# OUTLINE

1. Frequencies in question (Where the RF radiation is coming from)
2. Power densities for each frequency
3. Clock sources
   1. Overview of operation
      1. Oscillator types
         1. Crystal oscillator
         2. Ceramic resonator
         3. Internal Fast RC oscillator
      2. Chip modes
         1. XT Mode, medium gain, medium frequency mode to work with crystal frequencies of 3.5MHz to 10MHz [1] pg21
         2. HS Mode, High Gain, High-Frequency mode used to work with crystal frequencies of 10 MHz to 40 MHz [1] pg21
         3. EC Mode, if the on-chip oscillator is not used, the EC mode allows the internal oscillator to be bypassed. [1] pg21
      3. Oscillator Start-up Time [1] pg22
         1. Primary oscillator
         2. In reference to the experiment, the oscillator should be stable when taking measurements, and the oscillator startup time should be avoided.
      4. Low power RC oscillator
         1. Nominal 32 kHz
      5. RC oscillator
         1. 7.37 MHz
         2. -12% to +11.625%
         3. Phase shift oscillator [2]
         4. Wein bridge oscillator [2]
         5. Op-amp oscillators are restricted to the lower end of the frequency spectrum because they do not have the required bandwidth to achieve low phase shift at high frequencies. [3]
         6. “RC oscillators, in contrast, provide fast startup and low cost, but generally suffer from poor accuracy over temperature and supply voltage, and show variations from 5% to 50% of nominal output frequency.”
   2. Purpose for each type of oscillator
   3. Known data for internal oscillator

# Definitions

1. **Radiation** is the emission or transmission of energy in the form of waves or particles through space or through a material medium.
2. An **electronic oscillator** is an electronic circuit that produces a periodic, oscillating electronic signal, often a sine wave or a square wave.

# References

* [1] <http://ww1.microchip.com/downloads/en/DeviceDoc/70005131a.pdf>
* [2] <http://www.daenotes.com/electronics/digital-electronics/rc-feedback-oscillators>
* [3] <http://www.ti.com/lit/an/sloa060/sloa060.pdf>
* [4] <https://www.maximintegrated.com/en/app-notes/index.mvp/id/2154>

# Notes

* Combination of temperature drift and RF drift could cause a severe change in clock frequency, which could result in erratic control.