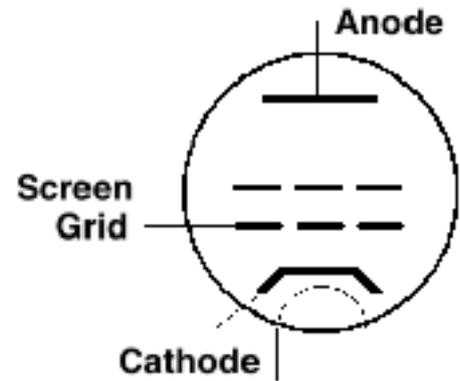


Tetrode

- 4 electrodes (*tetrode*).
- Normally used as an amplifier.
- Offers higher gain than Triodes



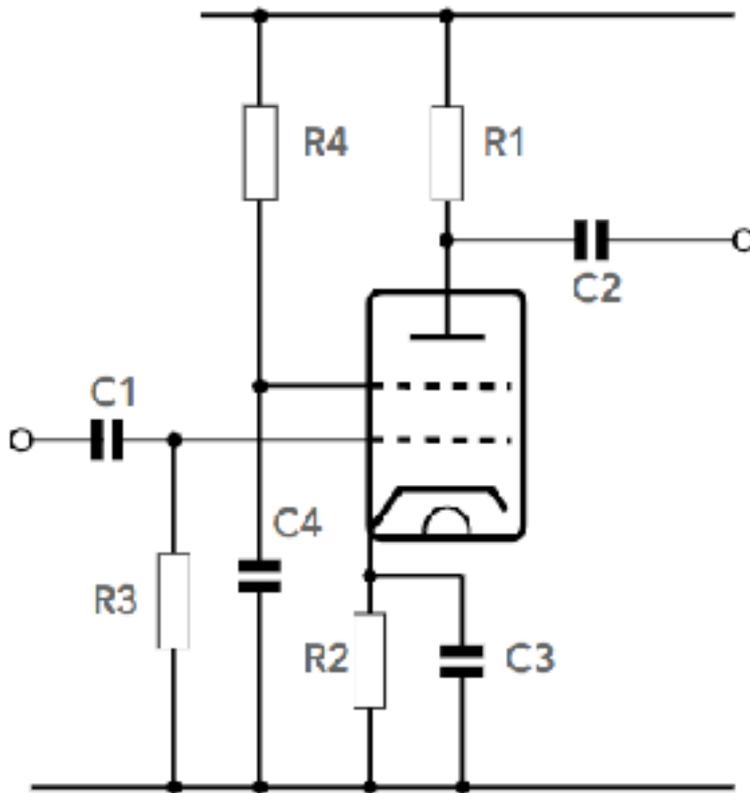
The Cathode emits electrons when heated which will flow to the Anode if a positive voltage (with respect to the cathode) is applied. Current will not flow in the reverse direction.

An electrode called the Control Grid or simply Grid is placed between the Cathode and Anode. When a negative voltage is applied to the Grid the flow of electrons between the Cathode and Anode is reduced due to negative electrostatic field.

With the addition of a new Screen Grid between the Control Grid and the Anode it was found the Millar capacitance effect could be neutralised thus allowing the Tetrode to operate at higher gain levels than the Triode. A positive voltage slightly lower than the Anode is applied to the Screen Grid.

Unfortunately the tetrode did have a new problem. In all valves when electrons strike the Anode, some will cause a secondary emission of electrons from the surface. This wasn't an issue in triodes as the positive Anode would re-capture the electrons. However in the case of the Tetrode another positive element in the form of the Screen Grid can capture these secondary electrons. This has the effect of reducing amplification.

Example Circuit



This Tetrode is configured to operate as an amplifier. The Characteristics need to be reviewed and components chosen to ensure the device is operating in a linear region.

Just as in the Triode circuit this circuit is implementing Cathode bias to achieve this. Please refer to my Triode data sheet for a full explanation.

The operation of the circuit is the same as for the Triode with the exception of the additional Screen Grid. The Screen Grid is set to a high positive voltage using the resistor R4 and C4 is used to provide a bypass to ground for higher frequencies.