

MIT Coffee Can Radar

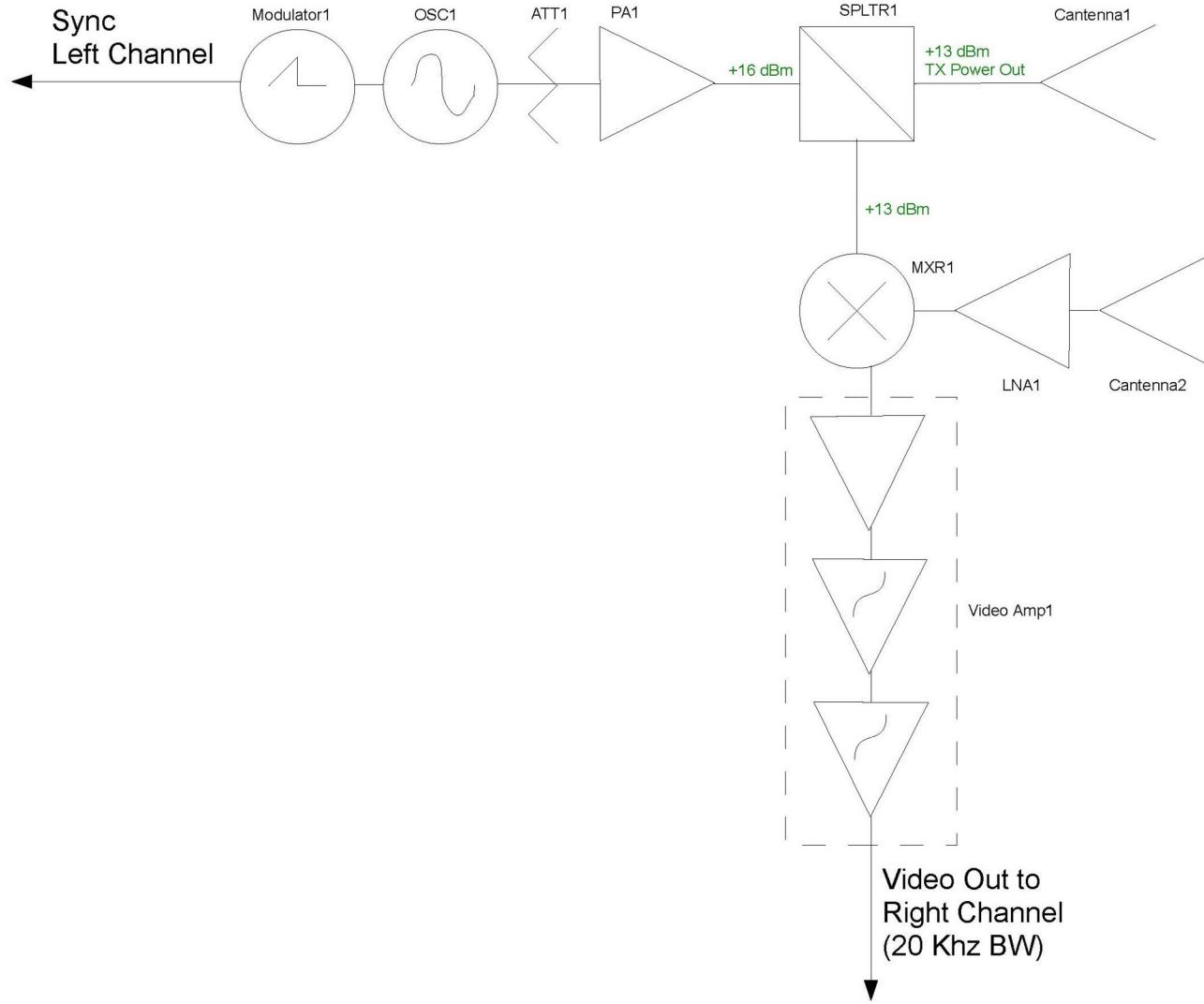
Making it more accessible

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Goals

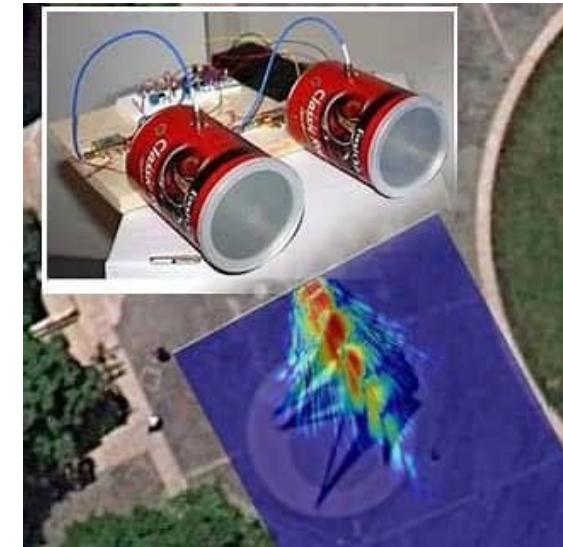
- Modernize the Radar system with modern components
- Update learning materials for high school aged students
- Keep cost affordable (~150 USD)
- Open source
- Align project with sponsor's goals and STEM education mission

How it Works



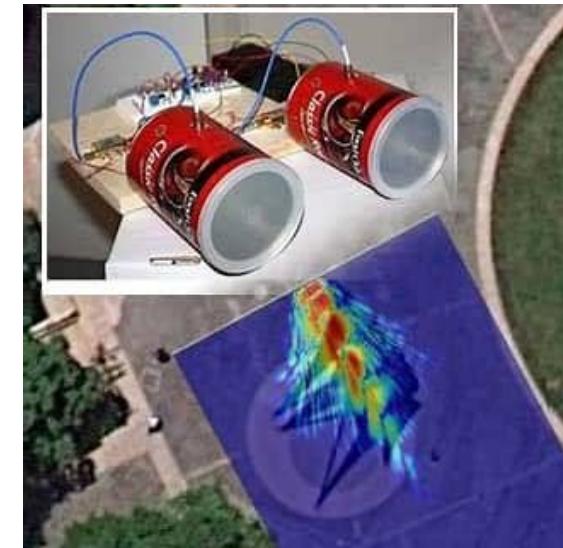
Background (MIT System)

- Design operates in S-band frequency range
- Analog components for signal and processing
- Full MATLAB software package support
- Uses audio amp splitter for laptop
- Hand made antennas (Coffee cans)



Updated system

- Design operates in S-band frequency range
- Modern components for signal and processing
- Full software package support
- Uses DAQ to pull data
- Hand made antennas



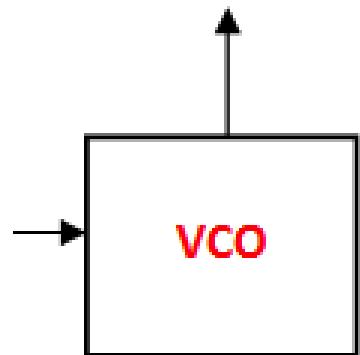
Stage 1 (Proof of Function)

- Use Software Defined Radio to prove function
- Ensure software support for
 - Range finding
 - Speed detection
- New homemade antenna design



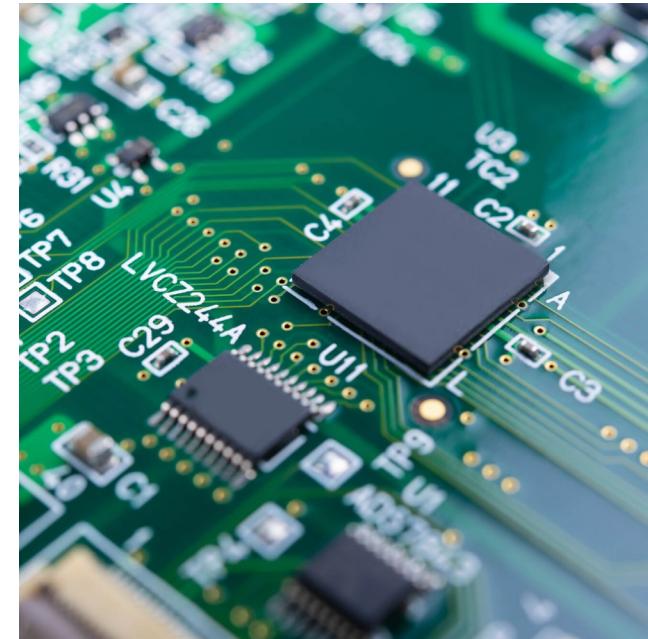
Stage 2 (Analog Components)

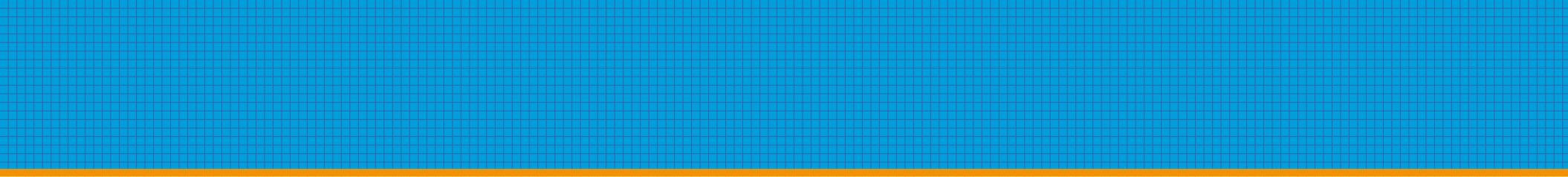
- Replace Software Defined Radio with breakout boards
- Ensure continuing software support for
 - Range finding
 - Speed detection
- Enclosure design (3D Printing)
- Cost analysis with BOM



Stage 3 (Wrap Up)

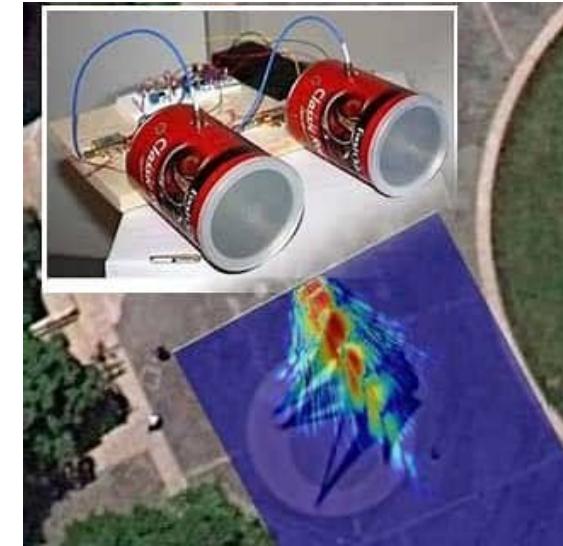
- Design all in one solution with PCB
 - FCC complaint
 - Small footprint
 - One to one with breakout boards
- Not for final cost
 - Optional advanced kit
 - Can still use stage 2 kit





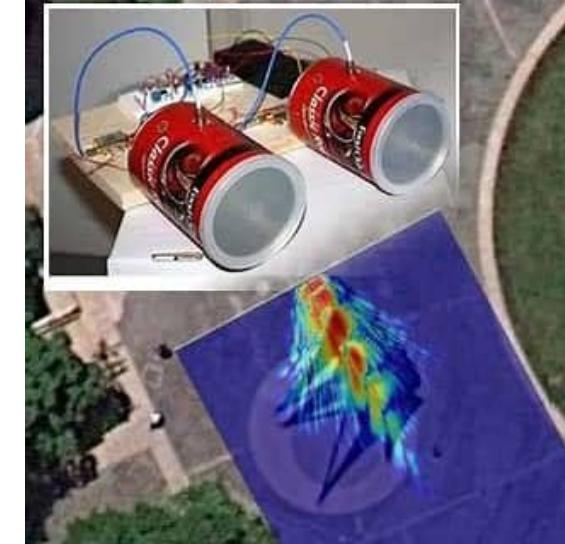
Timeline

- December
 - Formulate models for system
 - Obtain all hardware for stage 1
- January to February
 - Complete stage 1
 - Ensure basic software package



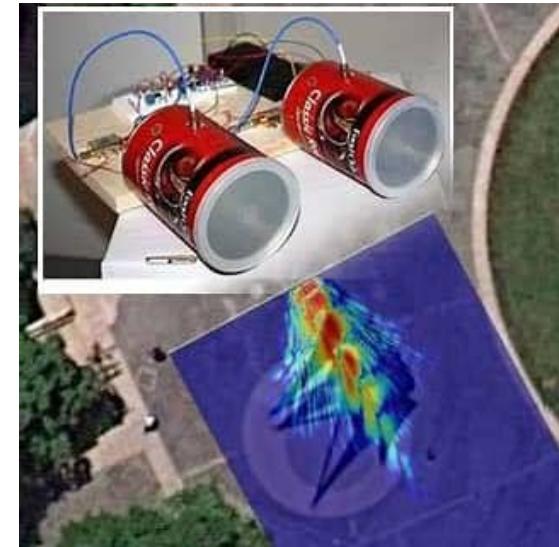
Timeline Continued

- March to April
 - Start stage 2
 - Refine software package
 - Presentation and report at MICS in Minneapolis
- May to June
 - Finalize stage 2
- July to August
 - Start and finish stage 3



Our Current Partners

- Corporate sponsor
 - Carl Lewis from the AFA (non profit support)
- End user sponsor
 - Randy Lee from NJROTC programs
 - Adam Lueken from Vernon Hills Highschool



Avenues for Partnership with Field Theory

- Project support
 - Support in antenna design
 - S parameter testing
 - Financial support through non profit (Carl Lewis)
- Marketing and promotion of goodwill
 - Include Field Theory in all documentation
 - MICS, NJROTC and Vernon Hills Highschool

