

# Technical Comments

## Comment on "Optimizing the Propulsion/Lift System for Turbofan STOL Aircraft"

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THE excellent article<sup>1</sup> discussed in this Comment has one serious deficiency—there is no consideration whatsoever of the noise problem. In this observer's opinion, the controlling factor as to whether or not a viable STOL transportation system is ever achieved in this country is the question of noise and the application of the necessary technology to insure that it does not exceed an acceptable level.

In this connection, it is noted that Hill's article<sup>2</sup> does point out the necessity of keeping the noise level below 95 PNdB (within the airport). Frankly, this should be more specific—95 PNdB within 500 ft of the vehicle, and the ultimate objective must be to insure that the noise emanating from the vehicle shall not exceed that of the ambient background.

In a discussion of the NASA/DOT/FAA STOL project, NASA's Advisory Committee on Aircraft Operating Problems insisted that noise attenuation be considered as one of the principal design characteristics of the vehicle, and the program was amended accordingly.

There is ample evidence in technical papers that the environmental aspects of STOL operation, including both noise and pollution, will be the determining factors as to whether or not suitable facilities in the form of STOLports can be located sufficiently close to the centers of population to achieve the basic objective of a "city center to city center" operation. The Chelsea (N.Y.C.) experience is dramatic evidence that the community would not accept a STOLport in their vicinity, and the principal factor was that of noise.

In summary, the single most important factor to be considered in the design specifications of the vehicle and propulsion system is noise attenuation. Present technology would indicate the ability to achieve a standard of 95 PNdB within 500 ft; it is this observer's opinion that this will have to be lowered as soon as possible to the neighborhood of 90 PNdB (at 500 ft) in order to insure community acceptance. Conversely, a "noisy" vehicle would be totally unacceptable and

will unquestionably inhibit any development of STOL operations close to the city center—the principal advantage of a STOL type operation.

### References

<sup>1</sup> Bowling, H. T., Hurkamp, C. H., and Thornton, R. M., "Optimizing the Propulsion/Lift System for Turbofan STOL Aircraft," *Journal of Aircraft*, Vol. 8, No. 6, June 1971, pp. 427-433.

<sup>2</sup> Hill, T. G., "An All Turbofan VTOL or STOL Intercity Transport," *Journal of Aircraft*, Vol. 8, No. 4, April 1971, pp. 254-257.

## Reply by Author to J. T. Pyle

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THE comments by Pyle with regard to the noise aspects of V/STOL aircraft design are certainly valid and are especially timely in view of the present NASA/industry STOL proposal activity. The propulsion/lift systems optimized and compared in the article considered application on a military tactical aircraft where the noise requirements are not firmly established. However, as pointed out by Pyle, the noise requirements for commercial V/STOL operation are established and are not playing a dominant role in all V/STOL vehicle design studies. One factor which must be kept in mind is the possibility of a joint military/commercial development of a STOL aircraft where some resolution must be made of the design noise criteria.

Lockheed-Georgia is presently involved in the NASA STOL Experimental Research Airplane proposal and could not be more cognizant of the design impact of the 95 PNdB criteria. The final selection of a propulsion lift system and the design of the vehicle which utilizes this system will be made considering the environmental as well as the normal economic and technical factors.

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