

EFFECT ON PERFORMANCE REDUCTION DATA SHEETS ISSUED BEFORE 1962 OF THE DEFINITION OF THE INTERNATIONAL NAUTICAL MILE AND THE INTRODUCTION OF A STANDARD ATMOSPHERE IN ITEM Nos 68046 AND 77022

1. INTRODUCTION

The use of the International Nautical Mile defined as 1 852 m instead of a UK nautical mile of 6 080 ft introduces slight changes in various conversion factors in the Performance "RJ", "RT" and "RP" Data Sheets. In addition, the introduction of a Standard Atmosphere in Item Nos 68046 and 77022 slightly modifies the assumed sea level values so that, although relative values in the atmosphere (*i.e.* ratio of a property at an altitude to its sea level value) are the same, absolute values may involve slight differences.

2. ATMOSPHERIC DATA

When required, atmospheric data should be extracted from Item No. 68046 or calculated using Item No. 77022. However, data appear in sheets issued before 1962 extracted from Aerodynamics Data Sheet No. 00.01.02, Issue 1, September 1947. Relative values will agree with values obtained from Item No. 68046 or 77022, but absolute values may differ slightly. The details of the changes appropriate to particular data sheets are not given here, since the reasons for any discrepancies will be obvious.

The sea level values of the atmospheric properties are also slightly different in Item Nos 68046 and 77022 from those in the earlier Aerodynamics Item No. 00.01.02 Issue 1, and since density is included in some of the constants given numerical values in the Performance Sheets, some minor changes are necessary. Where these occur the full equation is given in Section 4.

3. CONVERSION FACTORS

The appropriate conversion factors are given in Table 3.1

TABLE 3.1

<i>To convert</i>	<i>to</i>	<i>multiply by</i>	<i>instead of</i>	<i>Data sheets directly affected</i>
knots	ft/s	1.688	1.689	RT 1/0
(knots) ²	(ft/s) ²	2.849	2.852	
knots	ft/min	101.3	101.3	RJ 2/1
ft/s	knots	0.5925	0.5921	
hp	n.mile lbf/h	326	326	RT 1/0

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4. EQUATIONS INVOLVING NUMERICAL CONSTANTS

The following gives corrected versions of various equations containing numerical constants which are used in the text of the data sheets. The equation numbers are those used in the appropriate sheet. Where these equations are also used in the Examples they are not re-stated but should be modified in accordance with the text of the sheet. ALL OTHER CONSTANTS ARE UNAFFECTED TO THE ACCURACY QUOTED.

Data Sheets Perf RJ 2/0 and RT 1/0

$$1 + 0.088V \frac{d(w \cos \phi)}{dh} \quad \text{Correction for wind gradient}$$

Data Sheet Perf RP 1/0

$$D_{100} = 11.88 S C_{DZ} \quad \text{Notation}$$

$$V_{imd} = 23.97 D_{100}^{-1/4} [(W/b) K^{1/2}]^{1/2} \quad \text{Notation and Introduction}$$

$$\eta P \sigma^{1/2} = 0.8742 \times 10^{-6} D_{100} V_i^3 + 0.2885 K W^2 / (b^2 V_i) \quad (1)$$

$$+ 0.303 \times 10^{-4} W v_c \sigma^{1/2}$$

Data Sheet Perf RP 1/2

$$D_{100} = 11.88 S C_{DZ} \quad \text{Notation}$$

$$V_{imd} = 23.97 D_{100}^{-1/4} [(W/b) K^{1/2}]^{1/2} \quad \text{Notation}$$

$$1 + 0.088V \frac{d(w \cos \phi)}{dh} \quad (7)$$

Data Sheet Perf RP 1/2

$$D_{100} = 11.88 S C_{DZ} \quad \text{Notation}$$

$$V_{imd} = 23.97 D_{100}^{-1/4} [(W/b) K^{1/2}]^{1/2} \quad \text{Notation}$$

$$\eta P \sigma^{1/2} = 0.8742 \times 10^{-6} D_{100} V_i^3 + 0.2885 K W^2 / (b^2 V_i) \quad (1)$$

$$+ 0.303 \times 10^{-4} W v_c \sigma^{1/2}$$