The Vasant Corporation is offering to pay for your class project.

- *The Vasant Corporation, based in Fort Worth, Texas, incorporated in 1996 to provide high technology designs, products and services.*

- *CEO: George J Bugh, retired from Lockheed Martin after 33 years as an award winning senior staff electronics design engineer. Also an Advance/Expert class Amateur radio operator.*

- *Read more about George Bugh on LinkedIn:*
  https://www.linkedin.com/in/george-bugh-af5ie-53b42b7/

See our company website here: https://www.vasantcorporation.com/

We have more projects we need help with:

Project Details:

- We will supply the project parts and learning support to help you if you perform our research and development work.
- Projects are related to:
  - Electronic design
  - Material design
  - Mechanical design
  - Solid State Physics
- Specific projects are detailed in the following slides

- **For more information contact George Bugh**
- **Email: george.j.bugh@vasantcorporation.com**

More about Project 1

Radio transceiver consists of 13 interconnected modules:

1. Low noise VCO module with 1 octave range
2. Frequency Lock module
3. Band Select Module
4. Balanced Quadrature Synchronous Demodulator Module
5. Balanced Quadrature Synchronous Modulator Module
6. Switched Capacitor Low Pass Filters Module (already taken)
7. XMT and REC Weaver Single Sideband Encoder/Decoder Module (already taken)
8. Automatic Gain Control Module
9. Pulse Width Modulation Attenuator/Blanker Module
10. Balanced Class E Push-Pull Power Amplifier Module
11. Balanced High Input Impedance Low Noise Amplifier Module
12. Audio Input and Output Module
13. Power Management Module
14. RSSI (Received Signal Strength Indicator) / S-meter Module
15. Frequency Display Module

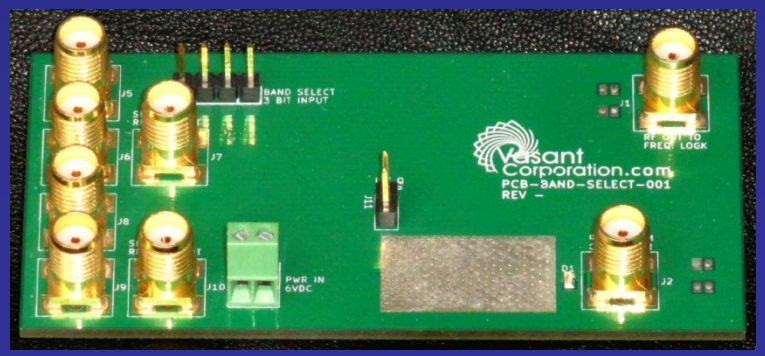
$1000 award for each fully completed production ready module

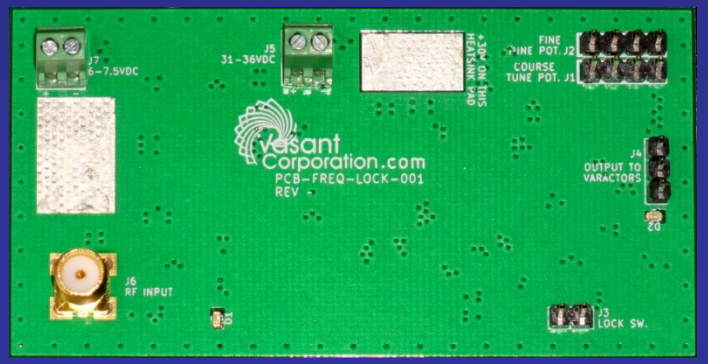
Project 1 *continued*

Radio transceiver, more details:

- The first module: “Low noise VCO module with 1 octave range”, needs a complete re-design as followings:
  1. Find a low noise VCO device with 1 octave range, like one of these examples:

     CVCO55CL-0200-0400 or V560ME09-LF or something better (and cheap) that you find.
  2. Add ultra low noise voltage regulator circuit
  3. Add ultra low noise tuning voltage circuit with coarse input, fine input and frequency lock input
  4. Add ultra low noise output frequency divider if needed.
  5. Add ultra low noise output buffer circuit if needed.
- Modules 13, 14 and 15 need to be designed, built and tested.
- Other modules are already designed so your task would be to build the initial prototype, test and modify as needed to get it running, optimized and production ready.





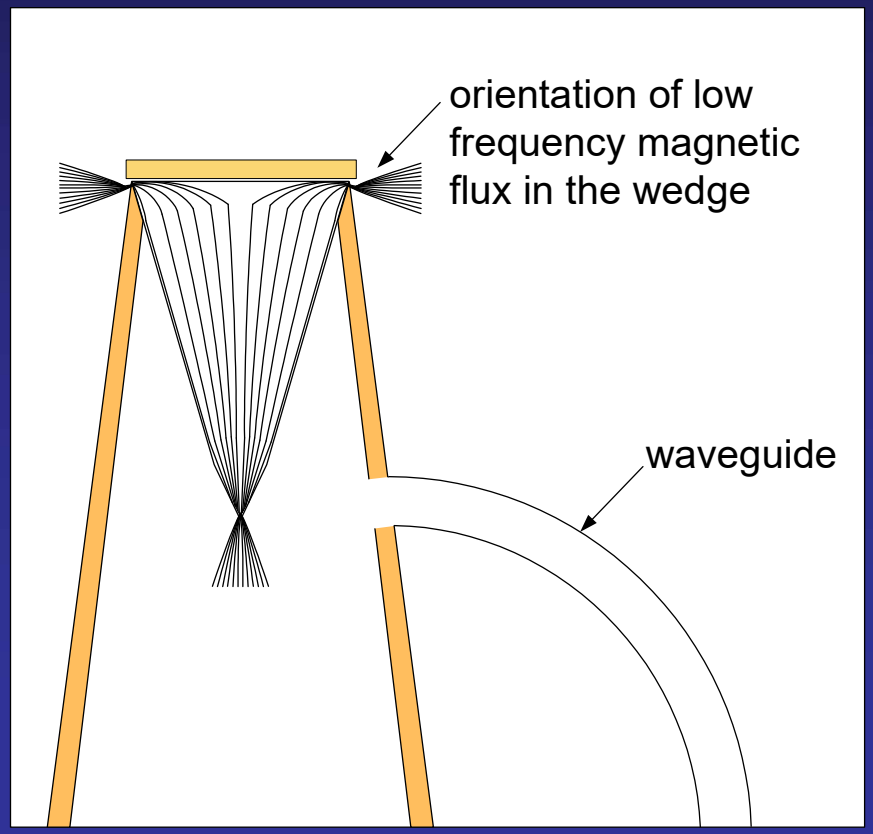
Project 2 reloaded and expanded

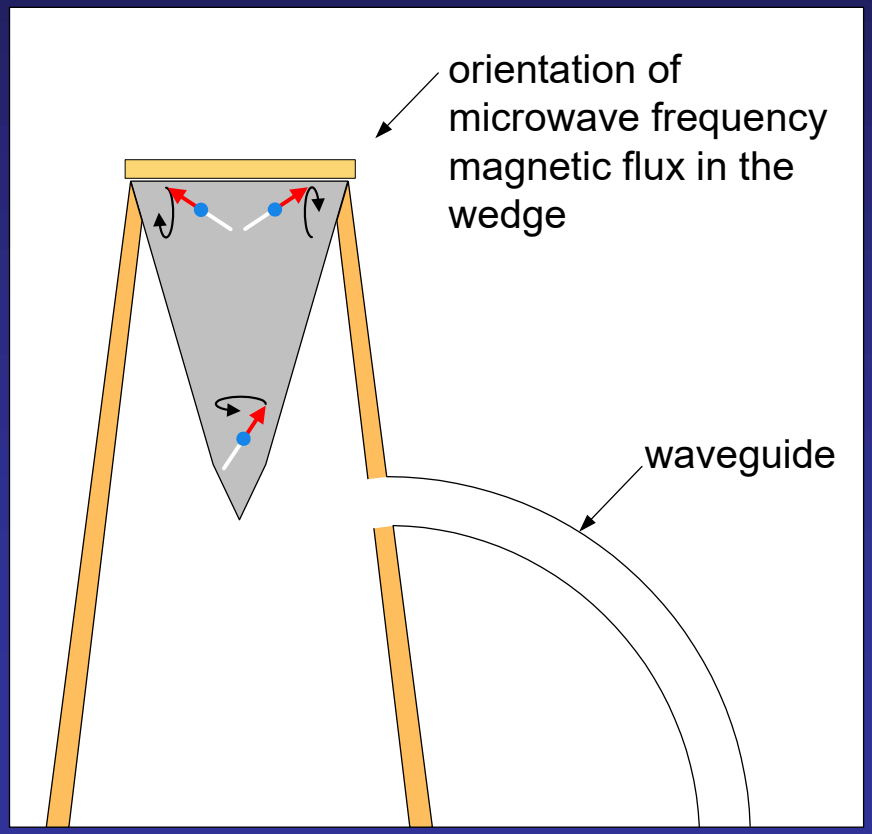
- Magnetic wave transmission and reception

This project relates to a wedge shaped piece of microwave magnetic material with resonance at the microwave frequency set by the strength of an external magnetic field.

The shape is instrumental in converting magnetic waves into traditional TEM microwaves.

This device converts between waves from rotating and counter-rotating magnetic fields and traditional TEM microwaves as the counter rotations at the top merge into same direction rotations at the bottom.





Project 2 reloaded and expanded

- This project consists of multiple parts:

1. Successful design and fabrication of a flat magnetic “Lenz’s Lens”
2. Successful design and fabrication of truncated conical magnetic “Lenz’s Lens”
3. Successful design and fabrication of wedge of magnetic material
4. Successful 10X concentration of magnetic field flux at tip of wedge
5. Successful generation of microwaves within the magnetic wedge.
6. Successful design and fabrication of semi-ellipsoid spin superradiance cavity
7. Successful transmission and reception between 2 spin superradiance cavities

$1000 for completion of parts 1 - 4

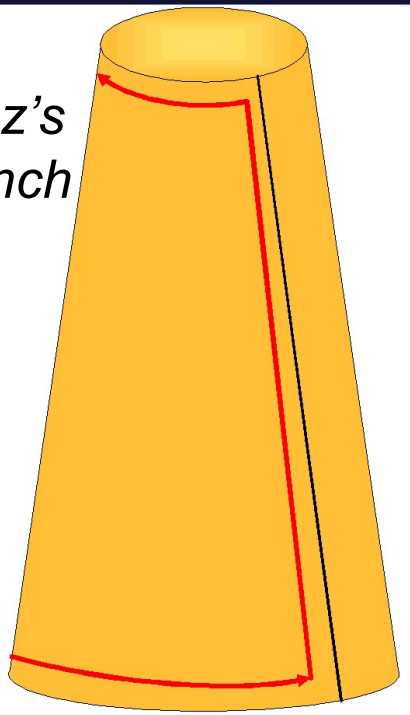
$500 for completion of part 5

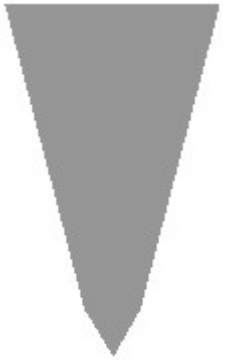
$1500 for completion of parts 6 and 7

There are additional future R & D tasks beyond these initial tasks

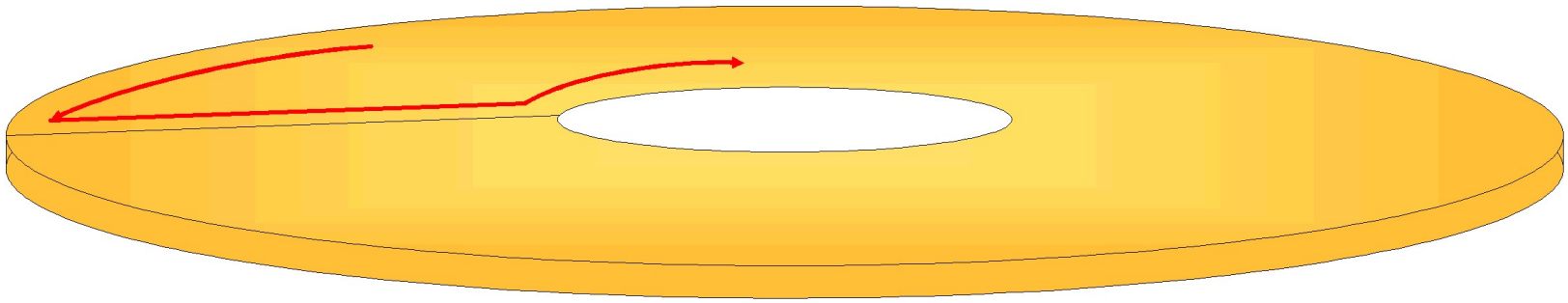
Lenz's Lenses

Truncated Conical Lenz's Lens made from 1/8th inch



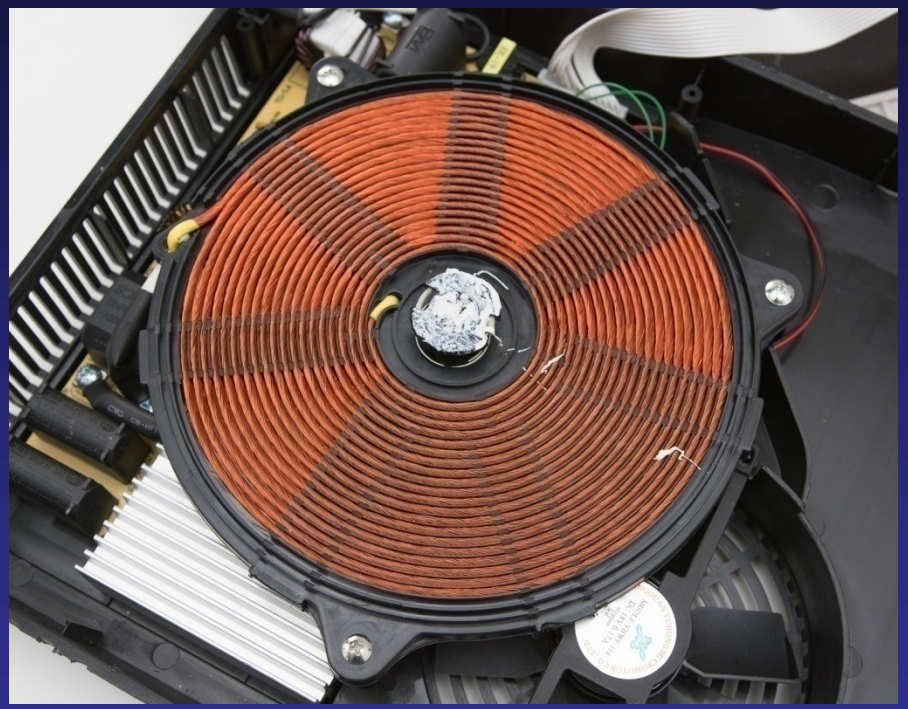


Magnetic Wedge



Flat Lenz's Lens made from 1/8th inch copper plate

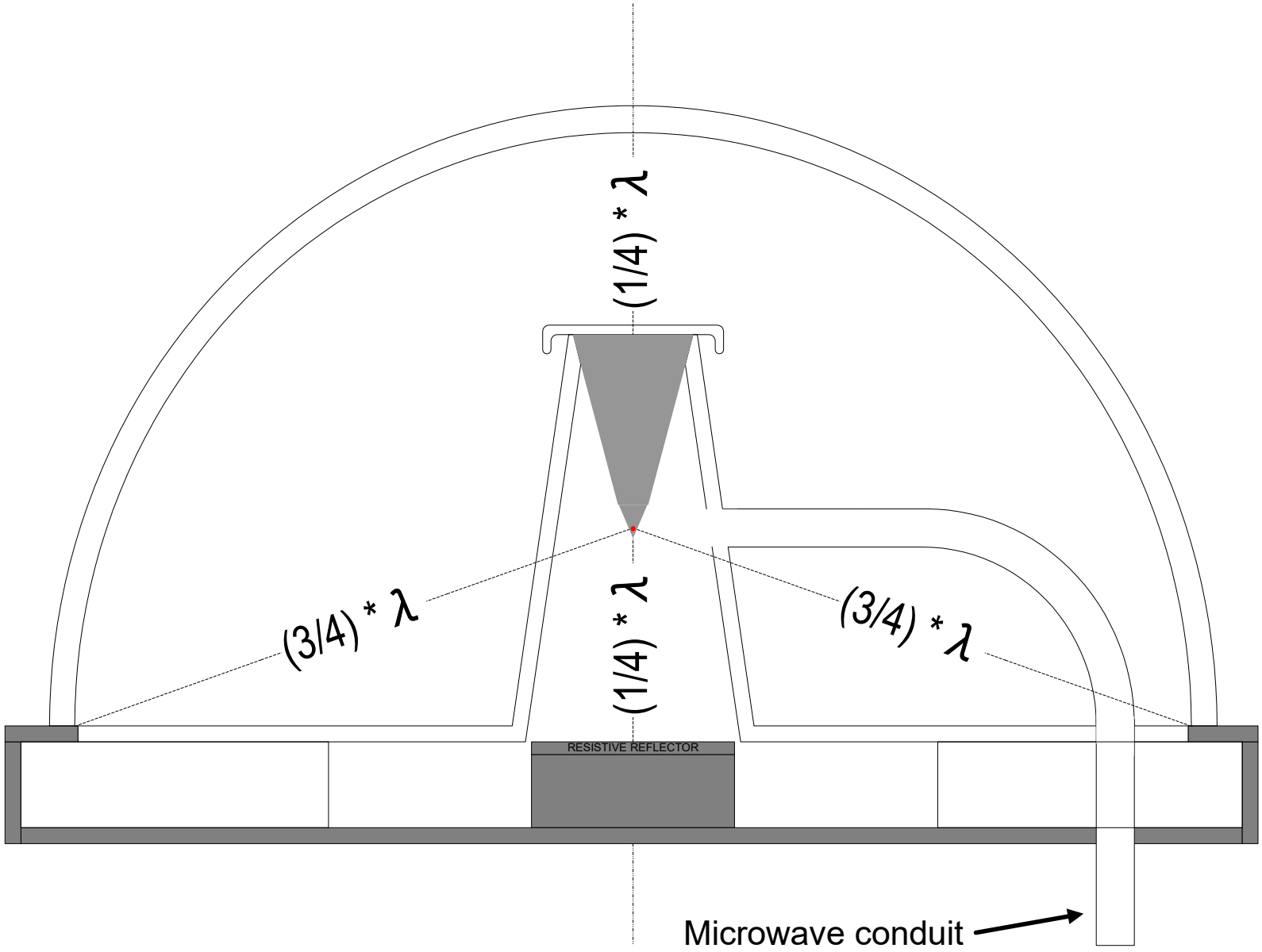
Example source of magnetic field



Induction Cooking Element

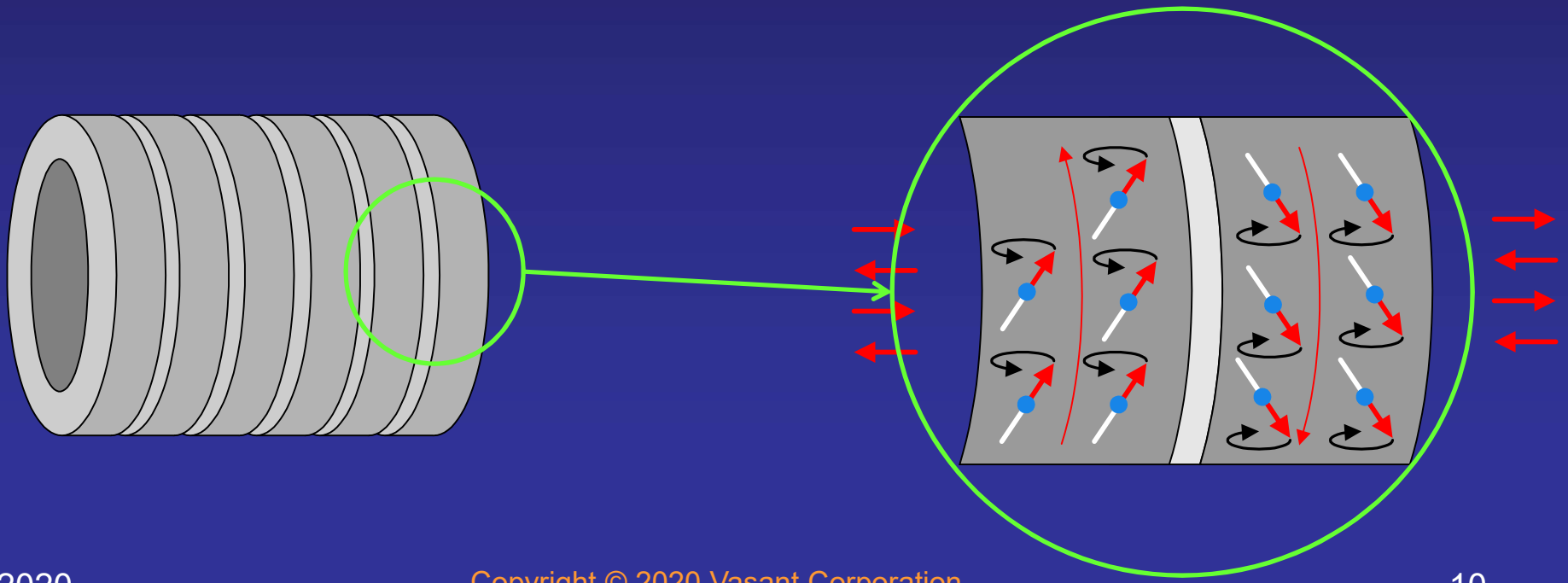
Note: The coil may need to be rewound to make a larger center hole. The 2 magnetic lenses are for the flux passing through the center hole area.

Semi-Ellipsoid Spin Superradiance Cavity



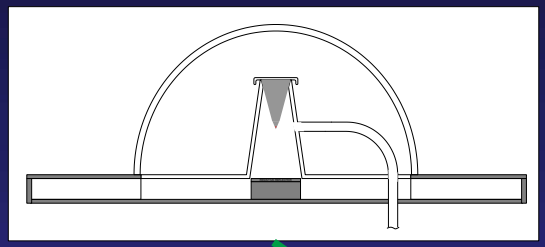
Project 3: High Power Magnetic Wave Antenna

- This antenna is like a Yagi-Uda antenna for purely magnetic waves as opposed to traditional TEM waves
- Stacked toroids of microwave magnetic material replace a set of Yagi antenna elements.
- The microwave frequency is set by the strength of the real axis magnetic field oriented around the interior of each toroid.
- Then each toroid is stimulated by microwave antennae that set the phase of the magnetic waves from each.



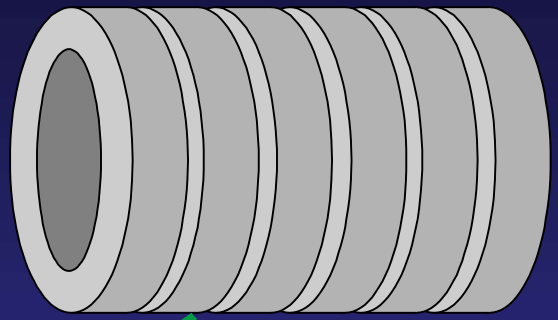
Project 2 and Project 3 used together:

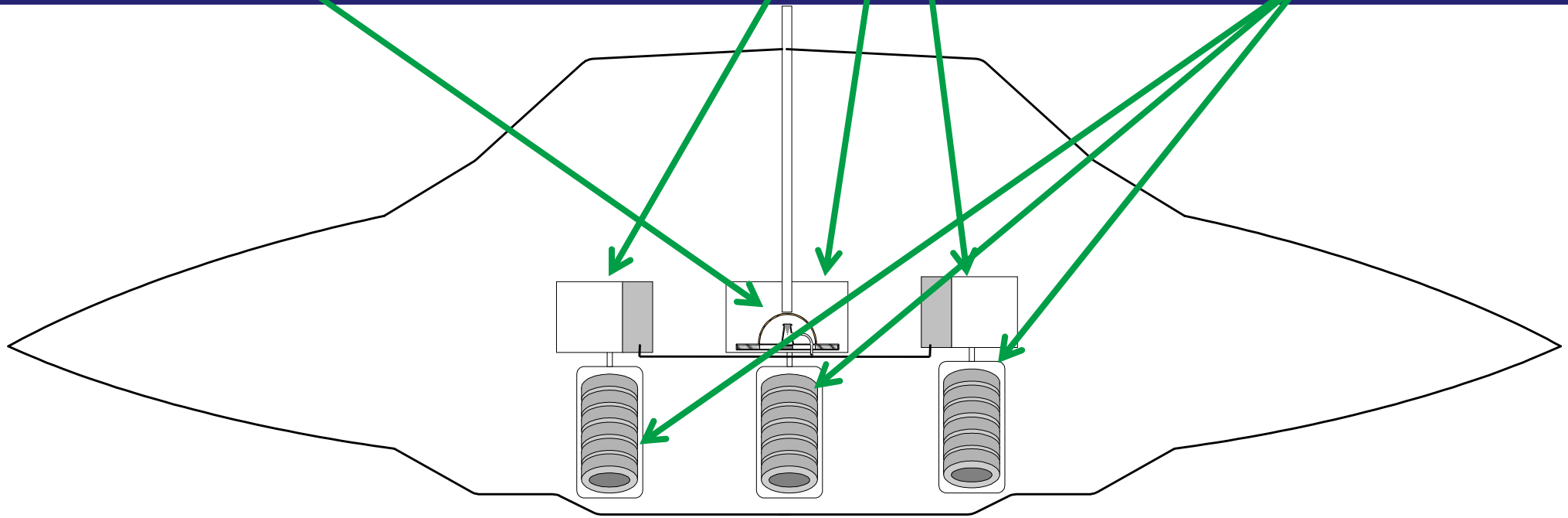
Senses external signal phase, converts to traditional microwaves & sends to processors



Microwave signal processors to control power level and phase

Magnetic waves antenna array





Electro-gravity propulsion

To understand antigravity you first need to understand where gravity comes from:

https://www.youtube.com/watch?v=lB5qG5wHJ_s
https://www.youtube.com/watch?v=KSbG1vaxSWE
https://www.youtube.com/watch?v=J02-iLzjFbE