Part 161 Summit

August 18, 2005
Denver, Colorado

8:00 am – 9:00 am	Continental breakfast
9:00 am – 9:30 am	Summit overview and introductions
9:30 am – 10:15 am	The Naples Story -- ▪ How did we get to adoption of the ban? ▪ What happened after adoption of the ban?
10:15 am – 10:30 am	Break
10:30 am – 11:15 am	What justifies deviation from DNL and from the 65 dB contour?
11:15 am – 12:00 pm	What facts are needed legally to justify a use restriction?
12:00 pm – 1:00 pm	Lunch - "*Life in the trenches, 24-7*" Ted Soliday, Naples Municipal Airport
1:00 pm – 1:45 pm	Blurring the line between Stage 2 and 3 restrictions
1:45 pm – 2:30 pm	Economic realities ▪ Status of Stage 2 fleet ▪ Estimating benefits and costs
2:30 pm – 2:45 pm	Break
2:45 pm – 3:30 pm	Alternative paths to noise relief ▪ Grandfathering ▪ Part 150 ▪ Federal legislation ▪ Other
3:30 pm – 5:00 pm	Wrap-up discussion: Where do we go from here?

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Discussion Outline

What Facts Are Needed to Justify a Use Restriction?

- Basic Principles
  - Need substantial factual basis for problem and solution
  - Policy and facts must match
- Selection of criteria
  - Documentation of local determination
  - Non-airport measures completely implemented
- Noise environment
  - Document existing and future cases
  - Non-airport sources of disturbance and effect on environment
- Need for restriction
  - Identify local problem, regional and national context
  - Other less-restrictive measures undertaken
  - Relationship to non-airport measures
- Local considerations
  - Documented policy support
  - Effect of no-restriction scenario
- Prior efforts
- Criteria required for Stage 3 restriction under Noise Act and FAR Part 161
  1. Reasonable, non-arbitrary, non-discriminatory
  2. No undue burden on interstate commerce
  3. No interference with safe and efficient airspace management
  4. No conflict with existing federal law or regulation
  5. Demonstration of adequate public comment
  6. No undue burden on national aviation system
- Anticipate FAA/industry/user rebuttals

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Discussion Outline

The Naples Story (Abridged)

Background

- Naples Municipal Airport is a very active general aviation airport with limited scheduled passenger service operated by the City of Naples Airport Authority
- The Airport Authority has a very active noise program and has completed a Part 150 Noise Compatibility Study (1987) and three Part150 updates (1997, 1998, 2000)
- The Airport Authority banned Stage 1 jets in 1998
- *City of Naples and Collier County adopted DNL 60 dB as the threshold of significant noise exposure for local land use purposes*

Part 161 Study

- In 2000, Stage 2 jets were less than 1 percent of total operations but accounted for 38 percent of complaints
- NAA initiated the Part 161 Study in May 1999; completed in June 2000
- Three alternatives: Stage 2 ban, Stage 2 curfew, and curfew on all operations
- Benefits = 90 percent reduction in residents exposed to noise above DNL 60 dB
- Cost = alternate airport, cancelled trip, hush-kit, lost FBO revenue
- NAA adopted Stage 2 ban in November 2000, effective Jan. 1, 2001
- FAA required NAA to supplement Part 161 Study; supplement completed in June 2001
- NAA began enforcing ban in March 1, 2002

Litigation

Five separate cases from Dec. 2000 to June 2005:

1	FAA Part 161 Enforcement Action	Resolved in favor of NAA
2	*NBAA v. NAA*	Decided in favor of NAA
3	*Rickard v. NAA*	Dismissed by Plaintiff
4	*Continental Aviation Services v. NAA*	Decided in favor of NAA
5	*NAA v. FAA*	Decided in favor of NAA

FAA Enforcement Action and Federal Appeal

- On October 31, 2001, FAA concluded the Part 161 enforcement action but on the same day initiated an enforcement action under Part 16
- FAA made numerous adverse findings in Director's Determination (e.g., Stage 2 ban is preempted, unreasonable and unjustly discriminatory)
- The Airport Authority was able to overcome each of the FAA's adverse factual findings through three levels of FAA review and appeal to U.S. Court of Appeals
- Court of Appeals ruled that (1) AIP grant assurances apply to Stage 2 restrictions adopted pursuant to ANCA, and (2) FAA had not established that Stage 2 ban is unreasonable

Discussion Outline

What Justifies Deviation from DNL and 65 dB DNL?

- Basic principles
  - Part 150 designated "yearly" DNL as the basis for determining noise exposure
  - Part 150 Appendix A, Table presents FAA land use compatibility guidelines
  - Part 161 (§161.11) calls for use of Part 150 "criteria"
  - Part 161 introduced "Airport Noise Study Area" concept
- Part 150 Appendix A, Table 1 "Land Use Compatibility with Yearly DNL"
  - 65 dB DNL is outer limit of non-compatibility guidelines
  - Footnote states: "... designations … do not constitute a Federal determination …"
  - DC Court of Appeals agreed with Naples that FAA guidelines are just that
- FAA provided Naples with guidance on "reasonable circumstances" that justify use of more restrictive compatibility thresholds (e.g., 60 dB DNL)
  - Bases and processes that jurisdictions used to select and adopt 60 dB DNL
  - Jurisdictions' enforcement of threshold and responses to variance requests
  - Documentation of local conditions that support threshold
  - FAA demanded that Naples provide assessment of noise-related liabilities (what is that?)
- Use of alternative cumulative exposure metrics (e.g., CNEL)
  - No specific Part 150 guidance
  - In Order 1050.1E, FAA "recognizes CNEL … as alternative metric for California."
  - FAA has historically accepted CNEL as equivalent to DNL in Part 150 documentation and other environmental submissions, without comment
  - Liberal interpretation of Table 1 footnote would seem to justify
- Value, use, and FAA recognition of supplemental metrics
  - Complaints
  - Seasonal exposure
  - Single event levels (e.g., SEL / SENEL or Lmax)
  - Sleep disturbance

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Discussion Outline

Blurring the Line Between Stage 2 and Stage 3 Restrictions

- ANCA and Part 161 contain very different requirements for Stage 2 and Stage 3 restrictions
  - Stage 2: study of alternatives, 180-day waiting period, *no FAA approval*
  - Stage 3: study of alternatives, 5 statutory criteria, FAA review and approval

- Grant assurance standards are very similar to ANCA standards for Stage 3 restrictions
  - Examples: reasonable, not unjustly discriminatory, no undue burden on interstate commerce

- FAA review of Part 161 studies involving Stage 2 restrictions has been rigorous and demanding
  - FAA characterized its role as "keeper of the process"
  - Extensive comments on each Part 161 Study
  - Most studies shelved based on negative comments
  - FAA uses enforcement under Part 161 to demand compliance
  - Substantial overlap between procedural and substantive requirements
  - Information from study can be used against airport in a Part 16 action

- Very little difference between standards for Stage 2 restrictions and Stage 3 restrictions
  - Stage 3 restrictions: Cannot be implemented without FAA approval, or lose grants
  - Stage 2 restrictions: Can be implemented without FAA approval, but may lose grants through *separate* Part 16 enforcement action
  - *The effective result is the same: FAA can suspend grants for restrictions it believes do not satisfy common standards*
  - May be worse for Stage 2 restrictions, since airports must adopt restrictions at their peril (open-ended risk of Part 16 enforcement)

- Question: If the standards for Stage 2 restrictions and Stage 3 restrictions are so similar, should airports worry about tailoring their restrictions around Stage 2 noise levels?
  - Loud noise events (such as Stage 2 operations) commonly considered to be the single greatest noise problem at airports
  - *But* Stage levels may be imperfect way to capture loudest noise events . . .
  - *And* some neighboring communities may be more annoyed by other aspects of airport operations (e.g., nighttime operations, etc.) where Stage 2 is a small portion of fleet

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Discussion Outline

Economic Realities

- Status of Stage 2 Fleet
  - Size and age of Stage 2 business jet fleet
  - Recent retirements
  - Other non-Stage 3 aircraft
- Stage 2 operations
  - Airports with the most Stage 2 operations
  - Day and nighttime operations
- Estimating benefits and costs
  - Forecast of operations without the proposed restriction(s)
    - Findings coordinated with other recent studies
  - Potential responses to proposed restriction(s)
    - Replace Stage 2 aircraft
    - Reschedule flights
    - Use alternative airports
    - Cancel flights
  - Key determinants of benefits and costs
    - Land use patterns near airport
    - Night operations
    - Types of operators
    - Less noise-sensitive alternative airport(s)
    - What benefits can be measured
    - Can benefits be monetized

Discussion Outline

Stage 2 Fleet

- The FAA Aircraft Registry includes approximately 10,000 business jets
- In July 2005, approximately 1,350 of these aircraft did not meet Stage 3 noise limits
- The most common Stage 2 business jets are Lear 23/24/25 (459), GII/GIII (375), and Falcon 20 (149)
- More than 60 percent of the Stage 2 fleet is over 30 years old

Share of Stage 2 fleet by year manufactured

A. Before 1970	B. 1970 to 1974	C. 1975 to 1979	D. 1980 to 1984	E. 1985 or later
39%	24%	21%	13%	3%

- The size of the Stage 2 fleet is decreasing slowly despite its age. From July 2004 to July 2005 only 37 aircraft were exported, retired or destroyed
- In April 2005, there were almost 10,000 Stage 2 aircraft departures from US airports including over 1,100 nighttime departures

Stage 2 Departures from US Airports, April 2005

Airport	Day	Night	Total
TEB	320	24	344
LAS	256	28	284
VNY	230		230
YIP	150	54	204
PDK	152	11	163
LRD	124	31	155
ADS	122	31	153
DAL	144	8	152
HOU	140	12	152
PBI	152		152
Subtotal	1,790	199	1,989
All Other	6,970	916	7,886
	8,760	1,115	9,875

Source: FAA ASDI database

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Discussion Outline

Alternative Paths to Noise Relief

- Traditional Part 150 NCP measures
  - Noise abatement flight profiles
  - Other FAA ATC measures
  - Runway use programs
  - Zoning and land use (mitigation, not abatement)
  - Land acquisition and redevelopment of collateral lands (revenue generation benefits)
- Economic regulation – carrots and sticks
  - Creative use of rates and charges (incentives and disincentives)
  - Cost allocation
  - Allocation of facilities in multi-airport system
  - Facilities use (e.g., incentives for small operators; allocation of facilities for commercial operators)
  - Aggressive incentive programs (*not* penalties)
- Grandfathering / Exempted Regulations
  - Pre-1990 restrictions (fully enforced)
  - Pre-1990 restrictions (latent)
  - Modifications to pre-1990 restrictions
  - Creative regulations which can have restrictive effect
  - Airport land use regulation
- Legislative solutions
  - Airport-specific approaches (Jackson Hole; Teterboro; Centennial; New Orleans; Minneapolis; ANCA exceptions such as Detroit, Denver)
  - Nationwide/Congressional approaches
    - Stage 2 ban
    - Phaseout
    - Local option

Part 161 Summit Follow-Up

Summit participants posed a number of interesting and complex questions during the course of the meeting about the future of noise control. There is no definitive answer to these questions, and, in fact, the response may vary from airport to airport.

One way to provide lasting value from the Summit is to gather input from participants on these topics (now that you have had some time to reflect on them) and to share the responses with the larger group. Please provide me with your thoughts on at least one of the following questions. We will compile and circulate the responses (without attribution) within the next few weeks.

1. Is AIP funding worth the strings attached? Should airports, individually or collectively, consider "defederalizing"?
2. The Naples decision confirmed the ability of local governments to declare noise levels below DNL 65 dB to be significant. What specific steps can/should local governments take to maximize the likelihood that FAA will accept these determinations?
3. How can we establish the validity of non-DNL metrics, such as sleep disturbance, as legitimate bases for defining the benefits of use restrictions or abatement measures?
4. Is it worth pursuing a national solution and, if so, where should airports focus their attention (Stage 1, Stage 2, curfews, formal noise abatement procedures, other)?
5. Part 161 does not require that airports first complete a Part 150 study, but doing so would seem to increase an airport's chance of success. For those airports without recent Part 150 studies, is it worth completing one or, to save time and money, should airports just jump directly to the Part 161 study?
6. The FAA considers use restrictions to be "measures of last resort." Have most airports reached that point by exhausting all other means to address noise?
7. One of the reasons airports increasingly are looking to use restrictions is because of a lack of cooperation from FAA Air Traffic on things like preferential runway use, flight tracks, departure and arrival procedures, and airspace reconfiguration. Should airports renew their efforts to pursue these options in lieu of use restrictions and, if so, how can airports convince the FAA to make formal commitments on the movement of aircraft?
8. Unlike NEPA, Part 161 does not call for a specific analysis of socio-economic impacts. Nevertheless, use restrictions can benefit low-income and minority populations, which often face the brunt of noise exposure. Should socio-economic impact be a larger factor in considering use restrictions?
9. Will the FAA ever approve a Part 161 study for a Stage 3 restriction? If not under current conditions, what will it take to change the FAA's institutional aversion to use restrictions?
10. What's "The Answer" to the noise problem, for you or the national air transportation system as a whole? Among all of the options that have been identified, what do you see to be the most realistic solution to address the continuing problem of noise?

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United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued March 4, 2005 Decided June 3, 2005

No. 03-1308

CITY OF NAPLES AIRPORT AUTHORITY,
PETITIONER

v.

FEDERAL AVIATION ADMINISTRATION,
RESPONDENT

On Petition for Review of a Decision of the
Federal Aviation Administration

W. Eric Pilsk argued the cause for petitioner. With him on the briefs were *Perry M. Rosen*, *Peter J. Kirsch*, *Lori Potter*, *Daniel S. Reimer*, and *F. Joseph McMackin, III*.

Thomas R. Devine, *Arthur P. Berg*, and *Patricia A. Hahn* were on the brief for *amicus curiae* Airports Council International -- North America in support of petitioner. *David T. Ralston, Jr.* entered an appearance.

Richard Baron was on the brief for *amicus curiae* Quiet Technologies, Inc. in support of petitioner.

Robert D. Pritt and *David C. Weigel* were on the brief for *amici curiae* City of Naples and Collier County in support of petitioner.

John A. Bryson, Attorney, U.S. Department of Justice, argued the cause for respondent. With him on the brief was *Ellen J. Durkee*, Attorney. *Andrew C. Mergen*, *Lisa E. Jones*, and *Ronald M. Spritzer*, Attorneys, entered appearances.

Kathleen A. Yodice, *Robert E. Doyle, Jr.*, *Daniel B. Rosenthal*, *David P. Murray*, *David A. Berg*, *Frank J. Costello, Jr.*, and *Scott M. Zimmerman* were on the brief of *amici curiae* Aircraft Owners and Pilots Association, Inc., *et al.* in support of respondent. *Meredith L. Flax* and *Thomas Richichi* entered appearances.

Before: RANDOLPH and ROBERTS, *Circuit Judges*, and WILLIAMS, *Senior Circuit Judge*.

Opinion for the Court filed by *Circuit Judge* RANDOLPH.

RANDOLPH, *Circuit Judge*: This is a petition for judicial review of an order of the Associate Administrator of the Federal Aviation Administration -- the FAA -- disqualifying the City of Naples Airport Authority from receiving grants under the Airport and Airway Improvement Act of 1982, 49 U.S.C. § 47107 *et seq*. (the "Improvement Act"). In order to be eligible for grants, an airport must be "available for public use on reasonable conditions and without unjust discrimination." 49 U.S.C. § 47107(a)(1). The FAA determined that a noise restriction on certain aircraft imposed an unreasonable condition on public use of the Naples Municipal Airport.

The City of Naples is a southern Florida community, bounded on three sides by Collier County and on the west by the Gulf of Mexico. It has 23,000 permanent residents and 13,000 seasonal residents. The Naples airport is located within the city's boundaries. Portions of the airport abut the county line. The city leases the land to the Airport Authority, a five-member

independent entity created by the Florida legislature for the purpose of operating and maintaining the Airport.

Neither the city nor the county provides funds to subsidize the airport, and no tax or other fiscal revenues are earmarked for the airport. The Airport Authority has no zoning power. The city is responsible for zoning in the areas surrounding the airport within its municipal boundary. The county is responsible for zoning all other property immediately adjacent to the airport.

In 1999, in response to complaints from residents, the Airport Authority commissioned a study to examine noise exposure from aircraft in the area surrounding the airport. The Airport Noise and Capacity Act of 1990, 49 U.S.C. § 47521 *et seq.* -- the Noise Act -- governs the manner in which individual airports may adopt noise restrictions on aircraft. Aircraft are classified roughly according to the amount of noise they produce, from Stage 1 for the noisiest to Stage 3 for those that are relatively quieter. Section 47524(b) of the Noise Act sets forth certain procedural requirements with which an airport must comply in order to restrict Stage 2 aircraft. Section 47524(c) contains similar procedural requirements for restrictions on Stage 3 aircraft, but also requires FAA approval of any Stage 3 restriction.

The Airport Authority's study found that approximately 1,400 residents were exposed to noise levels in excess of DNL 60 dB* and that a restriction on all Stage 2 aircraft would affect

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* Sound pressure is measured in decibels ("dB"). The Day-Night Average Sound Level ("DNL") is a widely used measure of noise exposure; it is equal to the steady noise level occurring during a 24-hour period, adjusting all noise occurring between 10:00 p.m. and 7:00 a.m. upward by ten decibels to account for increased sensitivity to noise during that time. 49 Fed. Reg. 49,260, 49,270 (Dec. 18, 1984).

only one percent of aircraft operations at the airport, while considerably reducing the number of people exposed to significant noise levels. Effective January 1, 2001, the Airport Authority adopted a ban against all Stage 2 aircraft.

Although the Airport Authority complied with the procedural requirements of § 47524(b) of the Noise Act, the FAA ruled that the Stage 2 ban was "unreasonable" and, therefore, contrary to the Airport Authority's obligation under § 47107(a)(1) of the Improvement Act. In the FAA's view, the Airport Authority failed to show that "noncompatible land uses exist in the DNL 60 dB contour."

The Airport Authority maintains § 47524(b) of the Noise Act removed the FAA's power to withhold grants on the basis of an "unreasonable" Stage 2 ban. There is no dispute that before passage of the Noise Act in 1990, the FAA could withhold grants if an airport operator's noise restriction violated the grant assurances in § 47107 of the Improvement Act. *See City & County of San Francisco v. FAA*, 942 F.2d 1391, 1394-95 (9th Cir. 1991). Under § 47533 -- the savings clause of the Noise Act -- the law in effect before its enactment shall remain unaffected, "[e]xcept as provided by section 47524." 49 U.S.C. § 47533(1).

Although § 47524 of the Noise Act is silent about grant eligibility in the face of a Stage 2 restriction, the Airport Authority claims the provision removed the FAA's pre-existing power to withhold grants when such a restriction proved unreasonable. One of the arguments is framed this way: If Congress had wanted to allow FAA review of such restrictions, Congress knew how to say as much. As cast, the "argument is weak." *Doris Day Animal League v. Veneman*, 315 F.3d 297, 299 (D.C. Cir. 2003). It may "be made in any case in which there is a fair dispute about the meaning of a statute." *Id.*

"Congress almost always could write a provision in a way more clearly favoring one side -- or the other . . .. Its failure to speak with clarity signifies only that there is room for disagreement about the statute's meaning." *Id.*

If § 47524(b) did not preclude FAA substantive review of Stage 2 noise restrictions, the Authority continues, there is no explaining § 47524(c). Subsection (c) requires (with an exception) the FAA to find a Stage 3 restriction "reasonable" and not an undue burden on interstate commerce before it can become effective. If the FAA already could review Stage 3 restrictions for reasonableness when it doled out grants pursuant to the Improvement Act, § 47524(c) would be "surplusage." Brief of Petitioner at 30. This would be a fair argument if the premise were accurate. But it is not. On its face, § 47524(c) gives the FAA considerably more power than it had when reviewing an airport operator's Stage 3 restriction at the grant stage. For one thing, the Stage 3 restriction cannot go into effect without the FAA's say-so. For another thing, subsection (c)'s requirement of FAA approval is not tied to grants; grants or not, no airport operator can impose a Stage 3 restriction unless the FAA gives its approval.

Still, the Authority has a point. Because in one subsection Congress explicitly required FAA approval of Stage 3 restrictions but in another subsection did not provide for substantive review of Stage 2 restrictions, this is some indication that Congress intended to allow airport operators to promulgate Stage 2 restrictions free from FAA review. *See Russello v. United States*, 464 U.S. 16, 23 (1983). But there is a contrary inference one may draw from another subsection of § 47524 of the Noise Act. Section 47524(e) states that when an airport operator adopts an FAA-approved Stage 3 restriction in compliance with § 47524(c), the operator becomes eligible for grants under the Improvement Act. In other words, the FAA

may not withhold grants under the Improvement Act on the basis of a Stage 3 noise restriction imposed under § 47524(c) of the Noise Act. No similar provision exists for Stage 2 restrictions. In the absence of such a provision, one may infer that Congress intended to continue allowing the FAA to withhold grants on the basis of a Stage 2 restriction even if the operator complies with the procedural requirements of § 47524(b).

The Airport Authority also invokes some legislative history of the Noise Act. Congress considered but did not enact other versions of the Noise Act requiring FAA review of Stage 2 restrictions and conditioning grant eligibility on compliance with these requirements. 136 CONG. REC. 25,376-82 (1990) (Senate Bill 3094). The Authority also points to an exchange between Senators Lautenberg and Ford in committee to show that Congress understood an airport operator would be permitted to impose restrictions on Stage 2 aircraft without FAA approval and "without risking the loss of" grants under the Improvement Act. 136 CONG. REC. 36,252 (1990). These excerpts are not particularly telling. Both speak only to the FAA's power under § 47524; neither deals with the FAA's pre-existing power to withhold grants under § 47107(a)(1).

Because the Noise Act does not clearly reveal whether the FAA may withhold grants when an airport operator imposes an unreasonable Stage 2 noise restriction, we shall defer to the FAA's determination that it retains that power under the Improvement Act. The agency's interpretation is linguistically permissible, and it represents a reasonable resolution of statutory uncertainty, particularly in light of § 47524(e) of the Noise Act and its savings clause in § 47533. *See Tax Analysts v. IRS*, 117 F.3d 607, 613-16 (D.C. Cir. 1997).

The question remains whether there is substantial evidence to support the FAA's ruling that the Authority's Stage 2 ban is unreasonable, or whether the FAA acted arbitrarily and capriciously, which amounts to the same thing in this context. *Ass'n of Data Processing Serv. Orgs. v. Bd. of Governors of the Fed. Reserve Sys.*, 745 F.2d 677, 683 (D.C. Cir. 1984). The ruling rested on the FAA's finding that noise levels between DNL 60 dB and DNL 65 dB were not incompatible with residential land use near the airport. The FAA promulgated non-binding guidelines regarding noise levels and land use in 1984. Those guidelines stated that levels below DNL 65 dB are generally compatible with all land use. Generally means not always. The guidelines thus acknowledged that "responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities," to which the FAA added that its guidelines "are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses." 49 Fed. Reg. 49,260, 49,275 (Dec. 18, 1984).

The FAA cited two reasons why the Airport Authority's selection of DNL 60 dB as the maximum acceptable noise level was unreasonable: (1) local ordinances did not "unequivocally prohibit" development in areas subjected to noise levels of DNL 60 dB or higher; and (2) the area presently subjected to DNL 60 dB was not "uniquely quiet."

As to the first, the FAA found that the City of Naples did not really believe that DNL 60 dB exposed residents to a significant noise level because it had not completely banned development in the DNL 60 dB contour. (The evidence showed, however, that neither the city nor the county had approved any residential development in that area after the Airport Authority

completed the study of sound levels. Amici Brief of City of Naples and Collier County at 14.) If the city did not believe that DNL 60 dB was a "significant noise threshold," the FAA reasoned, then the Airport Authority failed to demonstrate that "a land use compatibility problem exists in the DNL 60 dB" area. Without explaining how a local government could demonstrate the existence of a land use compatibility problem, the FAA stated that the City of Naples had merely adopted the DNL 60 dB level as a prophylactic against airport expansion and land use in the DNL 65 dB area. But there is no evidence -- aside from speculation by an FAA employee -- to support the FAA's conclusion about the city's motives. The record shows that during these proceedings the City of Naples did adopt an ordinance forbidding all noise in excess of DNL 60 dB, including music and construction equipment; that the area is a retirement community; that the area is one of outdoor living; and that aircraft noise is the leading cause of noise complaints. This evidence, much of which the FAA never addressed, all supports the conclusion that DNL 60 dB level is considered a significant noise threshold in the City of Naples.

There is also substantial evidence, including sound measurement data from the Airport Authority study, that Naples is a quiet community. The FAA concluded that the area is not "uniquely quiet," but it did not define what it meant by "uniquely." The FAA provided no data to contradict the study data. It did not perform any sound analysis. And it did not otherwise collect information on the subject. The FAA's Director of Airport Safety and Standards "inferred" from the fact that some residents lived in multi-family dwellings near multi-lane roads that the area was not "uniquely quiet," and the FAA's final decision simply stated that this "inference" was "reasonable." No mention of the sound measurement data was made.

The amici brief of the City of Naples and Collier County forcefully summarizes the state of the record. "Even if it had defined the term 'uniquely quiet', the FAA did not cite any factual support for its finding that [Naples is] not a 'uniquely quiet' community. The FAA did not visit the area as part of its investigation, did not perform any analysis of the local soundscape, did not contact any residents or local officials to obtain any information on this subject, and did not cross-examine the principal author of the Part 161 Study on this subject. Instead, the FAA Associate Administrator relied on the anecdotal information that there was some noise in the area -- largely the typical suburban noise associated with streets and shops -- in an attempt to establish that ambient noise levels must have been high. Moreover, the Associate Administrator ignored the Airport Authority Executive Director's actual testimony, wherein he explained that the existence of multi-family housing, streets and shops did not negate the quiet nature of the community.

"From this and other evidence, the Associate Administrator should have concluded that [the Naples] community revolves around this particular environment, that [its] economy is based almost entirely on the climate and amenities offered by [its] outdoor environment, and that [its] residents and visitors have an expectation of quiet throughout virtually the entire community. There was absolutely no basis for the Associate Administrator to conclude that the sound environment in this community does not support the Airport Authority's decision to ban Stage 2 aircraft." Amici Brief of City of Naples and Collier County at 19-20.

The Airport Authority and the City of Naples introduced ample evidence -- much of which went unrebutted -- demonstrating that the Stage 2 ban was justified. Because the FAA's conclusion to the contrary is not supported by substantial

evidence, the petition for review is granted, the FAA's order is vacated, and the case is remanded to the FAA.

So ordered.

Part 161 Summit
August 18, 2005
Denver, Colorado

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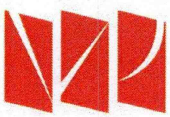

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Airport Ground Noise Control

Common sources of noise from ground-based operations at airports include engine maintenance run-ups, taxiing aircraft, operation of ground and auxiliary power units, preflight run-ups, takeoff roll and thrust reverses, and movement of surface vehicles. HMMH has extensive experience in the analysis and control of noise from all of these airport ground operations. We provide the following services for our clients:

- Evaluation of the effects of ground-based noise sources, based upon criteria for community annoyance and governing ordinances and restrictions;
- Preliminary feasibility analysis of noise abatement options;
- Detailed noise abatement design, including barriers, run-up enclosures, and operational procedures;
- Acceptance testing of noise abatement measures.

COMPREHENSIVE GROUND NOISE ANALYSIS

HMMH provides comprehensive ground noise analyses for airports ranging from commuter airline maintenance facilities to major air-carrier airports. Based on our breadth of experience, we tailor our studies to best fit the needs of each client, from analysis of specific issues such as the effect of relocating a single taxiway or ramp area, to broad studies addressing many noise sources and alternative abatement strategies.

GROUND RUN-UP ENCLOSURE (GRE) SITING/DESIGN

Nighttime maintenance run-ups often are a source of community annoyance near airports with maintenance facilities. HMMH assists airports in addressing these issues by evaluating the potential for community annoyance and/or regulatory compliance, helping to establish workable, effective procedural controls, and evaluating various mitigation options such as relocation and reorientation of run-up facilities and construction of ground run-up enclosures (GREs) and barriers.

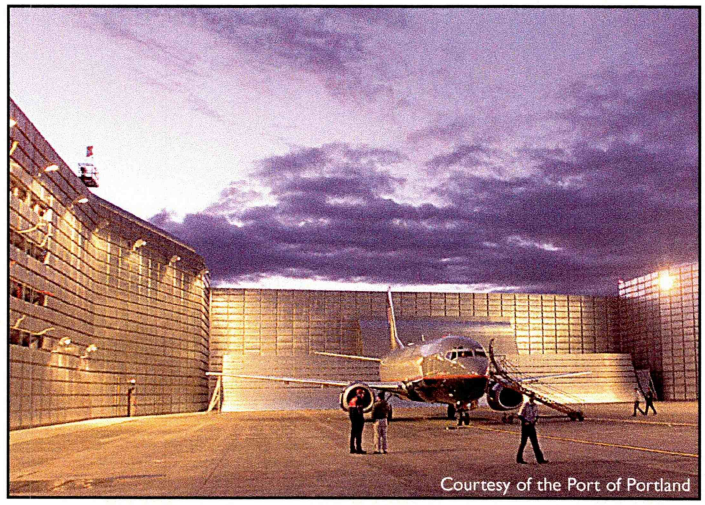
CREATIVE SOLUTIONS

HMMH takes pride in working with clients to find the best possible solutions for their specific needs. Because we work at airports throughout the United States and around the world, we understand that no two airports are alike, and we find creative solutions suited to each client's individual requirements.

REPRESENTATIVE PROJECTS

HMMH has conducted ground operations noise studies at airports across the United States, including:

Portland (OR) International Airport GRE Siting/Design Study, evaluated existing run-ups and various mitigation alternatives to comply with Oregon DEQ criteria.



Acceptance testing of GRE at Portland International Airport

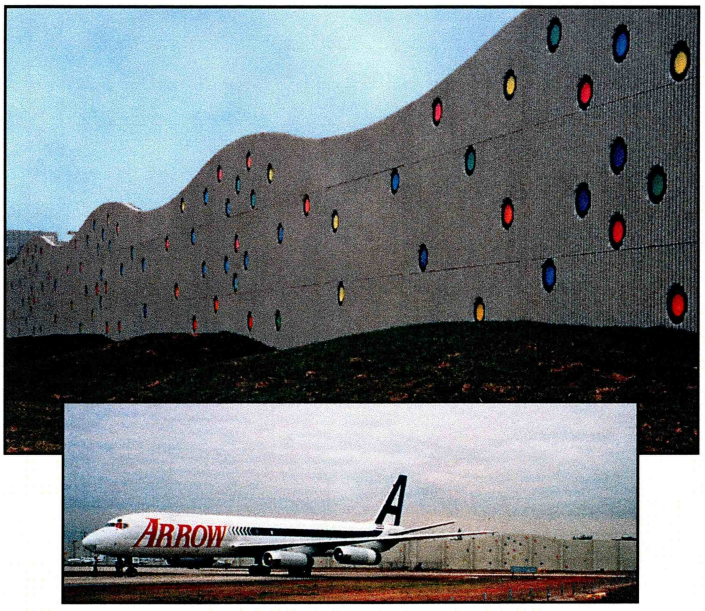
Ted Steven Anchorage International Airport Comprehensive Ground Noise Study, conducted round-the-clock measurements during both summer and winter conditions addressing all significant sources of aircraft ground noise.

Seattle-Tacoma International Airport GRE Siting Study, evaluated maintenance run-ups conducted at existing locations and with future GRE alternatives.

Pease International Tradeport Maintenance Run-up Enclosure, Portsmouth, NH, evaluated and designed a GRE for turboprop and air-carrier jet run-ups.

La Guardia Airport Barrier Study, conducted analysis and design of a noise barrier to reduce noise from take-off roll and other airport facilities.

Miami International Airport Ground Noise studies and Barrier Design, conducted evaluations of engine test cell, run-up area blast fence, and cargo facilities.



Noise abatement barrier, Miami International Airport

Baltimore-Washington International Airport Run-up Study and Mid-Field Cargo Facility, evaluated noise levels from existing run-ups and aircraft taxi and ramp activity for proposed cargo facility.

Boston Logan Airport Terminal A Study and International Gateway Improvements, evaluated taxi and ramp noise for terminal expansion projects.

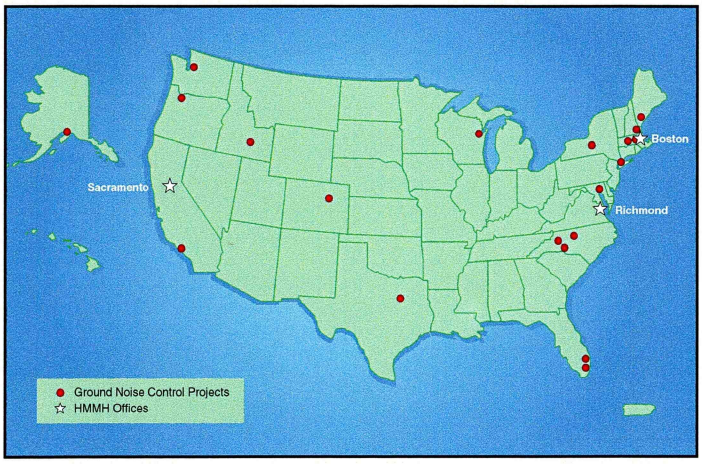
Fort Lauderdale-Hollywood International Airport Run-up Study, conducted evaluation of existing run-ups and preliminary analysis of mitigation alternatives.

San Diego International Airport Taxiway and Terminal Improvement Studies, evaluated taxi and ramp noise, provided conceptual design for noise barrier.

Dallas Love Field Barrier Study, designed noise barrier to reduce noise levels from takeoff roll, thrust reverses and run-ups.

El Segundo, Noise Barrier Feasibility Study, conducted feasibility study to reduce noise levels from takeoff roll, thrust reverses, taxiing, and run-ups at Los Angeles International Airport.

Seattle-Tacoma International Airport, South Aviation Support Area FEIS, evaluated effects of ground noise from proposed maintenance facility.



HMMH Ground Noise Studies in the U.S.

Portland (ME) International Jetport, GRE Feasibility and Final Design Study, evaluated noise levels from existing run-ups and abatement options.

Maintenance Facility Run-up Barrier Study, Hickory, NC, design of partial enclosure to provide mitigation for commuter turboprop maintenance run-ups.

Charlotte/Douglas International Airport Maintenance Facility, conducted conceptual GRE design study for proposed maintenance facility.

Denver Stapleton International Airport, Noise Barrier Studies, designed barrier for run-up area and evaluated sideline barrier for takeoff roll.

L.G. Hanscom Field Berm Study, Bedford, MA, evaluated berm to reduce noise levels from takeoff roll.

For further information, please contact:

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NOISE AND OPERATIONS MONITORING SYSTEM DESIGN, SPECIFICATION, INSTALLATION, SUPPORT, AND OPERATION

HMMH offers exceptional qualifications related to the design, specification, acquisition, installation, and use of airport noise and operations monitoring systems. HMMH has assisted over 65 airports worldwide with related services that include:

- assistance to airports in procuring monitoring systems from third-party vendors
- turn-key portable noise monitoring systems with proprietary software for data acquisition, transfer, management, and presentation
- operations monitoring systems using data from the Federal Aviation Administration (FAA) Automated Radar Terminal Service (ARTS)
- ARTS data-access and processing via optical disk and magnetic tape
- proprietary software (Real Contours™) that generates contours automatically from ARTS data, using actual flight tracks, for any time interval of interest

Related HMMH qualifications and experience include:

- installation and support of noise and operations monitoring systems
- the HMMH corporate focus on the analysis and control of airport-related noise
- extensive experience in assisting airports to effectively use monitoring systems
- comprehensive in-house staff and technical equipment
- HMMH staff members with experience at airport noise abatement offices

HMMH's continuing monitoring system assistance to a succession of airports over the past 24 years ensures that the firm is abreast of advances in the marketplace. In many areas, HMMH specifications have driven industry-wide innovation. For example, HMMH's design for the new Denver International Airport (DIA) introduced a generation of systems that incorporate the highest levels of integration, noise event identification and classification, and noise and flight track correlation.

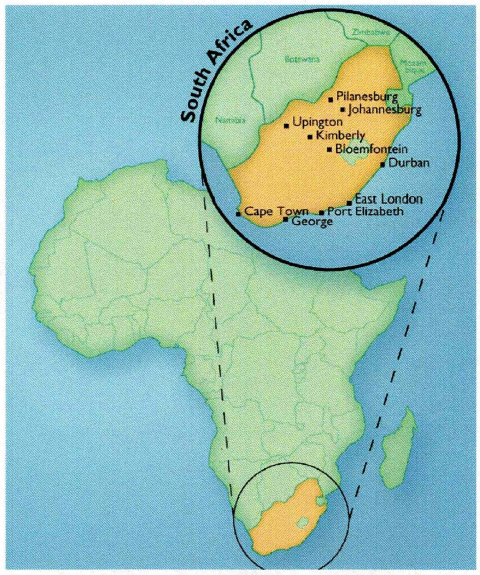
HMMH's familiarity with active system vendors and their products ensure that our specifications are comprehensive, practical and state-of-the-art. We can "push the technical envelope," without driving up system cost or complexity.

Our experience includes assistance to a broad range of airports in the U.S. and abroad.

HMMH Monitoring System Assistance Experience in the U.S.

Qualifications

HMMH's international experience includes assistance to the Airports Company South Africa (ACSA) to prepare an investment plan, overall monitoring approach, and specifications for a centralized monitoring system serving the ten major commercial service airports in the Republic of South Africa. HMMH also is assisting Beijing's Capital City International Airport to define its monitoring requirements.



Experience in Design and Specification of Monitoring Systems

HMMH staff has assisted over 50 airports with design, specification, procurement, installation monitoring, acceptance, training, and use of monitoring systems across the U.S. and overseas, including:

Airport (Year Project Initiated)	System Design	Monitor Site Selection	System Specification	Procurement Assistance	Installation Management	Acceptance Testing	Noise Monitoring Components	Flight Tracking Components	Staff Training	Continuing Support
Reno, NV (2005)	■	■	■	■	■					■
Beijing, China (2005)	■	■	■	■						
Easthampton, NY (2004)	■	■	■	■	■	■				
Boston-Logan and Hanscom (2003)	■		■	■	■	■				■
Indianapolis, IN (2003)	■	■	■	■	■	■				
Sarasota, FL (2003)			■	■		■				
Santa Clara, CA (2003) (3 airports)	■	■	■	■	■	■				
Louisville, KY (2003)	■	■	■	■	■	■				
10 South African airports (2003)	■	■	■	■	■	■				
San Diego, CA (2002)	■	■	■	■	■	■				■
San Antonio, TX (2002)	■	■	■	■	■	■				
Allentown, PA (2001) (2 airports)	■	■	■	■	■	■				
Anchorage, AK (2001)	■	■	■	■	■	■				
Raleigh - Durham, NC (2001)	■	■	■	■	■	■				■
San Francisco, CA (2001)	■	■	■	■	■	■				■
Tampa, FL (2000)	■	■	■	■	■	■				■
White Plains, NY (1999) (upgrade)	■	■		■		■				■
Naples, FL (1998)	■	■	■	■	■	■	■		■	■
Miami, FL (1997)	■	■	■	■	■	■	■		■	■
Sacramento, CA (1997) (3 airports)	■	■	■	■	■	■	■		■	■
Chicago Midway, IL (1995)	■	■	■	■	■	■				
Chicago O'Hare, IL (1995)	■	■	■	■	■	■				
John Wayne, CA (1995)	■	■	■	■	■	■				
Denver International, CO (1993)	■	■	■	■	■	■				■
New Orleans, LA (1993)	■		■	■	■		■	■	■	■
Palm Beach, FL (1993) (3 airports)	■	■	■	■	■	■	■		■	■
White Plains, NY (1993) (replacement)	■	■	■	■	■	■				
Seattle-Tacoma, WA (1992)								■	■	■
Fort Lauderdale - Hollywood, FL (1991)	■	■	■	■	■	■	■		■	■
Fort Lauderdale Executive, FL (1990)	■	■								■
Minneapolis - St. Paul, MN (1990)	■	■	■	■	■	■		■		■
Nashville, TN (1990)	■		■	■			■		■	■
Charlotte, NC (1988)	■	■	■	■	■		■		■	■
Columbus, OH (1988)	■	■	■	■	■	■			■	
Denver-Stapleton, CO (1988)	■	■	■	■	■	■				■
Salt Lake City, UT (1987)	■	■	■	■	■	■				■
Baltimore-Washington, MD (1984)		■	■	■	■	■			■	■
White Plains, NY (1981) (original)	■		■	■	■	■	■	■		

Corporate focus on the analysis and control of aviation noise

In a sense, all of HMMH's projects represent experience that is highly relevant to noise monitoring system development, because our principal business is the analysis of aviation noise. HMMH has assisted over 150 clients on several hundred noise measurement, modeling, and abatement projects. We are recognized nationally as a leader in the field and are regularly sought for assistance on the most controversial and technically challenging projects.

Our relevant experience includes Part 150 studies, preparation of state and federal environmental review documents (e.g., Environmental Assessments and Environmental Impact Statements), development of aircraft noise abatement procedures and airport noise regulations, noise exposure modeling, and noise model development for the FAA.

Extensive Experience Assisting Airports to Utilize Noise Monitoring Systems

The most difficult step in the development of a monitoring system comes after the equipment is installed. The airport staff must have the proper training to use the system effectively and appropriately. We have extensive experience in assisting airport noise abatement staffs on an ongoing basis, including projects directly related to the implementation of a new monitoring system.

HMMH experience includes recruiting, interviewing and selecting staff for airport noise abatement staffs, developing and presenting courses on relevant technical issues, providing on-site and on-call noise abatement staff, noise monitoring system training and developing standard procedures for airport staff in use of the system. We have provided these types of services at a number of airports, including

- Baltimore-Washington (MD)
- Boston-Logan (MA)
- Charlotte-Douglas (NC)
- Fort Lauderdale-Hollywood (FL)
- Fort Lauderdale Executive (FL)
- Palm Beach International (FL)
- San Diego (Lindbergh Field) (CA)
- San Francisco (CA)
- Anchorage (AK)
- Westchester County (NY)

Staff With Comprehensive Capabilities In All Relevant Technical Areas and Access to Comprehensive In-House Technical Equipment

HMMH's technical staff is one of the largest groups of its kind specializing in environmental acoustics and noise control. We have built a team of professionals with technical expertise in all areas relevant to monitoring system development.

In addition, two of HMMH's senior staff members held positions in airport noise abatement offices for Boston-Logan International, Hanscom Field 9Bedford, MA), General Mitchell International (Milwaukee, WI), and McClellan-Palomar (San Diego, CA). That experience provides HMMH's clients with practical and realistic perspective on the design and use of systems in highly controversial operating environments.

The development of a noise monitoring system requires the use of a number of technical tools, including computers, computerized models, and noise measurement equipment. HMMH has comprehensive in-house availability of this equipment, including:

- capability to process and analyze ARTS data from any FAA-used magnetic media
- proprietary analytical programs for specialized noise and operational analysis
- portable and laboratory equipment for measuring and evaluating noise and vibration, and for assessment of monitoring system performance

HMMH specializes in the analysis of environmental noise; we offer technical capabilities that translate into credibility for our clients' projects. Firms that perform noise analyses as a sideline cannot offer the technical competence that is required for such credibility.

HMMH Offers Noise Monitoring Software

HMMH has developed software products, called NoiseManager and NoiseLogger that can form the basis of a noise monitoring system using portable noise monitors. Airports that have purchased the NoiseManager software include:

- Miami International (FL)
- Nashville International (TN)
- Charlotte-Douglas International (NC)
- Naples Municipal (FL)
- New Orleans International (LA)

HMMH can also assist airports in the establishment of full noise monitoring systems using portable noise monitors, including provision of portable noise monitoring field kits assembled from third party suppliers, commercially available central computer hardware, NoiseManager software, staff training and ongoing support.

HMMH Offers Tools for Operations Monitoring Using FAA ARTS Data

HMMH's monitoring hardware includes systems for accessing and reading data from the FAA's ARTS system. The ARTS system provides aircraft identification (airline, flight number, aircraft type, etc.) and operational information (flight track, altitude, etc.) that is critical input to evaluation of noise impacts. The HMMH hardware and software allow airports to correlate the ARTS information with single event noise measurements to fully evaluate noise impacts on an event-by-event basis.

HMMH's ARTS-related hardware includes systems for downloading radar data from FAA optical disks or magnetic tape. HMMH has developed a family of computer programs to refine and use these data.

HMMH has installed ARTS-related hardware and/or software at

- Charlotte-Douglas International
- Salt Lake City International
- Seattle-Tacoma International
- New Orleans International

HMMH Offers Software for Modeling Exposure Directly from FAA ARTS Data

HMMH has developed two proprietary software programs that allow airports to directly model aircraft noise exposure from FAA ARTS data: (1) ARTSMAP™, based on the USAF NoiseMap model, and (2) RealContours™ based on the FAA's INM. These programs model every operation based on the actual recorded flight track and altitude profile. The software also supports development of modeling flight tracks based on ARTS data samples, factored up to reflect actual operations during the modeling time period. Denver, San Diego, Portland, Miami, and Sacramento International Airports use ARTSMAP to estimate noise exposure at their airports on a daily basis.

HMMH Has Experience In System Installation and Support

HMMH also installed and supported monitoring systems at over 30 airports in the U.S., Canada, the UK, and Europe, as part of a division that HMMH operated in the mid-1990s. HMMH has installed and supported system components including:

Birmingham, UK
Charlotte, NC
Chicago Midway
Chicago O'Hare
Civil Aviation Authority, UK
Denver International
Edmonton, Canada
Ft. Lauderdale Executive, FL
Ft. Lauderdale - Hollywood, FL
Gatwick, UK
Heathrow, UK
Long Beach, CA
Miami, FL
Milan, Italy
Minneapolis - St. Paul, MN
Minnesota Pollution Control
Naples, FL
Nashville, TN
New Orleans, LA
Oakland, CA
Orlando, FL
No. Palm Beach County, FL
Palm Beach County Park, FL
Palm Beach Inter'l, FL
Portland, OR
Sacramento, CA
San Diego, CA
San Jose, CA
Seattle, WA
Stansted, UK
Torrance, CA
Warsaw, Poland
Westchester, NY
Winnipeg, Canada

Aviation Noise Control

HMMH solves environmental noise and vibration problems from transportation sources, and has projects at airports in all regions of the United States. Our clients range from airport proprietors to the Federal Aviation Administration (FAA), NASA, the U.S. Navy and the U.S. Air Force. We have developed a nation-wide reputation for technical excellence, thorough familiarity with relevant regulations and review processes, and an unusual capability to communicate effectively with the interested public.

ENVIRONMENTAL ASSESSMENTS/ ENVIRONMENTAL IMPACT STATEMENTS

HMMH regularly analyzes noise for airport EAs and EISs. Though the primary focus is always full compliance with applicable regulatory requirements, we have found that an equally important objective is to provide the sponsor and the public with a clear understanding of the noise effects of the proposed action and alternatives.

MASTER PLANS

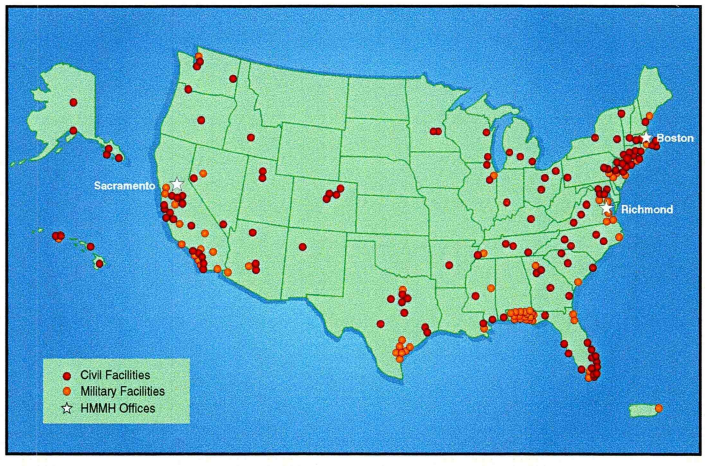
HMMH frequently is involved in the preparation of airport master plan studies and is familiar with the support required by engineering firms on such projects. Our experience includes participation in master plans for general aviation, air carrier, military, and joint-use airports. We tailor our technical approach to the requirements of the airport.

SUPPORT FOR THE U.S. NAVY AND AIR FORCE

For ten years, HMMH provided acoustical support for the Navy's AICUZ program. HMMH analyzed more than 70 facilities, ranging from master jet bases to practice landing fields. The support included short- and long-term noise measurements, expert testimony, interpretation of noise levels, preparation of noise contours, and documentation.

SOUND INSULATION STUDIES

HMMH offers comprehensive experience in sound insulation. Our projects include both original design and retrofit sound insulation programs for reducing aircraft-related noise in schools, residences, and commercial buildings. We bring to our work experience in: developing appropriate design criteria, pilot testing, interior and exterior measurements and predictions, sound insulation recommendations, cost estimation, construction monitoring, and post-construction noise measurements and evaluation.



HMMH Aviation Noise Studies in the U.S.

FAR PART 150 STUDIES

HMMH is very active in working with airports to develop noise and land use compatibility plans under Federal Aviation Regulation (FAR) Part 150. We have been involved in more than 50 FAR Part 150 studies at major air carrier airports as well as at general aviation and joint-use facilities. These studies require working with airport advisory committees, including local citizen groups, to explain noise assessment methods and interpret results; we have developed public involvement programs that insure all interested parties are given the opportunity to participate.

HMMH also provides support to airports in the implementation of noise compatibility programs prepared under FAR Part 150. Our services include assistance in the design specification, procurement, and use of noise monitoring systems; sound insulation programs; noise office development and staff training; and preparation of informational material, such as pilot handouts, newsletters, and web pages.

FAR PART 161 STUDIES

HMMH employees have more than 20 years' experience helping federal agencies, airport proprietors, and airport neighbors assess, develop, and implement aircraft noise restrictions. This effort spans the enactment of the

Aircraft Noise and Capacity Act (ANCA) in 1990 and includes the largest body of FAR Part 161 work by any single aviation noise consulting firm.

AIRCRAFT NOISE MONITORING SYSTEMS

In addition to its consulting, HMMH is experienced in the design, specification, acquisition, installation, and use of airport noise and operations monitoring systems. Our capabilities include a broad range of services in this area: specification of noise and operations monitoring systems, provision of complete portable noise monitoring systems, and ARTS radar and monitoring system data processing.

LITIGATION AND EXPERT TESTIMONY

HMMH offers airport clients technical support in airport litigation. HMMH staff members have testified in airport noise suits throughout the United States. Staff members also have testified in airport-related environmental litigation and hearings in the United States and Canada.

TRAINING SEMINARS AND GUIDELINES

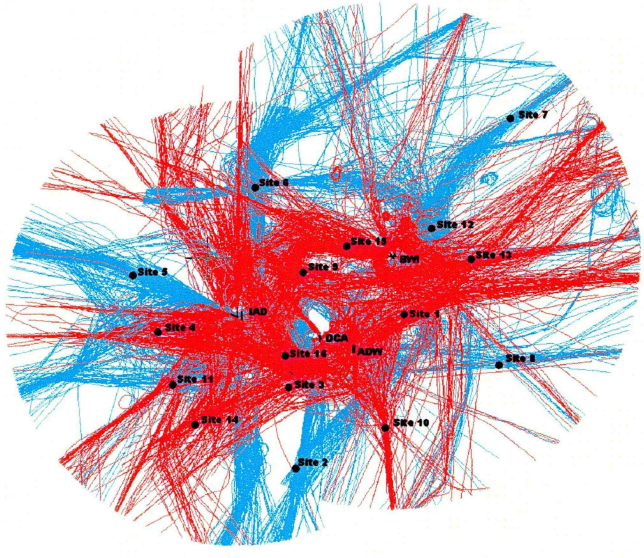
HMMH personnel have provided training seminars and courses for airport noise offices, for the Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA). We have developed manuals and guidelines on noise and vibration control for the FAA, FHWA, FTA, Environmental Protection Agency, Federal Railroad Administration and the National Park Service (NPS). HMMH also provides training on the FAA's Integrated Noise Model (INM) and the military's aircraft noise model, NOISEMAP.

RESEARCH AND SPECIAL PROJECTS

Evaluation of the effects of aircraft overflights on the National Park System: HMMH developed special low-noise instrumentation, measurement techniques, and visitor survey methods to apply in the unique environments of National Parks. HMMH continues to work with the Park Service to turn this research into useful practices and guidelines so that Park personnel may implement an orderly, scientifically based method of soundscape management.

Federal Interagency Committee on Aviation Noise: FICAN was formed in 1993 to provide forums for debate over future research needs to understand, predict, and control better the effects of aviation noise, and to encourage new development efforts in these areas. HMMH has administered FICAN's activities since 1994. This includes coordinating all meetings, public forums, and symposia; preparing meeting minutes, annual reports, and technical reports; and managing FICAN's web page.

Potomac Consolidated TRACON (PCT) Airspace Environmental Impact Statement (EIS): The PCT Airspace EIS involves combining the four TRACON (Terminal Radar Approach Control) facilities in the Baltimore - Washington region into a single TRACON handling the nation's fourth busiest airspace. HMMH is examining changes in aircraft noise at distances of up to 75 nautical miles from the center of the study area, and at altitudes up to 18,000 feet. HMMH's analysis consists of an extensive noise measurement program, and comprehensive noise modeling using the FAA's Noise Integrated Routing System (NIRS).



ARTS data from the Potomac Study area

For further information, please contact:

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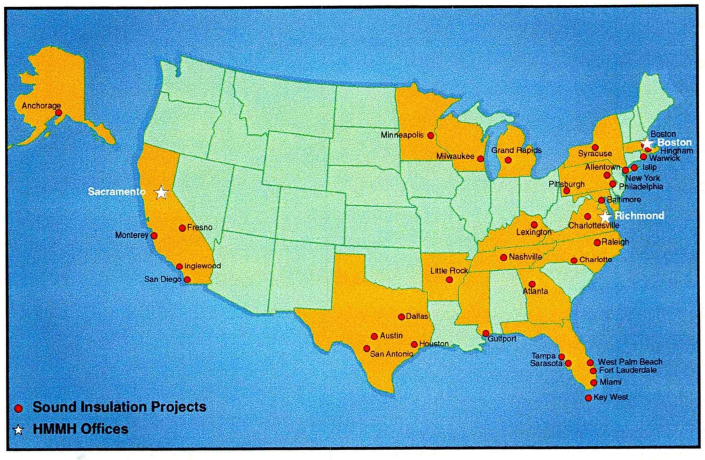
Sound Insulation Programs

Harris Miller Miller & Hanson Inc. (HMMH) offers exceptional qualifications related to residential and institutional sound insulation programs. HMMH has provided acoustical measurement and design services on sound insulation programs in more than 35 cities nationwide. We also have provided sound insulation services on a number of surface transportation projects.



HMMH Sound Insulation Projects Nationwide

Sound insulation programs require thorough technical and acoustical insight based on experience and knowledge. Our services include assisting architects and program managers to determine cost effective designs, to ensure that Federal Aviation Administration (FAA) criteria are met, and to maximize homeowners' satisfaction.

HMMH has specialized equipment for undertaking acoustical analysis for sound insulation programs, including a portable measurement system and software for analyzing field measurement data. Depending on the client's needs and the optimal method for the specific airport, HMMH performs sound insulation measurements using either actual aircraft noise or an artificial noise source.

Pilot Programs

Throughout the pilot phase of sound insulation programs, HMMH assists architects in developing cost effective treatment protocols. To facilitate these services, HMMH uses an acoustical model for predicting indoor/outdoor noise level reduction improvements based on proposed acoustical treatments. HMMH has successfully provided design services for major airports in more than 10 cities nationwide.

Program Implementation Studies

HMMH has performed numerous large-scale program implementation studies. For every program, HMMH continues to optimize measurement and analysis procedures with modernization of technology, thus maximizing study cost effectiveness.

New Development Design Services

For programs pertaining to new developments, HMMH uses an acoustical model to predict future interior acoustical conditions to assist architects and developers during the design stage. Our services help ensure that structures will meet interior acoustical specifications for sleep disturbance and speech intelligibility.

Representative Projects

Monterey Residential and Institutional Soundproofing Program: HMMH has performed a comprehensive acoustical study for the Residential and Institutional Soundproofing Program at Monterey Peninsula Airport since 1999.

HMMH has taken various technical details into account during the design process on this program, including improving acoustical properties of large picture windows and vaulted roof structures while maintaining aesthetics and adhering to local building codes for earthquakes.

Milwaukee Residential and Institutional Sound Insulation Program: HMMH has provided acoustical consulting services at General Mitchel International Airport in Milwaukee since 1992. This residential and institutional sound insulation program has included 750 residential structures, a nursing home, an aviation center, and six schools.

HMMH has worked in close coordination with the program architects in developing successful treatment options during the design phase. Due to the climate in Milwaukee, many residential structures and schools were well insulated with double- or triple-glazed windows prior to construction. Schools had primarily large windows along with spandrel panels. HMMH's testing and analysis led to the installation of new windows and acoustic panels, meeting the minimum noise level reduction requirements.

Historic Structures in San Diego

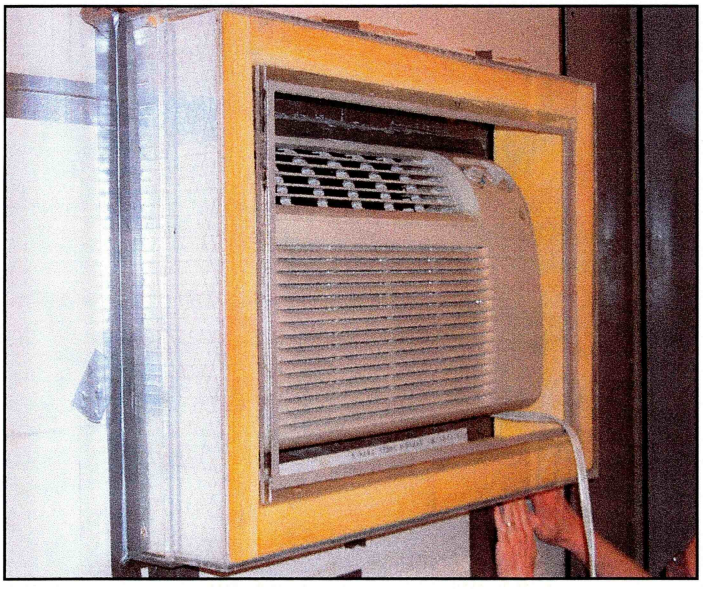
San Diego Residential Sound Attenuation Program: HMMH has been involved with the Residential Sound Attenuation Program acoustical study at San Diego International Airport since 1999. HMMH has performed acoustical testing, design, and analysis services at over 250 homes.

Homes on the west side of the airport were determined to be potential contributors to the Loma Portal Historic District. These homes were required to maintain the historical appearance while satisfying Federal Aviation Administration guidelines for sound insulation programs. These structures required special mitigation treatment options, such as the use of wooden acoustical windows and doors rather than standard replacement fixtures.

Minneapolis Residential Sound Insulation Program: HMMH has provided acoustical consulting services for both the low frequency and multi-family sound insulation programs at Minneapolis – St. Paul International Airport in Minneapolis since 1999.

The primary effect of low-frequency noise on people is annoyance due to secondary emissions – rattling noises and vibrations of windows, doors, and bric-a-brac. The low-frequency noise sound insulation study demonstrated the difficulty of mitigating interior low frequency noise levels, however, secondary emissions were significantly reduced.

The acoustical performance of the multi-family structures was adversely affected by the "pull-through air conditioners". HMMH took the lead in an extensive design and testing program on the air conditioners, including designs of numerous alternatives and several days of acoustical laboratory testing of actual designs. This design program led to effective treatment alternatives for the pull-through air conditioners and contributed to the uniqueness and overall success of the program.



Acoustical Test Setup for Pull-Through Air Conditioners

For further information, please contact:

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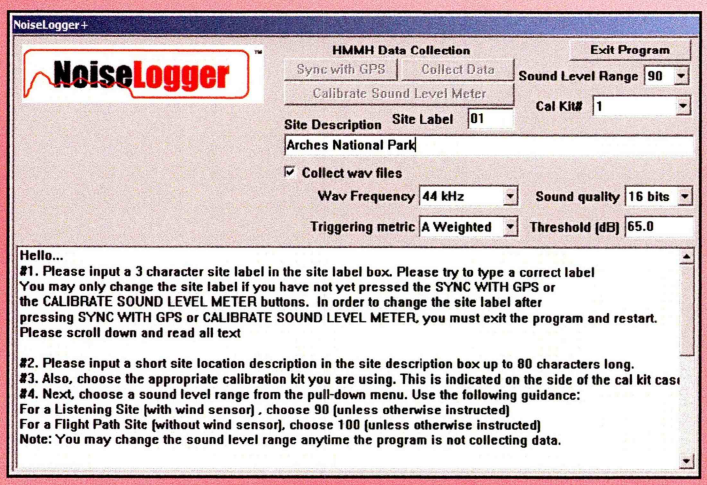
NoiseLogger™

HMMH developed the NoiseLogger and NoiseLogger+ measurement systems to conduct unattended, long-term (30+ days), continuous 1/3-octave band noise measurements. HMMH design NoiseLogger to meet our requirements for a long-term monitoring solution that is compact, light, efficient, rugged, and able to store more data than any available portable system. After extensive testing under difficult environmental conditions, we now offer these systems to our clients.

NOISELOGGER SYSTEM COMPONENTS

The basic system consists of a Larson Davis 824 noise monitor and a hand-held computer running the HMMH developed NoiseLogger software. This system uses very little power (less than 300mA at 12V) and can be "ruggedized" for extreme weather conditions.



NoiseLogger software main screen

NoiseLogger was designed for use on Windows CE hand-held devices, and is suited to long-term unattended measurements. The system acquires one-second linear A- and C-weighted overall levels, along with the 1/3-octave band data, and a number of operational parameters. Downloading NoiseLogger data is quick and easy through the use of hot-swappable memory cards. NoiseLogger can run for days with optional external battery power, or continuously with the optional solar panels. The NoiseLogger system is also capable of storing wind speed and direction data every second with the optional ultrasonic anemometer.

The basic NoiseLogger system includes:

- NoiseLogger software for Windows CE
- Windows CE handheld computer
- Larson Davis model 824-SSA
- Garmin GPS

NOISELOGGER+ SYSTEM COMPONENTS

NoiseLogger+ was developed after NoiseLogger to add the capability to make CD-quality recordings of event-triggered noise events, while simultaneously storing all the other measurement data. The basic NoiseLogger+ system utilizes a laptop computer instead of the handheld device. The use of the laptop computer increases the power requirements of the system (less than 1000mA), but allows for the additional storage capacity that is required to store thousands of recorded noise events. These recorded events can then be played back to help identify noise sources. Optional components include an ultrasonic anemometer and a variety of power supply systems.

The basic NoiseLogger+ system includes:

- NoiseLogger+ software for Windows 98/NT/2000
- Laptop computer
- Larson Davis model 824-SSA
- Garmin GPS

SYSTEM OPTIONS

The flexibility of the software allows the user to utilize almost any Windows CE machine or laptop computer. HMMH can customize the hardware and software to meet client needs and budget.

Common options include, but are not limited to, the following:

- Ultrasonic anemometer
- High capacity gel cell batteries
- Compact solar panel
- Waterproof storage cases
- Calibration/download kits
- Accessory kits
- Spare microphones & cables
- Additional memory cards
- Training in monitoring & analysis
- Hardware maintenance & calibration services
- Software support services

OPTIONAL TRAINING

HMMH provides training in the use of the noise monitors. The optional training includes instruction on field measurement techniques, calibration, support of the noise monitors, and analysis of the data. Training can include instruction at your site and in the field under actual measurement conditions.

OPTIONAL HARDWARE

HMMH's NoiseKit™ bundles many of the optional components that are required to facilitate deployment of a noise monitor in the field.

OPTIONAL SOFTWARE

HMMH provides additional software systems that further enhance the capabilities of our noise monitoring systems.

HMMH's NoiseManager™ software is a complete database management tool for the storage, analysis, and display of noise measurement data. NoiseManager is essential to anyone trying to manage a large amount of noise measurement data. NoiseManager can import NoiseLogger and NoiseLogger+ data as well as many other types of data. Recorded noise events from NoiseLogger+ can be played, identified, categorized, and deleted directly from the NoiseManager application.

PRICE

Prices for customized hardware, software, training, and support are available upon request.

For further information, please contact:

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NoiseManager™

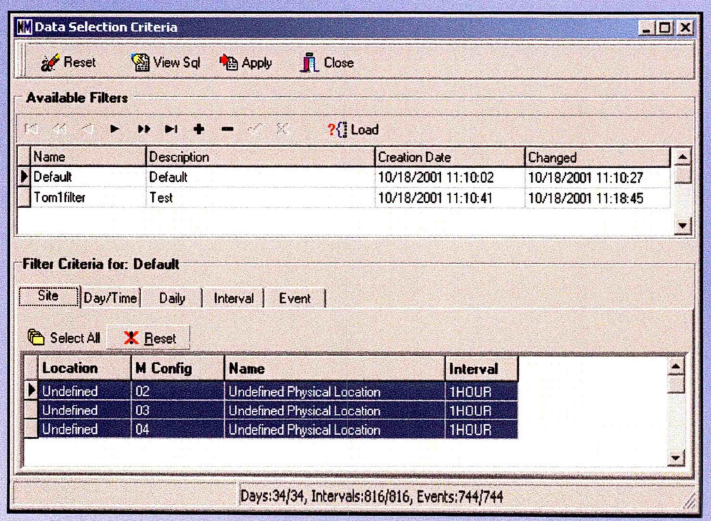
HMMH developed NoiseManager to control and manage noise data collected by our consultants. NoiseManager provides the user with customized tools to import noise data into a database and allows quick access and viewing of the data. NoiseManager can scale from a single user installation on a laptop up to a multi-node client-server network version. Additional software support and upgrade protection are available as options.

DATA IMPORT

NoiseManager currently imports four types of noise monitor data including NoiseLogger and NoiseLogger+ data. A helpful wizard guides the user through the data import process. The software uses either of two commercially available data base tools: Borland Interbase 6.x or Micro-soft SQL Server 2000. Once the data is imported into the database, NoiseManager and other applications, such as MS Access, Excel, and Crystal Reports, can access it.

DATA FILTERING

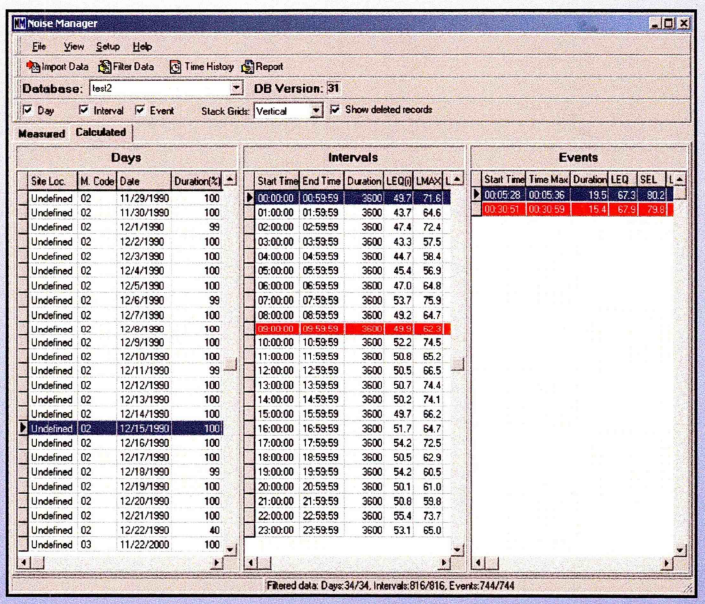
NoiseManager includes a filtering tool that allows the user to specify exactly which data to display on the main screen. The tool allows the user to save frequently used filters.



Data filtering in NoiseManager

MAIN SCREEN

The main screen of NoiseManager resembles a spreadsheet with three windows that display the data organized by days, intervals, and events. The user can sort, edit, and view a number of ways depending on the type of data. The main screen has two tabs – Measured and Calculated. NoiseManager allows the user to edit the data to delete unwanted events, intervals, or days.



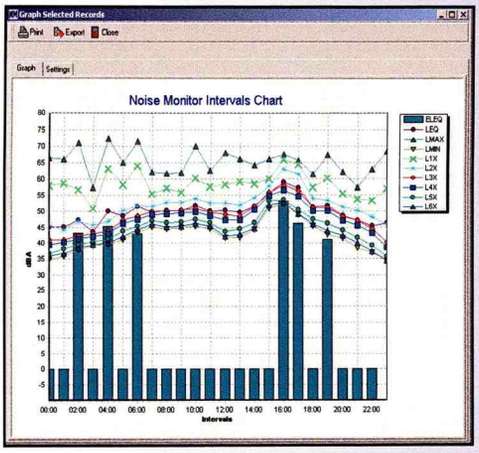
NoiseManager main screen

CHARTS, GRAPHS, AND REPORTS

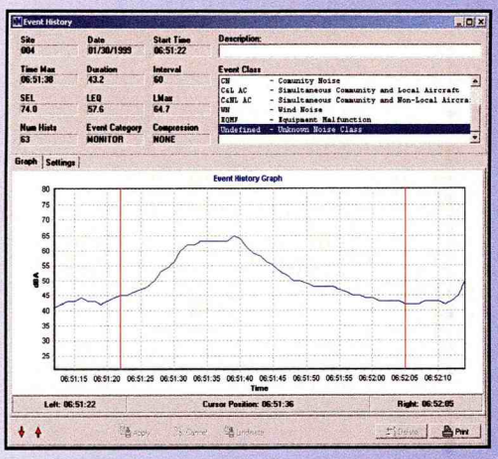
The user can view, print, or export all the data visible on the main screen, as well as customize each view. Graphs can be printed or exported to other applications.

Right-clicking an event on the main screen allows the user to enter the event history view. Events can be viewed, deleted, undeleted, identified, labeled, and played back from this one screen.

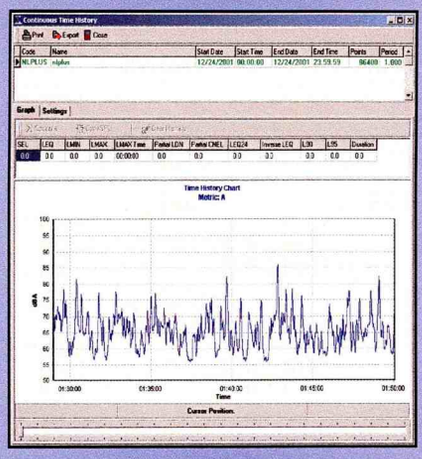
NoiseManager also has a powerful tool for viewing time history data and recalculating noise metrics for selected areas.



Customized Chart Showing Intervals



Event History View



Continuous Time History Graph

NoiseManager includes ten standard reports. The reports were designed using Crystal Reports software. Users can develop their own additional reports using Crystal Reports and other commercial software, or HMMH can customize them for you.

OPTIONAL TRAINING AND INSTALLATION

HMMH also offers software training and installation services. These services can be customized to meet client requirements and budget.

OPTIONAL HARDWARE KITS

NoiseKit™ is a state-of-the-art, portable, and user-friendly noise monitoring kit. Designed for all-weather operations, these kits contain all the necessary equipment and supplies required to undertake extended field measurements.

OPTIONAL SOFTWARE

NoiseLogger™ is a 1/3-octave band data acquisition system. The system consists of a 1/3-octave band analyzer connected to a laptop or Windows CE handheld computer. The system can be configured to continuously acquire data. Optional components include an ultrasonic anemometer (for wind speed and direction) and a sound card for event triggered wave file storage.

PRICE

Prices for this software, customized hardware, training, and support are available upon request.

For further information, please contact:

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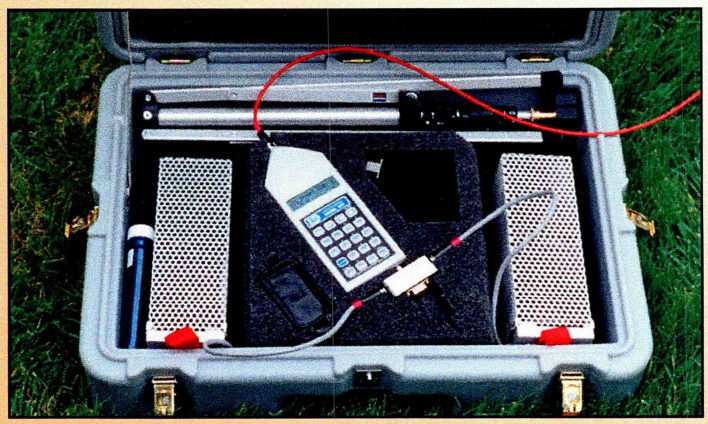
NoiseKit™

HMMH offers state-of-the-art, portable, user-friendly noise monitoring kits to our clients. Originally developed for field use by HMMH staff, these kits provide a complete noise monitoring system – hardware, software, and training – to collect, store, and report noise measurement data. In addition, HMMH provides on-going technical and consulting services to our clients – a unique benefit that other vendors cannot offer. We also offer optional software for comprehensive data logging, management, and noise data analysis.



HMMH's NoiseKit

SYSTEM COMPONENTS

NoiseKit's customized components and design features are not available with "off the shelf" noise monitors, and can include:

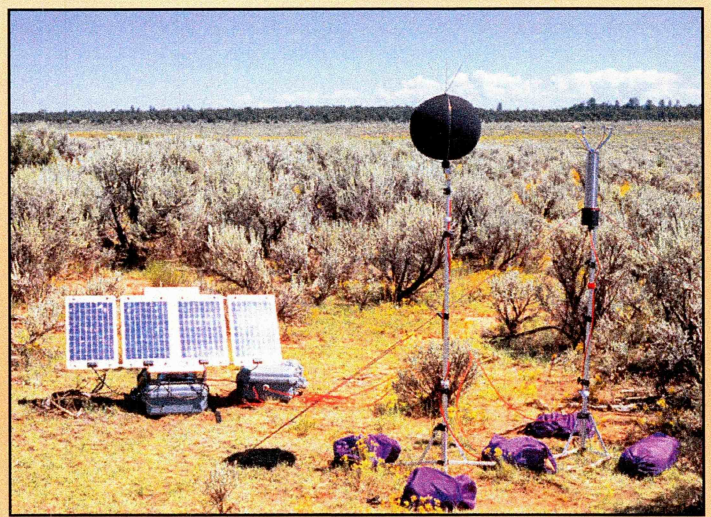
- Portable noise monitors
- Calibration case
- Laptop computer
- Semi-permanent enclosure and equipment
- Staff training in monitoring and analysis techniques
- Hardware maintenance and calibration
- Software support

SYSTEM DETAILS

NoiseKit is the most comprehensive portable noise monitor kit available to noise professionals. It is uniquely designed for all-weather measurements, and contains the necessary accessories and supplies to conduct extended field measurements. Plus, our damage-proof storage cases meet minimum space requirements – a pair of kits will easily fit in the trunk of a compact car.

NoiseKit contains the necessary tools to undertake noise measurements in the field. These include microphones, pre-amplifiers, calibrators, microphone cables, a tripod, stakes to secure tripod, simplified instructions, 7-day battery power, AC power converter, power cord, battery charger, microphone holder, windscreens, locks and chains. Customized features can be added at the user's request.

NoiseKit was designed for operation over extended measurement periods; it can run on AC power, solar panels, or using gel cell batteries for up to a week of unattended operations.



HMMH's NoiseKit with low noise windscreen and solar panels for long-term operation

The NoiseKit calibration case is equipped with supplies and parts to maintain the noise monitors in extended field applications. The case is custom-made, easy to pack, and weatherproof. It includes a collection of spare parts (microphones, pre-amplifiers, microphone cables, wind-screens, internal noise monitor batteries); field notebooks with data sheets; and other essential tools (flashlight, screwdriver, headphones).

NoiseKit setup and data download are easy with a laptop

NoiseKit's optional laptop computer allows the user easy set-up of noise monitors and quick download of noise data from the noise monitors while in the field. This convenience allows the user to transfer noise data from the field to the office without interrupting data collection.

EXISTING USERS

HMMH has provided more than 30 NoiseKits to airport noise offices throughout the U.S., including:

- APF - Naples, FL
- MIA - Miami, FL
- CLT - Charlotte, NC
- PBI - West Palm Beach, FL
- MSY - New Orleans, LA
- BWI - Baltimore, MD
- BNA - Nashville, TN
- FXE - Ft. Lauderdale, FL
- SAN - San Diego, CA
- SMF - Sacramento, CA
- HPN - Westchester, NY

OPTIONAL TRAINING

HMMH provides training in the use of NoiseKit. Our optional training includes instruction on field measurement techniques, calibration, support of the noise monitors, and analysis of the data. HMMH training includes instruction both at your site and in the field under actual measurement conditions.

OPTIONAL SOFTWARE

HMMH provides additional software systems that further enhance the capabilities of our noise monitoring kits.

HMMH's NoiseManager™ software is a complete database management tool for the storage, analysis, and display of noise measurement data.

HMMH's NoiseLogger™ software allows long-term data collection of 1/3-octave band noise data and wave file data.

PRICE

Prices for hardware, software, and training are available upon request.

For further information, please contact:

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RealContours™

RealContours revolutionizes airport noise modeling by automating all aspects of airport noise contour generation, management and display. By automatically generating noise contours using the FAA's Integrated Noise Model (INM) and radar flight track data, RealContours provides a fast and flexible alternative to the laborious technique of preparing INM inputs manually.

Available as a stand-alone system or integrated into an existing Noise and Operation Monitoring System (NOMS), RealContours greatly reduces the effort of preparing, processing, and displaying INM contours.

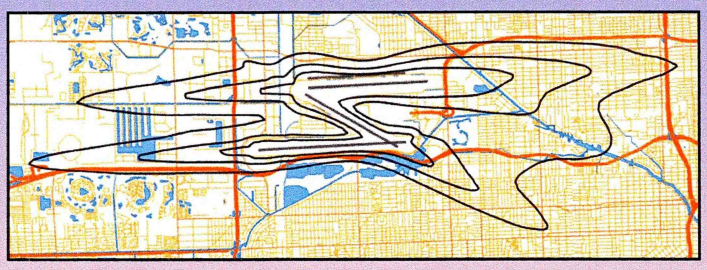
BUILT BY HARRIS MILLER MILLER & HANSON INC.

Harris Miller Miller & Hanson Inc. (HMMH) has over 20 years of aviation noise consulting experience, having assisted more than 200 airports worldwide on a comprehensive range of noise modeling assignments. HMMH aviation consultants are expert in the setup and running of the INM, and are active members of the INM design-review group, participating in the review of all INM versions before release. HMMH offers an INM training course several times a year at locations in the U.S. and abroad. Our course has attracted approximately 350 professionals, from FAA headquarters and regional offices, numerous consulting firms, major airframe manufacturers, and other aviation industry entities. We have incorporated our consulting experience and know-how into the design of RealContours to create a uniquely capable product unavailable elsewhere.

FLEXIBLE DESIGN

RealContours' flexible design allows users to choose different noise models for computation and different forms of data output. In addition, RealContours is compatible with any flight track data format. Airports that have a NOMS can integrate RealContours into their existing systems to create a powerful noise contour processing system. Flight tracks can be filtered using the NOMS and exported to RealContours for processing. Results from RealContours are then automatically sent back to the NOMS for display and analysis.

RealContours is generating noise contours for more than a dozen major airports throughout North America, including airports in the following cities: Anchorage, Baltimore, Boston, Denver, Los Angeles, Miami, Sacramento, Salt Lake City, San Diego and West Palm Beach. RealContours can be used as an independent system, or coupled with any of the major noise monitoring systems available today.

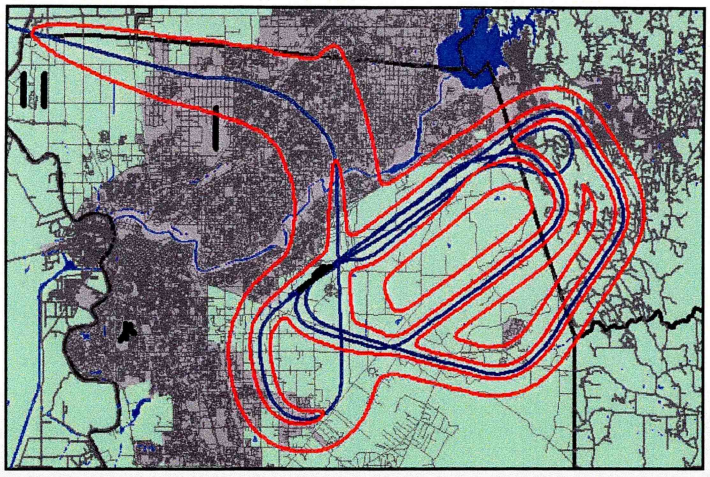


RealContours Output

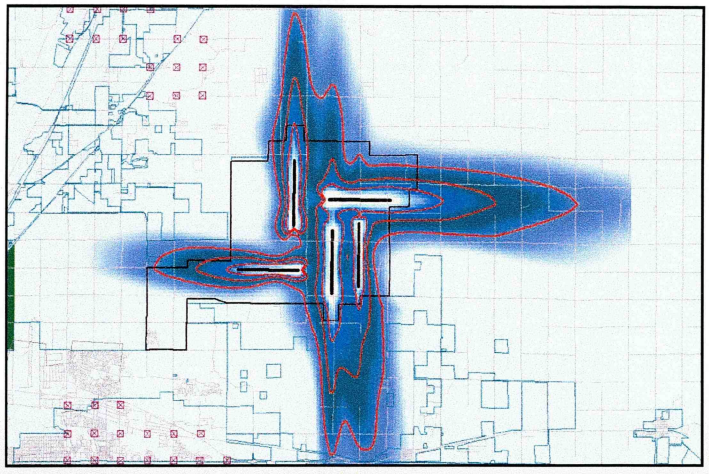
RealContours utilizes a separate Microsoft SQL Server 2000 database to store operations and flight track data. This stand-alone database enables RealContours to function separately from a NOMS, and it allows users to perform analysis and prepare reports with PC-based tools like Microsoft Excel and Crystal Reports. This feature also lets RealContours users take the program and data with them on a laptop computer to public meetings and demonstrations.

OPERATIONAL MODES

RealContours can operate in either an automatic or a



DNL contour from a C5A military transport during touch and go operations



Daily DNL contour with gradient

manual mode. The automatic mode generates daily contours that can be combined into weekly, monthly, quarterly, or annual noise contours using the AddGrids module, which allows users to add, subtract, and average numerous contours sets. The manual mode allows users to access the special contour interface, which is capable of filtering flight track data in many ways to produce special custom contours. These results can be used with AddGrids for powerful "what if" and scenario analysis.

RealContours is also available in a lower cost version that operates only in the automatic mode. This version was designed for airports needing daily, monthly, quarterly, and annual contours without user interaction.

For a typical airport (approximately 1000 flight tracks per day), RealContours can complete the daily contour in approximately 30 minutes. For larger airports, multiple computers can be networked to dramatically reduce computation time.

ADDED FEATURES

To improve noise modeling accuracy, HMMH recently has added the following modular features.

- RealContours utilizes the terrain feature of INM version 6.1.
- Touch and go and circuit operations are identified and modeled accordingly, increasing accuracy.
- The new RealProfiles module uses aircraft performance data to more accurately model the noise output of an aircraft based on its actual profile instead of using the default profiles built into the INM. This module represents a significant advancement in the accuracy of noise prediction, as verified by HMMH staff and others through comparison with measured noise levels.

DATA OUTPUT

RealContours can produce contours for several noise metrics including DNL, CNEL, LDEN, SEL, Lmax, and time above (N70). To satisfy the Federal Aviation Administration, RealContours also outputs all the data used in each run to enable re-creation of the INM runs for validation.

RealContours' integrated viewing capability allows it to import detailed base maps for reference and for generating report-quality output. Multiple contour views can be opened for comparison of contour runs and contours can be exported as "dxf" (AutoCAD) and shape (ArcView) files that easily can be imported into NOMS and GIS programs.

PRICE

Prices for the software, optional modules, customized hardware, training, and support are available upon request.

For further information, please contact:

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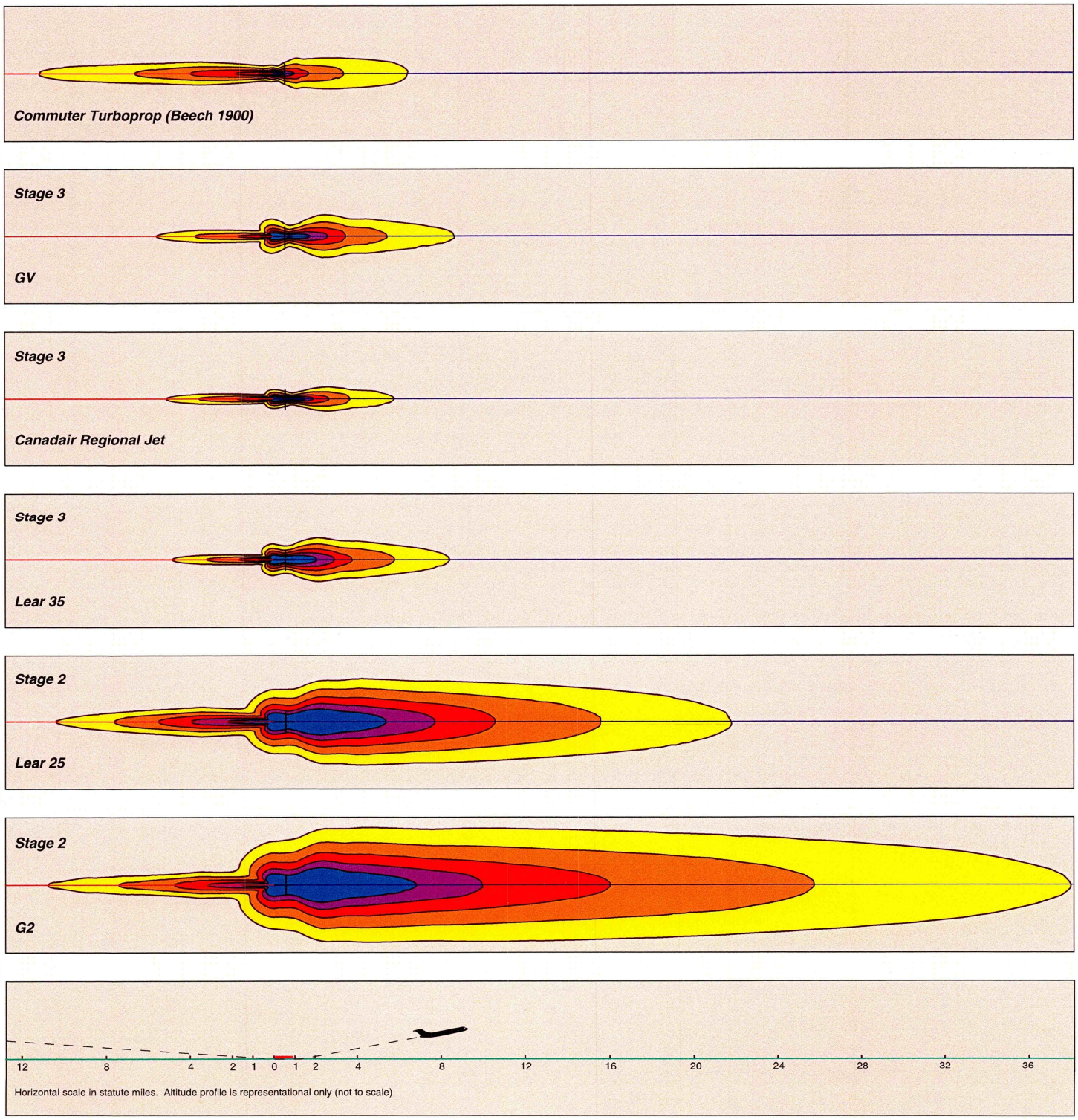
HARRIS MILLER MILLER & HANSON INC.

Single Event Comparison

(Sound Exposure Level, SEL, for Landing-Takeoff Cycle)



Prepared by HMMH using INM 6.0b (2001)

95 SEL | 90 SEL | 85 SEL | 80 SEL | 75 SEL

Evolution of the Boeing 737

Comparison of Maximum Noise Level on Takeoff

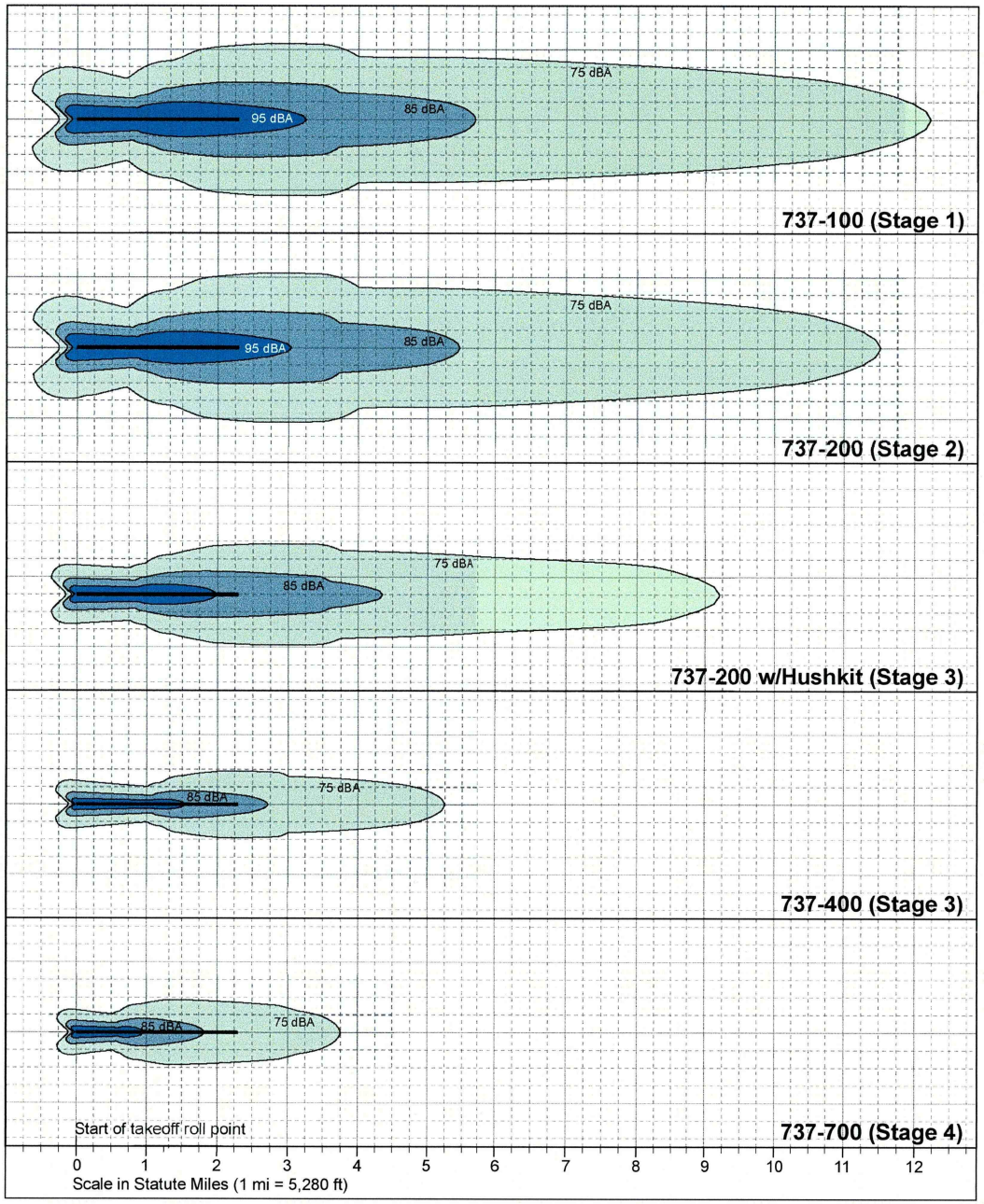

737-100


737-200


737-200 w/Hushkit


737-400


737-700



Model:	**737-100**
INM engine:	JT8D-9
Part 36:	Stage 1
Year of certification:	December 1967
Average T-O weight:	104,000 lbs
Average passengers:	103

Model:	**737-200**
INM engine:	JT8D-9QN
Part 36:	Stage 2
Year of certification:	December 1967
Average T-O weight:	115,500 lbs
Average passengers:	120

Model:	**737-200 w/hushkit**
INM engine:	JT8D-9 w/LGW Nordam kit
Part 36:	Stage 3
Year of certification:	1992
Average T-O weight:	115,500 lbs
Average passengers:	120

Model:	**737-400**
INM engine:	CFM56-3C-1
Part 36:	Stage 3
Year of certification:	March 1989
Average T-O weight:	138,500 lbs
Average passengers:	146

Model:	**737-700**
INM engine:	CFM56-7B
Part 36:	Stage 4
Year of certification:	December 1997
Average T-O weight:	115,600 lbs
Average passengers:	126

Noise contours were computed with the Integrated Noise Model (INM) version 6.0b, using standard atmospheric conditions and the stagelength weight that was similar to the Average T-O weight (in most cases it was the maximum).

Sound levels of 75 dBA Lmax may cause speech interference indoors, assuming normal construction techniques (10 dB reduction outdoors-to-indoors).

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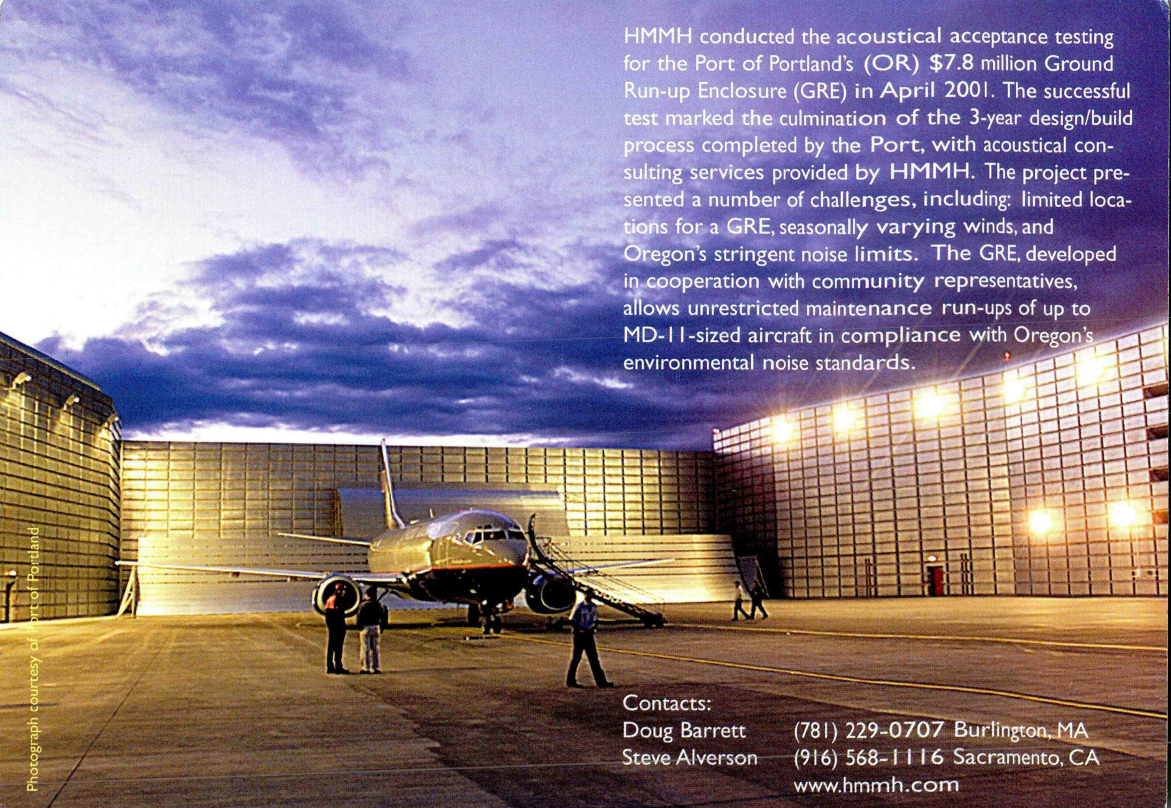

HMMH conducted the acoustical acceptance testing for the Port of Portland's (OR) $7.8 million Ground Run-up Enclosure (GRE) in April 2001. The successful test marked the culmination of the 3-year design/build process completed by the Port, with acoustical consulting services provided by HMMH. The project presented a number of challenges, including: limited locations for a GRE, seasonally varying winds, and Oregon's stringent noise limits. The GRE, developed in cooperation with community representatives, allows unrestricted maintenance run-ups of up to MD-11-sized aircraft in compliance with Oregon's environmental noise standards.

Photograph courtesy of Port of Portland

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