



AEROSPACE STANDARD

AS6502™

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Aircraft Propulsion System Performance Nomenclature

RATIONALE

Aircraft propulsion technology continues to evolve and advance to meet changing requirements and challenges for improved performance and capabilities. This document addresses an industry need to characterize classical propulsion system performance parameter names, and describes the logical framework by which new names can be constructed. Nomenclature definitions issued by other industry organizations were reviewed and considered as well as the application of this standard to alternate engine cycles.

The contents of this document were, originally, a subset of AS755E. Due to the growing complexity of station numbering schemes described in AS755, and a desire to expand the nomenclature section to include a fuller representation of "classical" (legacy use) names, a decision was made to separate its "station numbering" and "nomenclature" content into two separate documents. This document, then, was created using the "nomenclature" half of AS755E. Both documents will continue to be improved and expanded as industry needs dictate.

AS6502 has been reaffirmed to comply with the SAE Five-Year Review policy.

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Documents

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1. SCOPE

- 1.1 This SAE Aerospace Standard (AS) provides classical propulsion system performance parameter names for aircraft propulsion systems and their derivatives, and describes the logical framework by which new names can be constructed.
- 1.2 The contents of this document were, originally, a subset of AS755E. Due to the growing complexity of station numbering schemes described in AS755, and a desire to expand the original document's nomenclature section to include a fuller representation of "classical" (legacy use) names, a decision was made to separate its "station numbering" and "nomenclature" content into two separate documents. This document, then, was created using the "nomenclature" half of AS755E. Both documents will continue to be improved and revised as industry needs dictate.
- 1.3 The parameter naming conventions presented herein are for use in all communications concerning propulsion system performance such as computer programs, data reduction, design activities, and published documents. They are intended to facilitate calculations by the program user without unduly restricting the method of calculation used by the program supplier.
- 1.4 The list of symbols presented herein will be used for identification of input and output parameters. These symbols are not required to be used as internal parameter names within the engine subprogram.

2. REFERENCES

2.1 Applicable References

The following documents contain material relevant to the subject area of this document, but do not form a part of this document.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AS755 Aircraft Propulsion System Performance Station Designation and Nomenclature

ARP5571 Gas Turbine Engine Performance Presentation and Nomenclature for Object-Oriented Computer Programs

2.1.2 ICAO Publications

Available from International Civil Aviation Organization, 999 University Street, Montreal, Quebec H3C 5H7, Canada, Tel: +1 514-954-8219, <http://www.icao.int/>

Doc 7488 International Civil Aviation Organization, Manual of the ICAO Standard Atmosphere

3. STATION DESIGNATION

AS755 describes station numbering systems used to designate points in the gas flow path that are significant to propulsion system performance definitions. The performance parameter naming conventions outlined in this document rely, somewhat, on the station numbering schemes described in AS755. Refer to that document for more detail.

For computer symbols in this document, the following convention will be used:

- a. Ø denotes the numeric symbol
- b. O denotes the alphabetic symbol

4. NOMENCLATURE

The nomenclature defined in the following sections has been compiled to provide a uniform method of naming variables associated with airbreathing propulsion systems. Its use is encouraged for all communications involving propulsion system performance including computer programs (for object-oriented programs, see ARP5571).

Two columns of symbols follow the variable descriptions. The first column presents the recommended symbols for general use. The second column presents alternate symbols which are retained because of their widespread use. Subscripts and superscripts, Greek letters and other specialized characters have been avoided in the recommended symbols. Historically, symbols have been restricted to upper case letters to be compatible with most computer languages. Modern computer platforms and object-oriented computer languages, however, make extensive use of case-sensitive names. The symbols in this section may be rendered in mixed case as permitted by the conventions of such systems.

4.1 Basic Symbols

This section includes the symbols used to derive basic parameters and will normally form the leading letter, or letters, in compound groups. Most of these symbols will be expanded by the addition of a station number, component symbol or stream identification as described in later paragraphs. Examples of some resulting compound groups are contained in Section 5.

4.1.1 Properties and Fundamental Parameters

Note that in all sections of this document the alternate form of the symbol is in parentheses.

Area, geometric	A	
Altitude, pressure	ALT	
Angle	ANG	(AN, α , β , γ , etc.)
Density	RHO	(ρ)
Efficiency, adiabatic	E	(η , ETA)
Enthalpy – total, per unit mass	H	(h)
Entropy – total, per unit mass	S	(s)
Force, Thrust	F	
Frequency	FY	(f)
Heat Transfer Rate	QU	(Q)
Inertia - polar moment (see 4.4.3)	J	(XJ)
Length	L	(XL)
Mass	GM	(m)
Mass flow	W	
Power	PW	
Pressure - total	P	
Rotational speed	N	(XN)
Temperature - total	T	
Time	TIME	(t)
Torque	TRQ	
Velocity	V	
Viscosity	VIS	
Volume	VOL	(v)
Weight	WT	(w)