

Klystron

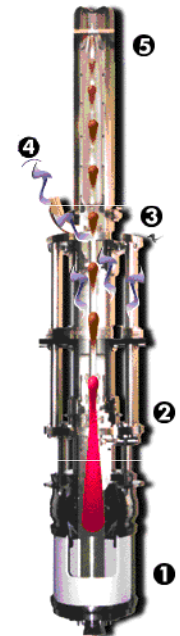
- A power [amplifier](#) tube used to amplify weak microwave energy (provided by a radio- frequency exciter) to a high power level for a radar transmitter.
- A klystron is characterized by [high power](#), [large size](#), [high stability](#), high gain, and high operating voltages.
- Electrons are formed into a beam that is [velocity](#) modulated by the [input](#) waveform to produce microwave energy.
- A klystron is sometimes referred to as a [linear](#) beam tube because the direction of the [electric field](#) that accelerates the [electron beam](#) coincides with the axis of the [magnetic field](#), in contrast to a crossed-field tube such as a magnetron.
- Klystrons provide a [coherent transmitted](#) signal appropriate for [Doppler radar](#) and pulse-compression applications.
- They are used in many operational radars, for example, [NEXRAD](#) (Next Generation Weather Radar) and TDWR ([Terminal Doppler Weather Radar](#)).

Klystron

In a klystron:

1. The electron gun produces a flow of [electrons](#).
2. The bunching cavities regulate the speed of the electrons so that they arrive in bunches at the output cavity.
3. The bunches of electrons excite microwaves in the output cavity of the klystron.
4. The microwaves flow into the waveguide, which transports them to the [accelerator](#).
5. The electrons are absorbed in the beam stop.

www2.slac.stanford.edu/vc/accelerators/klystron.html



Magnetron

- A self-excited oscillator used as a radar transmitter tube.
- Magnetrons are characterized by [high peak power](#), [small size](#), efficient operation, and low operating voltage.
- Emitted electrons interact with an [electric field](#) and a strong [magnetic field](#) to generate [microwave](#) energy.
- Because the direction of the electric field that accelerates the [electron beam](#) is [perpendicular](#) to the axis of the magnetic field, magnetrons are sometimes referred to as [crossed-field tubes](#).
- Unlike a klystron, a magnetron is [not a coherent](#) transmission source, but has a randomly changing phase from pulse to pulse.
- A coaxial magnetron uses a different architecture and has better stability, higher reliability, and longer life.
- Magnetrons are used in [inexpensive radars](#) and [microwave ovens](#).

<http://amsglossary.allenpress.com/glossary/search?id=magnetron1>

Magnetron

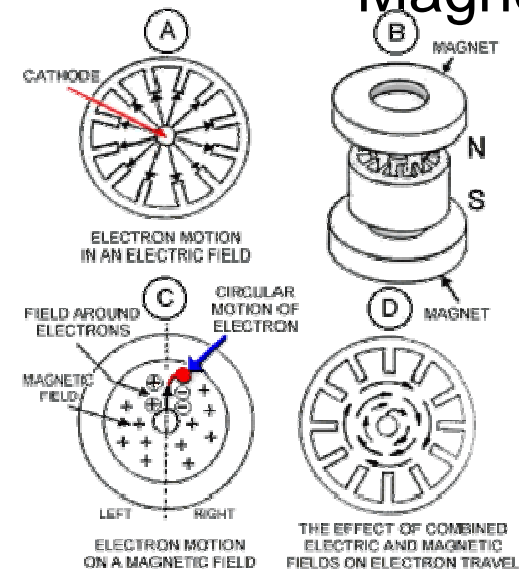
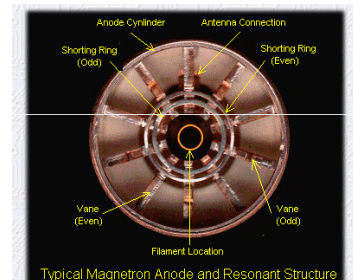
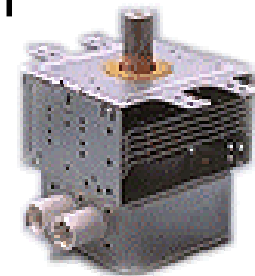


Figure 3 Electron motion in a magnetron tube
(Courtesy of Michael S. Wagner)



<http://www.gallawa.com/microtech/magnetron.html>

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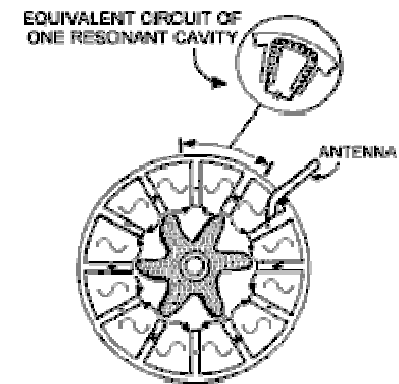


Fig. 4 Electrons form a rotating pattern
(Courtesy of Michael S. Wagner)