

NOTATION AND UNITS IN PERFORMANCE DATA ITEMS

1. DESCRIPTION

Each Data Item is self contained as regards Notation and Units and there is no one comprehensive system of Notation and Units applicable to all Performance Items. Such systems* are necessarily extensive and, because of the wide variety of subject areas to be accommodated, can be cumbersome when applied to simple calculations, see References 1 to 3 and, to a lesser extent, Reference 5. In practice, however, different combinations of notation and units are formulated to meet the demands of particular tasks and the Data Items tend to reflect this. Many Items contain numerical constants and/or conversion factors but where these are absent the user should consult either the Conversion Factors Item or one of the “key” Data Items listed in the Table overleaf or, in the case of the older, foolscap-size Data Sheets, the “Corrigenda” in Volume 14.

Table 2.1 identifies “key” Data Items containing the general systems of notation preferred for current work in Performance Data Items. Among these “key” Items, Nos 77022 and 80032 are indicative of the basic notation followed in the majority of Items. Further notation is required* for specialised subjects and differences and inconsistencies do exist particularly between the older Data Sheets issued before 1962 and more recent work.

Current practice is to write Performance Data Items in terms of both the “International System”, SI, and “British System” of units with formal precedence given to SI as, for example, in Reference 5. Exceptions to this scheme include the use of “British” units only in Data Sheets issued prior to 1962, the use of a single set of units in Items which take the form of worked examples and, occasionally, the inclusion of an additional set of units as, for example, in the case of a special industry standard.

The units in the Notation and Units sections of Items are expressed primarily in terms of the base units for mass, length, time and temperature and the customary units for force so as to simplify the checking of dimensions of equations, etc. The SI “special-name” quantities Hertz, Joule and Pascal are avoided whilst the use of non-coherent operational units is limited to Items where they are particularly relevant.

2. REFERENCES

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| 1. | ISO | Terms and symbols for flight dynamics – Part I: Aircraft motion relative to the air. International Organization for Standardization, ISO 1151, 1972. |
| 2. | ISO | Terms and symbols for flight dynamics – Part II: Motions of the aircraft and atmosphere relative to the Earth. International Organization for Standardization, ISO 1152, 1974. |
| 3. | ISO | Terms and symbols for flight dynamics – Part V: Quantities used in measurements. International Organization for Standardization, ISO 1151/V-1974 (E), 1974. |
| 4. | SAE | Gas turbine engine performance station identification and nomenclature. Society of Automotive Engineers, ARP 755A, April 1974. |

* See first entry in Table 2.1.

5. ICAO

Units of measurement to be used in air-ground communications. Amendment No. 13 to the international standards and recommended practices. Annex 5 to the Convention on International Civil Aviation. International Civil Aviation Organization, March 1979.

TABLE 2.1 KEY DATA ITEMS

<i>Subject Area</i>	<i>Data Item</i>	<i>Comments</i>
General flight-performance work, equations of motion, forces, speeds, rates, accelerations, and axes (including sign conventions)	78038 79018	Detailed notation (see References 1 to 3) for complex calculations; air-path, body and Earth axes
	80032	Simple notation for “project” work, air-path axes (still-air) only
Atmospheric data	77022	ISA and related conditions
	78012	“Non-standard” conditions
Winds	79018	Detailed representation (3 axes)
	73018	Simple representation
Gravity	79018	Detailed representation
	73018	Simple representation
Air-data	69026	
Drag, drag coefficient “laws” and associated quantities	81026	Includes conversion formulae to older systems of drag notation
Jet and fan engines: thrust definitions engine “station” designations (see Reference 4)	69006 76034	If total thrust and thrust “per engine” are required, F or F_N is used for the former, f_N for the latter

For ISO and ICAO policy on Notation and Units, see References 1, 2, 3 and 5.