APPENDIX E

NOISE

Appendix E
Noise

Introduction

Appendix E contains information used to support the technical noise analysis in the Environmental Impact Statement (EIS). An aircraft operations noise modeling summary paper is provided to introduce the metrics used in the technical modeling. This summary is followed by a detailed description of the onset-rate adjusted day-night average sound level (L_{dnmr}) metric and the relationship between this metric and Federal Aviation Administration (FAA) Order 1050.1E. As a part of the noise impact analysis for the EIS both existing and proposed Military Operations Areas (MOA) were modeled, including proposed Juniper Low MOA. Included within the text files in this appendix are MR_NMAP noise model inputs (e.g., MOA boundaries, aircraft operations, avoidance areas, etc.) and results for the two metrics, L_{dnmr} and Sound Exposure Level (SEL) above 65 decibels (dB). An additional file is provided that includes calculation for L_{max} of F-15 aircraft at various altitudes above ground level.

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Noise Background

General

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Of course, aircraft are not the only sources of noise in a rural surrounding. Noise from interstate and local roadway traffic, rail, industrial, and neighborhood sources also intrude on the everyday quality of life in these areas. Nevertheless, aircraft are readily identifiable to those affected by their noise and are typically singled out for special attention and criticism. Consequently, aircraft noise issues often dominate analyses of environmental impacts.

Sound is a physical phenomenon consisting of small vibrations, which travel through a medium (i.e., intervening substance) such as air, and are sensed by the human ear. Whether that sound is interpreted as pleasant (e.g., music) or unpleasant (e.g., transportation-related noise) depends largely on the listener’s current activity, past experience, and attitude toward the source of that sound. It is often true that one person’s music is another person’s noise.

The measurement and human perception of sound involves two basic physical characteristics – intensity and frequency. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. The higher the sound’s pressure, the more energy carried by the sound and the louder the perception of that sound. The second important physical characteristic is frequency, which is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.

The loudest sounds which can be detected comfortably by the human ear, have intensities that are 1 trillion times higher than those of sound that cannot be detected by humans. Because of this vast range, any attempt to represent the intensity of sound using a linear scale becomes very unmanageable. As a result, a logarithmic unit known as the decibel (dB) is used to represent the intensity of a sound. Such a representation is known as a sound level.

A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels.

Because of the logarithmic nature of the dB unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

60 dB + 60 dB = 63 dB, and

80 dB + 80 dB = 83 dB.

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

60.0 dB + 70.0 dB = 70.4 dB.

Because the addition of sound levels behaves differently than that of ordinary numbers, such an addition is often referred to as "dB addition" or "energy addition." The latter term arises from the fact that what we are really doing when we add dB values is first converting each dB value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its dB equivalent.

An important facet of dB addition arises later when the concept of time-average sound levels is introduced to explain Day-Night Average A-Weighted Sound Level (DNL) (see the Noise Metrics discussion below). Because of the logarithmic units, the time-average sound levels are dominated by the louder levels, which occur during the averaging period. As a simple example, consider a sound level of 100 dB that lasts for 30-seconds, followed by a sound level of 50 dB which also lasts for 30-seconds. The time-average sound level over the total 60-second period is 97 dB, not 75 dB.

Sound frequency is measured in terms of cycles per second (cps), or hertz (Hz), which is the preferred scientific unit for cps. The normal human ear can detect sounds over a wide range of frequencies. However, not all frequencies in this range are heard equally well by the human ear which is most sensitive to frequencies in the 1,000 to 4,000 Hz range. In measuring community noise, this frequency dependence is taken into account by adjusting the very high and low frequencies to approximate the human ear's lower sensitivity to those frequencies. This is called "A-weighting" and is commonly used in measurements of community environmental noise.

Sound levels measured using A-weighting are referred to as A-weighted sound levels. However, since most environmental impact analysis documents deal only with A-weighted sound levels, the adjective "A-weighted" is often omitted, and A-weighted sound levels are referred to simply as sound levels. In some instances the author will indicate that the levels have been A-weighted by using the abbreviation dBA for decibel. As long as the use of A-weighting is understood to be used, there is no difference implied by the terms "sound level" and "A-weighted sound level" or by the units dB and dBA. In this document all sound levels are A-weighted sound levels and the adjective "A-weighted" has been omitted.

Sound levels do not represent instantaneous measurements but rather averages over short periods of time. Two measurement time periods are most common – one second and one-eighth of a second. A measured sound level averaged over one second is called a slow response sound level; one averaged over one-eighth of a second is called a fast response sound level. Most environmental noise studies use slow response measurements, and the adjective "slow response" is usually omitted. It is easy to understand why the proper descriptor "slow response A-weighted sound level" is usually shortened to "sound level" in environmental impact analysis documents.

Noise Metrics

A "metric" is defined as something "of, involving, or used in measurement." As used in environmental noise analyses, a metric refers to the unit or quantity, which quantitatively measures the effect of noise on the environment. Noise studies have typically involved a confusing proliferation of noise metrics as individual researchers have attempted to understand and represent the effects of noise. As a result, past literature describing environmental noise abatement has included many different metrics.

More recently, however, various federal agencies involved in environmental noise mitigation have agreed on common metrics for environmental impact analysis documents, and both the Department of Defense (DoD) and the Federal Aviation Administration (FAA) have specified those which should be used for federal aviation noise assessments. These metrics are as follows:

Maximum Sound Level

The highest A-weighted sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight) is called the maximum A-weighted sound level (ALM) or maximum sound level, for short.

Sound Exposure Level

Individual time-varying noise events have two main characteristics – a sound level which changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The Sound Exposure Level (SEL) combines both of these characteristics into a single metric.

SEL is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of the constant sound that would, in one second, generate the same acoustic energy, as did the actual time-varying noise event. Since aircraft overflights usually last longer than one second, the SEL of an overflight is usually greater than the ALM of the overflight.

Note that SEL is a composite metric (i.e., made up of distinct parts), which represents both the intensity of a sound level and its duration. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that SEL measures this impact much more reliably than just the A-weighted sound level.

Because the SEL and the ALM are both A-weighted sound levels expressed in dBs, there is sometimes confusion between the two, so the specific metric used should be clearly stated.

Day-Night Average A-Weighted Sound Level

Time-averaged sound levels are measurements of sound levels, which are averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period.

For the evaluation of community noise effects, and particularly aircraft noise effects, DNL is used. DNL averages aircraft sound levels at a location over a complete 24-hour period, with a 10 dB adjustment added to those noise events which take place between 10:00 p.m. and 7:00 a.m. (local time). This 10 dB “penalty” represents the added intrusiveness of sounds which occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours.

DNL provides a single measure of overall noise impact, but does not provide specific information on the number of noise events or the individual sound levels, which occur during the day. For example, a DNL of 65 could result from a few very noisy events, or many quieter events during the 24-hour period.

As noted earlier for SEL, DNL does not represent the sound level heard at any particular time, but rather represents the total sound exposure. Scientific studies and social surveys, which have been conducted to determine community annoyance to all types of environmental noise, have found DNL to be the best measure of that annoyance. Its use is endorsed by the following scientific communities: American National Standards Institute (1980, 1988); United States Environmental Protection Agency [USEPA] (1974); and Federal Interagency Committee on Noise [FICON] (1980, 1992).

Opinion surveys about aircraft noise have been conducted in different countries to find the percentages of groups of people who express various degrees of annoyance when exposed to different levels of DNL. The results of these surveys are remarkably consistent. Synthesis of Social Surveys of Noise Annoyance (Schultz 1978) was published in 1978. A more recent study has reaffirmed the results found in the 1978 study (Fidell et al. 1991). In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors that influence the manner in which individuals react to noise. Nevertheless, the findings of these and other studies substantiate that community annoyance to aircraft noise is represented quite reliably using DNL.

This relation between community annoyance and time-average sound level also has been confirmed for infrequent aircraft noise events. Community Reactions to Helicopter Noise (Schmoer et al. 1991) reported the reactions of individuals in a community to daily helicopter overflights correlated quite well with the daily time-average sound levels over this range of numbers of daily noise events.

The use of DNL has been criticized recently as not accurately representing community annoyance and land-use compatibility with aircraft noise. Much of that criticism stems from a lack of understanding of the basis for the measurement or calculation of DNL. One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to “meaningless” time-average sound levels.

In fact, a time-average noise metric, such as DNL, takes into account both the noise levels of all individual events which occur during a 24-hour period and the number of times those events occur. As described briefly above, the logarithmic nature of the dB unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23-hours, 59-minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The DNL for this 24-hour period is 65.5. Assume, as a second example that ten such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23-hours and 55-minutes of the day. The DNL for this 24-hour period is 75.4. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events. This is the basic concept of a time-averaged sound metric such as DNL.

Onset Rate-Adjusted Day-Night Average

Onset rate-adjusted day-night average, a-weighted sound level (Ldnmr) is an additional noise metric which has been developed specifically for aircraft operations at low altitudes along Military Training Routes (MTRs) by the USAF under direction of the Armstrong Aerospace Medical Research Laboratory. Individual low-altitude events on MTRs are different from typical noise sources because the rapid onset of aircraft noise can create a “startle” effect. The Ldnmr is similar to the DNL in that it is an average metric with a 10 dB penalty for events occurring between 10:00 p.m. and 7:00 a.m. However, Ldnmr represents an average for an entire month utilizing the highest monthly sortie activity, and includes an additional 0 to 11 dB penalty to compensate for the “startle” effect of a low-altitude overflight. Because of this penalty, Ldnmr always equals or exceeds DNL. Ldnmr is currently the approved MTR noise metric for the armed services, and the USAF recommends calculation of Ldnmr values for noise assessments along MTRs. Because it is a conservative measure of average noise exposure over time with built-in penalties for rapid onset of noise, Ldnmr closely correlates with the probability of “highly annoying” a noise receptor, and is appropriate to use in areas where receptors would be highly sensitized to potential noise impacts.

Noise Effects

Hearing Loss

Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal workplace standards for protection from hearing loss allow a time-average level of (Equivalent Continuous Sound Pressure Level (LEQ) 90 dB over an 8-hour period, or LEQ 85 dB averaged over a 16-hour period. Even the most protective criterion suggests a time-averaged sound level of DNL 70 over a 24-hour period. Since it is unlikely that airport neighbors will remain outside their homes 24-hours per day for extended periods of time, and there is little possibility of hearing loss below a DNL of 75, this protection level is extremely conservative.

Nonauditory Health Effects

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor have not been found to occur at levels below those which protect against noise-induced hearing loss (described in Section C.3.1). Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institute of Health Conference on Noise and Hearing Loss, held on 22-24 January 1990 in Washington, D.C. (Von Gierke 1990).

> *The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria [an average of 75 dB for complete protection against hearing loss for an eight-hour day]. At the recent (1988) International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous. Consequently, one comes to the conclusion that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place*.

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous at best, and often contradictory. In addition, even those studies which purport to find such health effects use time-averaged noise levels of 75 dB and higher for their research.

For example, in an often-quoted paper, two University of California at Los Angeles (UCLA) researchers apparently found a relationship between aircraft noise levels under the approach path to Los Angeles International Airport (LAX) and increased mortality rates among the exposed residents by using an average noise exposure level greater than 75 dB for the “noise-exposed” population (Meacham et al. 1979). Nevertheless, three other UCLA professors analyzed those same data and found no relation between noise exposure and mortality rates (Frericks et al. 1980).

As a second example, two other UCLA researchers used this same population near LAX to show a higher rate of birth defects in 1970-1972 when compared with a control group residing away from the airport (Jones et al. 1978). Based on this report, a separate group at the United States Center for Disease Control performed a more thorough study of populations near Atlanta's Hartsfield International Airport for 1970-1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Edmonds et al. 1979).

In summary, there is no scientific basis for claims that potential auditory or nonauditory health effects exist for aircraft time-average sound levels below 75 dB.

Annoyance

The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by USEPA as any negative subjective reaction on the part of an individual or group (USEPA 1974). As noted in the discussion of DNL community annoyance is best measured by that metric.

It is often suggested that a lower DNL, such as 60 or 55, be adopted as the threshold of community noise annoyance for airport environmental analysis documents. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, a DNL of 65:

1. Provides a valid basis for comparing and assessing community noise effects;
2. Represents a noise exposure level which is normally dominated by aircraft noise and not other community or nearby highway noise sources; and
3. Reflects the FAA's threshold for grant-in-aid funding of airport noise mitigation projects.

The United States Department of Housing and Urban Development (HUD) also established a DNL standard of 65 for eligibility for federally guaranteed home loans. Although the FAA , HUD, and DoD consider 65 DNL as the threshold of significance for assessing noise impacts, this threshold does not distinguish between urban, suburban, or rural settings. Along with several other federal agencies, the USEPA takes a more conservative approach to noise assessment including a more restrictive 55 DNL threshold for noise in rural areas or "places in which quiet is a basis for use" (USEPA 1974).

Speech Interference

Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities such as radio or television listening, telephone use, or family conversation gives rise to frustration and irritation. The quality of speech communication is also important in classrooms, offices, and industrial settings and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that "whenever intrusive noise exceeds approximately 60 dB indoors, there will be interference with speech communication" (FICON 1992). A steady A-weighted background sound level of 60 dB will produce 93 percent intelligibility; that of 70 dB will produce 66 percent intelligibility; and that of 75 dB will produce 2 percent intelligibility (Figure C-1 in USEPA 1974).

Sleep Interference

Sleep interference may be measured in either of two ways: "Arousal" represents actual awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to another stage of lighter sleep without actual awakening. In general, arousal requires a somewhat louder noise level than does a change in sleep stage.

An analysis sponsored by the United States Air Force (USAF) summarized 21 published studies concerning the effects of noise on sleep (Pearsons et al. 1989). The analysis concluded that a lack of reliable studies in homes, combined with large differences among the results from the various laboratory studies and the limited in-home studies, did not permit development of an acceptable accurate assessment procedure. The noise events used in the laboratory studies and in contrived in-home studies were presented at much higher rates of occurrence than would normally be experienced in the home. None of the laboratory studies were of sufficiently long duration to determine any effects of habituation, such as that which would occur under normal community conditions.

Nevertheless, some guidance is available in judging sleep interference. The USEPA identified an indoor DNL of 45 as necessary to protect against sleep interference (USEPA 1974). Since typical dwelling units provide a sound level reduction of 20 dB, an outdoor noise level of DNL 65 would cause minimal interference with sleep.

The FICON (FICON 1992) reviewed the sleep disturbance issue and presented an USAF-developed sleep disturbance dose-response prediction curve, based on data from Analyses of the Predictability of Noise-Induced Sleep Disturbance (Pearsons et al. 1989), as an interim tool for analysis of potential sleep disturbance. This interim curve shows that for an indoor SEL of 65 dB, approximately 15 percent or less of those exposed would be awakened.

Noise Effects on Domestic Animals and Wildlife

Wildlife species differ greatly in their responses to noise. Each species has adapted, physically and behaviorally, to fill its ecological role in nature, and its hearing ability usually reflects that role. Animals rely on their hearing to avoid predators, obtain food, and communicate with and attract other members of their species. Aircraft noise may mask or interfere with these functions. Secondary effects may include nonauditory effects similar to those exhibited by humans – stress, hypertension, and other nervous disorders. Tertiary effects may include interference with mating and resultant population declines.

There are many scientific studies available regarding the effects of noise on wildlife and some anecdotal reports of wildlife "flight due to noise". Few of these studies or reports include any reliable measures of the actual noise levels involved.

In the absence of definitive data on the effect of noise on animals, the Committee on Hearing, Bioacoustics, and Biomechanics of the National Research council has proposed that protective noise criteria for animals be taken to be the same as for humans (National Academy of Sciences 1977).

Effects of Noise-Induced Vibration on Structures and Humans

The sound from aircraft overflight travels from the exterior to the interior of the house in one of two ways: through the solid structural elements and directly through the air. The sound transmission starts with noise impinging on the wall exterior. Some of this sound energy will be reflected away and a portion of this energy will make the wall vibrate. The vibrating wall radiates sound into the airspace, which in turn sets the interior finish surface vibrating, with some of the energy lost in the airspace. This surface then radiates sound into the dwelling interior. Vibrational energy also bypasses the air cavity by traveling through the studs and edge connections.

Normally, the most sensitive components of a structure to airborne noise are the windows and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressure impinging on (i.e., affecting) the structure is normally sufficient to determine the possibility of damage. In general, sound levels above 130 dB (peak sound pressure for window breakage) may be of more concern than other frequencies. Conservatively, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (Von Gierke et al 1991).

In terms of average acceleration of wall or ceiling vibration, the thresholds for structural damage (International Organization for Standardization [ISO] 1989) are:

- 0.5 m/s/s – threshold of risk of damage to sensitive structures (i.e. ancient monuments); and
- 1.0 m/s/s/ - threshold of risk of damage to normal dwellings (i.e. houses with plaster ceilings and walls).

Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or "rattle", of objects within the dwelling – hanging pictures, dishes, plaques, etc. Loose windowpanes may also vibrate noticeably when exposed to high levels of noise, causing homeowners to fear breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally compatible with residential land use. Thus, noise levels compatible for residential land use (i.e., below DNL 65) would not cause significant secondary noise-induced vibrations.

In the assessment of vibrations on humans, the following factors determine if a person will perceive and possibly react to building vibrations:

- Type of excitation: steady state, intermittent, or impulsive vibration;
- Frequency of the excitation. ISO 2631-2 recommends a frequency range of 1 to 80 Hz be used for assessing the effect of vibration on humans;
- Orientation of the body with respect to the vibration;
- The use of the occupied space; and
- Time of day.

Noise Effects on Terrain

It has been suggested that noise levels associated with low-flying aircraft may affect the terrain under the flight path by disturbing fragile soil or snow structures, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such effects, and it is considered improbable that such effects will result from routine, subsonic aircraft operations.

Noise Effects on Historical and Archaeological Sites

Because of the potential for increased fragility of structural components of historical buildings and other historical sites, aircraft noise may affect such sites more severely than newer, modern structures. Again, there are few scientific studies of such effects to provide guidance for their assessment.

One study involved the measurements of sound levels and structural vibration levels in a superbly restored plantation house, originally built in 1795, and now situated approximately 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport. These measurements were made in connection with the proposed scheduled operation of the supersonic Concorde aircraft at Dulles (Wesler 1977). There was a special concern for the building's windows, since roughly half of the 324 windowpanes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning.

As noted above for the noise effects of noise-induced vibrations on normal structures, assessments of noise exposure levels for normally compatible land uses should also assist in protecting historic and archaeological sites from structural damage caused by aircraft noise.

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Onset Rate-Adjusted Day-Night Average

Aircraft operations in Special Use Airspace (SUA), such as Military Operating Areas (MOAs) and Warning Areas, generate a noise environment somewhat different from other community noise environments. Overflights are sporadic, occurring at random times and varying from day to day and week to week. This situation differs from most community noise environments, in which noise tends to be continuous or patterned (e.g., airfields). Individual military overflight events also differ from typical community noise events in that noise from a low-altitude, high airspeed flyover can have a rather sudden onset (i.e., a rapid increase in noise).

To represent these differences, the conventional Day-Night Average A-Weighted Sound Level (DNL) metric is adjusted to account for the “surprise” effect of the sudden onset of aircraft noise events on humans (Plotkin *et al.* 1987; Stusnick *et al.* 1992; Stusnick *et al.* 1993). For aircraft exhibiting a rate of increase in sound level (called onset rate) of from 15 to 150 dB per second, an adjustment or penalty ranging from 0 to 11 dB is added to the normal SEL (refer to Sections 3.2 and 4.2 as well as Appendix E in the Preliminary Draft Environmental Impact Statement). Onset rates above 150 dB per second require an 11 dB penalty, while onset rates below 15 dB per second require no adjustment. The DNL is then determined in the same manner as for conventional aircraft noise events and is designated as Onset-Rate Adjusted Day-Night Average Sound Level (L_{dnmr}). Because of their regular occurrences of aircraft operations, the number of average daily operations is determined by using the calendar month with the highest number of operations. The monthly average is denoted L_{dnmr}. Noise levels are calculated the same way for both DNL and L_{dnmr}. L_{dnmr} is interpreted by the same criteria as used for DNL.

$$\mathbf{L_{dnmr} \geq DNL}$$

L_{dnmr} is always equal to or greater than DNL, so the impact is generally higher than would have been predicted if the onset rate and busiest-month adjustments were not accounted for. There are several points of interest in the noise-annoyance relation. The first is DNL of 65 dB. This is a level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities like aviation which do cause noise. Areas exposed to DNL above 65 dB are generally not considered suitable for residential use. The second is DNL of 55 dB, which was identified by USEPA as a level “...requisite to protect the public health and welfare with an adequate margin of safety,” (USEPA 1974) which is essentially a level below which adverse impact is not expected. The third is DNL of 75 dB. This is the lowest level at which adverse health effects could be credible (USEPA 1974). The very high annoyance levels correlated with DNL of 75 dB make such areas unsuitable for residential land use.

The Schultz curve, which correlates sound level and receptor annoyance, is generally applied to annual average DNL; however, the Schultz curve can also be used with L_{dnmr} as the noise metric as L_{dnmr} is always equal to or greater than DNL.

Relation to FAA Order 1050.1E

Section 14 within Appendix A, *Analysis of Environmental Impact Categories*, of FAA Order 1050.1E describes the requirements and procedures to be used in environmental impact analysis with regard to noise impacts. Within this section subsection 14.2b states that:

> "…AEE has approved the DoD computer models MR_NMAP and MR_BOOMMAP for use and analysis of Special Use Airspace (SUA)."

As the Proposed Action is associated with the establishment and modification of SUA, MR_NMAP version 3.0 was used to determine existing and proposed sound levels, using the metric L_{dnmr}.

Precedent for L_{dnmr} Noise Metric

The L_{dnmr} noise metric has been used and approved for a number of NEPA documents supporting different DoD airspace actions within the FAA Western Service Center, where the FAA has been both as a cooperating and reviewing agency:

Western Service Center

- *Draft Environmental Impact Statement for Proposed Continued Use and Projected Future Operations at Naval Weapons System Training Facility Boardman (2012)*
- *Environmental Assessment for Proposed Aircraft Robust and Short-term Construction Projects at the 173rd Fighter Wing Klamath Falls Airport-Kingsley Field (2007)*
- *Environmental Impact Statement for White Elk Military Operations Area EIS (2011)*

Other FAA Service Center

- *Environmental Impact Statement for United States Air Force F-35A Operational Basing (2012)*
- *Environmental Assessment for F-22A Beddown Environmental Assessment (2006)*

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION

Case Name:BASELINE W570 - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS

Number of MOAs and Ranges = 1   Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -224550., -404550.
Upper Right Corner of Grid in feet (X Y pair) = 224550., 404550.
Grid spacing = 900. feet   Number of events above an SEL of 65.0 dB
Temperature = 59 F   Humidity = 70   Flying days per month = 30

MOA SPECIFICATIONS

MOA name W570

Lat (deg)	Long (deg)
45.74973	-125.50140
46.16640	-124.33471
44.90055	-124.33443
44.84305	-124.35583
44.63305	-124.46777
44.18304	-125.50140
45.74973	-125.50140

Floor = 0 feet AGL   Ceiling = 18000 feet AGL

MISSION DATA

Mission name = 142 W570 BASELINE
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
1000	3000	5.0
3000	5000	5.0
5000	7000	5.0
7000	18000	85.0

MOA OPERATION DATA

MOA name = W570

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)	
142 W570 BASELINE	5.000	0.000	150.00	0.00	1800.	0.	30.	

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
W570	5940.8	40.1	0.1

<Run Log>
Date: 10/15/2014
Start Time: 15:34:22
Stop Time: 15:34:39
Total Running Time: 0 minutes and 18 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:BASELINE JUNIPER HART - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 4 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = 141159., -312267.
Upper Right Corner of Grid in feet (X Y pair) = 770259., 676833.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name MOA US HART NORTH

Lat (deg)	Long (deg)
42.66667	-120.30109
42.66668	-119.16775
42.43334	-119.22608
42.43334	-120.21832
42.66667	-120.30109

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name MOA US HART SOUTH

Lat (deg)	Long (deg)
42.43334	-120.21832
42.43334	-119.22608
41.49999	-119.45109
41.49999	-119.91776
42.43334	-120.21832

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name MOA US JUNIPER NORTH

Lat (deg)	Long (deg)
43.93308	-120.73444
43.95141	-120.43999
43.84169	-120.12998
43.35001	-120.52999
43.93308	-120.73444

Floor = 6000 feet AGL Ceiling = 12000 feet AGL

MOA name MOA US JUNIPER SOUTH

Lat (deg)	Long (deg)
43.35001	-120.52999
43.84169	-120.12998

43.63335 -119.56664
42.66668 -119.16775
42.66667 -120.30109
43.35001 -120.52999
Floor = 6000 feet AGL Ceiling = 12000 feet AGL

MISSION DATA

Mission name = 142 HART NORTH BASELINE
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART SOUTH BASELINE
Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER NORTH BASELINE
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER SOUTH BASELINE
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART NORTH BASELINE
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART SOUTH BASELINE

Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER NORTH BASELINE

Aircraft code =FM0430302 Speed = 350 kias Power = 89.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER SOUTH BASELINE

Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

MOA OPERATION DATA

MOA name = MOA US HART NORTH

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 HART NORTH BASELINE	1.389	0.000	41.67	0.00	500.	0.	10.
173 HART NORTH BASELINE	6.419	0.000	192.58	0.00	2311.	0.	3.

MOA name = MOA US HART SOUTH

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 HART SOUTH BASELINE	0.556	0.000	16.67	0.00	200.	0.	5.
173 HART SOUTH BASELINE	5.111	0.000	153.33	0.00	1840.	0.	11.

MOA name = MOA US JUNIPER NORTH

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER NORTH BASELINE	1.667	0.000	50.00	0.00	600.	0.	25.
173 JUNIPER NORTH BASELINE	1.442	0.000	43.25	0.00	519.	0.	4.

MOA name = MOA US JUNIPER SOUTH

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER SOUTH BASELINE	4.167	0.000	125.00	0.00	1500.	0.	25.
173 JUNIPER SOUTH BASELINE	9.042	0.000	271.25	0.00	3255.	0.	12.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
MOA US HART NORTH	874.6	41.4	0.3
MOA US HART SOUTH	2416.1	38.2	0.2
MOA US JUNIPER NORTH	640.9	43.9	0.3
MOA US JUNIPER SOUTH	3800.9	41.5	0.8

<Run Log>
Date: 10/15/2014
Start Time: 15:52: 3
Stop Time: 15:53: 2
Total Running Time: 0 minutes and 60 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION

Case Name:BASELINE JUNIPER LOW - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS

Number of MOAs and Ranges = 1 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = 125398., 155778.
Upper Right Corner of Grid in feet (X Y pair) = 664498., 694878.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name MOA US JUNIPER LOW

Lat (deg)	Long (deg)
43.93308	-120.73444
43.95141	-120.43999
43.63335	-119.56776
42.76668	-119.20747
42.76667	-120.33360
43.93308	-120.73444

Floor = 300 feet AGL Ceiling = 6000 feet AGL

MISSION DATA

Mission name = 142 JUNIPER LOW BASELINE
Aircraft code =FM0430300 Speed = 420 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	35.0
1000	3000	35.0
3000	5000	20.0
5000	6001	10.0

Mission name = 173 JUNIPER LOW BASELINE
Aircraft code =FM0430300 Speed = 420 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	999	20.0
1000	2999	40.0
3000	5000	35.0
5000	6001	5.0

MOA OPERATION DATA

MOA name = MOA US JUNIPER LOW

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER LOW BASELINE	1.667	0.000	50.00	0.00	600.	0.	10.
173 JUNIPER LOW BASELINE	1.833	0.000	55.00	0.00	660.	0.	13.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
MOA US JUNIPER LOW	4044.8	46.5	0.0

<Run Log>
Date: 10/15/2014
Start Time: 15:45:29
Stop Time: 15:45:55
Total Running Time: 0 minutes and 27 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:BASELINE MTR - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 0 Number of tracks =10
Lower Left Corner of Grid in feet (X Y pair) = -851125., -1.
Upper Right Corner of Grid in feet (X Y pair) = 1., 2.
Grid spacing = 0. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

TRACK SPECIFICATIONS
Track name IR300/313

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)
LW	42.28333	-120.25832	24304.	24304.	100			
LW	42.10000	-120.05831	24304.	24304.	100			
LW	40.94999	-119.14997	24304.	24304.	100			
LW	40.89999	-118.98331	24304.	18228.	100			
LW	41.08665	-118.49996	24304.	18228.	100			
LW	41.34999	-117.81663	24304.	24304.	100			
LW	41.44999	-117.73331	18228.	24304.	100			
LW	41.89166	-117.64993	18228.	24304.	100			
LW	41.99166	-117.63329	18228.	24304.	100			
LW	42.08333	-117.61662	24304.	24304.	100			
LW	42.14167	-117.58330	24304.	24304.	100			
LW	42.64167	-117.20829	24304.	24304.	100			
LW	42.65746	-117.19821	24304.	24304.	100			
LW	42.71667	-117.16660	24304.	24304.	100			
LW	42.90001	-117.15829	54685.	24304.	100			
LW	43.79169	-117.15827	54685.	18228.	100			
LW	43.85002	-117.15827	24304.	18228.	100			
LW	43.91669	-117.18330	24304.	24304.	100			

Track name IR342

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)
LW	44.31669	-119.71664	24304.	24304.	0			
LW	43.93336	-119.71664	24304.	24304.	0			
LW	43.30502	-119.69997	24304.	24304.	500			
LW	42.90334	-120.76333	24304.	24304.	500			
LW	43.46835	-120.74999	24304.	24304.	500			
LW	44.16503	-120.08331	24304.	24304.	500			
LW	45.21672	-120.49999	24304.	24304.	500			
LW	45.33336	-120.30832	24304.	24304.	500			
LW	45.72504	-119.68331	24304.	24304.	500			

Track name IR343

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)

LW	46.57033	-120.44460	24304.	24304.	7000
LW	45.93338	-119.29997	24304.	24304.	6000
LW	46.06172	-118.89996	24304.	24304.	6000
LW	45.91504	-118.38329	24304.	24304.	6000
LW	45.56671	-117.92496	24304.	24304.	8000
LW	45.38671	-118.30830	24304.	24304.	500
LW	44.75170	-119.63331	24304.	24304.	500
LW	45.29838	-120.13665	24304.	24304.	5000
LW	45.38338	-120.44999	24304.	24304.	5000
LW	45.58336	-121.18333	24304.	24304.	5000
LW	45.98838	-121.08167	24304.	24304.	6000
LW	46.21670	-120.94999	24304.	24304.	11000
LW	46.98340	-120.53332	24304.	24304.	11000
LW	47.22506	-120.05331	24304.	24304.	7000
LW	47.60506	-119.28330	24304.	24304.	7000
LW	47.75008	-119.58331	24304.	24304.	7000

Track name VR316

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)
LW	43.23335	-117.24994	36457.	36457.	100			
LW	43.18335	-117.68330	60761.	60761.	100			
LW	43.12501	-118.49996	60761.	60761.	100			
LW	42.91668	-119.49998	60761.	30381.	100			
LW	43.09168	-120.07498	30381.	30381.	100			
LW	43.70002	-120.11665	60761.	60761.	100			
LW	43.91669	-119.49997	60761.	60761.	100			
LW	43.79502	-118.99997	60761.	30381.	100			
LW	43.67002	-118.49996	60761.	60761.	100			
LW	43.55835	-118.04996	60761.	60761.	100			
LW	43.52502	-117.37496	24304.	24304.	100			
LW	43.51668	-117.14162	24304.	24304.	100			

Track name VR319

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)
LW	43.51668	-117.14162	24304.	24304.	100			
LW	43.52502	-117.37496	60761.	60761.	100			
LW	43.55835	-118.04996	60761.	60761.	100			
LW	43.67002	-118.49996	30381.	60761.	100			
LW	43.79502	-118.99997	60761.	60761.	100			
LW	43.91669	-119.49997	60761.	60761.	100			
LW	43.70002	-120.11665	30381.	30381.	100			
LW	43.09168	-120.07498	30381.	60761.	100			
LW	42.91668	-119.49998	60761.	60761.	100			
LW	43.10835	-118.49996	60761.	60761.	100			
LW	43.18335	-117.68330	36457.	36457.	100			
LW	43.23335	-117.24994	36457.	36457.	100			

Track name VR1251

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)
LW	39.83331	-124.50004	12152.	12152.	200			
LW	40.24998	-124.36670	12152.	12152.	200			
LW	40.69999	-123.75003	12152.	12152.	200			
LW	41.13332	-123.85003	12152.	12152.	200			
LW	41.61666	-123.58336	12152.	12152.	1000			

LW	41.93333	-122.98335	12152.	12152.	200			
LW	42.16667	-122.46668	12152.	12152.	200			
LW	42.68334	-122.13334	12152.	12152.	200			
LW	42.65001	-121.11666	12152.	12152.	200			
LW	41.88333	-120.59999	12152.	12152.	200			
LW	41.66666	-119.81665	12152.	12152.	200			
LW	40.20831	-119.54165	12152.	12152.	200			
LW	39.88331	-118.65830	12152.	12152.	200			
LW	40.05831	-118.36663	12152.	12152.	200			
LW	40.01664	-118.14996	12152.	12152.	200			
LW	39.93331	-118.24163	12152.	12152.	200			

Track name VR1254

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)
LW	41.63333	-121.30000	12152.	12152.	200			
LW	41.88333	-120.59999	12152.	12152.	200			
LW	41.66666	-119.83331	12152.	12152.	200			
LW	41.06665	-120.11665	12152.	12152.	200			
LW	40.20831	-119.54165	12152.	12152.	200			
LW	39.88331	-118.65830	12152.	12152.	200			
LW	40.05831	-118.36663	12152.	12152.	200			
LW	40.01664	-118.14996	12152.	12152.	200			
LW	39.93331	-118.24163	12152.	12152.	200			

Track name VR1301

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)
LW	44.31669	-116.54995	30381.	30381.	100			
LW	44.58336	-117.46661	30381.	30381.	100			
LW	44.15002	-118.09995	30381.	30381.	100			
LW	44.08336	-118.98330	30381.	30381.	100			
LW	43.35001	-119.88332	30381.	30381.	100			
LW	42.76667	-118.96664	30381.	30381.	100			
LW	42.59055	-117.86810	30381.	30381.	100			
LW	42.53334	-116.99993	30381.	30381.	100			

Track name VR1352

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)
LW	44.77003	-119.63664	24304.	24304.	200			
LW	43.20668	-119.13831	24304.	24304.	200			
LW	42.73334	-118.29996	24304.	24304.	200			
LW	42.31667	-117.81660	24304.	24304.	200			
LW	40.98332	-117.98329	24304.	24304.	200			
LW	40.13331	-118.06663	24304.	24304.	200			
LW	40.01664	-118.14996	24304.	24304.	200			

Track name VR1353

Flag Notation	Latitude	Longitude	Left (feet)	Right (feet)	Floor 1 (feet AGL)	Floor 2 (feet AGL)	Radius (feet)	Angle (degrees)
LW	41.31665	-118.79996	24304.	24304.	1000			
LW	42.20000	-119.53331	24304.	24304.	1000			
LW	42.51667	-120.24998	24304.	24304.	500			
LW	43.06334	-120.79166	24304.	24304.	500			
LW	43.46668	-120.74999	24304.	24304.	500			
LW	43.72502	-120.34998	24304.	24304.	200			
LW	45.20003	-120.49998	24304.	24304.	200			

LW 45.63338 -119.83331 24304. 24304. 200

MISSION DATA

Mission name = IR300 A10
Aircraft code =FM0090100 Speed = 325 kias Power = 5333.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = IR300 C17
Aircraft code =FM0200100 Speed = 250 kias Power = 92.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = IR300 F15
Aircraft code =FM0430300 Speed = 420 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = IR342 EA6B
Aircraft code =FM0370100 Speed = 301 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = IR343 EA6B
Aircraft code =FM0370100 Speed = 301 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	30.0
4000	11000	5.0

Mission name = VR316 A10
Aircraft code =FM0090100 Speed = 325 kias Power = 5333.0

Altitude Distribution

Lower Alt Upper Alt Percent

(feet AGL)	(feet AGL)	Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR316 C130
Aircraft code =FM0290300 Speed = 170 kias Power = 970.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR319 A10
Aircraft code =FM0090100 Speed = 325 kias Power = 5333.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	100.0

Mission name = VR1251 C17
Aircraft code =FM0200100 Speed = 250 kias Power = 92.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1251 C130
Aircraft code =FM0290300 Speed = 170 kias Power = 970.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1251 F16
Aircraft code =FM0440200 Speed = 420 kias Power = 90.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1251 F18
Aircraft code =FM0450100 Speed = 420 kias Power = 92.0
Altitude Distribution

Lower Alt	Upper Alt	Percent
(feet AGL)	(feet AGL)	Utilization

500	1000	65.0
1000	4000	35.0

Mission name = VR1254 C17
Aircraft code =FM0200100 Speed = 250 kias Power = 92.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1254 C130
Aircraft code =FM0290300 Speed = 170 kias Power = 970.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1254 F18
Aircraft code =FM0450100 Speed = 420 kias Power = 92.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1301 A10
Aircraft code =FM0090100 Speed = 325 kias Power = 5333.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1301 C130
Aircraft code =FM0290300 Speed = 170 kias Power = 970.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1301 F15
Aircraft code =FM0430300 Speed = 420 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization

500	1000	65.0
1000	4000	35.0

Mission name = VR1301 F18
Aircraft code =FM0450100 Speed = 420 kias Power = 92.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1352 EA6B
Aircraft code =FM0370100 Speed = 300 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

Mission name = VR1353 EA6B
Aircraft code =FM0370100 Speed = 300 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	65.0
1000	4000	35.0

TRACK OPERATION DATA

Track name = IR300/313

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
IR300 F15	0.108	0.000	3.25	0.00	39.	0.

Track name = IR342

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
IR342 EA6B	0.025	0.000	0.75	0.00	9.	0.

Track name = IR343

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
IR343 EA6B	0.011	0.000	0.33	0.00	4.	0.

Track name = VR316

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
VR316 C130	0.083	0.000	2.50	0.00	30.	0.

Track name = VR319

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
VR319 A10	0.006	0.000	0.17	0.00	2.	0.

Track name = VR1251

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
VR1251 F18	0.056	0.000	1.67	0.00	20.	0.

Track name = VR1254

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
VR1254 F18	0.008	0.000	0.25	0.00	3.	0.

Track name = VR1301

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
VR1301 F18	0.011	0.000	0.33	0.00	4.	0.

Track name = VR1352

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
VR1352 EA6B	0.014	0.000	0.42	0.00	5.	0.

Track name = VR1353

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
VR1353 EA6B	0.161	0.000	4.83	0.00	58.	0.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

TRACK RESULTS

Track Name = IR300/313

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	43.5	0.1
02 - 03	43.5	0.1
03 - 04	43.5	0.1
04 - 05	44.1	0.1
05 - 06	44.1	0.1
06 - 07	43.5	0.1
07 - 08	44.1	0.1
08 - 09	44.1	0.1
09 - 10	44.1	0.1
10 - 11	43.5	0.1
11 - 12	43.5	0.1
12 - 13	43.5	0.1
13 - 14	43.5	0.1
14 - 15	43.5	0.1
15 - 16	41.5	0.1
16 - 17	41.8	0.1
17 - 18	44.1	0.1

Track Name = IR342

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	30.6	0.0
02 - 03	30.6	0.0
03 - 04	30.6	0.0
04 - 05	30.6	0.0
05 - 06	30.6	0.0
06 - 07	30.6	0.0
07 - 08	30.6	0.0
08 - 09	30.6	0.0

Track Name = IR343

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	15.4	0.0
02 - 03	16.0	0.0
03 - 04	16.0	0.0
04 - 05	16.0	0.0
05 - 06	15.0	0.0
06 - 07	27.1	0.0
07 - 08	27.1	0.0
08 - 09	16.6	0.0
09 - 10	16.6	0.0
10 - 11	16.6	0.0

11 - 12	16.0	0.0
12 - 13	13.8	0.0
13 - 14	13.8	0.0
14 - 15	15.4	0.0
15 - 16	15.4	0.0

Track Name = VR316

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	21.8	0.0
02 - 03	19.6	0.0
03 - 04	19.6	0.0
04 - 05	20.8	0.0
05 - 06	22.5	0.0
06 - 07	19.6	0.0
07 - 08	19.6	0.0
08 - 09	20.8	0.0
09 - 10	19.6	0.0
10 - 11	19.6	0.0
11 - 12	23.4	0.0

Track Name = VR319

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	10.4	0.0
02 - 03	7.0	0.0
03 - 04	7.0	0.0
04 - 05	8.0	0.0
05 - 06	7.0	0.0
06 - 07	7.0	0.0
07 - 08	9.5	0.0
08 - 09	8.0	0.0
09 - 10	7.0	0.0
10 - 11	7.0	0.0
11 - 12	8.8	0.0

Track Name = VR1251

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	39.8	0.0
02 - 03	39.8	0.0
03 - 04	39.8	0.0
04 - 05	39.8	0.0
05 - 06	34.2	0.0
06 - 07	39.8	0.0
07 - 08	39.8	0.0
08 - 09	39.8	0.0
09 - 10	39.8	0.0
10 - 11	39.8	0.0
11 - 12	39.8	0.0
12 - 13	39.8	0.0
13 - 14	39.8	0.0
14 - 15	39.8	0.0
15 - 16	39.8	0.0

Track Name = VR1254

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	31.6	0.0
02 - 03	31.6	0.0
03 - 04	31.6	0.0
04 - 05	31.6	0.0
05 - 06	31.6	0.0
06 - 07	31.6	0.0
07 - 08	31.6	0.0
08 - 09	31.6	0.0

Track Name = VR1301

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	30.6	0.0
02 - 03	30.6	0.0
03 - 04	30.6	0.0
04 - 05	30.6	0.0
05 - 06	30.6	0.0
06 - 07	30.6	0.0
07 - 08	30.6	0.0

Track Name = VR1352

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	28.1	0.0
02 - 03	28.1	0.0
03 - 04	28.1	0.0
04 - 05	28.1	0.0
05 - 06	28.1	0.0
06 - 07	28.1	0.0

Track Name = VR1353

Track Segment	Maximum Centerline Level (dB)	Number of Events Above SEL of 65.0 dB
01 - 02	35.3	0.1
02 - 03	35.3	0.1
03 - 04	38.7	0.1
04 - 05	38.7	0.1
05 - 06	38.7	0.1
06 - 07	38.7	0.1
07 - 08	38.7	0.1

<Run Log>
Date: 10/15/2014
Start Time: 15:38:45
Stop Time: 15:38:47
Total Running Time: 0 minutes and 2 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:PROPOSED W570 - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 4 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -420311., -585692.
Upper Right Corner of Grid in feet (X Y pair) = 298789., 403408.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name W570A

Lat (deg)	Long (deg)
45.74973	-125.50140
46.16640	-124.33471
44.90055	-124.33443
44.84305	-124.35582
44.63305	-124.46777
44.18304	-125.50140
45.74973	-125.50140

Floor = 0 feet AGL Ceiling = 18000 feet AGL

MOA name W570B

Lat (deg)	Long (deg)
45.74973	-125.50140
45.85973	-125.50000
46.33335	-124.76666
46.33335	-124.33472
46.16640	-124.33471
45.74973	-125.50140

Floor = 1000 feet AGL Ceiling = 18000 feet AGL

MOA name W570C

Lat (deg)	Long (deg)
46.33335	-124.33472
46.33335	-124.21665
44.76666	-124.21666
44.63194	-124.46777
44.84305	-124.35582
44.90055	-124.33443
46.16640	-124.33471
46.33335	-124.33472

Floor = 11000 feet AGL Ceiling = 18000 feet AGL

MOA name W570D

Lat (deg)	Long (deg)
45.85973	-125.50000
45.28334	-126.36668
45.16667	-126.57502
45.00000	-126.50002
43.92498	-126.61668
43.72498	-126.46668
44.06665	-125.80834
44.18304	-125.50140
45.74973	-125.50140
45.85973	-125.50000

Floor = 1000 feet AGL   Ceiling = 18000 feet AGL

MISSION DATA

Mission name = 142 W570A PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
1000	3000	5.0
3000	5000	5.0
5000	7000	5.0
7000	18000	85.0

Mission name = 142 W570B PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
1000	3000	5.0
3000	5000	5.0
5000	7000	5.0
7000	18000	85.0

Mission name = 142 W570C PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	14999	50.0
14999	18000	50.0

Mission name = 142 W570D PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization

1000	3000	5.0
3000	5000	5.0
5000	7000	5.0
7000	18000	85.0

MOA OPERATION DATA

MOA name = W570A

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 W570A PROPOSED	5.000	0.000	150.00	0.00	1800.	0.	30.

MOA name = W570B

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 W570B PROPOSED	1.667	0.000	50.00	0.00	600.	0.	10.

MOA name = W570C

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 W570C PROPOSED	1.528	0.000	45.83	0.00	550.	0.	8.

MOA name = W570D

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 W570D PROPOSED	1.944	0.000	58.33	0.00	700.	0.	12.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
W570A	5940.9	40.1	0.1
W570B	871.2	40.6	0.1

W570C	673.0	35.0	0.7
W570D	5592.4	35.0	0.0

<Run Log>
Date: 10/15/2014
Start Time: 15:31:50
Stop Time: 15:33:21
Total Running Time: 1 minutes and 31 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION

Case Name:PROPOSED EEL MOA - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS

Number of MOAs and Ranges = 4 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -134550., -326702.
Upper Right Corner of Grid in feet (X Y pair) = 134550., 302398.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name EEL A MOA

Lat (deg)	Long (deg)
46.33334	-124.21667
46.33334	-123.83334
46.11667	-123.50000
45.96667	-123.50000
45.96667	-124.21667
46.33334	-124.21667

Floor = 11000 feet AGL Ceiling = 50000 feet AGL

MOA name EEL B MOA

Lat (deg)	Long (deg)
45.96667	-123.50000
45.96667	-124.21667
45.60000	-124.21667
45.60000	-123.50000
45.96667	-123.50000

Floor = 11000 feet AGL Ceiling = 50000 feet AGL

MOA name EEL C MOA

Lat (deg)	Long (deg)
45.60000	-124.21667
45.60000	-123.50000
45.19999	-123.50000
45.19999	-124.21667
45.60000	-124.21667

Floor = 11000 feet AGL Ceiling = 50000 feet AGL

MOA name EEL D MOA

Lat (deg)	Long (deg)
45.19999	-123.50000

45.19999 -124.21667
44.76665 -124.21667
45.11666 -123.50000
45.19999 -123.50000
Floor = 11000 feet AGL Ceiling = 50000 feet AGL

MISSION DATA

Mission name = 142 EEL A PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 EEL B PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 EEL C PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 EEL D PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

MOA OPERATION DATA

MOA name = EEL A MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 EEL A PROPOSED	0.500	0.000	15.00	0.00	180.	0.	20.

MOA name = EEL B MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)	
142 EEL B PROPOSED		0.750	0.000	22.50	0.00	270.	0.	20.

MOA name = EEL C MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)	
142 EEL C PROPOSED		0.750	0.000	22.50	0.00	270.	0.	20.

MOA name = EEL D MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)	
142 EEL D PROPOSED		0.500	0.000	15.00	0.00	180.	0.	20.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
EEL A MOA	751.2	35.0	0.4
EEL B MOA	876.9	35.0	0.4
EEL C MOA	963.2	35.0	0.4
EEL D MOA	625.0	35.0	0.5

<Run Log>
Date: 10/15/2014
Start Time: 16: 2:41
Stop Time: 16: 2:46
Total Running Time: 0 minutes and 5 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:PRPOSED JUNIPER HART MOAs - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 10 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -314550., -584550.
Upper Right Corner of Grid in feet (X Y pair) = 314550., 584550.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name HART A MOA

Lat (deg)	Long (deg)
42.66667	-120.30112
42.66667	-119.16777
42.43333	-119.22610
42.43333	-120.21834
42.66667	-120.30112

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name HART B MOA

Lat (deg)	Long (deg)
42.43333	-120.21834
42.43333	-119.22610
41.49998	-119.45111
41.49999	-119.91778
42.43333	-120.21834

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name HART C MOA

Lat (deg)	Long (deg)
42.66667	-119.16777
42.66667	-118.73138
42.43333	-118.73138
42.43333	-119.22610
42.66667	-119.16777

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name HART D MOA

Lat (deg)	Long (deg)
42.43333	-119.22610
42.43333	-118.73138

42.37611 -118.73138
41.87888 -118.86860
41.49999 -119.31000
41.49998 -119.45111
42.43333 -119.22610
Floor =   6000 feet AGL   Ceiling =   13000 feet AGL

MOA name HART E MOA

Lat (deg)	Long (deg)
41.49999	-119.91778
41.49998	-119.45111
41.49999	-119.31000
41.16665	-119.69444
41.16665	-119.79445
41.49999	-119.91778

Floor =   6000 feet AGL   Ceiling =   13000 feet AGL

MOA name HART F MOA

Lat (deg)	Long (deg)
41.87888	-118.86860
41.49999	-118.97194
41.16665	-119.39333
41.16665	-119.69444
41.49999	-119.31000
41.87888	-118.86860

Floor =   6000 feet AGL   Ceiling =   13000 feet AGL

MOA name JUNIPER A MOA

Lat (deg)	Long (deg)
43.93307	-120.73446
43.95141	-120.44001
43.84168	-120.13000
43.35001	-120.53001
43.93307	-120.73446

Floor =   6000 feet AGL   Ceiling =   13000 feet AGL

MOA name JUNIPER B MOA

Lat (deg)	Long (deg)
43.35001	-120.53001
43.84168	-120.13000
43.63335	-119.56667
42.66667	-119.16777
42.66667	-120.30112
43.35001	-120.53001

Floor =   6000 feet AGL   Ceiling =   13000 feet AGL

MOA name JUNIPER C MOA

Lat (deg)	Long (deg)
43.63335	-119.56667

43.51307	-119.20000
43.17112	-118.98555
43.17112	-119.37555
43.63335	-119.56667

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name JUNIPER D MOA

Lat (deg)	Long (deg)
43.17112	-119.37555
43.17112	-118.98555
42.76611	-118.73221
42.66667	-118.73221
42.66667	-119.16777
43.17112	-119.37555

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MISSION DATA

Mission name = 142 HART A PROPOSED

Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART B PROPOSED

Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART C PROPOSED

Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART D PROPOSED

Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART E PROPOSED
Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART F PROPOSED
Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER A PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER B PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER C PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER D PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART A PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART B PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART C PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART D PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART E PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART F PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER A PROPOSED
Aircraft code =FM0430302 Speed = 350 kias Power = 89.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER B PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER C PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER D PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

MOA OPERATION DATA

MOA name = HART A MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 HART A PROPOSED	1.111	0.000	33.33	0.00	400.	0.	10.
173 HART A PROPOSED	6.419	0.000	192.58	0.00	2311.	0.	3.

MOA name = HART B MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 HART B PROPOSED	0.417	0.000	12.50	0.00	150.	0.	5.
173 HART B PROPOSED	5.111	0.000	153.33	0.00	1840.	0.	9.

MOA name = HART C MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 HART C PROPOSED	0.111	0.000	3.33	0.00	40.	0.	5.
173 HART C PROPOSED	3.014	0.000	90.42	0.00	1085.	0.	3.

MOA name = HART D MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 HART D PROPOSED	0.028	0.000	0.83	0.00	10.	0.	5.
173 HART D PROPOSED	3.014	0.000	90.42	0.00	1085.	0.	3.

MOA name = HART E MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 HART E PROPOSED	0.003	0.000	0.08	0.00	1.	0.	1.
173 HART E PROPOSED	1.967	0.000	59.00	0.00	708.	0.	3.

MOA name = HART F MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 HART F PROPOSED	0.003	0.000	0.08	0.00	1.	0.	1.
173 HART F PROPOSED	1.967	0.000	59.00	0.00	708.	0.	2.

MOA name = JUNIPER A MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 JUNIPER A PROPOSED	1.111	0.000	33.33	0.00	400.	0.	25.
173 JUNIPER A PROPOSED	1.442	0.000	43.25	0.00	519.	0.	2.

MOA name = JUNIPER B MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 JUNIPER B PROPOSED	1.389	0.000	41.67	0.00	500.	0.	15.
173 JUNIPER B PROPOSED	9.042	0.000	271.25	0.00	3255.	0.	9.

MOA name = JUNIPER C MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)

142 JUNIPER C PROPOSED	0.317	0.000	9.50	0.00	114.	0.	10.
173 JUNIPER C PROPOSED	3.014	0.000	90.42	0.00	1085.	0.	2.

MOA name = JUNIPER D MOA

Mission Name	Daily Day OPS	Night OPS	Monthly Day OPS	Night OPS	Yearly Day OPS	Night OPS	Time On Range (minutes)
142 JUNIPER D PROPOSED	0.239	0.000	7.17	0.00	86.	0.	10.
173 JUNIPER D PROPOSED	3.014	0.000	90.42	0.00	1085.	0.	2.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
HART A MOA	874.7	41.0	0.3
HART B MOA	2416.5	37.1	0.2
HART C MOA	382.6	39.7	0.3
HART D MOA	1411.3	35.0	0.1
HART E MOA	423.0	36.9	0.2
HART F MOA	612.0	35.0	0.1
JUNIPER A MOA	640.8	42.2	0.1
JUNIPER B MOA	3800.8	38.5	0.2
JUNIPER C MOA	486.4	38.5	0.2
JUNIPER D MOA	773.2	36.3	0.1

<Run Log>
Date: 10/15/2014
Start Time: 15:47:13
Stop Time: 15:50: 0
Total Running Time: 2 minutes and 47 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:PROPOSED JUNIPER LOW and JUNIPER LOW EAST MOAs - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 2 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -330311., -26505.
Upper Right Corner of Grid in feet (X Y pair) = 208789., 512595.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name JUNIPER EAST LOW MOA

Lat (deg)	Long (deg)
43.63335	-119.56667
43.55946	-119.34110
43.44473	-119.15721
43.07612	-118.92693
42.76667	-118.92693
42.76667	-119.20750
43.63335	-119.56667

Floor = 500 feet AGL Ceiling = 11000 feet MSL

MOA name MOA US JUNIPER LOW

Lat (deg)	Long (deg)
43.93307	-120.73446
43.95141	-120.44001
43.63335	-119.56778
42.76667	-119.20750
42.76667	-120.33362
43.93307	-120.73446

Floor = 500 feet AGL Ceiling = 11000 feet MSL

MISSION DATA
Mission name = 142 JUNIPER EAST LOW PROPOSED
Aircraft code =FM0430300 Speed = 420 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	35.0
1000	3000	35.0
3000	5000	20.0
5000	6000	10.0

Mission name = 142 JUNIPER LOW PROPOSED
Aircraft code =FM0430300 Speed = 420 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	35.0
1000	3000	35.0
3000	5000	20.0
5000	6000	10.0

Mission name = 173 JUNIPER EAST LOW PROPOSED
Aircraft code =FM0430300 Speed = 420 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	20.0
1000	3000	40.0
3000	5000	35.0
5000	6000	5.0

Mission name = 173 JUNIPER LOW PROPOSED
Aircraft code =FM0430300 Speed = 420 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	20.0
1000	3000	40.0
3000	5000	35.0
5000	6000	5.0

MOA OPERATION DATA

MOA name = JUNIPER EAST LOW MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER EAST LOW PROPOSED	0.167	0.000	5.00	0.00	60.	0.	10.
173 JUNIPER EAST LOW PROPOSED	1.181	0.000	35.42	0.00	425.	0.	5.

MOA name = MOA US JUNIPER LOW

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER LOW PROPOSED	1.500	0.000	45.00	0.00	540.	0.	10.
173 JUNIPER LOW PROPOSED	1.833	0.000	55.00	0.00	660.	0.	10.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
JUNIPER EAST LOW MOA	975.9	46.3	0.0
MOA US JUNIPER LOW	4044.5	45.8	0.0

<Run Log>
Date: 10/15/2014
Start Time: 15:40:30
Stop Time: 15:41:17
Total Running Time: 0 minutes and 47 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:PROPOSED REDHAWK MOA - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 3 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -314550., -208789.
Upper Right Corner of Grid in feet (X Y pair) = 314550., 330311.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name REDHAWK A MOA

Lat (deg)	Long (deg)
45.10001	-121.01668
45.55001	-120.86668
45.50001	-120.25834
45.00001	-120.40000
45.10001	-121.01668

Floor = 7500 feet AGL Ceiling = 14500 feet AGL

MOA name REDHAWK B MOA

Lat (deg)	Long (deg)
45.50001	-120.25834
45.38334	-119.13332
44.58333	-119.14999
45.00001	-120.40000
45.50001	-120.25834

Floor = 7500 feet AGL Ceiling = 14500 feet AGL

MOA name REDHAWK C MOA

Lat (deg)	Long (deg)
45.10001	-121.01668
45.00001	-120.40000
44.58333	-119.14999
44.41666	-119.14999
44.45000	-121.01668
45.10001	-121.01668

Floor = 7500 feet AGL Ceiling = 14500 feet AGL

MISSION DATA
Mission name = 142 REDHAWK A PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
7500	11500	50.0
11500	14500	50.0

Mission name = 142 REDHAWK B PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
7500	11500	50.0
11500	14500	50.0

Mission name = 142 REDHAWK C PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
7500	11500	50.0
11500	14500	50.0

MOA OPERATION DATA

MOA name = REDHAWK A MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 REDHAWK A PROPOSED	0.278	0.000	8.33	0.00	100.	0.	20.

MOA name = REDHAWK B MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 REDHAWK B PROPOSED	1.389	0.000	41.67	0.00	500.	0.	20.

MOA name = REDHAWK C MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 REDHAWK C PROPOSED	1.389	0.000	41.67	0.00	500.	0.	20.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
REDHAWK A MOA	1016.1	35.0	0.0
REDHAWK B MOA	2674.9	35.0	0.0
REDHAWK C MOA	2808.4	35.0	0.0

<Run Log>
Date: 10/15/2014
Start Time: 15:37:30
Stop Time: 15:37:41
Total Running Time: 0 minutes and 12 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:PROPOSED ALT B REDHAWK MOA - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 3 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -239169., -133408.
Upper Right Corner of Grid in feet (X Y pair) = 299931., 315692.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name REDHAWK A MOA

Lat (deg)	Long (deg)
45.10001	-121.01668
45.55001	-120.86668
45.50001	-120.25834
45.00001	-120.40000
45.10001	-121.01668

Floor = 7500 feet AGL Ceiling = 14500 feet AGL

MOA name REDHAWK B MOA

Lat (deg)	Long (deg)
45.50001	-120.25834
45.38334	-119.13332
44.58333	-119.14999
45.00001	-120.40000
45.50001	-120.25834

Floor = 7500 feet AGL Ceiling = 14500 feet AGL

MOA name REDHAWK C MOA

Lat (deg)	Long (deg)
45.10001	-121.01668
45.00001	-120.40000
44.58333	-119.14999
44.41666	-119.14999
44.45000	-121.01668
45.10001	-121.01668

Floor = 7500 feet AGL Ceiling = 14500 feet AGL

MISSION DATA
Mission name = 142 EEL A PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 EEL B PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 EEL C PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 EEL D PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 REDHAWK A PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
7500	11500	50.0
11500	14500	50.0

Mission name = 142 REDHAWK B PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
7500	11500	50.0
11500	14500	50.0

Mission name = 142 REDHAWK C PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
7500	11500	50.0
11500	13500	50.0

MOA OPERATION DATA

MOA name = REDHAWK A MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 EEL A PROPOSED	0.500	0.000	15.00	0.00	180.	0.	20.
142 REDHAWK A PROPOSED	0.278	0.000	8.33	0.00	100.	0.	20.

MOA name = REDHAWK B MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 EEL B PROPOSED	0.750	0.000	22.50	0.00	270.	0.	20.
142 REDHAWK B PROPOSED	1.389	0.000	41.67	0.00	500.	0.	20.

MOA name = REDHAWK C MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 EEL C PROPOSED	0.750	0.000	22.50	0.00	270.	0.	20.
142 EEL D PROPOSED	0.500	0.000	15.00	0.00	180.	0.	20.
142 REDHAWK C PROPOSED	1.389	0.000	41.67	0.00	500.	0.	20.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
REDHAWK A MOA	1016.1	35.0	0.0
REDHAWK B MOA	2674.9	35.0	0.0
REDHAWK C MOA	2808.4	35.0	0.2

<Run Log>
Date: 10/15/2014
Start Time: 15:36:10
Stop Time: 15:36:27
Total Running Time: 0 minutes and 17 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:PROPOSED EEL MOA - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 4 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -134550., -326702.
Upper Right Corner of Grid in feet (X Y pair) = 134550., 302398.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name EEL A MOA

Lat (deg)	Long (deg)
46.33334	-124.21667
46.33334	-123.83334
46.11667	-123.50000
45.96667	-123.50000
45.96667	-124.21667
46.33334	-124.21667

Floor = 11000 feet AGL Ceiling = 50000 feet AGL

MOA name EEL B MOA

Lat (deg)	Long (deg)
45.96667	-123.50000
45.96667	-124.21667
45.60000	-124.21667
45.60000	-123.50000
45.96667	-123.50000

Floor = 11000 feet AGL Ceiling = 50000 feet AGL

MOA name EEL C MOA

Lat (deg)	Long (deg)
45.60000	-124.21667
45.60000	-123.50000
45.19999	-123.50000
45.19999	-124.21667
45.60000	-124.21667

Floor = 11000 feet AGL Ceiling = 50000 feet AGL

MOA name EEL D MOA

Lat (deg)	Long (deg)
45.19999	-123.50000

45.19999 -124.21667
44.76665 -124.21667
45.11666 -123.50000
45.19999 -123.50000
Floor = 11000 feet AGL Ceiling = 50000 feet AGL

MISSION DATA

Mission name = 142 EEL A PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 EEL B PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 EEL C PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 EEL D PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
11000	15000	50.0
15000	18000	50.0

Mission name = 142 REDHAWK A PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
7500	11500	50.0
11500	14500	50.0

Mission name = 142 REDHAWK B PROPOSED

Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
7500	11500	50.0
11500	14500	50.0

Mission name = 142 REDHAWK C PROPOSED

Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
7500	11500	50.0
11500	13500	50.0

MOA OPERATION DATA

MOA name = EEL A MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 EEL A PROPOSED	0.500	0.000	15.00	0.00	180.	0.	20.
142 REDHAWK A PROPOSED	0.139	0.000	4.17	0.00	50.	0.	20.

MOA name = EEL B MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 EEL B PROPOSED	0.750	0.000	22.50	0.00	270.	0.	20.
142 REDHAWK B PROPOSED	0.389	0.000	11.67	0.00	140.	0.	20.

MOA name = EEL C MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 EEL C PROPOSED	0.750	0.000	22.50	0.00	270.	0.	20.
142 REDHAWK C PROPOSED	0.389	0.000	11.67	0.00	140.	0.	20.

MOA name = EEL D MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 EEL D PROPOSED	0.500	0.000	15.00	0.00	180.	0.	20.

***** MOA RANGE NOISEMAP *****

RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
EEL A MOA	751.2	35.0	0.0
EEL B MOA	876.9	35.0	0.0
EEL C MOA	963.2	35.0	0.2
EEL D MOA	625.0	35.0	0.5

<Run Log>
Date: 10/15/2014
Start Time: 16: 1:35
Stop Time: 16: 1:43
Total Running Time: 0 minutes and 9 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:PRPOSED JUNIPER HART MOAs - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 10   Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -314550., -584550.
Upper Right Corner of Grid in feet (X Y pair) = 314550., 584550.
Grid spacing = 900. feet   Number of events above an SEL of 65.0 dB
Temperature = 59 F   Humidity = 70   Flying days per month = 30

MOA SPECIFICATIONS

MOA name HART A MOA

Lat (deg)	Long (deg)
42.66667	-120.30112
42.66667	-119.16777
42.43333	-119.22610
42.43333	-120.21834
42.66667	-120.30112

Floor = 6000 feet AGL   Ceiling = 13000 feet AGL

MOA name HART B MOA

Lat (deg)	Long (deg)
42.43333	-120.21834
42.43333	-119.22610
41.49998	-119.45111
41.49999	-119.91778
42.43333	-120.21834

Floor = 6000 feet AGL   Ceiling = 13000 feet AGL

MOA name HART_ C MOA

Lat (deg)	Long (deg)
42.66667	-119.16777
42.66667	-118.73138
42.43333	-118.73138
42.43333	-119.22610
42.66667	-119.16777

Floor = 6000 feet AGL   Ceiling = 13000 feet AGL

MOA name HART_D MOA

Lat (deg)	Long (deg)
42.43333	-119.22610
42.43333	-118.73138

42.37611 -118.73138
41.87888 -118.86860
41.49999 -119.31000
41.49998 -119.45111
42.43333 -119.22610
Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name HART_E MOA

Lat (deg)	Long (deg)
41.49999	-119.91778
41.49998	-119.45111
41.49999	-119.31000
41.16665	-119.69444
41.16665	-119.79445
41.49999	-119.91778

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name HART_F MOA

Lat (deg)	Long (deg)
41.87888	-118.86860
41.49999	-118.97194
41.16665	-119.39333
41.16665	-119.69444
41.49999	-119.31000
41.87888	-118.86860

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name JUNIPER A MOA

Lat (deg)	Long (deg)
43.93307	-120.73446
43.95141	-120.44001
43.84168	-120.13000
43.35001	-120.53001
43.93307	-120.73446

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name JUNIPER B MOA

Lat (deg)	Long (deg)
43.35001	-120.53001
43.84168	-120.13000
43.63335	-119.56667
42.66667	-119.16777
42.66667	-120.30112
43.35001	-120.53001

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name JUNIPER C MOA

Lat (deg)	Long (deg)
43.63335	-119.56667

43.51307	-119.20000
43.17112	-118.98555
43.17112	-119.37555
43.63335	-119.56667

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name JUNIPER D MOA

Lat (deg)	Long (deg)
43.17112	-119.37555
43.17112	-118.98555
42.76611	-118.73221
42.66667	-118.73221
42.66667	-119.16777
43.17112	-119.37555

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MISSION DATA

Mission name = 142 HART A PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART B PROPOSED
Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART C PROPOSED
Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART D PROPOSED
Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART E PROPOSED
Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART F PROPOSED
Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER A PROPOSED
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER B PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER C PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER D PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 REDHAWK PROPOSED 2
Aircraft code =FM0430300 Speed = 350 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 REDHAWK PROPOSED 3
Aircraft code =FM0430300 Speed = 350 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 REDHAWK PROPOSED 5
Aircraft code =FM0430300 Speed = 350 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 REDHAWK PROPOSED 6
Aircraft code =FM0430300 Speed = 350 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 REDHAWK PROPOSED 7
Aircraft code =FM0430300 Speed = 350 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 REDHAWK A PROPOSED 8
Aircraft code =FM0430300 Speed = 350 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 REDHAWK PROPOSED 4
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART A PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART B PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART C PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART D PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART E PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART F PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER A PROPOSED
Aircraft code =FM0430302 Speed = 350 kias Power = 89.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER B PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER C PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER D PROPOSED
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

MOA OPERATION DATA

MOA name = HART A MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 HART A PROPOSED	1.389	0.000	41.67	0.00	500.	0.	10.

173 HART A PROPOSED	6.419	0.000	192.58	0.00	2311.	0.	3.

MOA name = HART B MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 HART B PROPOSED	0.417	0.000	12.50	0.00	150.	0.	5.
142 REDHAWK PROPOSED 2	0.178	0.000	5.33	0.00	64.	0.	5.
173 HART B PROPOSED	5.111	0.000	153.33	0.00	1840.	0.	9.

MOA name = HART_ C MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 HART C PROPOSED	0.111	0.000	3.33	0.00	40.	0.	5.
142 REDHAWK PROPOSED 3	0.047	0.000	1.42	0.00	17.	0.	5.
173 HART C PROPOSED	3.014	0.000	90.42	0.00	1085.	0.	3.

MOA name = HART_D MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 HART D PROPOSED	0.028	0.000	0.83	0.00	10.	0.	5.
142 REDHAWK PROPOSED 4	0.011	0.000	0.33	0.00	4.	0.	5.
173 HART D PROPOSED	3.014	0.000	90.42	0.00	1085.	0.	3.

MOA name = HART_E MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 HART E PROPOSED	0.003	0.000	0.08	0.00	1.	0.	1.
173 HART E PROPOSED	1.967	0.000	59.00	0.00	708.	0.	3.

MOA name = HART_F MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 HART F PROPOSED	0.003	0.000	0.08	0.00	1.	0.	1.
173 HART F PROPOSED	1.967	0.000	59.00	0.00	708.	0.	2.

MOA name = JUNIPER A MOA

	Daily		Monthly		Yearly		
Mission Name	Day OPS	Night OPS	Day OPS	Night OPS	Day OPS	Night OPS	Time On Range (minutes)
142 JUNIPER A PROPOSED	1.111	0.000	33.33	0.00	400.	0.	25.
142 REDHAWK PROPOSED 5	0.469	0.000	14.08	0.00	169.	0.	25.
173 JUNIPER A PROPOSED	1.442	0.000	43.25	0.00	519.	0.	2.

MOA name = JUNIPER B MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER B PROPOSED	1.389	0.000	41.67	0.00	500.	0.	15.
142 REDHAWK PROPOSED 6	0.775	0.000	23.25	0.00	279.	0.	15.
173 JUNIPER B PROPOSED	9.042	0.000	271.25	0.00	3255.	0.	9.

MOA name = JUNIPER C MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER C PROPOSED	0.317	0.000	9.50	0.00	114.	0.	10.
142 REDHAWK PROPOSED 7	0.133	0.000	4.00	0.00	48.	0.	10.
173 JUNIPER C PROPOSED	3.014	0.000	90.42	0.00	1085.	0.	2.

MOA name = JUNIPER D MOA

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER D PROPOSED	0.239	0.000	7.17	0.00	86.	0.	10.
142 REDHAWK A PROPOSED 8	0.100	0.000	3.00	0.00	36.	0.	10.
173 JUNIPER D PROPOSED	3.014	0.000	90.42	0.00	1085.	0.	2.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
HART A MOA	874.7	41.3	0.3
HART B MOA	2416.5	37.2	0.2
HART_ C MOA	382.6	39.8	0.3
HART_D MOA	1411.3	35.0	0.1
HART_E MOA	423.0	36.9	0.2
HART_F MOA	612.0	35.0	0.1
JUNIPER A MOA	640.8	43.6	0.1
JUNIPER B MOA	3800.8	39.0	0.2
JUNIPER C MOA	486.4	39.1	0.2
JUNIPER D MOA	773.2	36.7	0.1

<Run Log>
Date: 10/15/2014
Start Time: 15:56:45
Stop Time: 16: 0:30
Total Running Time: 3 minutes and 46 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION
Case Name:BASELINE JUNIPER HART - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS
Number of MOAs and Ranges = 4 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = 141159., -312267.
Upper Right Corner of Grid in feet (X Y pair) = 770259., 676833.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name MOA US HART NORTH

Lat (deg)	Long (deg)
42.66667	-120.30109
42.66668	-119.16775
42.43334	-119.22608
42.43334	-120.21832
42.66667	-120.30109

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name MOA US HART SOUTH

Lat (deg)	Long (deg)
42.43334	-120.21832
42.43334	-119.22608
41.49999	-119.45109
41.49999	-119.91776
42.43334	-120.21832

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name MOA US JUNIPER NORTH

Lat (deg)	Long (deg)
43.93308	-120.73444
43.95141	-120.43999
43.84169	-120.12998
43.35001	-120.52999
43.93308	-120.73444

Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MOA name MOA US JUNIPER SOUTH

Lat (deg)	Long (deg)
43.35001	-120.52999
43.84169	-120.12998

43.63335 -119.56664
42.66668 -119.16775
42.66667 -120.30109
43.35001 -120.52999
Floor = 6000 feet AGL Ceiling = 13000 feet AGL

MISSION DATA

Mission name = 142 HART NORTH ALT D
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 HART SOUTH BASELINE
Aircraft code =FM0430301 Speed = 350 kias Power = 85.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER NORTH ALT D
Aircraft code =FM0430300 Speed = 350 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 142 JUNIPER SOUTH ALT D
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART NORTH BASELINE
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 HART SOUTH BASELINE

Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER NORTH BASELINE
Aircraft code =FM0430302 Speed = 350 kias Power = 89.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

Mission name = 173 JUNIPER SOUTH BASELINE
Aircraft code =FM0430300 Speed = 400 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
6000	10000	50.0
10000	13000	50.0

MOA OPERATION DATA

MOA name = MOA US HART NORTH

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 HART NORTH ALT D	1.111	0.000	33.33	0.00	400.	0.	10.
173 HART NORTH BASELINE	6.419	0.000	192.58	0.00	2311.	0.	3.

MOA name = MOA US HART SOUTH

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 HART SOUTH BASELINE	0.556	0.000	16.67	0.00	200.	0.	5.
173 HART SOUTH BASELINE	5.111	0.000	153.33	0.00	1840.	0.	11.

MOA name = MOA US JUNIPER NORTH

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER NORTH ALT D	1.222	0.000	36.67	0.00	440.	0.	25.
173 JUNIPER NORTH BASELINE	1.442	0.000	43.25	0.00	519.	0.	4.

MOA name = MOA US JUNIPER SOUTH

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER SOUTH ALT D	1.742	0.000	52.25	0.00	627.	0.	15.
173 JUNIPER SOUTH BASELINE	9.042	0.000	271.25	0.00	3255.	0.	12.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
MOA US HART NORTH	874.6	40.9	0.3
MOA US HART SOUTH	2416.1	38.1	0.2
MOA US JUNIPER NORTH	640.9	42.8	0.1
MOA US JUNIPER SOUTH	3800.9	39.6	0.2

<Run Log>
Date: 10/15/2014
Start Time: 15:54:25
Stop Time: 15:55:23
Total Running Time: 0 minutes and 59 seconds.

***** MOA RANGE NOISEMAP *****
Version 3.0
Release Date 2/7/2013

CASE INFORMATION

Case Name:PROPOSED JUNIPER LOW and JUNIPER LOW EAST MOAs - Baseline Scenario
Site Name:OREGON ANG AIRSPACE

SETUP PARAMETERS

Number of MOAs and Ranges = 1 Number of tracks = 0
Lower Left Corner of Grid in feet (X Y pair) = -330311., -26505.
Upper Right Corner of Grid in feet (X Y pair) = 208789., 512595.
Grid spacing = 900. feet Number of events above an SEL of 65.0 dB
Temperature = 59 F Humidity = 70 Flying days per month = 30

MOA SPECIFICATIONS

MOA name MOA US JUNIPER LOW

Lat (deg)	Long (deg)
43.93307	-120.73446
43.95141	-120.44001
43.63335	-119.56778
42.76667	-119.20750
42.76667	-120.33362
43.93307	-120.73446

Floor = 500 feet AGL Ceiling = 11000 feet MSL

MISSION DATA

Mission name = 142 JUNIPER EAST LOW PROPOSED
Aircraft code =FM0430300 Speed = 420 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	35.0
1000	3000	35.0
3000	5000	20.0
5000	6000	10.0

Mission name = 142 JUNIPER LOW PROPOSED
Aircraft code =FM0430300 Speed = 420 kias Power = 90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	35.0
1000	3000	35.0
3000	5000	20.0
5000	6000	10.0

Mission name = 173 JUNIPER LOW PROPOSED
Aircraft code =FM0430300 Speed = 420 kias Power =   90.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	20.0
1000	3000	40.0
3000	5000	35.0
5000	6000	5.0

MOA OPERATION DATA

MOA name = MOA US JUNIPER LOW

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS	Time On Range (minutes)
142 JUNIPER EAST LOW PROPOSED	0.167	0.000	5.00	0.00	60.	0.	10.
142 JUNIPER LOW PROPOSED	1.500	0.000	45.00	0.00	540.	0.	10.
173 JUNIPER LOW PROPOSED	1.833	0.000	55.00	0.00	660.	0.	13.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
MOA US JUNIPER LOW	4044.5	46.5	0.0

<Run Log>
Date: 10/15/2014
Start Time: 15:43:31
Stop Time: 15:44: 6
Total Running Time: 0 minutes and 35 seconds.

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                    ***** MOA RANGE NOISEMAP *****

                           Version  3.0
                    Release Date      2/7/2013

                          CASE INFORMATION
     Case Name:F15 PW-220 LMAX - Baseline Scenario

     Site Name:VOLK SAA


                          SETUP PARAMETERS
     Number of MOAs and Ranges =  0     Number of tracks = 6
     Lower Left  Corner of Grid in feet (X Y pair) =  -359550.,  -269550.
     Upper Right Corner of Grid in feet (X Y pair) =   359550.,   269550.
     Grid spacing =      900. feet      Number of events above an LMAX of 65.0 dB
     Temperature =  59 F      Humidity =  70     Flying days per month = 30


                        TRACK SPECIFICATIONS
      Track name F15 LMAX_1K
    Flag       Latitude    Longitude       Left        Right       Floor 1     Floor 2
     Radius       Angle
  Notation                                (feet)      (feet)   (feet AGL)  (feet
AGL)     (feet)     (degrees)
     LW          43.96788   -90.77038       101.        101.        1000
     LW          43.77851   -90.20390       101.        101.        1000
      Track name F15 LMAX_2K
    Flag       Latitude    Longitude       Left        Right       Floor 1     Floor 2
     Radius       Angle
  Notation                                (feet)      (feet)   (feet AGL)  (feet
AGL)     (feet)     (degrees)
     LW          43.73819   -90.14280       101.        101.        2000
     LW          43.49285   -89.28254       101.        101.        2000
      Track name F15 LMAX_4K
    Flag       Latitude    Longitude       Left        Right       Floor 1     Floor 2
     Radius       Angle
  Notation                                (feet)      (feet)   (feet AGL)  (feet
AGL)     (feet)     (degrees)
     LW          43.51856   -88.96410       101.        101.        4000
     LW          44.14748   -88.95306       101.        101.        4000
      Track name F15 LMAX_8K
    Flag       Latitude    Longitude       Left        Right       Floor 1     Floor 2
     Radius       Angle
  Notation                                (feet)      (feet)   (feet AGL)  (feet
AGL)     (feet)     (degrees)
     LW          44.53044   -88.94405       101.        101.        8000
     LW          44.53946   -89.95574       101.        101.        8000
      Track name F15 LMAX_10K
    Flag       Latitude    Longitude       Left        Right       Floor 1     Floor 2
     Radius       Angle
  Notation                                (feet)      (feet)   (feet AGL)  (feet
AGL)     (feet)     (degrees)
     LW          44.42927   -88.94902       101.        101.       10000
     LW          44.48355   -89.95984       101.        101.       10000
      Track name F15 LMAX_500
    Flag       Latitude    Longitude       Left        Right       Floor 1     Floor 2
     Radius       Angle
  Notation                                (feet)      (feet)   (feet AGL)  (feet
AGL)     (feet)     (degrees)
     LW          44.02644   -90.72537       101.        101.         500
     LW          43.80704   -90.19390       101.        101.         500
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                          MISSION DATA
Mission name = F15 LMAX_1K
Aircraft code =FM0430300  Speed =  400 kias  Power =    90.0
           Altitude Distribution
    Lower Alt    Upper Alt     Percent
   (feet AGL)   (feet AGL)   Utilization
      1000         1050       100.0


Mission name = F15 LMAX_2K
Aircraft code =FM0430300  Speed =  400 kias  Power =    90.0
           Altitude Distribution
    Lower Alt    Upper Alt     Percent
   (feet AGL)   (feet AGL)   Utilization
      2000         2050       100.0


Mission name = F15 LMAX_4K
Aircraft code =FM0430300  Speed =  400 kias  Power =    90.0
           Altitude Distribution
    Lower Alt    Upper Alt     Percent
   (feet AGL)   (feet AGL)   Utilization
      4000         4050       100.0


Mission name = F15 LMAX_8K
Aircraft code =FM0430300  Speed =  400 kias  Power =    90.0
           Altitude Distribution
    Lower Alt    Upper Alt     Percent
   (feet AGL)   (feet AGL)   Utilization
      8000         8050       100.0


Mission name = F15 LMAX_10K
Aircraft code =FM0430300  Speed =  400 kias  Power =    90.0
           Altitude Distribution
    Lower Alt    Upper Alt     Percent
   (feet AGL)   (feet AGL)   Utilization
     10000        10050       100.0


Mission name = F15 LMAX_500
Aircraft code =FM0430300  Speed =  400 kias  Power =    90.0
           Altitude Distribution
    Lower Alt    Upper Alt     Percent
   (feet AGL)   (feet AGL)   Utilization
       500          550       100.0
```

TRACK OPERATION DATA

Track name = F15 LMAX_1K

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
F15 LMAX_1K	1.014	0.000	30.42	0.00	365.	0.

Track name = F15 LMAX_2K

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
F15 LMAX_2K	1.014	0.000	30.42	0.00	365.	0.

Track name = F15 LMAX_4K

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
F15 LMAX_4K	1.014	0.000	30.42	0.00	365.	0.

Track name = F15 LMAX_8K

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
F15 LMAX_8K	1.014	0.000	30.42	0.00	365.	0.

Track name = F15 LMAX_10K

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
F15 LMAX_10K	1.014	0.000	30.42	0.00	365.	0.

Track name = F15 LMAX_500

Mission Name	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS	Yearly Night OPS
F15 LMAX_500	1.014	0.000	30.42	0.00	365.	0.

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Lmax.

TRACK RESULTS

Track Name = F15 LMAX_1K

Track Segment	Maximum Centerline Level (dB)	Number of Events Above LMAX of 65.0 dB
01 - 02	110.7	1.0

Track Name = F15 LMAX_2K

Track Segment	Maximum Centerline Level (dB)	Number of Events Above LMAX of 65.0 dB
01 - 02	104.9	1.0

Track Name = F15 LMAX_4K

Track Segment	Maximum Centerline Level (dB)	Number of Events Above LMAX of 65.0 dB
01 - 02	98.2	1.0

Track Name = F15 LMAX_8K

Track Segment	Maximum Centerline Level (dB)	Number of Events Above LMAX of 65.0 dB
01 - 02	90.1	1.0

Track Name = F15 LMAX_10K

Track Segment	Maximum Centerline Level (dB)	Number of Events Above LMAX of 65.0 dB
01 - 02	87.2	1.0

Track Name = F15 LMAX_500

Track Segment	Maximum Centerline Level (dB)	Number of Events Above LMAX of 65.0 dB
01 - 02	116.0	1.0

<Run Log>
Date: 11/ 5/2014
Start Time: 22:51:46
Stop Time: 22:51:46
Total Running Time: 0 minutes and 1 seconds.