

**RACING PIGEON
PERFORMANCE VALUATION**

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APC LOFT

INTRODUCTION

- "Performance Pigeons "earn their titles from being race winners or from having bred race winners however there are no accepted procedures or standards for calculating Performance Values for racing pigeons.
- "Performance Pigeon " status is arbitrarily declared when a racing pigeon places high on a race result regardless of the races distance , degree of difficulty , number of birds in the race or by having placed high on a multi race One Loft Race Average Speed list.
- The pigeon racing practice named "Average Speed "is illogical and faulted however it is commonly used to publish an order of placement of racing pigeons that competed in a One Loft Race series of 2 or more races.
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- The following exaggerated hypothetical example (Table 1) shows why OLR "Average Speed" calculation is a faulted practice.

Table1 (OLR Average Speed)

		400 Birds Race A	300 Birds Race B	200 Birds Race C	Sum A+B+C	Average Sum: Dist./Flyingtime
Bird #1	Flying Times HRS	7.5	5	2.5	15	1173.33 ypm
	Distance Miles	100	200	300	600	
Bird #2	Flying Times HRS	2.5	5	7.5	15	1173.33 ypm
	Distance Miles	100	200	300	600	

Exchanging birds flying times on Races A & C does not alter the total flying times of races A+B+C and since a racing pigeon can't fly 300 miles in 2.5 hours the practice of simply adding birds total flying times from a OLR series of races to determine their Average Speed placement and performance is illogical and faulted.

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- Therefore now by definition Performance Values for racing pigeons that compete in a One Loft Race depend in part on a value for their clocking order relative to their speed and also in part to a value that relates the races distance to a degree of difficulty.

- Racing pigeon One Loft Races are typically flown at distances from 100 to 400 miles and pigeon speeds (average velocities) are calculated by dividing a races distance by competing birds lapsed flying times from their release to arrival at one loft.
- Weather mainly affects the speeds of racing pigeons that compete in One Loft Races and a host of Difficulty Factors relative to a races distance also influence a racing pigeon's ability to compete.
- Wind speed and direction increases or decreases calculated racing pigeon speeds in comparison to a normal speed (average velocity) of approximately 1350ypm that modern racing pigeons are capable of sustaining for at least 8 hours when flying nonstop in normal weather.

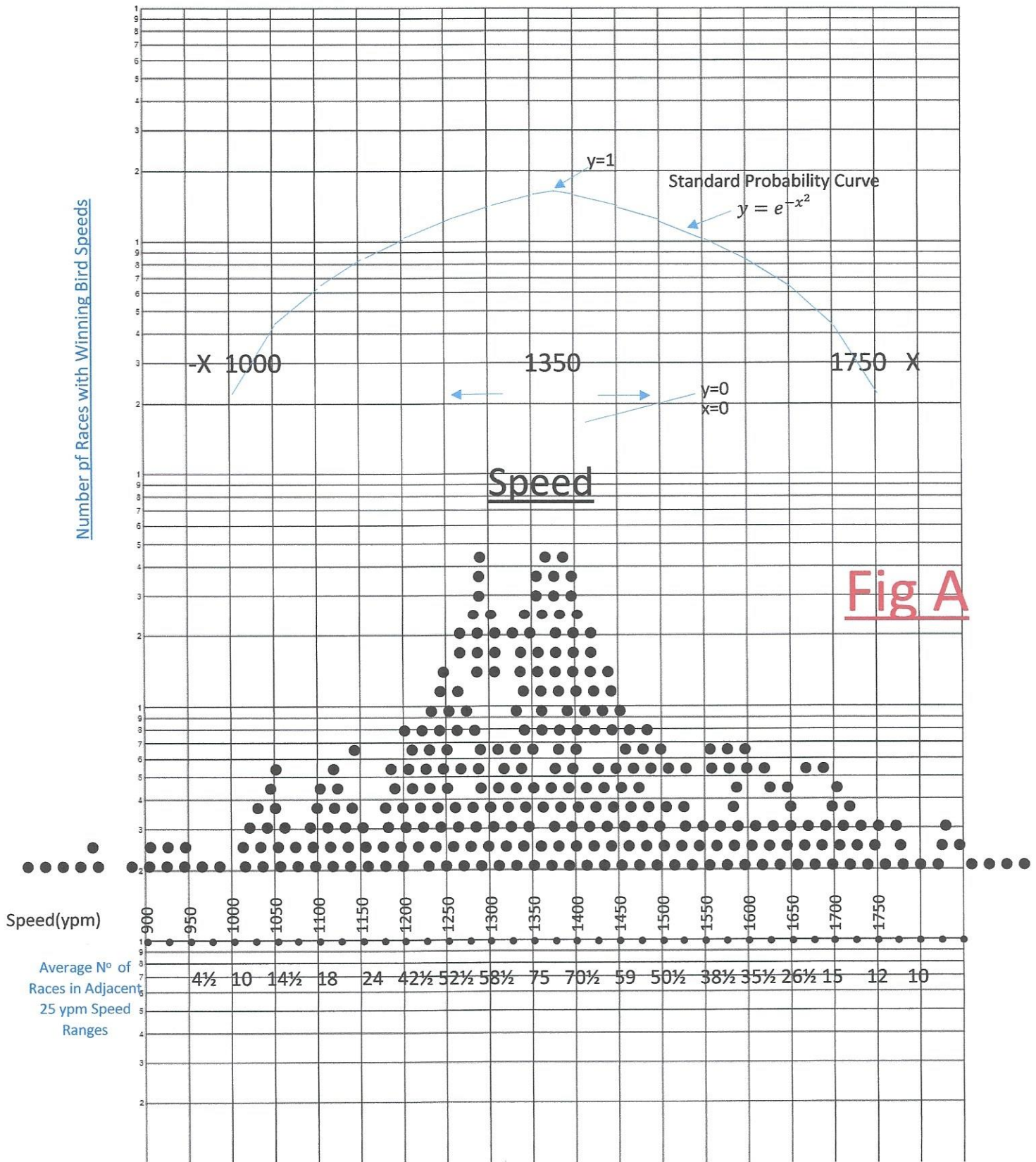
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Typical Difficulty Factors are: Homing ability
 Bird health and moult
 Feeding and nutrition
 Motivation
 Loft management & training
 Race course obstacles
 Etc. Etc.

Performance Values (PV) of racing pigeons that compete in a One Loft Races are calculated using Standard values for races winning birds speeds plus Standard values for race distances.

Pigeon race data such as speed and place, distance and race difficulty, together with numbers of birds entered and numbers of birds returning home in race time can be related to calculated Standard values that enable Level Playing Field comparison of racing pigeon's performances.

Number of Races with Winning Bird Speeds



Data used to plot Fig A was published on website (www.wincompanion.com) during the period 2013 to 2016.

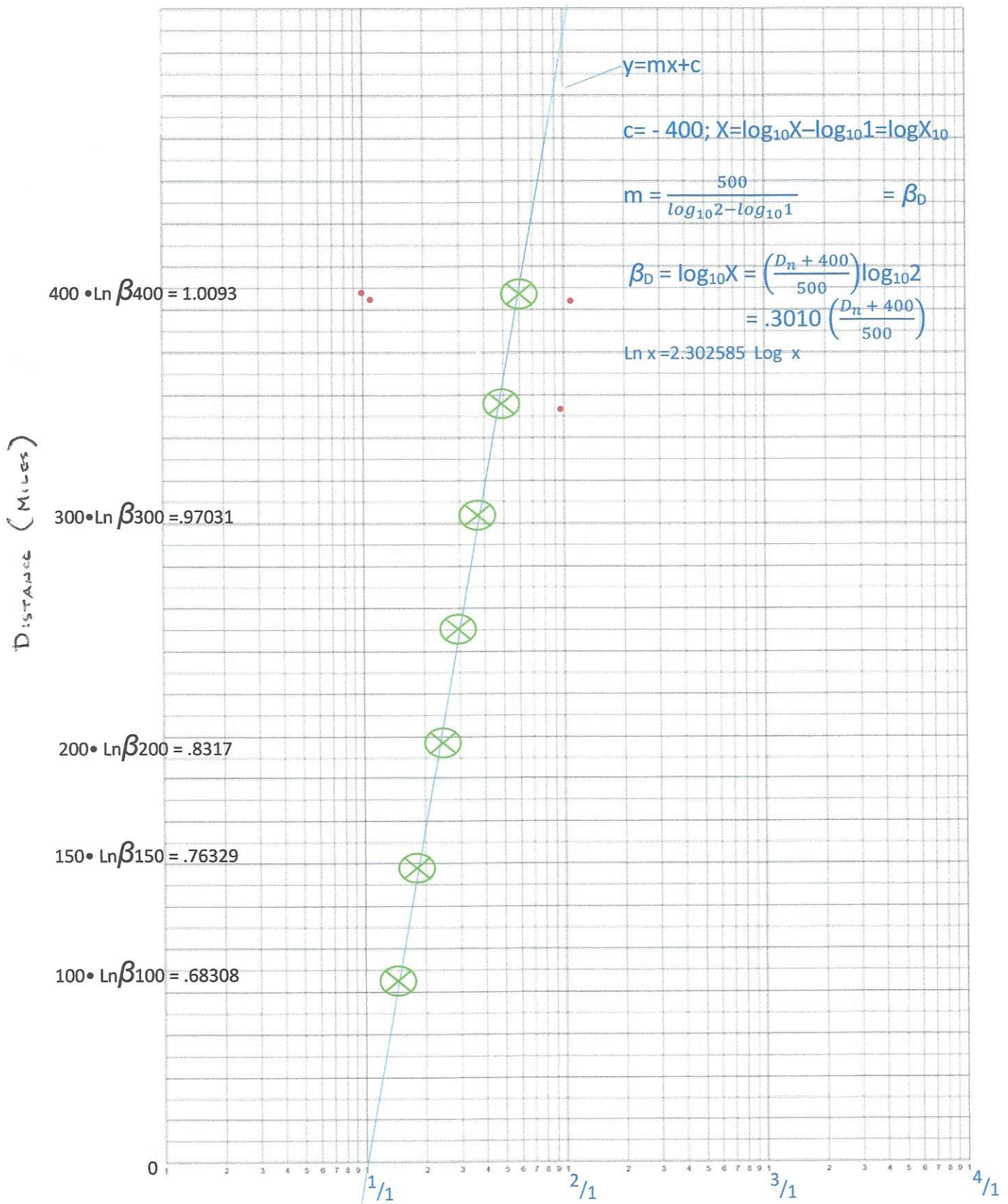
The semi-log graph (Fig A) indicates there is a Standard Probability distribution relationship covering the 650 races and the winning bird speeds for the 650 races and a maximum value for $y = 1$ occurs at a winning bird speed of 1350 ypm and minimum values for $y = .368$ correspond to winning birds speeds of 495.8 ypm ($x = -1$) and 2203 ypm ($x = +1$).

Fig2. Illustrates Standard winning bird speed values in the range 495.8 to 2203 ypm .

A host of Difficulty Factors collectively influence a racing pigeon performance and they can be expressed (Fig 1) as Standards related to race distance and the ratio of the number of Birds released to race versus the number that return home and are clocked in race time (BIR/BIRT).

By definition now Race Time (BIRT) is the lapsed time from release to when a races speed reduces to 495.8ypm.

FIG 1



Race Difficulty Factor: $\beta = \left(\frac{BIR}{BIRT} \right)$

$$\text{Race Difficulty Factor: } \beta = \left(\frac{BIR}{BIRT} \right)$$

Fig 1 is a semi – log plot covering 650 One Loft Races at distances from 100 to 400 miles versus Race Difficulty Factors (BIR/BIRT) that establishes that there is a linear cause and effect relationship between race distance (D) and race Difficulty Factors.

Distance related Race Difficulty Standard values shown calculated on **Fig 1** range from 0.693 at 100 miles to 1.0109 at 400 miles.

“Performance Value” of a racing pigeon is the combination of a calculated value related to the birds race speed and place and a calculated value relative to the respective races distance and degree of difficulty.

Performance Valuation (PV_n) of racing pigeons is made possible, in part, by using race data that is published on <www.wincompanion.com>.

Race Place: n

Race Distance of Winning Bird: $D_{n-(n-1)}$

Race Distance of Bird: D_n

Winning Birds Flying Time: $\Delta T_{n-(n-1)}$

Birds Flying Time: ΔT_n

Winning Birds Speed: $S_{n-(n-1)}$

Birds Speed: S_n

Birds Shipped to Race Release: **BIR**

Birds Returning at Speed ≥ 496.8 ypm: **BIRT**

Races in a Series: **N**

Also, in part, from derivation of Standard natural logarithmic expressions for Bird Speed (λ) and race Difficulty Factors (β) that enable calculation of Performance Values (PV_n).

Racing pigeon results published on website <www.wincompanion.com> from 2011 to 2016 are the primary data source used to develop ln Speed (λ) and ln Difficulty Factor (β) Standards.

Racing pigeons tend to fly at a speed of approximately 1350 yards per minute in still air and their average ground speed increases or decreases depending on wind speed and direction.

Selecting 1350 ypm as the maximum value when $y = 1$ on the standard distribution probability graph $y = e^{-x^2}$ Shown as **Fig A** produces values of 496.8 ypm when $x = -1$ and 2203.2 ypm when $x = 1$

(Note: 96.2% of Wincompanion Races over 100 miles during the period 2011 to 2016 had winning bird speeds between 850 and 1850 ypm.)

Over the domain of $y = e^{-x^2}$ in the range $x = -1$ to $x = 1$ where $y = \ln x$, $\ln e = 1$ and $e^{\ln x} = x$
 When $e^y = x$, the base logarithm of x
 $\ln(x) = \log_e(x) = y$

Negative values for $x = \left(\frac{1350 - S_{n-(n-1)}}{853.2} \right)$

Positive values for $x = \left(\frac{S_{n-(n-1)} - 1350}{853.2} \right)$

A winning race speed ln Standard is calculated either as :

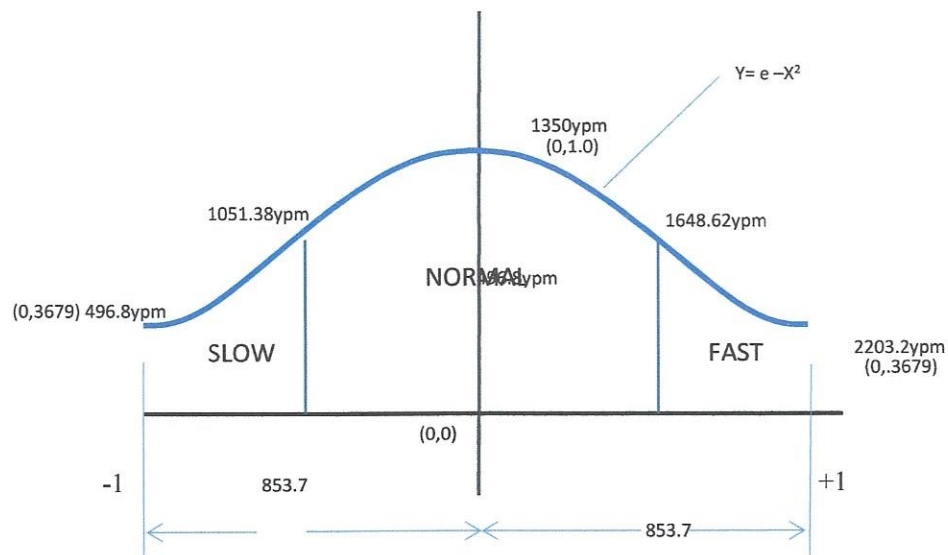
$$\ln, \lambda_{n-(n-1)} = e^{-\left(\frac{1350 - s_{n-(n-1)}}{853.2}\right)^2} \quad \text{Or} \quad \ln, \lambda_{n-(n-1)} = e^{-\left(\frac{s_{n-(n-1)} - 1350}{853.2}\right)^2}$$

Part of the performance value for a racing pigeon competing in a race is a measure of the birds Clocking Position (n) and the Number of Birds (**BIRT**) which clock in race time having a speed $\geq 496.8\text{ypm}$ expressed as:

$$\left(1 - \frac{n}{\text{BIRT} + 1}\right)$$

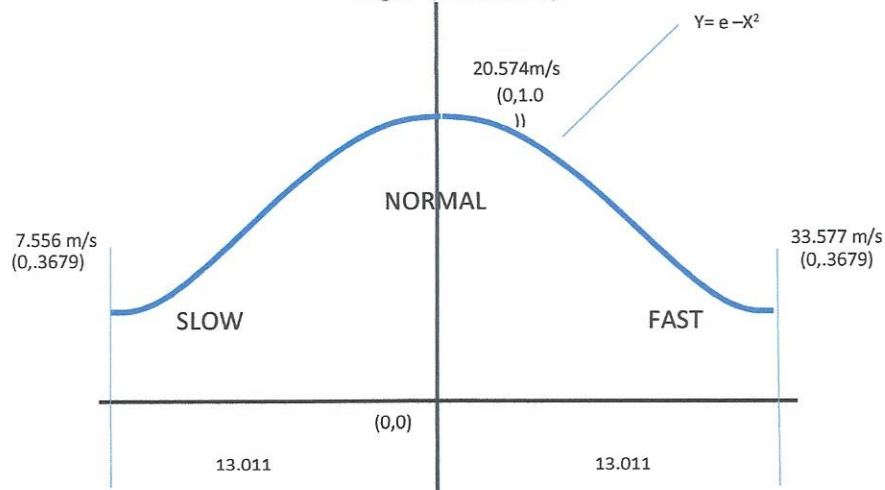
Fig 2 (Yards per minute)

$\ln \lambda$ (Speed) standards



1.

Fig 2 (meters/sec)



The performance value component for a birds place and speed in a race is the product:

$$\ln, \lambda_{n-(n-1)} * \left(1 - \frac{n}{BIRT + 1} \right) * \left(\frac{S_n}{S_{n-(n-1)}} \right)$$

The Number of Birds (**BIR**) released on a race versus the number (**BIRT**) that clock at a speed greater than 496.8ypm is a measure $\left(\frac{BIR}{BIRT} \right)$ of a races difficulty.

Coordinates $\left(\left(\frac{BIR}{BIRT} \right), D \right)$ from 650 races plotted on semi-logarithmic log paper, **Fig 1**, shows that race Distance (**D**) and its relationship to the race Degree of Difficulty Indicator Ratio $\left(\frac{BIR}{BIRT} \right)$ is a linear relationship.

Regression Analysis of 650 data points $\left(\left(\frac{BIR}{BIRT} \right), D \right)$ plotted on semi-log paper in 25 mile increments over distances from 100 to 400 miles produced a straight line.

Race Distance and Difficulty Factors plotted on **Fig 1** generate the graph $y = mx + c$ which becomes

$$\ln, \beta_{Dn-(n-1)} = .693 ((Dn-(n-1)+400)/500))$$

Performance Value (PV_n) for a racing pigeon competing in a race, in part, is a measure of the races difficulty and distance expressed as:

$$\left(1 - \frac{BIRT}{BIR+1}\right) * \left(\frac{D_n}{D_{n-(n-1)}}\right).$$

And the Standardized distance component value based on the races difficulty is

$$\ln, \beta_{D_{n-(n-1)}} * \left(1 - \frac{BIRT}{BIR+1}\right) * \left(\frac{D_n}{D_{n-(n-1)}}\right).$$

Performance Value (PV_n) for a Racing Pigeon competing in a One Loft Race is the sum of a Place by Speed component value plus a Difficulty by Distance component value expressed as:

$$\ln, PV_n = \ln, \lambda_{n-(n-1)} \left\{ \left(1 - \frac{n}{BIRT+1}\right) * \left(\frac{S_n}{S_{n-(n-1)}}\right) \right\} + \ln, \beta_{D_{n-(n-1)}} \left\{ \left(\frac{D_n}{D_{n-(n-1)}}\right) \left(1 - \frac{BIRT}{BIR+1}\right) \right\}$$

And

$$PV_n = (\ln, \lambda_{n-(n-1)} \left\{ \left(1 - \frac{n}{BIRT+1}\right) * \left(\frac{S_n}{S_{n-(n-1)}}\right) \right\} + \ln, \beta_{D_{n-(n-1)}} \left\{ \left(\frac{D_n}{D_{n-(n-1)}}\right) \left(1 - \frac{BIRT}{BIR+1}\right) \right\}) / e$$

A Racing Pigeons place on a OLR race series (SPV) is the addition of ratios of each birds race PV_n divided by each races winning birds $PV_{n-(n-1)}$ summed and divided by the number (N) races in the series.

$$SPV = \frac{\sum_{i=1}^N \left(\frac{PV_n}{PV_{n-(n-1)}} \right)}{N}$$

PV_n: PERFORMANCE VALUATION : VENUE STROOKEN RIVER BIRD N° 17033-US17APC (89-5

LOFT NAME	APC LOFT
101	101
102	102
103	103
104	104
105	105
106	106
107	107
108	108
109	109
110	110
111	111
112	112
113	113
114	114
115	115
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199	199
200	200

$$PV_n = \left(\gamma_{(n-1)} \left(1 - \frac{n}{(BIR+1)} \right) * \left(\frac{n}{n(n-1)} \right) \right) + \beta_{\alpha(n-1)} \left(\left(\frac{n}{n(n-1)} \right) * \left(1 - \frac{BIR}{BIR+1} \right) \right) / e$$

PV = 1.13219, 96331 1.18286 1.23933

RACE #N

DISTANCE: $\binom{D}{k-n-1} \text{MUS}$

PLACE	${}^nP_r$
1	${}^nP_1 = n$
2	${}^nP_2 = n(n-1)$
3	${}^nP_3 = n(n-1)(n-2)$
4	${}^nP_4 = n(n-1)(n-2)(n-3)$
5	${}^nP_5 = n(n-1)(n-2)(n-3)(n-4)$
6	${}^nP_6 = n(n-1)(n-2)(n-3)(n-4)(n-5)$
7	${}^nP_7 = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)$
8	${}^nP_8 = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)$
9	${}^nP_9 = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)$
10	${}^nP_{10} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)$
11	${}^nP_{11} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)$
12	${}^nP_{12} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)$
13	${}^nP_{13} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)$
14	${}^nP_{14} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)$
15	${}^nP_{15} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)(n-14)$
16	${}^nP_{16} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)(n-14)(n-15)$
17	${}^nP_{17} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)(n-14)(n-15)(n-16)$
18	${}^nP_{18} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)(n-14)(n-15)(n-16)(n-17)$
19	${}^nP_{19} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)(n-14)(n-15)(n-16)(n-17)(n-18)$
20	${}^nP_{20} = n(n-1)(n-2)(n-3)(n-4)(n-5)(n-6)(n-7)(n-8)(n-9)(n-10)(n-11)(n-12)(n-13)(n-14)(n-15)(n-16)(n-17)(n-18)(n-19)$

Bros. Speed: (S_x)

Wieder
Rück
S
S

BIRDS SENT TO RACE: (BIR)

(BIRT): BIRDS RETURNING SPEED ≥ 498.6 BIRT

Ratio $BIR/BIRT$

$$\text{PROBABILITY VALUE: } \hat{p} = e^{\left(\frac{1350 - 5n - n^2}{853.2} \right)}$$

$$e^{-\left(\frac{5(n-m)-1350}{853.2}\right)}$$
Place Percentages: $1 - \frac{1}{(B)}$

Speed Ratio: $\frac{S_n}{S_{n-1}}$

$$\text{Distance Equivalent } \beta = \frac{.693(p_{n-1} + 400)}{500}$$

Difficulty Percentage: $\left(1 - \frac{BIR_t}{BIR_{t+1}}\right)$

DISTANCE RATIO D_n / D_{n-1}

RACE PERFORMANCE % PV_n / PV_m

R/1	R/2	R/3	R/4	5	6	7	8	9	10
201-131	250-248	300-138	353-666						
307	20	6	23	8-356					
1395-014	1700-008	1442-162	1385-316						
1454-254	1748-155	1442-725	1425-209						
607	511	453	339						
509	449	327	228						
1-1925	1-1381	1-3853	1-4868						
/	/	/	/						
-97553	-80431	-98826	-99236						
-6096	-95555	-98171	-89956						
-9399	-9725	-99961	-9720						
-8332	-9009	-97058	1-04458						
-1628	-1230	-2797	-3294						
1-0000	1-0000	1-0000	1-0000						
-85479	-9786	-9952	-96351						
-96778	-9427	-10716	-11941						
(4 Race (SPN))									
Σ = 3-7921									
Ave = -948025									
17033									

 $(4P_{ACE}(SP))$

Ave = 948025

17033

3rd

$$\text{Reg}^+ \mathcal{Z} = \mathcal{Z} \cdot 9369$$
$$A_{\text{VE}} = 97896$$

17

PV_n: PERFORMANCE VALUATION : VENUE CROOKED RIVER / 17 BIRD N° 800Z-AU17RMC

Loft Name	RMC	Loft
101	101	101
102	102	102
103	103	103
104	104	104
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106	106	106
107	107	107
108	108	108
109	109	109
110	110	110
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200	200	200

$$PV_n = \left(T_{(n-m-1)} \left(1 - \frac{n}{(BIRT+1)} \right) * \left(\frac{n}{(n-m-2)} \right) \right) + \beta_{(n-m-1)} \left(\left(\frac{n}{(n-m-1)} \right) * \left(1 - \frac{(BIRT)}{(BIRT+1)} \right) \right) / e$$

$PV_1 = 1.13219 \cdot 96331 \cdot 1.18286 \cdot 1.23933$

RACE #N	R/1	R/2	R/3	R/4	5	6	7	8	9	10
DISTANCE: $(D_{(n-m)})_{\text{MUS}}$	201.131	250.245	300.138	353.666						
PLACE: (n)	97	147	18	28	$\Sigma = 290$					
BIRDS SPEED: (S_n)	1461.399	1666.923	1432.903	1375.135						
WINNING BIRDS SPEED: $(S_{(n-m)})$	1454.259	1748.155	1442.725	1425.209						
BIRDS SENT TO RACE: (BIR)	607	511	453	339						
(BIRT): BIRDS RETURNING SPEED ≥ 498.6	509	449	327	228						
RATIO $BIR/BIRT$	1.1925	1.1351	1.3553	1.4868						
PROBABILITY VALUE: $\lambda = e^{-\left(\frac{1850 - S_{(n-m)}}{553.2}\right)^2}$										
PLACE PERCENTAGE: $\left(1 - \frac{1}{(BIRT+1)}\right)$	.97553	.80431	.98826	.99226						
SPEED RATIO: $S_n/S_{(n-m)}$	.8098	.67333	.9451	.8777						
DISTANCE EQUIVALENT $\beta = \frac{500}{693(D_{(n-m)} + 400)}$	.4332	.9009	.97038	1.04438						
DIFFICULTY PERCENTAGE: $\left(1 - \left(\frac{BIRT}{(BIRT+1)}\right)\right)$	.1628	.1230	.2797	.3294						
DISTANCE RATIO $D_n/D_{(n-m)}$	1.000	1.000	1.020	1.000						
RACE PERFORMANCE % PV_n/PV_{n-m}	.93366	.88606	.98196	.95927						
PERFORMANCE VALUE: PV_n	1.05708	.29355	1.16152	1.18886						

