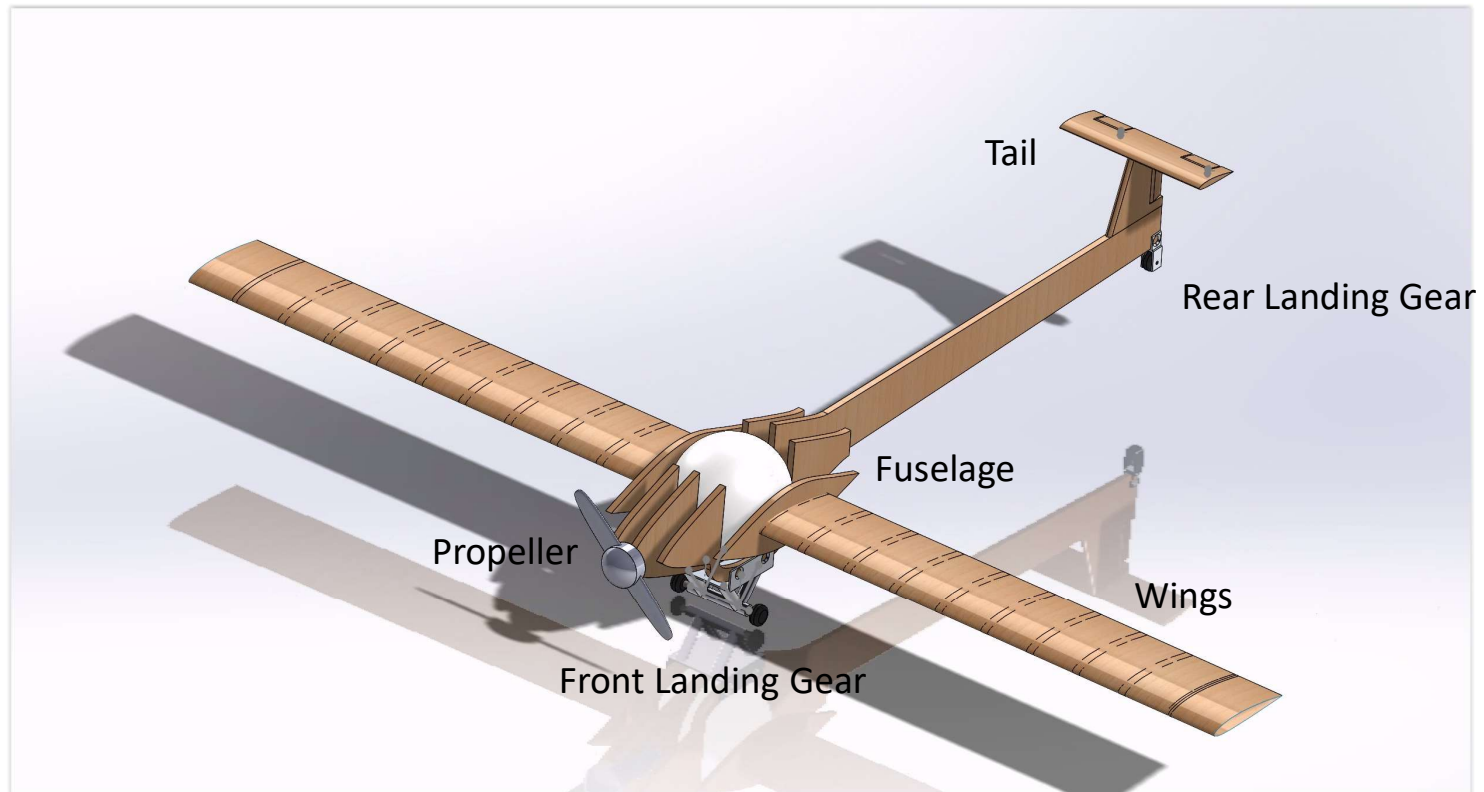




# SAE Aero #04 Hardware Review 1

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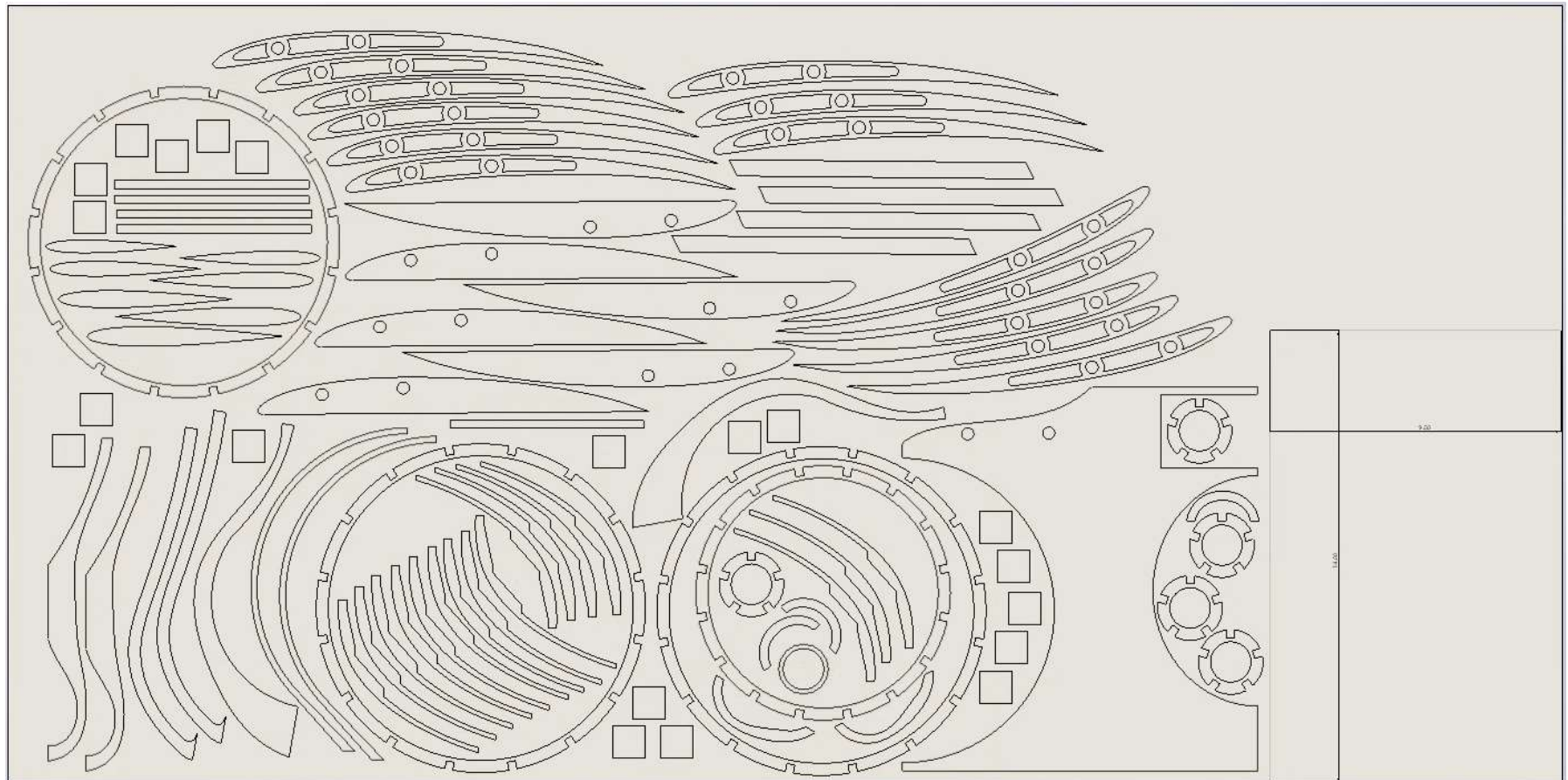
# Previous Design



New design



# DXF File





What got cut out



# Product

Product choice  
Between Birch Plywood and Balsa wood

Balsa	Birch Ply	
0.5	4	
3	8	
1.5	32	sq ft
7.34	\$ 35.02	1 sheet
\$ 4.89	\$ 1.09	price per sq ft
cost	347.1%	Percent difference









Mass of material			
	Balsa	Plywood	
Dimensions	0.196	0.188	in
	1	1	in
	1	1	in
	0.196	0.188	in <sup>3</sup>
Volume	0.000113	0.000109	ft <sup>3</sup>
Mass 1	0.38	1.22	
Mass 2	0.37	1.24	
	0.375	1.23	grams
	0.000827	0.002712	pounds
Density	7.288752	24.92443	lbs./ft <sup>3</sup>
Current model in cad	1.28		lbs.
What is the weight of airframe		4.37	lbs.
Total lift capacity of aircraft		~25	lbs.

<https://www.homedepot.com/p/Swaner-Hardwood-5-2-mm-1-4-in-Category-4-ft-x-8-ft-Birch-Plywood-165891/202085715>

<http://www.balsawoodinc.com/product/36-30>



# Some parts no longer on the list

							
DX6e 6-Channel DSMX Transmitter with AR620	60-Amp Pro Switch-Mode BEC	60-Amp Pro Switch-Mode BEC	Power 32 Brushless Outrunner	1000 watt limiter	Safety switch	22.2V 5000mAh 6S 30C Smart Li	A460 Sub-Micro Analog 23g Me

Some of the parts above we no longer need while other parts we still need. Will be working on narrowing down this list to get the official parts ordered.



# Timeline

- We are behind.
- The team is confident that we are making some great progress
  - Once we fine tune manufacturing, we will be on a good path

## Goal for Hardware Review 2

- Laser cut more parts – learn more about these tolerance issues
- Continue to iterate in CAD as we have done a redesign
- Obtain the missing electronics
- Obtain more material for the project

# Alternative information

Speed	50																							
Wing Span	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Area	CL	LIFT	
20																					138	0.9442	2.6335	-3.367
22																					162	1.0004	3.2755	-2.725
24																					186	1.0566	3.972	-2.028
26																					210	1.1128	4.723	-1.277
28	39.237																				234	1.169	5.5286	-0.471
30	37.209	46.512																			258	1.2252	6.3887	0.3887
32	35.381	44.226																			282	1.2814	7.3033	1.3033
34	33.724	42.155	50.585																		306	1.3376	8.2724	2.2724
36	32.215	40.268	48.322	56.376																	330	1.3938	9.2961	3.2961
38	30.835	38.544	46.253	53.961	61.67																354	1.45	10.374	4.3742
40	29.569	36.961	44.353	51.745	59.138	66.53															378	1.5062	11.507	5.5069
42	28.402	35.503	42.604	49.704	56.805	63.905	71.006														402	1.5624	12.694	6.6941
44	27.324	34.156	40.987	47.818	54.649	61.48	68.311	75.142	81.973												426	1.6186	13.936	7.9359
46	26.325	32.907	39.488	46.069	52.651	59.232	65.814	72.395	78.976	85.558											450	1.6748	15.232	9.2321
48	25.397	31.746	38.095	44.444	50.794	57.143	63.492	69.841	76.19	82.54	88.889										474	1.731	16.583	10.583
50	24.532	30.664	36.797	42.93	49.063	55.196	61.329	67.462	73.595	79.727	85.86	91.993									498	1.7872	17.988	11.988
52	23.723	29.654	35.585	41.516	47.446	53.377	59.308	65.239	71.17	77.1	83.031	88.962	94.893								522	1.8434	19.448	13.448
54	22.967	28.708	34.45	40.191	45.933	51.675	57.416	63.158	68.9	74.641	80.383	86.124	91.866	97.608							546	1.8996	20.962	14.962
56	22.257	27.821	33.385	38.949	44.513	50.077	55.641	61.206	66.77	72.334	77.898	83.462	89.026	94.59	100.15						570	1.9558	22.531	16.531
58	21.589	26.987	32.384	37.781	43.178	48.576	53.973	59.37	64.768	70.165	75.562	80.96	86.357	91.754	97.151	102.55	107.95	113.34			594	2.012	24.155	18.155
60	20.961	26.201	31.441	36.681	41.921	47.162	52.402	57.642	62.882	68.122	73.362	78.603	83.843	89.083	94.323	99.563	104.8	110.04	115.28		618	2.0682	25.832	19.832
62	20.368	25.46	30.552	35.644	40.736	45.827	50.919	56.011	61.103	66.195	71.287	76.379	81.471	86.563	91.655	96.747	101.84	106.93	112.02	117.11	642	2.1244	27.565	21.565
64	19.807	24.759	29.711	34.663	39.615	44.567	49.519	54.47	59.422	64.374	69.326	74.278	79.23	84.182	89.133	94.085	99.037	103.99	108.94	113.89	666	2.1806	29.352	23.352
66	19.277	24.096	28.916	33.735	38.554	43.373	48.193	53.012	57.831	62.651	67.47	72.289	77.108	81.928	86.747	91.566	96.386	101.2	106.02	110.84	690	2.2368	31.193	25.193
68	18.774	23.468	28.162	32.855	37.549	42.243	46.936	51.63	56.323	61.017	65.711	70.404	75.098	79.791	84.485	89.179	93.872	98.566	103.26	107.95	714	2.293	33.089	27.089
70	18.297	22.872	27.446	32.02	36.595	41.169	45.743	50.318	54.892	59.466	64.041	68.615	73.189	77.764	82.338	86.912	91.487	96.061	100.64	105.21	738	2.3492	35.04	29.04

- NACA 2412
- AOA@ 10
  - $C_l = 0.7429$
- AH-7-47-6
- AOA@ 10
  - $C_l = 1.5928$

