EPA 550/9-77-420, presented a method for the manual calculation of day-night average sound levels (Ldn) due to aircraft operations. Information was presented for different aircraft and different operational procedures. Addendum I presents the additional information needed to predict the noise levels produced by aircraft which utilize the Air Transport Association (ATA) procedures which were adopted December 1976.
SOUND EXPOSURE LEVELS (SEL) CHARTS FOR
CIVIL JET TRANSPORT AIRCRAFT TAKEOFFS
USING ATA PROCEDURES
(Adopted December 1976)

January 1978

Prepared for:
U.S. Environmental Protection Agency
Office of Noise Abatement and Control
Under Contract No. 68-01-4388

This report has been approved for general availability. The contents of this report reflect the views of the contractor, who is responsible for the facts and the accuracy of the data presented herein, and do not necessarily reflect the official views of policy of EPA. This report does not constitute a standard, specification, or regulation.
ADDENDUM I
SOUND EXPOSURE LEVEL (SEL) CHARTS FOR CIVIL JET TRANSPORT AIRCRAFT TAKEOFFS USING ATA PROCEDURES ADOPTED DECEMBER 1976

This addendum presents sound exposure level (SEL) charts for civil jet transport takeoffs based on the revised air transport association (ATA) procedures adopted in December 1976. For studies of current and forecast operations involving air transport aircraft using ATA procedures, these charts (as shown in the table below) should replace the takeoff charts given in Attachment 1, Calculations of Day-Night Levels ($L_{dn}$) Resulting From Civil Aircraft Operations, EPA Report 550/9-77-450.

<table>
<thead>
<tr>
<th>Aircraft Types</th>
<th>Aircraft Code</th>
<th>Replace Rept. 550/9-77-450 Pages</th>
<th>Attachment 1 Pages</th>
<th>With Addendum Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Engine LBPR turbofan</td>
<td>4-T-TFL</td>
<td>80-88</td>
<td>10-18</td>
<td></td>
</tr>
<tr>
<td>4-Engine LBPR turbofan</td>
<td>4-T-TFL(Q)</td>
<td>111-119</td>
<td>19-27</td>
<td></td>
</tr>
<tr>
<td>(quiet nacelle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Engine LBPR turbofan</td>
<td>3-T-TFL</td>
<td>142-147</td>
<td>28-33</td>
<td></td>
</tr>
<tr>
<td>(quiet nacelle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Engine LBPR turbofan</td>
<td>3-T-TFL(Q)</td>
<td>164-169</td>
<td>34-39</td>
<td></td>
</tr>
<tr>
<td>2-Engine LBPR</td>
<td>2-T-TFL</td>
<td>186-191</td>
<td>40-45</td>
<td></td>
</tr>
<tr>
<td>2-Engine LBPR turbofan</td>
<td>2-T-TFL(Q)</td>
<td>206-213</td>
<td>46-51</td>
<td></td>
</tr>
<tr>
<td>(quiet nacelle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-Engine HBPR turbofan</td>
<td>4-T-TFH</td>
<td>229-237</td>
<td>52-60</td>
<td></td>
</tr>
<tr>
<td>4-Engine HBPR turbofan</td>
<td>4-T-TFH(Q)</td>
<td>260-268</td>
<td>61-69</td>
<td></td>
</tr>
<tr>
<td>(quiet nacelle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Engine HBPR turbofan</td>
<td>3-T-TFH</td>
<td>291-299</td>
<td>70-78</td>
<td></td>
</tr>
</tbody>
</table>

The ATA procedures adopted in December 1976 differ in some details from those used previously. A comparison of procedures is given in Table 1. A comparison of takeoff profiles for a
Boeing 727 aircraft is given in Figure 1.* Note that as in the examples shown in Figure 1, the cutback to climb thrust is usually initiated at a lower altitude in the current ATA procedures than in the previous ATA procedures. Hence, aircraft taking off under the current procedures generally require a longer distance from the start of takeoff roll to reach a height of 3,000 feet.

Figures 2 through 6 show the takeoff profiles for the revised ATA procedures which were utilized to develop the SEL charts given in this addendum. These takeoff profiles may be compared with those given in Figures 2-3 through 2-7 of EPA Report 550/9-77-450.**

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*Detailed differences in the procedures will occur with aircraft type.

### TABLE I - COMPARISON OF ATA TAKEOFF PROCEDURES FOR CIVIL TURBOFAN TRANSPORT AIRCRAFT

<table>
<thead>
<tr>
<th>Phase</th>
<th>Procedures Adopted August 1972</th>
<th>Procedures Adopted December 1976</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Phase</strong></td>
<td>Takeoff to 1500 ft.</td>
<td>Takeoff to 1000 ft.</td>
</tr>
<tr>
<td></td>
<td>Takeoff (TO) thrust</td>
<td>Takeoff (TO) thrust</td>
</tr>
<tr>
<td></td>
<td>$V_2 + 10$ airspeed</td>
<td>$V_2 + 10$ airspeed</td>
</tr>
<tr>
<td></td>
<td>TO flaps</td>
<td>TO flaps</td>
</tr>
<tr>
<td><strong>Second Phase</strong></td>
<td><strong>1500 to 3000 ft.</strong></td>
<td><strong>1000 to 3000 ft.</strong></td>
</tr>
<tr>
<td></td>
<td>Reduce thrust to maximum</td>
<td>Reduce aircraft pitch to maintain 500</td>
</tr>
<tr>
<td></td>
<td>climb thrust</td>
<td>to 1000 rpm climb rate.</td>
</tr>
<tr>
<td></td>
<td>Maintain $V_2 + 10$ airspeed</td>
<td>Accelerate and initiate flap retraction at appropriate minimum speeds.</td>
</tr>
<tr>
<td></td>
<td>and TO flaps</td>
<td>Reduce engine power to climb thrust during/following cleanup of flaps and slats.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Climb to 3000 ft. at zero flap speed.</td>
</tr>
<tr>
<td><strong>Third Phase</strong></td>
<td><strong>3000 ft. and Above</strong></td>
<td><strong>3000 ft. and Above</strong></td>
</tr>
<tr>
<td></td>
<td>Accelerate to 250 kt, retract flaps on schedule while maintaining 500 FPM climb, then climb at 250 Kt.</td>
<td>Accelerate to 250 Kt. Maintain rate of climb of 500 to 1000 rpm during acceleration, then continue climb at 250 Kt.</td>
</tr>
</tbody>
</table>

*Procedure varies with aircraft model.*
FIGURE 1. COMPARISON OF ATA PROCEDURES FOR 3-ENGINE LBPR TURBOFAN TRANSPORT AIRCRAFT - 727 SERIES (3-T-TFL) - PROFILE 1
FIGURE 2. ATA TAKEOFF PROFILES FOR 4-ENGINE LBPR TURBOFAN TRANSPORT AIRCRAFT - DC-8, 707 SERIES (4-T-TFL) - REVISED PROCEDURES ADOPTED DECEMBER 1976
Figure 3. ATA Takeoff Profiles for 3-Engine LBPR Turbofan Transport Aircraft - 727 Series (3-T-TFL) - Revised Procedures Adopted December 1976
FIGURE 4. ATA TAKEOFF PROFILES FOR 2-ENGINE LDPR TURBOFAN TRANSPORT AIRCRAFT - DC-9, 737 SERIES (2-T-TFL) - REVISED PROCEDURES ADOPTED DECEMBER 1976
FIGURE 5. ATA TAKEOFF PROFILES FOR 4-ENGINE HBPR TURBOFAN TRANSPORT AIRCRAFT - 747 SERIES (4-T-TFH) - REVISED PROCEDURES ADOPTED DECEMBER 1976
FIGURE 4. ATA TAKEOFF PROFILES FOR 3-ENGINE HPFR TURBOFAN TRANSPORT—DC-10, L-1011 SERIES (3-T-1FH) — REvised PROCEDURES ADOPTED DECEMBER 1976
4-ENGINE LBPR TURBOFAN TRANSPORT
(707/DC8) RANGE 0 - 1,000 N MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 6,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in db

Distance from Aircraft Flight Track Centerline in feet

- 12 -
4-ENGINE LO PR TURBOFAN TRANSPORT
(707/DC9) RANGE 1,000 - 2,000 N. MILES

TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 6,000 ft. from start of Takeoff Roll
4-ENGINE LBPR TURBOFAN TRANSPORT (707/DC8) RANGE 1,000 - 2,000 N. MILES

TAKEOFF - ATA (Revised 1976)
Power Cutback at 18,000 ft.

Flight Track Distance Range
6,000 - 30,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEI) in dB

Distance from Aircraft Flight Track Centerline in feet
4-ENGINE LDBS TURBOFAN TRANSPORT
(707/DC8) RANGE 1,000 - 2,000 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
30,000 - 140,000 ft. from start of Takeoff Roll

Distance from Aircraft Flight Track Centerline in feet

Sound Exposure Level (SEL) in dB

- 17 -
4-ENGINE LBPR TURBOFAN TRANSPORT
(707/DC10) RANGE > 2,000 N. MILES
TAKEOFF - ATA (Revised 1976)

Flight Track Distance Range
0 - 8,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
4-ENGINE LBPR TURBOFAN TRANSPORT
QUIET NACELLES
(707/DC8) RANGE 0 - 1,000 N. MILES
TAKEOFF - ATA (Revised 1976)
Power Cutback at 15,000 ft.
Flight Track Distance Range
6,000 - 25,000 ft., from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
4-ENGINE LBPR TURBOFAN TRANSPORT
QUIET NACELLES
(707/DC10) RANGE 1,000 - 2,000 N. MILES
TAKEOFF - ATA (Revised 1976)

Flight Track Distance Range
0 - 6,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
4-ENGINE LBPR TURBOFAN TRANSPORT
QUIET NACELLES
(707/DC8) RANGE > 2,000 N. MILES

TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 8,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
4-ENGINE LOPR TURBOFAN TRANSPORT
QUIET NACELLES
(707/DC9) RANGE > 2,000 N. MILES

TAKEOFF-ATA (Revised 1976)
Power Cutback at 30,000 ft.

Flight Track Distance Range
6,000 - 35,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB vs Distance from Aircraft Flight Track Centerline in feet
3-CM. LINE LBPR TURBOFAN TRANSPORT
(727) RANGE: 0 - 500 N. MILES
TAKEOFF - ATA (Revised 1978)
Flight Track Distance Range
0 - 0,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
3-ENGINE LBFR TURBOFAN TRANSPORT
(727) RANGE 0 - 500 N. MILES
TAKEOFF AT (Revised 1976)
Power Cutback at 18,000 ft.
Flight Track Distance Range
8,000 - 30,000 ft, from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in Feet
3-ENGINE LDPR TURBOFAN TRANSPORT

(727) RANGE 0 - 500 N MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
30,000 - 140,000 ft, from start of Takeoff Roll

Sound Exposure Level (SEL) in dBA

Distance from Aircraft Flight Track Centerline in feet

- 32 -
3-ENGINE LBPR TURBOFAN TRANSPORT
(727) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 10,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet

- 33 -
3-ENGINE LBPR TURBOFAN TRANSPORT
(727) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Power Cutback at 20,000 ft.
Flight Track Distance Range
10,000 - 35,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet

- 34 -
3-ENGINE LBPR TURBOFAN TRANSPORT
QUIET NACELLES
(727) RANGE 0 - 500 N, MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 8,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet

- 36 -
2-ENGINE LBPR TURBOFAN TRANSPORT QUIET NACELLES
(727) RANGE 0 - 500 N, MILES
TAKEOFF - ATA (Revised 1976)
Power Cutback at 18,000 ft.
Flight Track Distance Range
8,000 - 30,000 ft. from start of Takeoff Roll

Distance from Aircraft Flight Track Centerline in feet

Sound Exposure Level (SEL) in dB
2-ENGINE LBPR TURBOFAN TRANSPORT QUIET NACELLES
(727) RANGE 0 - 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
30,000 - 140,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
3-ENGINE LBPR TURBOFAN TRANSPORT
QUIET NACELLES
(727) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 10,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet

- 39 -
3-ENGINE LBPR TURBOFAN TRANSPORT
QUIET NACELLES
(727) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Power Cutback at 20,000 ft.
Flight Track Distance Range
10,000 - 40,000 ft. from start of Takeoff Roll

Distance from Aircraft Flight Track Centerline in feet

Sound Exposure Level (SEL) in dB
3-ENGINE LBPR TURBOFAN TRANSPORT
QUIET NACELLES
(727) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
40,000 - 140,000 ft., from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet

- 41 -
2-ENGINE LBPR TURBOFAN TRANSPORT (DC-9/737) RANGE 0 - 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 6,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
2-ENGINE LBPR TURBOFAN TRANSPORT
(DC-9/737) RANGE 0 - 300 N. MILES

TAKOFOF - ATA (Revised 1976)
Power Cutback at 16,000 ft.
Flight Track Distance Range
6,000 - 22,000 ft. from start of Takeoff Roll
2-ENGINE LBPR TURBOFAN TRANSPORT
(DC-9/737) RANGE 0 - 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
22,000 - 100,000 ft, from start of Takeoff Roll
2-ENGINE LBPR TURBOFAN TRANSPORT
(DC-9/737) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 8,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
2-ENGINE LBPR TURBOFAN TRANSPORT
(DC-9/737) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Power Cutback at 10,000 ft.
Flight Track Distance Range
0,000 - 25,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
2-ENGINE LDPR TURBOFAN TRANSPORT
QUIET NACELLES
(DC-9/737) RANGE 0 - 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 6,000 ft. from start of Takeoff Roll

Distance from Aircraft Flight Track Centerline in feet

Sound Exposure Level (SEL) in dB
2-ENGINE LBPT TURBOFAN TRANSPORT
QUIET NACELLES
(737/747) RANGE 0 - 500 N, MILES
TAKEOFF - ATA (Revised 1976)
Power Cutoff at 16,000 ft.
Flight Track Distance Range
6,000 - 22,000 ft, from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet

- 49 -
2-ENGINE LDPR TURBOFAN TRANSPORT QUIET NACELLES (DC-9/737) RANGE 0 - 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
22,000 - 100,000 ft, from start of Takeoff Roll

Distance from Aircraft Flight Track Centerline in feet

Sound Exposure Level (SEL) in dB

- 50 -
2-ENGINE LBFR TURBOFAN TRANSPORT
QUIET NACELLES
(DC-9/737) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 8,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet

- 51 -
2-ENGINE LBPR TURBOFAN TRANSPORT
QUIET NACELLES
(DC-9/737) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Power Cutback at 18,000 ft.

Flight Track Distance Range
8,000 - 25,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dBA

Distance from Aircraft Flight Track Centerline in feet
2-ENGINE LBPR TURBOFAN TRANSPORT
QUIET NACELLES
(7C-5777) RANGE > 500 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
25,000 - 120,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
4-ENGINE HBPR TURBOFAN TRANSPORT
(747) RANGE 0 - 1,000 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
30,000 - 140,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet

- 56 -
4-ENGINE HIGH-BY-PASS RATIO TURBOFAN TRANSPORT (747) RANGE 1,000 - 2,000 N. MILES

TAKEOFF - ATA (Revised 1976)
Power Cutback at 25,000 ft.

Flight Track Distance Range
0,000 - 35,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB vs. Distance from Aircraft Flight Track Centerline in feet
4-ENGINE HIGH Bypass Ratio TURBOFAN TRANSPORT (747) RANGE 1,000 - 2,000 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
35,000 - 140,000 ft, from start of Takeoff Roll

Distance from Aircraft Flight Track Centerline in feet

Sound Exposure Level (SEL) in dB

- 59 -
4-ENGINE HBPR TURBOFAN TRANSPORT (747) RANGE > 2,000 N. MILES

TAKEOFF - ATA (Revised 1976)

Flight Track Distance Range
0 - 10,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dBA

Distance from Aircraft Flight Track Centerline in feet

- 60 -
4-ENGINE HBPR TURBOFAN TRANSPORT
(747) RANGE > 2,000 N. MILES

TAKEOFF - ATA (Revised 1976)
Power Cutback at 35,000 ft.
Flight Track Distance Range
10,000 - 40,000 ft, from start of Takeoff Roll
4-ENGINE HPF TRUBOFAN TRANSPORT
QUIET NACELLES
(747) RANGE 0 - 1000 N. MILES
TAKEOFF - ATA (Revised 1976)

Flight Track Distance Range
0 - 6,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
4-ENGINE HBPR TURBOFAN TRANSPORT
QUIET NACELLES
(747) RANGE 0 - 1,000 N. MILES

TAKEOFF - ATA (Revised 1976)
Power Cutback at 20,000 ft.

Flight Track Distance Range
8,000 - 30,000 ft., From Start of Takeoff Roll
4-ENGINE HBP TURBOFAN TRANSPORT
QUIET NACELLES
(747) RANGE 1,000 - 2,000 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 = 8,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
4-ENGINE HBPRT TURBOFAN TRANSPORT QUAL NACELLES
(747) RANGE 1,000 - 2,000 N. MILES

TAKEOFF - ATA (Revised 1976)
Power Cutback at 25,000 ft.

Flight Track Distance Range
8,000 - 35,000 ft, from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
4-ENGINE HBPR TURBOFAN TRANSPORT
QUIET NACELLES
(747) RANGE > 2,000 N. MILES
TAKEOFF - ATA (Revised 1976)

Flight Track Distance Range
0 - 10,000 ft., from start of Takeoff Roll
3-ENGINE H8PR TURBOFAN TRANSPORT (DC10/L1011) RANGE 0 - 1,000 N. MILES

TAKEOFF - ATA (Revised 1976)

Flight Track Distance Range
0 - 8,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
2-ENGINE HBPR TURBOFAN TRANSPORT
(DC10/L1011) RANGE 0 - 1,000 N. MILES

TAKEOFF - ATA (revised 1976)
Power Cutback at 20,000 ft.

Flight Track Distance Range
6,000 - 25,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet

- 73 -
3-ENGINE HD PR TURBOFAN TRANSPORT
(DC10/L1011) RANGE 0 - 1,000 N MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
25,000 - 140,000 ft. from start of Takeoff Roll

Sound Exposure Level (SE) in dB

Distance from Aircraft Flight Track Centerline in feet

- 74 -
3-ENGINE 188PR TURBOFAN TRANSPORT
(DC10/L1011) RANGE 1,000 - 2,000 N. MILES
TAKEOFF = ATA (Revised 1976)
Power Cutback at 25,000 ft.
Flight Track Distance Range
0,000 - 35,000 ft. from start of Takeoff Roll
3-ENGINE HBPR TURBOFAN TRANSPORT
(DC10/L1011) RANGE 1,000 - 2,000 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
35,000 - 140,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
3-ENGINE HSPR TURBOFAN TRANSPORT
(DC10/L1011) RANGE > 2,000 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
0 - 10,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
3-ENGINE HiBPR TURBOFAN TRANSPORT
(DC10/L1011) RANGE > 2,000 N. MILES

TAKEOFF - ATA (Revised 1976)
Power Cutback at 30,000 ft.

Flight Track Distance Range
10,000 - 35,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB

Distance from Aircraft Flight Track Centerline in feet
3-ENGINE HBPR TURBOFAN TRANSPORT
(DC-10/L-1011) RANGE > 2,000 N. MILES
TAKEOFF - ATA (Revised 1976)
Flight Track Distance Range
35,000 - 140,000 ft. from start of Takeoff Roll

Sound Exposure Level (SEL) in dB vs. Distance from Aircraft Flight Track Centerline in feet

Distance from Aircraft Flight Track Centerline in feet

- 80 -