Recreational Vehicle Conforming TV Antenna
TEC – TENNA
Project 25 Team 7

SDSU San Diego State University

Project Description

Owners of RVs have long indicated the desire to be able to watch over-the-air (OTA) television in their vehicle. However, end users have reported dissatisfaction with current solutions that have a reputation of being frequently damaged, stolen, or creating holes rainwater can leak through. Our antenna design will be integrated into the body of new RVs during manufacture and receive an OTA signal utilizing an array of loop antennas that will provide signal strength comparable to existing OTA TV antennas. Our design consists of antennas at the frequency of 272, 495, and 503 MHz, as this combination proved to be the optimal setup to capture all TV channels in the San Diego area. An optimization tool has also been developed to determine ideal antenna configurations for other possible locations.

Acknowledgements

Special thanks to Dr Shaffar and Professor Wield for arranging and advising this project. The team would also like to thank the SDSU mechatronics team for allowing us use their space and equipment for the entire duration of the project.

Meet The Team

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Team Lead

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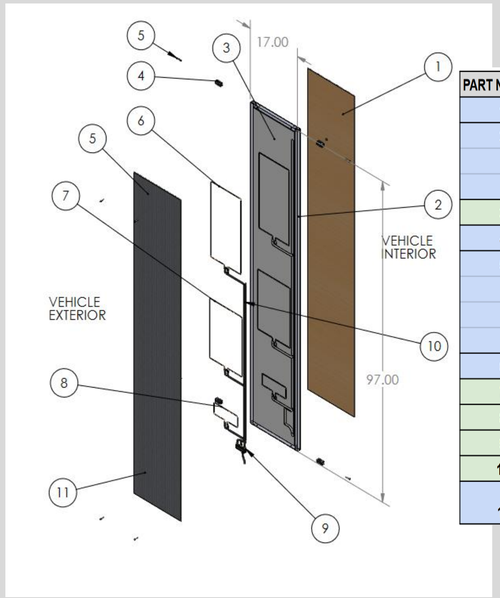
Design & Testing Lead

Marcus Stich
Manufacturing Lead

Cormac Gaynor
Research
& Safety Lead

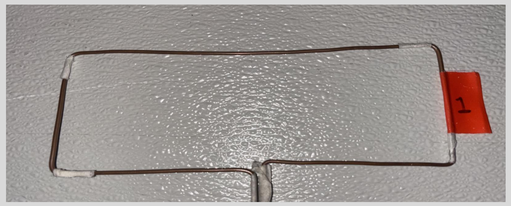
Grace Wise
Finance &
Procurement Lead

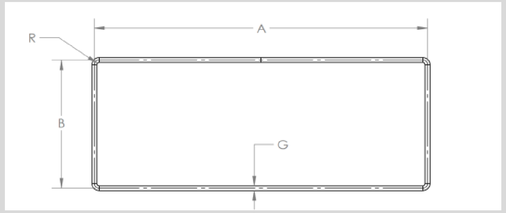
CAD

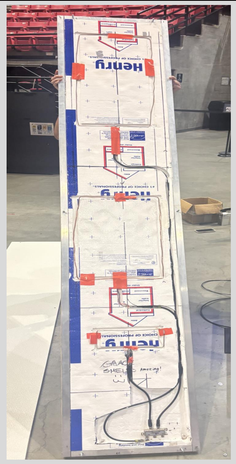


PART NUMBER	PART NAME	SUBSYSTEM	QTY
1	Interior Plywood Wall	Structural	1
2	Aluminum Frame	Structural	-
2-1	*Vertical Frame Member*	*Structural*	*2*
2-2	*Horizontal Frame Member*	*Structural*	*2*
3	Foam Core	Functional	1
4	Frame Coupler	Structural	4
5	Fasteners	Structural	-
5-1	*1/4-20 x 1.125" Pan Head Bolt*	*Structural*	*4*
5-2	*1/4-20 x 1.500 Pan Head Bolt*	*Structural*	*4*
5-3	*1/4-20 Hex Nut*	*Structural*	*8*
6	533 MHz Antenna	Functional	1
7	207 MHz Antenna	Functional	1
8	495 MHz Antenna	Functional	1
9	Signal Combiner	Functional	1
10	Coaxial Cable	Functional	-
11	Exterior Plywood Wall Composite Skin	Structural	1

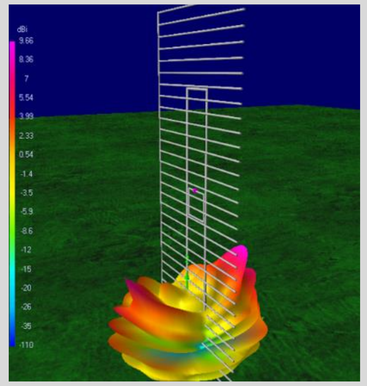
Antennas



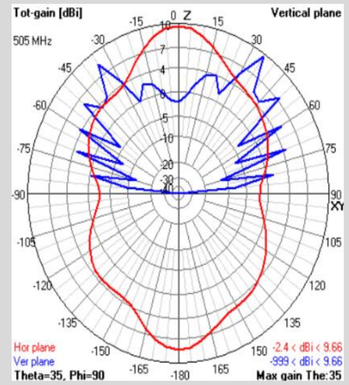




Signal Patterns

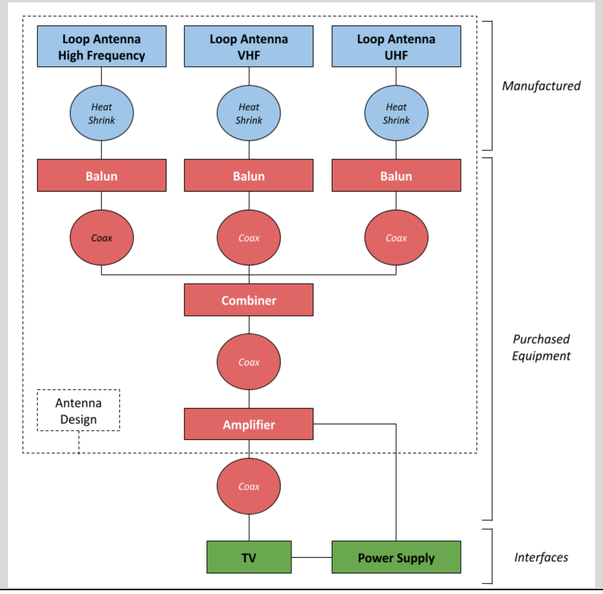


3D Signal Map

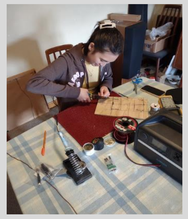


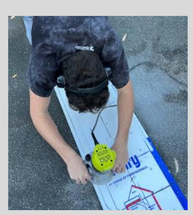
2D Signal Map

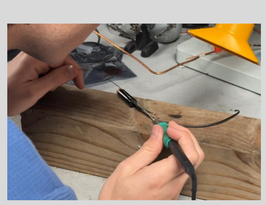
System Level Diagram

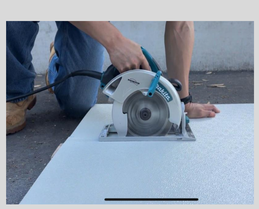


Manufacturing









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