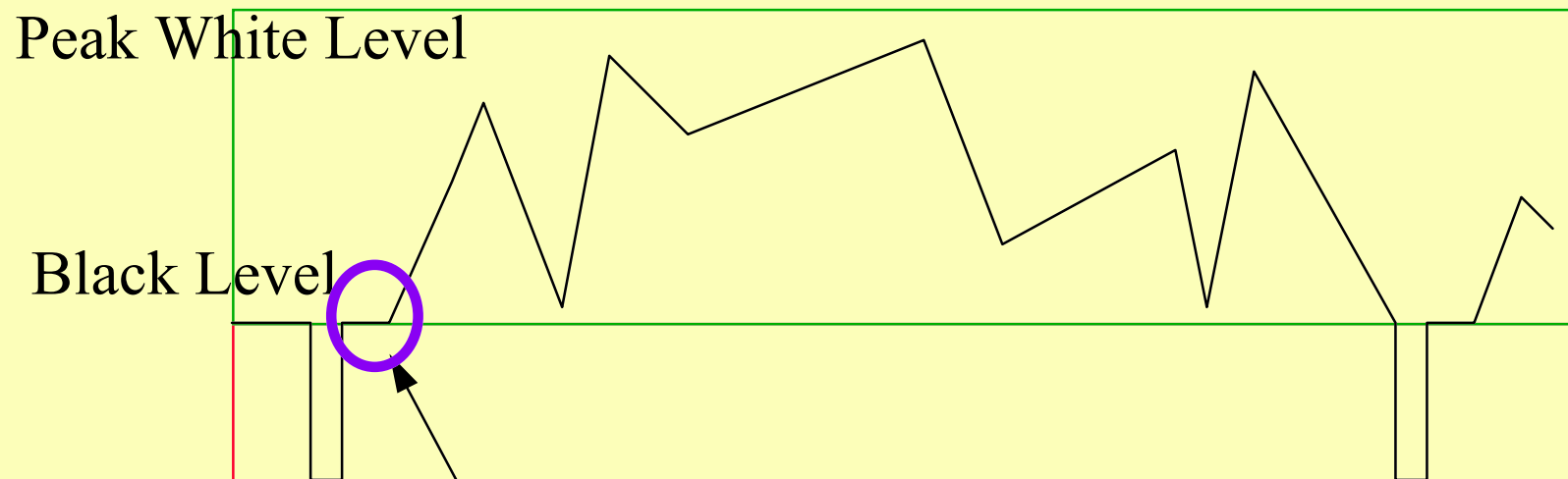
Transmission Signals.

- Where does the **Colour** come from ?
- The human is very poor at discriminating colour and providing we are given clues the brain fills in the rest of the information.



Transmission Signals.

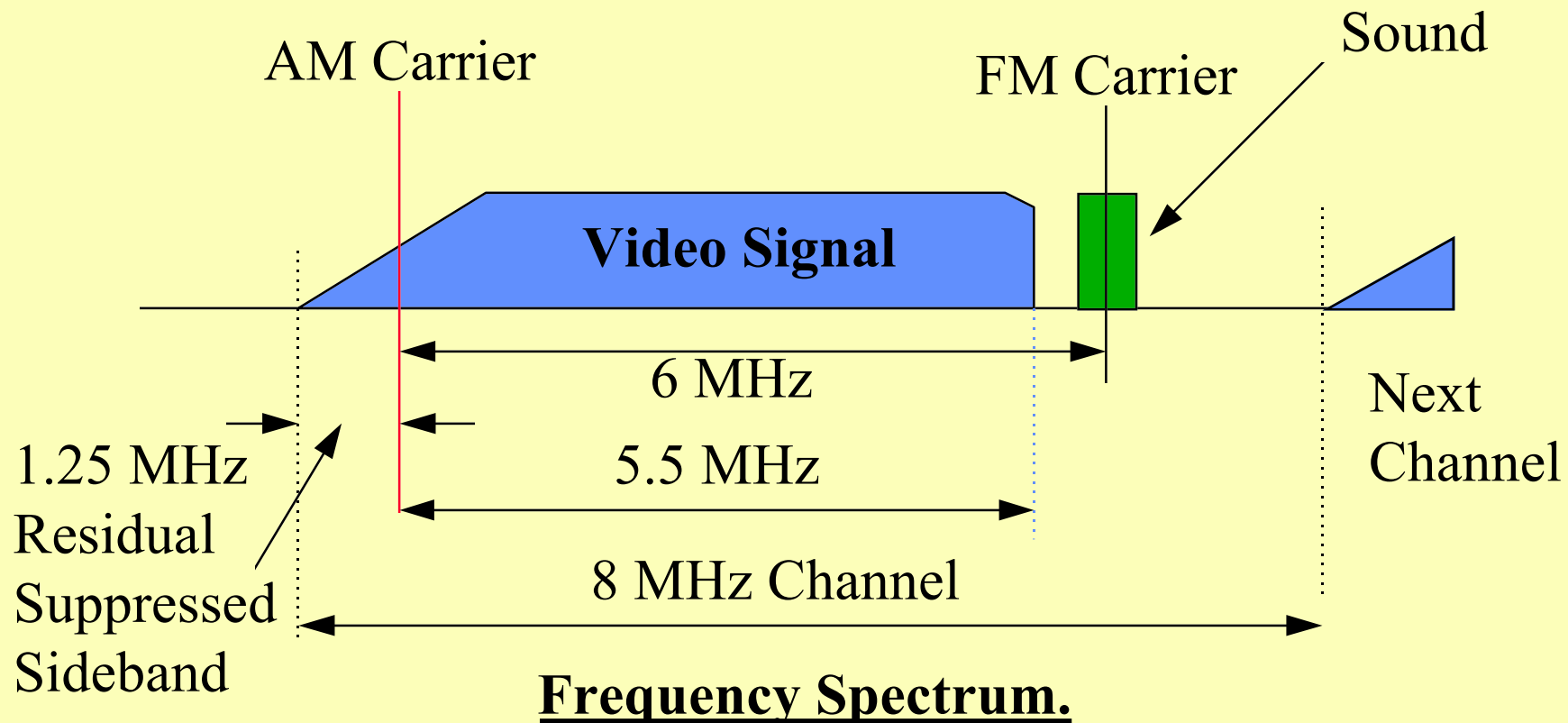
- The Colour burst signal synchronises a local oscillator and then it is the phase difference between it and main display signal that selects the **RED**, **GREEN** or **BLUE** guns.



Colour Burst Signal (Just a few cycles are present).

Transmission Signals.

- Where does the **Sound** come from ?
- This bit is easy just extract using a 6MHz offset and a standard FM decoder from video signal.



End Slide

Revision Page

<u>Title</u>	BASIC Television Electronics.
<u>Author</u>	R. J. Spriggs
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<u>Version</u>	1.01
<u>Edit</u>	0009

