

NASA TECH BRIEF

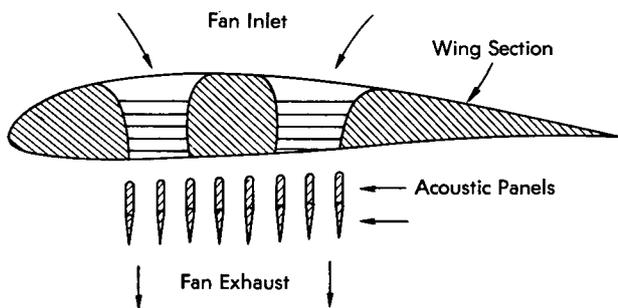
Ames Research Center



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Reduction of Fan Noise — A Concept

The intensive NASA program to reduce aircraft engine noise has required the investigation of novel methods for abating noise. Many ideas have been given consideration in study programs; however, the



concept of using acoustic materials strategically located within or near noise sources appears to be straightforward and readily adaptable to situations outside of aircraft technology.

The use of acoustic panels in the position shown in the diagram is considered to be quite effective for use on wing-mounted lift-fans which must direct fan thrust so as to translate horizontal motion of the aircraft into horizontal flight. The concept applies equally well to any fan, engine, nozzle, or other noise source (such as air-conditioning vents or ducts).

In operation, the acoustic panels would remain in essentially a fixed position as shown in the diagram, while the louvers, which are hinged to the aft edge of the panels, would rotate to direct the fan airflow

in the desired direction. In this position, the acoustic panels function somewhat as leading-edge flaps for the louvers and increase their effectiveness at high deflection angles. In a lift-fan application, it will probably be desirable to have the panels hinged near their leading edges also, so that the whole assembly can be retracted flush against the lower surface of the fan, thus closing off the fan and forming a relatively smooth lower wing surface.

The geometry (number, thickness, shape, and length) of the panels can be varied to obtain the noise suppression desired. The acoustic material can be single- or multiple-degree-of-freedom resonator panels; it can also be of felt or fibrous materials. End panels can be added to reduce noise still further.

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
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No patent action is contemplated by NASA.

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