

A NOISE ENCLOSURE FOR A RESIDENTIAL, CENTRAL AIR-CONDITIONING UNIT

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Air conditioners are the most complained of noise source in Ontario and one of the most complained-of in the rest of Canada and the U.S.

This paper reports on the construction of a lowcost demonstration noise enclosure on a central air-conditioning condenser unit, the first step in a program intended to result in a do-it-yourself brochure for home handymen and others. The work was performed while the author was with the Ministry of the Environment, and was carried out in collaboration with L. Butko, D. Fumerton, E. Granell and R. Purchase.

The essential details of the enclosure are given in the accompanying figure. Important features are as follows.

The sound attenuation it achieved was 14 dBA. The sides of the enclosure and the absorptive silencers to achieve this were, respectively, 11/16" weatherproofed particle board and 1/2" tentest boards. Though grouped into twelve "modules" of two boards each, the absorptive arrangement can be essentially described as that of 24 sheets of 1/2" tentest with a 1/2" airspace between each.

Heat exchange efficiency is preserved by avoiding undue flow constriction from the addition of excessive backpressure, and by well-separating the cold and hot airflows. The air conditioner worked satisfactorily through a summer which included several consecutive days of 30°C (90°F) peak temperatures.

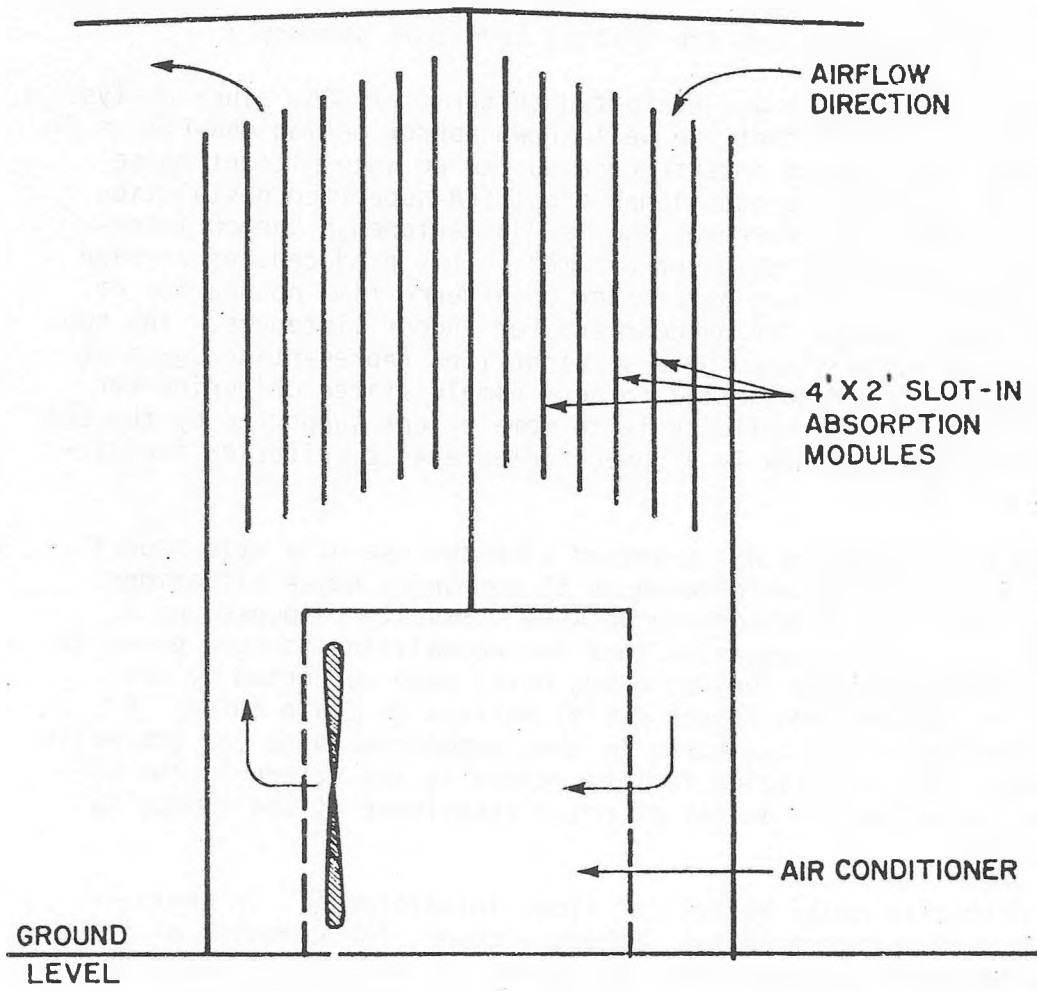
To permit maintenance of the air conditioner, and winter storage of the enclosure, the enclosure is easily removable. The roof also lifts off to allow the absorption materials to be inspected and replaced. The tentest material is cohesive enough to withstand the airflow and not clog the machine.

The ground space requirement is modest since the enclosure is built "up" rather than "sideways", but its height is not such as to block the view from most first floor windows. The overall appearance is not unaesthetic.

The materials are easily available and the design is comprehensible to a home handyman. The cost of materials was \$78, excluding tax. Since a quarter of this was wood preserver and paint, the sum is not an overoptimistic claim. The use of fiberglass batts rather than tentest, and a more modest use of wood preserver, could reduce the cost to about \$50; on the other hand, more expensive wood and decorative features like roof tiles could raise it to \$100.

Fuller details of the enclosure are available in the Noisexpo 76 proceedings, in a paper of the same title.

AIR-CONDITIONER NOISE ENCLOSURE DESIGN CONCEPT



4 1/2' HIGH, 2 1/2' WIDE, 4 1/2' LONG

Figure 1