Class 5
Ham Radio General Supplement

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1

Almost Done!

- Review
- Rectifiers
- Modulation, Deviation, and Bandwidth
- Transformer turns ratio [optional]

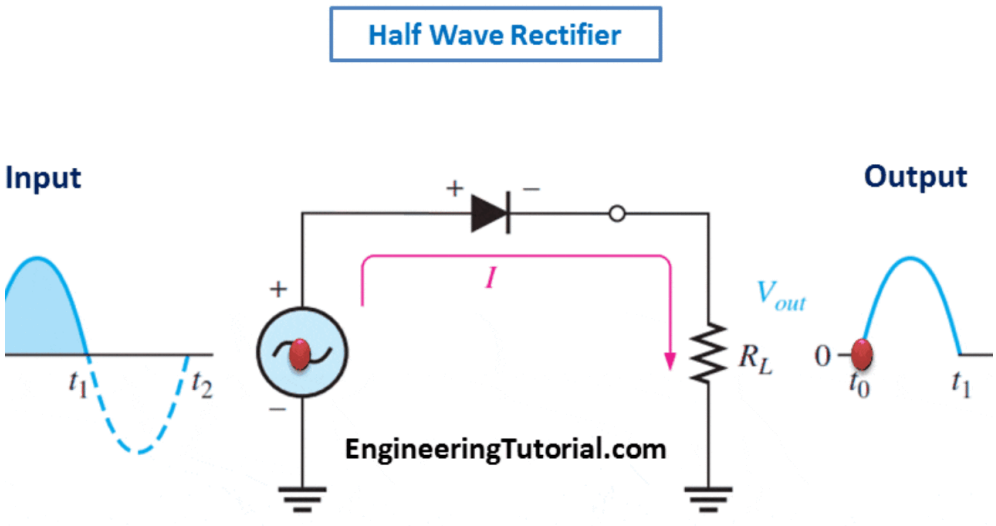
2

Rectifier

- Changes AC to DC
- Three Types
  - Half Wave
  - Full Wave
  - Full Wave Bridge

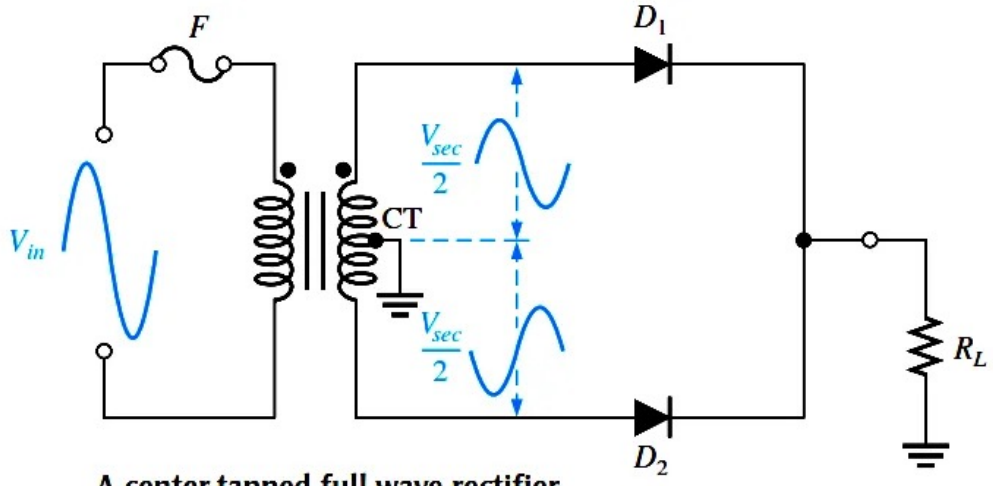
3

Half Wave Rectifier



4

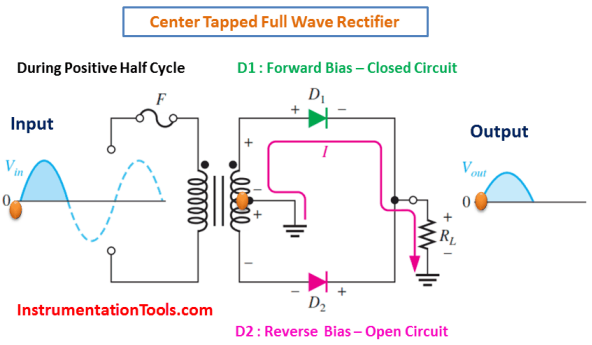
Full Wave Rectifier

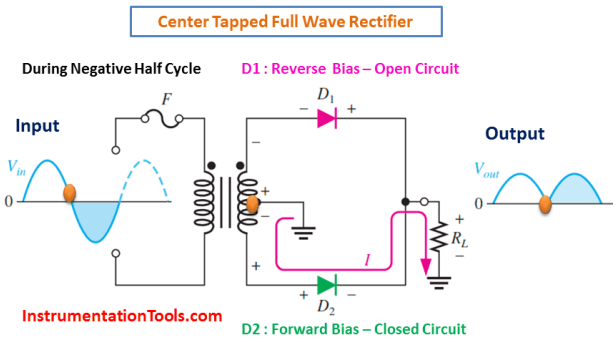


A center-tapped full-wave rectifier

5

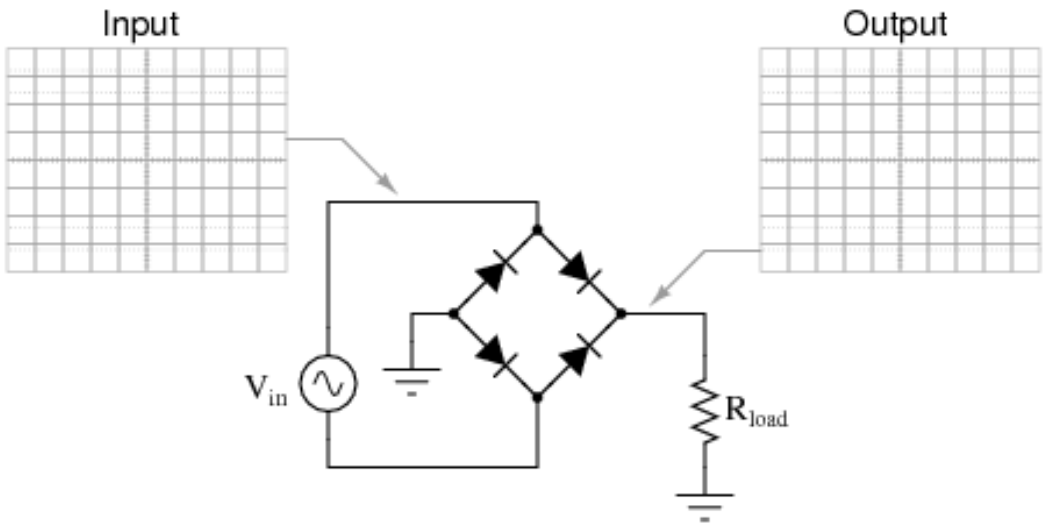
Full Wave Rectifier





6

Bridge Rectifier



7

FM Audio Modulation

- Audio frequency deviates the carrier
- The amplitude also deviates the carrier
- They add!

8

Carson's Rule

Peak deviation [a transmitter design parameter]

Plus

highest modulation frequency [enforced by filters]

All multiplied by two

9

Question G8B06

"What is the total bandwidth of an FM-phone transmission having a 5kHz deviation and a 3kHz modulating frequency?"

(5 + 3) x 2 = 16kHz

10

Question G8B02

"What is the total bandwidth of an FM-phone transmission having a 5kHz deviation and a 3kHz modulating frequency?"

(5 + 3) x 2 = 16kHz

11

Question G8B07

"What is the frequency deviation for a 12.21 MHz reactance modulated oscillator in a 5 kHz deviation, 146.52 MHz FM phone transmitter?"

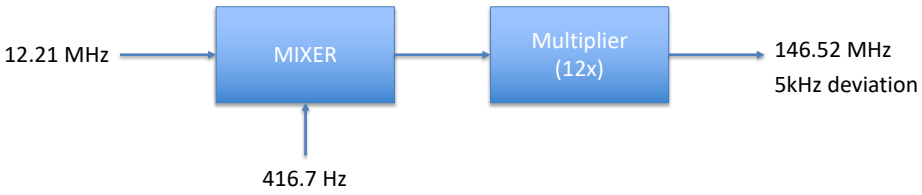
Divide deviation by ratio of frequencies

146.52/12.21 = 12

5/12 = 0.4167kHz = 416.7 Hz

12

Reactance Modulator



146.52MHz/12.21MHz = 12
5kHz/12 = 0.4167kHz = 416.7 Hz

13

Question G8B02

"If a receiver mixes a 13.800 MHz VFO with a 14.255 MHz received signal to produce a 455 kHz intermediate frequency (IF) signal, what type of interference will a 13.345 MHz signal produce in the receiver?"

Image Response

The IF is the difference of the signal and VFO

14

Question G5C07

"What is the turns ratio of a transformer used to match an audio amplifier having 600 ohm output impedance to a speaker having 4 ohm impedance?"

√ (600/4) = 12.1

100% derivable with just Ohms law!

15