

Tool info

Serial API : 1:1.0
Board : Custom STM32F401RE thrustBoard v2
Firmware : thrust++ : ChibiOS RT 7.1.0 : HAL 8.1.0
Commit : [28e06d2] : Mar 20 2022 - 17:31:34

Measurement info

Motor : T-Motor F1507
KV : 2700
Magnet poles : 14
Propeler : HQProp Duct 76mmx8
Blade number : 8
Note : comparison of the performance with and without the duct

Measurement Results without Duct:

Output [%]	Thrust [G]		Torque [G cm]		RPM [1/min]		Voltage [V]		Current [A]		Pin [W]	ThrustEff [G/W]
	mean	std dev	mean	std dev	mean	std dev	mean	std dev	mean	std dev		
20	30.04	0.208	49.06	0.202	8138	121.4	16.668	0.0072	0.408	0.0121	6.800	4.417
25	47.24	0.273	73.99	0.350	9842	80.8	16.649	0.0073	0.664	0.0181	11.058	4.273
30	66.96	0.173	103.19	0.222	11444	115.9	16.627	0.0081	0.988	0.0145	16.424	4.077
35	85.92	0.248	131.30	0.202	12763	243.4	16.601	0.0075	1.346	0.0201	22.352	3.844
40	106.30	0.386	163.26	0.409	14104	252.7	16.567	0.0074	1.766	0.0253	29.257	3.633
45	125.50	0.404	195.91	0.415	15512	376.6	16.529	0.0099	1.924	0.0267	31.798	3.947
50	144.74	2.850	234.91	1.405	16786	404.6	16.480	0.0082	1.971	0.0373	32.486	4.456
55	181.63	0.499	275.72	0.804	18267	291.4	16.427	0.0127	2.083	0.0535	34.224	5.307
60	211.97	1.136	325.09	1.014	19533	583.1	16.358	0.0109	2.317	0.0438	37.908	5.592
65	243.71	0.752	369.21	1.334	20708	426.4	16.284	0.0133	2.926	0.0548	47.641	5.115
70	278.24	0.840	411.30	1.363	22175	511.6	16.196	0.0127	3.798	0.0963	61.514	4.523
75	309.61	2.277	463.93	3.978	23169	449.1	16.097	0.0126	5.096	0.0732	82.030	3.774
80	339.82	3.009	514.46	4.794	24354	545.8	15.990	0.0097	6.883	0.0699	110.062	3.088
90	410.71	2.651	602.54	5.925	26446	456.2	15.806	0.0173	11.040	0.1127	174.498	2.354
100	460.15	3.974	689.96	7.139	27885	318.5	15.596	0.0183	15.245	0.1090	237.763	1.935

Measurement Results with Duct:

Output [%]	Thrust [G]		Torque [G cm]		RPM [1/min]		Voltage [V]		Current [A]		Pin [W]	ThrustEff [G/W]
	mean	std dev	mean	std dev	mean	std dev	mean	std dev	mean	std dev		
20	36.19	0.901	43.11	0.289	8233	87.6	16.675	0.0065	0.391	0.0140	6.524	5.547
25	54.59	0.774	68.57	0.268	10014	116.3	16.657	0.0091	0.622	0.0186	10.360	5.269
30	78.09	0.777	91.36	0.381	11772	157.1	16.632	0.0084	0.932	0.0206	15.494	5.040
35	101.89	0.824	121.68	0.569	13238	188.5	16.608	0.0076	1.298	0.0205	21.550	4.728
40	121.84	0.830	145.77	0.749	14480	169.5	16.576	0.0078	1.651	0.0263	27.369	4.452
45	148.23	0.844	174.95	0.907	15979	523.5	16.541	0.0093	1.943	0.0254	32.141	4.612
50	177.38	0.891	214.64	0.795	17415	300.2	16.494	0.0112	2.052	0.0259	33.843	5.241
55	209.49	0.896	254.91	1.193	18673	435.7	16.435	0.0111	2.183	0.0356	35.875	5.839
60	248.30	1.149	287.80	1.215	20116	556.9	16.372	0.0092	2.478	0.0411	40.566	6.121
65	286.57	1.603	338.44	2.536	21542	518.3	16.297	0.0157	3.087	0.0412	50.310	5.696
70	323.12	1.204	380.84	2.177	22909	526.4	16.216	0.0113	3.863	0.0609	62.637	5.159
75	360.33	1.595	432.03	1.998	24258	720.2	16.121	0.0118	5.183	0.0600	83.550	4.313
80	398.91	1.761	471.44	2.419	25330	403.9	16.013	0.0137	6.872	0.0843	110.043	3.625
90	485.15	3.696	571.83	6.384	27755	416.2	15.827	0.0174	10.574	0.1176	167.343	2.899
100	551.97	6.166	651.32	10.546	29308	283.0	15.616	0.0170	14.701	0.1102	229.564	2.404

Plots for Measurement Results:

