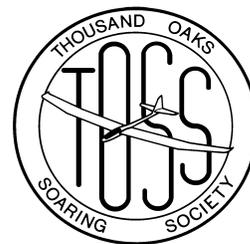


TOSSUP 98



"Annual Servo Edition"

This month we've got a couple of articles on servos for you. We have the 1998 edition of Bob Swet's database on the specifications of every known servo and an article abstracted from the April 1998 AMA National Newsletter.

Servo Current Drain

(Abstracted from an article by Larry Dungan that was originally published in "High Flight" Vol XI #4 and reprinted in the AMA National Newsletter of April 1998)

Larry Dungan was interested in working out how large a battery he needed for a particular flight pack. He obtained representative samples of servos from their manufacturers and tested them by mounting them firmly on the bench and attaching weights to the end of their output arm. He drove the servos from a servo test unit and measured their current drain, tabulating the results. The table listed current drain as a function of load (specified as a percentage of the rated torque), the peak load when the servo was stalled and an average load. (Note that he wasn't specific about how he estimated an average load.) Although the table doesn't include 'our' sorts of servos its reasonable to figure that the current drain characteristics are going to be similar, with the lower torque servos using less current and the current increasing in the same proportions as the servo is loaded to its stall point.

Make	Torque	Idle	25%	50%	75%	100%	Stalled	Average
Ace 14G26A	45.0	7.5	25	54	94	215	665	97
Ace 14G26AB	45.0	6.1	27	75	130	310	640	135
Airt 94102	50.0	4.6	20	190	310	410	510	232
Futaba 945210	110.0	8.5	55	290	385	500	720	307
Futaba 94732	67.0	6.6	65	235	380	415	580	274
Futaba S114	167.0	9.3	75	330	530	740	910	419
Futaba S128	48.7	9.5	35	125	245	340	590	186
Futaba S134	112.6	9.7	145	365	565	780	920	464
Futaba S134G	173.6	20.0	85	390	505	630	910	402
Futaba S148	42.0	9.0	45	170	245	325	600	196
Futaba S9101	41.7	9.2	50	165	245	325	500	199
Futaba S34	112.6	9.6	135	360	570	765	910	457
World S16	180.0	7.5	95	340	520	620	860	394
World S29	34.0	6.2	20	40	75	170	505	76

This table could be used to estimate how long a given battery pack would last - for example, a simple polyhedral glider like a Gentle Lady or Spirit would use two standard servos, S148s for example. Using this table he would expect an average current drain of around 400mA or about 90 minutes from one of the common 600mAH NiCad packs. Its also possible to estimate what will happen with a battery pack that has a significant internal resistance - old NiCads, dry cells or some other kind of battery. It also should serve as a warning for people to check their linkages binding since an unexpectedly high current drain due to binding will not only shorten battery life but may cause an unanticipated terminal voltage drop and consequent receiver malfunction.

April's Competition

This month's competition was billed as the "*Bent Wing / Built Up*" competition, TOSS's venture into Nostalgia Rules competitions. Unfortunately we forgot that the second Sunday in April was in fact Easter Sunday and so the turnout was very low. This didn't deter the diehards but it did cause a *de facto* postponement of the competition proper until later in the year.

Flying conditions were good, with a clear sky with some cumulus clouds, pleasant temperatures, a bit of a westerly breeze and quite good lift. The contest had four rounds of 4, 5, 6 and 7 minutes scoring 960/40 on each round. There were some initial problems getting the landings right and some people got caught later in the morning when the lift became inconsistent.

Name	Glider	R1			R2			R3			R4			Total
Don McNamee	Spirit 100+	3:58	0	952.0	5:02	84	987.2	6:00	75	990.0	5:33	98	800.3	3729.5
Bob Swet	Oly 650	3:09	0	756.0	5:00	95	998.0	4:14	40	693.3	6:58	75	985.4	3432.8
Don Northern	Gemini 'S'	4:04	74	973.6	3:33	94	719.2	5:59	80	989.3	5:05	93	734.3	3416.5
Art McNamee	Misty	4:02	71	980.4	3:33	85	715.6	5:14	61	861.7	3:05	73	452.1	3009.8
Bill Karp	Pantera	4:01	0	920.0	3:52	65	768.4	4:45	72	788.8	3:26	72	499.7	2976.9
Edgar Weisman	Paragon	2:25	0	580.0	4:57	73	979.6	0	0	0.0	0	0	0.0	1559.6

Although Bill Karp's Pantera was voted as 'the plane with the best chance of falling apart on launch' because of its amazing amount of flex and flutter on the winch it actually survived well. It fell to Edgar to have the only casualty when the left tip of his Paragon broke off just outside of the joiner box during the launch for the third round, badly damaging it during the subsequent crash.



Bob's Servo Listings

The next three pages have Bob Swet's compendium of servo characteristics..... Read on.....