

APPENDIX A TO PART 36—AIRCRAFT
NOISE MEASUREMENT AND EVALUA-
TION UNDER § 36.101

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Section A36.1 Introduction

A36.1.1 This appendix prescribes the conditions under which airplane noise certification tests must be conducted and states the measurement procedures that must be used to measure airplane noise. The procedures that must be used to determine the noise evaluation quantity designated as effective perceived noise level, EPNL, under §§ 36.101 and 36.803 are also stated.

A36.1.2 The instructions and procedures given are intended to ensure uniformity during compliance tests and to permit comparison between tests of various types of airplanes conducted in various geographical locations.

A36.1.3 A complete list of symbols and units, the mathematical formulation of perceived noisiness, a procedure for determining atmospheric attenuation of sound, and detailed procedures for correcting noise levels from non-reference to reference conditions are included in this appendix.

A36.1.4 For Stage 4 airplanes, an acceptable alternative for noise measurement and evaluation is Appendix 2 to ICAO Annex 16, Volume I, Amendment 7 (incorporated by reference, see § 36.6).

A36.1.5 For Stage 5 airplanes, an acceptable alternative for noise measurement and evaluation is Appendix 2 to ICAO Annex 16, Volume 1, Amendment 11-B (incorporated by reference, see § 36.6).

Section A36.2 Noise Certification Test and Measurement Conditions

A36.2.1 *General.*

A36.2.1.1 This section prescribes the conditions under which noise certification must be conducted and the measurement procedures that must be used.

NOTE: Many noise certifications involve only minor changes to the airplane type design. The resulting changes in noise can often be established reliably without resorting to a complete test as outlined in this appendix. For this reason, the FAA permits the

use of approved equivalent procedures. There are also equivalent procedures that may be used in full certification tests, in the interest of reducing costs and providing reliable results. Guidance material on the use of equivalent procedures in the noise certification of subsonic jet and propeller-driven large airplanes is provided in the current advisory circular for this part.

A36.2.2 *Test environment.*

A36.2.2.1 Locations for measuring noise from an airplane in flight must be surrounded by relatively flat terrain having no excessive sound absorption characteristics such as might be caused by thick, matted, or tall grass, shrubs, or wooded areas. No obstructions that significantly influence the sound field from the airplane must exist within a conical space above the point on the ground vertically below the microphone, the cone being defined by an axis normal to the ground and by a half-angle 80° from this axis.

NOTE: Those people carrying out the measurements could themselves constitute such obstruction.

A36.2.2.2 The tests must be carried out under the following atmospheric conditions.

(a) No precipitation;

(b) Ambient air temperature not above 95 °F (35 °C) and not below 14 °F (−10 °C), and relative humidity not above 95% and not below 20% over the whole noise path between a point 33 ft (10 m) above the ground and the airplane;

NOTE: Care should be taken to ensure that the noise measuring, airplane flight path tracking, and meteorological instrumentation are also operated within their specific environmental limitations.

(c) Relative humidity and ambient temperature over the whole noise path between a point 33 ft (10 m) above the ground and the airplane such that the sound attenuation in the one-third octave band centered on 8 kHz will not be more than 12 dB/100 m unless:

(1) The dew point and dry bulb temperatures are measured with a device which is accurate to ±0.9 °F (±0.5 °C) and used to obtain relative humidity; in addition layered sections of the atmosphere are used as described in section A36.2.2.3 to compute equivalent weighted sound attenuations in each one-third octave band; or

(2) The peak noise values at the time of PNL/T, after adjustment to reference conditions, occur at frequencies less than or equal to 400 Hz;

(d) If the atmospheric absorption coefficients vary over the PNL/TM sound propagation path by more than ±1.6 dB/1000 ft (±0.5 dB/100m) in the 3150Hz one-third octave band from the value of the absorption coefficient derived from the meteorological measurement obtained at 33 ft (10 m) above the surface, "layered" sections of the atmosphere must be used as described in section A36.2.2.3