

and accuracy requirements of section G36.105 of this appendix.

(d) Acoustic calibrators using sine wave or broadband noise of known sound pressure level. If broadband noise is used, the signal must be described in terms of its average and maximum root-mean-square (rms) value for non-overload signal level.

*Sec. G36.105 Sensing, Recording, and Reproducing Equipment.*

(a) The noise produced by the airplane must be recorded. A magnetic tape recorder, graphic level recorder, or sound level meter is acceptable when approved by the regional certificating authority.

(b) The characteristics of the complete system must comply with the requirements in IEC 651 and IEC 561 (incorporated by reference, see §36.6). Sound level meters must comply with the requirements for Type 1 sound level meters as specified in IEC 651.

(c) The response of the complete system to a sensibly plane progressive sinusoidal wave of constant amplitude must be within the tolerance limits specified in IEC 651, over the frequency range 45 to 11,200 Hz.

(d) If equipment dynamic range limitations make it necessary, high frequency pre-emphasis must be added to the recording channel with the converse de-emphasis on playback. The pre-emphasis must be applied such that the instantaneous recorded sound pressure level of the noise signal between 800 and 11,200 Hz does not vary more than 20 dB between the maximum and minimum one-third octave bands.

(e) The output noise signal must be read through an "A" filter with dynamic characteristics designated "slow" as defined in IEC 651. A graphic recorder, sound level meter, or digital equipment may be used.

(f) The equipment must be acoustically calibrated using facilities for acoustic free-field calibration and if analysis of the tape recording is requested by the Administrator, the analysis equipment shall be electronically calibrated by a method approved by the FAA. Calibrations shall be performed, as appropriate, in accordance with paragraphs A36.3.8 and A36.3.9 of appendix A of this part.

(g) A windscreen must be employed with the microphone during all measurements of aircraft noise when the wind speed is in excess of 5 knots (9 km/hr).

*Sec. G36.107 Noise Measurement Procedures.*

(a) The microphone must be a pressure type, 12.7 mm in diameter, with a protective grid, mounted in an inverted position such that the microphone diaphragm is 7 mm above and parallel to a white-painted metal circular plate. This white-painted metal plate shall be 40 cm in diameter and at least 2.5 mm thick. The plate shall be placed horizontally and flush with the surrounding

ground surface with no cavities below the plate. The microphone must be located three-quarters of the distance from the center to the back edge of the plate along a radius normal to the line of flight of the test airplane.

(b) Immediately prior to and after each test, a recorded acoustic calibration of the system must be made in the field with an acoustic calibrator for the purposes of checking system sensitivity and providing an acoustic reference level for the analysis of the sound level data. If a tape recorder or graphic level recorder is used, the frequency response of the electrical system must be determined at a level within 10 dB of the full-scale reading used during the test, utilizing pink or pseudorandom noise.

(c) The ambient noise, including both acoustic background and electrical systems noise, must be recorded and determined in the test area with the system gain set at levels which will be used for aircraft noise measurements. If aircraft sound pressure levels do not exceed the background sound pressure levels by at least 10 dB(A), a takeoff measurement point nearer to the start of the takeoff roll must be used and the results must be adjusted to the reference measurement point by an approved method.

*Sec. G36.109 Data Recording, Reporting, and Approval.*

(a) Data representing physical measurements and adjustments to measured data must be recorded in permanent form and appended to the record, except that corrections to measurements for normal equipment response deviations need not be reported. All other adjustments must be approved. Estimates must be made of the individual errors inherent in each of the operations employed in obtaining the final data.

(b) Measured and corrected sound pressure levels obtained with equipment conforming to the specifications in section G36.105 of this appendix must be reported.

(c) The type of equipment used for measurement and analysis of all acoustical, airplane performance, and meteorological data must be reported.

(d) The following atmospheric data, measured immediately before, after, or during each test at the observation points prescribed in section G36.101 of this appendix must be reported:

- (1) Ambient temperature and relative humidity.
- (2) Maximum and average wind speeds and directions for each run.

(e) Comments on local topography, ground cover, and events that might interfere with sound recordings must be reported.

(f) The aircraft position relative to the takeoff reference flight path must be determined by an approved method independent of normal flight instrumentation, such as radar