NEW TECHNOLOGIES IN AIRPORT NOISE & FLIGHT TRACK MONITORING

Edward Haboly, Environmental Specialist
Vancouver International Airport Authority
PO Box 23750 APO, Richmond BC V7B 1Y7 CANADA

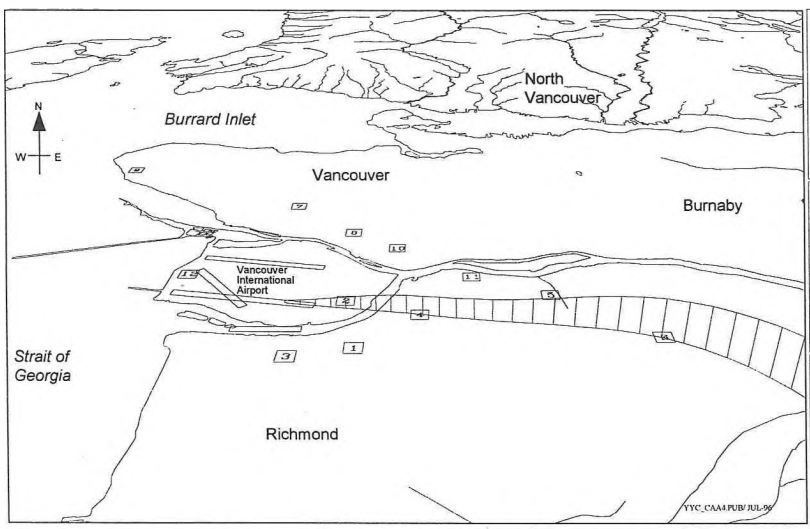
The art and science of airport noise monitoring has evolved to more advanced levels in the last decade. This has allowed those airports with new noise monitoring and radar flight tracking technologies to gain a better understanding of the true contribution of aircraft noise in the surrounding communities. In the past, permanent outdoor noise monitoring stations were strategically placed with the intent of measuring the noise of aircraft flyovers. However, without detailed analysis and sometimes human observation, it was not possible to distinguish a noise event between an aircraft or other noise source.

The new system acquired by the Vancouver International Airport Authority measures noise in real-time at 12 permanent outdoor noise monitoring terminals (NMT). The system also has a real-time interface to the air traffic control radar, that gives information about all aircraft operations including the type, airline, position, altitude and speed. The system automatically correlates noise events at the NMTs with the appropriate aircraft. In addition, the new system integrates all the analysis tools which were once separate, including noise monitoring, aircraft flight track investigations, statistical analysis, weather analysis, compliance monitoring, complaint investigation, mapping and reporting.

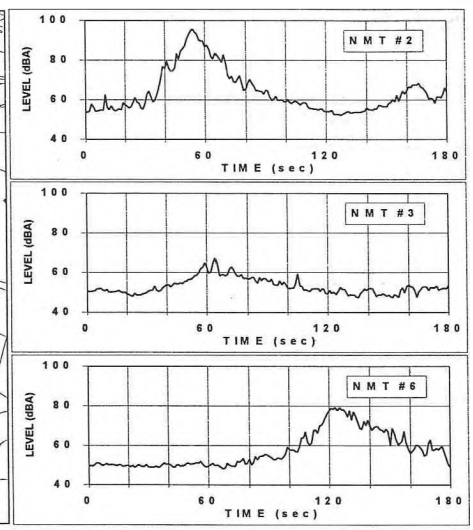
The figure below is an example 3-dimensional flight track of a B737-200 jet aircraft, which depicts the departure profile from the main runway of Vancouver International Airport (YVR). The measured one second time history at three of the NMTs is presented in the accompanying charts. The charts illustrate that the noise level for close overhead flyover at NMT #2 is about 20 dBA greater than for the higher altitude flyover at NMT #6, and 30 dBA greater than for the sideline noise experienced at NMT #3. The system automatically calculates the SEL (sound exposure level) by integrating the energy above a prescribed threshold for each time history curve.

Installation of this system was a commitment made to the recommendations of the Environmental Assessment Review Process (EARP) Panel for the new parallel runway at YVR. The commitment included stringent operational restrictions on the new runway, which will be monitored using the system. About one year of baseline noise and flight track data will have been collected by the system before the new runway opens in November 1996. This data will be be complemented by a baseline noise social survey, which was undertaken in August 1995. The intent of this survey was to ascertain the psycho-acoustic reaction of communities to airport noise, and compare the findings with other airports.

The system in conjunction with the overall noise management program is an important benefit, as it has enhanced the airport's ability to answer technical queries from airlines and air traffic control, as well as to address community concerns.



3-dimensional flight track of B737-200 jet departure to the east



Measured one second noise levels