

eCalc - Propeller Calculator

all data without guarantee - Accuracy: +/-15%

Project Name: Fixed-Wing Test-Bed Config Alpha

(c) by Solution for All - 7.25.000, 12.4.2021

Airplane	Units	Values
# of Motors:		1
All-up Weight:	g	2722
	oz	96
Wing Area:	in²	1152
Wing Load:	g/dm²	37
	oz/ft²	12.1
Cubic Wing Load:		4.2
est. Stall Speed:	km/h	29
	mph	18
est. Speed (level):	km/h	108
	mph	67
est. Speed (vertical):	km/h	76
	mph	47
est. rate of climb:	m/s	21.2
	ft/min	4165

Propeller	Units	APC Electric E (0°) 17" x 10.0"
# Blades:		2
Static Thrust:	g	7592
	oz	267.8
Revolutions*:	rpm	7578
Stall Thrust:	g	-
	oz	-
avail.Thrust @ Flight Sp	g@km/h	7592 @ 0
	oz@mph	267.8 @ 0
Pitch Speed:	km/h	116
	mph	72
specific Thrust:	g/W	4.48
	oz/W	0.16

Battery	Units	LiPo 8000mAh - 30/45C
Configuration:		8S1P
Load:	C	7.45
Voltage:	V	28.6
Rated Voltage:	V	29.6
Energy:	Wh	236.8
Total Capacity:	mAh	8000
max. discharge:		0.85
Used Capacity:	mAh	6800
min. Flight Time:	min	6.8
Mixed Flight Time:	min	23.2
Weight:	g	1608
	oz	56.7

Motor @ Maximum	Units	Turnigy G160-290 (290)
Gear Ratio:	: 1	1
Weight:	g	649
	oz	22.9
Current:	A	59.62
Voltage:	V	28.45
Revolutions*:	rpm	7578
electric Power:	W	1696.1
mech. Power:	W	1574.1
Efficiency:	%	92.8
est. Temperature:	°C	49
	°F	120

Total Drive	Units	Values
Drive Weight:	g	2626
	oz	92.6
Power-Weight:	W/kg	648
	W/lb	294
Thrust-Weight:	: 1	2.79
Current @ max:	A	59.62
P(in) @ max:	W	1764.7
P(out) @ max:	W	1574.1
Efficiency @ ma %		89.2

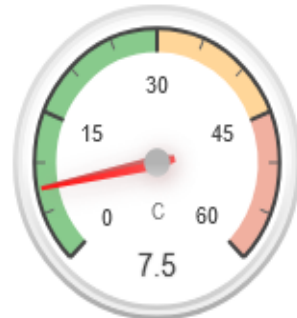
Controller	Type	max 100A
Current:	A cont.	100
	A max	100
Weight:	g	130
	oz	4.6
Battery extension Wire:		AWG10=5.27mm²
Length:	mm	0
	inch	0
Motor extension Wire:		AWG10=5.27mm²
Length:	mm	0
	inch	0

all data without guarantee - Accuracy: +/-10%

propCalc - Propeller Calculator

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General	Model Weight: <input type="text" value="2722"/> g <input type="button" value="incl. Drive"/> <input type="button" value="▼"/> <input type="text" value="96"/> oz	# of Motors: <input type="text" value="1"/> (on same Battery)	Wingspan: <input type="text" value="2438.4"/> mm <input type="text" value="96"/> inch	Wing Area: <input type="text" value="74.32"/> dm² <input type="text" value="1152"/> in²	Drag: <input type="text" value="simplified"/> <input type="button" value="▼"/> <input type="text" value="0.03"/> Cd	Field Elevation: <input type="text" value="500"/> m.ASL <input type="text" value="1640"/> ft.ASL	Air Temperature: <input type="text" value="25"/> °C <input type="text" value="77"/> °F	Pressure (QNH): <input type="text" value="1013"/> hPa <input type="text" value="29.91"/> inHg
Battery Cell	Type (Cont. / max. C) - charge state: <input type="text" value="LiPo 8000mAh - 30/45C"/> <input type="button" value="▼"/> - <input type="text" value="normal"/> <input type="button" value="▼"/>	Configuration: <input type="text" value="8"/> S <input type="text" value="1"/> P	Cell Capacity: <input type="text" value="8000"/> mAh <input type="text" value="8000"/> mAh total	max. discharge: <input type="text" value="85%"/> <input type="button" value="▼"/>	Resistance: <input type="text" value="0.0021"/> Ohm	Voltage: <input type="text" value="3.7"/> V	C-Rate: <input type="text" value="30"/> C cont. <input type="text" value="45"/> C max	Weight: <input type="text" value="201"/> g <input type="text" value="7.1"/> oz
Controller	Type - Timing: <input type="text" value="max 100A"/> <input type="button" value="▼"/> - <input type="text" value="normal"/> <input type="button" value="▼"/>	Current: <input type="text" value="100"/> A cont. <input type="text" value="100"/> A max	Resistance: <input type="text" value="0.0025"/> Ohm	Weight: <input type="text" value="130"/> g <input type="text" value="4.6"/> oz	Battery extension Wire: <input type="text" value="AWG10=5.27mm²"/> <input type="button" value="▼"/>	Length: <input type="text" value="0"/> mm <input type="text" value="0"/> inch	Motor extension Wire: <input type="text" value="AWG10=5.27mm²"/> <input type="button" value="▼"/>	Length: <input type="text" value="0"/> mm <input type="text" value="0"/> inch
Motor	Manufacturer - Type (Kv) - Cooling: <input type="text" value="Turnigy"/> <input type="button" value="▼"/> - <input type="text" value="G160-290 (290)"/> <input type="button" value="▼"/> <input type="text" value="good"/> <input type="button" value="▼"/> <input type="button" value="search..."/>	KV (w/o torque): <input type="text" value="290"/> rpm/V	no-load Current: <input type="text" value="1"/> A @ <input type="text" value="10"/> V	Limit (up to 15s): <input type="text" value="78"/> A <input type="button" value="▼"/>	Resistance: <input type="text" value="0.022"/> Ohm	Case Length: <input type="text" value="66"/> mm <input type="text" value="2.6"/> inch	# mag. Poles: <input type="text" value="10"/>	Weight: <input type="text" value="649"/> g <input type="text" value="22.9"/> oz
Propeller	Type - yoke twist: <input type="text" value="APC Electric E"/> <input type="button" value="▼"/> - <input type="text" value="0°"/> <input type="button" value="▼"/>	Diameter: <input type="text" value="17"/> inch <input type="text" value="431.8"/> mm	Pitch: <input type="text" value="10.0"/> inch <input type="text" value="254"/> mm	# Blades: <input type="text" value="2"/>	PConst / TConst: <input type="text" value="1.08"/> / <input type="text" value="1.0"/>	Gear Ratio: <input type="text" value="1"/> : <input type="text" value="1"/>	Flight Speed: <input type="text" value="0"/> km/h <input type="text" value="0"/> mph	<input type="button" value="calculate"/>



Load:



Mixed Flight Time:



Current:



est. Temperature:



Thrust-Weight:



Pitch Speed:

Remarks:

Battery		Motor @ Optimum Efficiency		Motor @ Maximum		Propeller		Total Drive		Airplane	
Load:	7.45 C	Current:	37.18 A	Current:	59.62 A	Static Thrust:	7592 g	Drive Weight:	2626 g	All-up Weight:	2722 g
Voltage:	28.60 V	Voltage:	28.88 V	Voltage:	28.45 V		267.8 oz		92.6 oz		96 oz
Rated Voltage:	29.60 V	Revolutions*:	7860 rpm	Revolutions*:	7578 rpm	Revolutions*:	7578 rpm	Power-Weight:	648 W/kg	Wing Load:	37 g/dm²
Energy:	236.8 Wh	electric Power:	1074.0 W	electric Power:	1696.1 W	Stall Thrust:	- g		294 W/lb		12.1 oz/ft²
Total Capacity:	8000 mAh	mech. Power:	1005.2 W	mech. Power:	1574.1 W		- oz	Thrust-Weight:	2.79 : 1	Cubic Wing Load:	4.2
Used Capacity:	6800 mAh	Efficiency:	93.6 %	Efficiency:	92.8 %	avail. Thrust @ 0 km/h:	7592 g	Current @ max:	59.62 A	est. Stall Speed:	29 km/h
min. Flight Time:	6.8 min			est. Temperature:	49 °C	avail. Thrust @ 0 mph:	267.8 oz	P(in) @ max:	1764.7 W		18 mph
Mixed Flight Time:	23.2 min				120 °F	Pitch Speed:	116 km/h	P(out) @ max:	1574.1 W	est. Speed (level):	108 km/h

Result Link: <https://www.ecalc.ch/motorcalc.php?ecalc&lang=er>

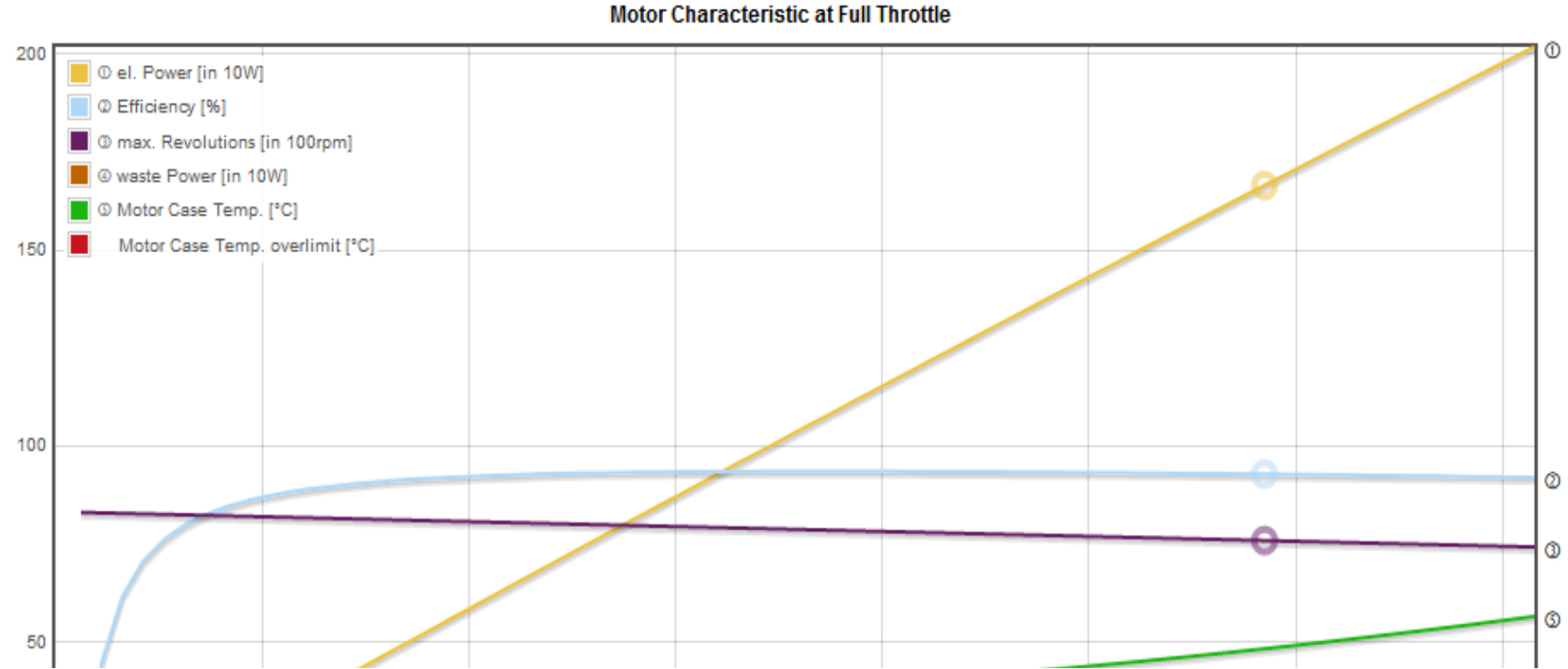
Weight: 1608 g
56.7 oz

Wattmeter readings
Current: 59.62 A
Voltage: 28.6 V
Power: 1705.1 W

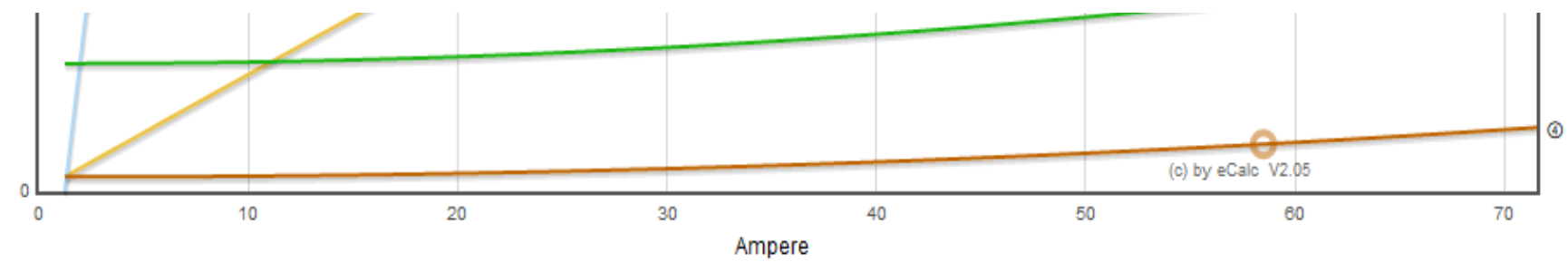
Tip Speed: 72 mph
617 km/h
383 mph
specific Thrust: 4.48 g/W
0.16 oz/W

Efficiency @ max: 89.2 %
Torque: 1.98 Nm
1.46 lbf.ft
est. Speed (vertical): 67 mph
76 km/h
47 mph
est. rate of climb: 21.2 m/s
4165 ft/min

Motor Partial Load															
Propeller	Throttle	Current (DC)	Voltage (DC)	el. Power	Efficiency	Thrust		Spec. Thrust		Pitch	Speed		Speed (level)		Motor Run Time
rpm	%	A	V	W	%	g	oz	g/W	oz/W	km/h	mph		km/h	mph	(85%) min
1000	12	0.2	29.6	7.0	51.3	132	4.7	18.8	0.66	15	9		-	-	1712.2
1500	18	0.6	29.6	17.6	69.2	297	10.5	16.9	0.60	23	14		-	-	683.8
2000	25	1.2	29.6	36.6	79.1	529	18.7	14.5	0.51	30	19		-	-	329.6
2500	31	2.3	29.6	66.7	84.7	826	29.1	12.4	0.44	38	24		-	-	180.5
3000	37	3.8	29.5	110.9	88.0	1190	42.0	10.7	0.38	46	28	43	27		108.4
3500	43	5.9	29.5	172.2	90.0	1619	57.1	9.4	0.33	53	33	50	31		69.7
4000	50	8.6	29.5	253.5	91.3	2115	74.6	8.3	0.29	61	38	57	35		47.3
4500	56	12.2	29.4	357.9	92.1	2677	94.4	7.5	0.26	69	43	64	40		33.4
5000	63	16.7	29.3	488.4	92.5	3305	116.6	6.8	0.24	76	47	71	44		24.4
5500	70	22.3	29.2	648.1	92.8	3999	141.1	6.2	0.22	84	52	79	49		18.3
6000	77	29.0	29.1	840.2	93.0	4759	167.9	5.7	0.20	91	57	86	53		14.1
6500	84	37.0	29.0	1067.8	93.0	5585	197.0	5.2	0.18	99	62	93	58		11.0



107	66	100	62	8.8
114	71	107	66	7.1
116	72	108	67	6.8



1&weight=2722&wingspan=2438.4&calc=auw&motornumber=1&warea=74.32&elev

