Unmanned Aerial Radio Tracking System for Monitoring Small Wildlife Species (Drone Project)

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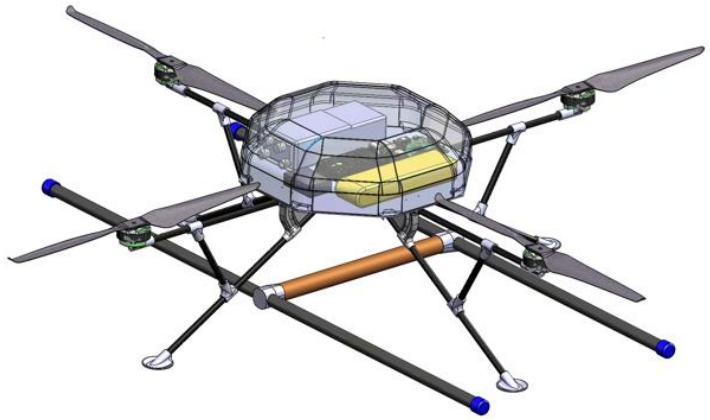
Project Description

Offer an efficient way to assist radio telemetry studies of bats in remote and difficult terrain in northern Arizona.

- Primary objective - design and produce a new collapsible frame design while maintaining structural integrity and ease of build
- Secondary objective - perform flight and signal reception tests

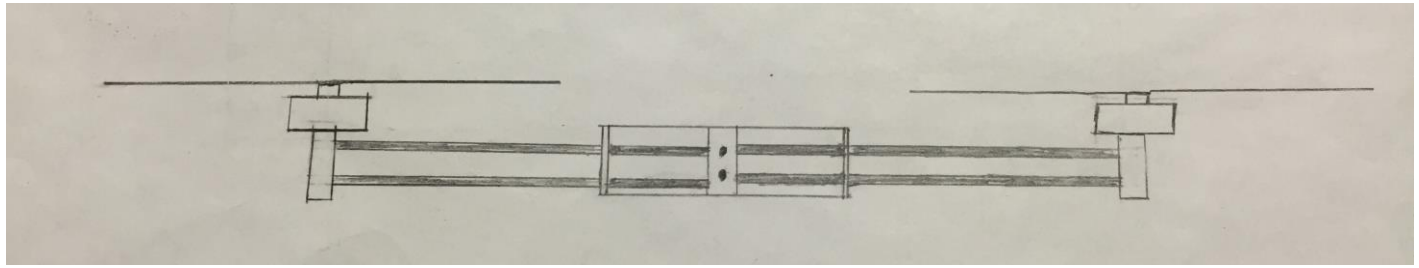
Sponsor/Client: Dr. Michael Shafer

Sponsor/Client Interest: Dr. Shafer has been conducting research in radio tracking systems.



Design Description

- Stacked plates
- Dual Carbon Fiber Arrow Booms
- Improved Central Hub
- Lighter
- Stronger



Design Description Cont.

Prototype I:
- Lightweight
- Rigid
- Electronics Protected
- Collapsible

Prototype II:
- Collapsible
- Low Cost
- Ease of Assembly (Already built)

Design Requirements

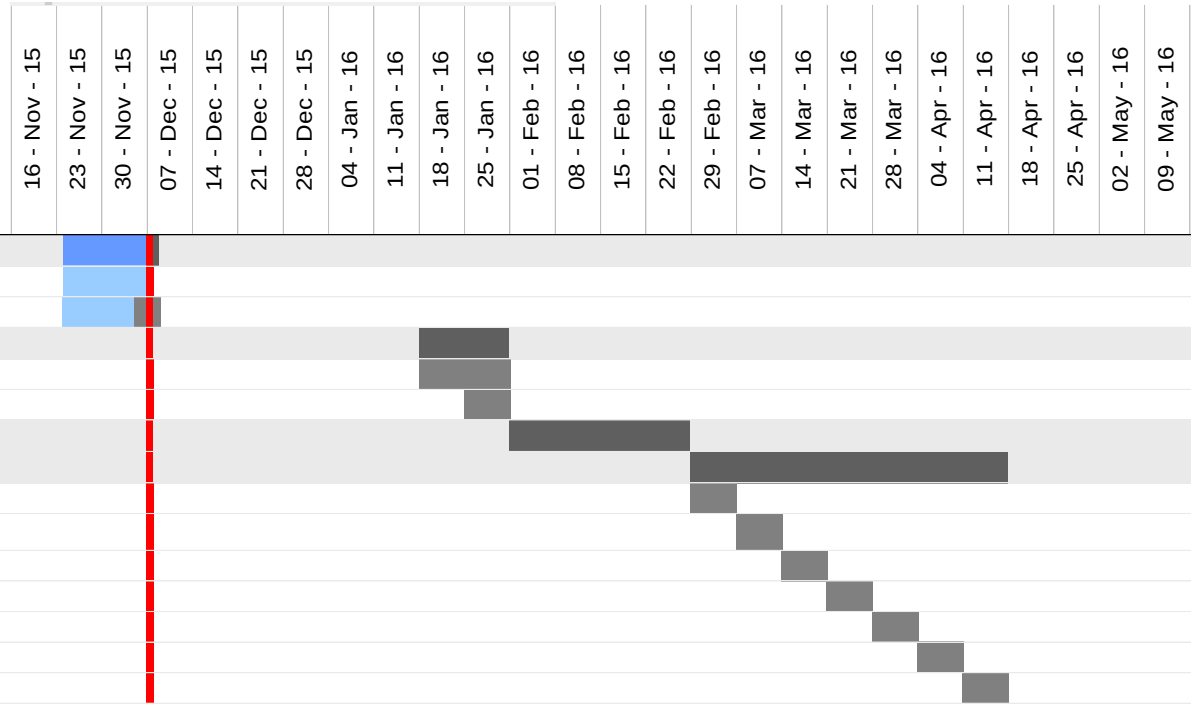
Customer Requirements	Design Satisfying Characteristic
1. Lightweight	Carbon fiber arrow skeleton, 3D printed pieces will have non structural materials removed.
2. Rigid/Strong	Double carbon fiber arrow arms.
3. Collapsible	Skeletal members are removable from joints and can be stored on body of the drone.
4. Low CG	Payload will be in between and below stacked platforms.

Design Requirements Cont.

Costumer Requirements	Design Satisfying Characteristic
5. Aesthetics	Enclosed electrical components.
6. Low Cost	Recycled arrows and 3D printed joints, free for researchers.
7. Ease of Build	Arrows slide into joints and have a tethered cotter pin and tension to secure, can unplug electrical components. Pegs on top platforms remove from key hole connectors on bottom platform. No tool assembly.

Schedule

WBS	Tasks	Task Lead	Start	End	Duration (Days)	% Complete	Working Days	Days Complete	Days Remaining
1	**Fall Semester**		11/24/15	12/8/15	15	87%	11	13	2
1.1	Presentation 3		11/24/15	12/7/15	14	100%	10	14	0
1.2	Preliminary Proposal		11/24/15	12/8/15	15	75%	11	11	4
2	**Testing Round 1**		1/18/16	1/31/16	14	0%	10	0	14
2.1	Procedure 8 - Parts Research		1/18/16	1/31/16	14	0%	10	0	14
2.2	Procedure 4 - Torsion Test		1/25/16	1/31/16	7	0%	5	0	7
3	**Frame Construction**		2/1/16	2/28/16	28	0%	20	0	28
4	**Testing Round 2**		2/29/16	4/17/16	49	0%	35	0	49
4.1	Procedure 1 - Weight Test		2/29/16	3/6/16	7	0%	5	0	7
4.2	Procedure 2 - Thrust Test		3/7/16	3/13/16	7	0%	5	0	7
4.3	Procedure 3 - Landing Test		3/14/16	3/20/16	7	0%	5	0	7
4.4	Procedure 5 - Load and Fatigure		3/21/16	3/27/16	7	0%	5	0	7
4.5	Procedure 6 - Spatial Volume		3/28/16	4/3/16	7	0%	5	0	7
4.6	Procedure 7 - CG Analysis		4/4/16	4/10/16	7	0%	5	0	7
4.7	Procedure 9 - Flight Test		4/11/16	4/17/16	7	0%	5	0	7



- Currently on Schedule

Budget

- Currently budget is unknown due to client waiting on research grant
- Total Expenses to date: $0
- Anticipated expenses: $50
  - Currently seeking sponsorship to alleviate expenses