

Technical Comments

Comment on “Off-Design Performance Prediction of Single-Spool Turbojets Using Gasdynamics”

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THE authors of this technical note¹ assert, without presenting supporting evidence, that the methods of Mattingly et al.² “gave results having more than 10–15% error in fuel flow and thrust, even at cruise flight conditions.” These methods have, in fact, been shown to reproduce thrust within a few percent, and fuel consumption within about 5% over a wide range of operation, even for complex dual-spool, mixed-

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flow, afterburning, military turbofan engines. These errors were largely a result of the use of constant gas properties in each engine component, an approach chosen for its great pedagogical value. Recently, Mattingly³ incorporated variable gas properties to demonstrate their influence and provide improved estimates of fuel consumption.

The authors¹ offer little evidence that their method is superior. In fact, even for the simple single-spool turbojet engine cycle analyzed, their few selected comparisons of thrust and fuel consumption are in error by as much as 5%.

This technical note is therefore an unsubstantiated advertisement for their method, and is a lucid example of the dangers associated with the publication of papers based on computer programs. New standards and reviewing procedures are absolutely essential to allow the editors of archival journals to deal with this rapidly proliferating problem.

References

¹Baig, M. F., and Saravanamuttoo, H. I. H., “Off-Design Performance Prediction of Single-Spool Turbojets Using Gasdynamics,” *Journal of Propulsion and Power*, Vol. 13, No. 6, 1997, pp. 808–810.

²Mattingly, J. D., Heiser, W. H., and Daley, D. H., *Aircraft Engine Design*, AIAA Education Series, AIAA, New York, 1987.

³Mattingly, J. D., *Elements of Gas Turbine Propulsion*, McGraw-Hill, New York, 1996, pp. 444–453.