Position N represents the helicopter location on the measured approach flight path for which PNLTM is observed at measuring station A, and N_r is the corresponding position on the reference approach flight path. The measured and reference noise propagation paths are AN and AN_r, respectively, both of which form the same angle, θ_{APP}, corresponding to PNLTM relative to their approach flight paths.

(e) *Correction of noise at source during level flyover.* (1) For level overflight, if any combination of the following three factors, airspeed deviations from reference, rotor speed deviations from reference, and temperature deviations from reference, results in a noise correlating parameter whose value deviates from the reference value of this parameter, then source noise adjustments must be determined from the manufacturer's data that is approved by the FAA.

(2) Off-reference tip Mach number adjustments must be based upon a sensitivity curve of PNLTM versus advancing blade tip Mach number, deduced from overflights performed at different airspeeds surrounding the reference airspeed. If the test aircraft is unable to attain the reference value, then an extrapolation of the sensitivity curve is permitted if data cover at least a range of 0.03 Mach units. The advancing blade tip Mach number must be computed using true airspeed, onboard outside air temperature, and rotor speed. A separate PNLTM versus advancing blade tip Mach number function must be derived for each of the three certification microphone locations, *i.e.*, centerline, sideline left, and sideline right. Sideline left and right are defined relative to the direction of flight for each run. PNLTM adjustments are to be applied to each microphone datum using the appropriate PNLTM function.

(f) *PNLT corrections.* If the measured ambient atmospheric conditions of temperature and relative humidity differ from those prescribed as reference conditions under this appendix (77 degrees F and 70 percent, respectively), corrections to the EPNL values must be calculated from the measured data under paragraph (a) of this section as follows:

(1) *Takeoff flight path.* For the takeoff flight path shown in Figure H1, the spectrum of PNLTM observed at station A for the aircraft at position L is decomposed into its individual $SPL(i)$ values.

(i) Step 1. A set of corrected values are then computed as follows:

$$SPL(i)_r = SPL(i) + C[\alpha(i) - \alpha(i)_o]AL + C\alpha(i)_o(AL - AL_r) + 20 \log (AL/AL_r)$$

where $SPL(i)$ and $SPL(i)_r$ are the measured and corrected sound pressure levels, respectively, in the *i*-th one-third octave band. The first correction term adjusts for the effect of change in atmospheric sound absorption where $\alpha(i)$ and $\alpha(i)_o$ are the sound attenuation coefficients for the test and reference atmospheric conditions, respectively, for the *i*-th one-third octave band, and AL is the measured takeoff sound propagation path. The conversion factor constant, C, is 0.001 for English System of Units and is 0.01 for International System of Units. The second correction term adjusts for the effects of atmospheric attenuation due to the difference in the sound propagation path length where AL_r is the Reference takeoff sound propagation path. The third correction term, known as the ''inverse square'' law, adjusts for the effect of the difference in the sound propagation path lengths.

(ii) Step 2. The corrected values of the $SPL(i)_r$ are then converted to reference condition PNLT and a correction term calculated as follows:

$$\Delta_1 = PNLT - PNLTM$$

which represents the correction to be added algebraically to the EPNL calculated from the measured data.

(2) *Level flyover flight path.* (i) The procedure described in paragraph (f)(1) of this section for takeoff paths is also used for the level flyover paths, with the values of $SPL(i)_r$ relating to the flyover sound propagation paths shown in Figure H2 as follows:

$$SPL(i)_r = SPL(i) + C[\alpha(i) - \alpha(i)_o]AM + C\alpha(i)_o(AM - AM_r) + 20 \log (AM/AM_r)$$

where the lines AM and AM_r are the measured and reference level flyover sound propagation paths, respectively.

(ii) The remainder of the procedure is the same for the flyover condition as that prescribed in the paragraph (f)(1)(ii) of this section regarding takeoff flight path.

(3) *Approach flight path.* (i) The procedure described in paragraph (f)(1) of this section for takeoff paths is also used for the approach paths, with the values of $SPL(i)_r$ relating to the approach sound propagation paths shown in Figure H3 as follows:

$$SPL(i)_r = SPL(i) + C[\alpha(i) - \alpha(i)_o]AN + C\alpha(i)_o(AN - AN_r) + 20 \log (AN/AN_r)$$

where the lines AN and AN_r are the measured and reference approach sound propagation paths, respectively.

(ii) The remainder of the procedure is the same for the approach condition as that prescribed in the paragraph (f)(1)(ii) of this section regarding takeoff flight path.

(4) *Sideline microphones.* (i) The procedure prescribed in paragraph (f)(1) of this section for takeoff paths is also used for the propagation to the sideline locations, with the values of $SPL(i)_r$ relating as follows to the measured sideline sound propagation path shown in Figure H3 as follows:

$$SPL(i)_r = SPL(i) + C[\alpha(i) - \alpha(i)_o]SX + C\alpha(i)_o(SX - SX_r) + 20 \log (SX/SX_r)$$

where S is the sideline measuring station and, based upon the flight condition, the helicopter positions, X and X_r, correspond to: