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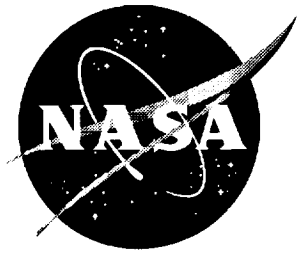

F-16XL and F-18 High Speed Acoustic Flight Test Databases

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December 1999

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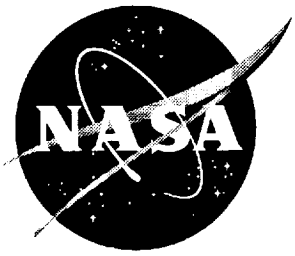

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c_o	average ambient speed of sound
f_c	anti-aliasing filter cutoff frequency
f_k	k-th bin center frequency
G_{pp}	power spectral density function
h	aircraft altitude (above ground level)
L_{oa}	overall sound-pressure level
M	aircraft Mach number
n_d	number of records in ensemble average
N	block size
p_{in}	digitized pressure signal
$\overline{p^2}$	mean squared pressure
$\hat{P}_i$	FFT of pressure-time history
$\mathbf{r}$	position vector from aircraft to microphone
r_x	x component of vector $\mathbf{r}$
t	reception time
t_1	start time for FFT window
t_2	stop time for FFT window
T	FFT window duration
$\mathbf{x}$	microphone position vector
$\dot{x},\dot{y},\dot{z}$	aircraft velocity components
$\mathbf{x}_S$	aircraft position vector
x_S	aircraft position coordinate along the array axis
Δf	frequency bin width
Δt	sampling interval (seconds)
$\Delta\theta$	smear angle

LIST OF SYMBOLS

(continued)

θ	emission directivity angle
θ_1	emission directivity angle at time τ_1
θ_2	emission directivity angle at time τ_2
τ	emission time

1. ABSTRACT

This report presents the recorded acoustic data and the computed narrow-band and 1/3-octave band spectra produced by F-18 and F-16XL aircraft in subsonic flight over an acoustic array. Both broadband-shock noise and turbulent mixing noise are observed in the spectra. Radar and c-band tracking systems provided the aircraft position which enabled directivity and smear angles from the aircraft to each microphone to be computed. These angles are based on source emission time and thus give some idea about the directivity of the radiated sound field due to jet noise. A follow-on static test was also conducted where acoustic and engine data were obtained. The acoustic data described in the report has application to community noise analysis, noise source characterization and validation of prediction models. A detailed description of the signal processing procedures is provided.

2. INTRODUCTION

Research into the development of the High Speed Civil Transport (HSCT) has produced increased interest in jet noise measurements obtained from flight tests. Since developmental funding for the HSCT is linked to environmental issues, one of which is noise, accurate acoustic data acquisition and signal analysis on aircraft engines that emulate the engines of the HSCT is of paramount importance. Due to the HSCT configuration and engine design for supersonic flight, jet noise becomes more of a dominant factor in contrast to conventional aircraft. The possibility of commercial supersonic flight has again brought jet noise to the forefront, which for subsonic aircraft has been largely alleviated by the use of high-bypass turbofan engines. The data presented in this report consists of acoustic measurements performed on F-18 and F-16XL aircraft. These measurements were obtained from flyover tests during November 1991 which were performed at NASA Dryden Flight Research Center, California.

The primary goal of the test program was to ascertain if a possible noise problem exists for the HSCT during climbout. This concern arises from the high jet noise levels and relatively poor low

speed aerodynamic performance anticipated for the HSCT compared to conventional aircraft in this flight regime. This report will not address that issue. An ancillary function of the test was the acquisition of a data base to validate the NASA Aircraft Noise Prediction Program (ANOPP) and other jet noise source codes over a full range of flight speeds. This report presents that database.

Aircraft position, weather data (atmospheric pressure, temperature, relative humidity, etc.) and engine state parameters were collected during the test. Aircraft tracking was obtained from radar and c-band systems. Weather data was obtained by rawinsondes and a tethered balloon and engine state parameters were recorded aboard the aircraft. All of the above data sets are required for analyzing the acoustic data and as input to noise prediction codes.

3. AIRCRAFT SELECTION AND TEST MATRIX

The F-16XL and the F-18 aircraft shown in Figures 1 and 2 were selected because of the high performance engines and the similarity of the nozzle conditions to HSCT propulsion systems under development. Although the engines are smaller and have less thrust than will be used on a full scale HSCT, the jet operating conditions and flight speeds are similar, allowing the acoustic data to be scaled, yielding an estimate of the HSCT noise levels.

The flights were divided into two groups, one for climb-to-cruise and one for ANOPP validation. Table 1 shows the climb-to-cruise test matrix. These flights were conducted at five different altitudes with different Mach numbers employed at each altitude. Table 2 shows the ANOPP validation test matrix. All the ANOPP runs were conducted at the same altitude (1500 feet AGL) with the Mach number varying from .3 to .95. Run numbers were assigned according to altitude and flight Mach number. For example, run numbers in the 100's correspond to Mach 0.3 and an altitude of 1500 feet Above Ground Level (AGL). This "hundreds" trend applies to all F-18 Climb-to-Cruise runs. Similarly, run numbers in the 1100's correspond to F-16XL runs at Mach 0.3 and an altitude of 1500 feet AGL. All ANOPP validation runs begin with the number 6 for the F-18 and the number 8 for the F-16XL.

The F-18 aircraft were powered by two F404-GE-400 afterburning turbofan engines which are in the 16,000-lb thrust class[1]. A standard F-18 maintenance data recorder allowed a limited number of aircraft and engine parameters to be collected aboard the aircraft. During the flight test, the left engine was set to flight idle to simulate acoustic data from a single engine. With one engine at flight idle, the F-18 was able to achieve a wide range of nozzle pressure ratios while maintaining a constant flight velocity over the microphone array.

The F-16XL with its cranked arrow delta wing is powered by a single F110-GE-129 afterburning turbofan engine in the 29,000-lb thrust class[2]. This aircraft and engine were fully instrumented for flight research. Data collected onboard were transferred from the aircraft to a ground recorder by telemetry. Since the F-16XL has a single high performance engine, it was not always possible to obtain the desired nozzle condition and maintain a constant flight speed. Consequently, most of the F-16XL Climb-to-Cruise data contains acceleration effects.

Notice, in both tables, that on some F-18 flights no engine data was collected even though acoustic data was acquired. Thus, as an aid in assessing the noise spectra, engine data from similar flights are included in Table 3.

4. DATA ACQUISITION AND ANALYSIS

A linear array of twelve microphones with a spacing of 350 feet between adjacent microphones was used to acquire the acoustic data. The 1/2 inch diameter B&K microphones, which were mounted on ground boards (Figure 3), had a flat frequency response from .01 to 40,000 hertz (Hz) and a maximum sound pressure level of 160 decibels (dB). The acoustic signals were FM-recorded on analog tape at 15 inches per second (ips) which gives a dynamic range of about 46 dB. Before recording, the signals were bandpass filtered from 25 Hz to 12.5 kHz to prevent aliasing. Due to the high impedance of the ground boards, a constant 6 dB frequency correction was made for each spectral bin for reflection.

One purpose of the test was to generate narrow-band spectra demonstrating the features of jet noise. This requires digitizing the analog data in order to input the signals into a fast Fourier transform (FFT) algorithm. Digital pressure time history files were created from the analog tapes utilizing the NASA/LaRC Acoustics Division Data Reduction and Analysis System (ADDRAS)[3]. To assess the impact on community noise, the test was designed to enable the computation of noise metrics such as A-weighted overall sound pressure levels, perceived noise level (PNL), tone corrected perceived noise level (PNLT) and effective perceived noise level (EPNL). These metrics are based on the 24 1/3-octave bands from 50 Hz to 10 kHz. Thus, in the digitization of the data, the upper filter cutoff frequency, f_C, was set at 12.5 kHz.

The sample rate for the analog-to-digital conversion was determined from the following relation

$$\begin{aligned} \text{sample rate} &= \frac{1}{\Delta t} \\ &= 2.5 f_c \end{aligned} \tag{1}$$

which satisfies the Nyquist criterion. With f_c = 12.5 kHz, this yields $\Delta t = 3.2\text{x}10^{-5}$ seconds or 31250 samples per second. After the signal was digitized, the ADDRAS software converted the digital signal to engineering units (EU). A calibration signal for each microphone channel was recorded on each analog tape prior to the flyovers.

In the digitization procedure, ADDRAS segments the pressure time history into contiguous digital blocks of 2048 data points. For each of these blocks, the data reduction software calculates the variance, σ^2, of the data which is the mean-squared pressure for the block, i.e.

$$\sigma^2 = \frac{1}{N-1}\sum_{n=1}^{N}[p(n\Delta t) - \bar{p}]^2 \tag{2}$$

This is converted to an overall sound-pressure level, paired to the middle of the time block and plotted as a function of time. The time spacing between the blocks is 2048/31250 = .0655 sec. Construction of these plots shows the range of a viable signal-to-noise ratio. Figure 4 illustrates overall sound

pressure level (OASPL) vs. time for a F-18 flyover at nominal values of altitude and Mach number equal to 1500 feet and .3, respectively.

5. SMEAR ANGLE AND ENSEMBLE AVERAGING

For aircraft flyover measurements, the acoustic signal appears nonstationary to a ground-based observer. Consequently, the Fourier transform of the signal will be time dependent. A short-time Fourier transform with a sliding window function[4] is employed to deal with this situation. A trade off must be made between time resolution and frequency resolution. One function of the window is to limit the duration of the time signal so that the spectral characteristics appear reasonably stationary. A rapidly varying signal requires a reduced window length, which in turn reduces the frequency resolution. On the other hand, increasing the window duration can lead to spectral smearing.

To perform ensemble averaging of acoustic flyover measurements, the smear angles must be known since averaging across a microphone array requires that each individual microphone be exposed to the same directivity angles. It will be assumed in the ensemble averaging scheme that the aircraft is in level flight at constant velocity and a fixed orientation. Deviations from this type of flight profile can present problems to ensemble averaged test data.

Figure 5 illustrates angles associated with smearing. The angle between the aircraft velocity vector **U** and the position vector **r** is denoted by θ and is the noise emission directivity angle. The angles θ_1 and θ_2 correspond to emission times τ_1 and τ_2, respectively, associated with the FFT time window. The smear angle is defined as

$$\Delta\theta = \theta_2 - \theta_1 \tag{3}$$

Note that the angles are based on the time of signal emission and not on the time of signal reception.

As can be seen in Figure 5, $\Delta\theta$ is a function of aircraft altitude and speed. Increasing the window duration, T, to improve frequency resolution (bin width) is only viable if $\Delta\theta$ is small. Otherwise, severe spectral smearing, which is indicated by the broadening of spectral peaks and tones, will occur

and become more severe as $\Delta\theta$ increases. Smearing becomes less of a problem as altitude increases and speed decreases, and is more pronounced for approach measurements than for receding measurements.[5] A standard technique in signal processing for a single output system (i.e., single microphone measurement) is to segment the time history into contiguous blocks, Fourier transform each block, then average the spectra.[6,7] This method assumes the signal is stationary over the total time series used in the block averaging. A necessary condition for this assumption to be valid is that the total smear angle is small. Using a linear microphone array allows spectral averaging across the array as shown in Figure 6. Each microphone output is treated as an individual record in the averaging. This can be done as long as each microphone measurement contains the same directivity angles which is indicated in Figure 6.

6. DIRECTIVITY AND SMEAR ANGLE DETERMINATION

Acoustic source emission times were determined for the spectra from the radar tracking data files. Since the flight paths were approximately along the array at constant altitude, an initial emission angle corresponding to emission time, τ, is designated and a range estimate is made by the following

$$x_s = h \cot \theta \tag{4}$$

where x_s is measured along the array axis. The radar file is then searched to find x_s after which the initial emission time, τ_1, is determined by way of linear interpolation. Also, the position vector, $\mathbf{r}(\tau)$, from the aircraft to the microphone is calculated:

$$\mathbf{r}(\tau) = \mathbf{x} - \mathbf{x}_s(\tau) \tag{5}$$

Next θ_1 is updated:

$$\theta_1 = \cos^{-1}\left(\frac{r_x}{r}\right) \tag{6}$$

It is assumed in equation (6) that the aircraft axis is aligned parallel with the array axis. The corresponding reception time, t, is determined from the retarded time relation

$$t = \tau + \frac{r(\tau)}{c_o} \tag{7}$$

where c_o is an averaged value of the speed of sound obtained from the rawinsonde or balloon data. The pressure-time history file is then searched to find t_1, the start time for the FFT record. Computation of the final reception time is easily found from

$$t_2 = t_1 + T \tag{8}$$

To arrive at a smear angle, $\Delta\theta$, τ_2 corresponding to t_2 must be calculated. This is done by rearranging equation (7) and using linear iteration[8]:

$$(\tau_2)_{i+1} = t_2 - \frac{r\left[(\tau_2)_i\right]}{c_o} \tag{9}$$

Here, the subscript i refers to the values of τ used in the iteration. Thus, the radar file is iteratively searched until equation (9) converges which determines τ_2 and $r(\tau_2)$. The convergence criterion is

$$\left|\frac{(\tau_2)_{i+1} - (\tau_2)_i}{(\tau_2)_{i+1}}\right| \leq 0.001 \tag{10}$$

Equation (6) will also yield θ_2 so that the smear angle can be computed from equation (3).

7. SPECTRAL ANALYSIS

The steps used to construct the narrow-band spectra are similar to those given in Ref. 6. To prevent aliasing, the bandwidth of the spectrum is first selected, the sample rate determined from equation (1) and, the signal is fed through a low-pass filter with cut-off frequency f_c. Equation (1) along with the block size, N, determine the FFT window duration

$$T = N\Delta t \tag{11}$$

The frequency bin width is given by

$$\Delta f = \frac{1}{T} \tag{12}$$

The FFT of the signal is expressed as

$$\hat{P}_i(f_k) = \Delta t P_i(f_k) \tag{13}$$

where

$$P_i(f_k) = \sum_{n=0}^{N-1} p_{in} \exp\left[-\frac{j2\pi kn}{N}\right] \tag{14}$$

In these relations, $P_i(f_k)$ is the actual output from the FFT algorithm and the subscript i designates the particular record or microphone used in the ensemble average. The FFT subroutine employed is based on the Cooley-Tukey[9] algorithm. The discrete frequencies, f_k, which are the bin center frequencies, are given by

$$f_k = \frac{k}{T}, \qquad k = 0,1,2,\ldots,\frac{N}{2} \tag{15}$$

With the FFT components computed, the power spectral density function ensemble averaged over the number of microphones n_d is evaluated from

$$G_{pp}(f_k) = \frac{2}{n_d T}\sum_{i=1}^{n_d}\left|\hat{P}_i(f_k)\right|^2, \qquad k = 0,1,2,\ldots\frac{N}{2} \tag{16}$$

Using equations (13) and (16), the mean squared pressure for the bin with center frequency f_k and width Δf can be approximated by

$$\overline{p^2(f_k,\Delta f)} = G_{pp}(f_k)\Delta f = \frac{2}{n_d N^2}\sum_{i=1}^{n_d}\left|P_i(f_k)\right|^2 \tag{17}$$

Thus, the sound-pressure level for the k-th bin is

$$L(f_k) = 10\log\left[\frac{\overline{p^2(f_k,\Delta f)}}{P_{ref}^2}\right] + \Delta L(f_k) \tag{18}$$

where $\Delta L(f_k)$ represents a weighting function in decibels (i.e. A-weighting). If no weighting is desired then $\Delta L(f_k) = 0$. The overall sound-pressure level for any desired frequency bandwidth is

$$L_{oa} = 10\log\left[\sum_{k=1}^{n_b} 10^{L(f_k)/10}\right] \tag{19}$$

where n_b is the number of the frequency band corresponding to the maximum desired frequency. For the results presented in this study, N = 16384 points so that T = .5243 sec. and Δf = 1.91 Hz. Also, n_d = 12 since twelve microphones were employed in the ensemble averaging.

8. FLYOVER ACOUSTIC MEASUREMENTS

Appendix A contains the narrow-band spectra constructed from the measured acoustic data for both the F-18 and F-16XL flights. Each flight has a maximum of seventeen spectra displayed corresponding to sixteen different emission angles and an ambient measurement characterizing background noise taken prior to the overflight. Some flights at the higher altitudes have fewer than sixteen spectra shown because the signal-to-noise ratio approaches one as the aircraft recedes from the array. In the presented spectra 6 db has been subtracted from each spectral bin to account for ground impedance and thus the spectra depict free-field propagation. L_{oa} given in the spectra was computed over the bandwidth shown, from 0 to 4 kHz.

Some extraneous noise does appear in the spectra. The spectral structure in the vicinity of 3 kHz is attributed to internal noise generated by the data acquisition system. Spikes at harmonics of 60 Hz are attributed to the power generator which provided the electrical supply to the instrumentation van. Contamination of the spectral data by this noise becomes significant at the 10,000 ft. flyovers and progressively worsens as the aircraft altitude increases due to the decreasing signal-to-noise ratio. In general, the maximum levels occur in the vicinity of 1 kHz or below for both aircraft.

9. 1/3-OCTAVE BAND SOUND PRESSURE LEVELS

Appendix B contains tables of 1/3-octave band sound pressure levels for twenty-four 1/3-octave bands from 50 Hz to 10 kHz. These levels are computed from the narrow-band spectra by simply summing up the sound-pressure levels contained in each 1/3-octave band, i.e.

$$L_{1/3}(f_{cen}) = 10\log\left[\sum_{f_l}^{f_u} 10^{L(f_k)/10}\right] \tag{20}$$

Here, f_{cen} is the 1/3-octave band center frequency. The lower and upper frequencies are given by f_l and f_u, respectively. $L(f_k)$ is the narrow-band SPL determined by the FFT scheme where $f_l \leq f_k \leq f_u$. Due to the presence of the previously mentioned extraneous noise, caution is advised in interpreting these values as characterizing aircraft noise for the flights above 5,000 feet.

10. FLIGHT TRACKING DATA

Appendix C displays plots representing the position of the aircraft during the flights. These plots were constructed from the radar tracking data. Shown are the rectangular coordinates, aircraft Mach number and emission angle for each flight. One of the end microphones was designated to define the origin of the coordinate system. For the Mach number computation, the position data was first smoothed with a cubic spline routine and then velocity components were found using a routine that evaluates the derivative of a cubic spline at a given point. The Mach number history was further smoothed by a cubic polynomial fit. The spacing in the radar data was approximately .05 seconds. In the speed history plot, total Mach number is shown, i.e.,

$$M(t) = \frac{\sqrt{\dot{x}^2 + \dot{y}^2 + \dot{z}^2}}{c_0} \tag{21}$$

11. ENGINE DATA

Engine data for the F-18 and F16XL flights are shown in Tables 3 and 4. This data was provided by NASA Dryden Flight Research Center[1,2]. Parameters directly measured during the flyovers included compressor speed and discharge pressure, fan speed, fuel flow, inlet and gas temperatures, and turbine discharge pressure. Engine parameters were calculated from manufacturers deck codes and nozzle conditions were computed from these results using isentropic flow equations.

12. WEATHER DATA

Two sources of weather data were measured during this test. This data is provided in Appendix D. The first consists of data obtained by a rawinsonde released during the early morning hours of each flight day. Table D1and D2 list the flight test run numbers with a corresponding date. Rawinsonde data for these dates are listed in Tables D3 through D9.

The second source of weather data was collected by a NASA Langley tethered balloon shown in Figure 7. This balloon was raised to an altitude of approximately 1500 feet and lowered several times during the tests. Tables D10 through D16 list the Balloon weather data. Due to technical difficulties balloon data was not collected for runs conducted on November 19, 1991.

13. STATIC TEST MEASUREMENTS

Acoustic and engine data were acquired from both an F-18 and F-16XL aircraft during the static tests. Microphone arrays were placed around the F-18 as shown in Figure 8 and around the F-16XL as shown in Figure 9. Each microphone was flush mounted above an acoustically hard surface (ground board).

The acoustic data was reduced using a similar signal processing procedure as that employed in the flyover measurements. That is, the analog signal was first passed through an anti-aliasing filter with a low pass setting of 15 Hz and a high pass setting of 12.5 kHz. The signal was then digitized at a sample rate of 31.25 kHz which satisfies the Nyquist criterion. A 16384 point FFT converted the digitized time history to acoustic spectra with a time window of 0.5243 seconds and a frequency resolution of 1.9 Hz. The window used in the FFT was rectangular . The displayed narrow band spectra in Appendix E were constructed by ensemble averaging 19 FFT records with a 50 % overlap. One-third octave band spectra, shown in Appendix F, were obtained from the narrow-band spectra by way of equation (20).

Engine data for the F-18 was recorded for 5 operating conditions as listed in Table 5. These conditions correspond to a single engine. For throttle settings greater than 80 degrees, power lever angle, the left engine was started and set to flight idle for stability reasons. Engine data for the F-16XL is given in Table 6.

14. CONCLUDING REMARKS

This report documents flyover noise data obtained from constant altitude flights of F-16XL and F-18 aircraft over a wide subsonic speed range. These results may be useful for noise prediction code validation or for assessing climbout noise for future aircraft, such as the HSCT.

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Table 1. Climb-To-Cruise Test Matrix

F-18 Flights	F-16XL Flights	Target Altitude Feet AGL	Target Mach Number
103 * 105 engine data only 100 101 104	1101 * 1102 *	1500	.3
205 211 * engine data only 206	1201 * 1202	5000	.6
305 315 engine data only 302 306 307 309	1301 *	10000	.65
409 411 engine data only 401 415		20000	.75
504 505 engine data only 503 507		30000	.9

* acoustic and engine data

Table 2. ANOPP Test Matrix

F-18 Flights	F-16XL Flights	Target Altitude Feet AGL	Target Mach Number
600 * 601 * 603 604	800 * 801 *	1500	.3
610 * 612 613 engine data only 611	810 * 811 *	1500	.6
621 * 622 623 engine data only 620	820 * 821 *	1500	.8
630 631 engine data only 632 633 634 635	830 * 831 *	1500	.95

* acoustic and engine data

Table 3. Engine Data for F18 Flights

RUN	PLA (deg)	Mach	Altitude (ft, AGL)	Tamb (deg R)	Pamb (psia)	T1 (deg R)	P1 (psia)	PS3 (psia)	P56 (psia)	WFT (lb/hr)	N1 (RPM)	N2 (RPM)
100	102 mil	.42	1383	511.9	12.80	530	14.17	277	40	7816	13403	15633
101	102 mil	.43	1426	510.9	12.70	530	14.24	282	41	7944	13137	15801
103	102 mil	.43	1441	510.6	12.79	529	14.24	278	40	7920	13270	15465
104	102 mil	.44	1412	511.3	12.79	531	14.31	281	41	7992	13138	15970
206	102 mil	.64	4923	514.6	11.21	557	14.47	278	38	7880	13668	15801
211	102 mil	.63	4915	514.1	11.21	555	14.35	274	38	7768	13403	15970
302	102 mil	.70	9920	479.2	9.24	526	12.55	251	36	7136	13270	15970
306	100	.66	10056	497.3	9.19	541	12.07	237	33	6688	13474	15633
307	103	.71	9938	499.2	9.23	550	12.67	251	36	6936	13403	15970
309	102 mil	.68	9952	496.7	9.23	542	12.33	244	34	6936	13402	15801
401	102 mil	.80	19893	451.8	6.14	510	9.17	190	28	5528	13535	15801
415	102 mil	.77	19959	454.2	6.12	508	8.88	193	29	5456	13403	15970
503	101	.90	29933	408.8	3.93	475	6.51	140	22	4040	13036	15297
507	102 mil	.89	29935	409.3	3.92	474	6.44	145	22	4168	12873	15633
600	75	.34	1373	512.2	12.81	524	13.60	178	30	4280	11412	14961
601	71	.33	1444	513.4	12.78	523	13.32	166	28	3896	11147	14457
610	91	.59	1390	512.0	12.85	548	15.95	283	46	7624	12341	15969
611	80	.61	1427	513.4	12.79	551	16.11	217	37	5448	11677	15297
620	100	.80	1423	510	12.79	575	19.10	357	50	9720	13403	16474
621	100	.80	1435	509.4	12.79	575	19.10	357	50	9784	13535	16474
632	102 mil	.90	1422	513	12.80	594	21.21	395	54	10288	13668	16642
633	102 mil	.90	1501	513	12.76	596	21.15	383	53	10104	13668	16474
634	102 mil	.90	1400	513	12.81	594	21.23	399	56	10184	13668	16642
635	102 mil	.90	1506	513	12.76	598	21.15	387	54	10064	13403	16474

RUN	Run number
PLA	Power lever angle
Mach	Aircraft Mach number
Tamb	Ambient temperature
Pamb	Ambient pressure
T1	Engine inlet total temperature
P1	Engine inlet total pressure
PS3	Compressor discharge static pressure
P56	Turbine discharge pressure
WFT	Fuel flow rate
N1	Fan rotor speed
N2	Core rotor speed

Table 3 (continued).

RUN	EGT (deg R)	P8 (psia)	T8 (deg R)	W8 (lb/sec)	A8 (sq in)	M9	V9 (ft/sec)	NPR	Mj	Vj (ft/sec)	AE9/AE8	PS9/Pamb	Fg avg (lb)
100	1950	36.67	1623.3	138.80	286	1.79	2794	2.86	1.34	2269	1.46	.506	9649.4
101	1955	38.25	1680.5	133.46	282	1.78	2833	2.99	1.37	2351	1.45	.538	9579.2
103	1951	36.85	1650.5	136.90	286	1.79	2816	2.88	1.35	2294	1.46	.510	9621.1
104	1955	38.25	1687.7	133.50	286	1.79	2847	2.99	1.37	2355	1.46	.531	9587.3
206	1952	34.18	1666.1	137.24	306	1.82	2863	3.05	1.39	2358	1.50	.513	9916.9
211	1948	34.91	1699.0	130.79	308	1.83	2895	3.11	1.40	2400	1.50	.521	9574.2
302	1957	33.78	1660.7	121.71	286	1.79	2823	3.59	1.50	2496	1.46	.638	9328.9
306	1950	30.01	1655.7	115.94	306	1.82	2855	3.27	1.44	2411	1.50	.548	8546.1
307	1961	33.51	1690.3	117.21	293	1.80	2861	3.63	1.51	2527	1.48	.633	9044.3
309	1955	31.15	1689.6	116.56	293	1.80	2861	3.38	1.46	2460	1.47	.588	8810.1
401	1959	25.63	1665.9	92.33	272	1.76	2795	4.18	1.61	2619	1.42	.780	7474.2
415	1959	27.05	1687.2	89.20	262	1.73	2780	4.42	1.64	2679	1.39	.868	7380.7
503	1928	20.52	1635.4	67.52	264	1.74	2747	5.23	1.76	2753	1.40	1.000	5721.9
507	1923	20.57	1682.9	66.42	251	1.70	2749	5.24	1.76	2769	1.36	1.071	5726.0
600	1669	28.60	1423.5	92.82	249	1.72	2543	2.24	1.15	1887	1.38	.440	5304.8
601	1624	26.89	1409.3	86.40	249	1.72	2525	2.10	1.10	1809	1.37	.417	4718.1
610	1930	44.17	1749.3	121.00	251	1.70	2801	3.45	1.48	2529	1.36	.708	9348.0
611	1793	35.58	1542.9	107.05	245	1.70	2621	2.78	1.32	2184	1.35	.577	7119.2
620	1955	46.78	1718.7	163.51	303	1.81	2897	3.66	1.52	2556	1.49	.628	12672.6
621	1592	46.49	1701.1	167.39	301	1.81	2878	3.64	1.51	2537	1.48	.627	12917.1
632	1950	50.39	1694.5	180.09	284	1.77	2833	3.94	1.57	2596	1.44	.721	14313.8
633	1946	49.38	1686.1	178.63	296	1.80	2852	3.87	1.55	2576	1.47	.681	14036.2
634	1950	52.66	1683.6	180.19	277	1.75	2802	4.11	1.59	2621	1.42	.778	14454.4
635	1946	50.98	1736.8	169.55	291	1.78	2880	3.4	1.58	2641	1.45	.721	13619.6

EGT	Exhaust gas temperature downstream of the turbine
P8	Exhaust nozzle throat total pressure
T8	Exhaust nozzle total temperature at throat
W8	Mass flow rate at nozzle throat
A8	Exhaust nozzle throat area
M9	Mach number at nozzle exit
V9	Velocity at nozzle exit
NPR	Nozzle pressure ratio (P8/Pamb)
Mj	Fully expanded jet Mach number
Vj	Fully expanded jet velocity
AE8	Exhaust nozzle effective throat area
AE9	Exhaust nozzle effective exit plane area
PS9	Exit plane static pressure
Fg avg	Gross thrust

Table 4. Engine Data for F16XL Flights

RUN	PLA (deg)	Mach	Altitude (ft, AGL)	Tamb (deg R)	Pamb (psia)	T1 (deg R)	P1 (psia)	PS3 (psia)	PT2.5 (psia)	WFT (lb/hr)	N1 (RPM)	N2 (RPM)
1101	85.0	.34	1215	508.9	12.90	521	13.72	381	46	10789	8305	14686
1102	85.1	.33	1148	510.3	12.93	521	13.66	376	45	11033	8300	14607
1201	85.0	.62	4692	501.3	11.32	540	14.18	410	49	12071	8470	14887
1301	85.0	.68	9625	496.9	9.36	543	12.54	356	43	10724	8486	14866
800	46.1	.43	1316	521.4	12.92	529	13.32	194	30	4429	6789	13212
801	48.5	.30	1348	520.6	12.82	530	13.36	200	30	4880	6940	13303
810	32.9	.60	1436	520.9	12.79	558	15.92	177	30	3865	6132	13073
811	35.0	.60	1384	521.7	12.81	560	16.06	194	32	4341	6388	13318
820	46.6	.80	1372	519.6	12.81	586	19.21	291	43	7184	7310	14070
821	43.2	.80	1414	517.7	12.79	586	19.17	273	42	6519	7101	13722
830	55.6	.95	1374	518.1	12.81	611	22.42	380	55	9906	7814	14580
831	57.1	.95	1324	518.9	12.84	612	22.42	391	56	10362	7890	14648

RUN	Run number
PLA	Power lever angle
Mach	Aircraft Mach number
Tamb	Ambient temperature
Pamb	Ambient pressure
T1	Engine inlet total temperature
P1	Engine inlet total pressure
PS3	Compressor discharge static pressure
PT2.5	Fan discharge total pressure
WFT	Fuel flow rate
N1	Fan rotor speed
N2	Core rotor speed

Table 4 (continued).

RUN	EGT (deg R)	P8 (psia)	T8 (deg R)	W8 (lb/sec)	A8 (sq in)	M9	V9 (ft/sec)	NPR	Mj	Vj (ft/sec)	AE9/AE8	PS9/Pamb	Fg avg (lb)
1101	1846	41.80	1422.0	248.50	446	1.52	2328.00	3.24	1.43	2223.0	1.20	.88	16793.0
1102	1821	41.60	1421.0	247.10	446	1.51	2317.00	3.22	1.42	2216.0	1.19	.88	16647.0
1201	1920	44.50	1484.0	258.70	446	1.55	2415.00	3.93	1.56	2422.0	1.22	1.01	19145.0
1301	1998	38.50	1489.0	224.20	445	1.55	2418.00	4.11	1.59	2460.0	1.22	1.06	16852.0
800	1627	23.54	1089.5	168.40	475	1.35	1855.04	1.82	.97	1431.1	1.09	.62	7278.3
801	1615	23.52	1077.5	169.29	478	1.35	1857.08	1.83	.98	1437.4	1.09	.62	7349.9
810	1550	23.71	1031.5	165.06	457	1.31	1782.87	1.86	.99	1418.2	1.07	.66	7085.4
811	1573	25.09	1057.6	174.85	461	1.32	1810.50	1.96	1.03	1492.8	1.08	.69	7897.4
820	1744	35.21	1191.2	235.96	469	1.38	1991.07	2.75	1.30	1899.7	1.11	.89	13650.4
821	1674	33.87	1170.2	226.61	465	1.34	1931.82	2.65	1.27	1852.2	1.09	.91	12779.2
830	1780	44.26	1291.0	291.22	472	1.58	2273.35	3.45	1.46	2158.1	1.24	.85	19185.6
831	1901	45.17	1306.8	297.14	474	1.58	2289.73	3.52	1.47	2184.9	1.24	.86	19837.5

EGT	Exhaust gas temperature downstream of the turbine
P8	Exhaust nozzle throat total pressure
T8	Exhaust nozzle total temperature at throat
W8	Mass flow rate at nozzle throat
A8	Exhaust nozzle throat area
M9	Mach number at nozzle exit
V9	Velocity at nozzle exit
NPR	Nozzle pressure ratio (P8/Pamb)
Mj	Fully expanded jet Mach number
Vj	Fully expanded jet velocity
AE8	Exhaust nozzle effective throat area
AE9	Exhaust nozzle effective exit plane area
PS9	Exit plane static pressure
Fg avg	Gross thrust

Table 5. Engine Data for F18 Static Tests

RUN	PLA (deg)	Mach	Altitude (ft, ASL)	Tamb (deg R)	Pamb (psia)	T1 (deg R)	P1 (psia)	PS3 (psia)	P56 (psia)	WFT (lb/hr)	N1 (RPM)	N2 (RPM)
5	54	0.	2350	518.6	13.49	524	13.27	91	19	1928	8626	13112
9	80	0.	2350	518.6	13.49	524	13.03	175	29	4248	11545	14723
12	87	0.	2350	518.6	13.49	522	12.91	205	33	5192	12076	15297
15	92	0.	2350	518.6	13.49	522	12.75	237	37	6248	12607	15970
17	102 mil	0.	2350	518.6	13.49	520	12.48	259	39	7128	13139	16138

RUN	EGT (deg R)	P8 (psia)	T8 (deg R)	W8 (lb/sec)	A8 (sq in)	M9	V9 (ft/sec)	NPR	Mj	Vj (ft/sec)	AE9/AE8	PS9/Pamb	Fg avg (lb)
5	1447	18.50	1200.2	56.56	220	UND	UND	1.37	0.69	1117.1	1.31	1.000	1866.4
9	1680	27.72	1437.3	91.29	249	1.71	2542.60	2.05	1.08	1800.7	1.24	0.413	5198.5
12	1784	31.45	1527.8	100.74	249	1.71	2629.35	2.33	1.18	1998.0	1.28	0.465	6400.0
15	1879	35.14	1622.1	110.11	249	1.70	2701.63	2.61	1.27	2176.3	1.28	0.528	7411.4
17	1930	36.66	1671.9	120.60	264	1.74	2784.81	2.72	1.30	2252.6	1.32	0.520	8809.7

UND Undetermined

RUN	Run number
PLA	Power lever angle
Mach	Aircraft Mach number
Tamb	Ambient temperature
Pamb	Ambient pressure
T1	Engine inlet total temperature
P1	Engine inlet total pressure
PS3	Compressor discharge static pressure
P56	Turbine discharge pressure
WFT	Fuel flow rate
N1	Fan rotor speed
N2	Core rotor speed

EGT	Exhaust gas temperature downstream of the turbine
P8	Exhaust nozzle throat total pressure
T8	Exhaust nozzle total temperature at throat
W8	Mass flow rate at nozzle throat
A8	Exhaust nozzle throat area
M9	Mach number at nozzle exit
V9	Velocity at nozzle exit
NPR	Nozzle pressure ratio (P8/Pamb)
Mj	Fully expanded jet Mach number
Vj	Fully expanded jet velocity
AE8	Exhaust nozzle effective throat area
AE9	Exhaust nozzle effective exit plane area
PS9	Exit plane static pressure
Fg avg	Gross thrust

Table 6. Engine Data for F16XL Static Tests

RUN	PLA (deg)	Mach	Altitude (ft, ASL)	Tamb (deg R)	Pamb (psia)	T1 (deg R)	P1 (psia)	PS3 (psia)	PT2.5 (psia)	WFT (lb/hr)	N1 (RPM)	N2 (RPM)
5	38.7	0.	2350	517.6	13.53	517.6	12.8	145	24.6	3481	6051	12529
6	43.9	0.	2350	517.6	13.53	517.6	12.6	168	26.5	4062	6491	12846
7	48.9	0.	2350	517.6	13.53	517.6	12.5	185	28.1	4578	6858	13117
8	55.1	0.	2350	517.6	13.53	517.6	12.3	207	30.1	5310	7207	13445
9	60.2	0.	2350	517.6	13.53	517.6	12.1	227	31.7	6042	7510	13765
10	67.6	0.	2350	517.6	13.53	517.6	12.0	251	33.8	6882	7693	14033
11	72.8	0.	2350	517.6	13.53	517.6	11.8	287	36.7	8197	7860	14339
12	83.6	0.	2350	517.6	13.53	517.6	11.4	312	38.5	9427	8187	14663
13	85.2	0.	2350	517.6	13.53	517.6	11.4	314	38.3	9385	8215	14710

RUN	EGT (deg R)	P8 (psia)	T8 (deg R)	W8 (lb/sec)	A8 (sq in)	M9	V9 (ft/sec)	NPR	Mj	Vj (ft/sec)	AE9/AE8	PS9/Pamb	Fg avg (lb)
5	1542	19.4	991	140.2	496	1.372	1804	1.436	.746	1082	1.100	.47	4537
6	1580	21.0	1032	151.9	491	1.362	1831	1.550	.826	1210	1.096	.52	5498
7	1631	22.2	1065	161.3	489	1.362	1859	1.642	.882	1302	1.096	.55	6302
8	1678	24.0	1115	173.2	492	1.364	1905	1.770	.952	1423	1.097	.59	7426
9	1732	25.6	1165	183.6	494	1.368	1951	1.890	1.011	1529	1.100	.63	8478
10	1793	28.2	1233	191.5	482	1.348	1985	2.088	1.095	1682	1.090	.72	9732
11	1899	31.9	1321	195.3	444	1.300	1998	2.360	1.194	1867	1.068	.87	11049
12	1999	34.6	1411	206.8	445	1.305	2071	2.559	1.258	2009	1.070	.94	12626
13	1996	34.7	1415	207.3	444	1.307	2076	2.567	1.261	2015	1.071	.94	12696

RUN	Run number
PLA	Power lever angle
Mach	Aircraft Mach number
Tamb	Ambient temperature
Pamb	Ambient pressure
T1	Engine inlet total temperature
P1	Engine inlet total pressure
PS3	Compressor discharge static pressure
PT2.5	Fan discharge total pressure
WFT	Fuel flow rate
N1	Fan rotor speed
N2	Core rotor speed

EGT	Exhaust gas temperature downstream of the turbine
P8	Exhaust nozzle throat total pressure
T8	Exhaust nozzle total temperature at throat
W8	Mass flow rate at nozzle throat
A8	Exhaust nozzle throat area
M9	Mach number at nozzle exit
V9	Velocity at nozzle exit
NPR	Nozzle pressure ratio (P8/Pamb)
Mj	Fully expanded jet Mach number
Vj	Fully expanded jet velocity
AE8	Exhaust nozzle effective throat area
AE9	Exhaust nozzle effective exit plane area
PS9	Exit plane static pressure
Fg avg	Gross thrust

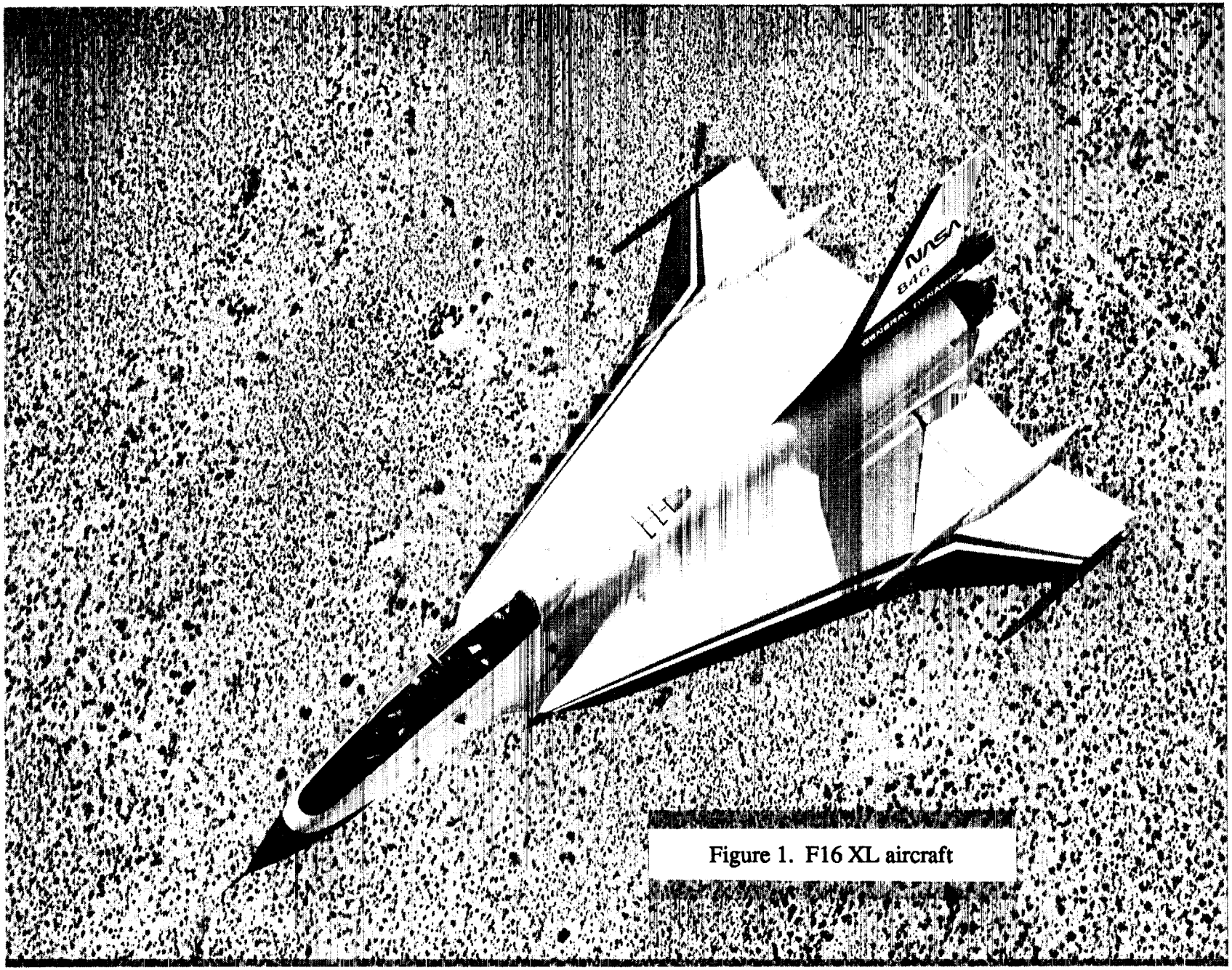


Figure 1. F16 XL aircraft

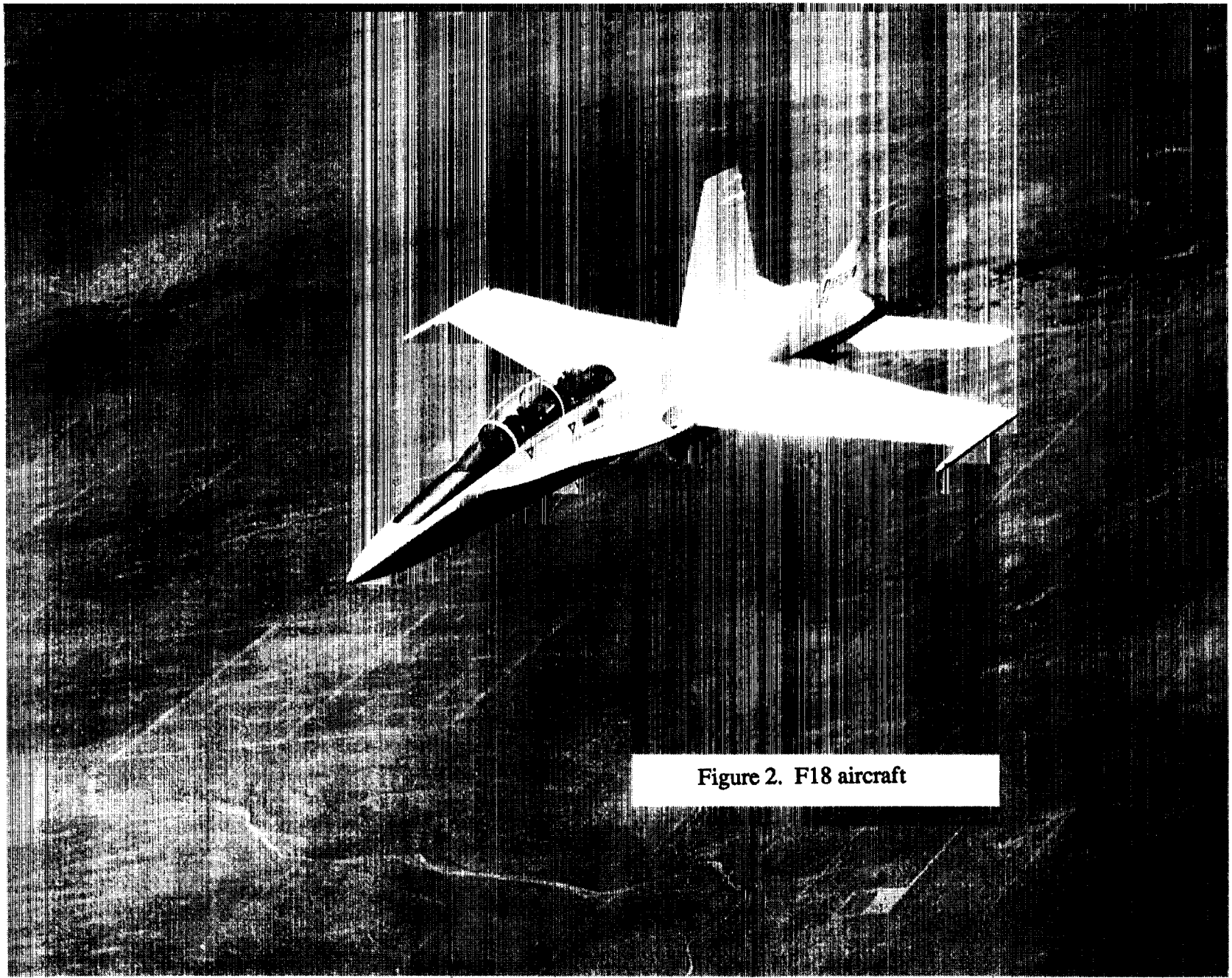


Figure 2. F18 aircraft

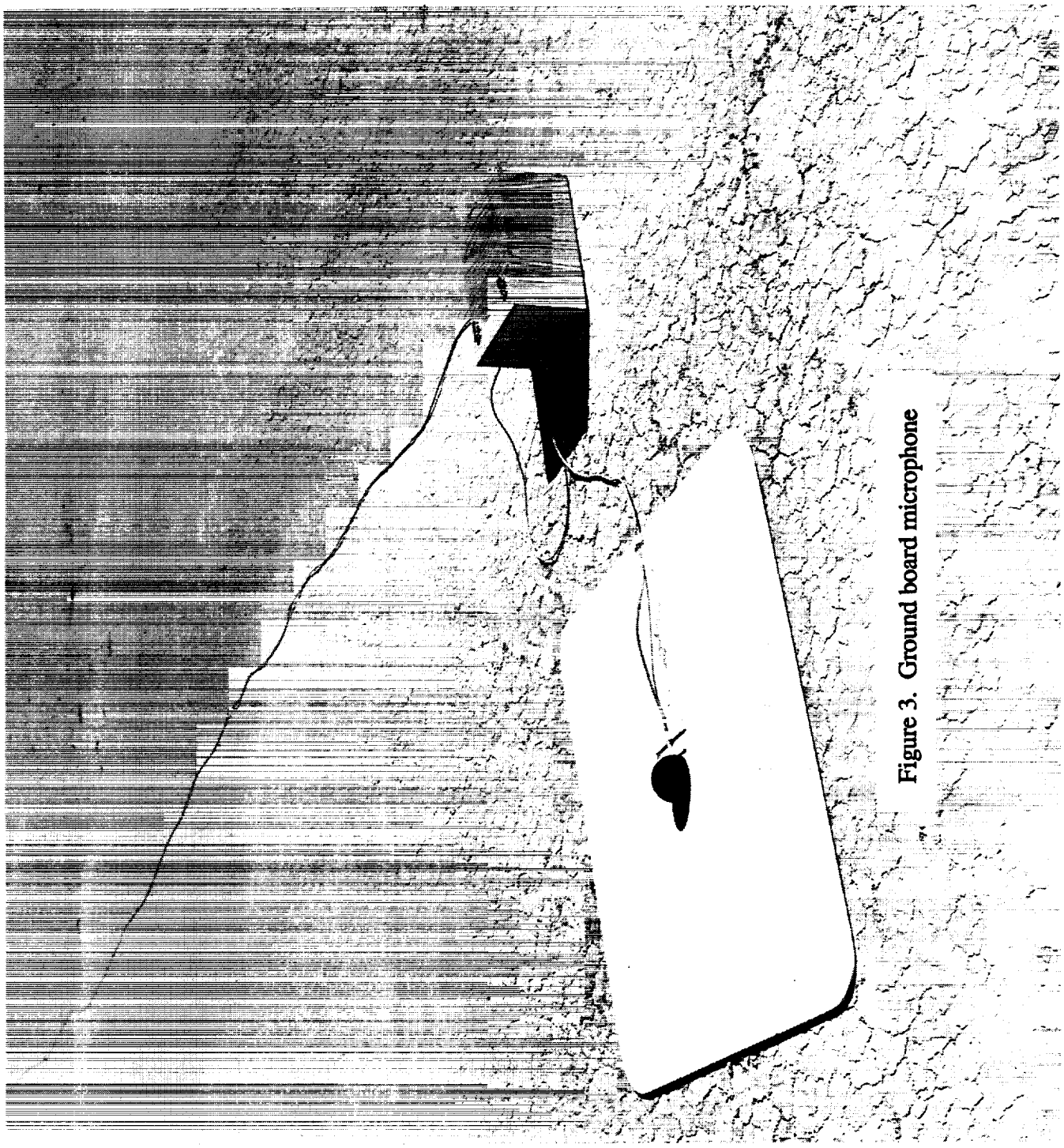


Figure 3. Ground board microphone

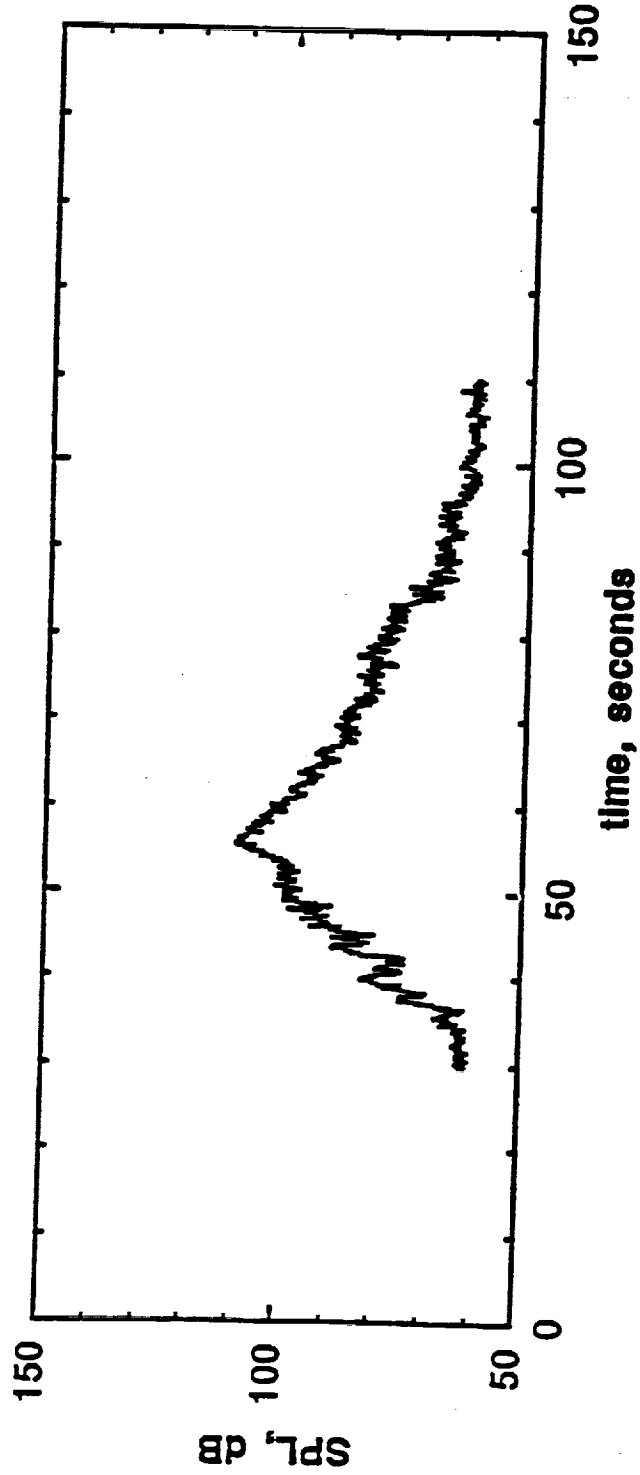


Figure 4. OASPL vs. time for F-18 aircraft, altitude=1500 ft., M=.3.

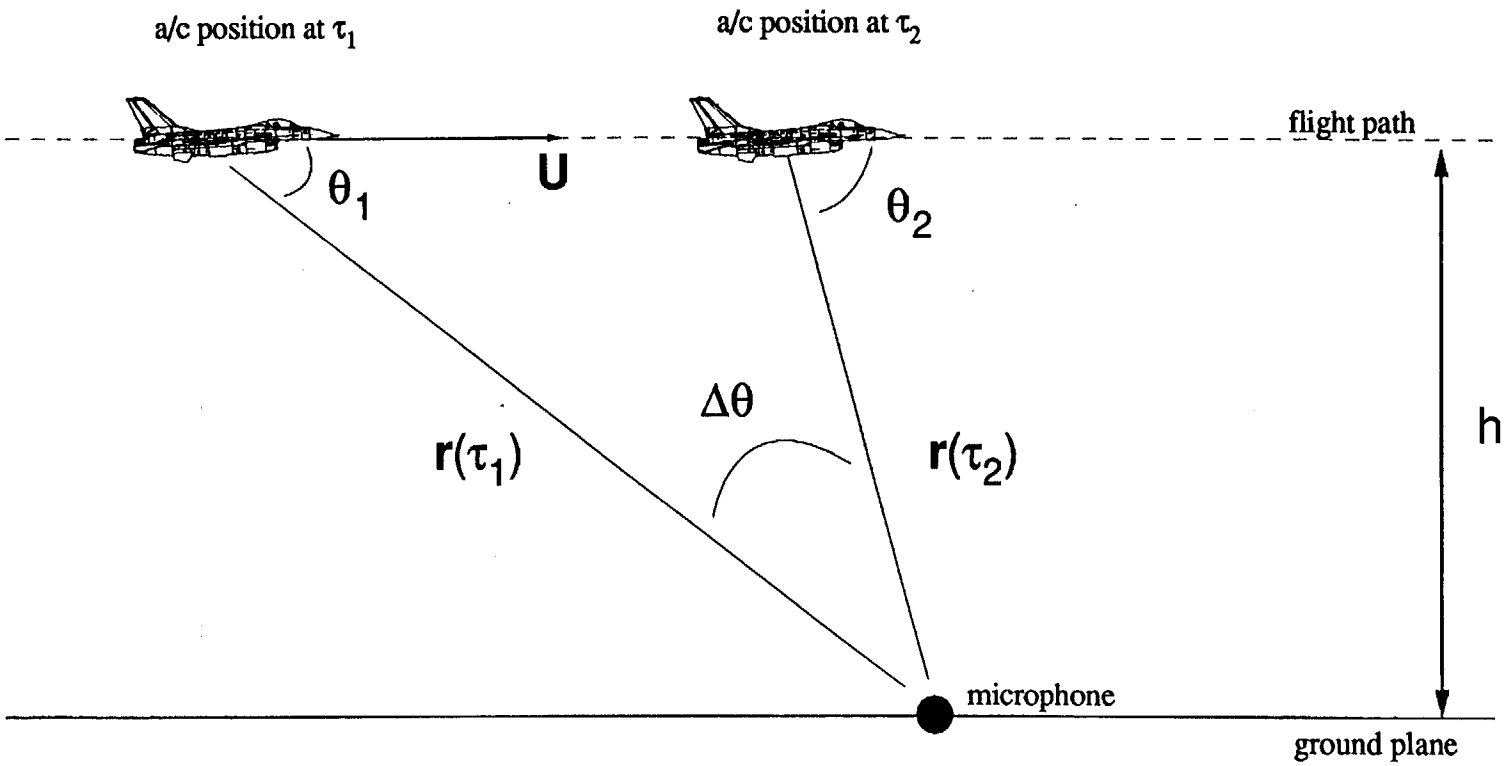


Figure 5. Definition of emission directivity angles.

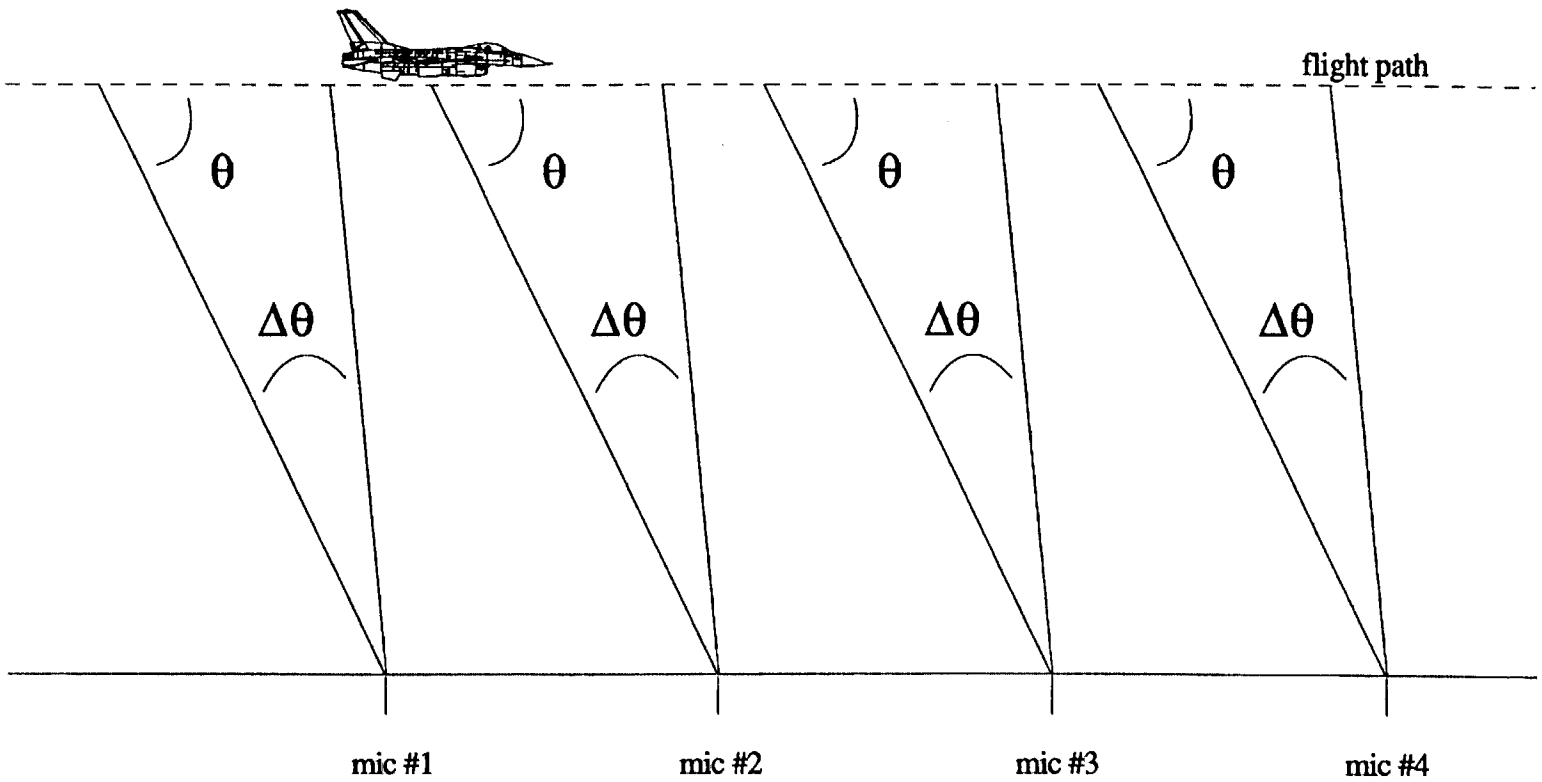


Figure 6. Microphone configuration for ensemble averaging.

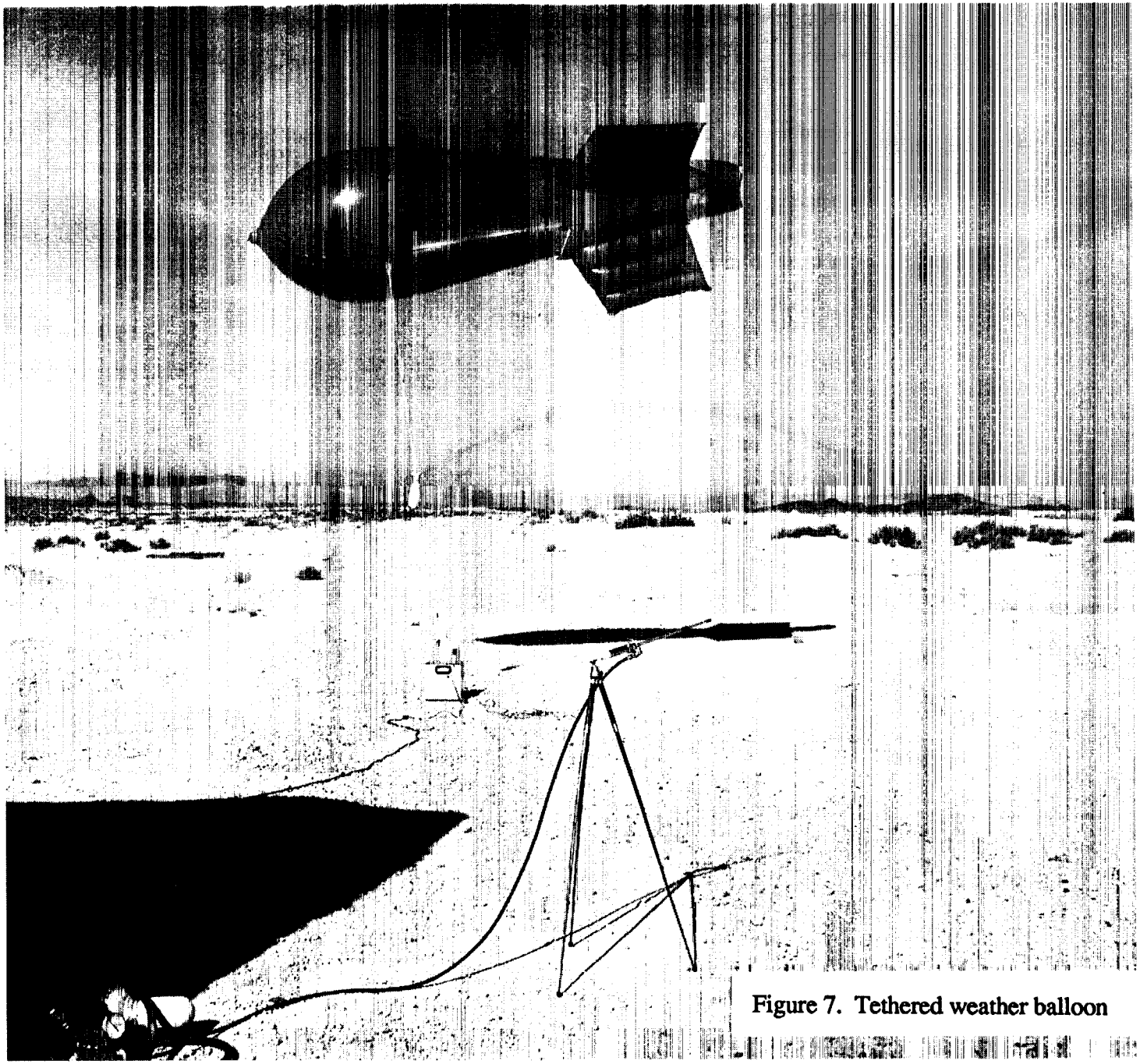
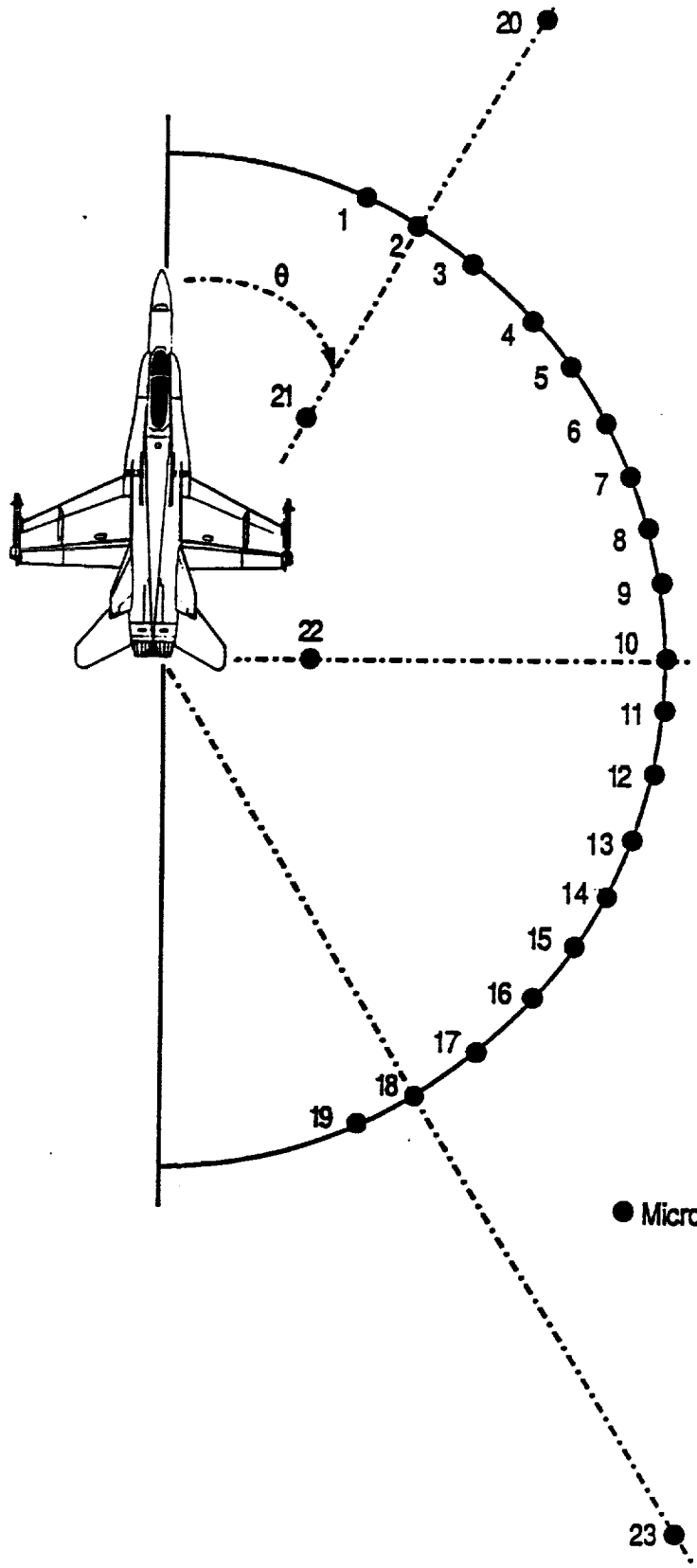
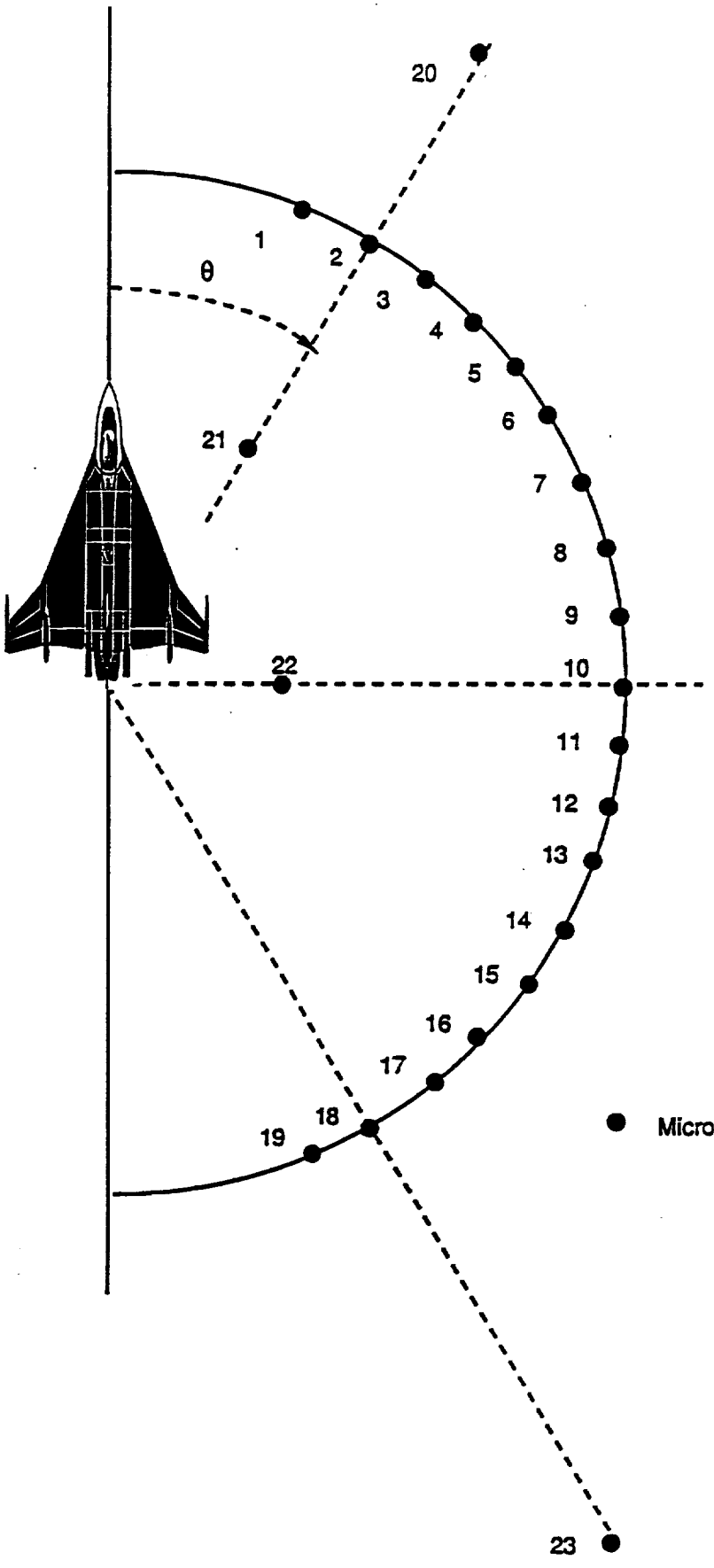


Figure 7. Tethered weather balloon



Mic Position	θ (deg)	r (ft)
1	22.1	70.0
2	31.3	70.0
3	37.2	70.0
4	47.4	70.0
5	53.1	70.0
6	61.1	70.0
7	68.6	70.0
8	75.3	70.0
9	82.9	70.0
10	90.0	70.0
11	97.2	70.0
12	103.7	70.0
13	110.9	70.0
14	118.8	70.0
15	126.7	70.0
16	133.8	70.0
17	141.1	70.0
18	149.8	70.0
19	156.1	70.0
20	31.3	110.0
21	31.3	35.0
22	90.5	17.5
23	149.7	140.0

Figure 8. Microphone array for the F-18 static test.



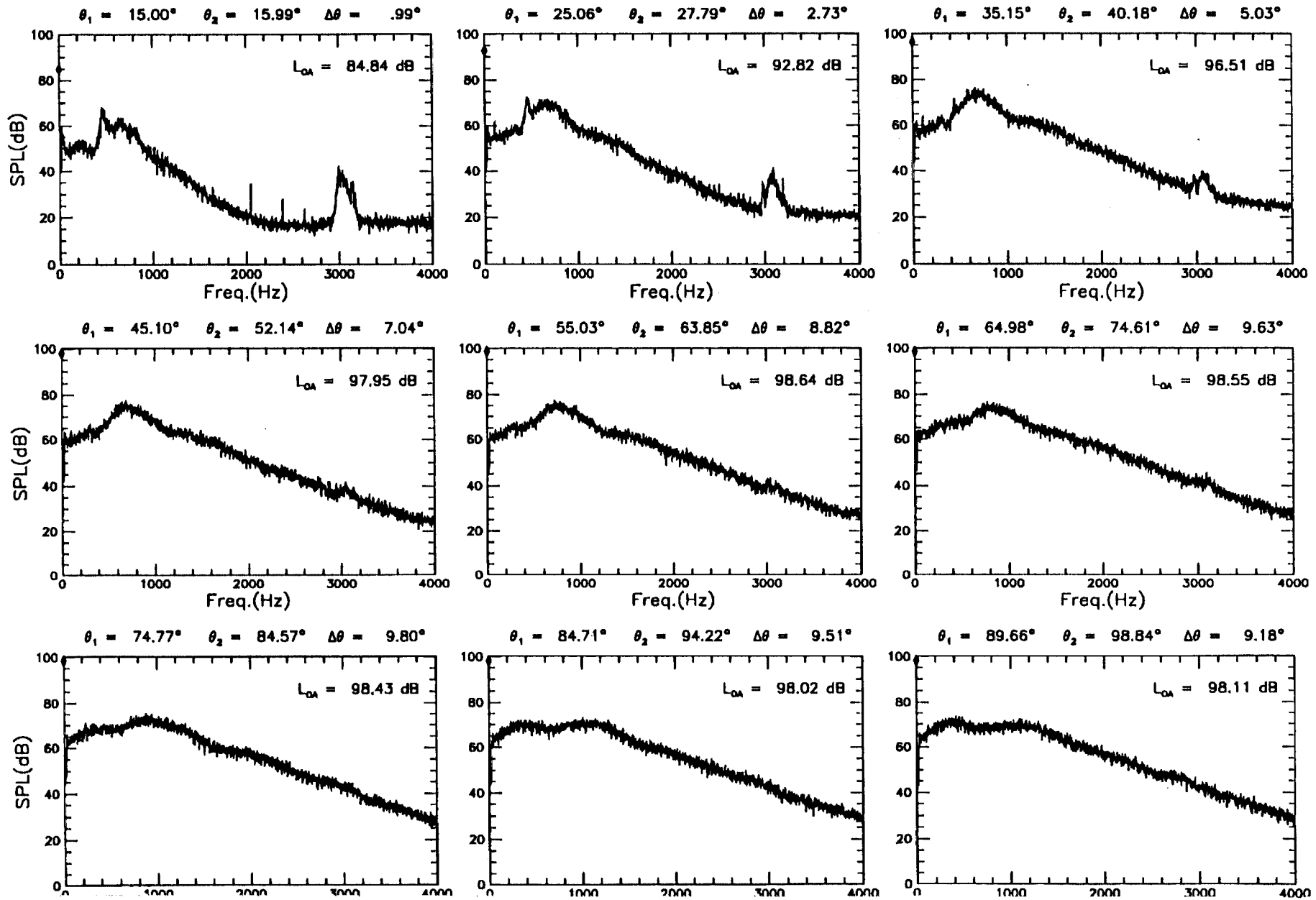
Mic Position	θ (deg)	r (ft)
1	22.1	99
2	31.3	99
3	37.2	99
4	47.4	99
5	53.1	99
6	61.1	99
7	68.6	99
8	75.3	99
9	82.9	99
10	90.0	99
11	97.2	99
12	103.7	99
13	110.9	99
14	118.8	99
15	126.7	99
16	133.8	99
17	141.1	99
18	149.8	99
19	156.1	99
20	31.3	155.5
21	31.3	49.5
22	90.5	24.7
23	149.7	198

Figure 9. Microphone array for the F-16XL static test.

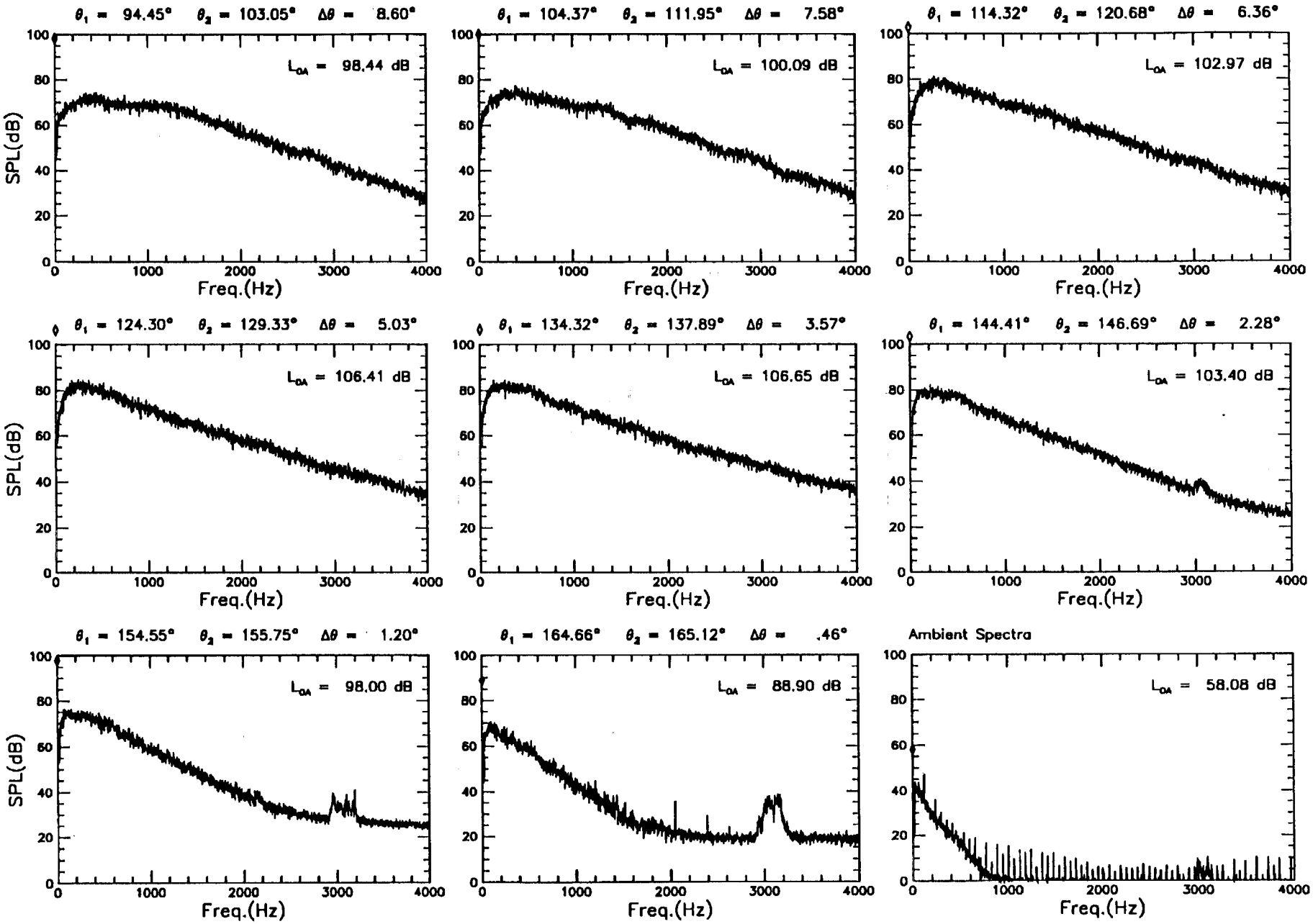
APPENDIX A

NARROW-BAND SPECTRA DATABASE FOR FLIGHT TESTS

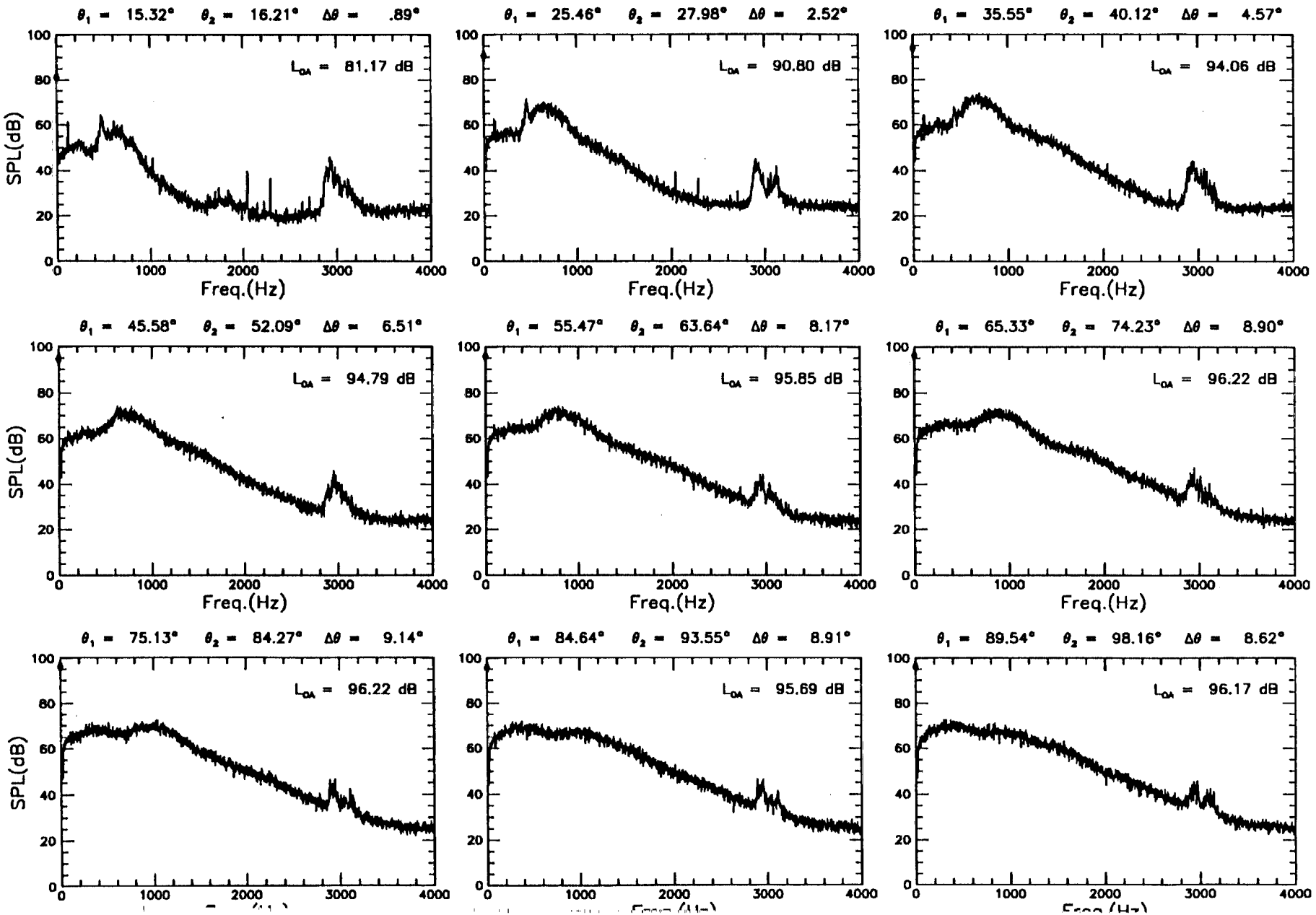
(Sound pressure levels in 2 Hz bandwidth)


Climb–to–Cruise Run 103
θ1 = 15.00° θ2 = 15.99° Δθ = .99°
LOA = 84.84 dB
θ1 = 25.06° θ2 = 27.79° Δθ = 2.73°
LOA = 92.82 dB
θ1 = 35.15° θ2 = 40.18° Δθ = 5.03°
LOA = 96.51 dB
θ1 = 45.10° θ2 = 52.14° Δθ = 7.04°
LOA = 97.95 dB
θ1 = 55.03° θ2 = 63.85° Δθ = 8.82°
LOA = 98.64 dB
θ1 = 64.98° θ2 = 74.61° Δθ = 9.63°
LOA = 98.55 dB
θ1 = 74.77° θ2 = 84.57° Δθ = 9.80°
LOA = 98.43 dB
θ1 = 84.71° θ2 = 94.22° Δθ = 9.51°
LOA = 98.02 dB
θ1 = 89.66° θ2 = 98.84° Δθ = 9.18°
LOA = 98.11 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

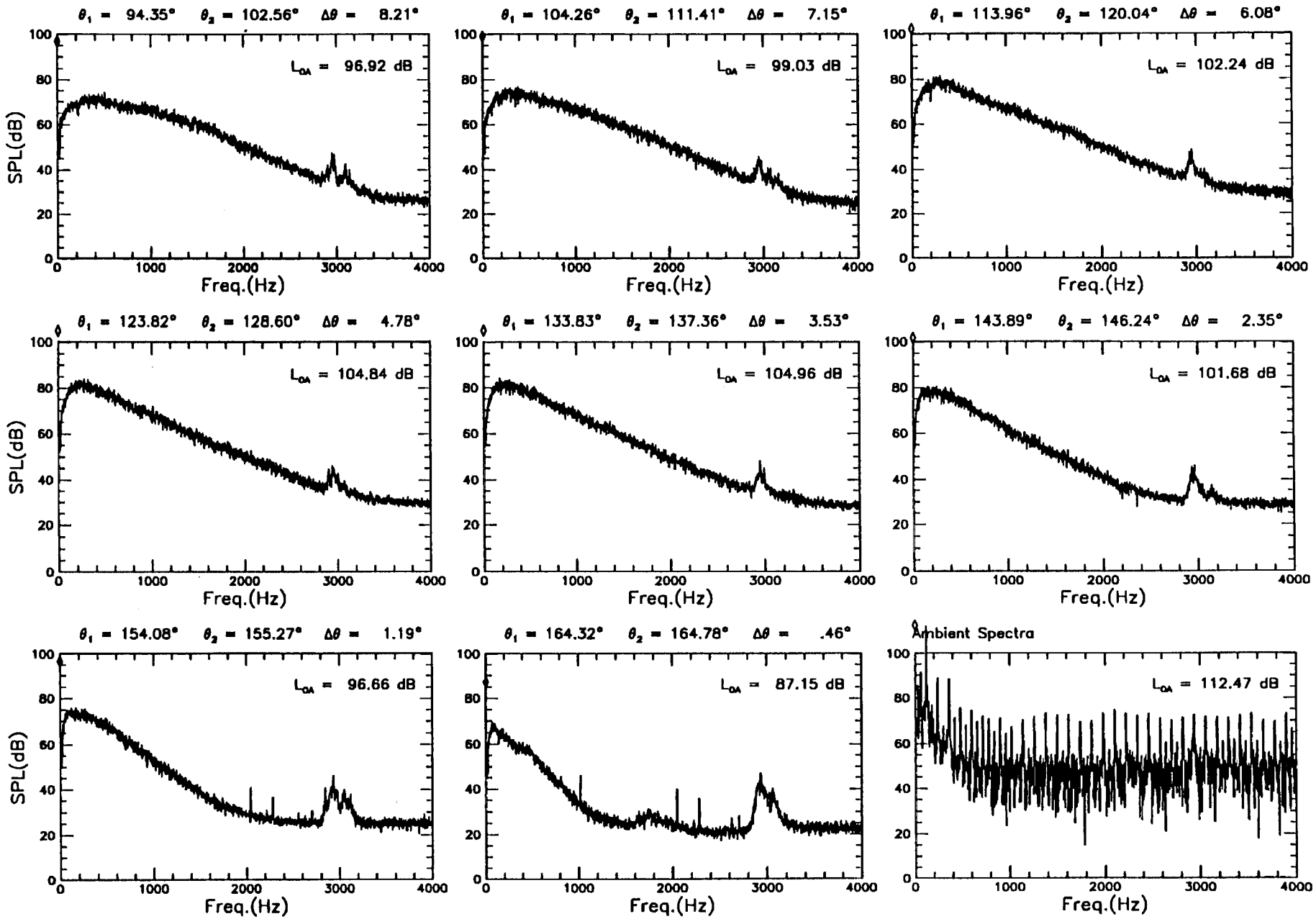
Climb–to–Cruise Run 103



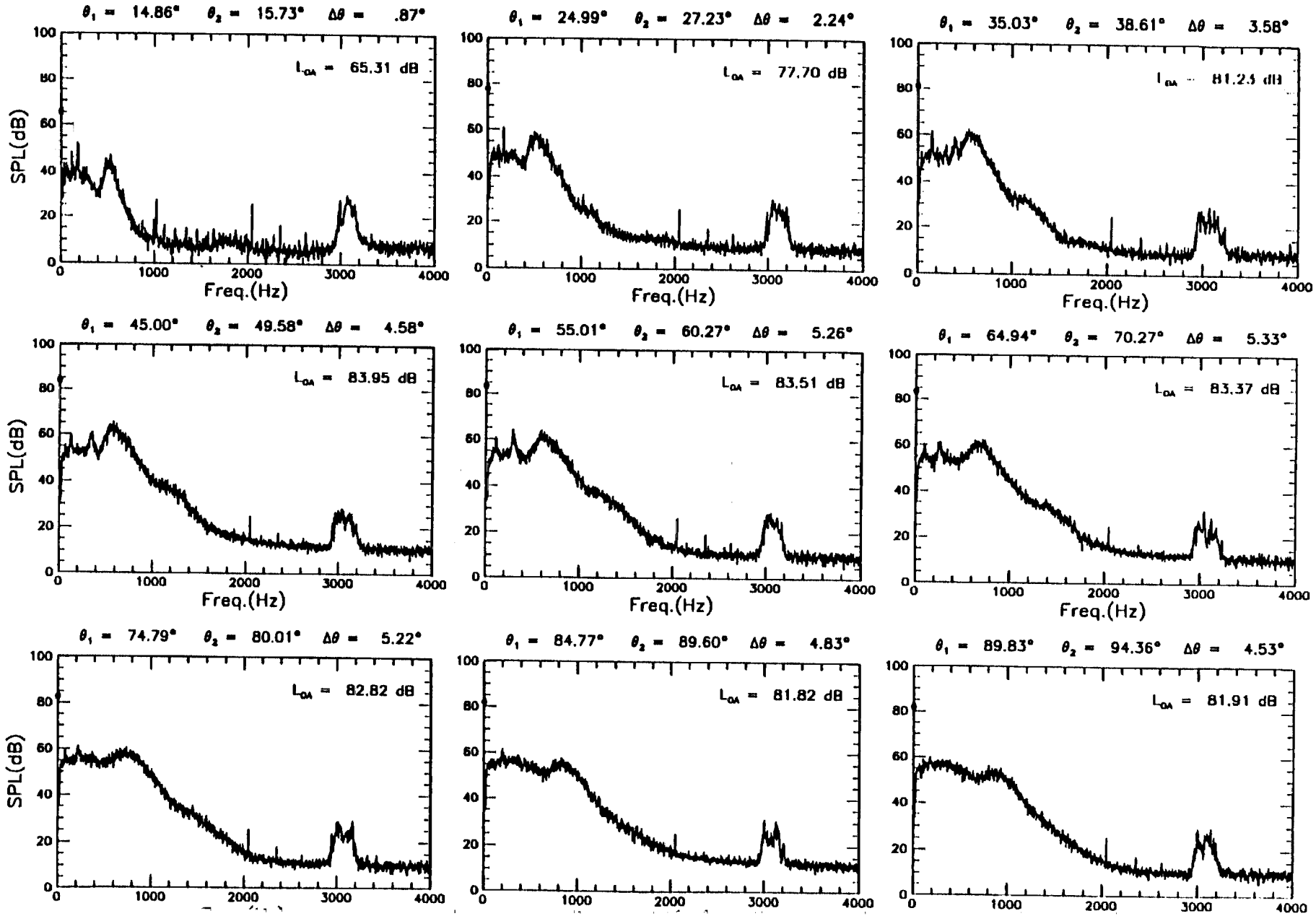
Climb–to–Cruise Run 105



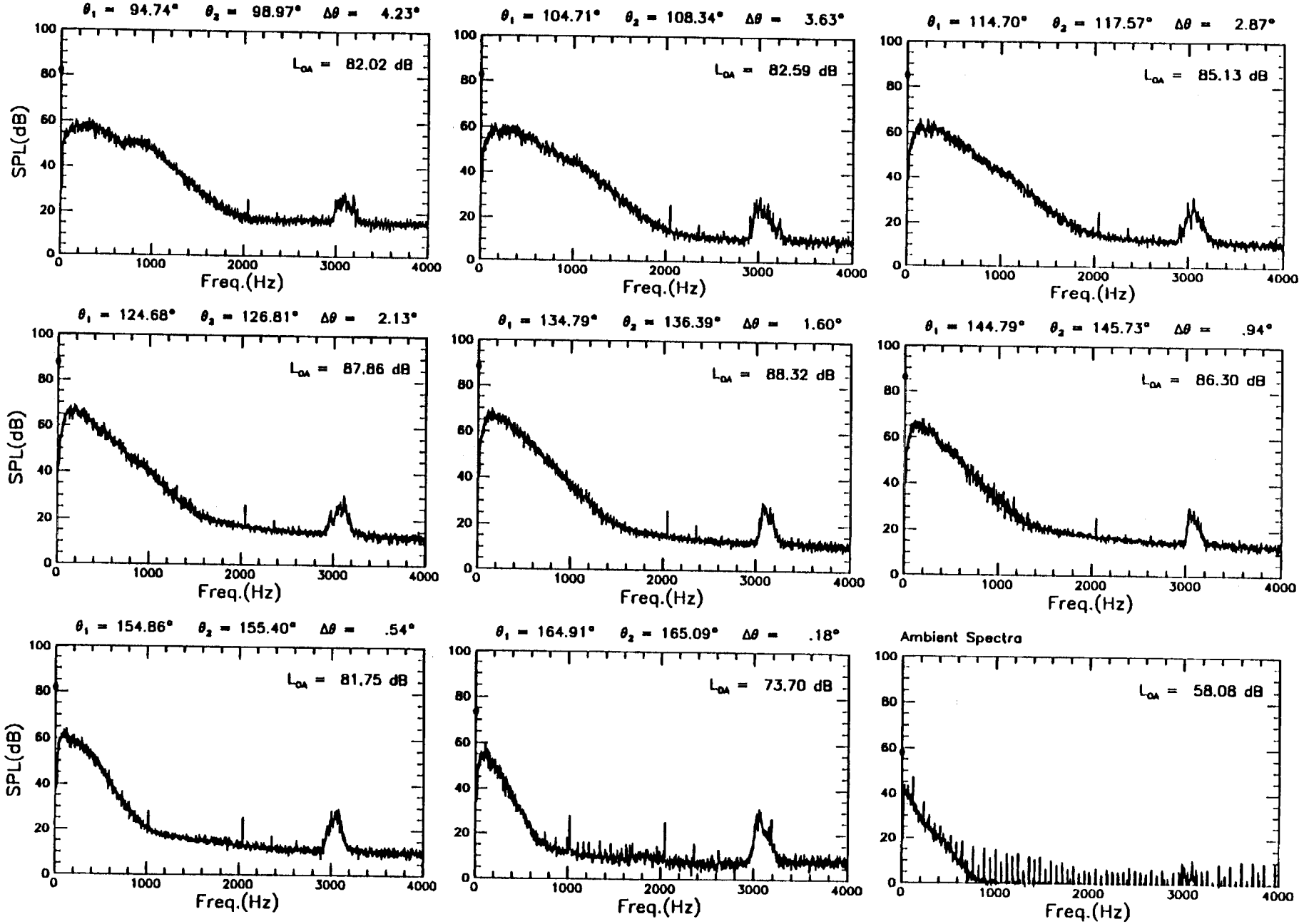
Climb-to-Cruise Run 105

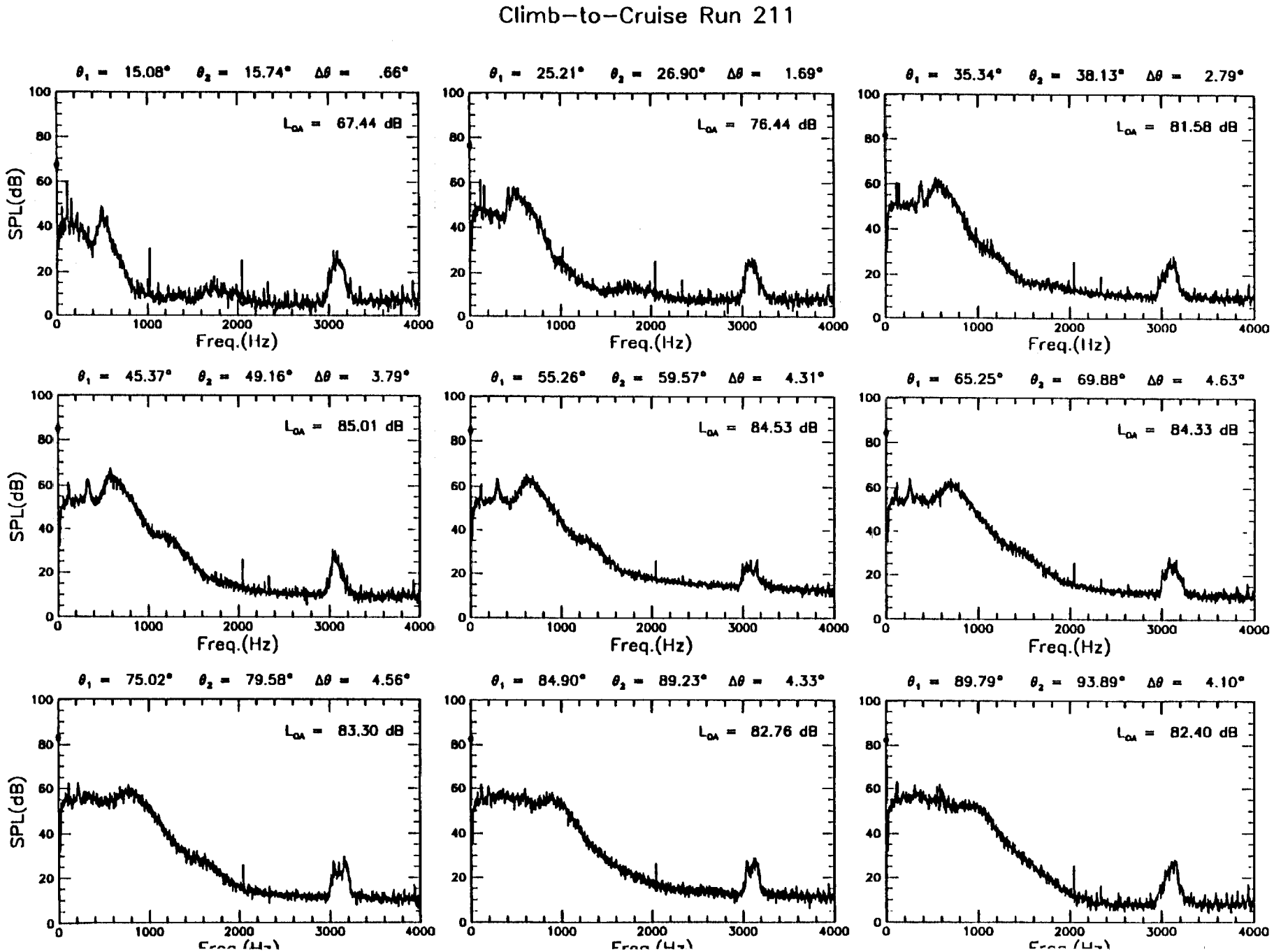


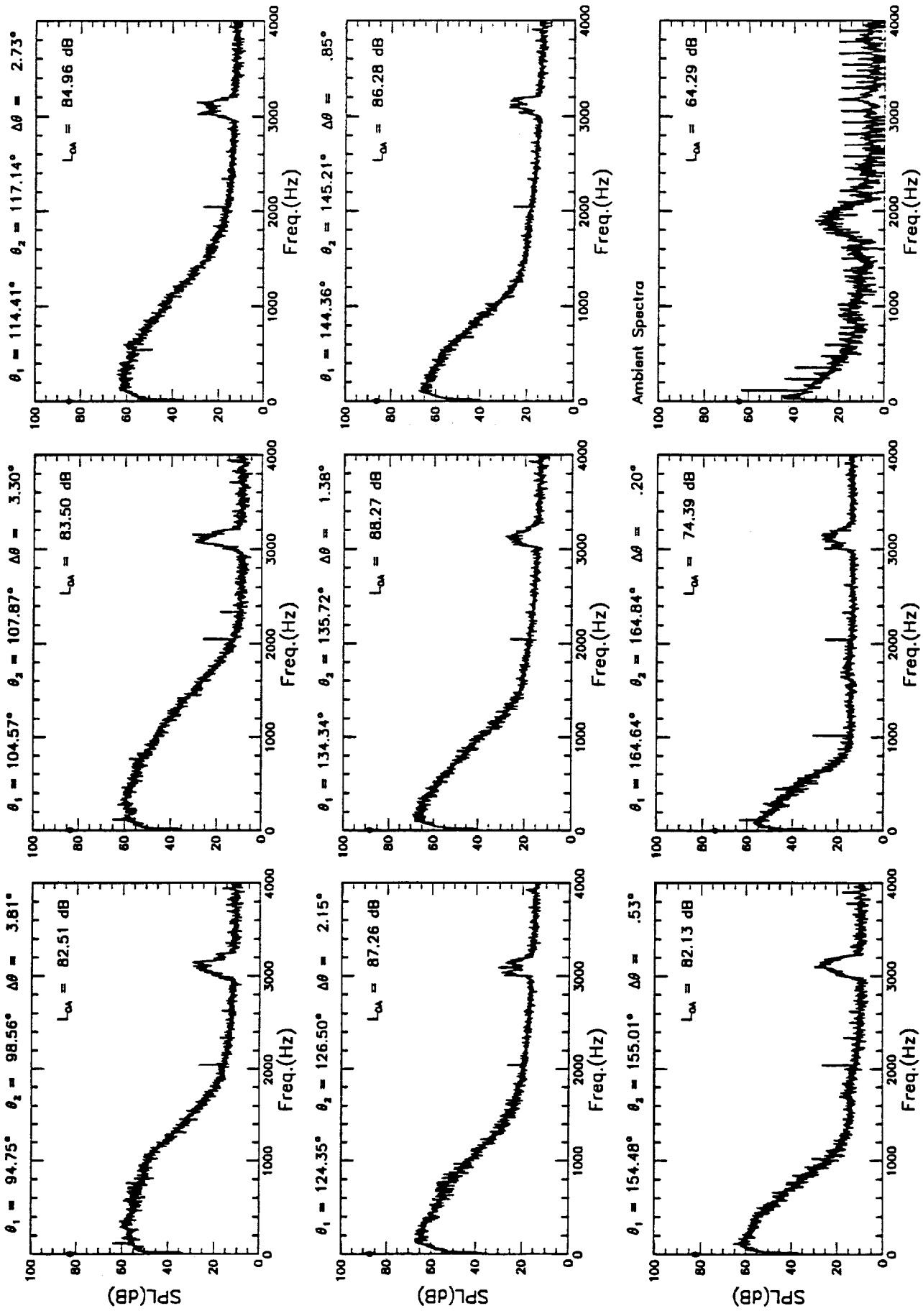
Climb–to–Cruise Run 205



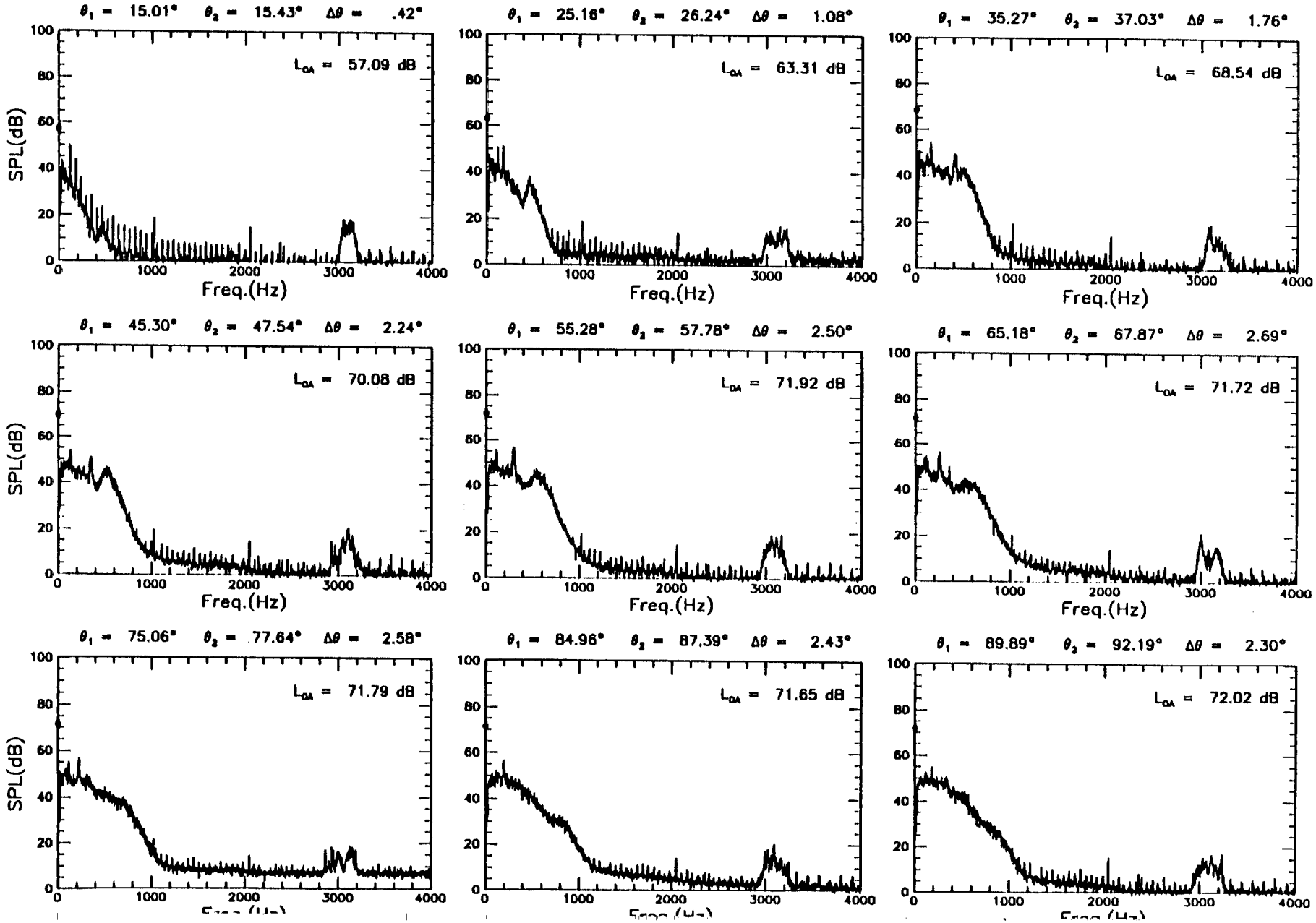
Climb-to-Cruise Run 205



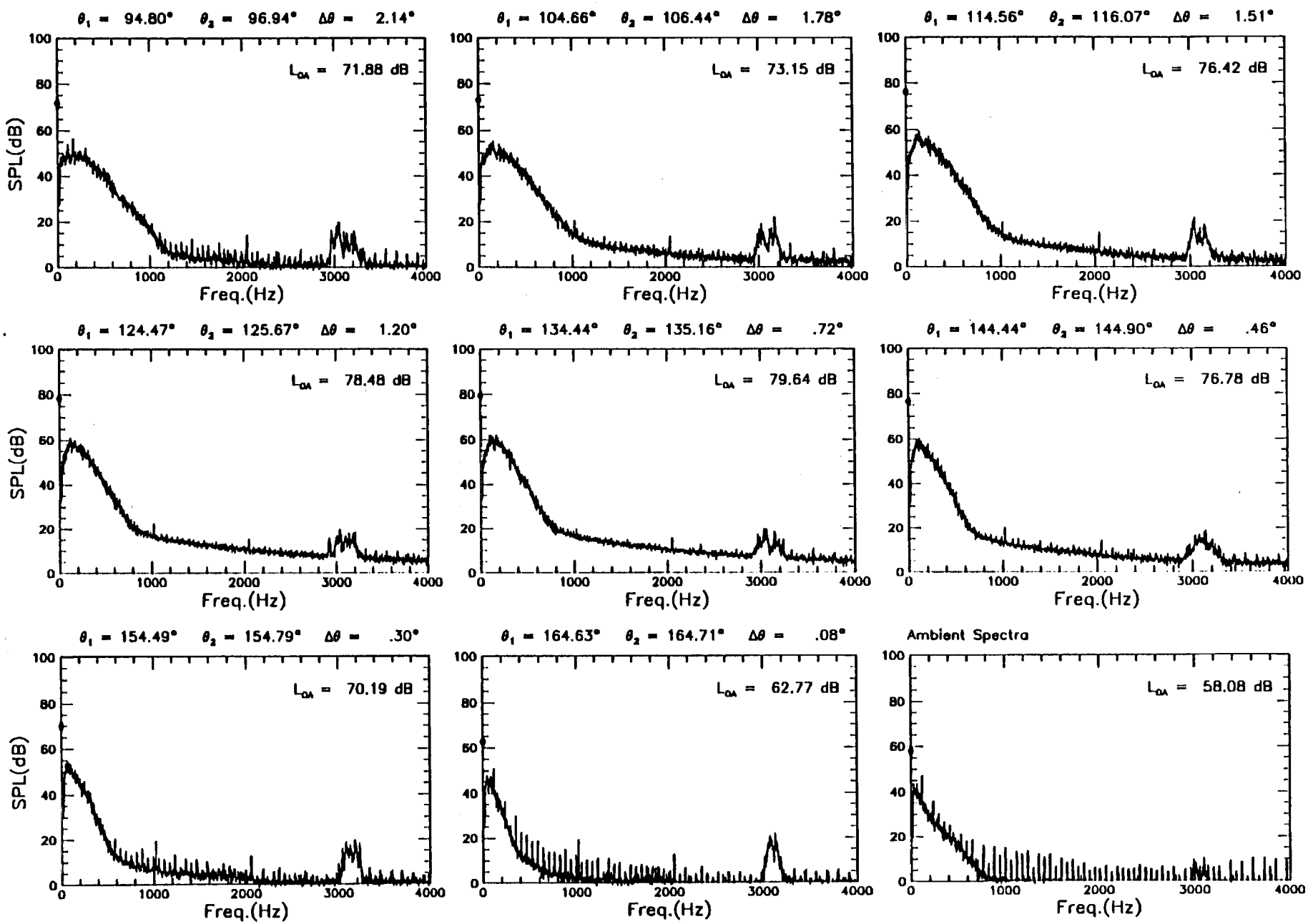

Climb–to–Cruise Run 211
θ1 = 15.08° θ2 = 15.74° Δθ = .66°
LOA = 67.44 dB
θ1 = 25.21° θ2 = 26.90° Δθ = 1.69°
LOA = 76.44 dB
θ1 = 35.34° θ2 = 38.13° Δθ = 2.79°
LOA = 81.58 dB
θ1 = 45.37° θ2 = 49.16° Δθ = 3.79°
LOA = 85.01 dB
θ1 = 55.26° θ2 = 59.57° Δθ = 4.31°
LOA = 84.53 dB
θ1 = 65.25° θ2 = 69.88° Δθ = 4.63°
LOA = 84.33 dB
θ1 = 75.02° θ2 = 79.58° Δθ = 4.56°
LOA = 83.30 dB
θ1 = 84.90° θ2 = 89.23° Δθ = 4.33°
LOA = 82.76 dB
θ1 = 89.79° θ2 = 93.89° Δθ = 4.10°
LOA = 82.40 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000


Climb–to–Cruise Run 211
θ1 = 94.75° θ2 = 98.56° Δθ = 3.81°
LOA = 82.51 dB
θ1 = 104.57° θ2 = 107.87° Δθ = 3.30°
LOA = 83.50 dB
θ1 = 114.41° θ2 = 117.14° Δθ = 2.73°
LOA = 84.96 dB
θ1 = 124.35° θ2 = 126.50° Δθ = 2.15°
LOA = 87.26 dB
θ1 = 134.34° θ2 = 135.72° Δθ = 1.38°
LOA = 88.27 dB
θ1 = 144.36° θ2 = 145.21° Δθ = .85°
LOA = 86.28 dB
θ1 = 154.48° θ2 = 155.01° Δθ = .53°
LOA = 82.13 dB
θ1 = 164.64° θ2 = 164.84° Δθ = .20°
LOA = 74.39 dB
Ambient Spectra
LOA = 64.29 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

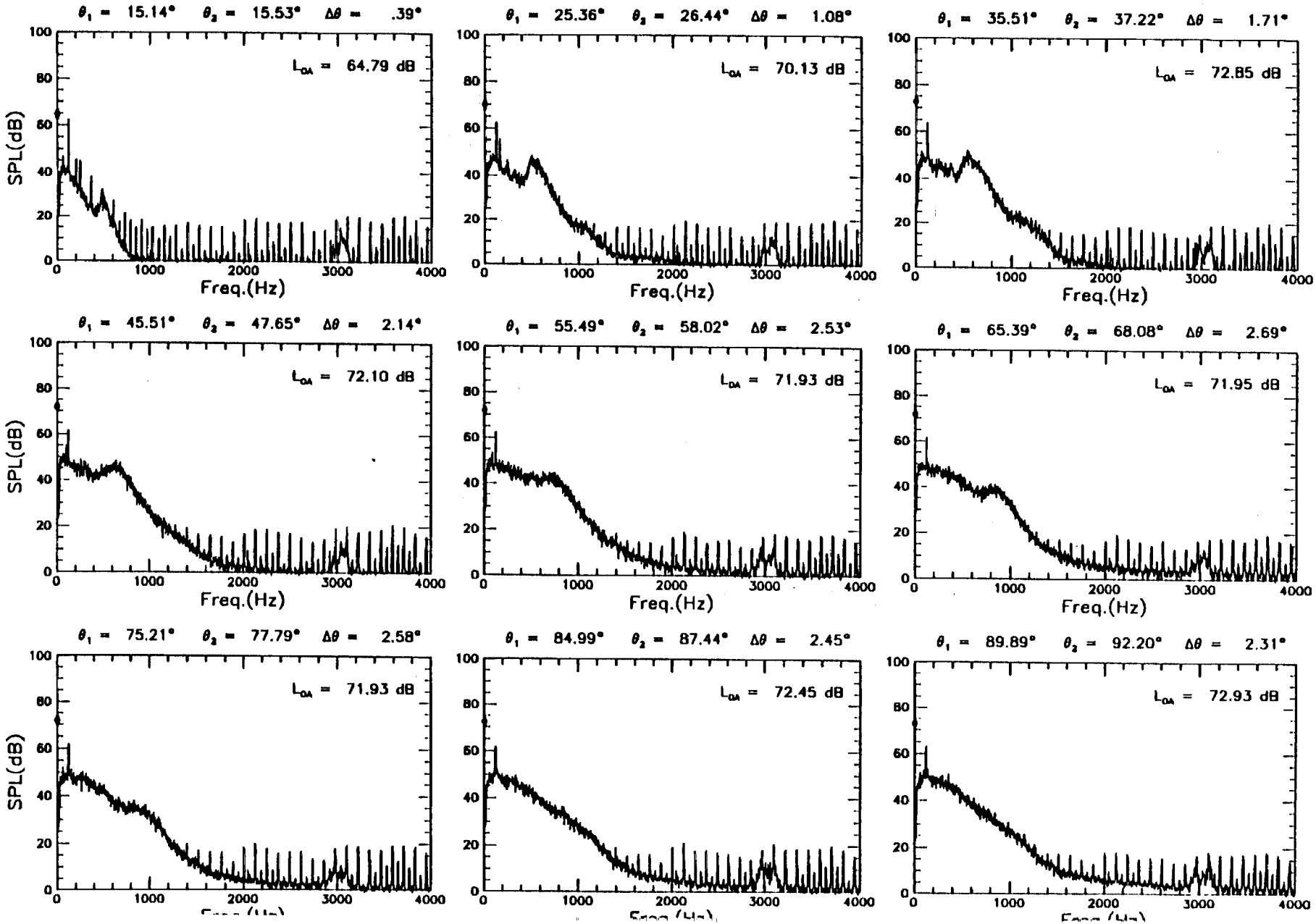
Climb–to–Cruise Run 305

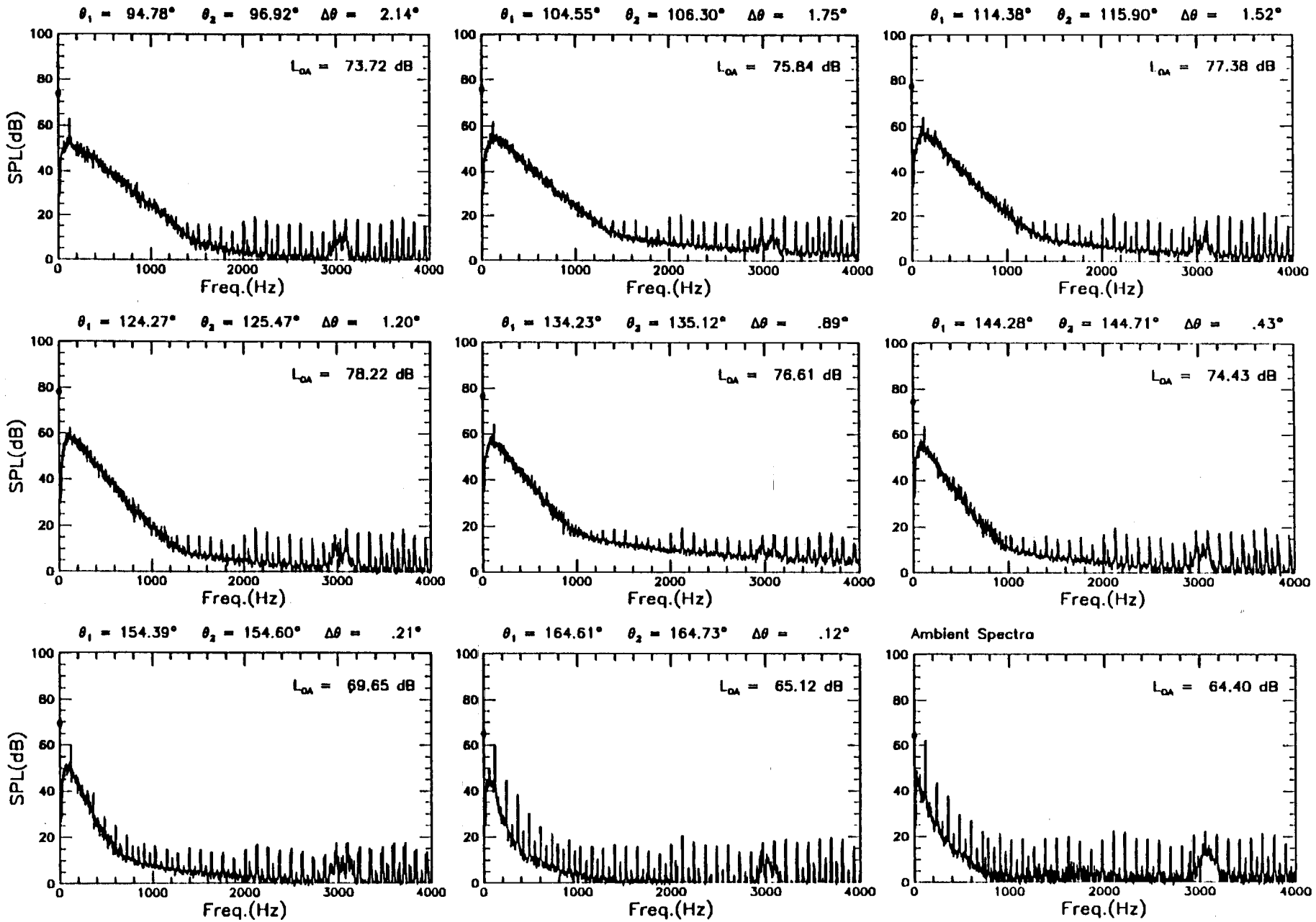


Climb–to–Cruise Run 305

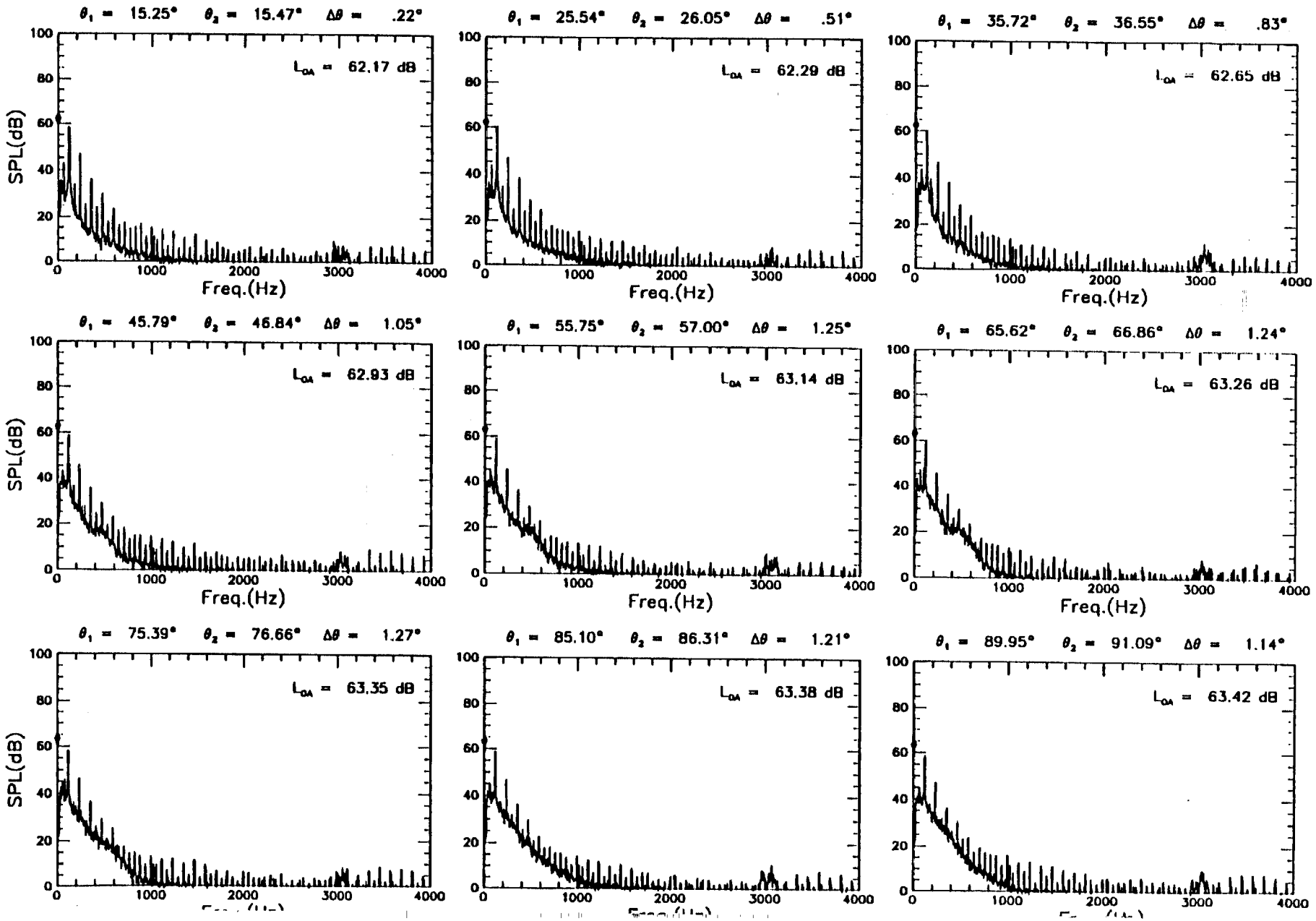


Climb–to–Cruise Run 315

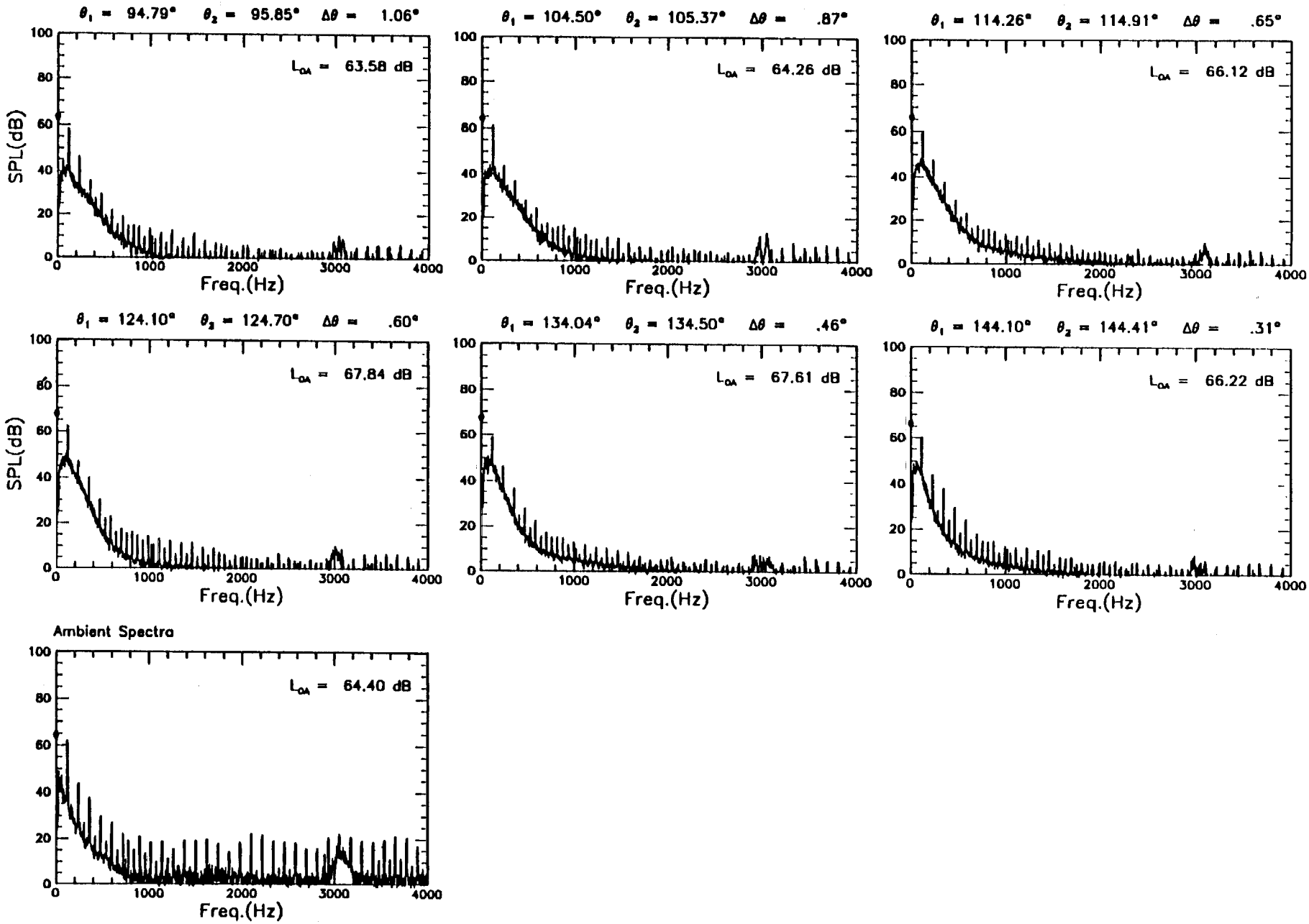



θ1 = 94.78° θ2 = 96.92° Δθ = 2.14°
L_OA = 73.72 dB
θ1 = 104.55° θ2 = 106.30° Δθ = 1.75°
L_OA = 75.84 dB
θ1 = 114.38° θ2 = 115.90° Δθ = 1.52°
L_OA = 77.38 dB
θ1 = 124.27° θ2 = 125.47° Δθ = 1.20°
L_OA = 78.22 dB
θ1 = 134.23° θ2 = 135.12° Δθ = .89°
L_OA = 76.61 dB
θ1 = 144.28° θ2 = 144.71° Δθ = .43°
L_OA = 74.43 dB
θ1 = 154.39° θ2 = 154.60° Δθ = .21°
L_OA = 69.65 dB
θ1 = 164.61° θ2 = 164.73° Δθ = .12°
L_OA = 65.12 dB
Ambient Spectra
L_OA = 64.40 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

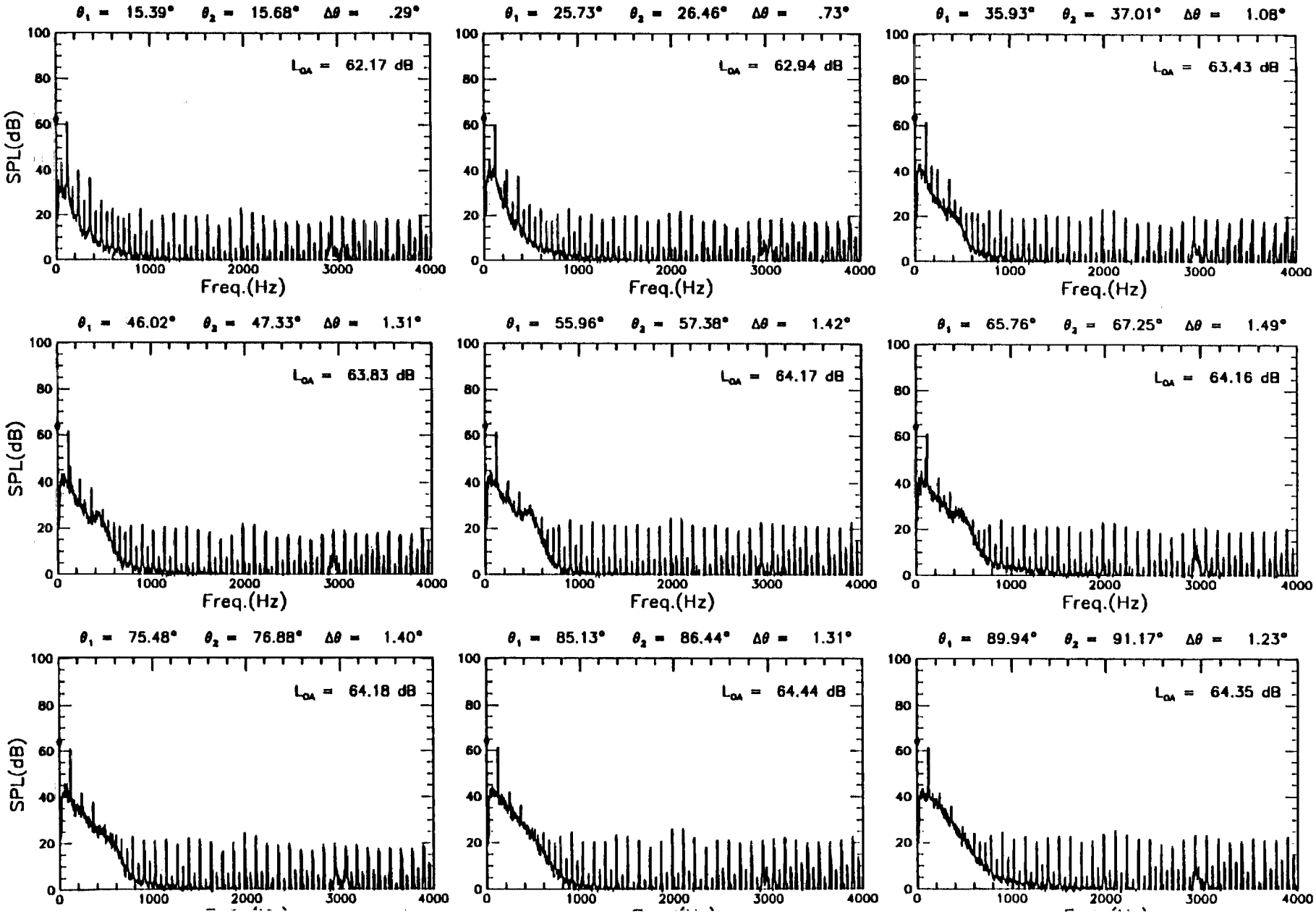
Climb–to–Cruise Run 409



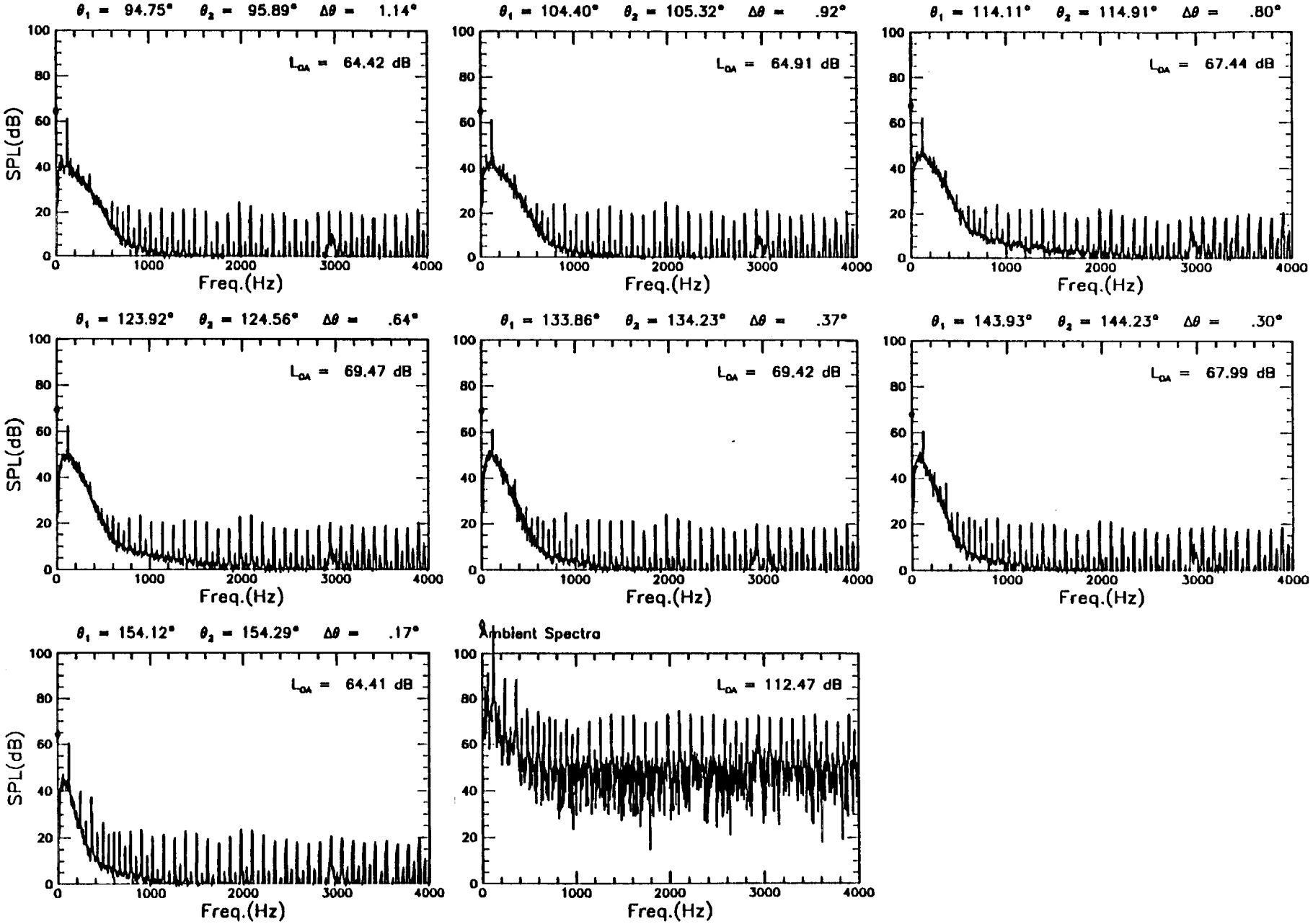
Climb–to–Cruise Run 409



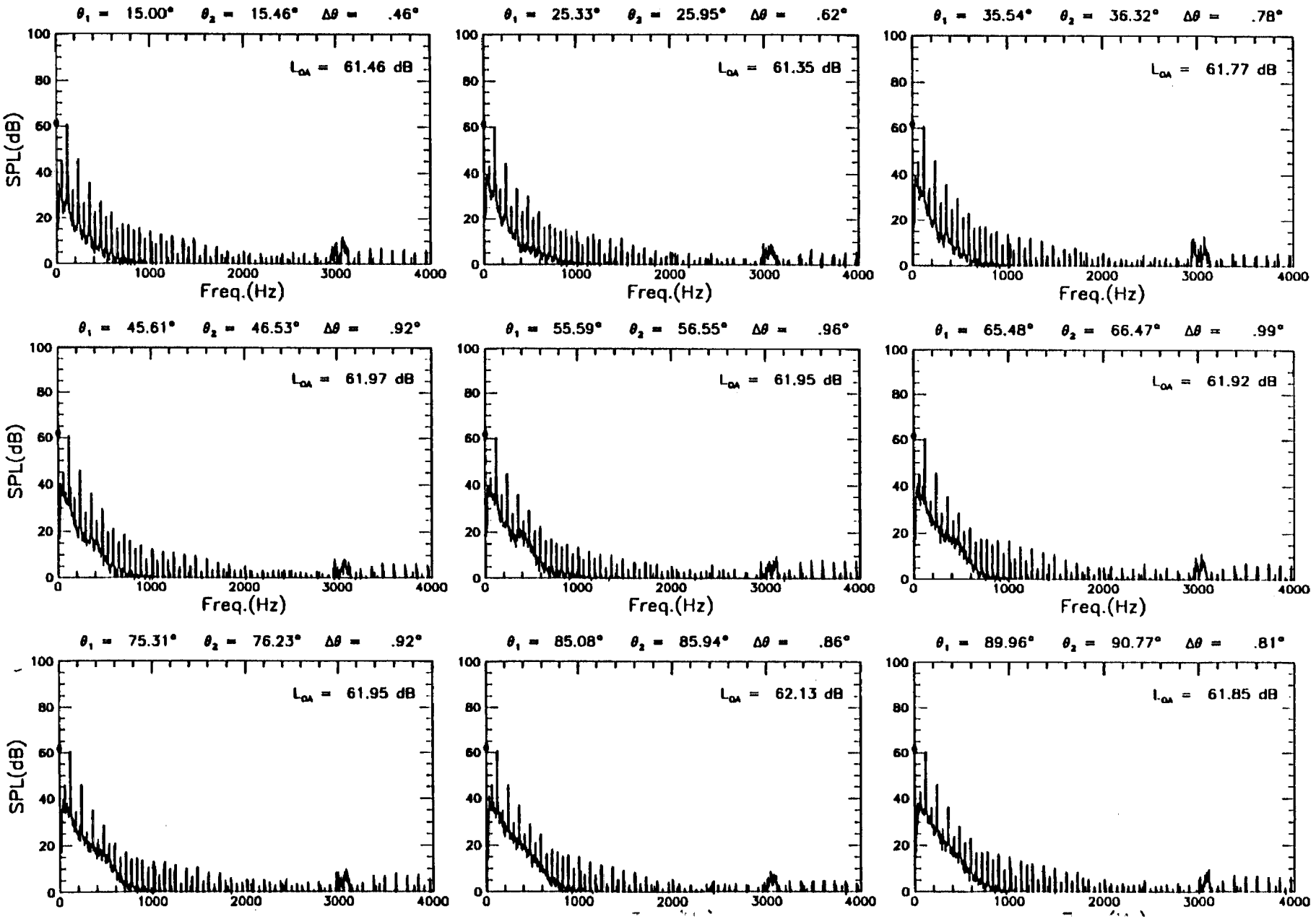
Climb–to–Cruise Run 411



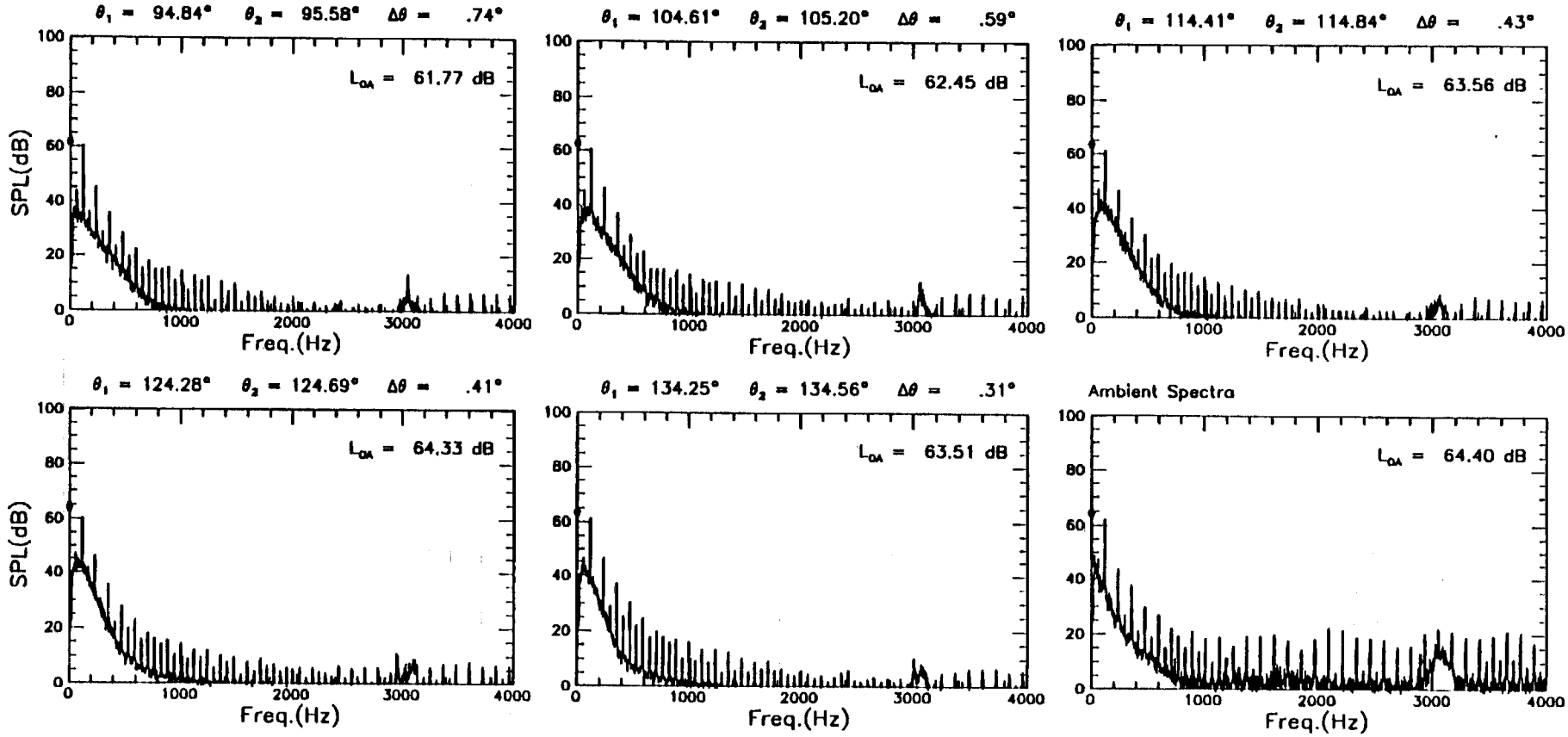
Climb–to–Cruise Run 411



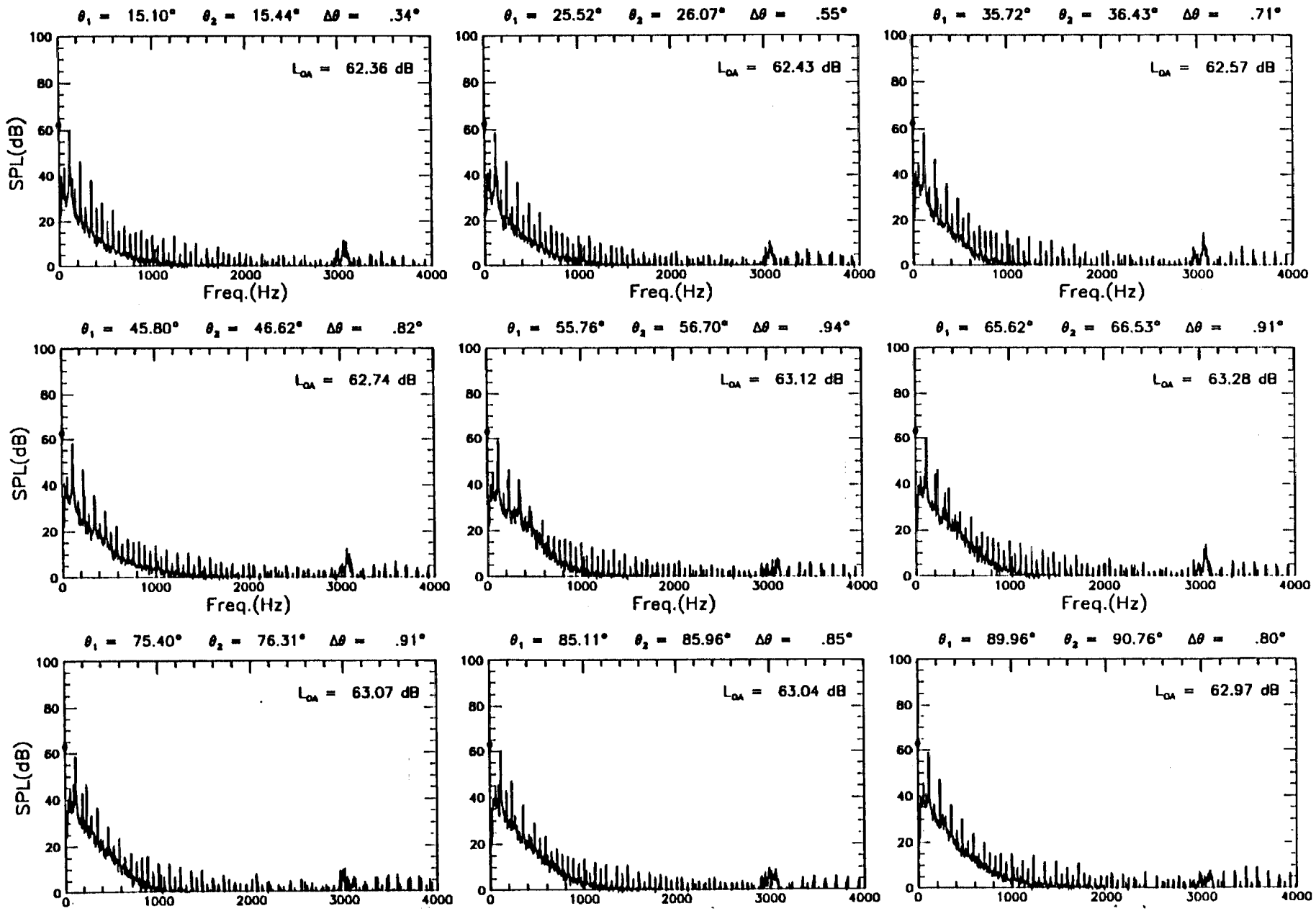
Climb–to–Cruise Run 504



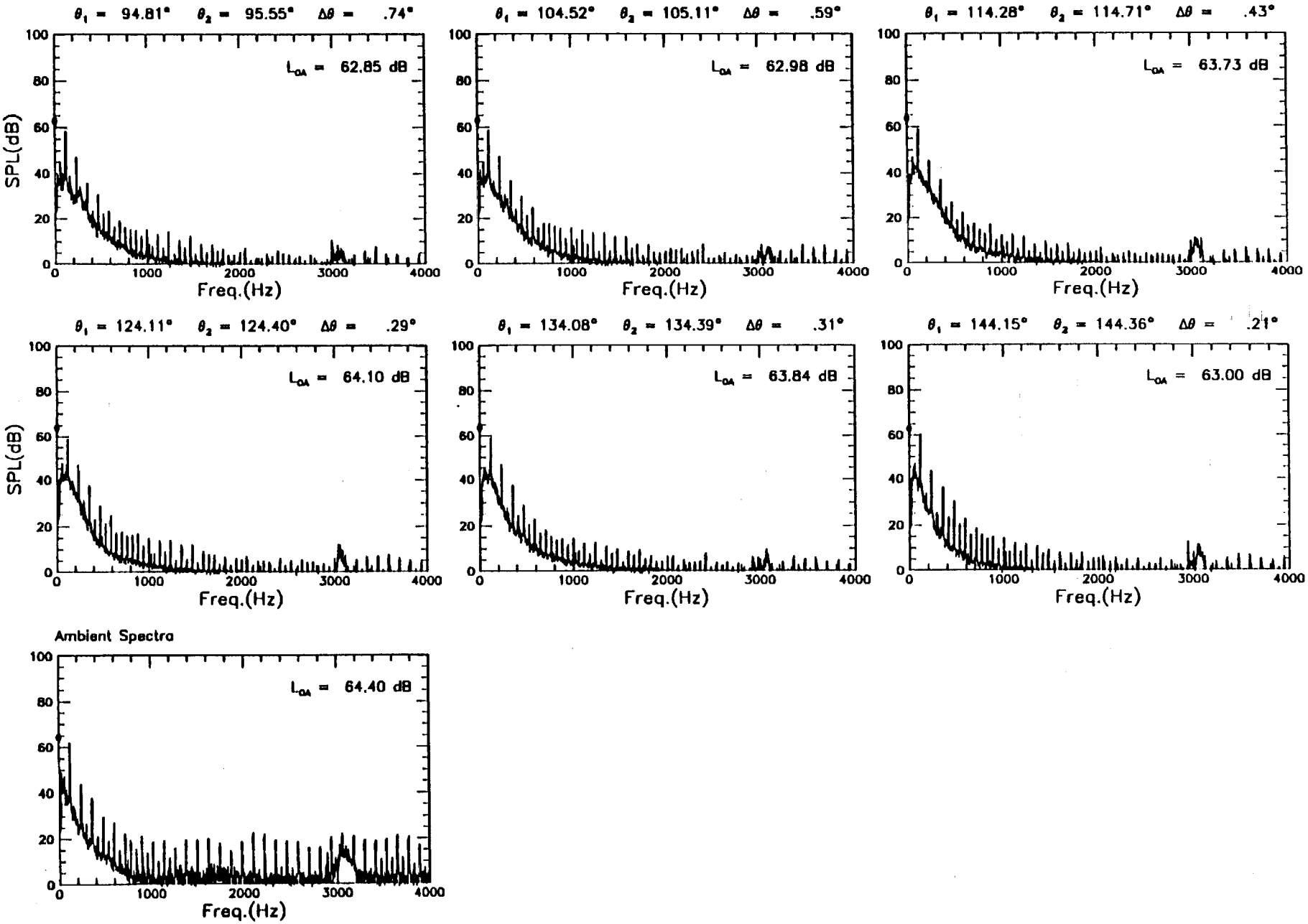
Climb-to-Cruise Run 504



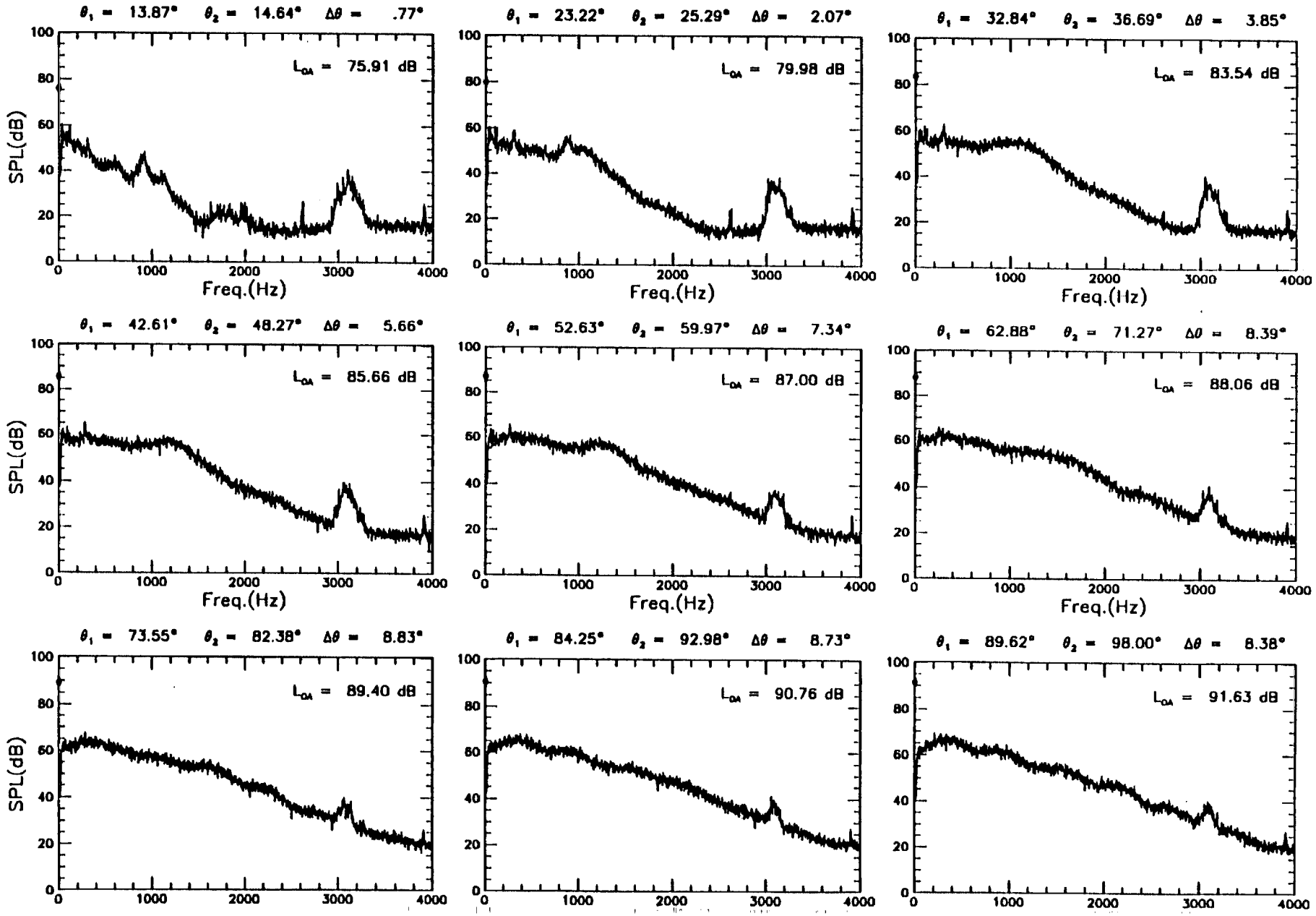
Climb–to–Cruise Run 505

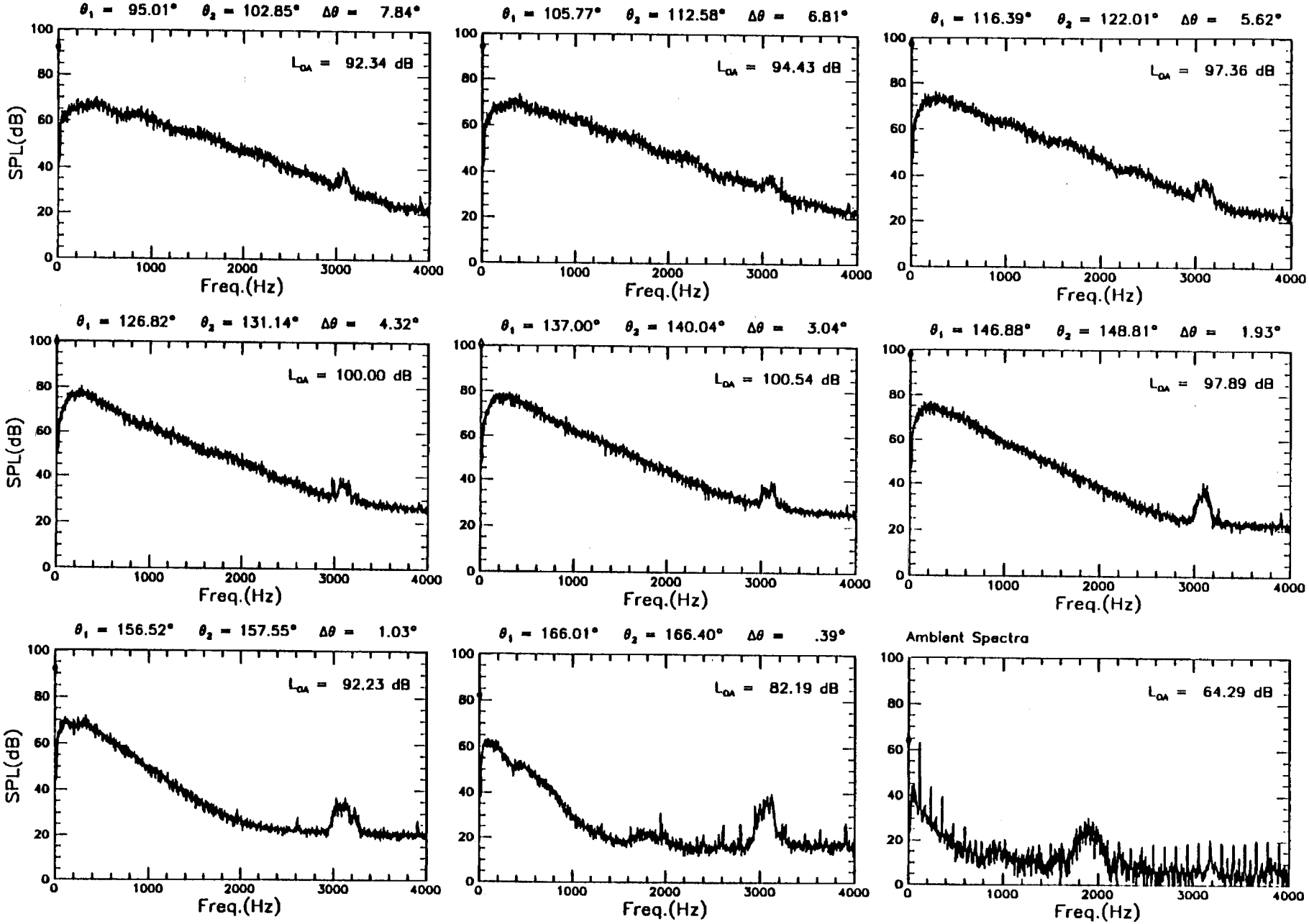


Climb–to–Cruise Run 505

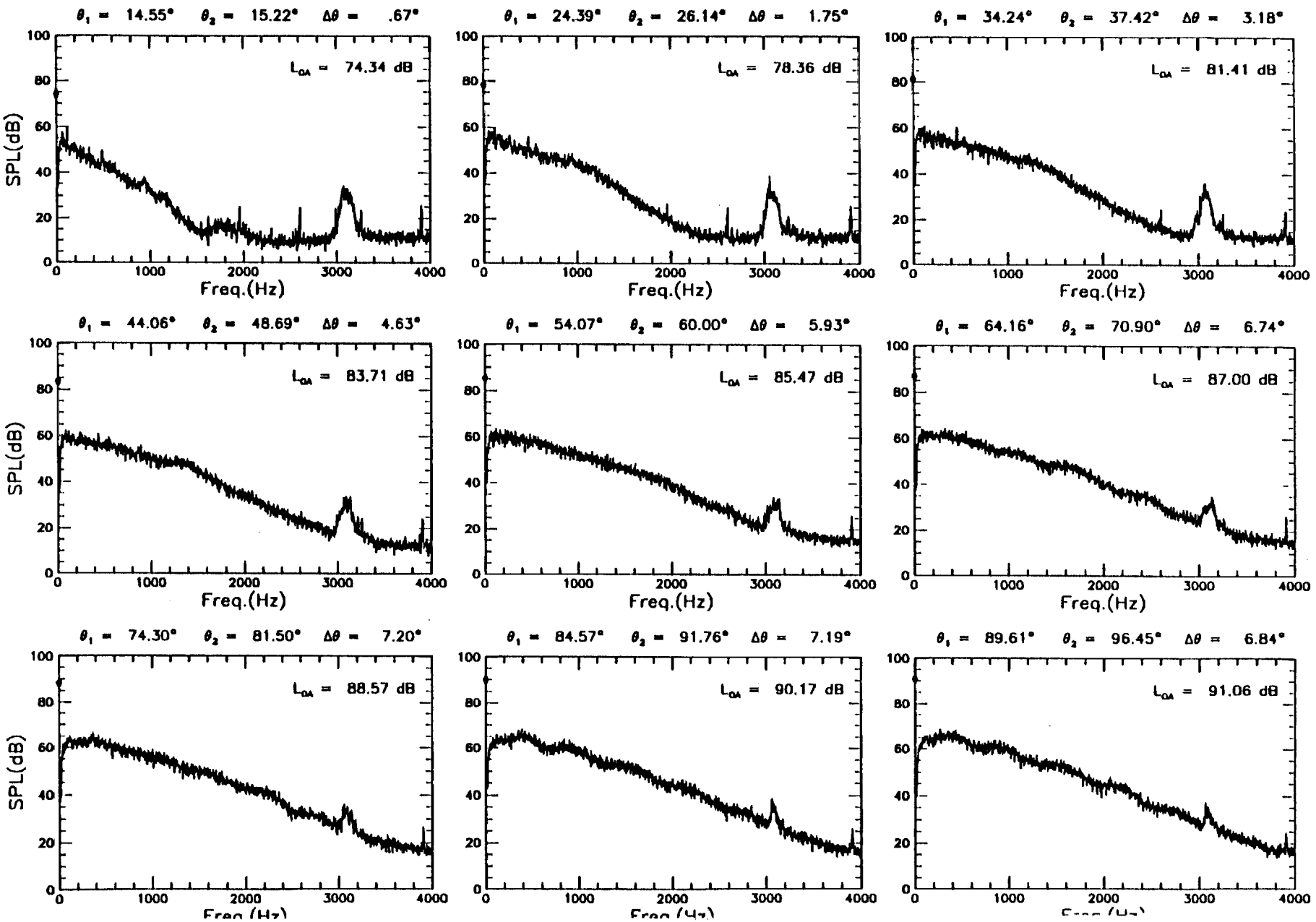


Climb–to–Cruise Run 600

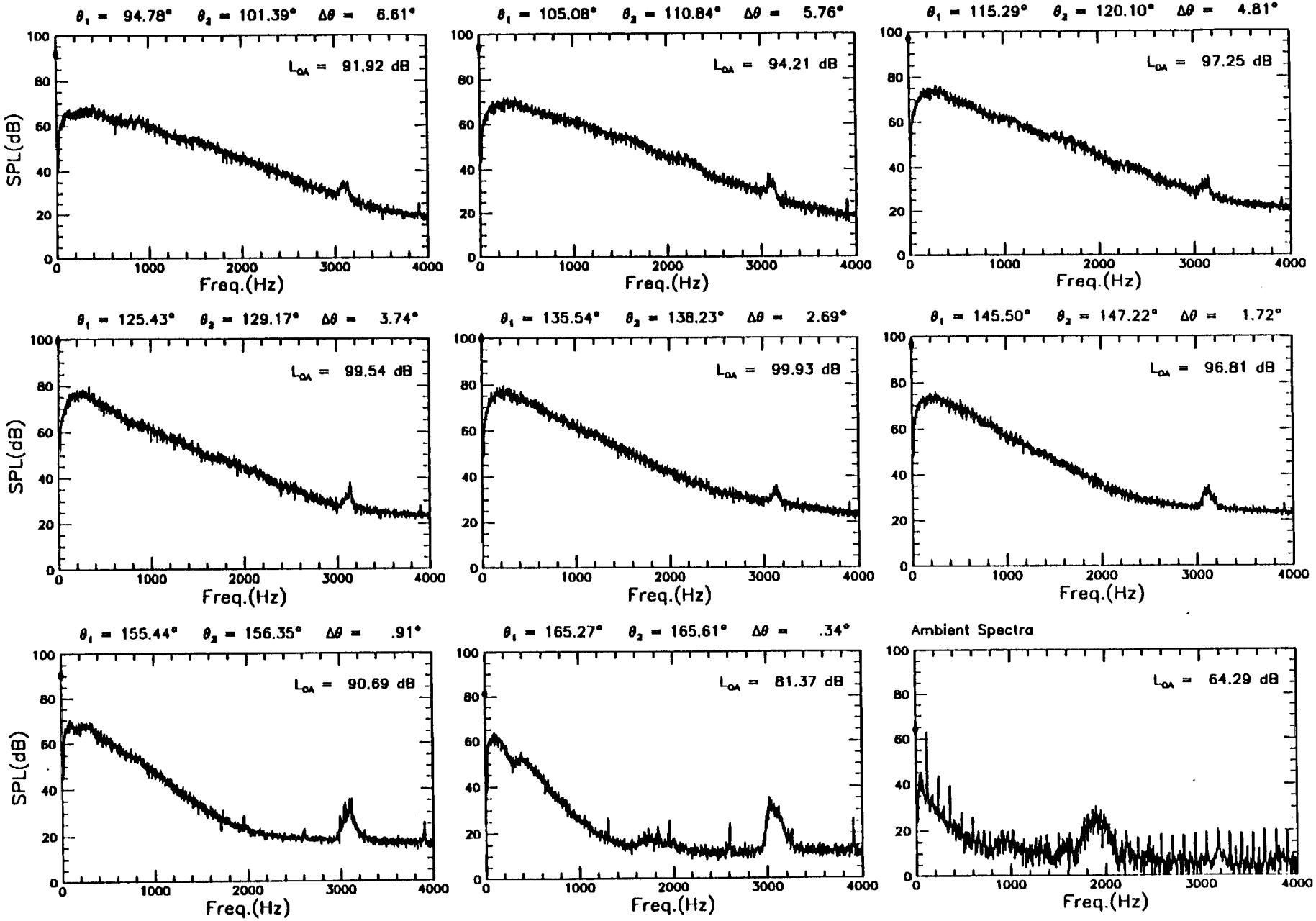



θ1 = 95.01° θ2 = 102.85° Δθ = 7.84°
L_OA = 92.34 dB
θ1 = 105.77° θ2 = 112.58° Δθ = 6.81°
L_OA = 94.43 dB
θ1 = 116.39° θ2 = 122.01° Δθ = 5.62°
L_OA = 97.36 dB
θ1 = 126.82° θ2 = 131.14° Δθ = 4.32°
L_OA = 100.00 dB
θ1 = 137.00° θ2 = 140.04° Δθ = 3.04°
L_OA = 100.54 dB
θ1 = 146.88° θ2 = 148.81° Δθ = 1.93°
L_OA = 97.89 dB
θ1 = 156.52° θ2 = 157.55° Δθ = 1.03°
L_OA = 92.23 dB
θ1 = 166.01° θ2 = 166.40° Δθ = .39°
L_OA = 82.19 dB
Ambient Spectra
L_OA = 64.29 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

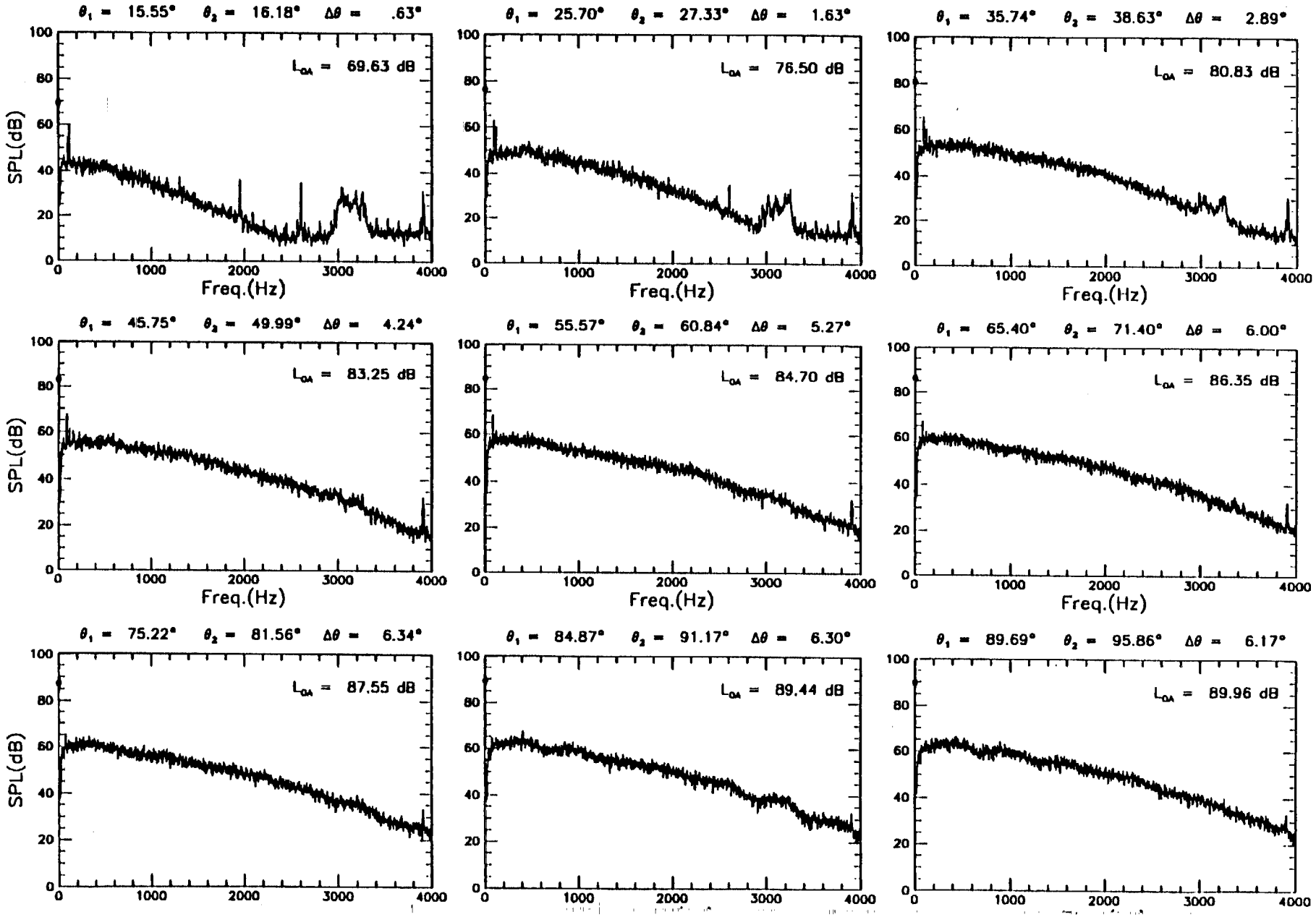
Climb–to–Cruise Run 601



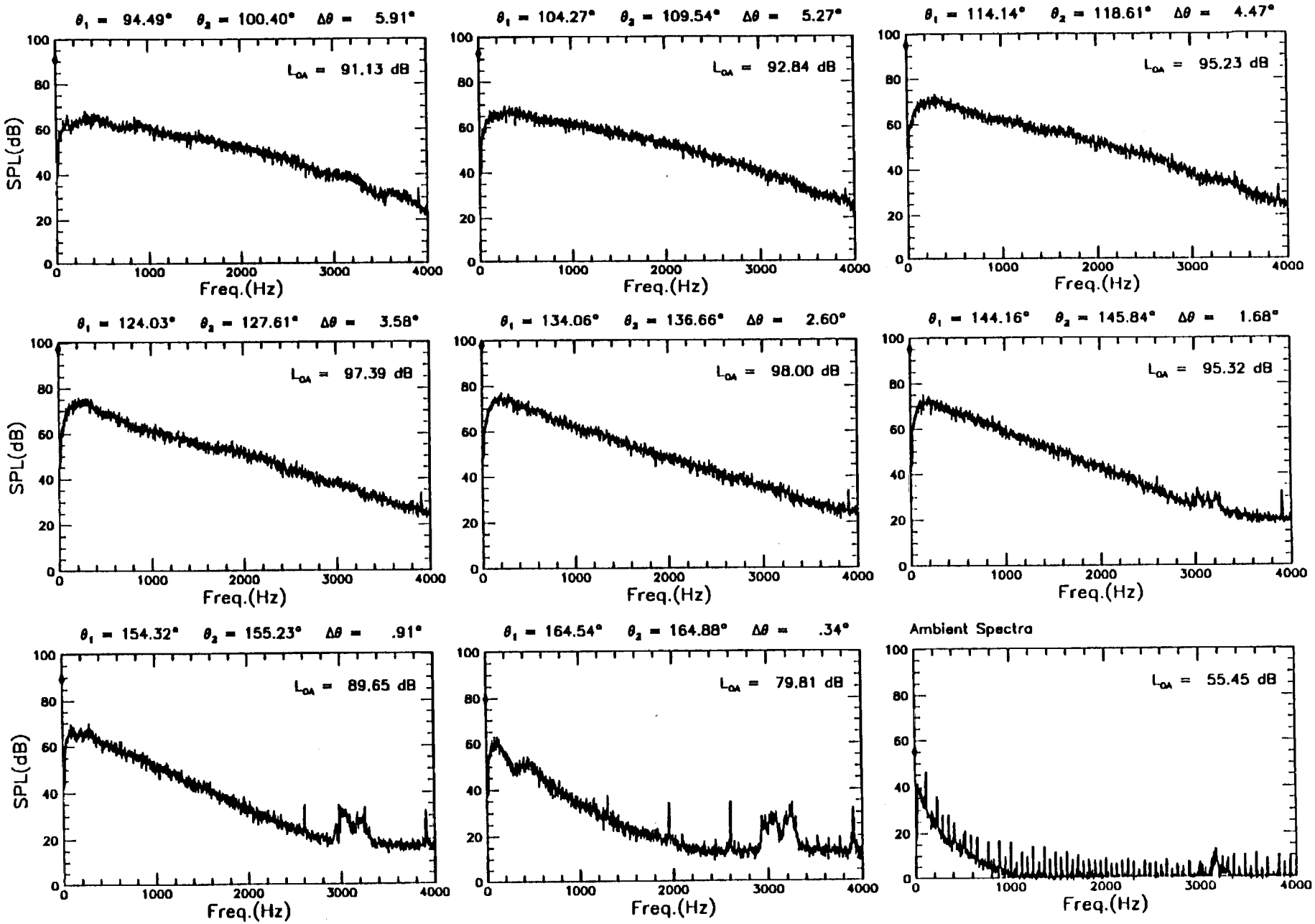
Climb–to–Cruise Run 601



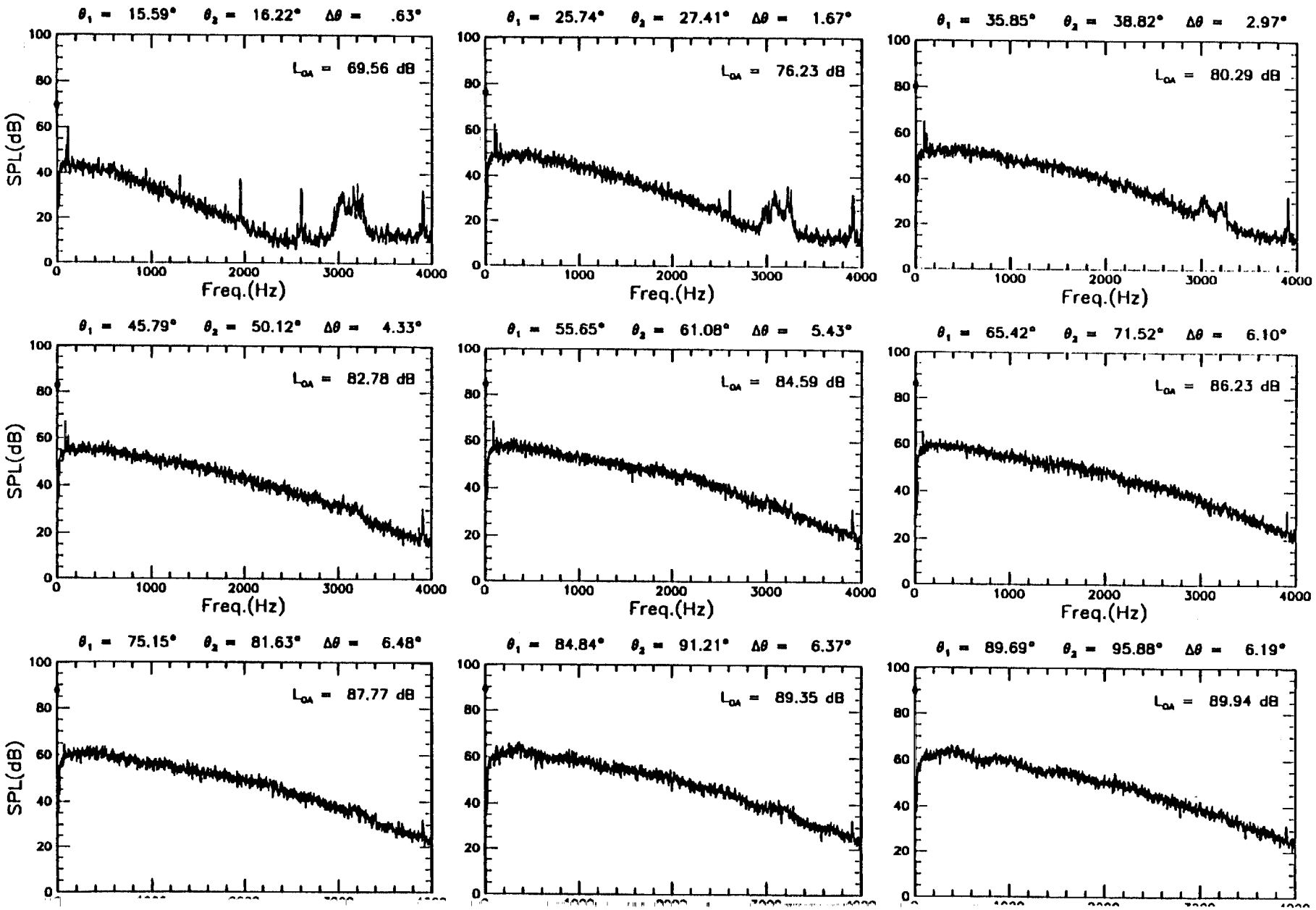
Climb–to–Cruise Run 603



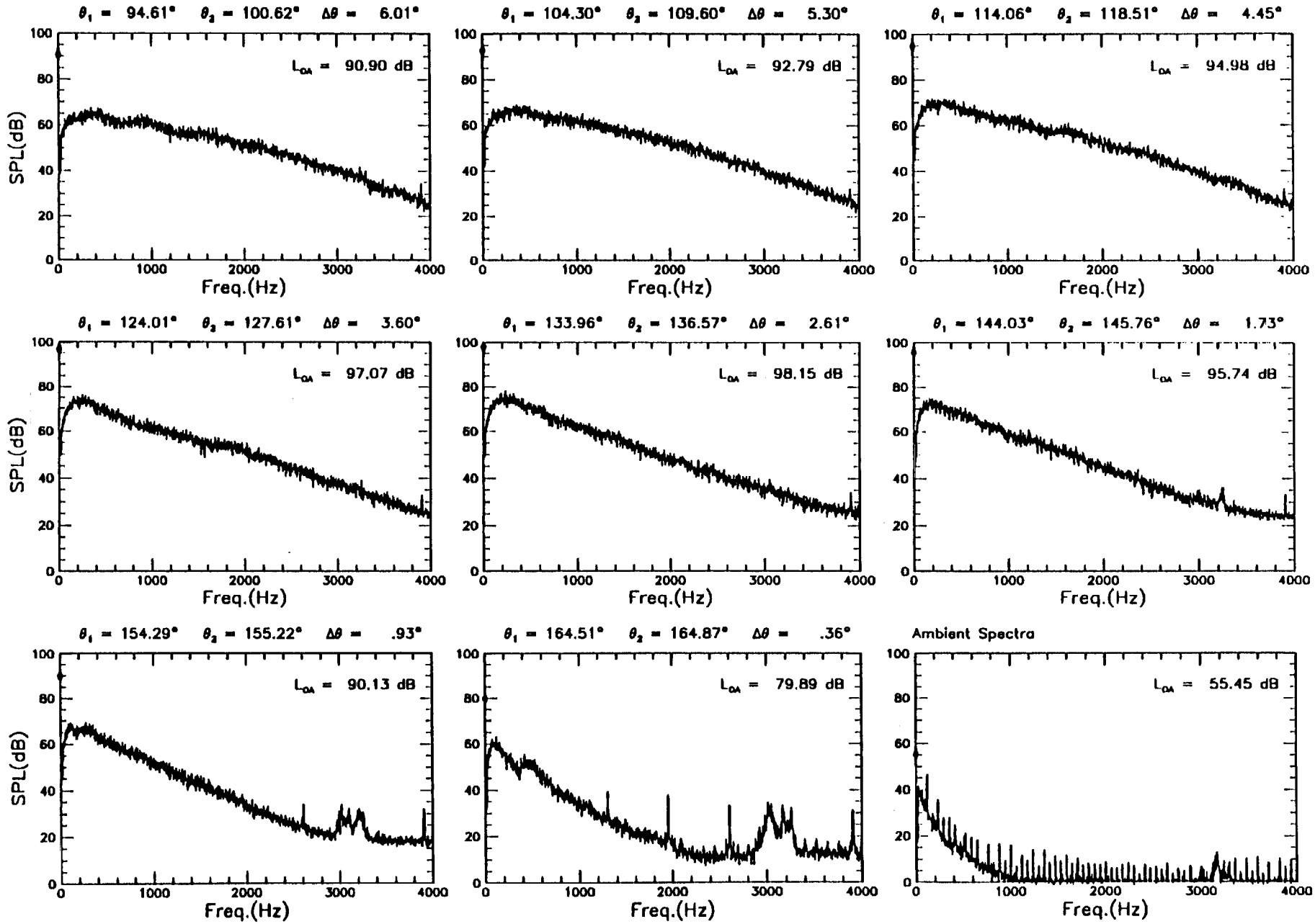
Climb–to–Cruise Run 603



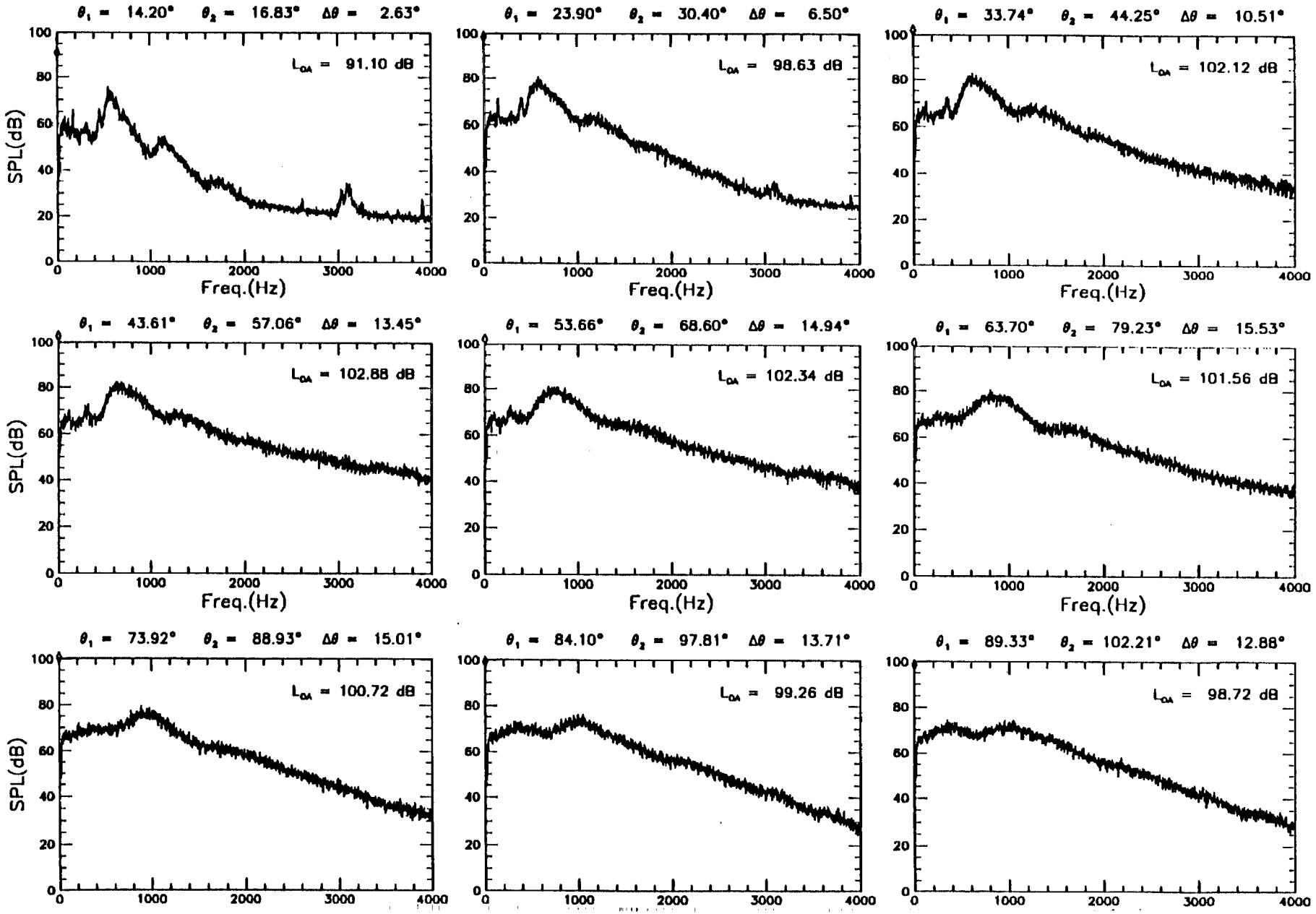
Climb–to–Cruise Run 604

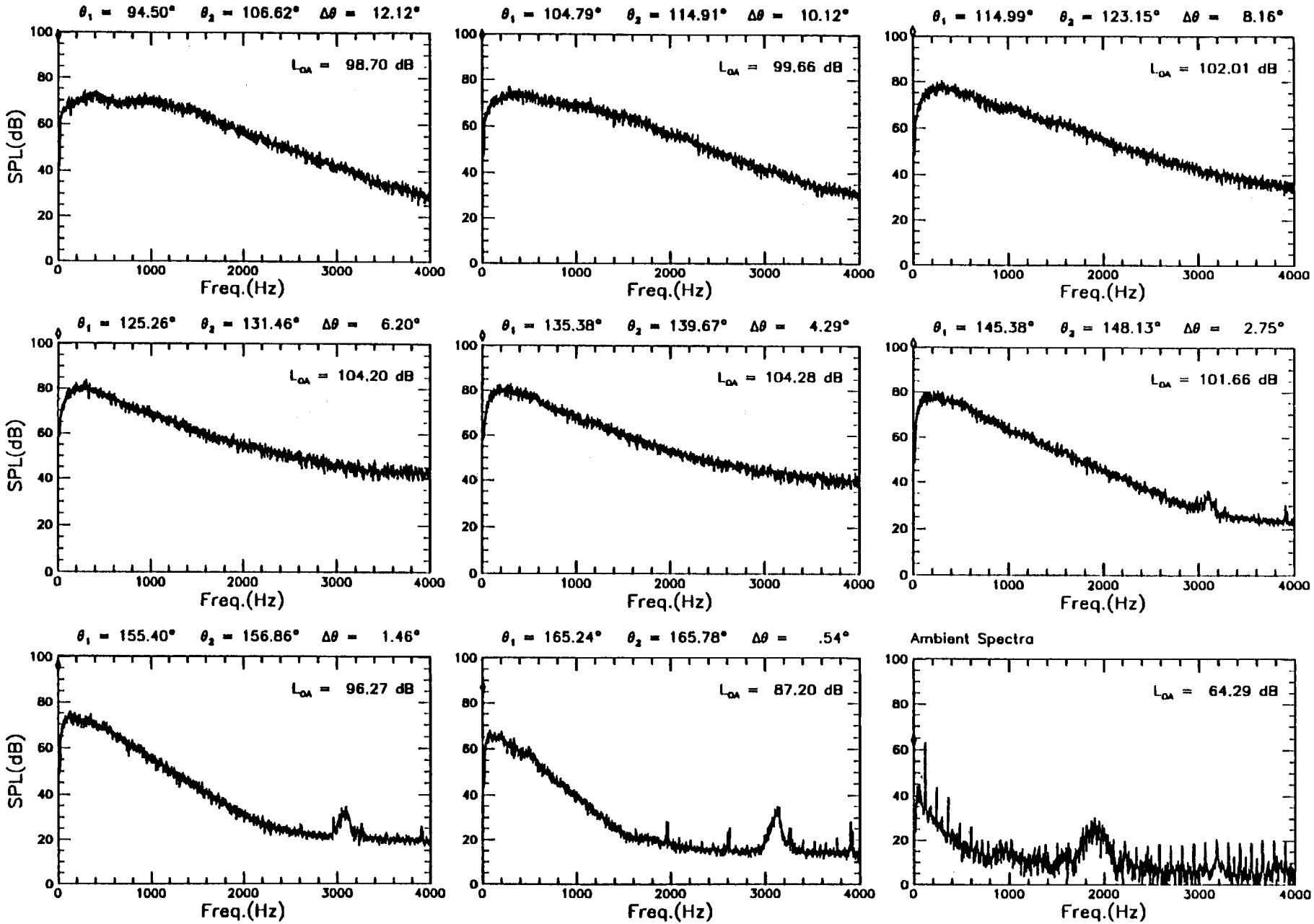


Climb–to–Cruise Run 604

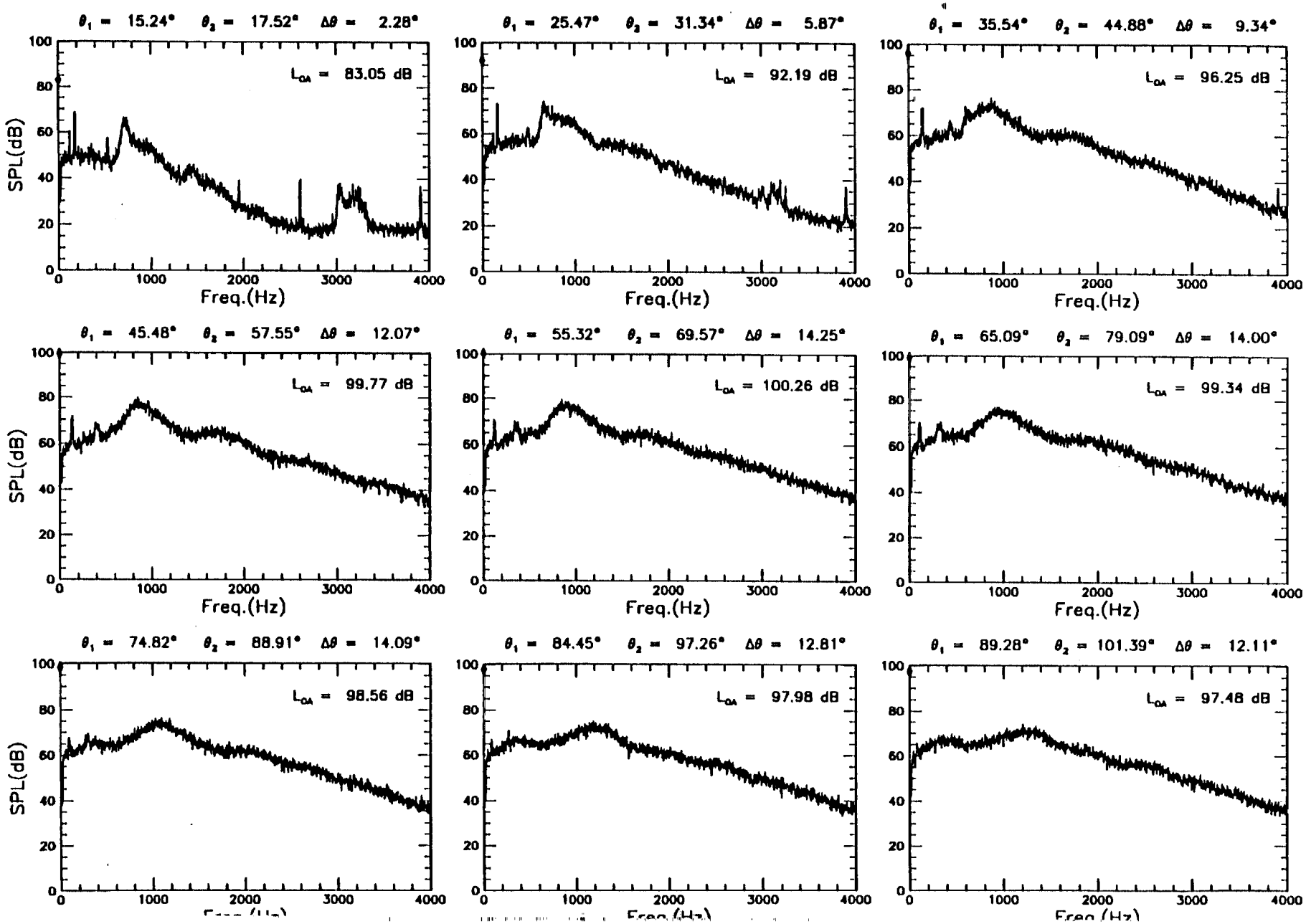


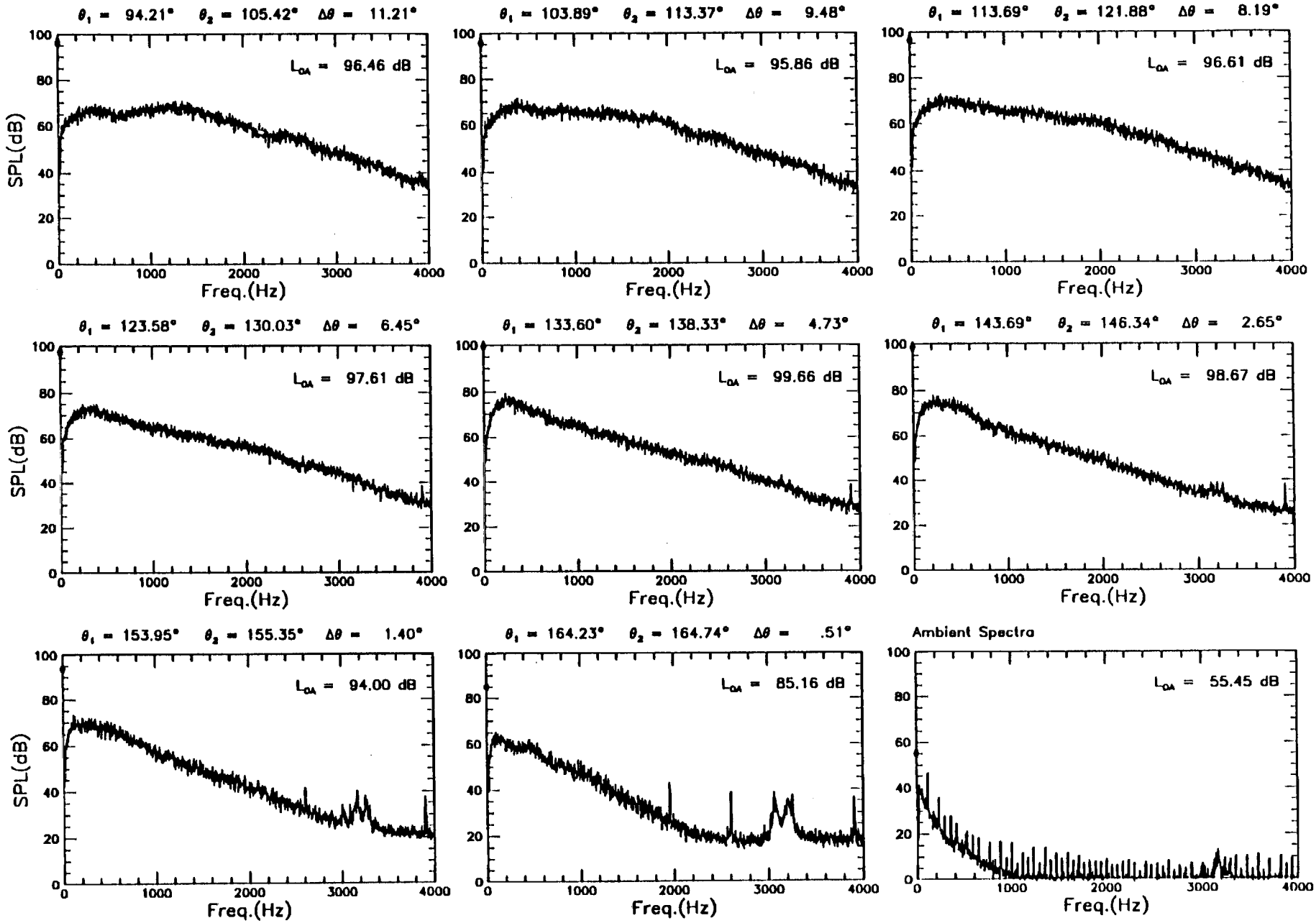
Climb–to–Cruise Run 610



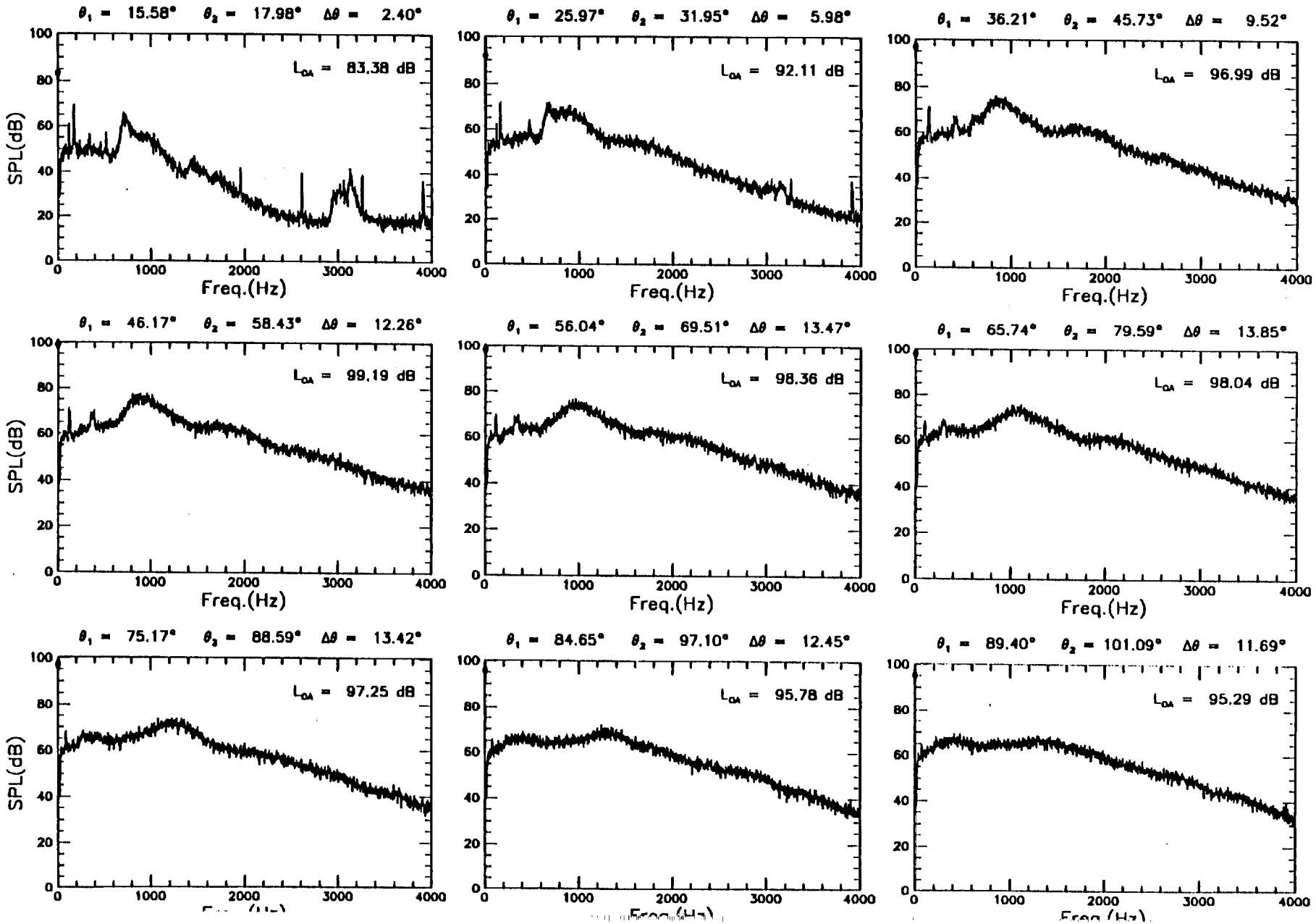

θ1 = 94.50° θ2 = 106.62° Δθ = 12.12°
LOA = 98.70 dB
θ1 = 104.79° θ2 = 114.91° Δθ = 10.12°
LOA = 99.66 dB
θ1 = 114.99° θ2 = 123.15° Δθ = 8.16°
LOA = 102.01 dB
θ1 = 125.26° θ2 = 131.46° Δθ = 6.20°
LOA = 104.20 dB
θ1 = 135.38° θ2 = 139.67° Δθ = 4.29°
LOA = 104.28 dB
θ1 = 145.38° θ2 = 148.13° Δθ = 2.75°
LOA = 101.66 dB
θ1 = 155.40° θ2 = 156.86° Δθ = 1.46°
LOA = 96.27 dB
θ1 = 165.24° θ2 = 165.78° Δθ = .54°
LOA = 87.20 dB
Ambient Spectra
LOA = 64.29 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

Climb–to–Cruise Run 612

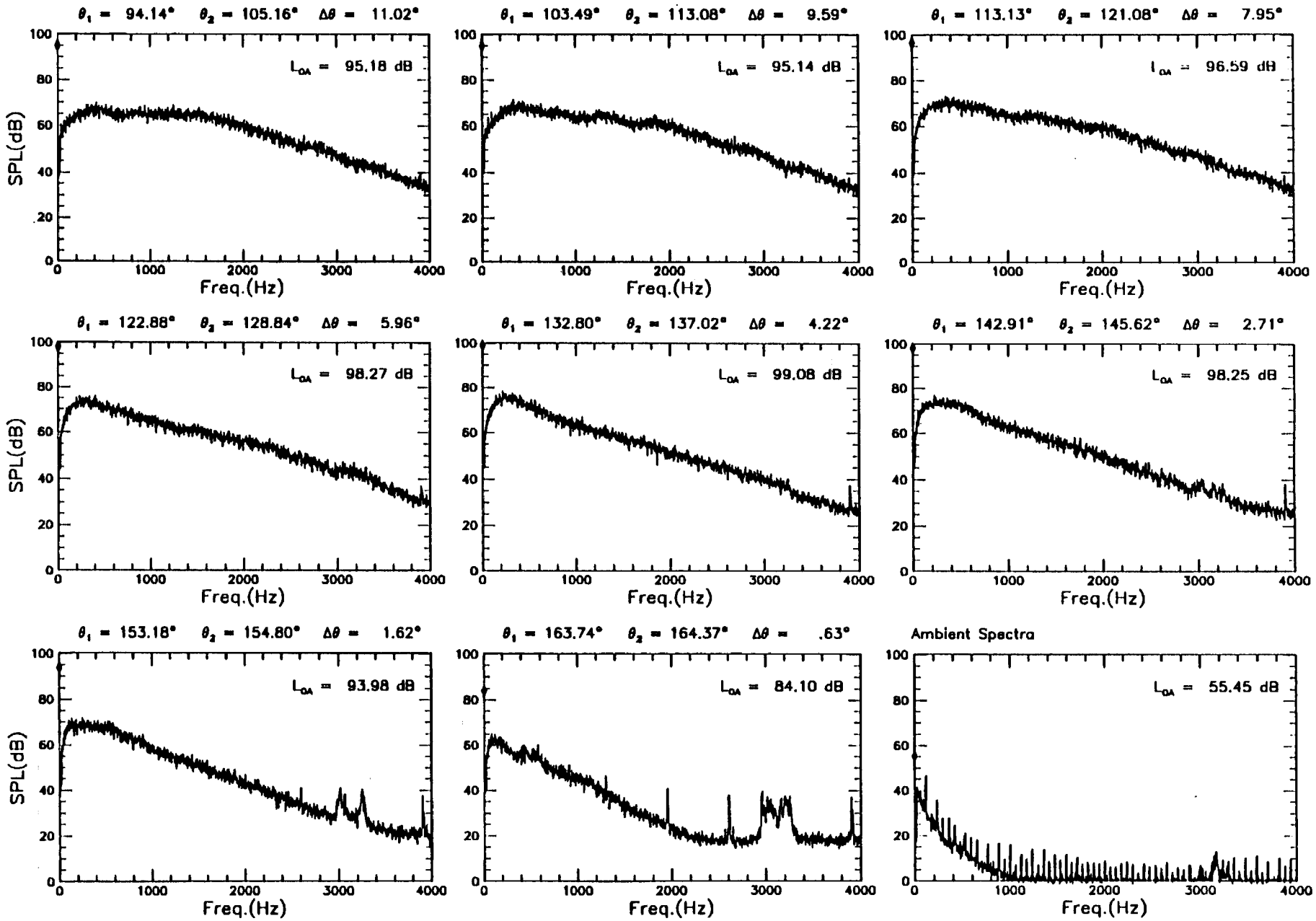



θ1 = 94.21° θ2 = 105.42° Δθ = 11.21°
L_OA = 96.46 dB
θ1 = 103.89° θ2 = 113.37° Δθ = 9.48°
L_OA = 95.86 dB
θ1 = 113.69° θ2 = 121.88° Δθ = 8.19°
L_OA = 96.61 dB
θ1 = 123.58° θ2 = 130.03° Δθ = 6.45°
L_OA = 97.61 dB
θ1 = 133.60° θ2 = 138.33° Δθ = 4.73°
L_OA = 99.66 dB
θ1 = 143.69° θ2 = 146.34° Δθ = 2.65°
L_OA = 98.67 dB
θ1 = 153.95° θ2 = 155.35° Δθ = 1.40°
L_OA = 94.00 dB
θ1 = 164.23° θ2 = 164.74° Δθ = .51°
L_OA = 85.16 dB
Ambient Spectra
L_OA = 55.45 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

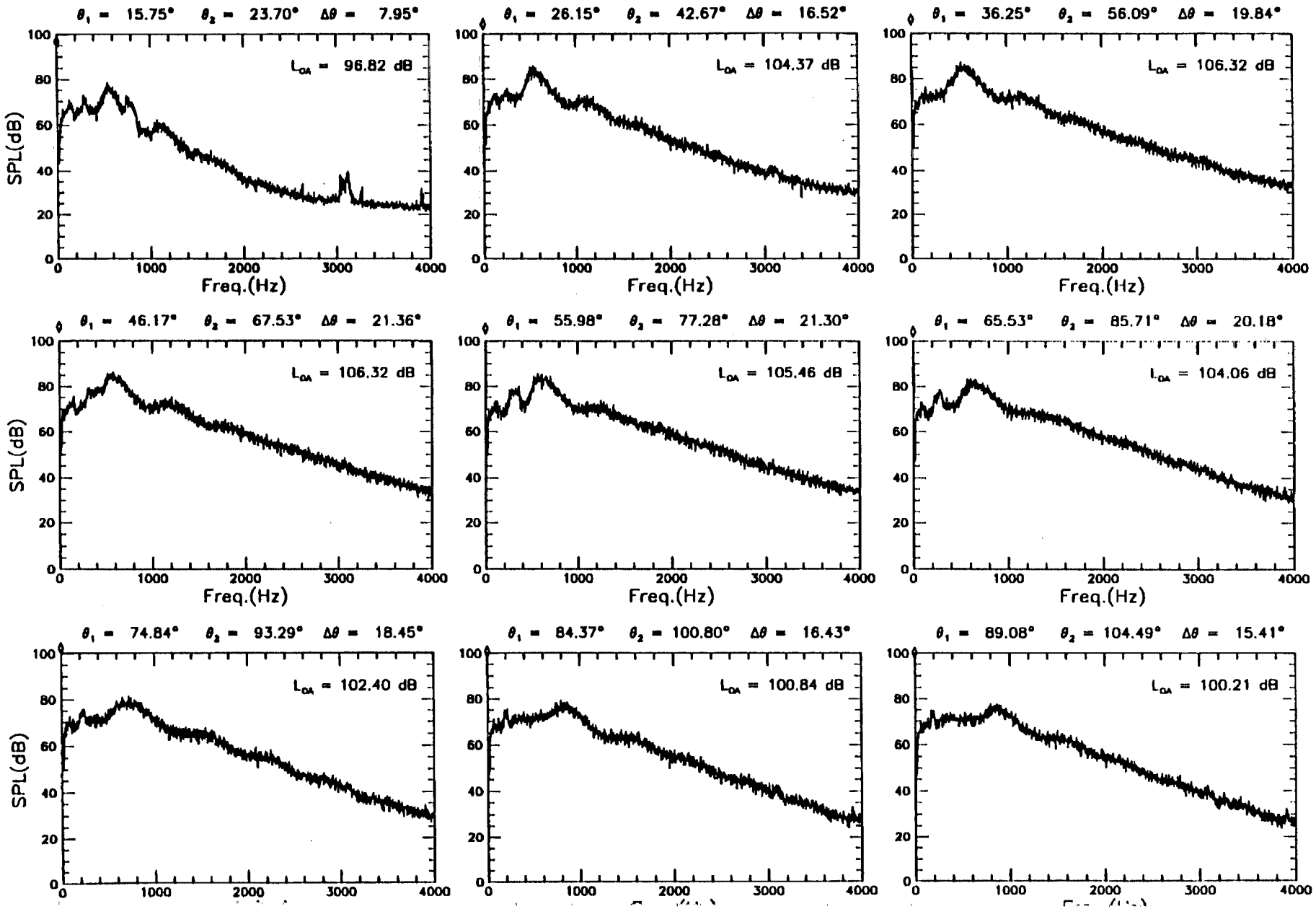
Climb–to–Cruise Run 613



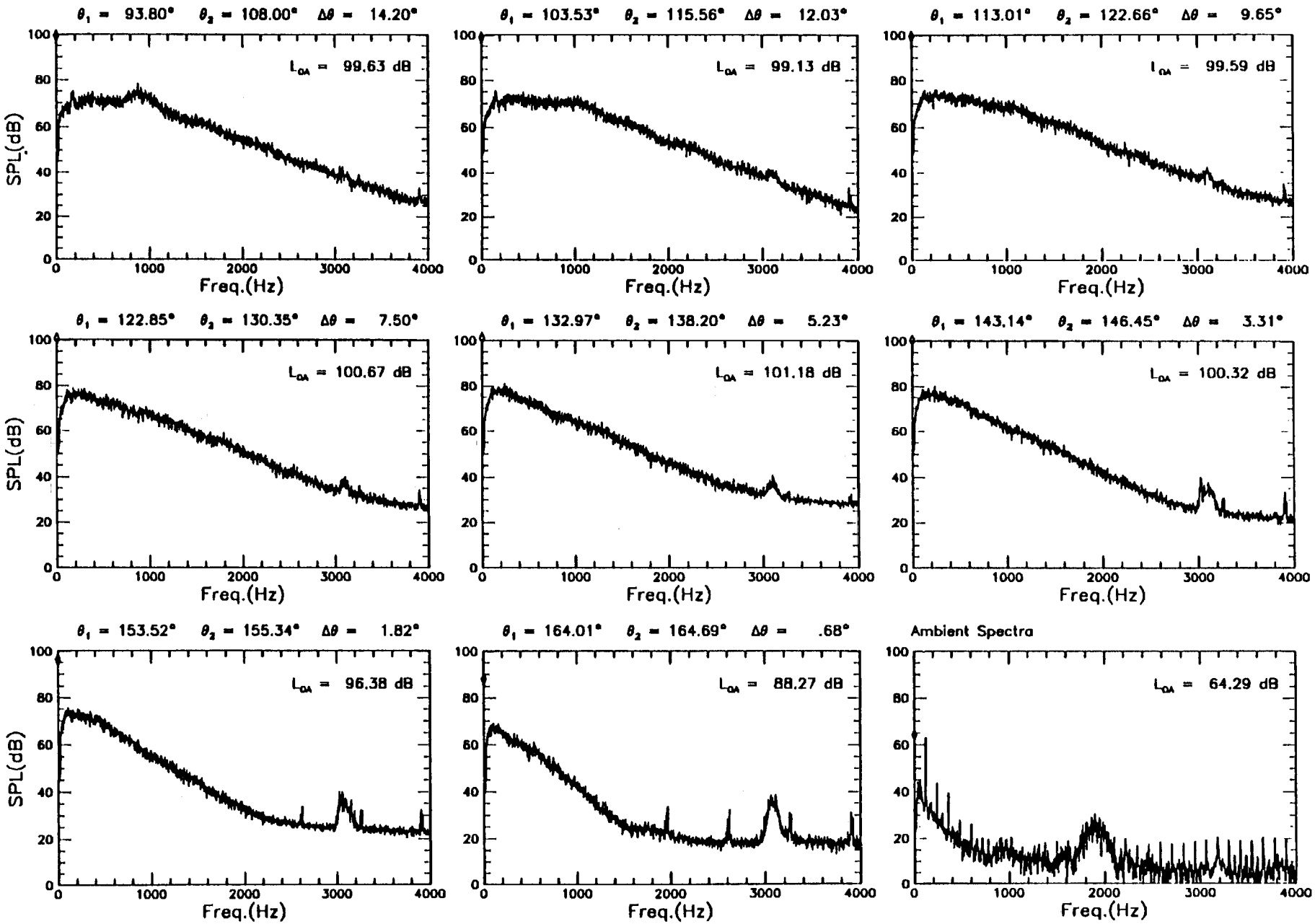
Climb–to–Cruise Run 613

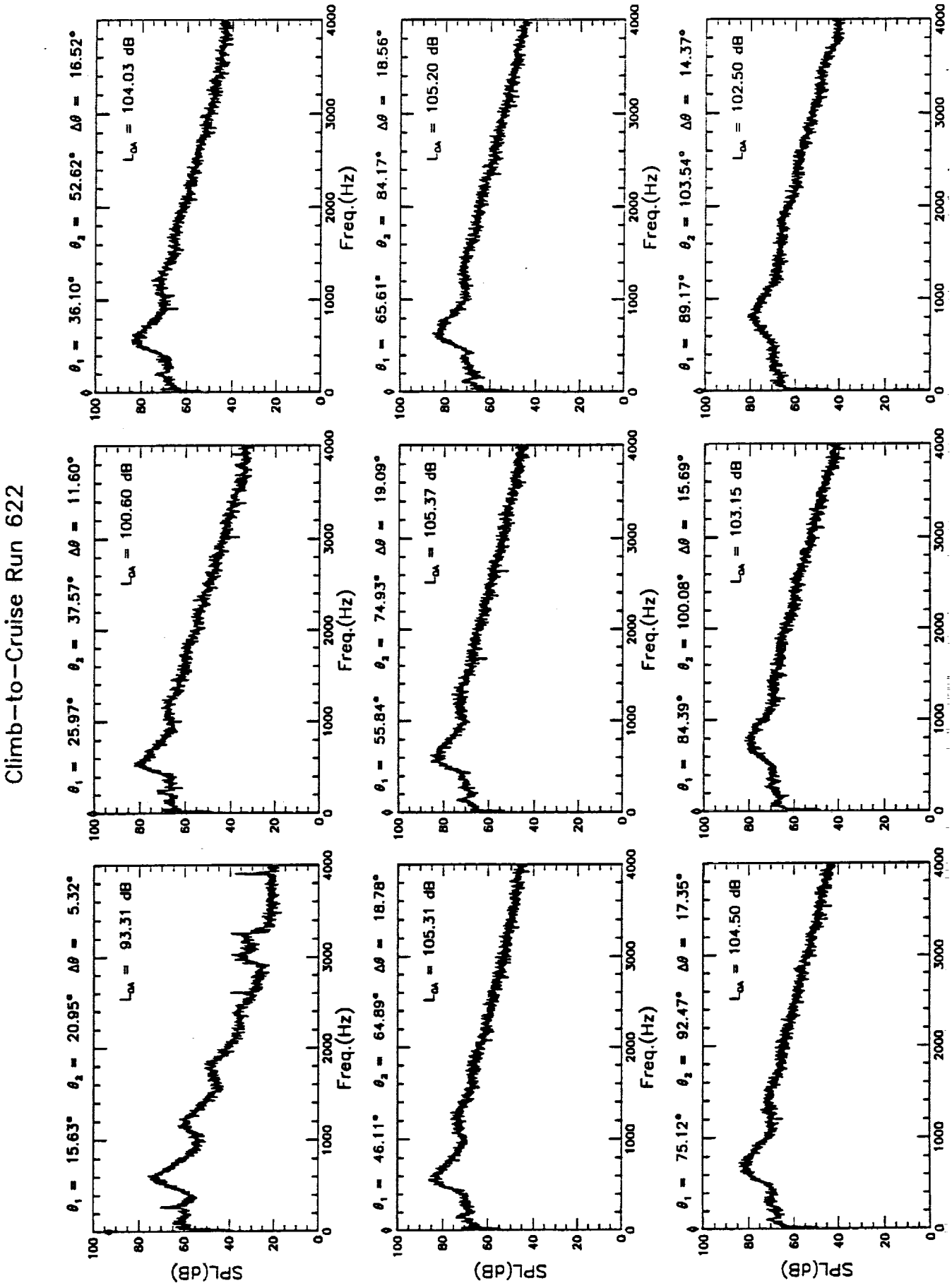


Climb–to–Cruise Run 621

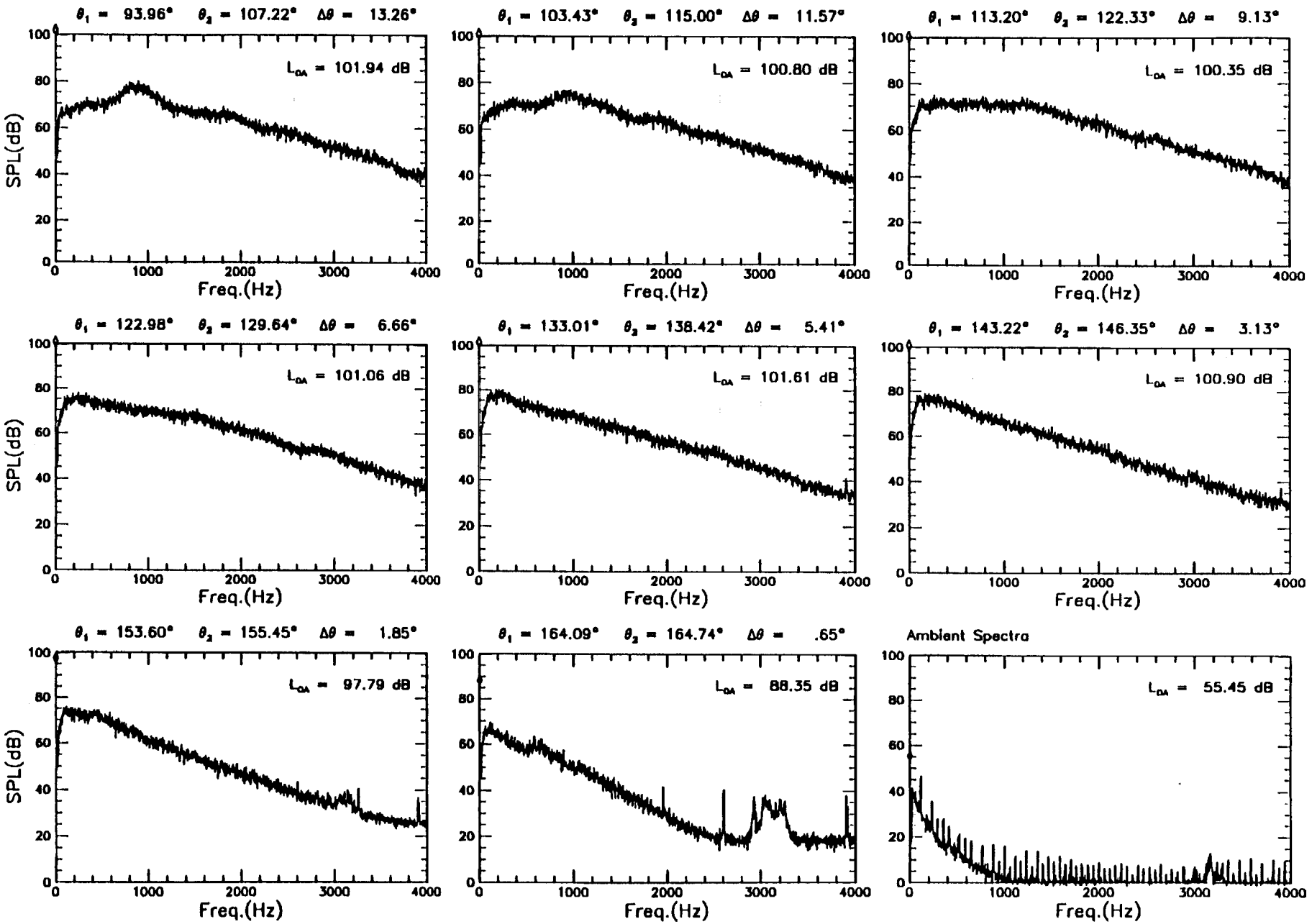


Climb–to–Cruise Run 621

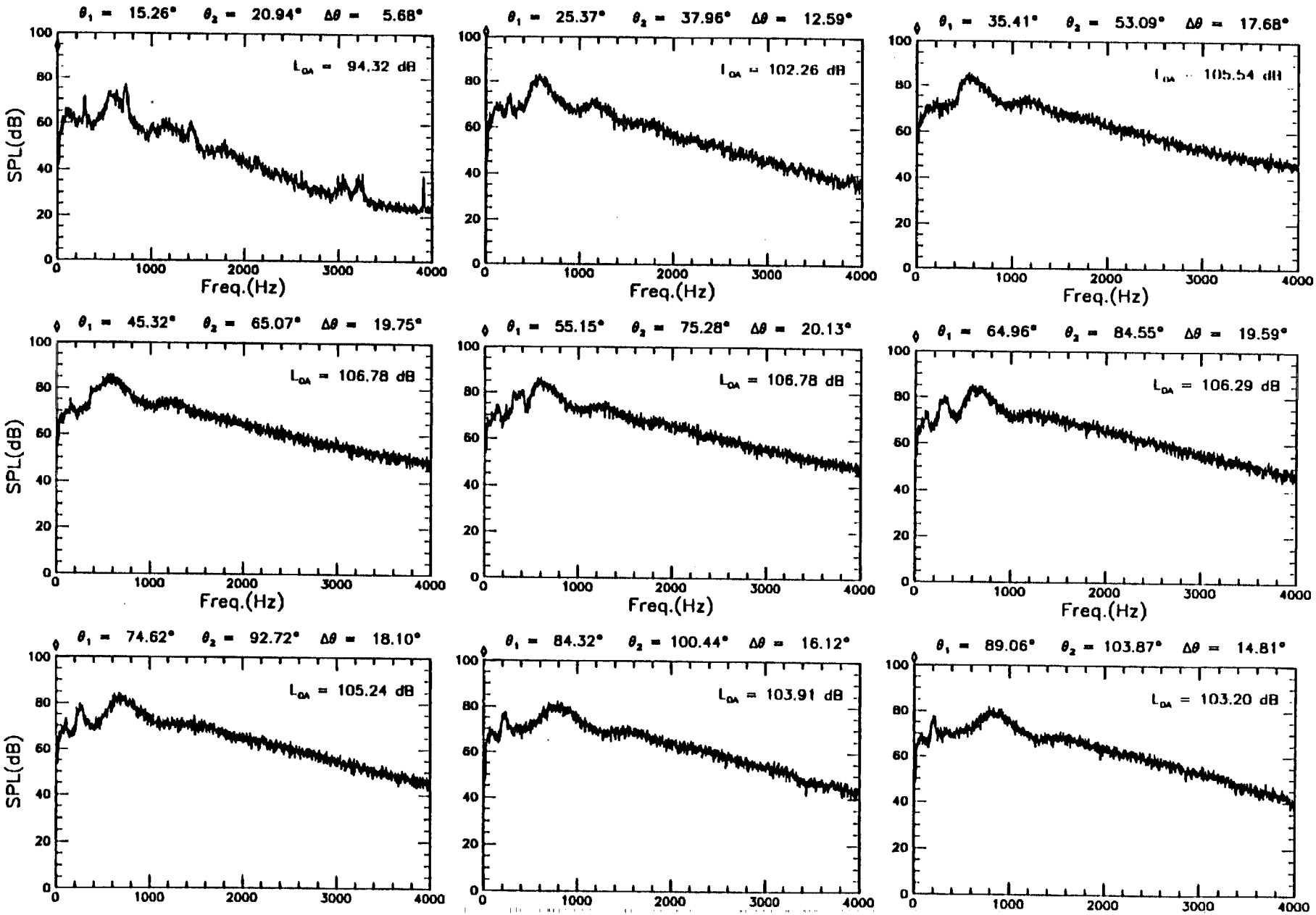


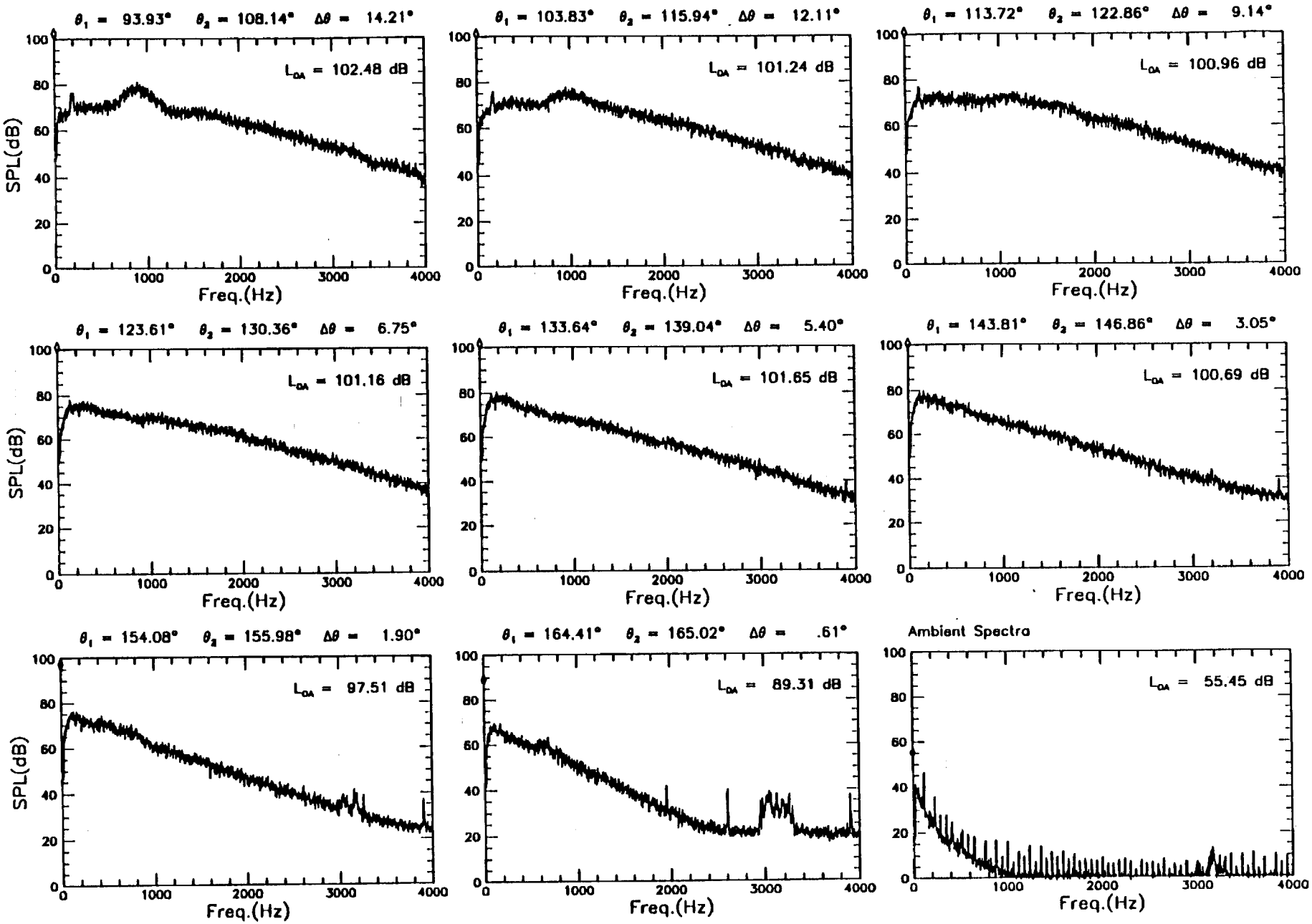

Climb–to–Cruise Run 622
θ1 = 15.63° θ2 = 20.95° Δθ = 5.32°
LOA = 93.31 dB
θ1 = 25.97° θ2 = 37.57° Δθ = 11.60°
LOA = 100.60 dB
θ1 = 36.10° θ2 = 52.62° Δθ = 16.52°
LOA = 104.03 dB
θ1 = 46.11° θ2 = 64.89° Δθ = 18.78°
LOA = 105.31 dB
θ1 = 55.84° θ2 = 74.93° Δθ = 19.09°
LOA = 105.37 dB
θ1 = 65.61° θ2 = 84.17° Δθ = 18.56°
LOA = 105.20 dB
θ1 = 75.12° θ2 = 92.47° Δθ = 17.35°
LOA = 104.50 dB
θ1 = 84.39° θ2 = 100.08° Δθ = 15.69°
LOA = 103.15 dB
θ1 = 89.17° θ2 = 103.54° Δθ = 14.37°
LOA = 102.50 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

Climb–to–Cruise Run 622

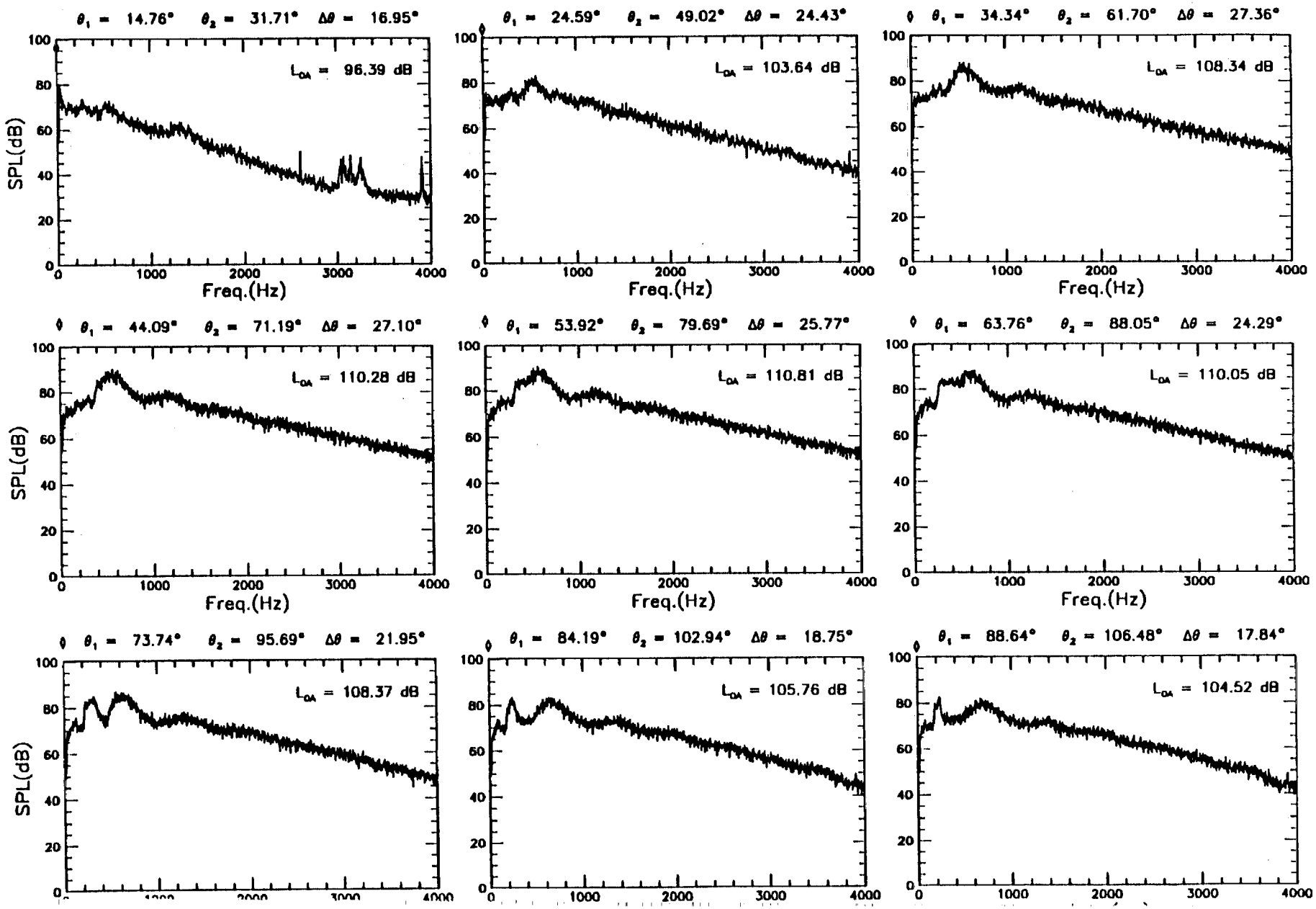


Climb–to–Cruise Run 623

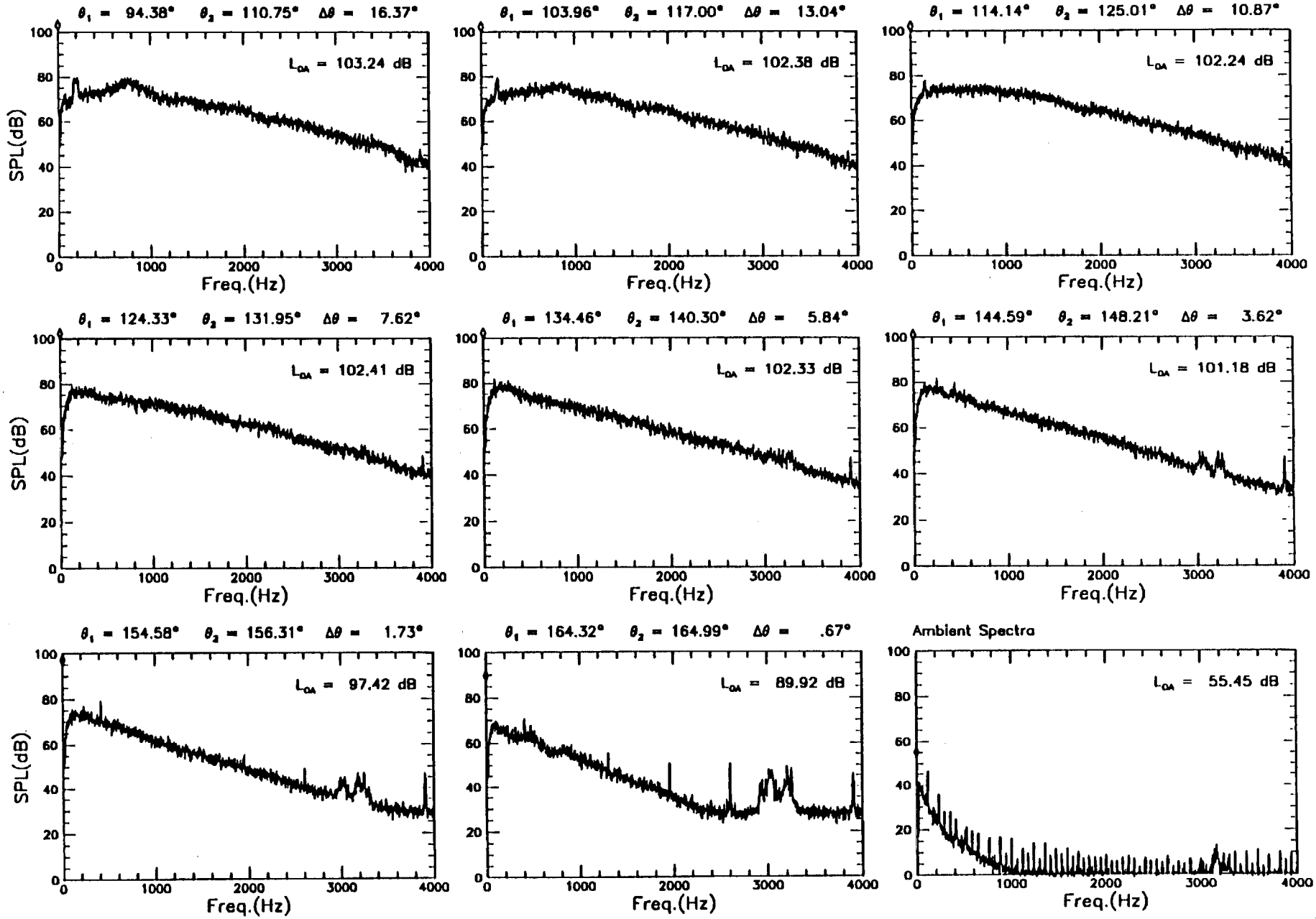



θ1 = 93.93° θ2 = 108.14° Δθ = 14.21°
LOA = 102.48 dB
θ1 = 103.83° θ2 = 115.94° Δθ = 12.11°
LOA = 101.24 dB
θ1 = 113.72° θ2 = 122.86° Δθ = 9.14°
LOA = 100.96 dB
θ1 = 123.61° θ2 = 130.36° Δθ = 6.75°
LOA = 101.16 dB
θ1 = 133.64° θ2 = 139.04° Δθ = 5.40°
LOA = 101.65 dB
θ1 = 143.81° θ2 = 146.86° Δθ = 3.05°
LOA = 100.69 dB
θ1 = 154.08° θ2 = 155.98° Δθ = 1.90°
LOA = 97.51 dB
θ1 = 164.41° θ2 = 165.02° Δθ = .61°
LOA = 89.31 dB
Ambient Spectra
LOA = 55.45 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

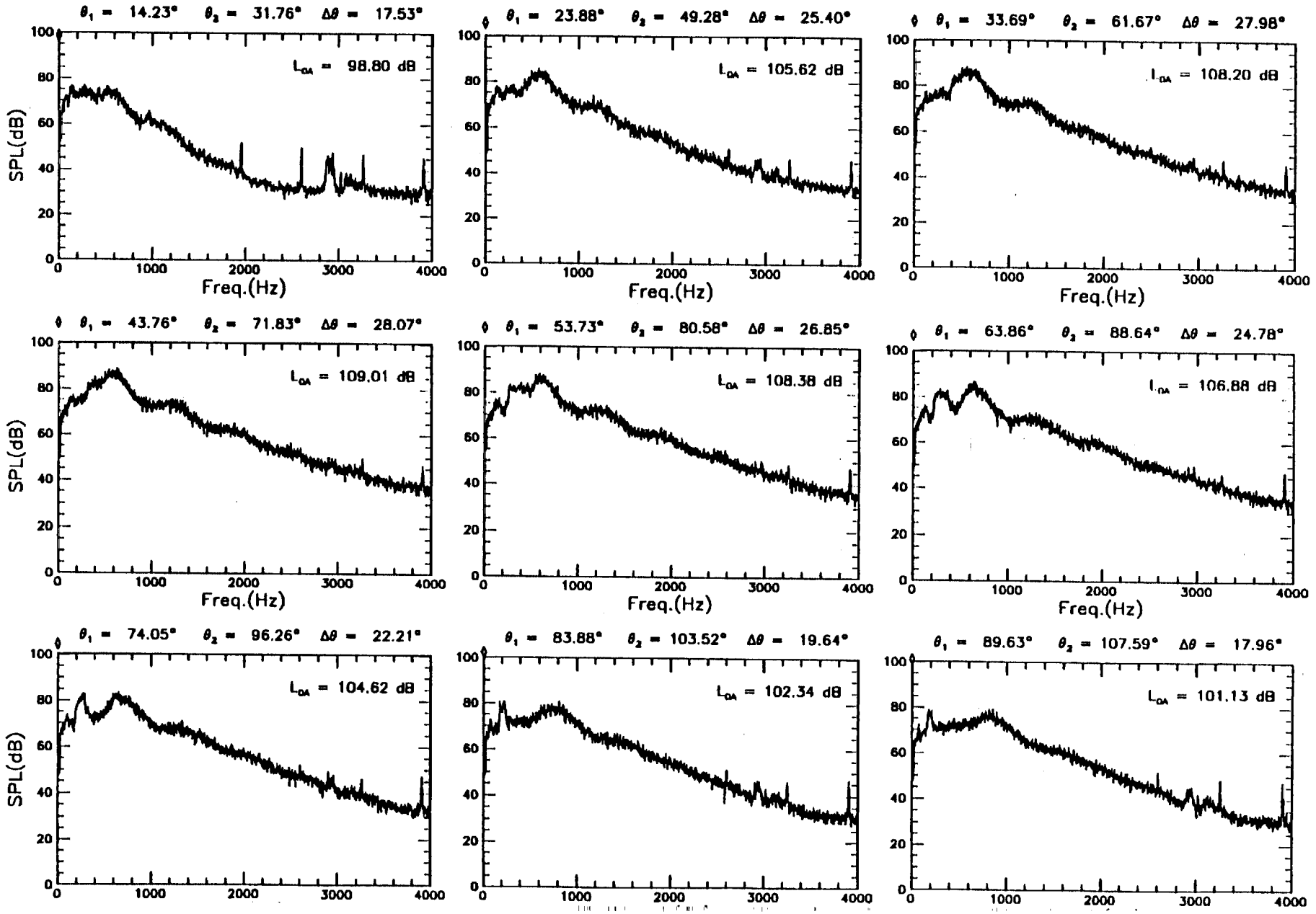
Climb–to–Cruise Run 630



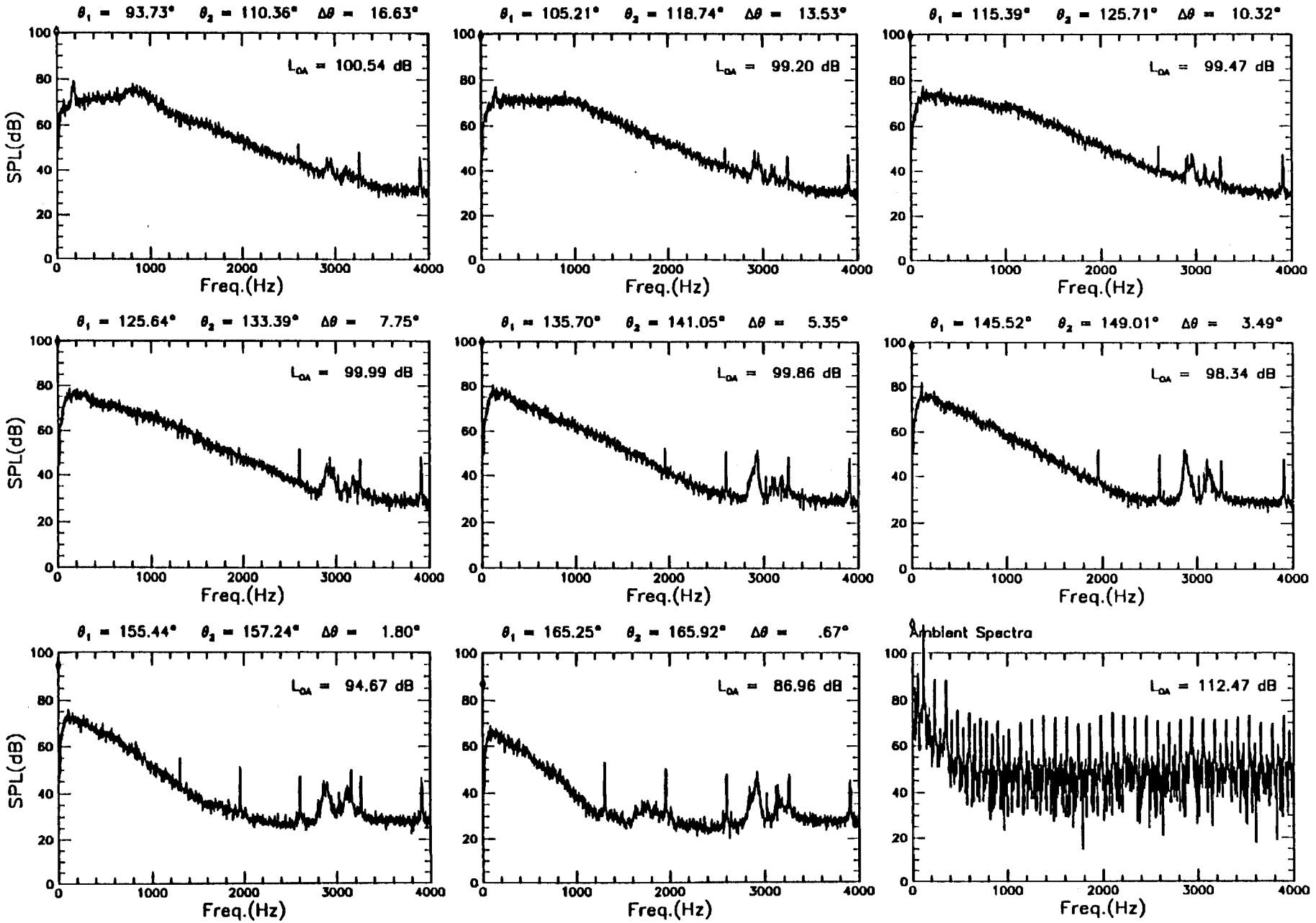
Climb–to–Cruise Run 630



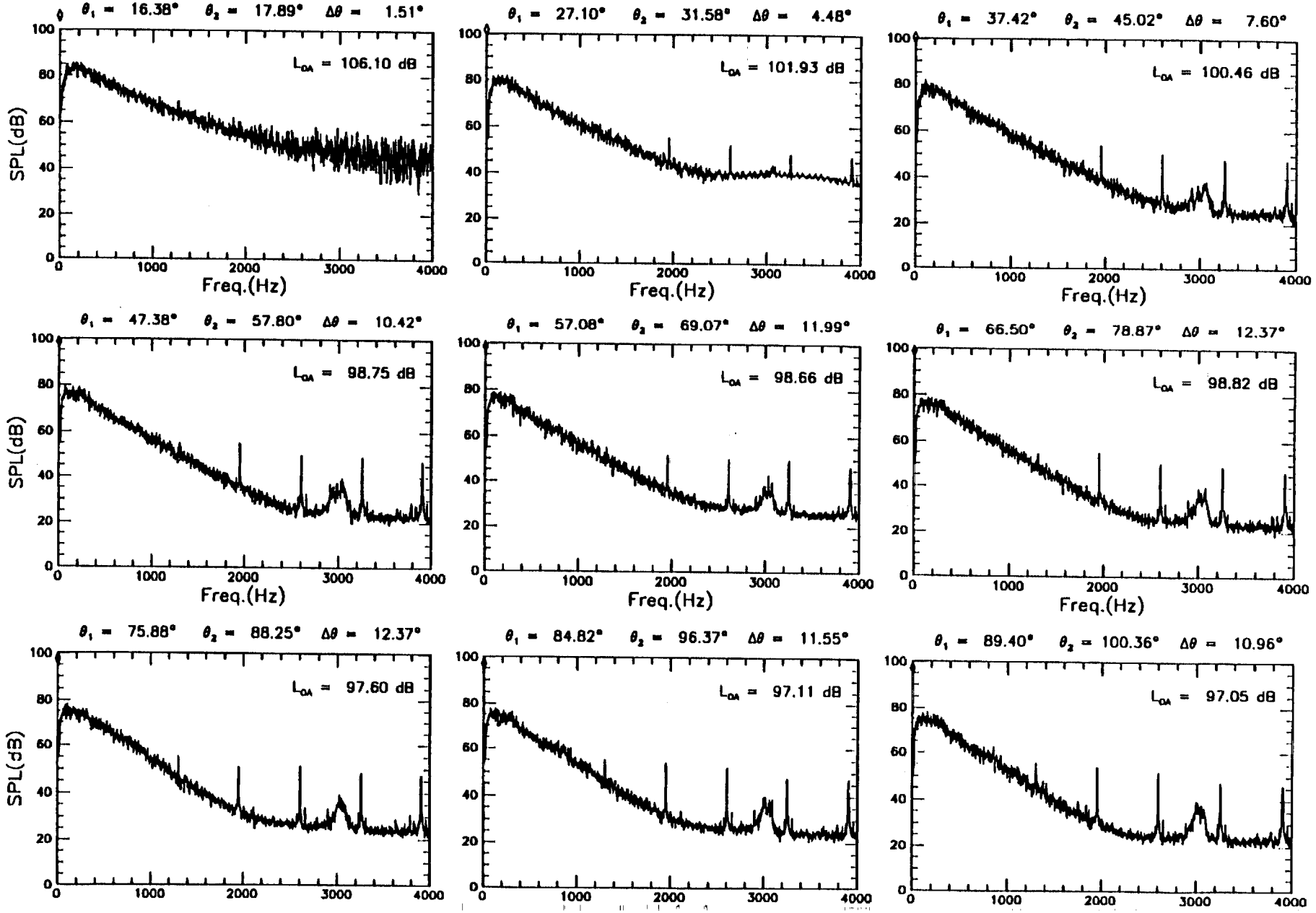
Climb–to–Cruise Run 631



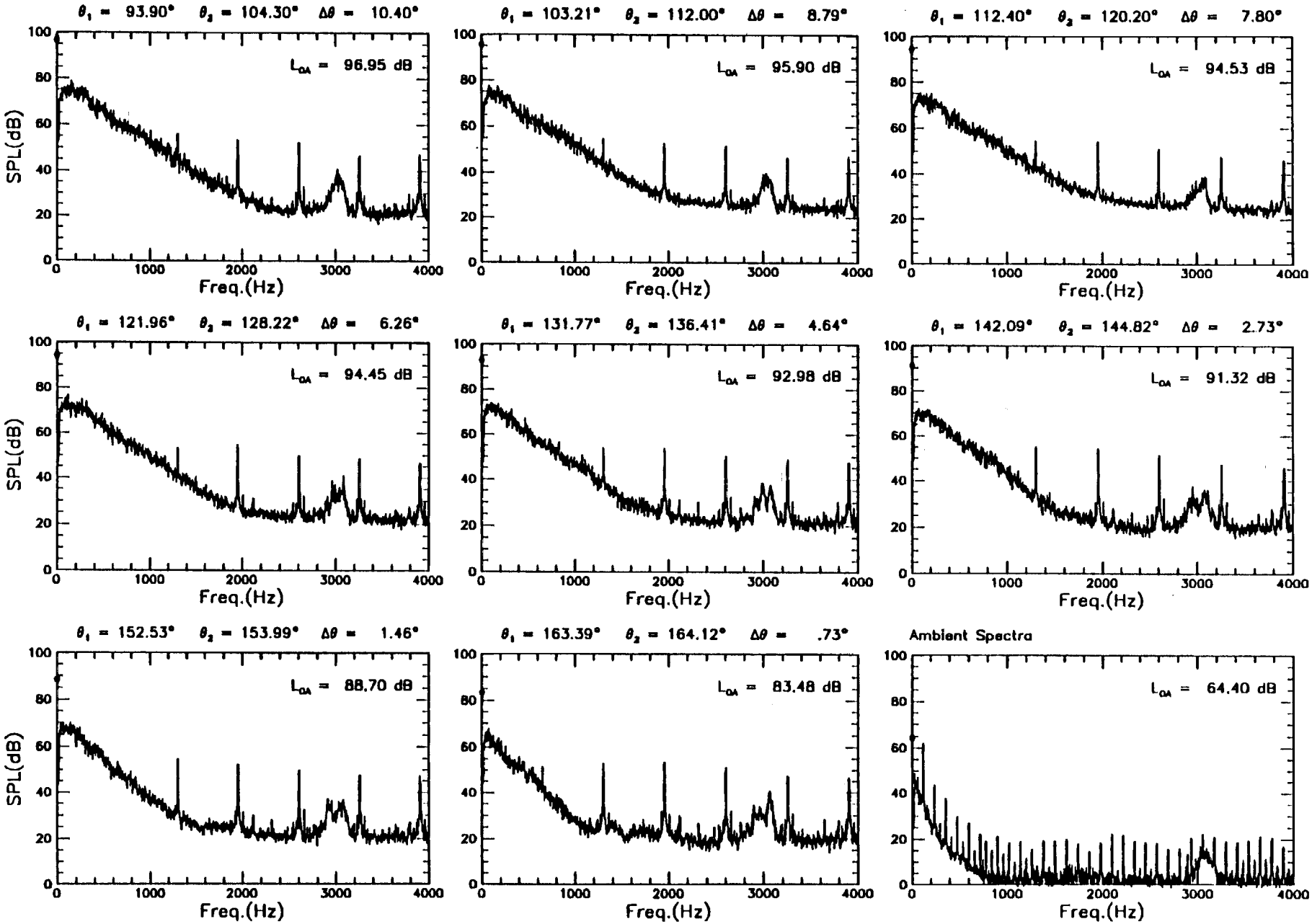
Climb–to–Cruise Run 631

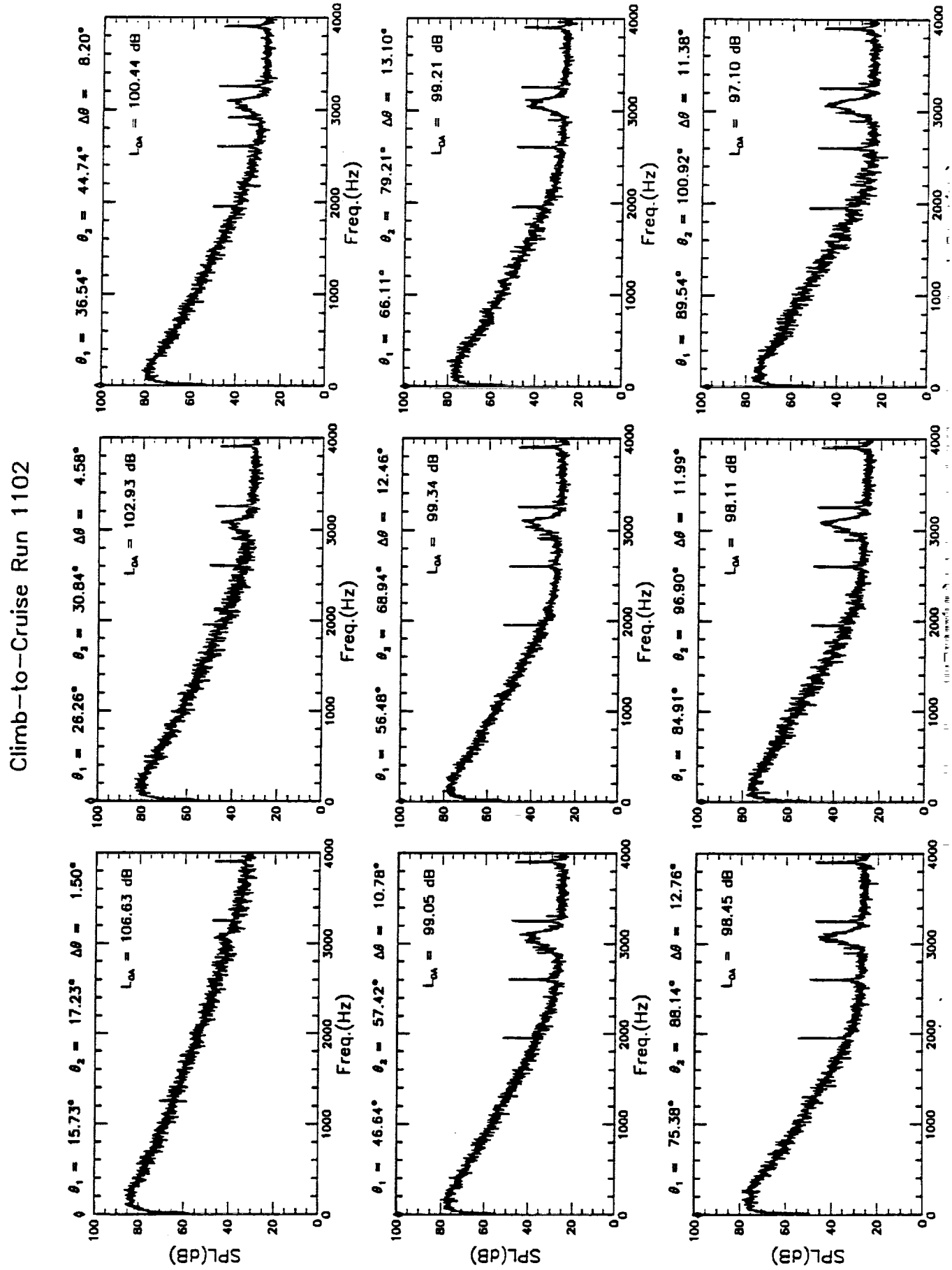


Climb–to–Cruise Run 1101

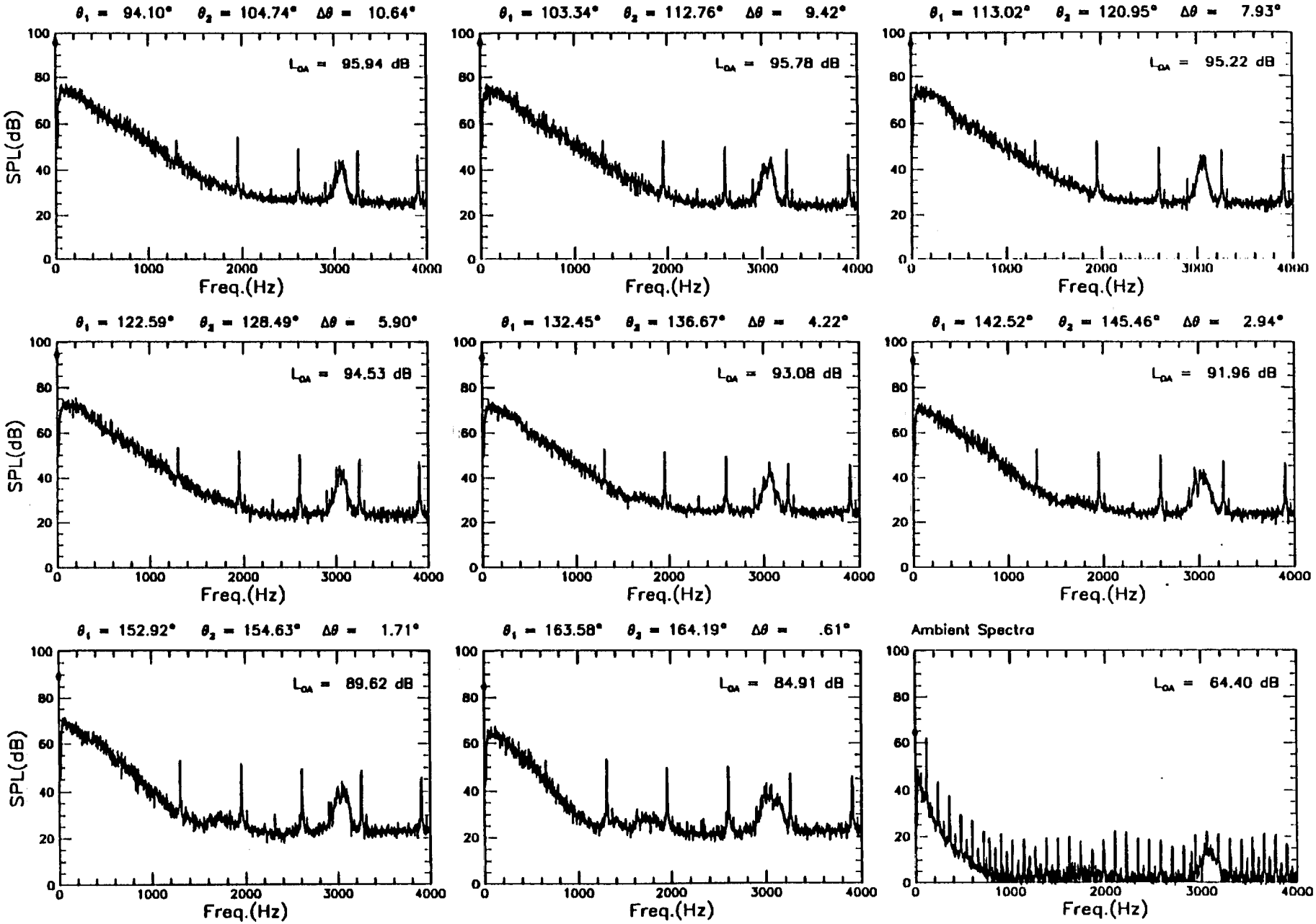


Climb–to–Cruise Run 1101

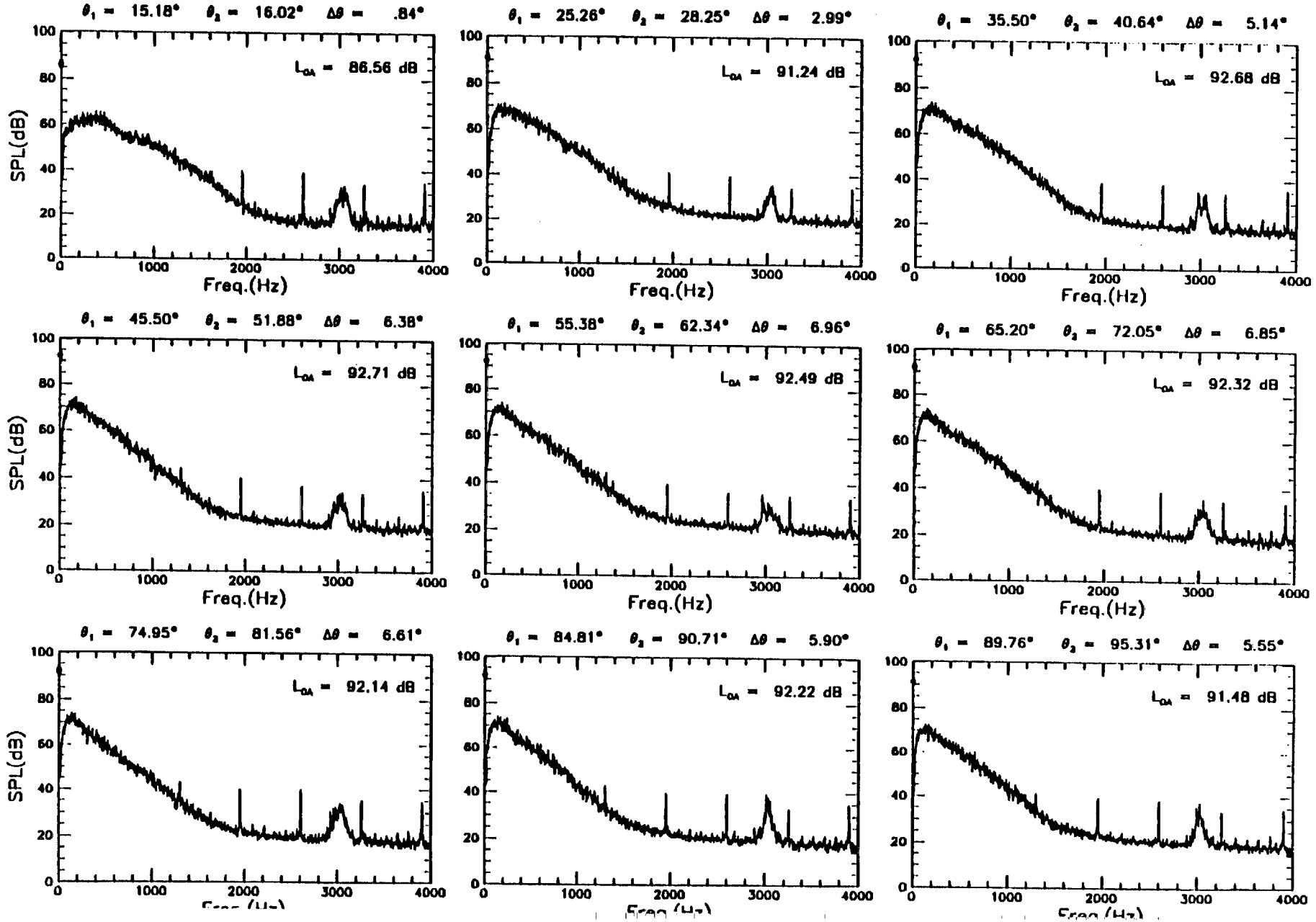


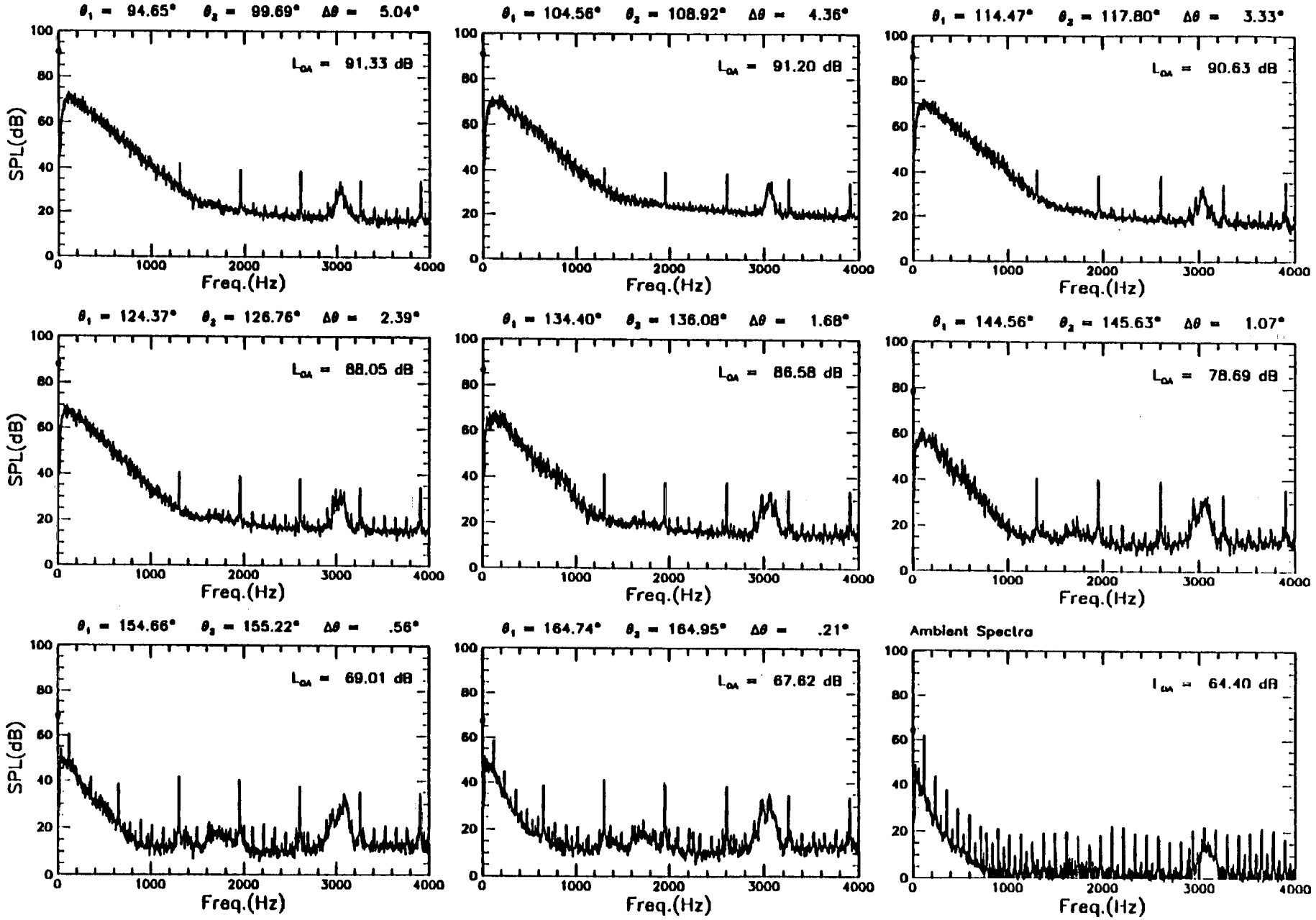

Climb–to–Cruise Run 1102
θ1 = 15.73° θ2 = 17.23° Δθ = 1.50°
LOA = 106.63 dB
θ1 = 26.26° θ2 = 30.84° Δθ = 4.58°
LOA = 102.93 dB
θ1 = 36.54° θ2 = 44.74° Δθ = 8.20°
LOA = 100.44 dB
θ1 = 46.64° θ2 = 57.42° Δθ = 10.78°
LOA = 99.05 dB
θ1 = 56.48° θ2 = 68.94° Δθ = 12.46°
LOA = 99.34 dB
θ1 = 66.11° θ2 = 79.21° Δθ = 13.10°
LOA = 99.21 dB
θ1 = 75.38° θ2 = 88.14° Δθ = 12.76°
LOA = 98.45 dB
θ1 = 84.91° θ2 = 96.90° Δθ = 11.99°
LOA = 98.11 dB
θ1 = 89.54° θ2 = 100.92° Δθ = 11.38°
LOA = 97.10 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

Climb–to–Cruise Run 1102

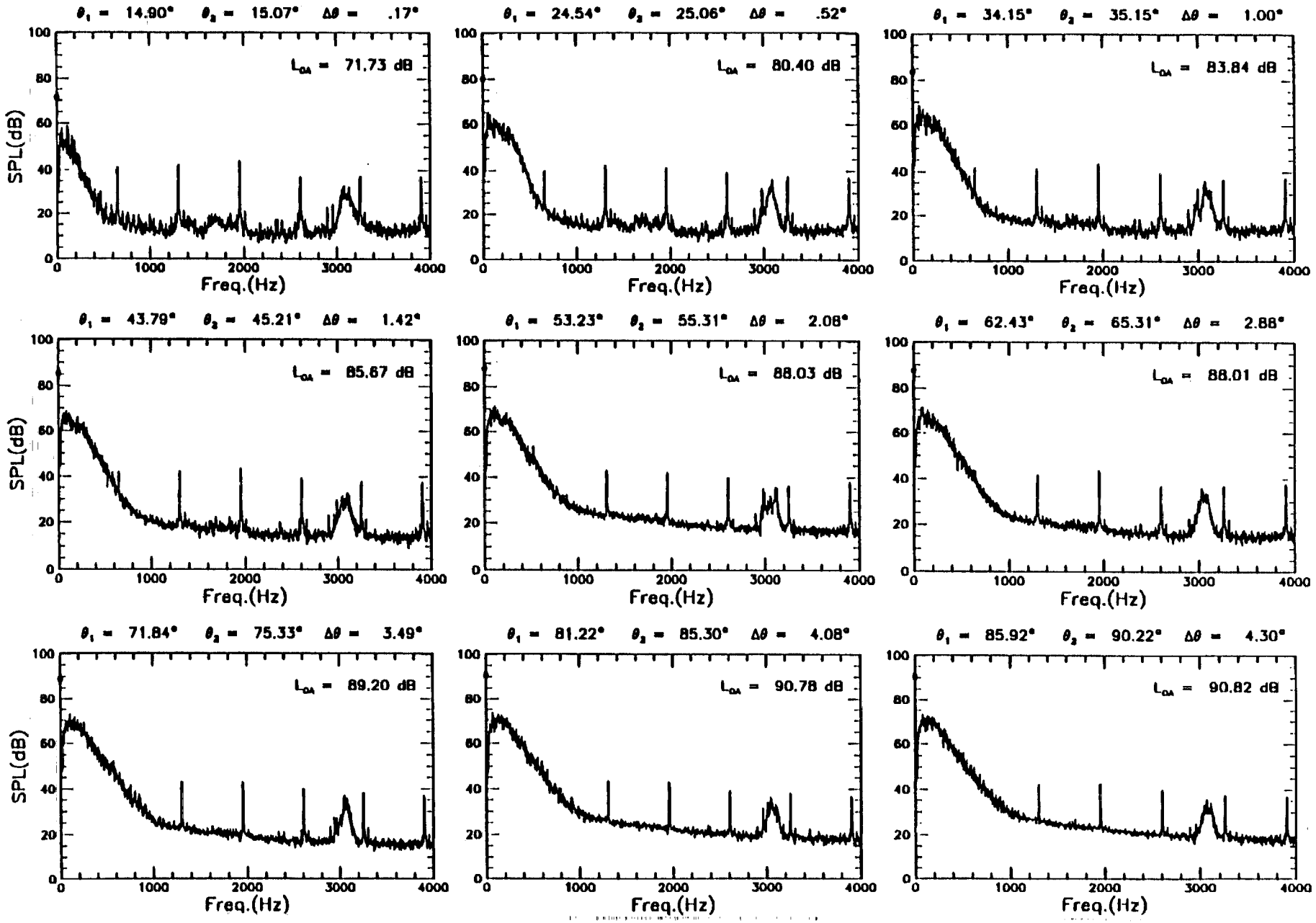


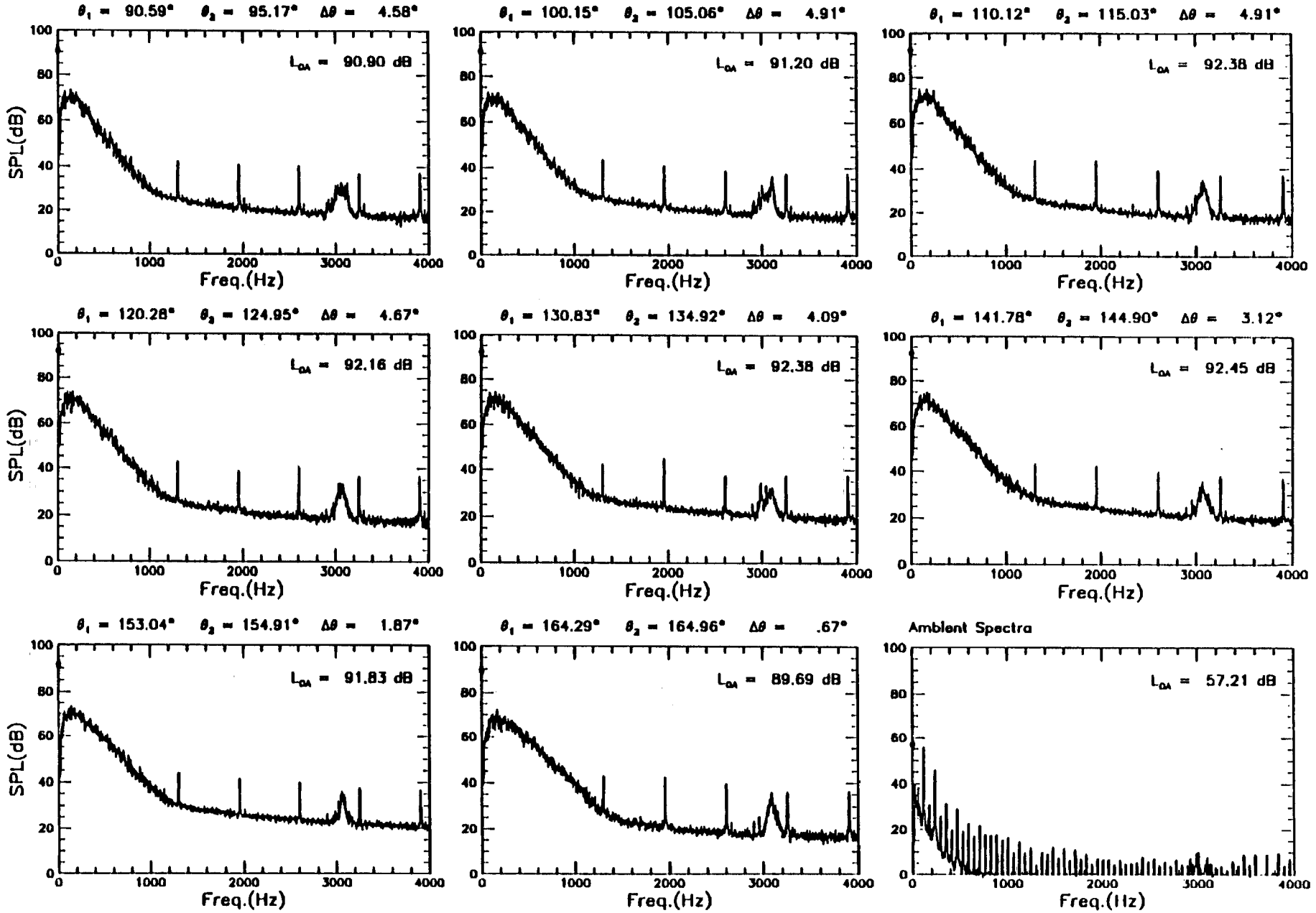
Climb–to–Cruise Run 1201



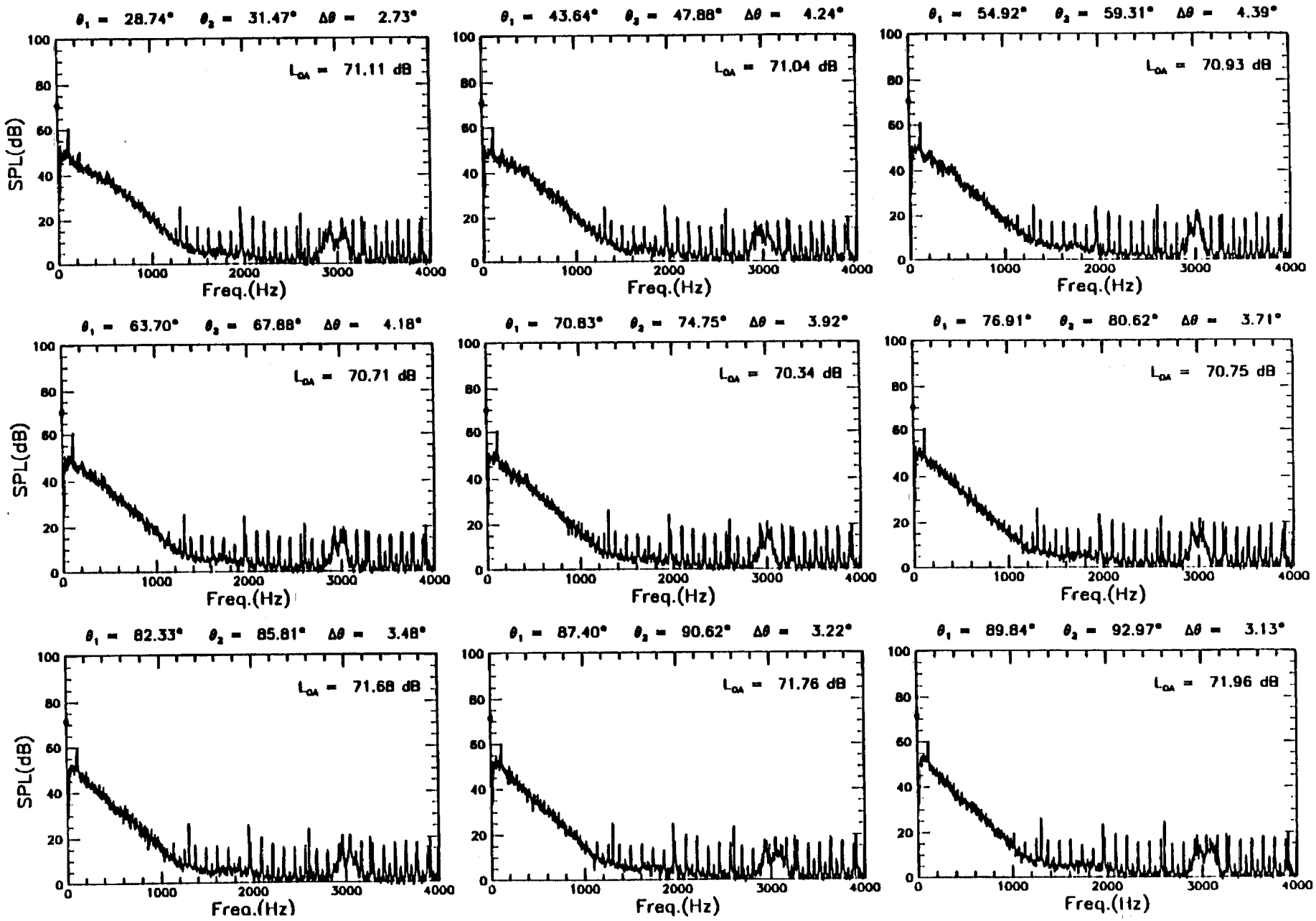

θ1 = 94.65° θ2 = 99.69° Δθ = 5.04°
LOA = 91.33 dB
θ1 = 104.56° θ2 = 108.92° Δθ = 4.36°
LOA = 91.20 dB
θ1 = 114.47° θ2 = 117.80° Δθ = 3.33°
LOA = 90.63 dB
θ1 = 124.37° θ2 = 126.76° Δθ = 2.39°
LOA = 88.05 dB
θ1 = 134.40° θ2 = 136.08° Δθ = 1.68°
LOA = 86.58 dB
θ1 = 144.56° θ2 = 145.63° Δθ = 1.07°
LOA = 78.69 dB
θ1 = 154.66° θ2 = 155.22° Δθ = .56°
LOA = 69.01 dB
θ1 = 164.74° θ2 = 164.95° Δθ = .21°
LOA = 67.62 dB
Ambient Spectra
LOA = 64.40 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

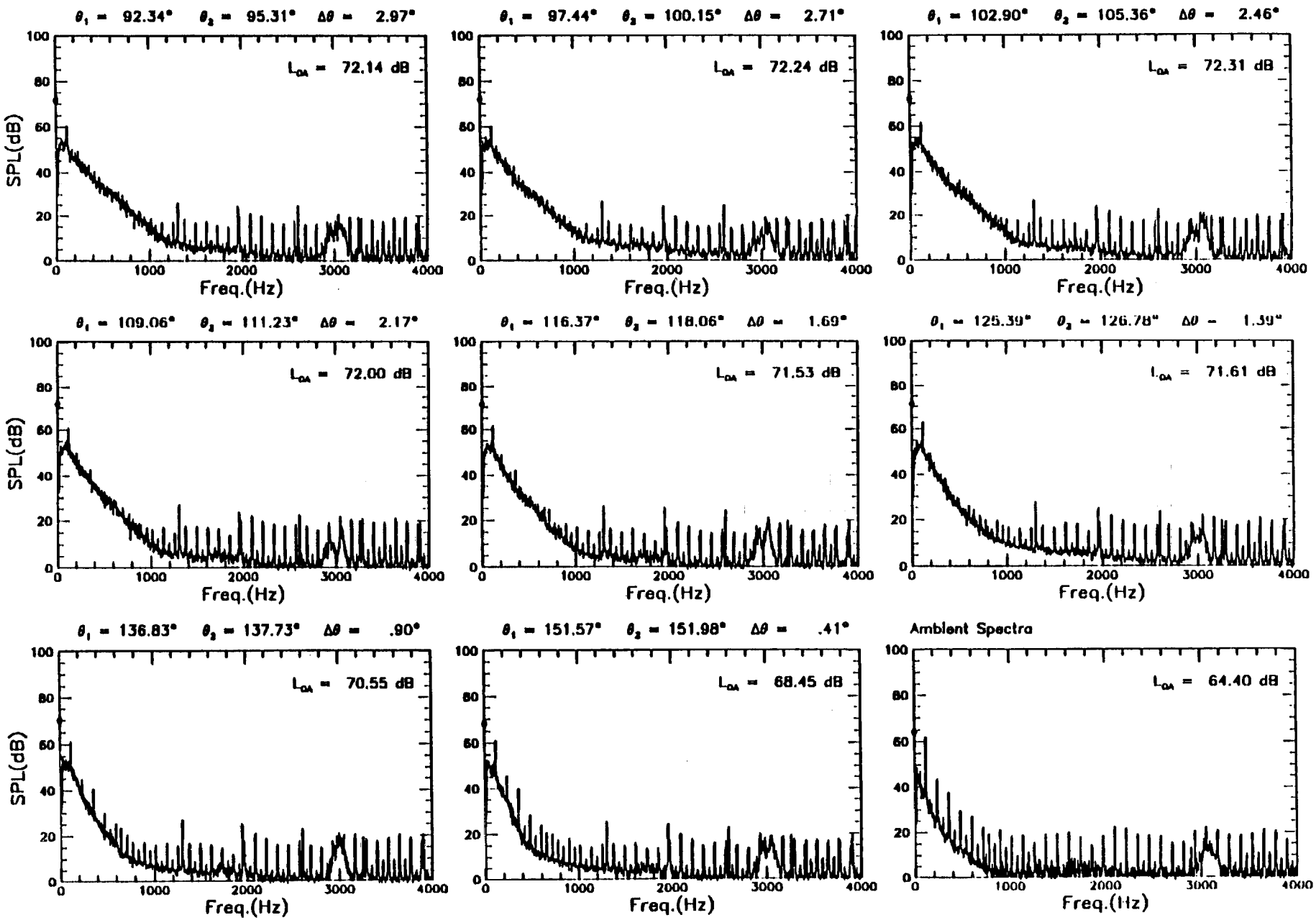
Climb–to–Cruise Run 1202



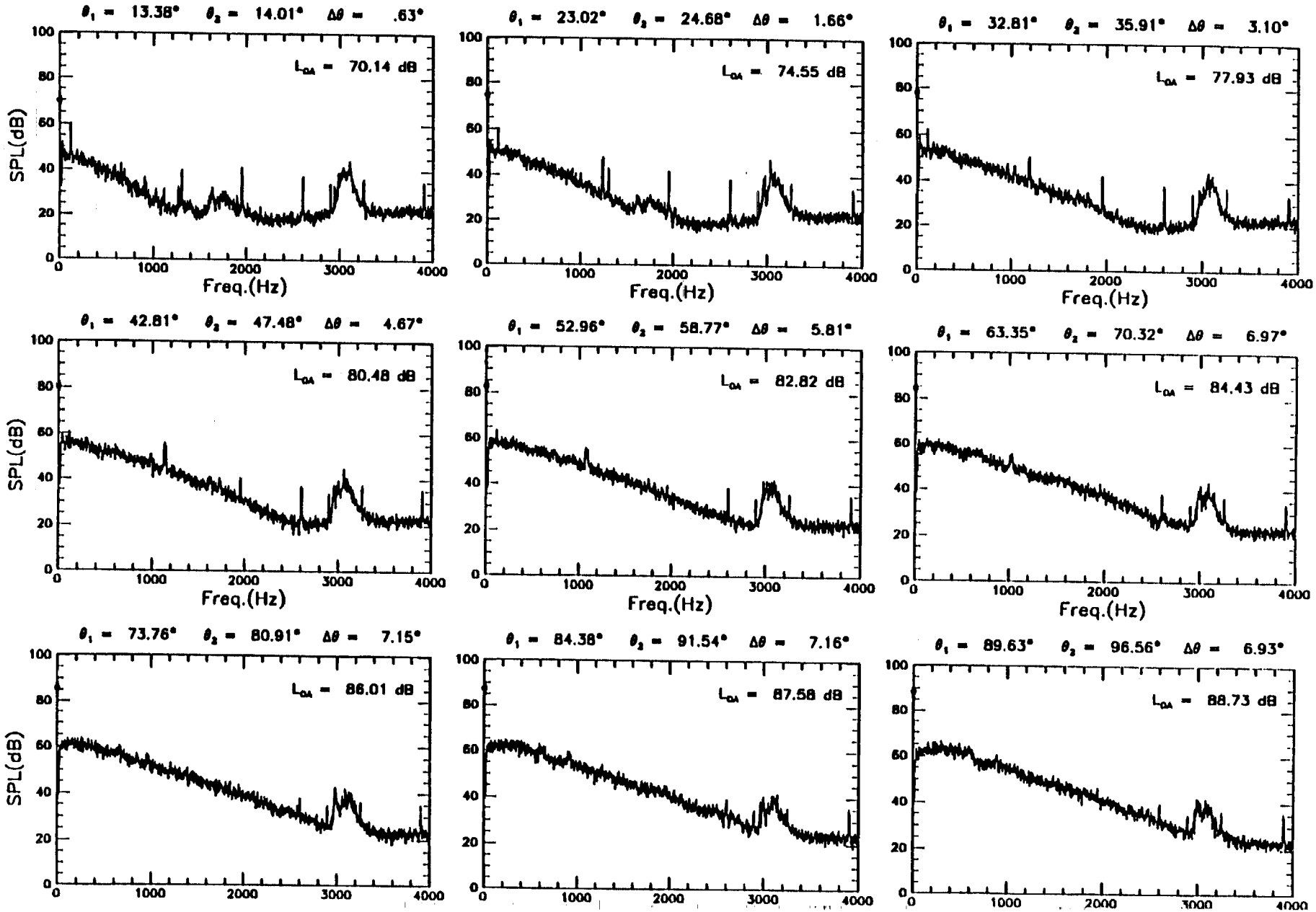

θ1 = 90.59° θ2 = 95.17° Δθ = 4.58°
L_OA = 90.90 dB
θ1 = 100.15° θ2 = 105.06° Δθ = 4.91°
L_OA = 91.20 dB
θ1 = 110.12° θ2 = 115.03° Δθ = 4.91°
L_OA = 92.38 dB
θ1 = 120.28° θ2 = 124.95° Δθ = 4.67°
L_OA = 92.16 dB
θ1 = 130.83° θ2 = 134.92° Δθ = 4.09°
L_OA = 92.38 dB
θ1 = 141.78° θ2 = 144.90° Δθ = 3.12°
L_OA = 92.45 dB
θ1 = 153.04° θ2 = 154.91° Δθ = 1.87°
L_OA = 91.83 dB
θ1 = 164.29° θ2 = 164.96° Δθ = .67°
L_OA = 89.69 dB
Ambient Spectra
L_OA = 57.21 dB
SPL(dB)
Freq.(Hz)

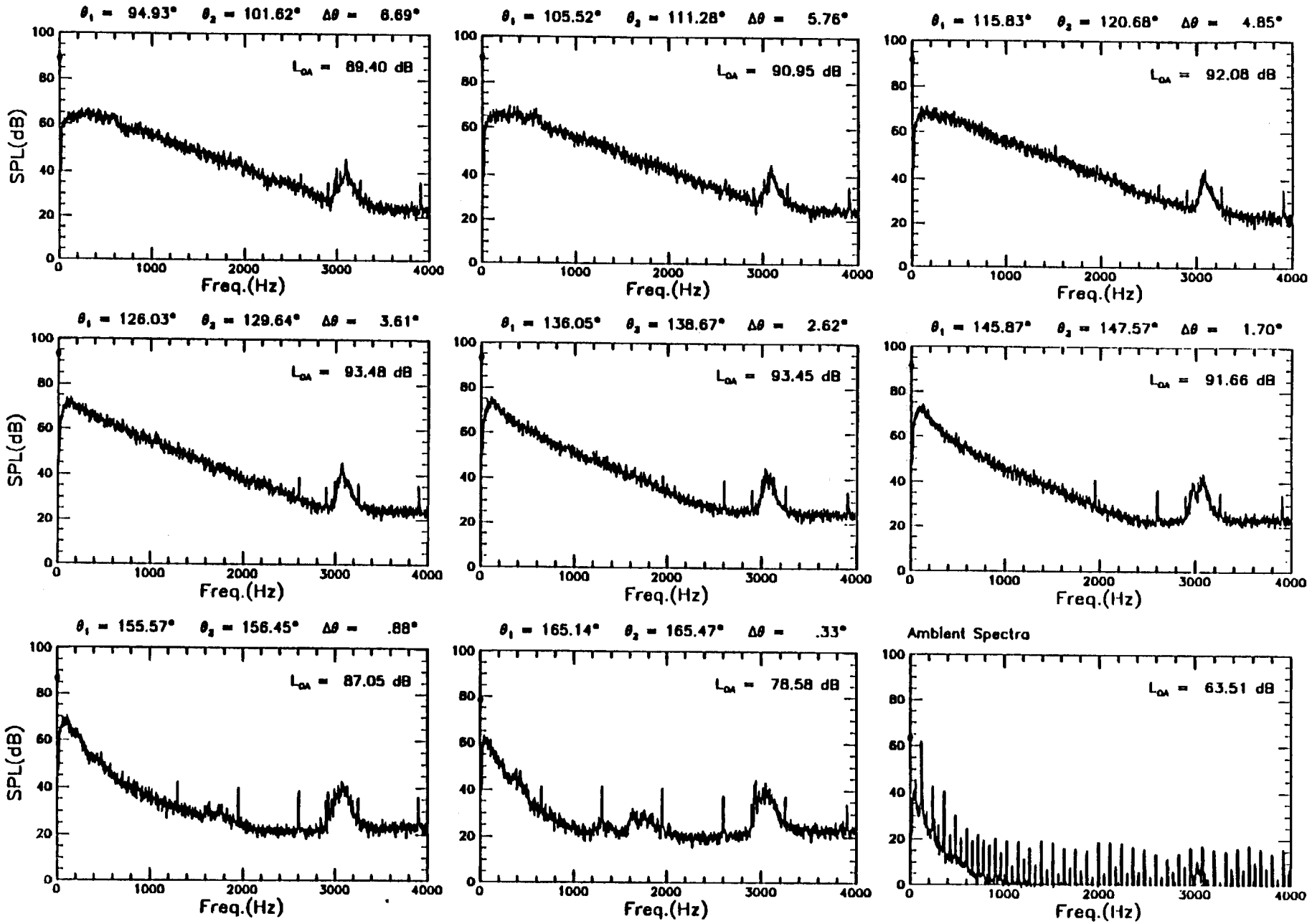
Climb–to–Cruise Run 1301



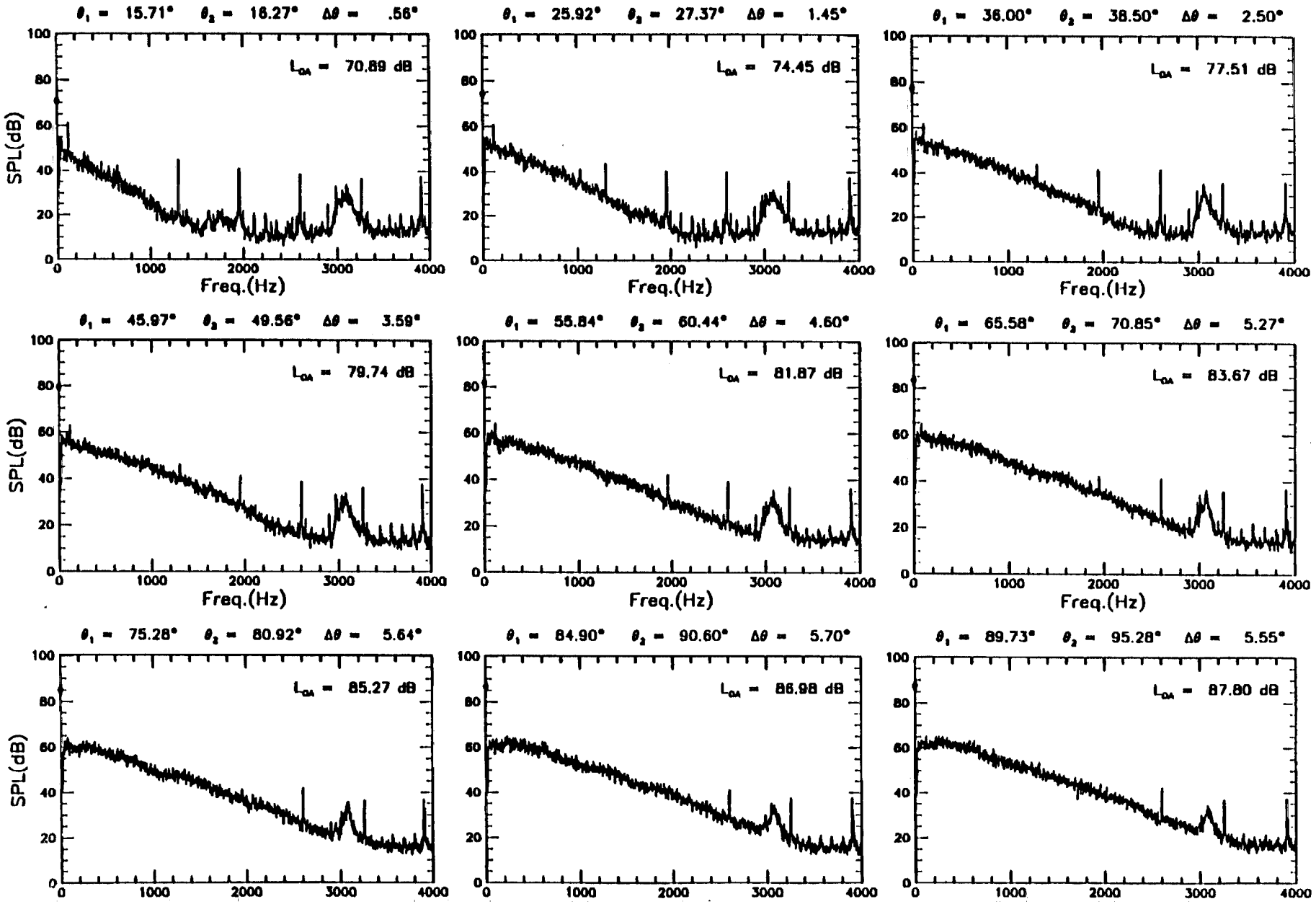

θ1 = 92.34° θ2 = 95.31° Δθ = 2.97°
L_OA = 72.14 dB
θ1 = 97.44° θ2 = 100.15° Δθ = 2.71°
L_OA = 72.24 dB
θ1 = 102.90° θ2 = 105.36° Δθ = 2.46°
L_OA = 72.31 dB
θ1 = 109.06° θ2 = 111.23° Δθ = 2.17°
L_OA = 72.00 dB
θ1 = 116.37° θ2 = 118.06° Δθ = 1.69°
L_OA = 71.53 dB
θ1 = 125.39° θ2 = 126.78° Δθ = 1.39°
L_OA = 71.61 dB
θ1 = 136.83° θ2 = 137.73° Δθ = .90°
L_OA = 70.55 dB
θ1 = 151.57° θ2 = 151.98° Δθ = .41°
L_OA = 68.45 dB
Ambient Spectra
L_OA = 64.40 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

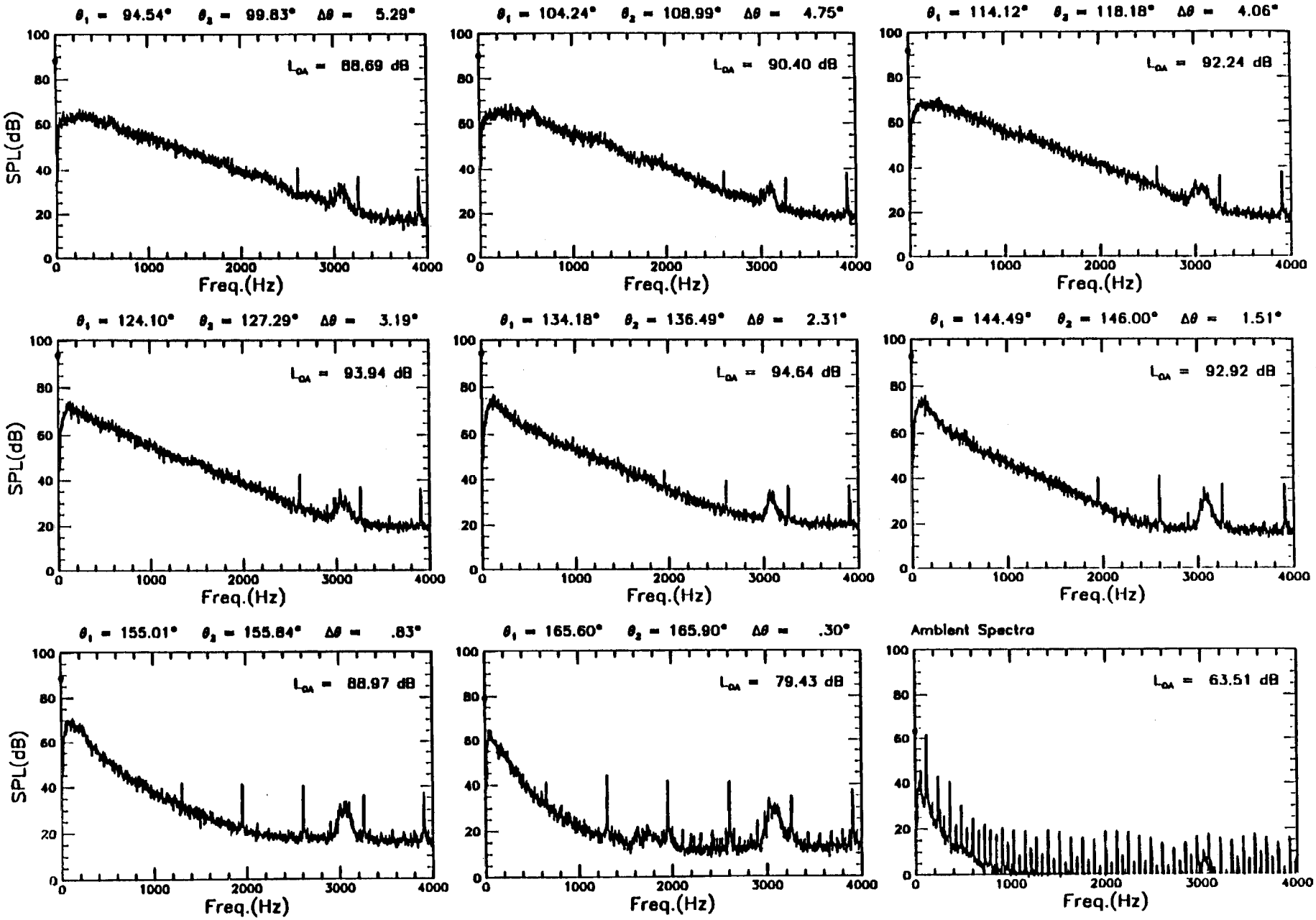
Climb–to–Cruise Run 800



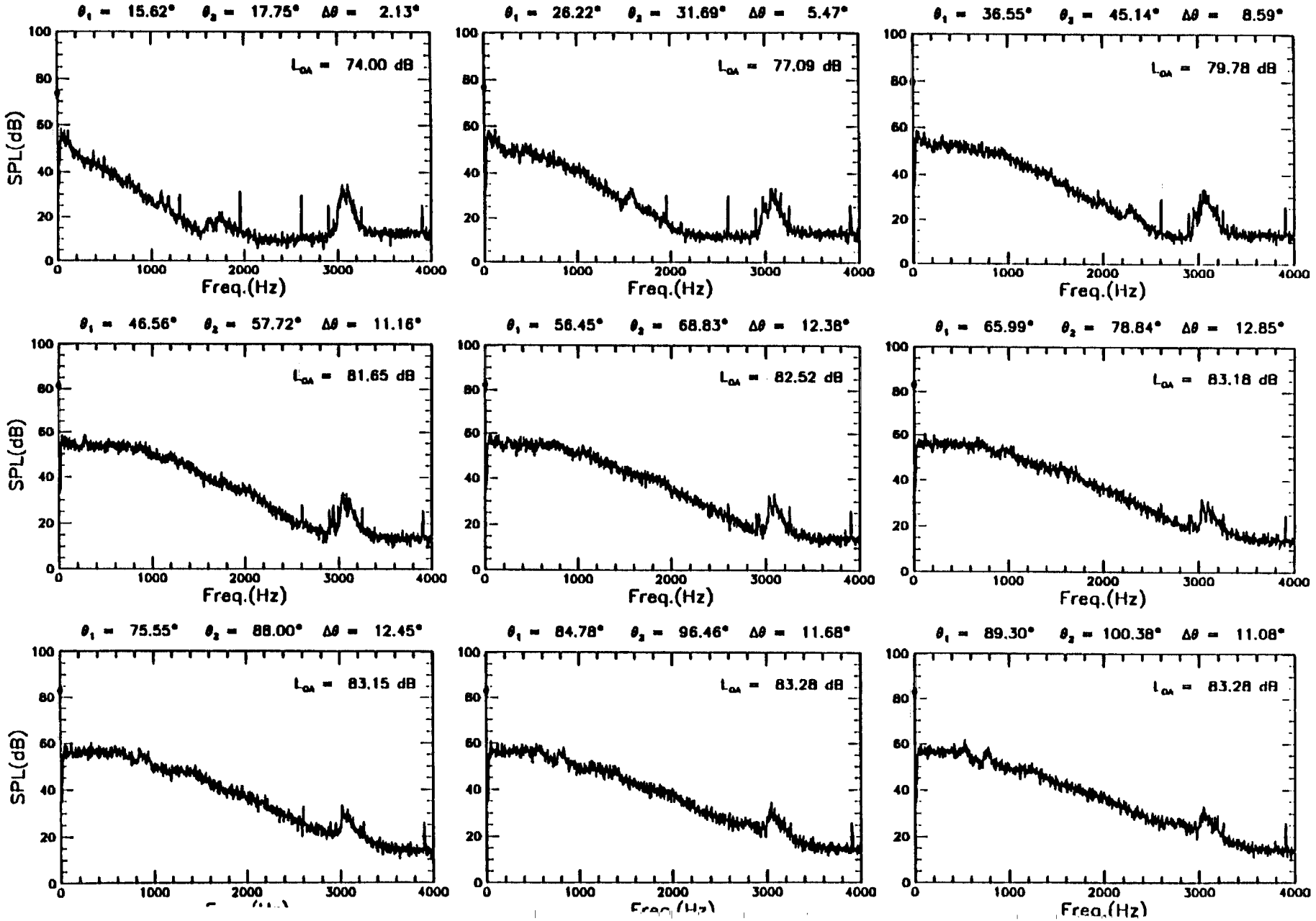

θ1 = 94.93° θ2 = 101.62° Δθ = 6.69°
L_OA = 89.40 dB
θ1 = 105.52° θ2 = 111.28° Δθ = 5.76°
L_OA = 90.95 dB
θ1 = 115.83° θ2 = 120.68° Δθ = 4.85°
L_OA = 92.08 dB
θ1 = 126.03° θ2 = 129.64° Δθ = 3.61°
L_OA = 93.48 dB
θ1 = 136.05° θ2 = 138.67° Δθ = 2.62°
L_OA = 93.45 dB
θ1 = 145.87° θ2 = 147.57° Δθ = 1.70°
L_OA = 91.66 dB
θ1 = 155.57° θ2 = 156.45° Δθ = .88°
L_OA = 87.05 dB
θ1 = 165.14° θ2 = 165.47° Δθ = .33°
L_OA = 78.58 dB
Ambient Spectra
L_OA = 63.51 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

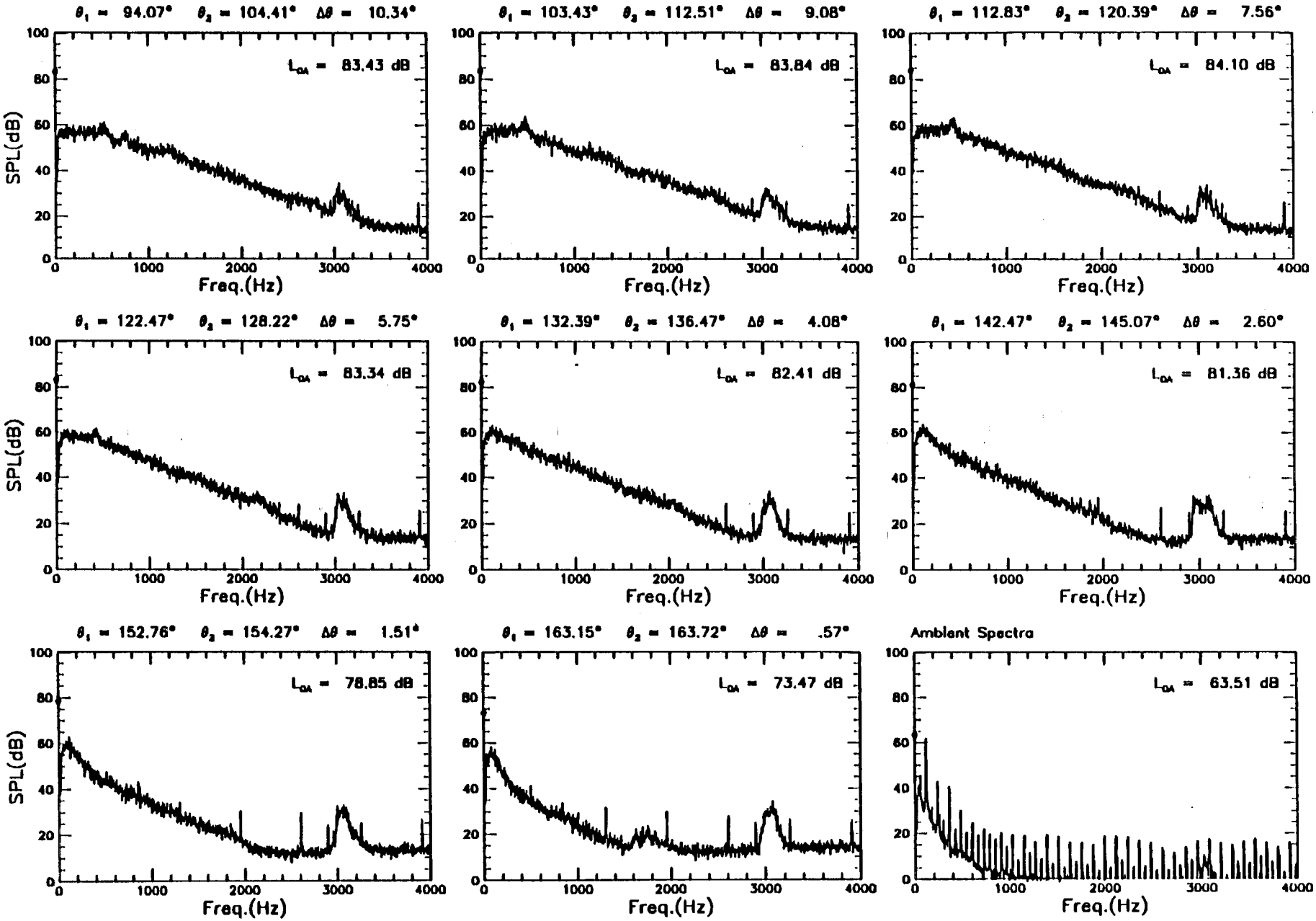
Climb–to–Cruise Run 801



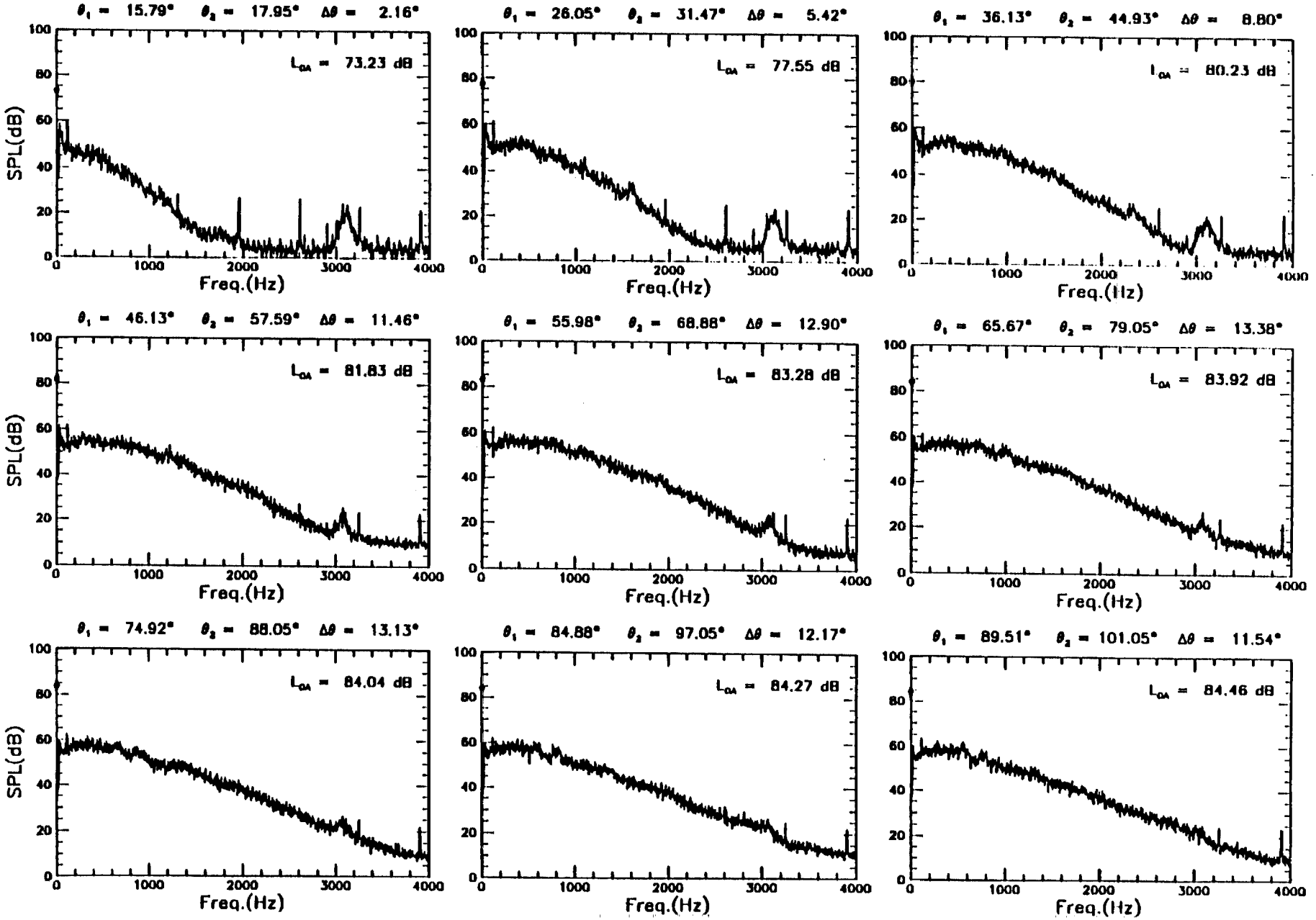

θ1 = 94.54° θ2 = 99.83° Δθ = 5.29°
L_OA = 88.69 dB
θ1 = 104.24° θ2 = 108.99° Δθ = 4.75°
L_OA = 90.40 dB
θ1 = 114.12° θ2 = 118.18° Δθ = 4.06°
L_OA = 92.24 dB
θ1 = 124.10° θ2 = 127.29° Δθ = 3.19°
L_OA = 93.94 dB
θ1 = 134.18° θ2 = 136.49° Δθ = 2.31°
L_OA = 94.64 dB
θ1 = 144.49° θ2 = 146.00° Δθ = 1.51°
L_OA = 92.92 dB
θ1 = 155.01° θ2 = 155.84° Δθ = .83°
L_OA = 88.97 dB
θ1 = 165.60° θ2 = 165.90° Δθ = .30°
L_OA = 79.43 dB
Ambient Spectra
L_OA = 63.51 dB
SPL(dB)
Freq.(Hz)

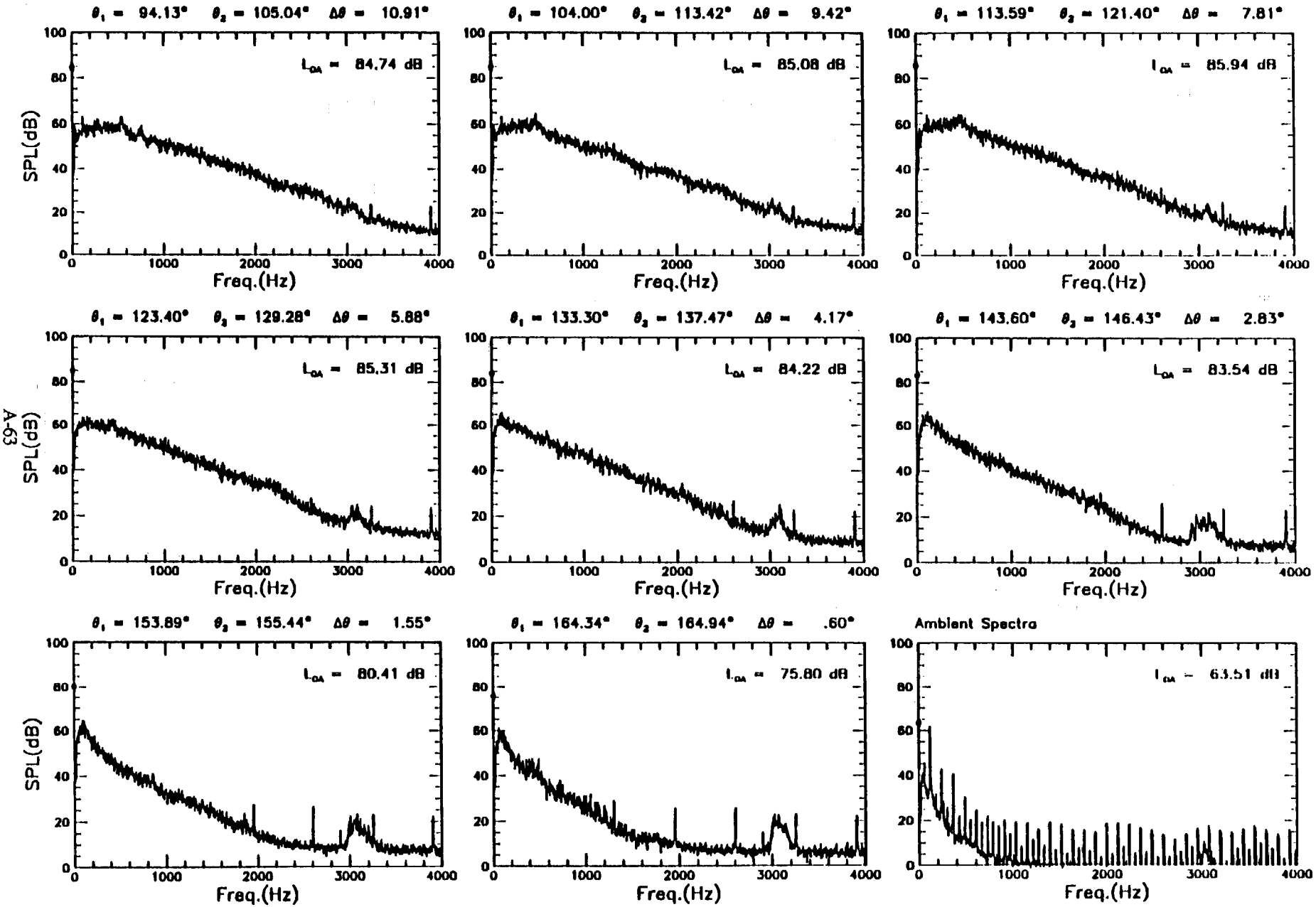
Climb–to–Cruise Run 810



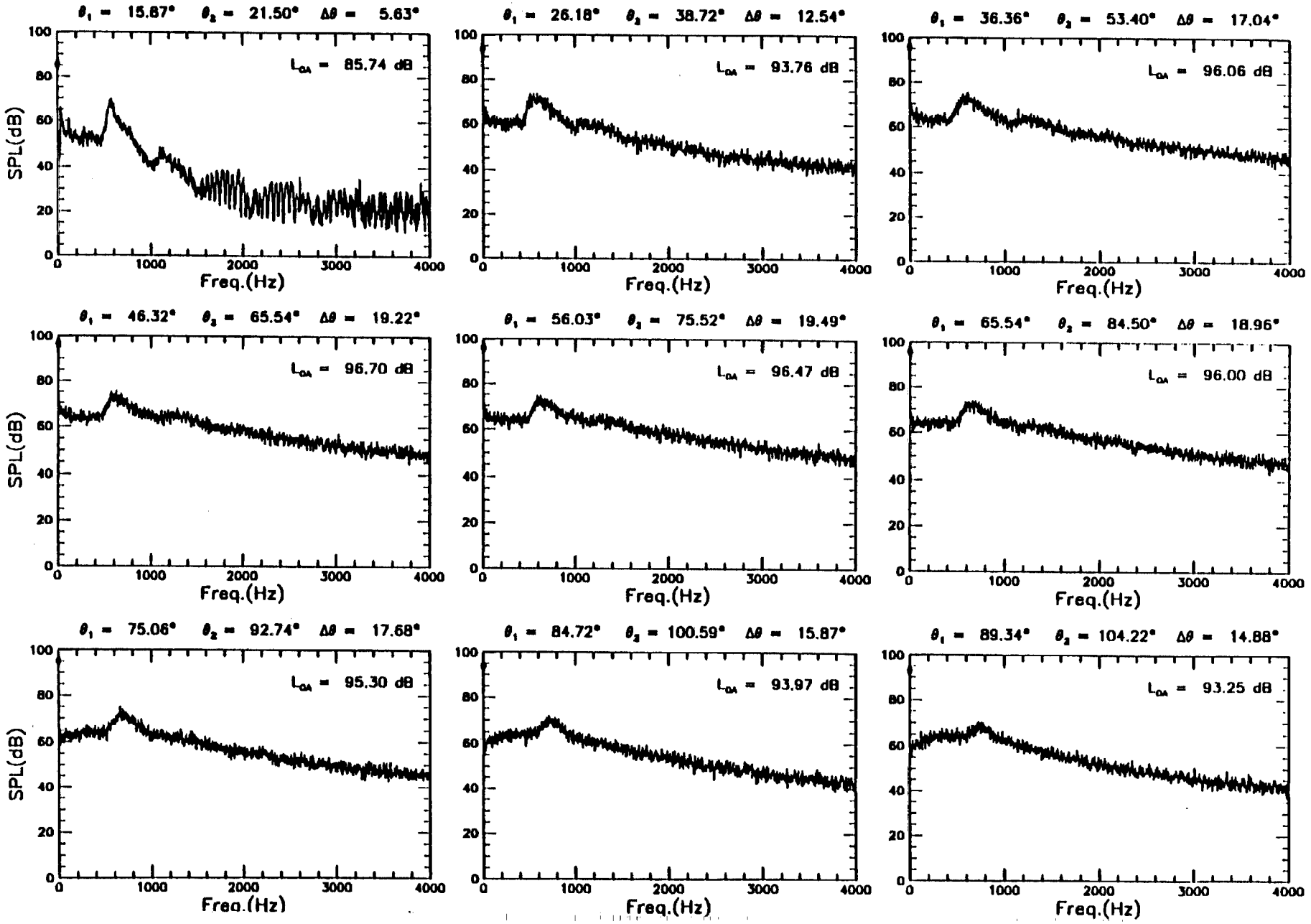

θ1 = 94.07° θ2 = 104.41° Δθ = 10.34°
L_OA = 83.43 dB
θ1 = 103.43° θ2 = 112.51° Δθ = 9.08°
L_OA = 83.84 dB
θ1 = 112.83° θ2 = 120.39° Δθ = 7.56°
L_OA = 84.10 dB
θ1 = 122.47° θ2 = 128.22° Δθ = 5.75°
L_OA = 83.34 dB
θ1 = 132.39° θ2 = 136.47° Δθ = 4.08°
L_OA = 82.41 dB
θ1 = 142.47° θ2 = 145.07° Δθ = 2.60°
L_OA = 81.36 dB
θ1 = 152.76° θ2 = 154.27° Δθ = 1.51°
L_OA = 78.85 dB
θ1 = 163.15° θ2 = 163.72° Δθ = .57°
L_OA = 73.47 dB
Ambient Spectra
L_OA = 63.51 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

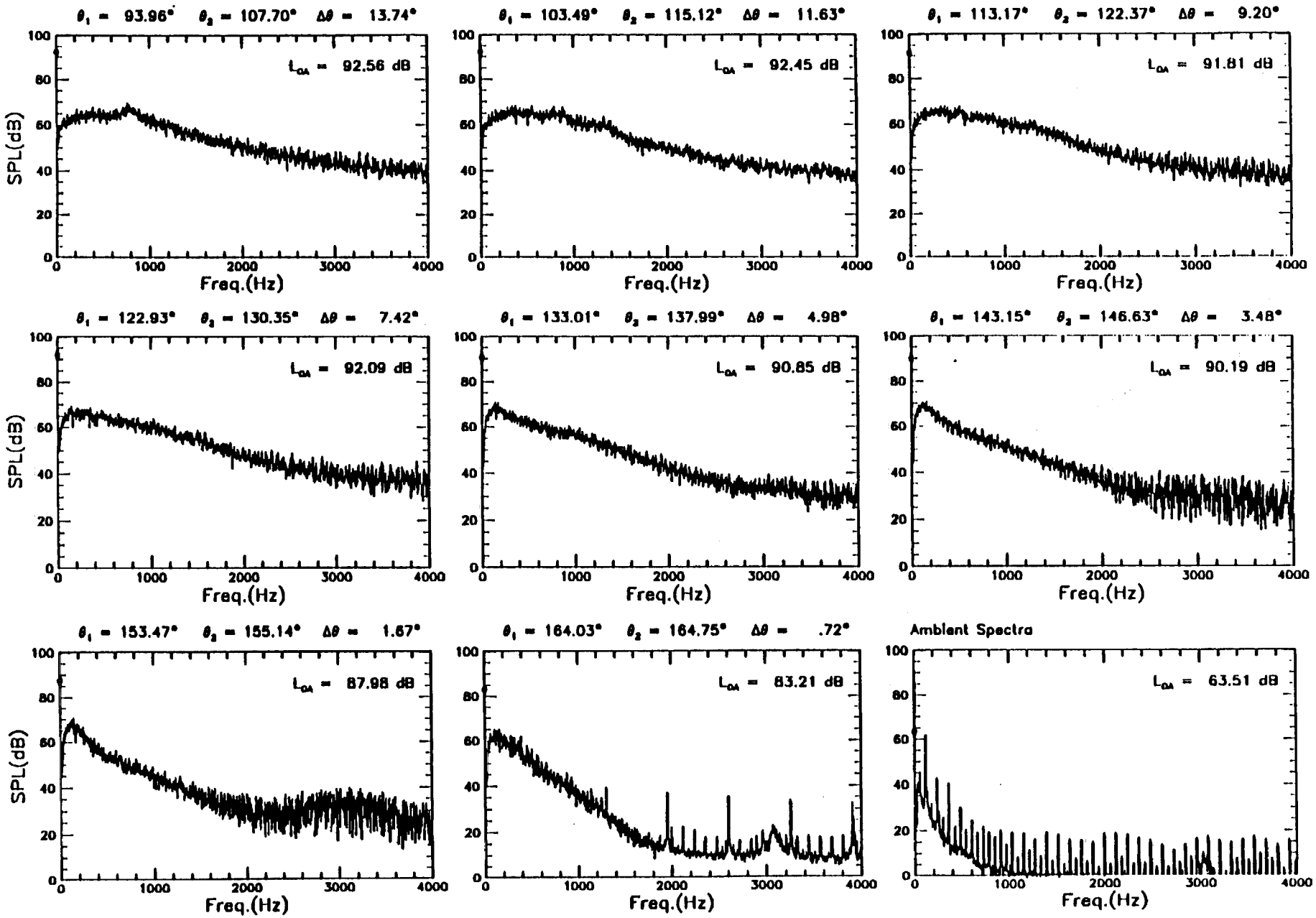
Climb–to–Cruise Run 811



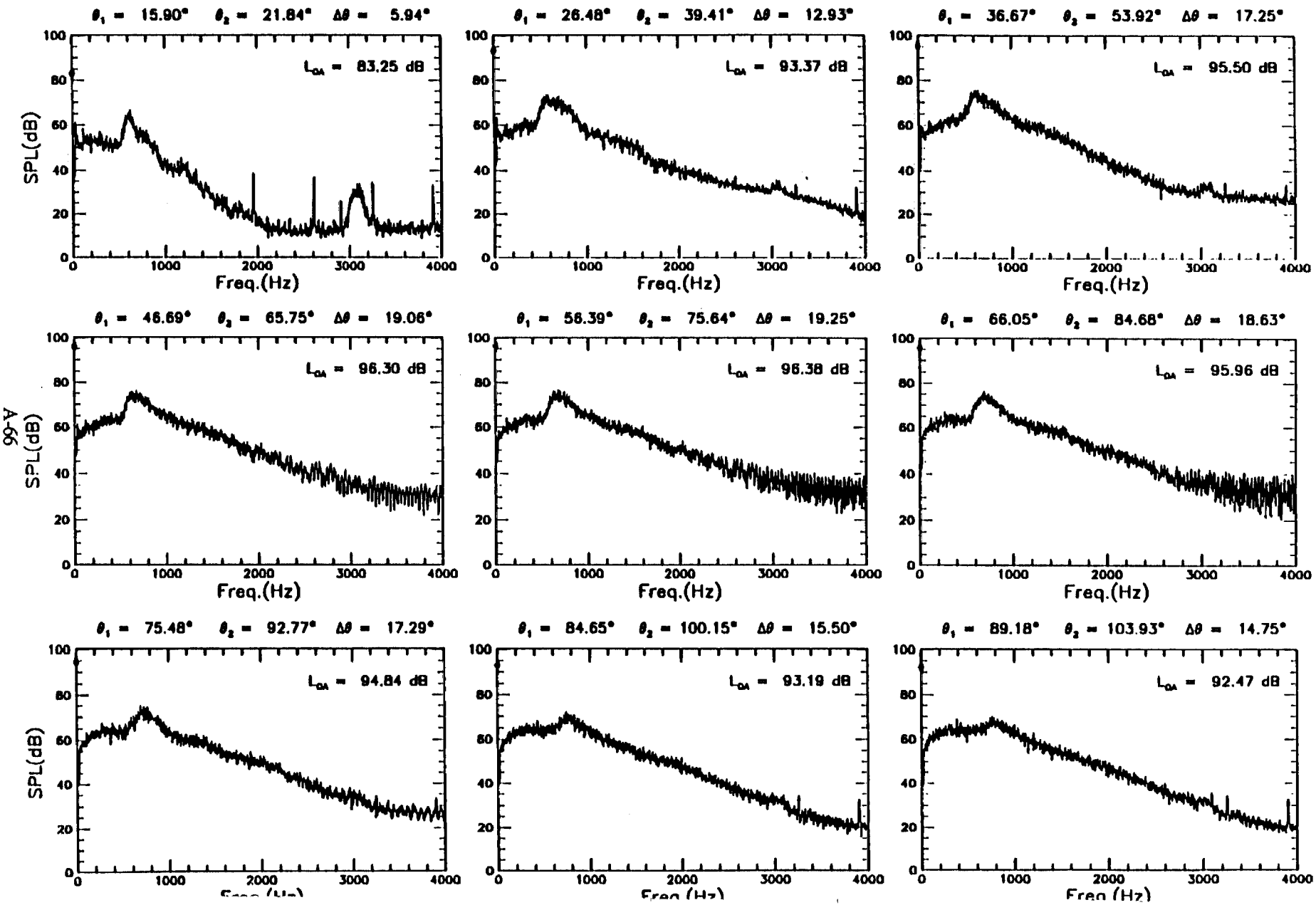

θ1 = 94.13° θ2 = 105.04° Δθ = 10.91°
L_OA = 84.74 dB
θ1 = 104.00° θ2 = 113.42° Δθ = 9.42°
L_OA = 85.08 dB
θ1 = 113.59° θ2 = 121.40° Δθ = 7.81°
L_OA = 85.94 dB
θ1 = 123.40° θ2 = 129.28° Δθ = 5.88°
L_OA = 85.31 dB
θ1 = 133.30° θ2 = 137.47° Δθ = 4.17°
L_OA = 84.22 dB
θ1 = 143.60° θ2 = 146.43° Δθ = 2.83°
L_OA = 83.54 dB
θ1 = 153.89° θ2 = 155.44° Δθ = 1.55°
L_OA = 80.41 dB
θ1 = 164.34° θ2 = 164.94° Δθ = .60°
L_OA = 75.80 dB
Ambient Spectra
L_OA = 63.51 dB
SPL(dB)
Freq.(Hz)

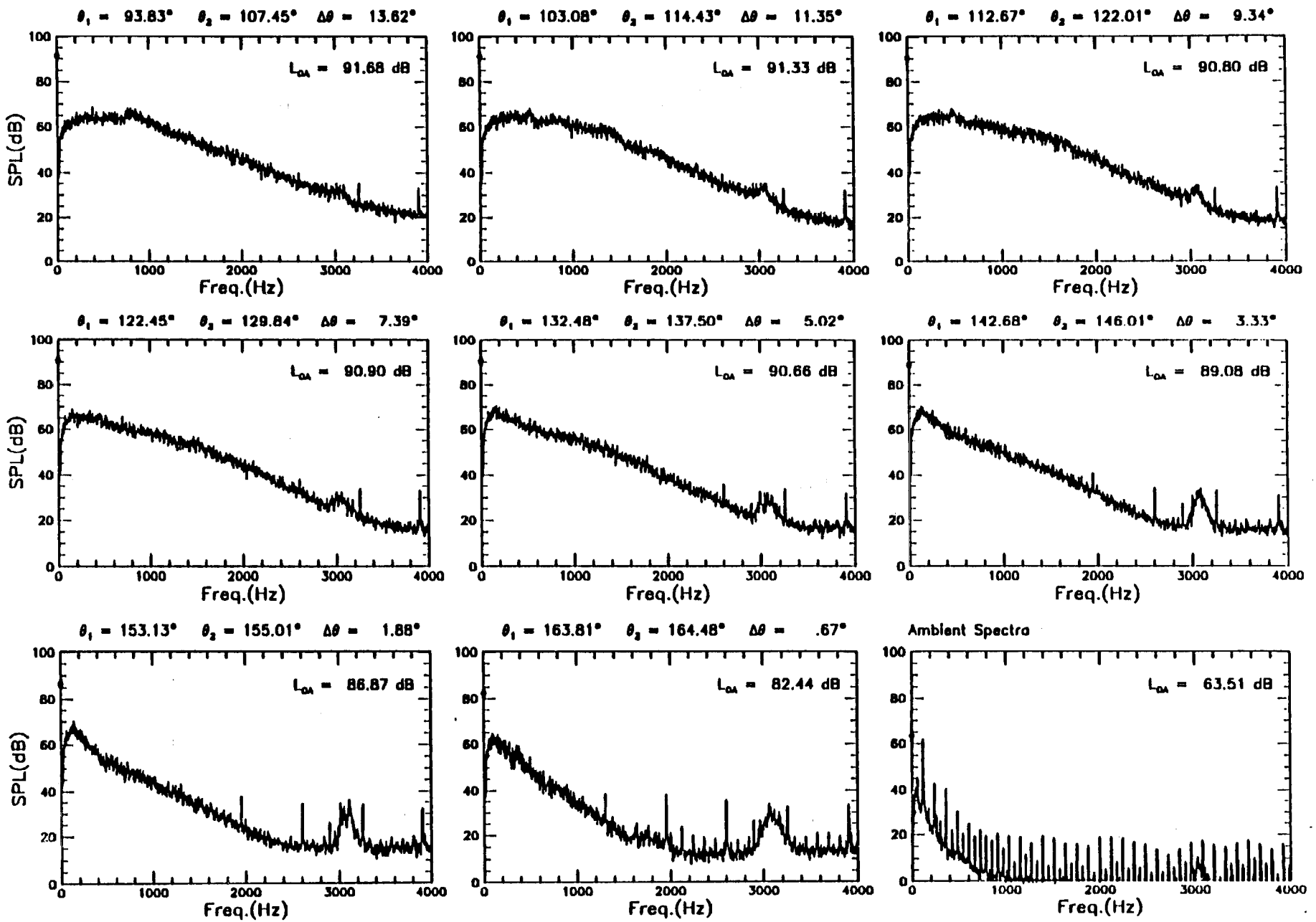
Climb–to–Cruise Run 820



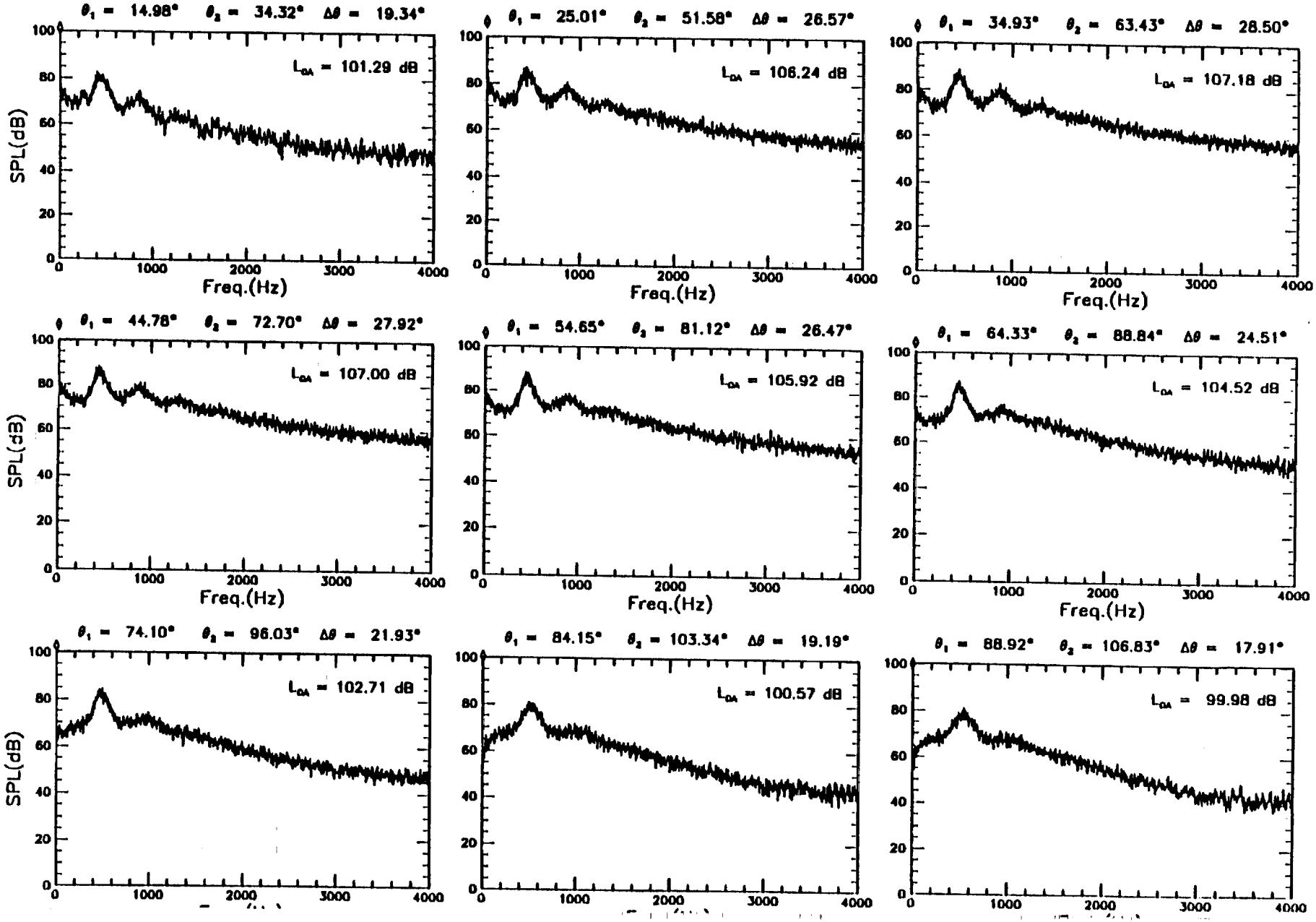

θ1 = 93.96° θ2 = 107.70° Δθ = 13.74°
L_OA = 92.56 dB
θ1 = 103.49° θ2 = 115.12° Δθ = 11.63°
L_OA = 92.45 dB
θ1 = 113.17° θ2 = 122.37° Δθ = 9.20°
L_OA = 91.81 dB
θ1 = 122.93° θ2 = 130.35° Δθ = 7.42°
L_OA = 92.09 dB
θ1 = 133.01° θ2 = 137.99° Δθ = 4.98°
L_OA = 90.85 dB
θ1 = 143.15° θ2 = 146.63° Δθ = 3.48°
L_OA = 90.19 dB
θ1 = 153.47° θ2 = 155.14° Δθ = 1.67°
L_OA = 87.98 dB
θ1 = 164.03° θ2 = 164.75° Δθ = .72°
L_OA = 83.21 dB
Ambient Spectra
L_OA = 63.51 dB
SPL(dB)
Freq.(Hz)

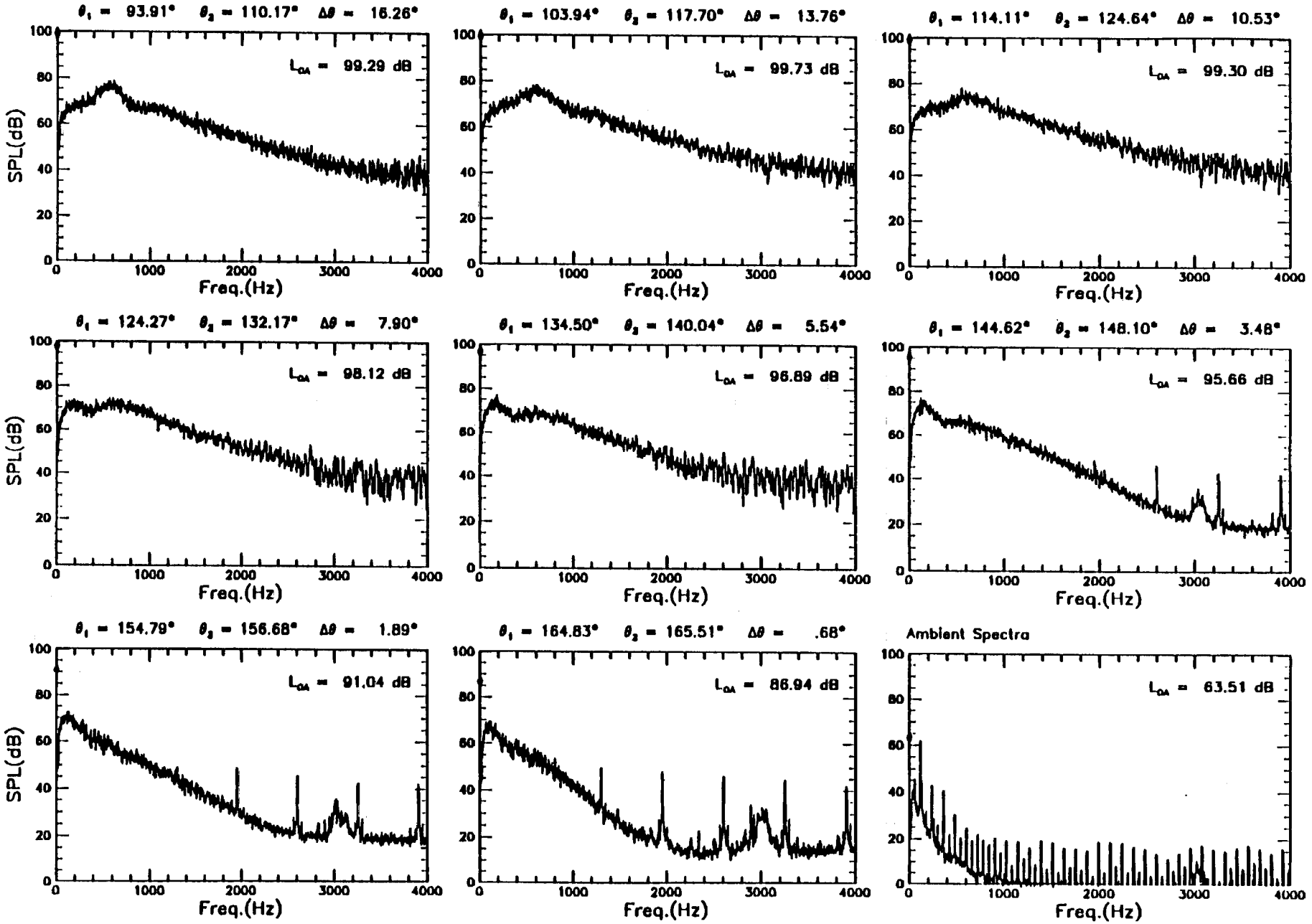
Climb–to–Cruise Run 821



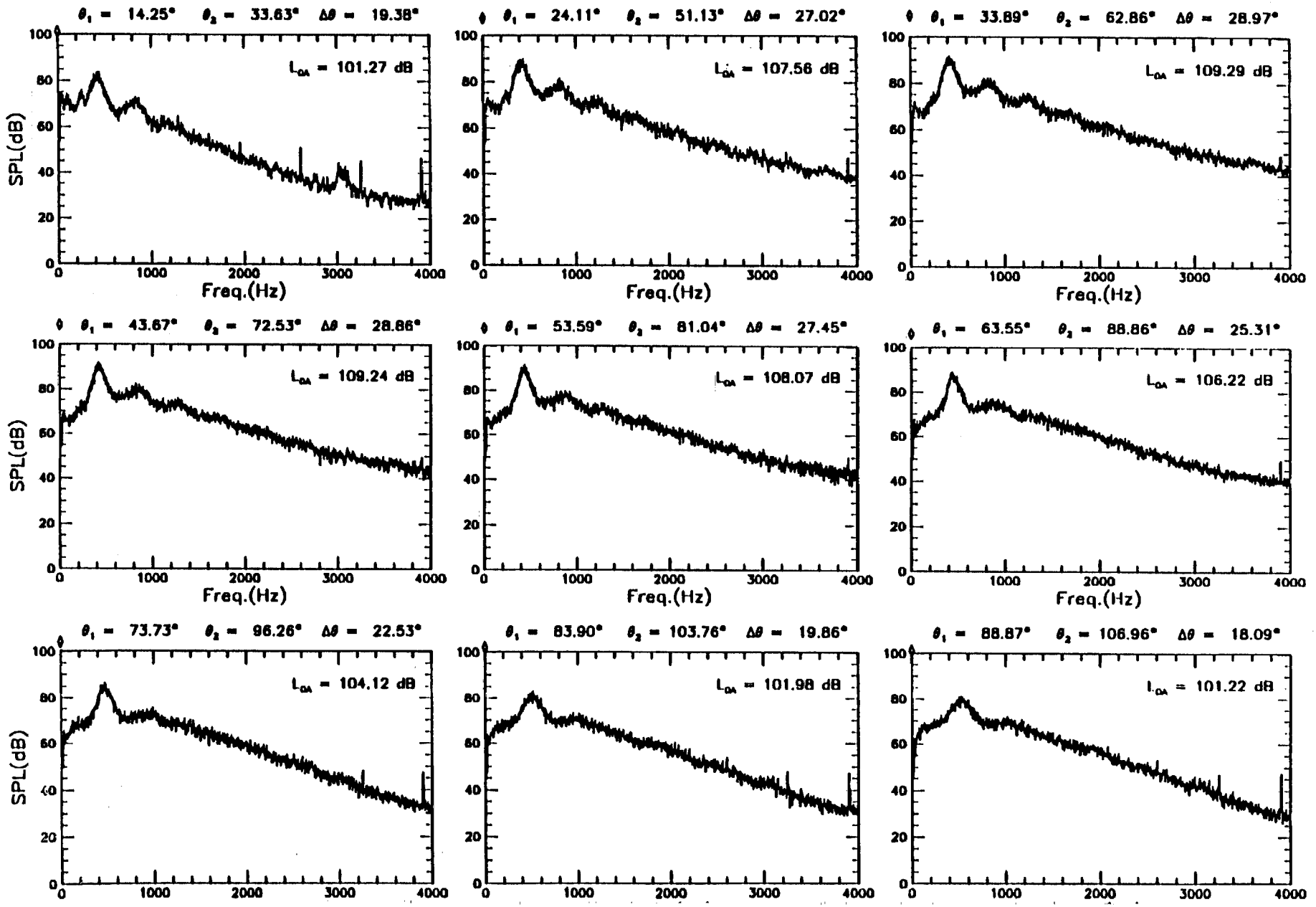

θ1 = 93.83° θ2 = 107.45° Δθ = 13.62°
LOA = 91.68 dB
θ1 = 103.08° θ2 = 114.43° Δθ = 11.35°
LOA = 91.33 dB
θ1 = 112.67° θ2 = 122.01° Δθ = 9.34°
LOA = 90.80 dB
θ1 = 122.45° θ2 = 129.84° Δθ = 7.39°
LOA = 90.90 dB
θ1 = 132.48° θ2 = 137.50° Δθ = 5.02°
LOA = 90.66 dB
θ1 = 142.68° θ2 = 146.01° Δθ = 3.33°
LOA = 89.08 dB
θ1 = 153.13° θ2 = 155.01° Δθ = 1.88°
LOA = 86.87 dB
θ1 = 163.81° θ2 = 164.48° Δθ = .67°
LOA = 82.44 dB
Ambient Spectra
LOA = 63.51 dB
SPL(dB)
Freq.(Hz)

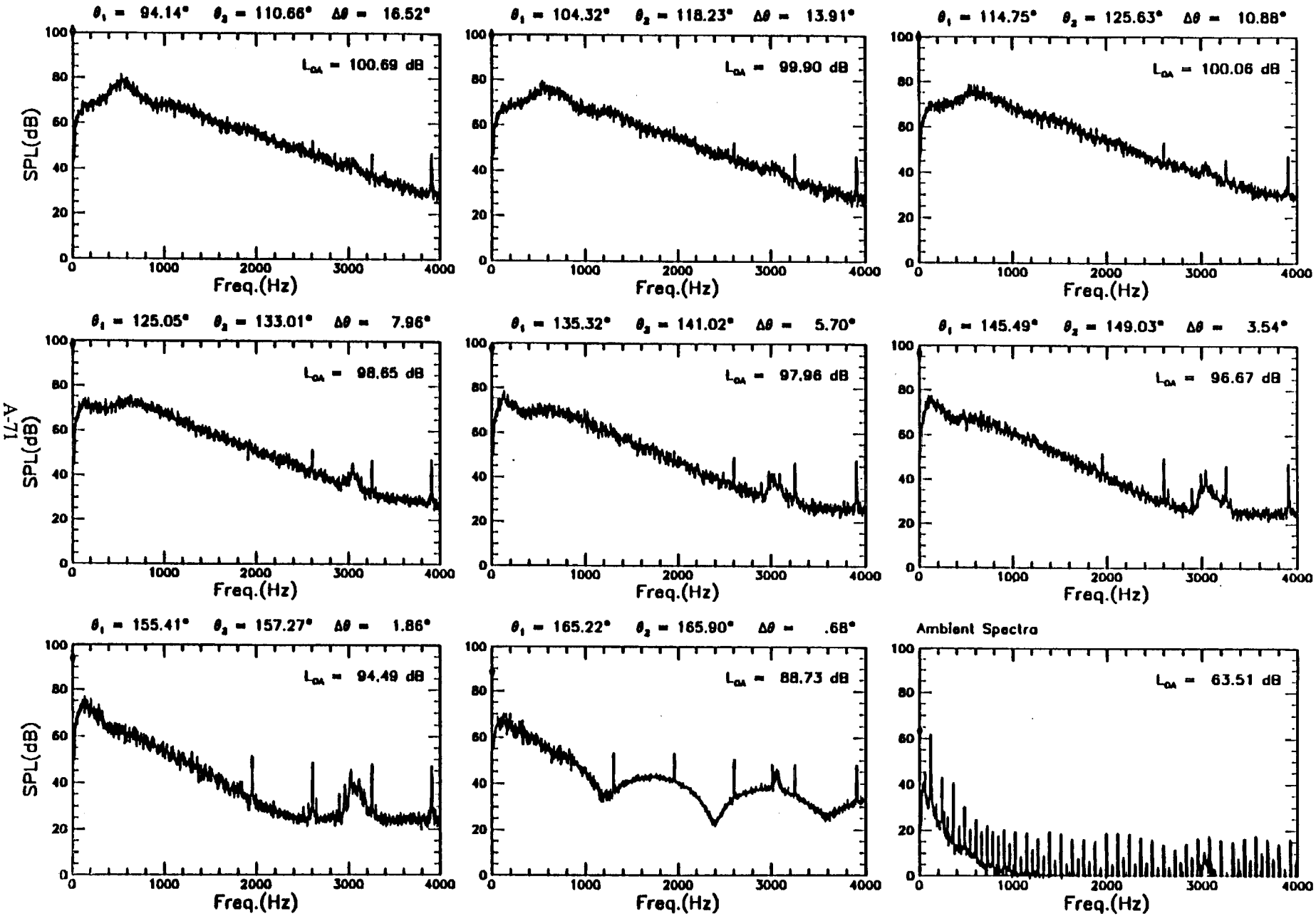
Climb–to–Cruise Run 830




θ1 = 93.91° θ2 = 110.17° Δθ = 16.26°
L_OA = 99.29 dB
θ1 = 103.94° θ2 = 117.70° Δθ = 13.76°
L_OA = 99.73 dB
θ1 = 114.11° θ2 = 124.64° Δθ = 10.53°
L_OA = 99.30 dB
θ1 = 124.27° θ2 = 132.17° Δθ = 7.90°
L_OA = 98.12 dB
θ1 = 134.50° θ2 = 140.04° Δθ = 5.54°
L_OA = 96.89 dB
θ1 = 144.62° θ2 = 148.10° Δθ = 3.48°
L_OA = 95.66 dB
θ1 = 154.79° θ2 = 156.68° Δθ = 1.89°
L_OA = 91.04 dB
θ1 = 164.83° θ2 = 165.51° Δθ = .68°
L_OA = 86.94 dB
Ambient Spectra
L_OA = 63.51 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

Climb–to–Cruise Run 831




θ1 = 94.14° θ2 = 110.66° Δθ = 16.52°
L_OA = 100.69 dB
θ1 = 104.32° θ2 = 118.23° Δθ = 13.91°
L_OA = 99.90 dB
θ1 = 114.75° θ2 = 125.63° Δθ = 10.88°
L_OA = 100.06 dB
θ1 = 125.05° θ2 = 133.01° Δθ = 7.96°
L_OA = 98.65 dB
θ1 = 135.32° θ2 = 141.02° Δθ = 5.70°
L_OA = 97.96 dB
θ1 = 145.49° θ2 = 149.03° Δθ = 3.54°
L_OA = 96.67 dB
θ1 = 155.41° θ2 = 157.27° Δθ = 1.86°
L_OA = 94.49 dB
θ1 = 165.22° θ2 = 165.90° Δθ = .68°
L_OA = 88.73 dB
Ambient Spectra
L_OA = 63.51 dB
SPL(dB)
Freq.(Hz)
0
20
40
60
80
100
1000
2000
3000
4000

APPENDIX B

1/3-OCTAVE BAND SOUND PRESSURE LEVELS FOR FLIGHT TESTS

Climb-to-Cruise Run 103

1/3-Octave Sound Pressure Levels

θ_1	15.0	25.1	35.2	45.1	55.0	65.0	74.8	84.7	89.7	94.4	104.4	114.3	124.3	134.3	144.4	154.6	164.7
θ_2	16.0	27.8	40.2	52.1	63.8	74.6	84.6	94.2	98.8	103.1	111.9	120.7	129.3	137.9	146.7	155.8	165.1
Frequency																	
50.	60.0	62.6	64.4	67.3	68.9	69.3	70.2	71.2	71.4	71.3	72.1	75.1	78.8	80.9	80.8	79.7	73.7
63.	58.2	63.0	66.3	68.0	69.8	71.2	72.8	72.8	73.0	73.2	75.4	78.4	82.9	84.7	84.2	82.2	76.0
80.	59.5	64.3	67.0	69.4	71.3	73.1	74.1	74.8	74.5	75.1	77.2	81.2	86.1	88.0	88.0	84.5	78.3
100.	59.8	68.2	70.7	71.9	72.5	73.6	74.6	75.1	75.6	75.9	79.2	84.1	88.2	89.8	88.8	84.9	78.9
125.	60.6	66.9	69.5	72.2	73.5	74.7	77.1	78.1	78.7	79.7	82.9	87.6	91.4	92.4	90.2	86.4	79.2
160.	63.7	68.7	72.1	73.8	75.6	77.2	78.9	80.0	80.6	81.6	84.3	89.5	94.2	94.8	92.1	87.1	79.7
200.	65.4	69.3	73.4	75.4	76.8	78.6	80.1	81.2	82.5	82.8	85.2	91.0	95.2	95.0	92.6	87.3	78.7
250.	66.6	71.7	75.2	77.3	79.9	80.9	82.2	83.8	84.2	85.0	88.3	93.1	97.1	96.8	93.7	88.3	78.8
315.	65.5	74.1	77.4	79.6	81.2	82.3	84.5	86.0	86.7	87.4	89.9	94.1	98.1	97.6	94.3	89.5	79.0
400.	70.5	80.6	81.4	81.0	82.5	83.9	85.3	86.7	87.7	88.7	91.3	95.0	97.9	98.2	94.8	88.9	77.0
500.	80.9	85.6	86.4	86.2	86.0	85.9	85.9	86.8	87.7	88.9	90.9	93.7	97.6	98.4	94.9	88.1	76.7
630.	79.6	88.4	92.0	93.2	92.2	90.0	88.2	87.3	87.7	88.7	91.2	93.6	97.1	97.4	93.1	87.0	73.1
800.	76.9	86.9	91.6	93.2	94.3	93.6	92.0	89.2	88.8	89.0	90.9	92.4	94.6	94.7	90.5	84.0	69.3
1000.	67.9	79.8	85.7	88.7	91.2	92.3	92.3	90.9	90.3	89.5	89.3	90.0	92.6	93.0	87.7	79.7	63.9
1250.	62.3	76.5	83.1	84.9	85.8	87.7	90.2	90.9	90.3	89.7	89.6	88.9	89.5	90.1	84.8	75.8	59.2
1600.	54.1	72.2	79.8	82.6	83.9	84.8	85.0	85.7	86.6	86.9	86.7	86.4	87.1	87.3	81.2	70.5	51.7
2000.	45.1	63.0	72.5	75.4	77.9	80.1	80.7	80.7	80.7	81.1	82.3	80.8	82.0	81.7	75.4	63.1	46.6
2500.	41.8	54.8	64.8	69.2	72.1	73.6	74.6	74.7	74.8	74.8	75.9	74.8	77.2	77.1	68.4	56.2	44.2
3150.	56.1	55.8	58.8	61.8	63.9	65.9	67.3	67.2	67.3	67.4	68.5	67.7	70.2	71.6	61.4	56.9	55.3
4000.	44.7	47.6	51.5	52.2	54.7	55.1	56.2	57.3	57.0	56.4	57.7	58.0	62.4	64.1	53.2	52.0	45.7
5000.	45.3	47.4	50.3	49.5	51.1	49.5	49.9	53.1	52.2	50.3	51.3	52.7	56.9	59.5	50.5	51.2	46.0
6300.	49.6	49.8	51.8	51.1	52.2	50.9	51.1	54.0	53.3	51.4	52.3	53.0	56.2	58.4	51.9	52.4	49.2
8000.	50.3	50.7	52.1	51.8	52.4	51.6	51.7	54.4	53.8	52.0	52.6	53.3	56.0	57.9	52.4	52.9	50.1
10000.	52.2	52.5	53.3	53.1	53.5	53.2	53.1	55.1	54.7	53.3	53.7	54.3	56.1	58.0	53.7	53.7	52.3
PNL	90.3	98.3	102.3	103.8	105.0	105.1	105.0	105.4	105.3	105.6	106.6	108.8	111.8	112.3	108.4	102.4	91.9
PNLT	94.6	99.8	103.3	105.0	105.7	105.8	105.0	105.5	105.3	105.6	106.6	108.8	111.8	112.3	108.4	103.3	95.3
OASPL	84.8	92.8	96.5	97.9	98.6	98.5	98.4	98.0	98.1	98.4	100.1	103.0	106.4	106.6	103.4	97.9	88.7

Climb-to-Cruise Run 105

1/3-Octave Sound Pressure Levels

θ_1	15.3	25.5	35.5	45.6	55.5	65.3	75.1	84.6	89.5	94.3	104.3	114.0	123.8	133.8	143.9	154.1	164.3
θ_2	16.2	28.0	40.1	52.1	63.6	74.2	84.3	93.6	98.2	102.6	111.4	120.0	128.6	137.4	146.2	155.3	164.8
Frequency																	
50.	55.0	60.3	64.0	65.8	67.8	69.9	70.7	70.3	70.4	70.2	72.5	75.0	78.2	80.9	80.9	79.1	73.5
63.	57.3	63.0	65.7	67.6	69.7	72.2	72.8	72.2	72.8	72.7	75.4	78.6	82.4	84.1	83.0	81.8	76.0
80.	57.9	64.7	66.6	68.8	71.8	72.9	74.5	74.5	74.1	75.1	77.0	81.0	84.6	86.1	86.2	84.2	78.0
100.	60.4	67.4	70.9	71.9	73.6	73.3	75.6	75.3	75.8	76.9	78.9	83.4	87.9	89.5	88.1	84.2	77.9
125.	64.8	68.5	71.1	72.3	74.2	75.8	77.1	77.7	78.3	79.6	82.4	87.4	91.0	92.0	89.7	85.9	77.2
160.	63.1	68.8	71.5	73.7	76.0	77.6	78.7	80.1	81.2	81.8	85.2	90.1	93.4	94.3	91.6	86.6	77.7
200.	64.7	69.5	71.9	74.5	76.6	78.7	80.0	81.2	81.8	82.1	85.9	90.6	94.7	94.8	92.0	86.6	77.2
250.	66.0	71.2	74.9	77.2	79.1	80.5	82.1	82.7	83.8	84.8	88.4	93.3	96.2	95.8	92.6	87.9	76.6
315.	64.7	72.3	75.8	78.5	80.7	82.6	84.1	85.4	86.0	86.8	89.8	94.4	97.0	96.8	93.3	88.2	75.3
400.	68.2	77.0	79.5	79.8	81.7	83.1	85.2	85.9	86.8	88.2	90.8	94.6	96.7	96.4	93.0	87.1	75.0
500.	76.8	84.0	84.0	83.3	83.2	83.9	85.1	86.2	87.1	88.1	90.3	93.0	95.4	95.7	91.6	85.8	73.6
630.	76.0	86.5	89.9	89.7	88.3	86.6	85.8	85.9	86.8	88.2	90.2	92.2	94.4	94.6	90.3	83.4	68.9
800.	71.5	85.1	89.2	90.0	91.2	90.6	88.6	86.5	87.2	87.7	89.4	90.3	91.6	91.6	86.8	79.2	62.6
1000.	61.6	77.0	82.7	85.9	89.1	90.5	90.0	87.6	87.2	87.2	87.5	87.9	89.3	88.8	82.9	73.9	55.8
1250.	53.3	71.2	77.6	80.0	83.3	85.6	87.2	85.8	85.2	85.0	85.1	85.1	85.4	85.3	78.3	67.7	49.2
1600.	49.1	65.1	73.1	75.8	78.1	79.3	80.7	81.7	82.2	82.3	81.4	81.2	80.8	80.6	73.0	60.4	49.5
2000.	48.4	55.0	62.9	66.6	71.9	73.7	74.1	73.5	74.2	74.8	74.9	74.1	74.4	73.3	65.1	53.5	49.0
2500.	45.9	50.6	54.2	58.2	63.0	65.3	67.1	66.4	66.8	66.9	67.1	66.6	67.5	65.9	58.4	51.1	46.8
3150.	59.8	60.2	60.4	60.2	60.2	61.6	62.1	62.2	62.3	62.3	61.8	63.2	62.8	62.4	60.9	59.5	60.3
4000.	49.6	51.1	50.6	51.1	51.0	51.2	52.3	52.5	52.2	53.0	52.2	56.4	56.4	55.4	56.0	51.9	49.9
5000.	49.8	51.1	50.5	50.9	50.6	50.5	51.6	51.7	51.4	52.1	51.4	55.7	55.3	54.4	56.0	51.5	50.1
6300.	54.0	54.4	54.3	54.5	54.4	54.4	54.8	55.3	55.0	55.3	54.8	57.6	57.0	56.4	57.8	54.5	54.7
8000.	55.2	55.5	55.3	55.5	55.4	55.4	55.7	55.9	55.8	55.9	55.7	58.1	57.4	57.0	58.8	55.5	55.3
10000.	55.8	55.9	56.0	56.0	55.9	55.9	56.1	56.2	56.1	56.2	56.2	58.3	57.5	57.2	59.2	56.0	55.8
PNL	87.8	96.5	99.8	100.7	102.2	102.5	102.7	101.9	102.3	102.8	104.7	107.6	109.7	109.7	106.1	100.4	90.1
PNLT	91.9	99.6	102.5	102.5	102.6	103.0	102.8	102.1	102.5	102.8	104.7	107.6	109.7	109.7	107.4	103.1	94.0
OASPL	81.1	90.8	94.1	94.8	95.8	96.2	96.2	95.7	96.2	96.9	99.0	102.2	104.8	104.9	101.7	96.6	87.0

Climb-to-Cruise Run 205

1/3-Octave Sound Pressure Levels

θ_1	14.9	25.0	35.0	45.0	55.0	64.9	74.8	84.8	89.8	94.7	104.7	114.7	124.7	134.8	144.8	154.9	164.9	
θ_2	15.7	27.2	38.6	49.6	60.3	70.3	80.0	89.6	94.4	99.0	108.3	117.6	126.8	136.4	145.7	155.4	165.1	
Frequency																		
50.	47.8	56.3	57.1	58.0	58.6	61.2	61.3	62.3	62.3	61.1	60.6	63.8	65.0	67.0	66.8	66.9	60.8	
63.	49.2	58.1	58.3	61.2	61.3	63.6	63.4	63.5	64.3	63.6	62.4	66.5	70.1	72.0	71.5	69.1	63.5	
80.	49.8	59.3	61.4	62.4	64.1	64.9	66.3	65.1	64.5	64.1	65.1	68.8	73.4	74.7	74.4	71.3	64.4	
100.	48.5	60.3	61.5	63.6	66.9	67.9	65.3	65.1	66.1	66.6	67.4	71.4	75.9	76.9	75.6	72.5	65.6	
125.	54.0	62.2	63.5	69.1	67.9	66.4	66.7	66.7	68.1	68.4	70.2	74.1	77.6	78.5	77.1	73.2	66.2	
160.	54.4	67.6	69.6	66.3	66.5	67.3	68.5	69.1	70.1	71.1	72.3	75.8	79.4	79.7	78.0	72.5	64.8	
200.	57.7	62.3	64.8	66.6	67.3	67.8	70.8	71.4	70.8	70.9	71.0	75.2	79.9	79.6	77.8	72.3	63.9	
250.	53.1	63.7	65.2	67.8	69.3	73.3	71.8	71.0	71.4	72.2	73.1	76.2	79.8	80.2	77.8	72.5	62.1	
315.	51.5	63.9	67.0	72.6	74.8	71.0	71.9	72.5	73.1	73.8	74.9	77.5	79.6	80.0	77.6	71.9	59.4	
400	49.6	66.3	71.4	71.5	69.6	70.4	71.7	72.2	73.0	73.6	74.6	76.4	77.2	77.7	73.8	69.2	53.7	
500.	60.4	73.9	75.9	77.7	74.1	72.4	71.6	71.5	72.0	72.4	73.0	74.6	74.5	75.3	71.7	64.9	47.5	
630.	53.7	70.6	76.7	80.1	79.5	78.5	75.7	70.8	70.7	70.6	71.7	72.8	72.0	71.7	67.9	58.4	39.9	
800	37.3	60.1	67.5	73.4	74.8	76.8	76.7	74.2	72.6	70.9	69.2	68.2	66.6	65.9	61.8	49.8	34.7	
1000.	34.0	47.7	55.3	62.4	64.8	67.2	70.1	70.9	70.8	69.2	65.4	63.5	61.6	58.6	54.8	42.2	34.8	
1250.	30.5	41.4	50.4	56.9	57.6	57.7	59.3	59.7	60.9	61.5	59.8	57.4	53.5	50.5	47.8	38.9	32.5	
1600.	32.1	36.7	39.6	46.1	49.5	52.1	51.8	50.0	50.3	51.7	50.3	48.6	45.7	42.4	43.3	38.5	33.7	
2000.	32.8	35.7	35.6	39.1	38.3	40.6	40.7	42.0	39.9	42.5	39.5	39.8	41.1	39.2	41.4	37.6	33.8	
2500	31.2	34.4	34.2	37.4	35.8	37.8	36.1	38.9	36.1	41.6	36.3	37.7	39.9	38.1	40.4	36.4	32.3	
3150.	45.1	46.1	45.3	46.1	45.8	46.0	45.8	46.2	45.6	46.7	45.2	45.9	46.1	45.7	46.1	45.0	45.3	
4000.	34.7	35.9	35.9	37.7	36.5	37.7	36.8	38.7	36.7	42.7	37.0	37.9	39.4	38.1	40.0	37.1	35.2	
5000.	35.4	36.2	36.3	37.6	36.8	37.6	36.9	38.3	36.8	42.9	37.1	37.9	39.0	38.0	39.5	37.1	35.7	
6300.	39.1	39.7	39.8	40.3	39.8	40.4	39.9	40.6	39.9	44.6	40.1	40.6	40.9	40.2	41.3	39.9	39.2	
8000.	40.2	40.4	40.9	41.1	40.6	41.0	40.6	41.2	40.6	46.2	40.9	41.3	41.6	41.2	41.8	40.9	40.2	
10000.	42.3	42.7	42.9	42.7	42.6	42.8	42.7	43.0	42.6	46.2	42.5	43.1	43.1	43.0	43.3	42.7	42.6	
PNL		71.2	82.8	85.9	89.0	88.8	88.5	87.8	86.6	86.2	86.8	86.9	88.7	90.5	90.8	88.6	83.1	73.6
PNLT		75.2	86.5	89.3	91.8	92.0	91.3	90.9	89.0	89.2	88.4	89.7	91.4	92.7	93.3	90.5	85.9	77.5
OASPL	65.2	77.7	81.2	83.9	83.5	83.3	82.8	81.8	81.8	82.0	82.6	85.1	87.8	88.3	86.3	81.6	73.5	

Climb-to-Cruise Run 211

1/3-Octave Sound Pressure Levels

θ_1	15.1	25.2	35.3	45.4	55.3	65.3	75.0	84.9	89.8	94.8	104.6	114.4	124.3	134.3	144.4	154.5	164.6
θ_2	15.7	26.9	38.1	49.2	59.6	69.9	79.6	89.2	93.9	98.6	107.9	117.1	126.5	135.7	145.2	155.0	164.8
Frequency																	
50.	46.4	53.4	57.0	57.9	59.6	61.2	61.1	60.5	59.9	59.9	61.7	62.9	64.8	67.5	67.2	66.3	60.6
63.	52.7	56.0	59.7	61.3	61.9	63.2	62.3	63.2	62.8	62.2	63.7	65.7	67.5	70.9	70.5	67.8	63.4
80	51.2	57.7	60.0	61.8	63.2	63.7	65.8	65.3	64.3	63.8	65.3	67.2	70.9	73.1	73.4	70.4	65.5
100.	52.8	58.7	61.5	62.7	66.0	67.3	65.1	65.1	65.9	66.1	67.6	69.7	74.0	76.4	75.0	71.6	64.7
125.	62.8	64.0	65.7	68.9	68.0	67.3	67.9	68.4	69.0	69.0	70.9	73.0	76.9	77.9	76.9	73.4	67.5
160.	57.7	64.6	67.6	66.4	66.2	67.3	67.9	67.9	68.6	70.5	71.6	74.0	78.0	80.0	77.6	73.8	65.4
200.	54.3	59.9	63.9	66.9	67.3	68.0	71.1	71.3	70.3	70.6	70.9	74.1	78.0	79.6	77.4	72.7	63.9
250.	54.3	60.7	65.4	67.9	69.9	74.4	71.5	70.7	70.4	71.6	73.8	75.9	79.1	79.8	77.1	72.5	62.0
315.	52.8	61.1	66.8	75.1	75.1	71.8	72.6	73.0	73.8	74.3	75.7	77.1	79.3	80.3	77.6	72.8	62.5
400.	51.2	67.5	72.8	70.8	70.1	71.4	72.5	73.5	73.4	73.8	75.4	76.7	77.7	78.2	75.8	71.5	58.5
500.	61.0	72.7	76.0	77.5	74.2	72.9	71.9	73.2	72.9	73.0	74.5	75.4	75.4	75.8	74.2	67.9	55.4
630.	52.4	68.8	77.0	81.9	81.1	78.9	75.2	73.9	74.1	73.8	73.8	75.4	74.4	72.9	71.0	63.5	48.2
800.	38.2	60.3	69.6	74.8	76.7	78.9	77.8	74.5	72.6	72.1	71.9	70.8	72.2	67.0	63.9	56.0	39.0
1000.	34.0	45.5	56.2	62.8	65.7	69.1	72.3	73.3	71.9	69.5	66.8	64.5	64.6	60.3	55.9	46.6	37.0
1250.	30.7	38.3	49.4	56.7	57.4	58.5	60.9	62.5	62.5	62.5	61.2	57.6	55.8	51.3	47.2	38.9	36.4
1600.	34.2	36.1	40.4	45.9	49.0	51.3	51.0	50.3	50.1	51.5	51.6	47.6	47.9	44.6	43.8	37.9	38.2
2000.	34.1	35.6	37.8	37.9	41.8	40.7	40.8	41.7	38.2	40.6	38.6	41.0	43.4	42.0	42.3	37.1	38.3
2500.	30.9	33.1	35.9	35.7	40.2	37.8	37.1	38.8	33.4	38.0	34.6	39.1	42.1	40.8	41.1	35.1	38.3
3150.	44.2	43.4	44.3	44.8	44.4	44.3	44.9	45.5	44.5	45.5	44.7	45.1	46.0	44.9	45.2	44.7	44.5
4000.	35.5	36.1	37.4	37.2	40.0	38.2	38.0	39.0	36.3	38.5	36.8	39.2	41.4	40.5	40.7	37.2	41.1
5000.	36.5	36.8	37.7	37.7	39.8	38.4	38.2	38.8	37.0	38.5	37.5	39.2	40.9	40.2	40.3	37.5	41.7
6300.	38.7	38.8	39.5	39.7	40.7	39.7	39.8	40.4	39.0	40.0	39.4	40.5	41.8	41.1	41.2	39.4	43.4
8000.	39.8	40.0	40.4	40.5	41.5	40.7	40.5	41.0	40.1	40.7	40.2	41.1	42.1	41.7	41.7	40.3	44.5
10000.	42.0	42.0	42.4	42.5	42.8	42.4	42.5	42.9	42.2	42.4	42.3	42.9	43.3	43.2	43.1	42.3	45.7
PNL	72.0	81.6	86.2	90.1	89.9	89.1	88.5	87.2	86.7	86.8	87.7	88.9	90.6	91.1	88.9	84.1	75.8
PNLT	75.7	84.5	88.8	92.8	91.6	91.2	90.9	89.4	89.9	89.3	90.7	90.8	92.0	92.5	90.3	86.9	77.4
OASPL	67.3	76.4	81.6	85.0	84.5	84.3	83.3	82.7	82.4	82.5	83.5	84.9	87.2	88.2	86.2	82.0	74.2

Climb-to-Cruise Run 305

1/3-Octave Sound Pressure Levels

θ_1	15.0	25.2	35.3	45.3	55.3	65.2	75.1	85.0	89.9	94.8	104.7	114.6	124.5	134.4	144.4	154.5	164.6
θ_2	15.4	26.2	37.0	47.5	57.8	67.9	77.6	87.4	92.2	96.9	106.4	116.1	125.7	135.2	144.9	154.8	164.7
Frequency																	
50.	44.9	50.5	53.6	54.2	55.0	55.1	55.2	56.0	55.4	55.1	55.2	57.4	60.0	61.9	60.2	59.5	54.0
63.	45.6	52.5	53.3	56.5	58.4	58.0	58.6	57.5	58.2	57.2	56.9	60.0	62.9	64.3	64.3	62.1	52.9
80.	46.3	50.9	54.9	57.3	58.7	58.5	60.2	58.4	58.6	58.0	59.5	63.2	66.2	67.3	67.3	61.8	55.6
100.	44.7	51.6	56.8	57.6	60.6	61.3	59.1	58.6	59.4	59.2	61.1	66.3	67.8	69.6	68.3	61.6	54.0
125.	51.8	54.9	58.1	62.1	61.7	61.7	61.4	61.7	62.0	61.3	64.0	68.0	70.2	71.9	69.1	61.1	55.1
160.	44.8	56.7	61.9	58.5	59.4	59.6	60.5	62.1	62.6	63.9	65.6	68.8	71.5	72.6	69.4	61.5	50.4
200.	47.0	51.7	56.3	58.2	59.7	60.0	64.0	64.5	63.8	62.3	64.0	67.8	70.2	72.1	68.2	58.6	46.8
250.	42.1	51.2	56.7	58.6	60.8	65.6	63.5	62.2	62.9	63.2	64.7	68.0	70.4	70.8	65.9	56.7	43.4
315.	36.2	48.4	56.7	61.9	66.5	60.6	62.6	62.8	64.0	64.2	64.6	67.0	68.4	68.5	64.0	54.0	37.4
400.	30.4	46.8	60.2	58.6	57.9	58.7	59.5	61.1	61.1	61.3	62.2	64.3	64.0	63.2	58.1	45.5	30.6
500.	30.6	50.0	58.6	61.3	61.2	59.8	58.5	58.1	59.4	58.2	58.4	59.7	58.2	57.3	50.8	37.8	29.1
630.	26.6	38.0	51.9	56.9	60.2	59.8	57.5	53.4	54.3	53.7	53.1	53.6	51.6	48.8	41.7	31.4	27.3
800.	24.8	27.2	36.2	42.6	48.2	51.3	52.7	49.8	48.5	46.8	44.8	44.3	42.4	40.8	35.8	29.3	25.5
1000.	25.6	27.3	28.0	30.6	33.0	36.0	39.6	41.2	41.0	38.7	36.4	35.8	37.9	37.5	34.2	28.8	25.9
1250.	23.9	26.8	26.3	28.0	27.5	29.6	31.4	31.0	29.4	28.7	32.2	32.6	36.4	36.2	33.2	27.5	24.5
1600.	25.3	27.6	26.8	28.3	27.3	28.8	31.7	30.5	28.3	27.9	31.5	32.2	35.9	35.7	32.9	28.0	25.6
2000.	25.5	27.7	26.4	27.2	26.6	28.0	31.6	29.2	27.4	27.1	30.2	30.8	34.4	34.2	31.6	27.2	25.7
2500.	25.2	27.4	25.6	26.3	25.9	27.0	31.9	28.3	26.3	26.3	29.4	29.8	33.5	33.3	30.9	26.3	25.2
3150.	35.2	34.6	34.4	35.5	35.5	35.6	37.1	35.4	34.5	35.2	35.6	36.1	37.5	37.1	36.0	35.4	35.7
4000.	27.8	30.0	28.0	28.3	28.0	28.3	34.1	29.0	28.3	28.2	29.7	30.1	32.7	32.6	31.1	28.2	27.9
5000.	28.3	30.7	28.4	28.9	28.5	29.0	34.6	29.3	28.6	28.6	29.5	29.8	32.1	31.9	30.9	28.6	28.4
6300.	30.3	32.5	30.3	30.8	30.5	33.3	36.4	32.7	30.6	30.6	31.2	31.5	33.0	32.9	32.4	30.3	30.3
8000.	31.9	33.9	32.4	32.7	31.9	36.1	37.7	35.2	32.3	32.5	32.1	32.6	33.7	33.6	33.4	31.6	31.8
10000.	34.6	35.8	35.8	35.1	34.4	37.6	39.2	36.7	35.0	34.6	34.2	35.1	35.3	35.8	35.2	34.0	34.2
PNL	58.0	64.0	70.9	72.5	74.9	74.3	74.2	73.7	74.1	74.0	74.8	77.4	79.4	80.1	76.3	67.7	59.8
PNLT	60.9	66.5	73.5	75.3	77.8	77.0	75.6	75.9	76.5	76.6	76.8	79.4	80.9	81.5	77.9	70.4	62.9
OASPL	56.1	62.7	68.3	69.9	71.7	71.5	71.6	71.5	71.9	71.7	73.0	76.4	78.4	79.6	76.7	69.9	62.0

Climb-to-Cruise Run 315

1/3-Octave Sound Pressure Levels

θ_1	15.1	25.4	35.5	45.5	55.5	65.4	75.2	85.0	89.9	94.8	104.6	114.4	124.3	134.2	144.3	154.4	164.6
θ_2	15.5	26.4	37.2	47.7	58.0	68.1	77.8	87.4	92.2	96.9	106.3	115.9	125.5	135.1	144.7	154.6	164.7
Frequency																	
50.	48.9	52.4	54.9	55.5	56.1	56.0	55.1	55.3	55.9	57.0	57.5	59.0	61.1	61.1	61.3	56.4	51.4
63.	51.7	54.9	57.9	58.4	58.2	57.7	58.4	57.9	58.1	59.0	60.5	62.5	64.6	64.3	62.7	60.0	54.7
80.	51.3	57.1	59.4	59.0	60.2	59.1	58.5	59.0	58.9	60.8	62.9	65.0	67.4	67.3	65.5	60.0	53.3
100.	51.1	57.9	58.7	61.2	58.4	58.8	58.8	60.3	61.8	62.7	64.7	66.8	68.6	67.9	65.7	61.3	53.2
125.	63.1	64.0	66.1	64.2	64.9	64.9	65.3	66.0	66.3	67.0	68.5	70.5	70.3	69.1	68.1	64.8	63.1
160.	50.3	61.2	59.9	59.6	60.1	60.9	61.4	62.8	63.2	64.7	67.6	69.3	70.9	68.6	65.7	59.5	47.1
200.	51.0	55.6	58.8	59.6	60.4	60.9	60.8	61.1	62.1	63.9	67.4	68.7	69.5	67.3	64.3	57.1	41.6
250.	48.9	56.3	60.1	59.8	61.0	62.0	62.2	62.5	63.0	64.1	67.1	68.7	68.8	65.9	62.3	54.0	45.7
315.	42.8	55.5	59.7	60.8	60.8	61.9	62.6	63.0	63.5	63.6	65.9	67.1	67.3	63.7	59.0	51.3	35.5
400.	43.3	55.4	59.7	59.1	60.0	61.5	61.2	61.8	62.8	62.5	63.3	63.7	63.3	60.9	55.8	45.6	41.5
500.	43.8	62.8	65.5	61.5	60.2	59.7	59.6	60.2	59.8	59.3	60.0	59.9	59.2	57.1	51.4	39.0	32.9
630.	35.3	60.2	65.5	64.3	60.9	57.6	56.4	57.3	57.0	56.8	57.3	55.9	55.1	52.4	45.7	34.6	30.6
800.	27.1	48.3	57.0	59.0	60.6	58.4	55.1	53.9	53.3	52.0	51.6	49.5	47.9	45.3	39.3	31.2	28.4
1000.	26.0	38.2	45.1	48.2	51.6	53.7	52.5	49.0	47.9	45.7	45.5	42.8	41.1	38.6	32.7	29.9	27.2
1250.	26.0	32.0	39.6	39.6	40.4	41.3	42.9	41.9	40.9	39.0	38.6	35.7	34.1	36.1	31.0	29.3	26.9
1600.	26.8	28.7	30.0	32.0	33.2	33.6	33.5	33.3	33.8	31.5	33.9	32.6	31.0	35.4	30.8	29.3	27.1
2000.	28.2	29.1	28.8	29.2	30.0	31.0	30.5	30.9	31.5	29.7	32.6	31.8	30.5	34.3	30.6	29.7	29.0
2500.	29.4	29.5	29.5	29.6	30.2	31.1	30.5	30.7	31.4	30.1	32.4	31.6	30.7	33.9	30.5	29.8	28.8
3150.	33.0	33.0	33.3	33.0	33.5	33.7	33.3	34.2	34.2	33.4	34.5	34.0	33.8	35.1	34.0	33.3	33.1
4000.	35.7	35.7	35.7	35.8	35.9	36.1	35.9	35.9	36.0	35.8	36.3	36.2	35.9	36.8	35.9	35.7	35.5
5000.	35.9	36.0	35.9	35.9	35.9	36.3	36.0	36.1	36.2	35.9	36.3	36.0	35.8	36.7	36.1	35.9	35.9
6300.	32.4	32.5	32.4	32.4	32.5	33.2	32.5	32.6	32.8	32.4	33.0	32.8	32.6	33.6	32.6	32.3	32.3
8000.	33.0	32.8	33.0	33.1	33.3	33.9	33.2	33.2	33.3	33.2	33.7	33.7	33.4	33.8	33.1	33.0	33.2
10000.	34.6	35.3	35.2	34.5	34.9	35.8	34.8	35.2	34.6	34.6	35.1	34.9	34.9	35.0	35.4	35.0	34.4
PNL	65.1	73.5	76.4	75.8	74.7	74.9	74.6	75.0	75.6	75.5	77.4	78.5	78.7	76.8	73.4	68.4	64.2
PNLT	67.1	75.1	78.1	77.1	75.6	76.1	75.5	75.8	76.2	76.1	77.4	78.5	78.7	76.8	73.4	69.2	66.4
OASPL	64.6	70.0	72.7	71.9	71.8	71.8	71.8	72.4	72.8	73.6	75.8	77.3	78.1	76.5	74.2	69.4	64.8

Climb-to-Cruise Run 409

1/3-Octave Sound Pressure Levels

θ_1	15.3	25.5	35.7	45.8	55.8	65.6	75.4	85.1	89.9	94.8	104.5	114.3	124.1	134.0	144.1
θ_2	15.5	26.0	36.5	46.8	57.0	66.9	76.7	86.3	91.1	95.8	105.4	114.9	124.7	134.5	144.4
Frequency															
50.	39.9	41.4	44.4	45.8	46.7	46.8	47.9	48.3	47.0	47.1	47.8	52.2	53.4	54.4	54.3
63.	45.7	46.3	47.6	48.4	49.4	50.9	51.3	50.2	50.5	50.2	49.0	53.8	56.2	57.3	57.0
80.	39.5	41.7	46.2	48.1	49.5	49.5	51.2	49.5	49.6	49.8	51.8	54.9	57.1	58.4	57.3
100.	46.3	46.7	48.1	48.7	49.4	52.0	50.8	50.8	51.4	51.6	51.8	56.6	59.2	58.9	56.2
125.	61.6	61.6	61.7	61.8	61.8	61.4	61.4	61.6	61.5	61.8	62.3	62.6	64.0	63.4	62.2
160.	40.4	41.2	45.7	45.3	46.1	48.0	47.4	48.9	49.6	49.6	52.3	56.2	58.0	57.2	51.9
200.	34.5	35.8	37.3	41.1	43.1	45.6	46.0	46.4	47.0	46.9	49.6	53.7	55.0	52.7	46.0
250.	47.2	47.2	47.2	47.4	47.8	48.6	48.8	49.1	49.3	49.4	50.3	52.9	53.7	51.1	48.5
315.	39.4	39.8	39.7	40.5	41.5	42.7	43.5	44.6	45.0	45.1	46.5	48.1	48.8	45.5	41.5
400.	30.7	30.7	31.3	34.9	36.6	38.1	39.2	39.6	41.3	40.8	42.1	42.2	41.6	37.8	33.5
500.	32.5	32.5	32.8	35.2	37.4	38.8	37.5	37.2	37.1	36.5	37.1	37.7	36.0	34.8	33.8
630.	29.3	29.6	29.3	30.5	31.8	34.0	34.6	33.3	32.5	31.5	32.5	32.8	31.0	31.1	30.7
800.	26.1	26.7	25.9	26.3	26.9	26.9	27.8	29.3	28.4	27.5	27.9	29.2	26.6	28.3	27.5
1000.	25.2	25.6	24.8	25.1	25.4	24.7	24.8	26.3	25.4	24.9	25.8	27.6	25.3	27.1	26.3
1250.	23.8	24.3	23.9	24.1	24.3	23.6	23.8	24.5	23.7	23.4	24.1	26.4	24.1	25.9	25.3
1600.	24.4	24.8	24.4	24.6	24.5	24.4	24.4	25.0	24.4	24.3	24.4	26.3	24.5	25.9	25.4
2000.	24.3	24.3	24.2	24.2	24.2	24.1	24.1	24.3	24.2	24.2	24.3	25.2	24.2	24.8	24.5
2500.	25.1	25.0	25.0	25.0	24.9	24.9	24.9	25.1	25.1	24.9	25.1	25.3	25.1	25.2	25.1
3150.	27.4	27.1	28.6	27.4	28.0	27.4	27.4	28.0	27.9	28.1	28.9	27.8	28.3	27.8	27.4
4000.	27.6	27.6	27.6	27.5	27.5	27.4	27.6	27.5	27.6	27.4	27.6	27.5	28.0	27.5	27.6
5000.	28.2	28.3	28.2	28.2	28.1	28.1	28.3	28.2	28.3	28.1	28.2	28.2	28.5	28.1	28.1
6300.	29.1	29.1	29.1	29.1	29.1	29.0	29.1	29.1	29.1	29.0	29.1	29.1	29.1	29.0	29.0
8000.	30.1	30.1	30.1	30.1	30.1	30.2	30.1	30.1	30.1	30.1	30.1	30.0	30.1	30.0	30.0
10000.	31.6	31.8	32.5	31.7	31.9	33.0	31.9	32.5	31.9	31.5	32.9	31.6	32.5	31.5	31.5
PNL	60.6	60.8	61.2	61.5	61.9	62.1	62.2	62.4	62.5	62.6	63.4	64.7	65.9	65.1	63.3
PNLT	63.6	63.7	63.6	64.0	64.2	64.0	64.3	64.4	64.4	64.5	65.1	65.8	66.8	66.0	64.6
OASPL	62.1	62.2	62.5	62.8	62.9	63.0	63.1	63.2	63.2	63.4	64.1	65.9	67.6	67.3	65.7

Climb-to-Cruise Run 411

1/3-Octave Sound Pressure Levels

θ_1	15.4	25.7	35.9	46.0	56.0	65.8	75.5	85.1	89.9	94.8	104.4	114.1	123.9	133.9	143.9	154.1
θ_2	15.7	26.5	37.0	47.3	57.4	67.3	76.9	86.4	91.2	95.9	105.3	114.9	124.6	134.2	144.2	154.3
Frequency																
50.	39.7	47.5	49.5	49.6	49.0	49.3	49.9	49.4	49.1	48.1	46.9	50.7	54.8	55.1	55.4	51.3
63.	46.1	49.5	49.8	50.1	51.1	51.4	52.1	52.0	50.4	51.2	51.7	54.8	57.5	57.8	57.7	53.6
80.	40.9	47.8	49.7	51.3	51.3	51.2	52.6	52.1	50.3	50.1	51.6	55.8	58.8	60.2	59.5	53.5
100.	42.4	49.8	49.3	50.2	50.6	53.6	50.0	51.7	50.8	50.5	52.6	56.7	60.0	60.8	59.1	53.0
125.	61.7	61.8	61.9	61.9	62.4	61.8	62.0	62.1	62.2	62.3	62.5	63.9	64.8	64.2	63.7	62.1
160.	39.3	44.9	48.6	52.4	49.1	50.1	50.3	51.6	52.1	52.4	53.6	58.1	61.4	61.6	57.0	48.5
200.	33.6	42.0	42.4	45.6	47.1	48.2	49.1	50.0	50.7	51.0	52.2	56.6	59.0	58.3	54.1	42.4
250.	43.3	44.1	44.9	47.0	48.0	48.9	49.2	50.1	50.6	50.7	51.6	55.3	57.0	55.3	51.5	43.8
315.	31.2	34.3	39.2	42.9	44.4	46.1	45.5	47.1	47.8	48.7	49.7	52.2	53.4	51.2	46.7	33.8
400.	39.1	39.2	41.6	43.8	45.0	45.0	44.5	45.2	45.0	45.6	45.9	47.3	47.1	45.3	41.2	39.4
500.	30.3	30.3	34.2	39.8	43.6	43.5	40.9	40.1	39.4	39.6	39.5	39.6	38.6	36.1	32.2	30.5
630.	28.3	28.5	28.7	31.2	34.3	35.9	35.9	34.5	33.8	33.1	33.0	33.5	32.8	31.0	29.4	29.2
800.	28.8	29.2	28.1	28.7	29.3	30.3	30.0	30.4	30.7	30.2	30.3	30.9	31.3	30.6	30.3	30.2
1000.	25.5	26.0	27.7	27.4	25.9	27.0	26.5	25.8	26.8	26.8	26.4	30.6	29.0	27.1	26.8	26.0
1250.	29.1	29.3	29.4	29.6	29.5	29.9	29.7	29.6	29.9	29.8	29.8	31.1	30.8	30.1	30.2	30.0
1600.	28.6	28.8	28.9	29.0	29.0	29.3	29.1	29.1	29.4	29.3	29.3	30.5	30.1	29.5	29.5	29.4
2000.	32.4	32.5	32.6	32.6	32.7	32.8	32.7	32.7	32.8	32.8	32.9	33.2	33.1	33.0	33.0	33.1
2500.	30.2	30.3	30.4	30.5	30.4	30.5	30.5	30.5	30.6	30.5	30.6	30.9	30.8	30.6	30.7	30.7
3150.	34.4	34.4	34.5	34.5	34.5	34.7	34.6	34.6	34.7	34.7	34.7	35.0	34.7	34.7	34.6	34.8
4000.	37.6	37.7	37.3	37.3	37.8	37.8	37.8	37.8	37.8	37.8	37.8	37.3	37.8	37.9	37.9	38.0
5000.	39.9	39.9	40.2	40.2	40.0	40.1	40.1	40.1	40.1	40.1	40.1	40.5	40.1	40.1	40.1	40.1
6300.	32.9	32.9	32.8	32.8	33.0	33.0	32.9	32.9	33.1	33.0	33.0	32.9	33.0	33.1	33.0	33.0
8000.	32.1	31.9	31.8	31.9	32.3	32.1	32.0	32.4	32.3	32.1	31.9	31.9	32.0	32.2	32.1	31.8
10000.	34.7	34.3	33.7	34.1	34.8	34.4	34.2	35.1	34.2	34.5	33.8	35.1	33.9	34.3	33.9	34.1
PNL	62.6	63.3	63.9	64.7	65.2	65.2	65.2	65.4	65.5	65.5	65.9	67.9	69.0	68.5	67.1	64.2
PNLT	65.9	65.7	66.1	66.4	67.2	66.9	67.1	67.1	67.3	67.3	67.5	69.7	70.6	70.0	68.6	66.1
OASPL	62.2	62.9	63.2	63.7	64.0	63.9	64.0	64.2	64.2	64.3	64.8	67.3	69.4	69.3	67.8	64.1

Climb-to-Cruise Run 504

1/3-Octave Sound Pressure Levels

θ_1	15.0	25.3	35.5	45.6	55.6	65.5	75.3	85.1	90.0	94.8	104.6	114.4	124.3	134.3
θ_2	15.5	26.0	36.3	46.5	56.5	66.5	76.2	85.9	90.8	95.6	105.2	114.8	124.7	134.6
Frequency														
50.	37.4	44.6	43.3	46.0	45.2	43.9	43.6	44.4	43.5	43.4	43.7	46.6	49.7	50.4
63.	45.7	45.3	47.1	47.3	47.3	47.9	48.6	48.4	47.2	46.9	48.3	51.5	52.9	52.5
80.	35.1	41.4	42.7	45.5	45.4	45.5	46.6	46.4	45.7	45.2	47.0	51.3	53.9	51.8
100.	38.4	43.1	41.8	43.9	45.6	46.5	45.1	44.7	45.0	44.8	48.4	50.6	53.0	50.5
125.	61.0	60.6	61.0	61.1	61.0	60.9	60.9	61.1	60.8	60.8	61.2	61.6	61.4	61.5
160.	36.4	39.2	40.7	40.8	41.9	42.2	42.6	44.7	44.6	44.8	46.8	51.4	53.5	49.2
200.	29.6	33.4	33.2	35.1	37.8	39.1	39.5	41.2	41.1	42.1	44.1	48.6	49.8	44.3
250.	46.5	46.5	46.5	46.6	46.5	46.9	47.5	47.0	47.5	47.4	48.1	48.9	49.3	47.5
315.	38.1	35.9	37.6	38.4	38.9	39.3	39.6	41.1	40.3	40.7	42.2	43.1	42.7	39.6
400.	29.7	34.9	32.8	34.6	37.6	36.7	36.2	36.8	36.3	37.1	36.7	36.9	36.8	30.8
500.	32.0	32.3	32.1	32.7	34.4	34.7	35.1	34.6	34.1	34.0	33.7	33.9	33.4	32.3
630.	27.9	27.9	28.0	28.2	28.5	28.7	29.3	30.3	29.2	29.3	29.4	29.2	28.9	28.7
800.	25.1	26.6	25.2	25.5	26.5	26.2	26.0	26.0	26.2	26.3	25.9	26.1	26.8	26.0
1000.	23.4	23.5	23.2	23.2	23.8	23.5	23.8	23.7	23.6	23.6	23.8	23.7	24.4	24.0
1250.	24.1	24.4	24.1	24.1	24.1	24.1	24.3	24.0	24.5	24.2	24.1	24.1	24.5	24.5
1600.	24.3	24.3	24.3	24.3	24.3	24.2	24.3	24.3	24.3	24.2	24.3	24.4	24.5	24.4
2000.	24.0	24.1	24.1	24.0	24.1	24.1	24.1	24.0	24.0	24.0	24.1	24.1	24.2	24.2
2500.	25.0	24.9	24.9	24.9	25.0	25.0	25.0	24.9	25.0	24.9	25.0	24.9	25.1	25.0
3150.	28.8	28.1	29.0	27.6	27.9	28.1	27.9	27.5	27.4	27.6	28.0	27.7	28.1	27.7
4000.	27.5	27.4	27.4	27.5	27.6	27.6	27.5	27.4	27.6	27.4	27.6	27.5	27.6	27.5
5000.	28.1	28.0	28.1	28.1	28.1	28.2	28.1	28.0	28.2	28.0	28.2	28.1	28.2	28.1
6300.	29.1	29.0	29.1	29.0	29.0	29.1	29.1	29.0	29.1	29.0	29.1	29.1	29.1	29.1
8000.	30.1	30.0	30.1	30.0	30.1	30.1	30.1	30.0	30.1	30.1	30.1	30.1	30.1	30.1
10000.	32.7	32.1	31.7	31.3	31.7	31.5	31.9	31.2	32.1	31.5	31.7	32.2	32.1	32.0
PNL	59.7	59.8	60.1	60.3	60.5	60.6	60.7	60.9	60.7	60.7	61.4	62.3	62.7	61.7
PNLT	63.1	63.0	63.3	63.4	63.4	63.3	63.5	63.6	63.4	63.3	63.6	64.1	64.0	63.6
OASPL	61.4	61.2	61.6	61.8	61.8	61.7	61.8	62.0	61.7	61.6	62.3	63.5	64.1	63.3

Climb-to-Cruise Run 505

1/3-Octave Sound Pressure Levels

θ_1	15.1	25.5	35.7	45.8	55.8	65.6	75.4	85.1	90.0	94.8	104.5	114.3	124.1	134.1	144.1
θ_2	15.4	26.1	36.4	46.6	56.7	66.5	76.3	86.0	90.8	95.6	105.1	114.7	124.4	134.4	144.4
Frequency															
50.	40.4	43.1	44.8	44.1	44.6	46.1	46.5	46.2	46.0	44.3	44.8	46.0	49.5	50.3	49.4
63.	45.6	45.8	47.6	47.0	48.5	48.0	48.5	49.3	48.9	47.7	48.0	51.0	52.1	51.5	51.5
80.	39.7	41.1	43.9	44.3	45.5	46.8	48.1	50.1	47.7	47.0	47.4	52.0	52.0	51.8	50.9
100.	45.9	46.4	47.2	47.8	49.2	52.8	51.2	48.7	48.7	49.0	49.9	52.7	53.3	52.8	48.9
125.	61.7	61.6	61.6	61.8	61.9	61.8	61.6	61.6	61.7	61.5	61.7	61.6	61.8	61.7	61.3
160.	44.7	40.6	42.7	43.5	44.4	44.8	44.9	48.7	46.7	47.8	47.1	51.1	51.7	50.5	44.5
200.	35.3	34.6	36.9	39.5	45.7	47.8	47.4	43.8	43.1	44.1	44.1	48.5	48.5	46.1	40.1
250.	47.2	47.0	47.7	48.9	49.2	47.5	48.4	48.7	48.8	49.5	48.5	49.5	49.2	48.2	47.2
315.	40.5	39.9	40.1	41.0	48.2	44.5	43.5	42.1	43.5	44.6	43.6	44.7	42.4	41.3	39.2
400.	31.7	31.7	33.2	37.9	40.6	39.3	37.2	37.8	37.2	37.0	36.7	38.0	35.0	35.2	31.1
500.	32.2	32.6	33.4	35.0	38.7	36.4	35.9	35.8	35.5	35.0	34.3	34.2	33.3	34.5	32.5
630.	29.5	29.9	29.1	30.4	32.6	32.3	31.6	32.3	32.4	31.6	30.9	30.7	29.9	30.5	28.6
800.	26.3	26.2	25.4	27.2	27.3	27.7	26.7	27.9	28.2	27.8	27.1	27.3	27.0	27.5	25.5
1000.	25.1	25.2	24.3	25.9	25.3	25.2	24.5	25.7	26.2	26.0	25.6	26.1	25.7	26.2	24.6
1250.	24.1	23.8	23.3	24.7	24.0	23.7	23.4	24.0	24.8	24.6	24.4	24.7	24.6	25.1	23.7
1600.	24.5	24.4	24.3	24.9	24.5	24.6	24.3	24.6	25.1	24.8	24.7	24.9	24.7	25.1	24.4
2000.	24.2	24.2	24.1	24.4	24.3	24.2	24.1	24.2	24.3	24.3	24.3	24.4	24.4	24.5	24.2
2500.	25.0	24.9	24.9	25.0	25.0	25.0	24.9	25.0	25.1	25.1	25.1	25.0	25.1	25.1	25.0
3150.	28.0	27.7	28.3	28.1	27.4	28.4	27.8	28.4	27.6	27.7	27.8	28.8	28.3	27.3	28.7
4000.	27.4	27.5	27.5	27.5	27.6	27.5	27.5	27.5	27.6	27.4	27.6	27.5	27.6	27.5	27.5
5000.	28.1	28.1	28.2	28.2	28.3	28.2	28.2	28.1	28.3	28.1	28.3	28.2	28.3	28.2	28.2
6300.	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.0	29.1	29.0	29.1	29.1	29.1	29.0	29.0
8000.	30.0	30.1	30.1	30.1	30.1	30.0	30.1	30.0	30.1	30.0	30.2	30.0	30.1	30.0	30.0
10000.	31.6	31.6	32.7	32.2	32.5	32.3	32.2	32.8	32.1	31.6	33.0	31.8	31.6	31.4	31.3
PNL	60.9	60.7	61.0	61.5	62.4	62.3	62.0	62.0	61.9	61.9	61.9	62.6	62.6	62.3	61.1
PNLT	63.6	63.7	63.8	64.2	64.9	64.5	64.2	64.2	64.3	64.1	64.1	64.3	64.2	64.0	63.6
OASPL	62.3	62.2	62.4	62.6	63.0	63.1	62.9	62.9	62.8	62.7	62.8	63.6	63.9	63.6	62.8

Climb-to-Cruise Run 600

1/3-Octave Sound Pressure Levels

θ_1	13.9	23.2	32.8	42.6	52.6	62.9	73.6	84.3	89.6	95.0	105.8	116.4	126.8	137.0	146.9	156.5	166.0
θ_2	14.6	25.3	36.7	48.3	60.0	71.3	82.4	93.0	98.0	102.8	112.6	122.0	131.1	140.0	148.8	157.6	166.4
Frequency																	
50.	63.3	64.6	66.1	67.7	67.4	69.7	69.7	70.1	69.4	69.1	70.8	72.2	74.7	76.1	75.1	72.5	68.7
63.	63.6	65.2	66.7	68.4	69.4	69.8	70.8	71.3	71.0	70.7	71.7	75.6	78.7	79.7	78.7	77.2	70.9
80.	64.2	64.7	66.2	67.8	70.1	71.2	71.6	72.3	72.0	72.2	74.1	77.1	81.1	82.2	81.5	77.9	71.6
100.	65.6	65.0	67.8	69.6	69.6	70.5	71.7	73.5	73.0	73.4	76.2	80.1	83.6	84.4	82.9	79.0	72.4
125.	66.1	65.1	67.8	69.2	70.5	71.7	73.7	74.7	75.8	76.0	78.8	82.8	86.5	87.6	84.7	81.1	73.3
160.	64.4	66.8	68.3	70.3	72.1	73.9	75.2	76.7	77.0	78.3	80.3	85.5	89.6	90.3	87.7	81.1	73.7
200.	65.1	66.5	69.3	71.0	73.6	74.8	76.2	78.2	79.0	79.2	81.7	86.3	90.1	90.6	88.2	81.8	73.3
250.	64.3	67.5	70.7	74.1	76.1	77.5	78.8	79.8	80.7	81.0	83.1	87.9	91.9	91.8	89.1	83.0	71.4
315.	64.9	70.7	73.6	75.7	76.5	77.9	80.0	81.3	82.4	83.0	85.6	89.1	92.5	92.5	89.5	84.9	69.3
400.	60.9	67.5	72.0	74.1	76.4	78.2	80.2	82.2	83.3	84.1	86.6	89.3	91.5	92.3	89.2	84.0	68.6
500.	59.9	67.9	72.0	74.7	76.9	78.3	79.8	81.4	82.4	83.6	85.1	88.2	89.8	90.9	88.3	81.3	68.4
630.	60.8	68.0	72.4	75.0	76.9	78.3	79.5	80.3	81.2	82.2	85.2	87.4	88.4	89.6	87.2	79.3	65.3
800.	60.5	71.3	74.3	75.2	76.1	77.5	78.9	80.8	82.1	82.9	84.2	85.2	85.3	86.5	84.0	75.8	60.4
1000.	61.3	71.6	75.8	76.6	76.2	76.6	78.1	80.2	81.1	81.5	83.1	83.8	83.4	83.2	79.7	70.4	51.0
1250.	52.4	66.2	74.1	77.5	78.5	76.8	76.6	76.9	77.5	78.3	80.3	80.9	80.2	80.2	76.0	64.9	44.8
1600.	43.3	56.3	66.1	71.0	73.5	75.7	76.2	75.9	76.7	77.2	78.1	77.8	75.6	75.4	70.9	58.1	43.5
2000.	42.9	47.0	56.5	60.9	65.5	68.2	69.9	71.2	71.3	71.5	71.9	71.6	70.5	67.9	62.7	50.5	43.8
2500.	39.5	40.6	47.9	54.2	59.0	60.6	63.4	64.8	65.3	65.8	65.9	65.1	63.1	60.7	54.8	47.6	41.4
3150.	54.6	54.5	54.6	55.8	55.6	56.6	57.5	58.3	58.6	59.0	59.4	58.2	58.5	57.6	55.8	54.3	55.1
4000.	43.6	43.6	44.1	44.0	45.0	45.8	47.4	47.6	47.3	49.1	50.1	49.6	53.4	52.6	49.1	47.3	44.2
5000.	44.4	44.5	44.7	44.8	45.0	45.3	46.2	46.3	45.9	47.7	48.5	48.4	52.3	51.7	48.7	47.1	45.0
6300.	47.9	47.9	47.9	48.1	48.0	48.3	48.6	48.8	48.6	49.5	50.2	49.9	52.9	52.4	50.4	49.1	48.3
8000.	49.1	49.0	49.1	49.1	49.2	49.2	49.5	49.6	49.4	50.1	50.6	50.7	53.0	52.6	51.0	49.9	49.5
10000.	51.1	51.0	51.0	51.1	51.1	51.0	51.3	51.3	51.2	51.6	51.9	52.0	53.5	53.3	52.2	51.4	51.0
PNL	80.6	85.7	89.8	92.5	93.9	95.0	96.1	96.9	97.7	98.4	100.4	102.8	104.7	105.2	102.3	96.4	84.9
PNLT	84.9	89.9	92.7	94.7	95.1	95.5	96.4	96.9	97.8	98.5	100.4	102.8	104.7	105.2	103.6	98.7	89.0
OASPL	75.2	79.7	83.4	85.6	86.9	88.0	89.3	90.7	91.6	92.3	94.4	97.3	100.0	100.5	97.9	92.2	82.0

Climb-to-Cruise Run 601

1/3-Octave Sound Pressure Levels

θ_1	14.6	24.4	34.2	44.1	54.1	64.2	74.3	84.6	89.6	94.8	105.1	115.3	125.4	135.5	145.5	155.4	165.3
θ_2	15.2	26.1	37.4	48.7	60.0	70.9	81.5	91.8	96.4	101.4	110.8	120.1	129.2	138.2	147.2	156.4	165.6
Frequency																	
50.	60.8	63.4	65.3	66.2	67.3	68.3	68.3	68.1	68.2	67.8	70.1	72.1	75.2	75.6	75.6	73.4	68.5
63.	64.2	65.6	66.9	68.2	69.7	69.3	69.5	70.8	70.5	70.7	72.1	75.0	78.0	78.9	78.3	75.9	69.6
80.	63.7	65.9	67.6	69.9	70.3	71.1	72.3	72.4	73.3	73.1	75.2	78.3	80.8	82.5	80.8	78.1	71.2
100.	62.4	66.3	68.2	69.3	70.6	71.5	73.2	73.4	75.0	75.4	76.8	80.2	83.2	84.2	82.2	78.8	72.0
125.	64.6	66.2	68.1	70.4	72.2	73.4	75.1	75.7	76.5	77.1	79.2	83.4	86.5	86.2	84.5	79.4	73.3
160.	64.1	68.7	70.1	72.4	73.7	74.9	75.5	77.2	77.3	78.3	81.1	86.2	89.0	89.4	86.3	79.7	73.3
200.	64.1	66.4	68.9	71.0	73.6	74.3	76.0	77.0	78.1	79.0	82.4	86.8	89.7	90.2	87.1	81.0	71.5
250.	63.7	67.6	70.7	73.2	74.6	75.9	77.3	78.9	80.1	80.9	83.4	88.2	91.6	91.2	88.1	82.2	68.6
315.	63.6	67.5	71.3	73.3	75.6	77.7	79.1	80.8	82.0	82.8	85.9	89.8	92.3	92.3	88.6	83.1	67.4
400.	61.6	67.5	70.8	73.5	75.7	77.6	80.0	81.9	82.8	83.6	86.1	88.8	91.1	91.2	88.0	80.8	68.9
500.	61.9	67.5	72.0	73.7	75.8	77.7	79.2	81.2	81.9	82.8	85.1	87.3	89.2	90.3	86.9	78.8	66.3
630.	60.0	66.8	70.7	74.0	75.9	77.3	78.5	79.4	80.4	81.9	84.5	86.8	87.6	89.1	85.8	76.7	61.7
800.	55.9	66.1	70.2	72.7	74.1	75.9	77.8	80.2	81.0	82.1	83.4	84.2	84.4	85.9	82.4	73.8	54.6
1000.	53.9	64.8	68.5	70.9	73.0	74.9	76.8	79.3	80.2	81.0	81.9	82.3	82.0	82.6	78.1	68.4	47.2
1250.	47.6	61.1	67.1	70.3	71.0	72.6	74.7	75.7	76.4	77.4	79.4	79.2	78.8	79.2	73.9	62.1	41.1
1600.	39.3	53.6	62.4	66.7	68.6	71.0	72.2	74.3	75.1	75.4	76.4	76.1	74.4	74.1	68.6	54.7	39.5
2000.	38.2	43.5	53.0	58.0	63.2	64.8	66.9	68.1	68.7	69.3	69.9	69.8	68.6	65.9	60.1	46.8	39.1
2500.	35.5	37.6	43.7	50.3	54.7	58.5	60.5	62.0	62.5	62.8	63.3	62.6	60.8	59.4	53.6	44.1	37.3
3150.	49.4	50.1	49.9	49.8	50.8	52.0	53.7	54.9	55.0	55.4	55.7	55.2	54.9	55.4	53.4	50.2	49.5
4000.	39.1	39.5	39.7	39.9	42.3	42.4	44.2	44.2	44.2	46.4	46.3	48.6	50.5	50.4	50.2	43.7	39.6
5000.	39.9	40.3	40.3	40.4	42.1	41.6	43.1	42.9	42.4	44.9	44.6	47.3	49.3	46.1	49.2	43.4	40.3
6300.	43.1	43.5	43.4	43.1	44.1	43.9	44.8	44.8	44.5	46.0	45.9	47.8	49.4	47.5	49.5	45.2	43.4
8000.	44.2	44.3	44.4	44.3	44.9	44.8	45.4	45.4	45.2	46.5	46.4	48.0	49.5	47.9	49.3	45.7	44.4
10000.	46.3	46.3	46.4	46.2	46.6	46.5	46.9	47.0	46.8	47.6	47.7	48.7	49.9	48.2	49.7	47.1	46.3
PNL	77.7	82.8	86.6	89.0	91.0	92.6	94.4	96.1	96.9	97.7	99.8	102.2	104.0	104.2	101.1	94.3	82.8
PNLT	81.7	86.7	89.4	90.0	91.0	92.6	94.4	96.2	97.0	97.7	99.8	102.2	104.0	104.2	101.1	96.4	86.5
OASPL	74.1	78.2	81.3	83.6	85.4	86.9	88.5	90.1	91.0	91.9	94.2	97.2	99.5	99.9	96.8	90.6	81.1

Climb-to-Cruise Run 603

1/3-Octave Sound Pressure Levels

θ_1	15.6	25.7	35.7	45.8	55.6	65.4	75.2	84.9	89.7	94.5	104.3	114.1	124.0	134.1	144.2	154.3	164.5
θ_2	16.2	27.3	38.6	50.0	60.8	71.4	81.6	91.2	95.9	100.4	109.5	118.6	127.6	136.7	145.8	155.2	164.9
Frequency																	
50.	51.9	56.2	59.1	61.7	64.1	65.0	65.2	65.3	65.9	64.7	66.6	68.6	71.3	73.2	72.4	71.4	65.9
63.	53.7	58.0	60.4	63.6	65.0	66.8	67.4	67.9	68.1	68.6	70.1	72.3	76.0	77.7	76.7	73.8	68.4
80.	53.0	57.6	61.5	69.0	70.6	70.9	71.2	70.9	70.8	71.4	73.3	76.0	78.9	80.3	78.9	75.9	69.9
100.	58.4	64.4	67.7	66.6	67.4	69.4	70.7	72.1	71.6	72.7	74.0	77.5	80.6	81.9	81.5	78.2	69.6
125.	61.7	62.9	65.7	67.5	69.4	71.3	72.3	74.0	74.4	75.2	77.3	80.0	83.8	85.3	82.5	78.6	71.7
160.	56.9	62.3	67.1	69.9	71.3	73.0	73.4	75.1	74.9	75.2	78.5	82.6	86.4	87.2	85.1	78.5	71.7
200.	56.6	62.2	66.1	69.1	71.4	73.4	74.1	75.8	76.2	76.4	79.2	83.3	87.5	88.4	85.8	79.6	69.4
250.	57.4	63.5	68.2	70.5	72.3	74.0	75.7	77.2	77.6	78.3	81.1	85.0	88.6	88.5	85.9	80.5	67.2
315.	58.9	64.8	69.3	72.0	73.8	75.6	77.2	79.1	79.6	81.2	83.3	86.8	90.0	90.0	86.7	81.6	65.2
400.	58.6	67.1	70.3	72.3	74.0	76.4	77.7	80.2	80.5	82.1	83.8	86.6	88.4	88.8	85.8	79.3	67.7
500.	60.0	67.6	71.1	73.6	75.2	76.3	77.4	79.8	80.5	81.8	83.3	86.0	87.0	88.0	85.2	78.3	67.6
630.	59.0	67.0	71.5	73.9	75.2	76.6	77.8	78.7	79.2	80.8	83.1	85.2	86.4	87.6	84.4	77.4	63.3
800.	58.0	67.0	71.5	73.0	74.2	76.1	77.0	79.7	80.4	81.8	82.8	84.0	83.6	85.0	82.9	75.8	59.2
1000.	56.0	65.3	70.1	72.6	73.9	75.5	76.9	79.6	80.2	81.4	82.2	82.8	82.3	82.8	79.9	72.5	54.9
1250.	52.8	64.1	69.8	72.5	73.0	74.7	76.6	77.6	78.3	79.4	81.3	81.3	80.4	81.0	76.6	68.7	51.8
1600.	48.2	62.2	68.5	71.3	72.2	74.2	75.2	77.0	78.2	79.0	79.8	80.0	78.2	77.5	73.2	64.5	46.1
2000.	44.4	56.6	64.7	67.3	69.9	71.0	72.4	74.3	74.6	75.5	76.5	75.4	75.2	72.1	66.6	57.0	43.4
2500.	40.9	50.1	58.6	63.2	65.6	66.8	68.3	70.3	70.8	71.5	71.7	71.1	69.6	66.9	60.1	49.9	41.3
3150.	49.5	49.3	52.2	57.1	58.7	60.7	61.7	63.2	64.2	64.4	65.0	63.7	62.4	60.3	53.2	51.5	49.7
4000.	41.9	42.5	42.9	45.3	48.1	49.8	51.2	52.7	53.4	54.2	53.7	53.0	53.1	52.3	47.5	44.8	42.5
5000.	42.5	42.7	42.7	43.0	43.4	44.0	44.5	44.8	46.0	45.3	45.4	46.4	49.3	49.4	46.5	44.6	42.9
6300.	43.9	44.1	44.3	44.3	44.7	45.1	45.1	45.4	46.9	46.0	45.7	46.7	49.3	49.1	47.0	45.7	44.3
8000.	45.2	45.4	45.5	45.5	45.7	45.9	46.1	46.3	47.6	46.7	46.6	47.4	49.3	49.2	47.7	46.4	45.7
10000.	47.2	47.2	47.3	47.3	47.4	47.7	47.6	47.6	48.9	48.1	47.9	48.5	49.8	49.8	48.7	47.8	47.4
PNL	76.2	83.2	88.2	90.9	92.2	94.0	95.1	96.9	97.7	98.6	99.8	101.3	102.9	103.1	100.0	94.1	82.6
PNLT	78.9	83.9	88.9	91.2	92.2	94.0	95.1	96.9	97.7	98.6	99.9	101.3	102.9	103.1	100.0	95.5	85.2
OASPL	69.6	76.5	80.8	83.2	84.7	86.3	87.5	89.4	89.9	91.1	92.8	95.2	97.4	98.0	95.3	89.6	79.6

Climb-to-Cruise Run 604

1/3-Octave Sound Pressure Levels

θ_1	15.6	25.7	35.8	45.8	55.7	65.4	75.2	84.8	89.7	94.6	104.3	114.1	124.0	134.0	144.0	154.3	164.5
θ_2	16.2	27.4	38.8	50.1	61.1	71.5	81.6	91.2	95.9	100.6	109.6	118.5	127.6	136.6	145.8	155.2	164.9
Frequency																	
50.	49.9	55.6	58.5	61.8	63.7	65.0	64.9	65.3	65.3	65.1	66.2	68.7	72.1	73.5	73.5	70.6	65.1
63.	53.1	58.3	60.5	62.3	64.7	66.0	67.2	67.8	67.6	67.8	69.9	71.9	75.8	76.8	77.2	74.2	68.2
80.	54.1	58.9	61.3	68.9	70.8	70.0	70.9	70.1	70.6	70.4	71.8	75.6	78.8	79.8	79.3	76.8	69.9
100.	57.6	64.5	68.1	66.9	67.6	68.8	70.2	70.9	72.2	72.3	73.7	77.4	80.6	82.1	81.7	77.9	69.9
125.	62.0	63.2	65.0	68.3	69.3	71.2	72.3	73.5	73.9	74.4	76.6	79.4	83.0	84.9	83.6	79.0	71.2
160.	57.1	62.7	66.6	69.2	71.2	72.8	73.6	74.3	74.9	76.2	77.8	82.8	86.5	87.5	85.3	79.2	71.7
200.	56.6	62.1	65.6	68.2	71.3	73.0	74.5	75.3	75.4	76.4	78.7	83.3	87.0	87.9	86.2	79.7	69.3
250.	57.6	63.4	67.7	70.4	72.6	74.1	75.5	77.1	77.5	78.3	80.8	84.1	88.5	89.4	86.7	81.2	68.1
315.	58.8	65.4	68.7	71.7	73.8	75.2	77.2	79.1	79.8	80.8	82.6	85.9	89.3	90.0	87.1	82.3	66.8
400.	59.0	66.3	69.5	72.0	74.0	75.9	78.1	80.1	80.7	81.7	83.8	86.2	88.1	89.2	86.0	80.3	67.9
500.	59.2	66.8	70.5	73.2	74.4	76.2	78.0	79.4	80.4	81.3	83.6	85.3	86.8	88.4	85.7	78.7	68.3
630.	59.8	66.3	70.9	73.1	75.0	76.6	77.9	78.9	79.7	80.6	83.1	85.2	85.9	87.6	84.9	77.6	64.3
800.	57.3	66.7	71.0	72.6	74.1	75.9	77.5	79.6	80.3	81.4	83.0	84.1	83.6	85.0	82.7	76.0	59.1
1000.	55.0	65.1	69.3	72.0	73.7	75.4	77.1	79.6	80.5	81.5	82.5	83.2	82.2	83.1	79.9	72.8	55.2
1250.	52.4	63.6	69.0	71.6	73.0	74.8	76.6	77.9	77.9	79.0	81.6	81.7	80.5	80.7	77.9	68.9	51.0
1600.	47.9	61.3	68.1	70.6	72.3	74.7	75.6	77.6	78.0	78.9	80.0	80.7	78.2	77.6	74.8	65.0	45.6
2000.	44.3	55.9	64.0	66.8	70.1	71.5	73.0	74.7	74.4	75.5	76.5	76.3	75.4	71.9	68.7	58.0	43.4
2500.	39.6	49.6	58.2	62.5	65.8	67.4	68.9	70.4	70.5	71.4	71.8	71.9	69.7	66.7	62.9	50.8	40.4
3150.	49.6	50.0	52.0	56.4	58.3	61.3	62.2	63.4	63.8	64.8	64.8	64.1	62.1	60.5	56.1	50.9	49.7
4000.	42.1	42.1	43.3	45.5	47.8	50.6	51.3	52.9	53.2	54.0	53.7	53.2	53.3	53.2	51.1	45.7	41.9
5000.	42.5	42.6	43.2	43.5	43.2	44.5	44.4	45.5	45.7	45.1	45.3	45.9	49.9	50.5	49.6	45.1	42.7
6300.	44.1	44.0	44.6	44.6	44.4	45.4	45.2	45.8	46.3	45.5	45.7	46.3	49.8	50.8	49.7	46.3	44.2
8000.	45.4	45.5	45.8	45.7	45.6	46.3	46.1	46.5	46.8	46.4	46.6	47.0	49.9	51.1	49.8	47.3	45.5
10000.	47.3	47.4	47.6	47.4	47.4	47.7	47.6	47.9	48.1	47.9	48.0	48.4	50.3	51.7	50.2	48.3	47.3
PNL	76.1	82.7	87.8	90.4	92.2	94.2	95.4	97.1	97.5	98.4	99.9	101.2	102.6	103.3	100.6	94.7	82.9
PNLT	79.0	84.1	88.6	90.4	92.2	94.2	95.4	97.1	97.5	98.4	99.9	101.2	102.6	103.3	100.6	95.4	85.7
OASPL	69.5	76.2	80.2	82.7	84.6	86.2	87.7	89.3	89.9	90.9	92.8	95.0	97.1	98.1	95.7	90.1	79.7

Climb-to-Cruise Run 610

1/3-Octave Sound Pressure Levels

θ_1	14.2	23.9	33.7	43.6	53.7	63.7	73.9	84.1	89.3	94.5	104.8	115.0	125.3	135.4	145.4	155.4	165.2
θ_2	16.8	30.4	44.3	57.1	68.6	79.2	88.9	97.8	102.2	106.6	114.9	123.2	131.5	139.7	148.1	156.9	165.8
Frequency																	
50.	65.5	70.3	72.7	73.0	73.7	74.0	73.9	73.8	74.2	73.8	72.9	75.7	78.8	80.7	80.1	77.1	71.9
63.	68.7	72.2	73.1	75.2	75.4	75.0	75.6	75.4	75.1	75.2	75.4	78.7	81.2	82.4	81.8	79.7	74.2
80.	69.2	73.0	75.6	76.1	76.4	77.5	77.4	77.3	76.1	76.0	78.3	81.3	85.1	86.5	85.8	82.2	76.4
100.	68.3	73.8	76.7	77.3	78.6	77.4	77.1	77.9	78.4	78.6	80.7	83.9	87.1	87.8	86.9	83.3	75.7
125.	70.5	74.1	79.7	78.9	77.8	78.3	78.2	78.6	79.0	80.0	82.1	86.4	89.4	90.3	89.3	85.7	76.7
160.	73.1	79.6	77.6	77.9	79.1	79.8	80.7	81.2	81.7	81.9	84.0	88.9	92.3	93.3	91.0	86.6	78.1
200.	69.9	75.5	78.1	78.2	79.8	81.4	82.5	82.6	82.5	83.2	85.8	90.6	93.8	93.8	91.0	86.3	78.4
250.	70.5	76.9	79.9	80.9	83.7	83.6	83.1	84.3	84.6	85.3	87.5	91.8	95.0	95.1	92.4	86.4	77.4
315.	73.4	79.2	83.9	85.7	84.8	84.6	85.4	86.5	87.0	87.8	89.9	93.7	96.7	95.8	93.0	87.6	77.6
400.	74.1	84.4	84.3	83.6	84.3	84.9	86.6	87.3	88.1	88.9	90.5	93.6	95.7	95.9	93.3	86.9	75.8
500.	85.8	92.2	92.6	91.5	88.3	87.0	87.0	87.5	87.8	88.4	90.6	92.9	94.8	95.2	92.7	86.5	75.3
630.	88.2	95.3	98.8	99.1	96.4	92.5	89.4	87.3	87.4	88.3	90.5	92.8	93.8	94.2	90.9	84.3	71.3
800.	79.3	90.4	96.0	97.6	98.2	97.1	94.4	90.9	90.0	89.7	90.3	90.7	91.4	91.4	88.2	80.9	66.1
1000.	70.7	83.5	89.1	92.0	94.5	96.0	96.2	93.8	91.9	90.7	89.5	89.4	89.9	88.8	84.5	76.3	60.4
1250.	71.1	83.3	88.6	89.2	88.5	89.4	91.2	90.9	90.2	89.4	88.6	87.2	87.1	86.4	81.4	71.3	53.2
1600.	59.9	77.3	85.4	86.9	87.2	86.9	85.9	86.6	87.1	87.3	86.5	85.0	83.4	82.6	76.7	65.0	45.5
2000.	52.7	70.8	78.7	80.8	82.0	82.3	82.2	80.3	80.0	80.7	80.7	79.2	78.9	77.0	69.6	55.6	42.3
2500.	48.1	62.8	72.5	76.8	76.9	76.5	76.1	75.2	74.8	74.6	74.3	73.2	75.2	72.8	61.8	48.8	40.6
3150.	51.3	56.4	67.0	73.2	71.7	69.7	68.5	67.0	66.6	66.6	66.5	67.3	71.4	69.4	55.5	51.2	49.8
4000.	46.8	52.3	62.0	69.1	67.6	64.3	60.0	56.6	57.4	57.2	58.3	62.4	69.7	66.8	50.3	46.5	42.2
5000.	46.3	51.1	58.3	65.3	64.4	60.8	56.0	49.5	53.0	52.7	54.8	58.7	67.2	64.7	49.2	46.2	42.5
6300.	46.7	51.0	57.2	64.5	62.6	58.2	55.3	49.1	52.8	52.5	53.4	55.1	65.6	63.4	49.2	46.9	43.9
8000.	47.1	50.8	55.8	63.4	61.4	56.1	54.2	49.1	52.5	52.3	51.4	56.1	64.9	63.3	49.3	47.3	44.9
10000.	48.3	51.0	55.5	62.0	59.7	54.2	52.7	49.6	52.0	51.7	50.2	55.3	64.9	63.4	50.1	48.4	46.8
PNL	96.4	104.4	108.5	109.7	109.2	108.3	107.6	106.1	105.8	105.9	106.2	107.9	110.1	109.9	106.3	100.0	89.7
PNLT	98.8	105.8	110.2	111.2	110.2	109.3	108.7	107.1	105.8	105.9	106.2	107.9	110.1	109.9	106.3	101.2	92.5
OASPL	91.1	98.6	102.1	102.9	102.3	101.5	100.7	99.2	98.7	98.7	99.7	102.0	104.2	104.3	101.6	96.2	87.1

Climb-to-Cruise Run 612

1/3-Octave Sound Pressure Levels

θ_1	15.2	25.5	35.5	45.5	55.3	65.1	74.8	84.4	89.3	94.2	103.9	113.7	123.6	133.6	143.7	153.9	164.2
θ_2	17.5	31.3	44.9	57.5	69.6	79.1	88.9	97.3	101.4	105.4	113.4	121.9	130.0	138.3	146.3	155.4	164.7
Frequency																	
50.	55.9	60.7	63.3	63.9	65.9	67.7	68.3	68.6	68.1	67.2	65.3	67.1	68.6	72.1	73.0	70.9	67.9
63.	58.1	61.8	65.5	67.1	68.5	69.4	69.8	68.3	68.6	68.4	69.9	69.4	72.3	76.5	76.8	75.5	70.7
80.	58.9	64.6	67.1	68.2	70.4	70.4	72.0	74.3	73.4	72.2	71.0	72.3	76.2	79.3	79.8	77.5	72.1
100.	59.8	65.5	67.9	69.5	71.8	77.0	75.9	72.3	72.8	72.3	72.4	74.4	78.0	81.8	83.1	79.5	73.3
125.	63.9	67.3	69.4	79.7	79.2	75.1	73.2	73.2	73.9	74.7	74.8	77.2	81.2	85.3	84.6	81.6	74.1
160.	71.0	78.1	79.3	74.1	73.2	74.0	74.8	75.8	76.8	77.1	77.5	79.2	83.9	87.5	87.0	82.6	75.7
200.	64.8	69.3	71.5	73.4	74.8	76.1	76.5	77.3	78.1	78.7	79.8	81.4	85.2	89.1	88.3	83.0	74.4
250.	63.5	70.7	73.2	75.9	77.2	77.7	79.6	80.6	80.3	80.4	81.6	83.6	87.5	91.3	89.4	83.8	74.7
315.	66.4	72.9	75.8	78.1	81.9	83.6	82.6	82.4	82.8	82.6	83.8	85.9	88.8	91.8	90.2	85.4	74.7
400.	66.3	74.2	78.5	82.4	82.4	81.6	82.2	83.3	84.0	84.3	85.3	86.8	88.9	91.3	90.7	84.8	75.7
500.	66.9	75.9	79.0	81.7	82.5	82.3	82.3	83.2	83.8	84.0	85.0	86.7	88.2	89.6	90.1	85.4	76.0
630.	76.6	86.8	87.3	87.1	86.2	85.4	84.0	83.8	84.0	83.9	85.0	87.1	88.2	89.1	88.3	84.4	73.0
800.	79.6	87.4	92.0	95.7	95.4	92.3	88.8	86.9	86.3	85.9	86.4	87.4	87.0	86.7	85.0	81.6	70.8
1000.	73.1	84.8	90.5	94.7	95.9	95.3	93.8	91.1	89.6	88.0	86.5	86.1	85.6	85.9	82.9	78.1	68.4
1250.	65.0	78.6	84.7	88.7	90.4	91.3	92.8	93.4	92.4	89.9	86.9	86.6	84.5	83.4	80.6	75.3	64.2
1600.	63.4	77.1	83.5	87.7	87.7	87.2	87.8	88.8	89.3	89.0	87.0	85.9	83.3	81.2	77.5	71.7	58.0
2000.	52.8	70.7	79.8	84.3	85.0	85.6	85.2	84.3	84.4	84.0	84.5	84.0	80.1	76.6	72.7	66.0	51.2
2500.	47.1	64.0	73.4	78.1	80.2	80.6	81.0	80.8	80.4	79.7	79.2	79.1	75.1	72.7	66.8	59.1	46.5
3150.	54.7	57.9	65.8	72.2	74.3	74.6	74.4	73.8	73.8	73.2	72.5	72.2	68.8	64.9	60.0	55.4	53.4
4000.	46.9	49.7	55.6	63.9	65.2	65.1	64.8	64.3	63.8	62.9	62.1	62.4	57.8	55.9	53.6	49.5	47.0
5000.	47.3	48.6	50.7	55.0	57.3	56.2	54.8	54.2	53.6	52.5	51.9	53.4	51.1	52.2	51.8	49.1	47.3
6300.	49.3	50.4	51.6	53.2	55.3	54.2	52.9	52.5	51.9	50.9	50.8	52.9	51.2	52.5	52.4	50.4	49.0
8000.	50.5	51.2	52.0	53.3	54.4	53.5	53.2	52.9	52.3	51.5	51.7	53.2	52.1	53.1	53.0	51.3	50.5
10000.	52.4	52.6	53.3	54.0	54.8	54.1	54.1	53.8	53.5	53.0	53.0	54.0	53.2	53.9	53.9	52.8	52.3
PNL	89.8	98.2	102.9	106.5	107.1	106.7	106.4	106.4	106.2	105.7	104.8	104.9	104.0	105.3	104.0	99.2	90.1
PNLT	92.3	100.0	104.4	107.9	108.9	107.9	107.4	107.6	107.2	105.7	104.8	104.9	104.0	105.3	104.0	99.2	92.3
OASPL	83.0	92.2	96.3	99.8	100.3	99.3	98.6	98.0	97.5	96.4	95.9	96.6	97.6	99.7	98.7	94.0	85.1

Climb-to-Cruise Run 613

1/3-Octave Sound Pressure Levels

θ_1	15.6	26.0	36.2	46.2	56.0	65.7	75.2	84.7	89.4	94.1	103.5	113.1	122.9	132.8	142.9	153.2	163.7
θ_2	18.0	32.0	45.7	58.4	69.5	79.6	88.6	97.1	101.1	105.2	113.1	121.1	128.8	137.0	145.6	154.8	164.4
Frequency																	
50.	54.9	59.7	63.5	65.8	67.0	68.2	67.7	67.4	66.4	66.1	64.9	67.4	69.8	73.1	73.8	72.2	67.4
63.	58.2	62.9	66.7	68.8	69.5	68.9	68.5	67.9	68.7	68.6	69.8	70.4	73.6	75.9	76.0	74.6	70.3
80.	60.2	64.7	67.9	69.9	69.7	70.6	73.8	72.9	71.5	69.9	69.3	73.2	77.2	79.6	79.3	76.7	72.9
100.	59.3	64.0	68.6	69.7	75.4	76.5	73.7	72.1	72.1	72.0	72.5	74.9	79.1	81.1	81.2	79.1	72.4
125.	64.1	67.1	76.4	79.0	76.2	72.3	73.2	73.5	73.8	74.0	74.2	77.5	81.7	84.1	83.7	81.2	74.5
160.	72.3	77.3	76.8	72.3	72.8	74.5	75.3	75.7	75.7	75.9	77.0	80.8	85.1	87.0	86.4	81.9	74.9
200.	64.6	68.6	71.9	73.7	74.9	76.3	76.4	77.1	77.6	78.0	79.4	82.3	86.2	88.7	86.8	82.2	74.2
250.	64.4	69.8	74.1	76.5	77.1	78.5	80.1	80.1	79.8	79.8	81.4	83.9	88.6	90.4	88.4	83.6	73.2
315.	67.0	72.3	75.3	79.3	82.7	82.4	81.7	81.9	82.0	82.4	83.7	86.1	89.7	91.5	89.5	84.8	72.5
400.	66.3	74.0	80.2	82.8	80.8	81.8	82.7	83.1	83.6	84.1	85.0	87.2	89.6	90.7	90.2	85.1	73.5
500.	67.8	75.9	78.5	81.3	81.6	81.8	82.3	83.4	83.8	84.4	85.0	87.0	89.0	89.5	90.0	85.4	73.7
630.	75.1	85.4	84.8	84.8	83.9	83.6	83.0	83.3	83.6	84.1	85.3	87.7	88.7	88.6	88.8	85.0	72.2
800.	80.2	87.5	92.6	94.3	91.0	88.0	86.0	84.7	84.9	85.2	85.7	87.2	87.4	86.1	85.9	82.8	68.5
1000.	74.6	85.9	92.2	94.7	94.3	93.3	89.7	86.5	86.0	85.9	84.7	85.5	86.0	84.3	83.5	79.5	66.2
1250.	66.0	79.0	86.1	89.7	90.7	92.3	92.9	90.1	88.0	86.8	85.9	86.0	83.9	82.3	81.5	76.3	62.4
1600.	63.7	77.4	84.4	86.5	86.2	87.5	88.6	88.3	87.9	87.4	85.2	85.1	83.2	80.1	78.9	73.1	55.5
2000.	54.0	72.7	81.9	84.1	84.2	84.2	83.1	83.0	83.3	83.7	83.7	82.7	79.9	75.4	74.2	67.4	49.5
2500.	47.2	65.3	74.9	78.1	79.9	80.1	79.9	78.5	78.4	78.6	78.7	78.2	75.6	70.7	68.1	60.5	46.1
3150.	55.2	58.7	68.2	72.6	73.0	73.3	73.5	73.0	72.4	72.4	72.4	71.8	68.8	64.4	61.2	57.1	55.5
4000.	46.7	49.7	58.8	63.3	63.6	63.8	63.8	62.4	61.8	61.8	61.5	61.4	58.4	54.3	53.6	48.6	46.9
5000.	47.2	48.5	52.0	54.6	54.1	54.3	53.1	52.6	51.8	50.8	51.3	51.9	51.7	50.5	51.3	48.4	47.2
6300.	49.6	49.8	51.7	52.9	52.0	52.4	51.5	51.9	51.4	50.5	50.9	51.8	51.9	51.2	51.6	50.0	49.7
8000.	50.6	50.9	52.3	53.1	52.5	52.7	51.9	52.2	51.9	51.2	51.7	52.5	52.5	52.0	52.0	51.0	50.7
10000.	52.4	52.6	53.4	54.0	53.5	53.7	53.2	53.3	53.1	52.8	52.9	53.6	53.5	53.2	53.2	52.7	52.4
PNL	90.2	98.3	103.7	105.9	105.7	105.8	105.8	105.0	104.7	104.5	103.9	104.4	104.5	104.6	103.9	99.3	88.7
PNLT	93.0	99.9	105.0	107.8	106.9	106.8	107.1	105.8	104.7	104.5	103.9	104.4	104.5	104.6	103.9	99.4	91.7
OASPL	83.4	92.1	97.0	99.2	98.4	98.0	97.2	95.8	95.3	95.2	95.1	96.6	98.3	99.1	98.2	94.0	84.0

Climb-to-Cruise Run 621

1/3-Octave Sound Pressure Levels

θ_1	15.8	26.1	36.3	46.2	56.0	65.5	74.8	84.4	89.1	93.8	103.5	113.0	122.8	133.0	143.1	153.5	164.0
θ_2	23.7	42.7	56.1	67.5	77.3	85.7	93.3	100.8	104.5	108.0	115.6	122.7	130.4	138.2	146.4	155.3	164.7
Frequency																	
50.	69.6	74.7	76.5	75.9	75.9	76.2	76.3	74.3	73.5	73.6	72.4	73.9	77.3	78.7	78.0	76.2	73.2
63.	74.2	75.8	76.6	77.5	78.5	78.0	77.8	78.1	77.0	76.1	75.1	76.5	78.6	80.8	81.5	80.0	74.6
80.	75.1	79.3	79.7	80.0	79.6	80.7	80.3	78.1	77.3	76.7	76.7	79.6	82.0	84.8	84.6	82.7	76.8
100.	76.7	81.9	82.4	81.8	81.8	81.2	79.0	78.0	78.6	79.0	79.7	82.2	84.8	87.6	86.8	84.4	77.7
125.	80.2	83.8	83.2	83.6	82.8	80.7	80.8	80.7	80.6	80.3	82.3	85.2	88.4	89.3	88.4	85.0	78.2
160.	80.7	84.2	86.1	85.2	82.2	81.7	82.1	83.4	84.4	85.1	85.3	86.4	88.8	91.0	90.3	86.1	80.0
200.	78.8	85.6	85.6	83.6	83.4	84.5	86.5	87.0	85.9	84.4	84.2	86.5	90.0	91.3	90.3	86.3	79.0
250.	81.6	88.0	87.0	86.8	89.5	90.4	88.0	84.6	84.8	85.2	86.0	88.5	91.0	92.8	91.4	86.8	77.9
315.	85.3	87.8	89.4	93.1	93.6	90.7	87.4	87.2	87.4	87.4	88.3	89.8	92.2	92.6	91.9	87.7	77.7
400.	83.7	90.5	95.0	95.0	90.6	88.5	88.4	88.5	88.6	88.7	89.1	89.9	91.4	91.7	91.0	87.7	77.5
500.	91.5	100.1	101.5	99.9	97.4	94.2	91.0	89.2	88.6	88.7	89.3	89.9	90.7	90.7	90.7	86.7	76.0
630.	91.8	99.7	101.8	102.4	101.8	100.0	96.6	91.8	90.4	89.6	89.8	90.8	90.8	90.1	89.0	84.0	73.8
800.	87.7	92.8	95.5	96.6	97.4	97.7	97.5	96.2	94.9	93.3	90.5	89.7	88.9	87.2	86.3	81.0	69.3
1000.	79.0	90.1	92.1	92.1	91.5	91.4	92.4	93.3	93.3	92.8	91.0	89.5	87.9	85.3	82.7	76.0	63.4
1250.	77.5	89.3	92.6	92.9	91.6	89.8	87.7	86.3	86.7	87.4	88.6	87.5	85.2	82.5	79.4	71.6	55.8
1600.	69.8	83.8	87.0	87.5	88.0	88.0	87.0	85.5	85.0	84.6	84.9	84.3	80.9	77.6	74.7	65.7	48.6
2000.	61.7	78.0	81.6	83.1	83.0	81.5	80.1	79.1	78.7	78.4	77.9	77.4	75.1	70.2	66.6	56.9	46.1
2500.	54.9	71.6	75.9	77.0	76.9	76.2	74.8	72.9	72.4	72.0	72.0	70.9	67.3	63.4	58.2	51.7	44.3
3150.	55.6	64.5	69.3	70.4	69.6	68.6	67.1	65.1	64.5	64.2	63.8	62.9	60.1	59.2	55.8	55.6	53.9
4000.	50.6	57.6	60.4	62.1	61.7	59.4	57.5	55.4	54.6	54.5	52.7	54.5	54.2	55.2	49.5	50.2	45.8
5000.	50.2	55.1	54.8	57.1	57.2	54.5	53.1	52.1	51.7	51.6	48.9	52.3	53.0	54.2	49.2	49.8	46.4
6300.	50.9	55.1	54.3	56.4	56.5	54.3	53.2	52.4	52.1	52.1	50.3	52.8	53.3	54.3	50.5	51.0	48.5
8000.	51.6	54.9	54.5	56.3	56.2	54.3	53.4	52.8	52.5	52.4	50.9	52.9	53.5	54.3	51.4	51.4	49.7
10000.	52.7	55.3	55.7	56.8	56.3	54.7	54.1	53.6	53.4	53.4	52.4	53.8	54.1	54.7	52.6	52.5	51.5
PNL	102.2	110.2	112.2	112.6	112.0	110.6	108.8	107.5	106.8	106.0	105.1	105.4	105.8	105.7	104.5	100.6	91.4
PNLT	103.4	111.9	113.2	114.0	113.6	111.9	109.9	108.7	107.8	106.1	105.1	105.4	105.8	105.7	104.5	102.1	94.3
OASPL	96.8	104.4	106.3	106.3	105.5	104.1	102.4	100.8	100.2	99.6	99.1	99.6	100.7	101.2	100.3	96.3	88.2

Climb-to-Cruise Run 622

1/3-Octave Sound Pressure Levels

θ_1	15.6	26.0	36.1	46.1	55.8	65.6	75.1	84.4	89.2	94.0	103.4	113.2	123.0	133.0	143.2	153.6	164.1
θ_2	21.0	37.6	52.6	64.9	74.9	84.2	92.5	100.1	103.5	107.2	115.0	122.3	129.6	138.4	146.4	155.4	164.7
Frequency																	
50.	69.7	72.3	74.2	75.0	74.0	73.8	74.1	74.3	73.8	73.9	72.9	70.8	74.5	76.5	77.1	76.2	72.8
63.	69.0	74.0	75.3	75.2	75.1	75.9	76.9	77.0	76.2	76.3	74.1	74.1	77.9	79.8	80.5	79.7	75.2
80.	71.1	75.7	77.6	77.7	77.8	77.2	77.4	78.1	77.4	76.2	75.4	76.7	80.0	84.2	85.1	83.1	75.5
100.	72.4	76.8	78.0	79.0	78.6	80.3	81.0	78.1	76.8	76.6	76.8	79.8	84.3	86.6	86.7	84.3	77.0
125.	73.8	79.0	80.6	80.6	82.7	82.4	79.9	78.8	79.0	79.2	79.5	81.9	85.9	88.9	88.3	85.2	79.0
160.	73.8	79.4	82.6	84.9	83.1	80.5	80.5	79.9	80.0	80.2	81.2	83.8	87.6	90.2	89.6	86.7	78.4
200.	73.6	81.5	85.0	82.4	81.0	81.5	82.0	81.6	81.9	82.0	82.2	83.8	88.9	91.4	90.5	86.8	78.0
250.	79.6	83.6	83.1	84.0	84.4	84.0	84.2	84.4	84.3	83.5	84.3	86.2	89.9	92.5	91.3	87.3	77.7
315.	76.3	82.9	85.1	86.2	86.1	86.2	86.2	85.5	85.5	85.8	86.7	87.8	91.0	92.9	92.0	88.2	77.5
400.	75.6	85.2	88.4	89.0	88.8	87.7	86.5	86.7	86.8	86.7	87.8	88.5	90.7	91.5	91.4	89.5	76.5
500.	86.2	95.7	97.9	98.7	97.0	94.3	91.5	88.6	88.1	87.7	88.1	88.7	90.6	91.0	91.1	88.7	75.9
630.	90.4	95.8	99.8	101.2	101.5	101.3	99.7	95.9	93.5	91.3	89.5	90.3	91.0	91.0	90.5	87.7	78.0
800.	82.0	90.6	94.5	96.2	97.7	99.1	99.6	98.8	98.1	96.8	93.0	91.2	90.6	89.6	88.5	85.7	75.2
1000.	76.5	87.7	91.4	92.7	92.7	92.7	93.4	95.2	95.9	96.3	94.9	91.5	90.8	89.1	86.9	82.1	71.2
1250.	79.7	87.8	92.7	94.6	94.4	93.4	92.4	91.2	90.8	91.2	92.8	92.7	90.0	87.0	85.1	79.6	67.6
1600.	71.4	84.1	89.0	91.0	91.8	92.5	92.4	91.0	90.0	89.6	89.4	90.9	89.6	85.3	82.6	76.2	61.9
2000.	66.9	80.0	85.8	87.7	88.4	88.5	88.3	88.0	87.6	87.4	86.8	86.6	85.3	80.6	78.2	70.8	53.8
2500.	58.4	74.9	81.0	83.3	84.3	84.3	84.2	83.7	83.1	82.8	82.0	81.8	80.2	76.9	72.1	64.9	47.6
3150.	56.3	68.4	75.2	78.4	79.2	79.3	79.0	77.7	77.1	76.7	76.0	75.7	75.0	70.4	66.0	59.7	55.6
4000.	48.8	60.2	69.9	73.1	73.2	72.8	71.7	69.2	68.0	67.2	66.5	66.6	64.9	61.0	58.0	52.7	47.1
5000.	48.6	55.7	64.8	68.0	67.9	67.0	65.5	61.8	59.2	58.1	55.9	54.6	55.6	54.5	53.1	51.6	47.1
6300.	50.4	54.2	60.4	63.6	63.8	62.6	61.3	58.6	56.5	56.1	54.2	52.1	53.8	53.9	53.4	52.4	49.4
8000.	51.3	53.5	58.3	60.4	60.5	59.1	57.9	56.7	55.4	55.3	54.0	52.5	53.8	53.9	53.6	52.8	50.6
10000.	52.8	53.9	57.2	58.4	58.8	57.4	56.8	56.4	55.3	55.3	54.6	53.5	54.3	54.6	54.3	53.7	52.3
PNL	99.8	107.0	111.1	112.5	112.8	112.5	111.6	110.6	109.9	109.2	108.3	108.9	108.8	107.4	106.3	103.2	92.7
PNLT	102.3	109.0	112.7	114.2	114.4	114.1	113.0	111.9	111.1	110.2	108.3	108.9	108.9	107.4	106.3	103.2	95.5
OASPL	93.3	100.6	104.0	105.3	105.4	105.2	104.5	103.1	102.5	101.9	100.8	100.3	101.1	101.6	100.9	97.8	88.2

Climb-to-Cruise Run 623

1/3-Octave Sound Pressure Levels

θ_1	15.3	25.4	35.4	45.3	55.2	65.0	74.6	84.3	89.1	93.9	103.8	113.7	123.6	133.6	143.8	154.1	164.4	
θ_2	20.9	38.0	53.1	65.1	75.3	84.6	92.7	100.4	103.9	108.1	115.9	122.9	130.4	139.0	146.9	156.0	165.0	
Frequency																		
	50.	68.2	71.0	73.3	74.7	74.4	73.7	74.3	75.0	74.3	73.9	72.6	71.7	73.7	75.6	77.4	76.3	72.2
63.	69.0	72.3	74.6	75.4	76.1	77.6	77.7	76.7	76.6	76.3	75.0	73.8	77.7	81.4	81.8	80.6	75.7	
80.	71.9	76.4	77.4	78.3	78.8	78.7	78.5	78.6	78.4	77.3	76.0	77.7	82.1	84.8	84.6	82.7	77.0	
100.	75.0	78.4	80.1	80.1	79.9	81.8	81.8	78.7	77.7	77.9	78.4	80.6	83.7	86.3	86.9	85.0	78.2	
125.	75.6	80.0	81.2	81.9	83.8	83.5	79.9	78.7	78.6	79.0	79.7	82.4	87.5	89.3	88.6	86.0	79.1	
160.	76.3	80.9	83.1	85.4	84.5	80.8	80.4	80.6	81.7	84.4	86.2	86.6	87.7	90.9	90.4	87.3	79.5	
200.	74.0	80.3	85.0	83.4	82.2	82.1	85.1	88.4	89.0	87.3	82.9	84.8	89.0	91.7	90.4	86.3	79.0	
250.	76.7	85.6	84.5	85.0	85.8	90.5	91.7	88.3	85.5	84.9	84.6	86.7	90.3	92.2	90.8	87.2	78.8	
315.	81.1	83.4	86.9	88.5	93.7	94.0	89.6	86.1	86.4	86.5	86.9	88.5	91.5	92.8	91.5	87.4	79.0	
400.	77.9	86.4	91.0	96.2	95.1	89.3	87.1	87.1	86.9	87.2	88.4	89.1	91.1	91.7	90.8	88.2	78.0	
500.	86.3	96.4	100.4	100.4	98.1	95.4	92.3	89.7	88.9	88.4	88.3	89.1	90.4	90.8	91.0	88.1	77.4	
630.	89.9	98.7	100.8	102.2	102.6	102.2	100.3	96.3	93.4	90.7	89.4	90.4	91.1	90.8	90.3	87.0	79.1	
800.	88.4	91.4	95.7	97.3	98.5	99.4	99.6	99.3	98.6	97.2	93.0	91.2	90.3	89.4	88.1	86.1	76.0	
1000.	77.9	88.6	92.6	93.8	93.8	93.6	94.4	96.2	96.8	96.9	95.3	92.6	90.7	88.5	86.3	81.7	71.4	
1250.	79.5	90.0	93.7	95.2	95.3	94.3	92.8	91.3	90.9	91.3	93.2	92.9	90.0	87.5	84.7	79.4	67.7	
1600.	75.9	85.3	90.5	92.0	92.4	93.1	93.1	92.0	91.2	90.7	90.6	91.9	88.7	85.0	82.2	76.4	62.3	
2000.	68.5	81.4	87.0	88.6	89.7	89.8	88.8	88.0	87.4	87.3	87.2	87.0	85.4	80.8	77.0	70.7	54.7	
2500.	61.2	76.7	82.7	84.7	85.3	85.6	85.2	84.4	83.7	83.4	83.3	83.3	80.4	76.5	72.0	64.9	49.1	
3150.	57.2	70.7	77.7	80.4	80.8	80.6	79.8	78.5	77.8	77.4	77.1	77.2	74.4	70.1	65.3	59.5	55.8	
4000.	50.9	63.5	73.0	75.7	75.4	74.5	72.7	70.3	68.8	68.1	67.9	67.7	64.9	60.5	58.1	51.9	48.3	
5000.	50.3	57.8	68.0	70.8	70.2	69.0	66.8	62.8	59.5	58.0	58.1	57.1	55.8	54.1	53.7	50.8	48.4	
6300.	51.1	55.0	64.1	66.5	65.9	64.9	62.5	59.0	56.0	55.4	56.0	53.5	54.4	53.6	53.4	51.8	50.2	
8000.	51.9	54.0	61.0	63.2	62.7	61.6	59.3	56.9	54.5	54.7	55.7	53.0	54.3	53.7	53.5	52.2	51.2	
10000.	53.1	54.2	59.4	60.9	60.7	59.9	57.8	56.3	54.6	54.8	55.9	53.7	54.8	54.5	54.4	53.4	52.7	
PNL	100.5	109.0	112.4	114.0	114.3	113.8	112.5	111.3	110.6	109.8	109.2	109.7	108.6	107.3	106.0	102.6	93.7	
PNLT	101.8	111.0	114.2	115.1	115.7	115.4	113.9	112.4	111.7	110.9	110.0	109.7	108.6	107.3	106.0	102.6	96.1	
OASPL	94.3	102.3	105.5	106.8	106.8	106.3	105.2	103.9	103.2	102.5	101.2	101.0	101.2	101.6	100.7	97.5	89.2	

Climb-to-Cruise Run 630

1/3-Octave Sound Pressure Levels

θ_1	14.8	24.6	34.3	44.1	53.9	63.8	73.7	84.2	88.6	94.4	104.0	114.1	124.3	134.5	144.6	154.6	164.3
θ_2	31.7	49.0	61.7	71.2	79.7	88.1	95.7	102.9	106.5	110.8	117.0	125.0	131.9	140.3	148.2	156.3	165.0
Frequency																	
50.	80.0	79.5	78.7	77.0	77.9	77.3	76.8	76.8	76.5	76.2	74.7	74.1	75.1	79.2	78.4	77.0	72.9
63.	81.6	82.2	81.7	81.4	80.2	80.4	79.5	79.2	78.5	78.5	76.9	77.1	79.5	81.0	81.5	79.8	75.2
80.	80.7	82.9	82.9	82.6	81.9	81.6	81.6	81.7	81.3	80.5	78.6	79.1	81.8	84.9	84.9	82.3	78.0
100.	79.3	82.2	82.9	82.2	81.7	82.8	83.1	82.4	80.2	79.2	80.0	81.6	84.8	86.9	86.5	83.6	78.1
125.	82.1	84.3	84.6	84.0	86.0	86.4	85.9	81.9	81.8	81.7	81.7	84.4	88.6	90.0	88.8	85.4	78.9
160.	83.1	85.3	86.2	87.6	87.9	87.4	84.6	83.6	84.7	87.9	89.4	87.3	89.4	91.5	90.5	86.9	79.3
200.	82.3	85.8	88.0	88.8	88.7	86.8	88.3	91.8	92.5	91.9	85.9	86.6	90.3	92.1	90.6	86.5	79.4
250.	84.7	88.3	89.7	90.2	90.1	94.2	96.4	95.7	93.2	86.8	86.8	88.9	91.2	93.0	91.9	88.0	78.7
315.	86.0	90.9	92.2	92.7	97.4	99.0	98.9	91.2	89.5	88.9	88.8	89.9	92.5	93.1	91.6	87.9	79.0
400.	85.2	91.9	95.3	99.4	100.5	100.0	93.6	90.3	90.3	89.9	90.0	90.8	91.8	92.1	91.9	88.5	81.3
500.	87.4	97.5	102.6	104.4	104.4	102.3	98.8	94.7	92.8	91.5	91.2	91.3	91.4	91.2	91.3	86.9	80.4
630.	86.9	96.7	103.1	105.2	105.9	105.0	103.4	100.2	98.0	95.1	93.0	92.9	92.7	91.6	90.5	87.1	77.1
800.	83.7	94.4	98.0	99.6	99.8	100.0	99.5	98.4	97.9	97.1	95.3	93.7	92.4	90.9	89.0	85.2	76.5
1000.	81.3	92.8	96.9	98.3	98.4	96.8	94.6	93.5	93.6	93.8	94.1	93.4	92.2	89.9	87.3	82.6	74.1
1250.	81.8	91.5	97.2	99.1	99.6	98.6	96.9	94.3	93.0	92.0	93.0	93.2	91.0	88.6	85.9	80.2	70.3
1600.	78.6	89.4	94.4	96.2	96.7	96.1	95.0	93.1	92.2	91.2	90.6	91.5	90.0	86.5	83.4	77.6	65.9
2000.	71.8	85.2	91.3	93.2	94.1	93.5	92.5	90.3	89.6	88.6	88.2	87.8	86.1	82.1	79.5	72.8	60.6
2500.	65.2	81.2	87.6	90.1	90.8	90.2	88.4	86.3	85.4	84.6	83.8	83.5	82.4	78.2	74.0	67.1	56.6
3150.	64.3	75.7	82.9	85.5	86.3	85.4	83.7	80.9	80.0	78.9	78.5	78.3	76.5	73.1	68.9	64.8	64.7
4000.	57.8	68.0	77.0	79.3	79.9	78.5	76.0	72.4	71.1	69.9	69.3	69.8	67.9	64.0	60.6	57.3	56.3
5000.	57.5	62.1	70.4	72.2	72.5	70.7	67.7	62.9	61.5	60.4	60.5	60.6	60.3	59.0	58.0	57.3	57.0
6300.	59.2	61.4	66.5	66.7	66.6	64.5	63.5	61.1	60.2	59.7	60.0	59.6	59.6	59.7	59.7	59.2	59.2
8000.	60.7	62.4	64.6	64.1	64.1	63.4	63.3	61.8	61.3	61.0	61.0	60.8	60.9	61.0	60.8	60.6	60.5
10000.	62.4	63.7	64.9	64.5	64.3	64.0	64.0	63.0	62.7	62.5	62.6	62.4	62.5	62.6	62.5	62.4	62.3
PNL	102.1	110.8	115.6	117.5	118.1	117.5	115.9	113.2	111.8	110.8	110.1	110.5	110.0	108.3	107.1	103.3	96.1
PNLT	102.3	111.8	116.7	118.5	119.4	118.7	117.4	114.4	112.6	111.6	111.1	110.5	110.0	108.3	107.1	103.4	98.9
OASPL	95.6	103.6	108.3	110.3	110.8	110.0	108.4	105.8	104.5	103.2	102.4	102.2	102.4	102.3	101.2	97.4	89.9

Climb-to-Cruise Run 631

1/3-Octave Sound Pressure Levels

θ_1	14.2	23.9	33.7	43.8	53.7	63.9	74.1	83.9	89.6	93.7	105.2	115.4	125.6	135.7	145.5	155.4	165.3
θ_1	31.8	49.3	61.7	71.8	80.6	88.6	96.3	103.5	107.6	110.4	118.7	125.7	133.4	141.1	149.0	157.2	165.9
Frequency																	
50.	76.0	76.5	76.4	76.1	76.2	75.7	75.6	75.3	74.5	74.4	72.8	73.1	75.9	76.6	77.7	75.2	71.5
63.	79.3	80.7	79.3	79.4	79.0	78.5	77.7	76.9	76.5	76.0	75.7	77.3	79.7	81.4	81.2	79.5	74.3
80.	81.5	82.3	81.1	81.3	80.9	81.0	80.8	80.4	79.2	78.9	78.5	81.0	83.6	84.5	84.0	81.6	76.1
100.	80.7	83.8	83.3	82.8	83.0	83.3	82.7	78.6	78.0	77.8	79.2	82.3	85.2	87.1	87.0	83.7	76.4
125.	85.7	87.9	86.5	86.5	86.5	85.8	82.3	81.2	80.8	80.6	82.0	86.0	88.0	89.4	87.2	83.5	77.2
160.	87.9	88.4	87.9	88.1	87.8	85.4	83.2	85.6	86.9	87.6	87.3	86.8	89.4	90.2	88.8	85.4	78.5
200.	86.3	87.8	89.1	88.4	86.2	86.7	90.6	91.5	90.1	88.2	84.3	87.3	89.9	90.8	89.2	85.0	77.2
250.	88.6	90.9	90.8	90.4	93.3	95.7	95.5	90.2	85.7	85.3	86.4	88.1	90.5	91.2	89.4	85.6	76.7
315.	89.6	92.1	92.5	95.7	97.5	97.3	92.9	88.1	87.6	87.4	87.5	89.8	91.1	91.1	89.1	85.8	76.8
400.	89.8	94.0	97.7	99.5	98.9	94.4	89.8	89.1	88.7	88.7	88.7	89.6	90.1	89.2	88.5	84.4	76.3
500.	91.2	99.3	102.7	102.7	100.4	96.5	93.1	90.4	89.8	89.4	88.9	89.3	89.5	88.8	87.5	83.5	74.1
630.	91.2	101.6	104.0	105.0	104.4	102.9	99.7	95.3	92.5	91.3	90.0	90.4	89.9	88.0	86.3	82.2	70.6
800.	84.5	95.2	97.8	98.7	98.9	98.8	98.1	97.2	96.0	95.0	91.3	89.8	88.2	85.6	83.4	78.4	67.3
1000.	82.2	90.5	93.2	93.9	92.9	91.6	91.3	92.5	92.7	92.8	91.2	89.4	86.8	83.2	79.5	72.6	60.3
1250.	77.7	89.9	93.2	94.4	93.6	91.8	89.4	87.1	86.8	87.2	88.1	87.2	84.0	79.8	75.3	67.3	57.9
1600.	69.0	83.5	86.9	88.3	88.2	87.9	86.6	85.2	84.0	83.6	83.3	82.8	79.1	74.3	69.0	60.3	54.7
2000.	62.7	77.7	81.4	83.6	83.4	82.6	80.1	78.3	77.5	77.2	76.3	75.2	71.5	66.0	62.0	58.3	57.2
2500.	58.3	70.9	75.0	76.9	76.6	75.3	73.5	71.6	70.6	70.2	68.8	67.6	64.3	59.3	57.4	55.5	54.7
3150.	62.8	65.6	68.6	70.5	70.2	69.1	67.0	65.1	64.4	64.4	64.5	64.3	62.9	64.1	65.4	63.0	62.6
4000.	57.8	60.6	61.7	63.9	62.8	61.9	60.5	58.8	58.3	58.5	58.4	58.2	57.5	57.7	57.6	56.9	56.3
5000.	57.6	59.2	59.2	61.0	59.9	59.4	59.0	57.9	57.6	57.7	57.5	57.5	56.9	57.3	57.3	56.7	56.4
6300.	59.2	60.1	59.7	61.3	60.4	60.3	60.0	59.1	58.9	59.0	59.3	59.2	58.7	59.6	60.2	58.6	58.4
8000.	60.6	61.3	61.2	62.2	61.5	61.4	61.2	60.7	60.5	60.6	60.6	60.7	60.4	60.8	60.9	60.2	60.2
10000.	61.3	61.8	61.8	62.5	62.1	61.9	61.7	61.4	61.2	61.3	61.3	61.2	61.2	61.2	61.2	61.2	60.9
PNL	104.0	111.9	114.1	115.1	114.6	113.3	110.9	108.8	107.7	107.1	105.4	105.3	105.1	104.4	102.8	99.0	91.9
PNLT	105.5	113.3	115.4	116.5	116.2	114.8	112.1	109.9	108.9	108.1	106.1	105.3	105.1	106.3	105.5	101.3	94.2
OASPL	98.8	105.6	108.2	109.0	108.4	106.9	104.6	102.3	101.1	100.5	99.2	99.5	100.0	99.8	98.3	94.6	86.9

Climb-to-Cruise Run 1101

1/3-Octave Sound Pressure Levels

θ_1	16.4	27.1	37.4	47.4	57.1	66.5	75.9	84.8	89.4	93.9	103.2	112.4	122.0	131.8	142.1	152.5	163.4
θ_2	17.9	31.6	45.0	57.8	69.1	78.9	88.3	96.4	100.4	104.3	112.0	120.2	128.2	136.4	144.8	154.0	164.1
Frequency																	
50.	85.5	83.0	81.8	82.5	81.7	81.5	80.6	80.6	79.4	79.5	79.3	79.5	79.0	78.8	77.4	75.9	73.0
63.	89.5	86.8	86.1	85.1	85.0	84.6	83.9	84.1	83.8	83.1	82.8	81.4	80.9	80.4	79.4	77.6	72.8
80.	92.2	89.6	88.2	87.2	86.8	87.0	86.2	85.5	85.0	84.8	84.6	83.3	82.6	82.0	79.8	77.2	74.8
100.	92.4	89.6	88.3	86.5	86.6	86.2	85.5	85.0	84.5	84.5	84.6	83.2	82.6	82.5	79.8	78.3	73.6
125.	94.7	91.6	90.0	88.0	88.2	88.1	86.7	86.7	86.7	86.6	85.4	84.3	84.3	83.5	81.1	78.9	73.7
160.	97.2	92.8	91.3	89.4	89.0	89.1	88.2	87.8	88.2	88.5	87.6	85.8	85.0	84.8	83.4	80.7	74.1
200.	96.9	93.2	91.3	89.5	89.6	89.4	88.3	87.7	87.5	87.5	87.0	85.4	84.5	83.6	81.9	79.5	73.2
250.	96.8	93.0	91.8	90.5	90.2	90.2	88.8	88.5	88.9	88.6	86.8	85.4	85.8	82.7	81.5	78.8	70.6
315.	97.2	92.8	91.5	89.4	89.6	90.6	88.6	88.7	88.5	88.2	86.8	85.2	86.2	82.8	81.5	76.9	69.3
400.	96.1	91.5	89.7	87.5	87.2	87.9	86.7	85.5	85.4	85.4	82.7	82.2	83.2	80.4	79.0	75.4	69.0
500.	94.9	89.6	88.3	86.0	86.4	86.7	85.4	83.7	83.7	83.6	82.0	80.7	81.1	78.4	75.8	73.0	66.2
630.	93.8	87.9	85.8	84.0	84.0	84.8	83.2	81.7	80.8	80.4	80.1	78.3	78.2	75.3	74.1	68.9	62.9
800.	91.7	85.0	83.6	81.8	81.6	81.5	80.6	79.8	78.8	78.3	77.8	76.3	74.7	72.6	70.7	64.8	56.0
1000.	88.9	81.8	79.5	77.5	77.8	76.9	75.5	74.9	73.9	73.8	73.4	71.7	70.5	67.6	64.8	58.4	49.2
1250.	86.5	78.8	75.2	73.3	73.6	72.5	70.0	70.0	69.3	69.0	67.7	66.7	65.5	63.0	59.9	58.3	56.0
1600.	83.5	74.2	69.8	67.4	67.3	65.8	63.4	62.9	62.0	61.3	60.3	59.9	57.9	54.0	50.3	48.9	46.7
2000.	79.0	67.7	63.2	60.9	60.9	60.0	58.2	58.5	58.2	57.6	57.7	58.2	57.3	57.2	56.6	56.4	56.1
2500.	75.9	64.8	57.5	55.8	56.7	55.4	56.3	56.2	56.0	55.6	56.4	56.1	54.7	54.6	54.9	53.9	54.6
3150.	75.0	66.0	57.4	57.4	58.4	57.4	57.1	57.5	57.0	56.6	57.2	57.2	56.6	56.5	55.7	56.3	56.3
4000.	73.5	63.2	54.7	54.1	55.1	54.2	54.7	54.7	54.2	54.1	54.7	54.5	53.8	54.1	53.2	53.7	53.5
5000.	71.8	58.2	54.2	53.7	54.8	54.0	54.3	54.3	54.1	53.6	54.2	54.1	53.7	53.7	53.1	53.4	53.3
6300.	70.0	59.9	53.2	52.9	53.9	52.9	53.0	53.2	52.8	52.3	53.1	53.2	52.6	52.2	51.7	51.9	52.1
8000.	70.6	61.0	53.5	53.1	54.0	53.2	53.4	53.5	53.2	52.7	53.2	53.5	52.9	52.6	52.4	52.5	52.3
10000.	70.2	59.8	55.2	55.0	55.5	55.0	55.2	55.2	55.1	54.8	55.1	55.2	54.8	54.7	54.5	54.6	54.5
PNL	111.6	106.1	104.1	102.3	102.3	102.6	101.2	100.9	100.6	100.4	99.3	98.0	98.2	95.9	94.4	91.6	86.4
PNLT	111.6	106.1	104.1	103.0	103.0	103.4	101.2	100.9	100.6	100.4	99.3	98.0	98.2	96.9	95.7	93.3	89.1
OASPL	106.1	101.9	100.4	98.6	98.6	98.7	97.5	97.0	96.9	96.8	95.8	94.4	94.3	92.8	91.1	88.4	83.0

Climb-to-Cruise Run 1102

1/3-Octave Sound Pressure Levels

θ_1	15.7	26.3	36.5	46.6	56.5	66.1	75.4	84.9	89.5	94.1	103.3	113.0	122.6	132.4	142.5	152.9	163.6
θ_2	17.2	30.8	44.7	57.4	68.9	79.2	88.1	96.9	100.9	104.7	112.8	120.9	128.5	136.7	145.5	154.6	164.2
Frequency																	
50.	85.9	84.2	83.5	82.3	82.2	81.2	81.3	80.8	81.1	81.1	80.0	80.2	78.6	78.2	78.6	77.1	72.3
63.	89.6	88.4	86.4	86.1	85.0	85.1	84.5	84.7	84.2	84.2	83.6	83.5	82.1	81.2	80.6	78.4	73.1
80.	91.5	89.1	87.7	86.6	86.5	85.9	85.7	85.6	84.9	84.3	84.4	82.9	82.3	81.6	80.7	79.7	74.6
100.	94.1	90.1	88.6	87.0	86.8	86.7	85.6	85.2	85.0	84.0	84.1	83.7	82.7	81.7	81.0	78.3	73.9
125.	95.4	91.8	90.4	88.6	88.8	88.1	87.6	86.8	86.2	86.1	85.6	84.9	84.6	83.3	82.3	79.3	75.8
160.	96.7	93.7	91.7	89.6	90.5	89.6	89.4	88.8	87.4	86.7	86.7	86.0	85.5	83.8	82.5	79.9	75.7
200.	97.3	93.7	91.6	90.1	89.9	89.9	88.8	88.5	88.0	87.0	86.7	85.8	85.5	83.7	82.5	80.0	75.8
250.	98.0	94.4	91.9	90.5	91.1	90.9	90.3	89.4	88.0	86.6	86.3	86.8	85.8	84.0	81.7	78.6	74.6
315.	98.2	94.2	91.1	89.3	90.3	90.9	90.1	89.4	88.2	86.2	86.4	86.3	85.1	83.6	81.8	78.6	73.9
400.	96.5	92.8	89.1	88.7	89.2	89.5	88.5	88.2	86.6	84.6	84.8	84.1	83.7	82.2	80.9	78.9	71.6
500.	95.2	91.3	87.1	86.4	86.6	87.1	85.8	86.0	83.9	82.2	81.9	79.8	80.4	78.1	77.4	76.4	69.4
630.	94.8	89.6	85.7	84.6	84.2	84.0	83.1	84.0	82.7	80.5	79.6	78.3	78.7	76.2	75.5	72.5	65.2
800.	91.8	86.8	83.2	81.7	81.7	81.2	79.8	81.8	80.6	78.2	76.7	74.9	75.3	72.8	72.1	68.1	58.2
1000.	89.4	83.2	79.2	77.3	77.5	76.9	75.2	78.0	76.9	73.4	71.8	70.2	69.8	67.6	64.8	61.4	50.9
1250.	86.6	79.9	75.7	73.3	72.3	73.2	70.5	73.0	71.5	67.8	66.8	65.7	64.6	62.4	59.7	57.9	56.1
1600.	83.5	75.5	70.8	67.2	66.3	67.0	64.3	66.3	64.7	60.3	60.2	59.1	57.2	55.2	53.2	51.1	50.2
2000.	77.7	68.7	63.7	60.6	59.8	60.3	59.1	59.4	58.6	57.9	57.0	57.1	56.1	56.3	55.4	55.4	54.8
2500.	72.2	62.5	58.7	56.4	56.8	56.7	56.0	56.1	55.0	55.4	54.8	55.2	54.6	55.0	55.1	53.9	54.5
3150.	66.3	62.0	60.5	59.9	60.6	60.7	60.8	61.2	60.7	60.3	60.6	60.8	60.2	59.7	60.3	59.6	59.3
4000.	59.9	57.9	55.7	54.7	55.5	55.4	55.3	55.1	54.4	55.0	54.4	54.3	54.1	54.5	53.8	53.5	53.7
5000.	57.2	57.1	55.1	54.5	55.2	54.8	54.6	54.6	54.1	54.6	54.2	54.4	54.1	54.1	53.8	53.8	53.7
6300.	57.7	57.8	56.2	55.6	56.1	55.9	55.9	55.9	55.4	55.6	55.4	55.5	55.2	55.2	55.3	55.1	54.7
8000.	57.8	57.8	56.5	56.1	56.3	56.3	56.1	56.1	55.8	56.1	55.8	55.8	55.6	55.8	55.8	55.6	55.6
10000.	59.0	58.9	58.0	57.7	58.0	58.0	57.9	58.0	57.7	57.8	57.7	57.8	57.6	57.6	57.5	57.3	57.3
PNL	111.3	107.1	104.1	102.7	103.0	103.1	102.2	102.1	101.0	99.4	99.2	98.7	98.0	96.5	95.4	93.3	88.6
PNLT	111.3	107.1	105.2	104.1	104.4	104.7	103.9	104.0	103.0	101.1	101.2	100.8	99.9	98.2	97.3	95.3	90.4
OASPL	106.6	102.9	100.4	98.9	99.3	99.1	98.4	98.0	97.0	95.8	95.6	95.1	94.4	92.9	91.7	89.4	84.6

Climb-to-Cruise Run 1201

1/3-Octave Sound Pressure Levels

θ_1	15.2	25.3	35.5	45.5	55.4	65.2	74.9	84.8	89.8	94.7	104.6	114.5	124.4	134.4	144.6	154.7	164.7
θ_2	16.0	28.3	40.6	51.9	62.3	72.1	81.6	90.7	95.3	99.7	108.9	117.8	126.8	136.1	145.6	155.2	164.9
Frequency																	
50.	65.4	69.5	72.0	72.8	73.6	74.4	74.3	74.9	75.0	74.6	74.9	73.9	73.4	72.0	64.8	56.5	56.3
63.	66.6	73.5	75.4	76.0	76.5	76.4	76.6	76.6	76.7	76.5	76.5	77.0	76.6	73.6	65.9	56.9	56.5
80.	67.6	75.9	78.5	79.5	80.2	80.2	80.7	80.1	79.8	80.3	79.2	79.6	77.1	74.9	68.6	58.4	57.2
100.	70.1	77.9	80.6	81.4	81.1	81.6	81.3	81.1	80.2	80.9	80.6	79.9	78.4	75.9	69.2	58.5	57.4
125.	71.9	80.4	82.5	83.0	83.1	83.3	83.0	82.3	82.0	82.4	81.5	81.7	78.9	77.8	69.5	63.7	62.7
160.	74.8	81.5	84.2	84.9	84.8	84.7	85.1	85.0	83.8	83.6	82.8	82.1	79.7	78.5	70.3	59.5	54.9
200.	74.7	81.9	84.0	83.8	83.7	83.0	83.5	84.2	82.8	82.3	82.7	82.0	78.7	79.0	70.3	56.8	51.8
250.	76.3	82.3	83.9	84.4	83.8	83.3	83.2	83.4	82.3	82.3	82.5	81.8	78.7	78.1	69.2	53.8	50.7
315.	78.4	82.9	83.9	83.4	82.8	82.2	81.5	81.6	81.3	81.1	81.0	80.2	77.4	75.2	67.2	51.8	45.4
400.	79.3	82.0	82.0	81.4	80.5	80.5	79.9	80.1	79.9	79.0	80.3	78.6	74.8	72.1	63.1	49.4	43.9
500.	78.3	80.9	80.8	79.6	79.5	79.1	77.5	78.2	77.9	77.0	77.6	76.3	72.4	68.0	60.6	46.5	38.2
630.	75.7	79.4	79.4	77.5	77.7	77.3	74.7	75.8	75.6	73.6	74.8	73.3	68.2	64.7	56.0	44.7	43.1
800.	74.1	75.5	75.6	73.0	73.5	73.3	70.1	71.4	71.0	69.2	69.2	68.4	63.0	60.7	49.0	36.6	34.9
1000.	72.0	71.3	70.8	67.7	68.4	68.5	65.3	64.5	65.1	62.2	62.6	62.0	55.0	52.9	40.9	34.0	33.8
1250.	66.9	64.8	63.8	61.1	62.5	62.3	58.6	57.6	58.6	55.7	55.9	54.3	49.3	47.1	44.1	44.1	44.0
1600.	60.3	56.6	54.8	52.8	54.3	54.1	50.9	50.2	50.5	47.9	50.3	47.5	44.8	43.5	40.2	39.4	39.5
2000.	49.1	50.5	47.9	48.7	49.5	48.6	47.5	47.9	48.2	46.8	49.0	46.8	46.0	44.6	45.0	44.4	44.0
2500.	45.1	48.2	46.2	46.9	47.9	46.9	46.0	46.8	47.0	45.2	47.9	45.7	44.6	43.6	43.2	42.2	42.8
3150.	49.1	51.5	50.2	50.6	51.1	50.5	50.9	51.7	50.9	49.1	51.0	49.5	49.5	49.6	49.4	49.2	50.0
4000.	44.7	47.2	46.1	46.7	47.2	46.4	45.8	46.0	46.5	45.1	47.2	45.5	44.6	44.2	43.6	43.2	43.2
5000.	44.9	46.7	45.8	46.2	46.9	46.1	45.5	45.9	46.1	45.1	46.8	45.5	44.8	44.6	43.7	43.7	43.4
6300.	45.4	47.4	46.5	46.8	47.2	46.6	46.5	46.9	46.7	45.5	47.0	45.8	45.4	45.4	44.8	44.7	44.9
8000.	46.0	47.4	46.9	47.2	47.6	47.0	46.7	46.8	47.0	46.3	47.3	46.4	46.0	45.9	45.5	45.4	45.4
10000.	47.4	48.3	48.0	48.1	48.4	48.1	48.0	48.2	48.1	47.6	48.4	47.9	47.4	47.5	47.2	47.1	47.2
PNL	91.7	95.1	95.9	95.5	95.3	95.0	94.4	94.6	94.0	93.5	93.8	93.0	90.0	88.7	81.0	73.5	72.8
PNLT	93.1	96.4	97.2	96.8	96.5	96.3	96.1	96.4	95.4	94.8	94.9	94.3	91.6	90.6	83.0	76.0	75.3
OASPL	86.5	91.2	92.7	92.7	92.5	92.3	92.1	92.2	91.4	91.3	91.1	90.6	87.9	86.5	78.5	68.4	66.9

Climb-to-Cruise Run 1202

1/3-Octave Sound Pressure Levels

θ_1	14.9	24.5	34.2	43.8	53.2	62.4	71.8	81.2	85.9	90.6	100.2	110.1	120.3	130.8	141.8	153.0	164.3
θ_2	15.1	25.1	35.2	45.2	55.3	65.3	75.3	85.3	90.2	95.2	105.1	115.0	124.9	134.9	144.9	154.9	165.0
Frequency																	
50.	62.4	69.1	71.7	74.3	73.3	73.7	74.5	74.7	75.0	74.9	75.5	75.4	75.1	74.5	74.5	73.3	69.1
63.	61.8	69.9	70.4	74.8	76.9	75.3	77.4	79.2	78.3	77.9	77.5	77.1	76.5	77.4	76.7	77.8	71.8
80.	62.0	70.4	74.7	76.2	77.8	79.5	78.3	79.6	80.2	80.0	80.4	80.7	81.3	80.6	80.2	79.3	75.8
100.	61.8	69.4	74.9	75.5	78.3	78.1	80.1	79.7	80.3	79.6	80.6	81.6	81.5	81.4	81.4	79.7	78.2
125.	64.4	71.7	74.8	77.2	79.9	78.7	79.9	82.0	81.8	81.9	81.9	83.0	82.9	83.0	83.8	82.4	79.7
160.	62.8	72.3	75.1	76.7	79.1	80.1	81.3	83.6	83.4	83.5	83.7	85.0	84.4	84.9	85.3	84.4	81.6
200.	60.4	71.1	73.7	76.5	78.8	79.0	81.3	82.8	83.0	83.3	83.5	84.7	84.2	84.2	84.3	83.7	80.5
250.	56.2	70.3	75.1	75.9	79.3	78.7	79.9	81.7	81.9	81.9	82.3	84.5	83.9	84.2	83.8	83.7	81.6
315.	51.5	69.6	72.4	73.9	77.3	77.0	77.3	79.3	79.3	80.3	80.5	82.0	82.1	82.9	82.4	81.9	81.4
400.	44.9	63.6	66.7	68.2	71.8	72.6	72.8	75.6	75.3	75.7	76.6	78.0	78.8	79.5	79.6	80.1	79.5
500.	39.4	53.4	59.9	62.0	66.5	66.2	69.0	70.4	71.0	71.7	72.9	74.6	74.4	75.5	75.7	76.6	76.5
630.	43.9	46.0	52.4	55.0	60.4	60.2	64.5	65.2	65.0	67.2	68.1	69.8	70.9	71.5	71.7	73.0	73.2
800.	35.8	38.6	42.7	45.7	52.5	51.0	55.6	57.1	58.1	59.5	60.3	62.3	62.6	64.2	65.0	66.4	67.3
1000.	34.6	37.0	39.6	41.5	47.1	44.7	48.0	50.9	51.1	51.3	52.6	54.2	55.1	56.3	57.4	59.3	60.8
1250.	45.6	46.0	45.7	46.0	48.5	47.0	48.1	50.2	50.0	49.4	50.3	50.5	50.4	51.6	52.6	54.0	52.9
1600.	38.8	39.7	40.6	41.3	45.7	43.4	44.4	47.6	47.8	46.6	47.4	47.1	47.0	49.2	49.4	51.3	46.4
2000.	46.5	45.7	46.1	46.4	47.4	47.3	47.0	48.7	48.6	47.5	47.8	48.5	47.3	50.0	49.4	50.6	47.4
2500.	43.0	43.9	44.2	44.3	46.2	44.5	45.6	47.2	47.7	46.8	47.1	46.6	47.3	47.9	48.3	49.9	46.0
3150.	48.9	50.0	50.3	49.3	50.9	51.2	51.3	51.7	51.3	50.4	50.8	50.8	50.3	51.2	51.5	51.9	50.3
4000.	43.9	43.8	44.2	44.3	45.7	44.7	45.0	46.6	46.6	46.0	46.2	46.1	46.2	47.2	47.2	48.5	45.6
5000.	43.6	43.9	43.8	44.1	45.1	44.7	44.6	46.0	46.1	45.4	45.6	45.8	45.7	46.6	46.6	47.8	45.1
6300.	44.5	44.9	45.3	44.9	46.1	45.9	46.2	46.9	46.9	46.2	46.5	46.4	46.4	47.0	47.2	48.2	45.9
8000.	45.5	45.6	45.7	45.8	46.5	46.1	46.2	47.0	47.0	46.8	46.9	46.8	46.8	47.5	47.5	48.4	46.4
10000.	47.4	47.5	47.6	47.5	48.0	47.9	47.9	48.4	48.3	48.1	48.2	48.3	48.2	48.6	48.7	49.3	48.1
PNL	74.1	81.7	85.3	86.6	89.6	89.2	90.6	92.2	92.3	92.5	92.8	94.3	94.0	94.5	94.4	94.4	92.6
PNLT	77.1	84.2	87.4	88.2	91.2	91.4	92.6	93.8	93.7	93.8	94.2	95.7	95.2	95.7	95.6	95.2	94.1
OASPL	71.2	80.2	83.6	85.4	87.9	87.9	89.1	90.6	90.7	90.8	91.1	92.3	92.1	92.3	92.4	91.8	89.6

Climb-to-Cruise Run 1301

1/3-Octave Sound Pressure Levels

θ_1	28.7	43.6	54.9	63.7	70.8	76.9	82.3	87.4	89.8	92.3	97.4	102.9	109.1	116.4	125.4	136.8	151.6
θ_2	31.5	47.9	59.3	67.9	74.8	80.6	85.8	90.6	93.0	95.3	100.2	105.4	111.2	118.1	126.8	137.7	152.0
Frequency																	
50.	56.5	55.6	56.3	56.5	57.3	57.3	58.6	59.8	59.9	60.2	59.6	60.4	58.9	60.2	59.5	59.1	58.5
63.	58.6	58.0	58.8	58.6	58.2	59.7	60.7	61.2	61.5	62.2	61.7	61.9	61.4	61.7	61.5	61.2	57.7
80.	59.6	59.6	59.7	59.7	59.0	59.5	61.2	61.7	63.0	62.3	62.5	62.8	63.0	62.0	62.4	61.7	59.1
100.	62.7	61.8	62.2	61.7	61.2	61.0	63.6	62.8	62.8	63.4	63.8	63.7	63.3	63.1	63.4	61.2	58.5
125.	64.4	64.2	64.5	64.3	64.3	65.2	65.4	65.2	65.3	66.0	66.1	66.2	65.7	65.6	65.8	64.6	63.2
160.	60.3	59.4	59.7	59.5	59.6	59.8	61.0	61.5	61.6	61.6	62.5	62.5	62.2	61.7	61.7	59.5	54.1
200.	59.3	60.3	60.4	60.1	59.4	59.3	60.2	60.2	60.3	59.9	60.5	60.3	60.7	59.6	59.2	56.1	51.8
250.	59.0	59.7	59.4	59.1	57.9	58.7	58.9	59.1	58.6	58.8	58.5	58.7	58.5	56.2	56.4	52.7	50.6
315.	58.9	60.0	58.7	58.8	57.9	57.8	57.9	58.1	57.7	57.8	57.0	56.5	56.3	53.8	53.4	48.8	43.7
400.	57.7	58.9	58.0	57.4	56.6	56.0	56.0	55.5	54.6	54.9	53.2	52.9	52.9	49.8	48.9	45.6	42.1
500.	56.7	57.8	55.6	55.0	53.4	52.3	52.0	51.9	51.3	51.6	49.7	49.7	48.6	45.9	43.4	39.7	34.5
630.	54.2	53.5	50.9	51.3	50.0	48.8	49.6	49.0	48.5	48.8	46.7	46.7	45.2	41.9	39.5	35.7	32.2
800.	49.7	49.6	46.5	46.3	45.1	43.4	44.2	43.7	42.8	43.1	40.5	40.6	38.7	35.6	35.2	31.2	30.5
1000.	42.2	41.8	39.2	39.4	38.1	36.8	37.3	36.5	35.6	36.3	34.1	33.9	32.2	29.8	31.4	28.4	28.0
1250.	35.0	35.1	34.0	33.7	33.2	32.8	33.0	32.5	32.4	32.8	33.0	32.6	32.1	31.5	33.0	32.0	31.3
1600.	30.8	30.7	31.0	30.7	30.1	30.5	30.5	30.2	30.4	30.5	31.4	30.7	30.1	29.7	31.3	29.8	29.6
2000.	33.4	33.2	33.0	32.9	32.9	33.0	33.2	33.2	32.8	33.2	33.5	33.0	32.8	33.0	33.4	32.8	32.8
2500.	31.6	31.9	31.9	31.5	31.3	31.6	31.7	31.8	31.7	31.9	32.4	31.7	31.4	31.5	31.8	31.3	31.1
3150.	37.0	36.2	38.0	36.5	36.8	36.8	36.5	36.4	36.7	37.1	36.0	37.7	35.9	36.8	36.7	37.3	36.9
4000.	37.3	37.2	37.2	37.1	37.2	37.2	37.1	37.2	37.1	37.2	37.1	37.2	37.2	37.2	37.4	37.3	37.1
5000.	38.4	38.4	38.4	38.3	38.3	38.5	38.4	38.3	38.3	38.4	38.6	38.5	38.4	38.5	38.6	38.4	38.4
6300.	34.2	33.9	34.4	33.8	34.0	34.1	34.0	34.0	34.0	34.2	33.9	34.4	33.9	34.0	34.2	34.2	34.0
8000.	34.4	34.6	34.5	34.7	34.5	34.6	34.5	34.6	34.7	34.5	34.5	34.4	34.5	34.2	34.4	34.4	34.4
10000.	35.9	36.6	36.1	36.1	36.1	36.7	36.0	36.0	36.0	36.1	36.1	36.1	36.7	35.8	36.1	36.9	36.6
PNL	72.4	72.8	72.2	71.8	71.2	71.2	71.6	71.5	71.5	71.9	71.7	71.7	71.2	70.5	70.5	68.8	66.8
PNLT	73.2	73.7	73.3	72.7	72.0	72.1	72.5	72.4	72.3	72.7	72.7	72.8	72.2	71.5	71.4	69.8	67.9
OASPL	70.7	70.7	70.6	70.3	70.0	70.3	71.3	71.3	71.5	71.7	71.8	71.9	71.6	71.2	71.2	69.8	67.4

Climb-to-Cruise Run 800

1/3-Octave Sound Pressure Levels

θ_1	13.4	23.0	32.8	42.8	53.0	63.3	73.8	84.4	89.6	94.9	105.5	115.8	126.0	136.1	145.9	155.6	165.1
θ_2	14.0	24.7	35.9	47.5	58.8	70.3	80.9	91.5	96.6	101.6	111.3	120.7	129.6	138.7	147.6	156.4	165.5
Frequency																	
50.	53.9	59.1	62.9	64.2	65.4	66.5	68.0	68.9	67.7	67.8	69.1	71.9	75.3	77.6	76.9	74.0	69.4
63.	55.8	60.0	61.9	63.9	67.3	68.0	69.3	70.1	70.6	70.1	72.0	75.7	9.0	80.2	80.1	76.9	70.0
80.	55.5	59.9	62.9	66.0	67.9	69.2	71.2	72.0	72.5	72.0	74.3	76.9	80.9	82.0	81.8	77.5	69.9
100.	56.7	60.6	63.5	66.6	68.6	69.0	71.1	72.3	72.5	73.5	74.8	78.9	82.2	83.6	82.7	78.5	69.3
125.	62.5	64.3	66.9	68.0	70.8	72.1	73.1	74.2	74.4	75.1	77.0	80.0	83.6	85.6	84.1	79.4	68.7
160.	58.6	63.1	66.6	69.4	71.1	73.4	74.6	75.3	76.4	76.1	78.8	81.7	84.6	85.6	83.5	78.0	67.9
200.	58.6	63.8	66.8	69.1	70.9	72.3	74.2	75.6	76.9	77.6	79.4	81.1	83.6	83.7	81.9	76.7	65.8
250.	58.7	63.7	67.1	69.3	71.9	73.9	75.5	77.0	78.1	78.9	80.3	82.2	84.0	82.9	80.0	76.0	63.7
315.	58.9	65.3	68.6	71.0	73.2	74.9	76.3	78.5	79.5	80.5	81.9	82.5	83.5	81.9	78.9	72.2	61.5
400.	58.1	63.4	67.2	69.8	72.7	74.5	76.6	78.6	79.8	80.8	82.2	82.9	82.6	80.0	76.5	69.6	62.1
500.	57.1	62.6	66.7	69.4	72.1	73.8	75.5	77.7	79.6	80.3	82.5	81.9	81.1	79.1	74.7	67.6	56.1
630.	56.4	62.4	66.7	70.3	72.6	75.0	76.5	77.9	79.6	80.3	81.8	81.6	80.7	77.7	73.1	63.7	51.8
800.	52.5	60.7	65.1	68.5	71.5	72.7	74.3	75.7	77.3	77.9	8.9	79.8	78.4	74.6	70.2	60.4	47.8
1000.	48.7	57.6	63.6	67.0	71.1	71.5	73.0	75.2	76.1	76.6	76.9	77.0	76.2	72.4	66.8	56.9	44.3
1250.	47.9	56.8	62.0	66.9	66.9	68.6	70.7	72.2	73.0	73.9	75.3	74.7	72.9	69.3	64.0	54.5	48.0
1600.	49.2	50.9	57.0	61.1	64.1	66.8	68.1	69.4	70.6	71.1	71.4	72.0	69.2	65.7	59.9	52.7	49.8
2000.	48.1	48.9	51.8	54.9	58.3	61.3	63.2	65.0	65.5	66.0	66.6	65.9	62.9	58.7	53.4	49.6	48.4
2500.	46.1	46.3	46.7	48.5	52.3	54.8	57.0	58.7	59.4	59.5	60.0	58.4	56.8	52.7	48.7	47.7	46.6
3150.	59.4	59.4	59.0	58.7	58.7	58.9	59.1	59.0	59.3	59.5	59.6	59.0	59.5	59.4	59.3	59.2	59.5
4000.	49.9	49.9	49.8	49.9	50.0	50.0	50.1	50.8	50.5	50.6	51.6	50.7	51.2	51.3	50.7	50.6	50.3
5000.	50.0	50.0	50.1	50.1	50.1	50.1	50.1	50.7	50.3	50.5	51.6	50.5	51.0	51.1	50.7	50.5	50.6
6300.	53.2	53.1	53.1	53.1	53.1	53.1	53.0	53.1	53.1	53.1	53.8	53.0	53.5	53.6	53.5	53.4	53.6
8000.	55.0	55.1	55.0	55.0	55.1	55.1	55.1	55.1	55.1	55.1	55.7	55.0	55.3	55.4	55.3	55.2	55.4
0000.	56.5	56.4	56.5	56.4	56.4	56.4	56.4	56.5	56.4	56.5	57.1	56.6	56.7	56.7	56.6	56.6	56.7
PNL	81.3	83.4	85.1	86.9	89.0	90.8	92.3	93.8	94.8	95.5	96.9	97.6	97.8	96.5	94.1	89.2	83.3
PNLT	85.2	87.1	88.7	90.0	91.6	92.9	94.1	95.2	95.8	96.5	97.6	99.1	99.7	99.0	97.3	92.5	86.9
OASPL	70.1	74.3	77.7	80.3	82.7	84.3	85.9	87.5	88.7	89.4	90.9	92.0	93.4	93.4	91.5	86.8	78.0

Climb-to-Cruise Run 801

1/3-Octave Sound Pressure Levels

θ_1	15.7	25.9	36.0	46.0	55.8	65.6	75.3	84.9	89.7	94.5	104.2	114.1	124.1	134.2	144.5	155.0	165.6
θ_2	16.3	27.4	38.5	49.6	60.4	70.8	80.9	90.6	95.3	99.8	109.0	118.2	127.3	136.5	146.0	155.8	165.9
Frequency																	
50.	60.3	60.7	62.6	64.6	65.9	67.0	68.1	69.3	68.7	68.8	68.0	71.0	74.2	77.1	76.8	74.6	69.6
63.	57.5	61.1	62.7	64.7	66.1	68.0	68.9	70.0	70.0	70.6	71.0	73.6	77.5	80.1	80.1	77.6	71.0
80.	58.2	62.8	65.7	67.4	69.9	71.9	72.5	72.5	72.8	73.2	73.4	76.1	79.9	83.2	83.1	79.6	70.4
100.	58.0	61.4	65.3	67.2	68.8	70.1	70.8	71.4	72.4	72.4	74.0	77.6	82.4	84.2	83.7	79.0	69.6
125.	63.7	64.9	66.8	68.6	70.1	71.5	71.9	72.9	73.6	74.7	76.0	79.8	84.2	86.0	85.0	80.7	69.4
160.	59.3	63.6	66.1	68.3	69.6	71.3	72.6	74.3	75.2	76.0	77.8	80.9	84.8	86.4	85.4	80.7	68.9
200.	58.3	62.9	65.9	67.9	69.4	71.6	73.3	75.4	75.9	76.8	78.7	81.2	84.2	85.6	83.7	80.5	68.1
250.	57.9	63.3	66.4	68.5	71.5	72.5	74.9	77.0	77.8	78.5	80.1	82.4	84.4	84.9	81.9	79.2	65.7
315.	59.8	65.1	67.9	69.7	72.1	74.1	76.3	77.5	78.8	79.7	81.0	83.7	84.4	84.1	80.2	75.6	62.9
400.	57.8	63.0	66.5	68.7	71.8	73.6	75.8	77.8	78.6	80.1	81.9	83.1	83.7	82.2	78.0	72.5	59.3
500.	56.1	62.3	66.5	68.7	70.9	73.4	75.0	77.3	78.2	79.1	81.2	82.4	82.2	80.9	76.8	69.5	54.6
630.	55.7	61.6	66.0	69.0	71.5	73.6	75.4	77.7	78.4	79.5	82.1	82.6	81.8	79.8	74.8	66.5	52.3
800.	51.8	59.7	64.5	67.5	69.7	72.1	73.7	75.1	76.1	76.9	78.7	80.2	79.5	76.7	71.1	62.9	47.5
1000.	46.5	56.2	61.8	66.0	68.1	69.2	70.3	73.0	74.3	75.4	76.3	76.9	76.3	74.6	68.0	58.9	43.2
1250.	47.2	52.9	59.0	62.5	64.7	66.2	69.2	71.9	72.3	72.9	74.8	75.2	72.8	71.1	64.6	55.4	46.8
1600.	40.4	45.9	53.7	58.8	61.6	64.4	66.4	68.2	68.9	69.8	70.4	71.9	69.9	67.1	59.8	50.5	40.6
2000.	45.7	45.5	48.9	52.0	55.2	58.3	60.1	63.0	63.3	64.1	65.2	65.3	63.1	59.9	52.4	48.1	46.1
2500.	43.1	44.1	45.2	45.6	48.8	51.6	54.2	55.9	56.7	57.7	57.6	58.6	56.0	53.0	47.4	46.0	44.4
3150.	49.5	49.4	49.9	50.0	50.4	50.9	51.0	51.6	51.6	52.3	52.5	52.6	52.2	52.0	50.6	50.4	49.5
4000.	44.5	44.6	44.4	44.6	44.5	44.8	45.5	45.5	45.9	46.3	47.4	46.9	47.7	48.2	46.2	45.8	44.4
5000.	44.5	44.5	44.6	44.6	45.0	44.7	45.4	45.1	45.7	46.0	46.7	46.3	47.2	47.7	45.8	45.6	44.2
6300.	43.9	44.0	44.0	44.3	44.4	44.3	44.8	44.5	45.0	45.5	46.1	45.9	46.8	47.1	45.3	45.3	43.9
8000.	45.6	45.7	45.6	45.8	45.8	45.8	46.0	46.0	46.3	46.5	47.1	47.0	47.6	48.0	46.7	46.4	45.7
10000.	47.4	47.5	47.5	47.5	47.5	47.6	47.7	47.6	47.8	47.9	48.3	48.2	48.7	48.9	48.2	48.0	47.4
PNL	75.8	79.3	82.4	84.7	87.0	88.8	90.6	92.4	93.2	94.2	95.9	97.3	98.0	97.7	94.8	90.7	79.6
PNLT	77.7	80.9	84.1	86.3	88.2	89.0	90.6	92.4	93.2	94.2	95.9	97.3	98.0	97.7	96.1	92.1	81.3
OASPL	70.1	74.1	77.2	79.5	81.7	83.5	85.1	86.9	87.7	88.6	90.3	92.2	93.9	94.6	92.8	88.8	78.6

Climb-to-Cruise Run 810

1/3-Octave Sound Pressure Levels

θ_1	15.6	26.2	36.5	46.6	56.5	66.0	75.6	84.8	89.3	94.1	103.4	112.8	122.5	132.4	142.5	152.8	163.1
θ_2	17.8	31.7	45.1	57.7	68.8	78.8	88.0	96.5	100.4	104.4	112.5	120.4	128.2	136.5	145.1	154.3	163.7
Frequency																	
50.	62.6	64.3	63.6	63.2	64.8	64.4	64.7	65.8	65.1	64.5	64.0	64.9	64.9	66.2	66.8	66.0	60.8
63.	63.9	64.5	65.6	65.1	65.9	65.0	64.9	65.6	66.7	65.8	65.4	66.0	67.1	68.1	69.0	67.4	64.1
80.	64.2	64.4	64.7	65.1	65.6	66.3	67.1	66.5	66.4	66.7	66.8	67.2	68.5	69.6	70.8	69.6	65.5
100.	63.9	64.8	64.9	65.3	66.2	66.3	66.2	66.6	67.1	67.4	67.3	68.5	69.3	70.6	71.5	70.0	64.6
125.	65.4	66.7	66.7	66.8	67.7	68.7	67.9	68.5	68.5	68.8	69.2	70.4	71.0	72.7	73.3	70.7	65.5
160.	62.7	65.3	66.4	67.8	68.8	69.3	69.0	70.2	70.8	70.8	71.2	71.3	71.7	72.9	73.1	70.5	64.1
200.	61.5	64.4	65.7	67.1	67.9	69.8	70.3	70.1	70.3	70.3	71.6	72.1	72.4	72.7	71.7	68.2	60.7
250.	61.1	64.0	67.4	69.8	70.7	71.3	71.1	71.3	71.5	71.9	72.4	72.6	72.5	72.0	70.1	67.3	58.8
315.	60.5	66.0	69.5	71.0	70.8	71.9	72.6	72.8	72.8	73.1	74.3	74.7	73.8	72.5	69.4	65.5	56.5
400.	61.1	66.3	69.5	70.8	72.0	73.1	73.3	74.0	74.0	74.2	75.4	76.9	75.9	72.2	67.8	63.3	54.5
500.	59.5	66.9	69.9	71.6	72.4	73.5	73.6	74.4	75.2	75.9	76.7	75.7	73.2	70.2	66.2	61.4	52.8
630.	57.1	66.0	70.1	73.0	74.1	74.8	75.0	74.2	73.2	73.1	73.6	73.7	72.7	69.2	65.6	60.2	50.6
800.	54.4	64.8	70.0	73.1	74.3	74.1	73.9	74.1	73.8	73.5	72.2	72.3	70.7	67.7	63.3	58.5	49.0
1000.	48.5	62.1	68.6	71.1	72.1	73.0	71.7	70.4	70.4	70.3	69.6	69.6	68.1	65.7	60.5	54.8	45.2
1250.	44.6	56.7	64.7	69.1	69.6	69.4	69.7	70.3	70.0	69.8	69.1	67.4	64.6	62.2	57.7	51.5	41.4
1600.	40.4	51.3	60.0	64.2	65.7	67.5	67.5	66.6	65.8	65.4	64.5	64.3	61.7	58.3	53.2	47.2	41.0
2000.	38.9	42.2	50.9	57.8	60.3	60.4	60.9	61.3	60.5	59.9	59.4	57.7	55.7	52.6	47.2	41.7	39.7
2500.	36.7	38.4	44.4	47.6	51.1	52.4	53.0	53.4	53.5	53.7	53.6	52.3	48.3	44.7	39.8	38.3	38.2
3150.	49.6	48.9	49.2	49.3	48.8	48.8	49.6	50.6	50.5	50.3	50.0	49.7	49.3	49.0	50.0	49.2	49.3
4000.	40.3	40.6	40.7	40.9	41.3	41.5	41.1	41.8	41.6	41.6	41.8	40.9	41.1	40.7	40.9	40.6	41.5
5000.	40.5	40.7	40.7	40.9	41.0	41.2	40.9	41.4	41.1	41.1	41.3	40.7	41.0	40.8	40.9	40.6	41.9
6300.	43.2	43.2	43.2	43.4	43.3	43.3	43.2	43.6	43.4	43.4	43.5	43.2	43.4	43.3	43.8	43.4	44.4
8000.	45.0	45.2	45.2	45.2	45.3	45.3	45.3	45.3	45.3	45.3	45.3	45.1	45.3	45.3	45.5	45.2	46.1
10000.	46.6	46.7	46.7	46.7	46.7	46.6	46.6	46.8	46.7	46.7	46.8	46.7	46.8	46.8	46.7	46.8	47.4
PNL	76.7	81.6	85.0	87.4	88.4	89.1	89.1	89.1	89.2	89.5	89.9	89.9	89.0	86.8	84.2	80.8	75.5
PNLT	80.4	84.7	87.2	89.0	88.6	89.2	89.3	89.4	89.5	89.7	89.9	90.3	90.5	88.9	87.4	84.1	78.6
OASPL	73.4	76.7	79.5	81.5	82.4	83.1	83.1	83.2	83.2	83.3	83.8	84.0	83.3	82.3	81.2	78.6	73.0

Climb-to-Cruise Run 811

1/3-Octave Sound Pressure Levels

θ_1	15.8	26.0	36.1	46.1	56.0	65.7	74.9	84.9	89.5	94.1	104.0	113.6	123.4	133.3	143.6	153.9	164.3
θ_2	18.0	31.5	44.9	57.6	68.9	79.1	88.1	97.1	101.1	105.0	113.4	121.4	129.3	137.5	146.4	155.4	164.9
Frequency																	
50.	61.1	61.8	62.6	63.2	63.9	63.6	63.7	63.2	62.9	62.9	62.7	63.6	65.0	66.9	68.6	67.3	63.2
63.	61.7	61.9	62.8	63.2	64.0	64.8	64.6	65.2	64.7	63.4	64.8	65.6	68.1	70.1	71.0	69.4	66.8
80.	58.9	61.3	63.2	63.5	64.4	64.8	65.1	65.9	66.2	66.6	66.7	68.7	69.9	71.3	71.9	71.2	67.6
100.	59.0	61.0	62.9	63.5	65.1	66.0	67.0	67.2	67.0	67.1	68.2	69.2	71.1	72.7	74.1	72.8	67.6
125.	63.3	64.6	65.2	66.7	67.6	68.4	69.0	69.5	70.0	70.5	70.9	71.7	72.7	74.2	75.5	72.8	67.7
160.	60.7	63.5	65.3	67.1	68.3	69.4	70.2	71.1	71.1	71.2	71.7	72.1	73.7	74.6	75.2	71.7	66.3
200.	60.8	64.6	66.4	67.9	69.5	70.6	71.3	71.3	71.6	72.0	72.5	73.7	74.5	73.9	74.1	68.9	63.3
250.	61.5	66.0	68.3	69.7	71.4	71.9	72.1	72.9	73.3	73.3	74.2	74.9	74.9	74.1	73.1	68.0	61.8
315.	62.5	67.2	70.4	71.9	72.9	73.1	74.3	74.5	74.7	74.8	75.4	76.3	76.1	74.7	71.5	66.3	60.3
400.	62.9	68.9	71.4	71.7	73.1	74.5	74.7	75.1	75.3	75.8	76.9	78.3	77.0	73.8	70.1	64.2	60.4
500.	61.8	68.7	70.3	71.8	73.4	74.3	74.4	75.2	76.1	77.1	78.2	78.8	75.8	72.1	68.8	61.6	58.4
630.	58.8	66.8	70.9	73.1	74.8	75.5	75.7	75.3	75.3	75.4	74.8	75.9	74.9	72.1	67.0	60.3	53.5
800.	56.7	66.1	70.5	72.8	74.9	74.9	74.4	75.0	74.8	74.5	73.3	74.3	72.9	69.4	64.9	58.1	51.6
1000.	50.7	62.8	69.3	71.0	72.6	73.6	72.4	71.6	71.7	71.9	71.0	71.7	70.8	67.9	62.2	53.3	47.5
1250.	45.3	58.5	65.4	69.6	70.6	70.3	70.7	70.5	70.3	70.4	70.1	69.7	67.5	64.5	58.7	50.9	42.5
1600.	35.5	53.2	61.6	64.5	66.6	68.3	68.0	66.7	66.7	67.0	65.7	66.2	64.2	60.3	54.8	46.3	36.6
2000.	33.5	41.8	52.0	58.1	61.1	61.4	61.8	61.4	61.2	61.6	61.1	60.2	58.5	54.1	47.9	40.0	34.9
2500.	32.2	34.0	45.0	48.4	52.5	53.5	54.2	53.9	54.6	55.3	55.0	53.6	51.2	45.9	38.9	35.5	33.5
3150.	39.1	39.4	39.3	42.1	43.0	45.2	46.4	47.4	47.1	46.9	46.3	44.9	43.9	41.2	40.3	39.8	39.4
4000.	32.8	33.8	34.1	37.5	35.0	37.6	37.2	38.7	37.6	39.0	40.0	38.6	39.6	36.5	35.2	34.9	33.8
5000.	32.9	33.7	33.7	36.6	34.2	36.2	35.9	37.5	36.3	37.5	38.5	37.2	38.6	35.9	34.9	34.7	33.8
6300.	33.9	34.4	34.6	37.0	35.1	36.6	36.4	37.6	36.6	37.7	38.5	37.4	38.6	36.3	35.7	35.5	34.6
8000.	35.6	35.9	36.0	37.6	36.4	37.4	37.2	38.2	37.4	38.3	38.9	38.0	38.9	37.2	36.9	36.5	36.2
10000.	37.9	37.7	38.1	39.1	38.7	39.2	38.8	39.2	38.6	39.1	39.7	39.1	39.7	38.8	38.4	38.2	38.7
PNL	75.8	81.7	85.0	87.0	88.6	89.4	89.6	89.5	89.9	90.4	90.8	91.4	90.4	88.0	85.6	80.8	75.6
PNLT	78.0	83.5	85.3	87.0	88.6	89.5	89.6	89.5	89.9	90.4	90.9	91.4	90.4	88.0	86.7	82.4	77.5
OASPL	72.3	77.0	79.9	81.6	83.1	83.8	83.9	84.2	84.4	84.7	85.0	85.9	85.2	84.1	83.4	80.2	75.5

Climb-to-Cruise Run 820

1/3-Octave Sound Pressure Levels

θ_1	15.9	26.2	36.4	46.3	56.0	65.5	75.1	84.7	89.3	94.0	103.5	113.2	122.9	133.0	143.1	153.5	164.0
θ_2	21.5	38.7	53.4	65.5	75.5	84.5	92.7	100.6	104.2	107.7	115.1	122.4	130.4	138.0	146.6	155.1	164.8
Frequency																	
50.	67.7	69.7	72.7	73.6	73.7	71.8	69.2	69.1	67.8	67.0	67.6	68.4	70.1	71.9	72.5	71.2	67.8
63.	66.0	70.8	73.6	74.8	74.6	73.3	72.0	70.8	70.4	70.0	68.8	69.7	72.5	74.0	75.3	74.2	70.1
80.	65.3	70.6	75.1	75.7	75.5	74.9	73.8	72.1	71.6	71.8	72.0	72.1	74.2	76.7	77.9	76.6	71.7
100.	65.4	71.9	74.2	75.5	75.0	75.1	73.4	72.3	71.6	71.2	71.9	72.9	75.2	77.5	79.0	77.6	72.6
125.	67.3	72.5	76.3	77.3	76.3	75.4	74.5	73.5	73.7	74.2	74.8	75.7	78.5	80.3	81.5	80.2	73.7
160.	66.9	74.0	76.8	77.3	78.0	77.3	76.3	76.3	76.3	76.2	76.8	77.6	79.9	81.4	82.2	80.0	74.6
200.	66.7	73.9	76.5	77.6	77.6	77.2	76.9	77.0	77.0	77.1	77.8	78.5	80.4	81.0	81.1	79.5	73.7
250.	67.5	74.2	77.7	79.0	79.1	79.0	78.9	78.8	78.9	78.8	79.5	80.0	81.2	80.5	80.2	78.1	73.3
315.	69.8	76.9	79.5	79.8	80.3	80.6	80.8	80.4	80.6	80.5	81.8	81.9	82.3	81.0	79.6	76.4	74.0
400.	69.5	77.9	80.3	81.2	81.4	81.3	81.3	81.4	81.5	81.8	82.3	82.0	81.9	80.2	78.0	74.1	72.1
500.	79.3	87.2	87.1	86.0	84.9	83.7	82.8	82.1	82.1	81.8	83.0	82.9	82.5	79.5	76.5	71.4	69.4
630.	82.7	89.2	91.1	91.4	91.0	90.6	89.5	86.7	85.2	83.8	83.2	81.9	82.0	79.1	75.7	71.1	65.8
800.	73.7	85.1	87.7	88.4	88.5	88.9	89.2	88.5	87.5	86.5	84.8	82.8	81.9	78.1	74.4	68.8	62.6
1000.	64.4	80.5	84.2	85.6	85.9	85.6	84.7	83.8	83.7	83.3	82.8	81.2	81.0	77.5	72.4	65.8	58.2
1250.	63.8	80.8	85.1	86.4	85.7	84.6	83.8	82.3	81.4	80.8	81.8	80.7	79.1	75.1	69.5	62.7	52.4
1600.	56.9	77.4	82.9	84.8	84.7	83.9	82.6	80.6	79.4	78.0	78.0	78.0	77.2	71.7	66.0	59.4	43.4
2000.	54.5	74.9	80.3	82.1	82.0	81.1	79.7	77.6	76.2	74.5	73.7	72.4	72.0	66.3	61.1	55.2	42.3
2500.	52.8	72.1	77.9	79.7	79.7	78.9	77.2	74.9	73.7	71.6	70.0	68.7	68.3	61.5	57.8	56.2	41.0
3150.	51.0	70.4	76.0	77.7	77.5	76.7	75.2	72.7	71.4	69.4	67.4	67.0	65.8	59.4	57.8	59.3	42.3
4000.	51.3	68.8	74.0	75.7	75.3	74.2	72.6	70.0	68.9	67.1	65.4	64.8	64.0	58.2	55.7	54.3	41.3
5000.	51.1	67.0	71.7	73.3	72.8	71.9	70.4	67.9	66.7	64.9	63.0	62.9	62.5	57.2	54.2	52.6	42.2
6300.	50.3	66.0	70.6	72.1	71.7	70.8	69.3	67.0	65.7	63.6	61.4	62.2	61.3	55.0	53.2	53.5	38.4
8000.	49.8	65.3	69.7	71.2	70.9	70.0	68.4	65.9	64.5	62.6	60.3	60.9	60.9	54.5	52.6	51.6	39.2
10000.	48.4	63.7	68.4	69.9	69.3	68.2	66.6	64.1	62.7	60.8	58.3	59.3	58.9	52.9	52.6	50.7	41.1
PNL	92.0	101.9	105.0	105.9	105.6	105.0	104.0	102.6	101.8	100.8	100.0	99.4	99.2	96.5	94.5	91.8	85.8
PNLT	94.4	103.5	106.4	107.3	107.1	106.5	105.1	103.7	102.8	101.7	100.0	99.4	99.2	96.5	94.5	93.0	85.9
OASPL	85.6	93.6	95.9	96.6	96.4	96.0	95.3	94.0	93.2	92.5	92.4	91.8	92.1	90.8	90.1	87.9	83.1

Climb-to-Cruise Run 821

1/3-Octave Sound Pressure Levels

θ_1	15.9	26.5	36.7	46.7	56.4	66.1	75.5	84.7	89.2	93.8	103.1	112.7	122.4	132.5	142.7	153.1	163.8
θ_2	21.8	39.4	53.9	65.8	75.6	84.7	92.8	100.2	103.9	107.4	114.4	122.0	129.8	137.5	146.0	155.0	164.5
Frequency																	
50.	60.3	64.6	65.4	65.0	64.9	65.4	65.4	65.3	65.5	65.1	64.4	66.0	68.4	70.4	70.8	70.4	67.9
63.	61.5	64.5	65.3	66.2	66.1	67.3	67.9	67.8	67.6	67.7	67.7	67.2	70.2	72.7	73.6	73.6	70.2
80.	61.9	65.1	66.5	67.6	69.2	69.5	68.8	69.6	70.0	70.6	70.3	70.9	74.0	76.3	75.2	74.6	71.4
100.	61.8	66.5	68.6	69.7	69.6	70.6	71.1	70.9	71.0	71.1	71.5	72.0	74.2	77.0	77.9	76.8	72.1
125.	65.8	69.3	71.2	72.0	72.5	72.5	72.7	73.3	73.0	73.3	74.2	75.2	77.6	80.0	79.8	78.3	73.6
160.	66.6	70.1	72.3	73.4	73.5	74.7	75.8	75.9	75.4	75.8	76.7	76.8	79.4	81.6	81.1	79.4	73.9
200.	66.7	71.4	73.4	74.5	75.2	75.8	76.8	76.7	76.6	76.4	77.0	77.8	79.3	80.7	80.1	78.5	73.6
250.	67.6	73.5	75.2	76.2	77.1	77.8	78.4	78.3	78.3	78.3	78.8	79.3	79.9	81.0	80.0	77.3	72.1
315.	68.8	76.1	78.0	79.2	79.8	80.1	80.4	80.5	80.5	80.4	80.3	80.3	81.6	80.9	79.0	75.3	72.0
400.	68.5	77.0	79.7	80.5	80.2	80.6	81.3	81.4	81.4	81.2	81.8	81.4	81.9	80.7	77.4	73.4	71.5
500.	72.0	85.8	84.7	83.2	82.4	81.7	81.6	81.8	81.6	81.6	82.8	82.7	81.4	78.8	75.7	70.7	67.2
630.	80.8	89.8	92.1	92.7	92.5	91.3	88.7	85.1	84.1	83.0	81.8	81.1	80.6	79.0	74.9	69.9	63.4
800.	74.4	87.3	89.7	90.7	91.2	91.5	90.8	88.4	87.0	85.2	82.9	81.2	79.9	77.9	73.0	67.9	60.9
1000.	64.8	79.2	84.2	85.9	86.1	85.4	84.6	84.5	84.0	83.1	81.6	79.8	79.3	76.7	70.7	64.6	55.5
1250.	60.7	76.0	81.0	82.4	82.4	82.4	81.6	80.3	79.9	79.5	80.6	79.2	77.1	74.1	67.8	60.9	50.3
1600.	50.3	71.9	77.3	79.4	80.2	79.9	78.3	76.7	76.3	75.9	77.1	77.2	75.0	70.7	63.9	55.8	43.6
2000.	44.4	64.2	68.5	72.6	73.7	73.5	73.3	71.6	70.9	70.1	70.6	70.0	68.4	62.8	56.3	48.4	43.1
2500.	41.7	59.3	61.0	66.7	68.4	67.8	65.5	63.9	63.5	62.8	62.5	61.5	60.1	54.9	47.8	43.0	41.2
3150.	49.5	56.0	56.3	61.4	63.1	62.5	58.2	56.3	55.7	55.6	55.2	53.9	51.9	50.3	50.1	50.2	49.0
4000.	42.4	48.0	54.0	57.9	60.5	60.8	53.7	48.2	47.6	48.7	45.9	46.6	44.8	44.8	44.3	43.7	43.1
5000.	43.0	50.8	52.8	59.0	60.7	59.2	52.8	46.6	46.4	47.7	45.4	46.0	44.9	45.2	44.9	44.3	43.8
6300.	43.7	53.9	52.4	56.3	58.1	57.3	52.8	46.3	46.3	47.4	45.4	45.9	44.8	45.1	44.7	44.3	43.7
8000.	45.3	49.6	52.0	57.0	57.7	55.3	53.2	47.0	47.1	47.9	46.3	46.7	46.1	46.2	46.1	45.6	45.3
10000.	46.9	51.5	50.6	54.9	56.1	55.4	52.5	48.0	48.0	48.6	47.5	47.7	47.3	47.4	47.7	47.2	46.8
PNL	89.3	99.2	101.6	102.8	103.0	102.5	101.5	99.7	98.9	98.0	97.2	96.9	96.5	95.4	92.7	89.7	85.2
PNLT	91.9	100.5	103.2	104.8	104.9	104.4	103.2	100.9	99.9	98.0	97.2	97.1	96.5	95.4	94.1	91.9	87.5
OASPL	83.2	93.4	95.5	96.3	96.4	96.0	94.8	93.2	92.5	91.7	91.3	90.8	90.9	90.6	89.0	86.8	82.4

Climb-to-Cruise Run 830

1/3-Octave Sound Pressure Levels

θ_1	15.0	25.0	34.9	44.8	54.7	64.3	74.1	84.2	88.9	93.9	103.9	114.1	124.3	134.5	144.6	154.8	164.8
θ_2	34.3	51.6	63.4	72.7	81.1	88.8	96.0	103.3	106.8	110.2	117.7	124.6	132.2	140.0	148.1	156.7	165.5
Frequency																	
50.	81.9	84.8	85.4	85.0	83.1	77.8	73.2	70.9	70.6	71.0	71.7	72.3	72.8	75.8	75.7	75.8	72.6
63.	80.8	85.2	86.4	86.0	83.3	79.4	74.3	73.0	72.5	72.5	73.6	74.6	76.5	78.3	79.3	77.9	75.4
80.	80.4	84.7	86.1	85.5	83.3	79.2	76.0	74.5	74.8	74.6	75.0	76.5	78.1	80.3	82.1	79.4	76.1
100.	81.5	85.4	86.3	85.3	81.8	79.1	76.5	76.2	75.8	76.3	77.0	77.2	80.6	83.0	83.6	80.4	77.1
125.	81.1	85.9	86.4	85.9	82.8	80.4	78.8	78.0	78.2	78.1	78.6	80.1	83.0	85.2	86.0	82.5	78.8
160.	83.4	85.8	86.5	86.3	84.9	83.2	81.5	80.4	80.2	80.3	81.0	81.4	84.4	86.6	87.5	82.6	78.6
200.	83.6	86.6	86.7	86.4	84.5	83.0	81.6	81.3	81.2	81.6	82.5	83.2	85.1	86.5	86.4	81.7	76.9
250.	87.6	88.2	88.2	87.3	86.2	84.9	84.0	82.6	82.9	83.1	84.4	84.1	85.6	85.6	85.2	80.8	75.1
315.	88.0	92.9	93.2	91.7	90.3	88.5	87.2	85.6	85.0	85.2	86.3	86.3	85.9	85.2	83.8	80.2	74.7
400.	96.5	101.0	101.6	101.1	100.0	98.1	94.7	90.6	89.8	88.8	89.1	87.7	86.5	84.7	83.3	78.3	74.8
500.	95.1	99.1	100.1	100.5	100.6	100.3	99.1	96.5	95.1	93.0	92.2	91.2	88.6	86.7	84.1	77.6	73.0
630.	87.4	93.1	94.2	94.1	93.1	92.5	92.8	93.6	94.1	94.3	94.4	93.0	91.0	88.2	84.7	76.1	72.4
800.	90.6	96.8	97.9	97.4	95.5	92.9	90.5	88.4	88.5	88.9	91.6	91.9	90.4	87.3	83.4	74.0	68.8
1000.	86.6	94.2	96.0	96.1	94.9	93.6	92.0	89.5	88.6	87.5	88.2	88.8	88.2	84.7	80.5	70.9	63.5
1250.	84.8	92.6	94.4	94.4	93.0	91.2	89.0	87.0	86.6	86.1	87.0	86.9	84.5	81.6	77.0	67.4	57.9
1600.	82.8	90.8	92.6	92.7	91.4	89.7	87.3	84.5	83.9	83.0	84.0	84.5	80.7	78.4	72.2	61.5	48.2
2000.	80.1	88.0	89.6	89.6	87.9	86.0	83.2	80.1	79.4	78.2	79.3	79.7	76.3	73.0	64.9	55.5	51.7
2500.	77.6	85.5	87.2	87.2	85.3	82.9	79.5	75.7	74.7	73.2	75.0	75.9	72.4	68.9	56.4	51.1	49.4
3150.	76.1	83.7	85.4	85.5	83.5	80.6	76.5	71.9	70.5	68.1	71.1	72.0	67.5	67.4	52.7	52.1	51.7
4000.	75.0	82.2	83.7	83.6	81.3	78.5	74.2	69.9	68.8	66.9	68.1	68.7	66.0	65.3	49.7	49.4	48.2
5000.	73.1	80.3	81.7	81.5	79.4	76.8	72.4	68.3	66.8	66.3	66.8	67.6	65.7	65.3	49.3	49.3	48.3
6300.	72.0	79.6	81.2	80.8	78.7	75.5	70.9	66.4	65.1	64.2	66.2	67.1	64.3	64.1	47.7	47.6	46.4
8000.	71.4	79.1	80.6	80.3	78.0	75.1	70.6	66.3	65.2	63.7	65.3	66.7	63.9	63.3	48.5	48.4	47.8
10000.	70.3	77.7	79.2	79.0	76.7	73.4	68.5	63.6	62.6	61.7	63.2	64.8	62.7	61.6	50.3	50.1	49.5
PNL	109.2	114.7	115.7	115.4	114.2	112.7	110.7	108.1	107.2	106.5	107.1	106.8	105.2	103.5	99.7	94.2	89.8
PNLT	110.4	115.7	116.7	116.6	116.0	114.8	112.4	109.6	108.3	107.6	107.8	106.8	105.2	103.5	99.7	94.3	90.7
OASPL	101.1	106.0	107.0	106.8	105.8	104.5	102.7	100.6	100.0	99.3	99.7	99.3	98.1	96.9	95.6	90.9	86.8

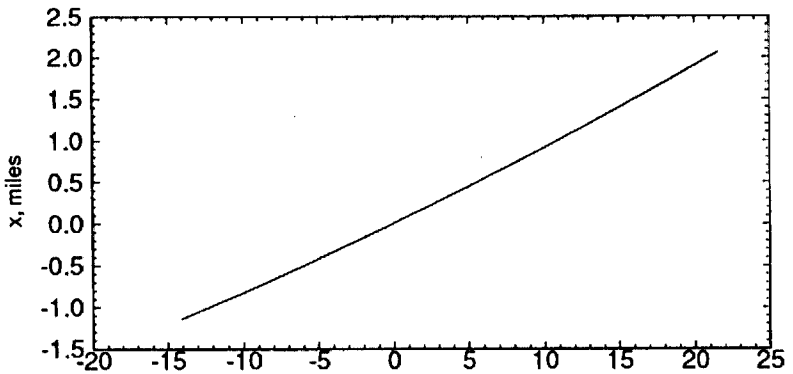
Climb-to-Cruise Run 831

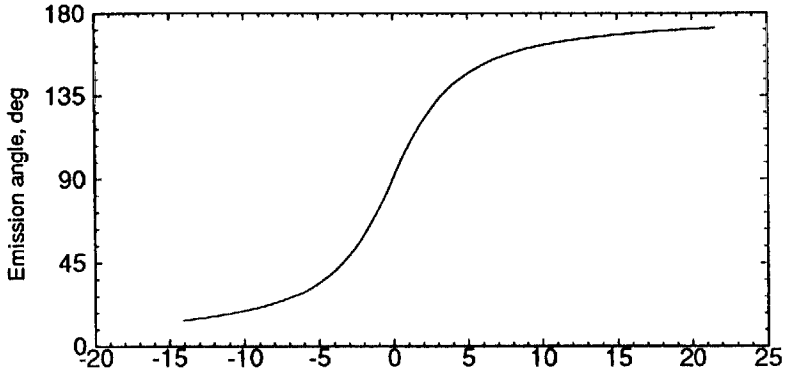
1/3-Octave Sound Pressure Levels

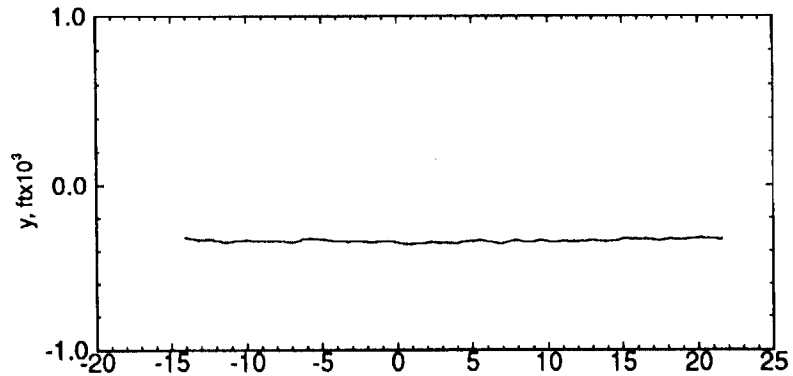
θ_1	14.3	24.1	33.9	43.7	53.6	63.5	73.7	83.9	88.9	94.1	104.3	114.8	125.1	135.3	145.5	155.4	165.2
θ_2	33.6	51.1	62.9	72.5	81.0	88.9	96.3	103.8	107.0	110.7	118.2	125.6	133.0	141.0	149.0	157.3	165.9
Frequency																	
50.	80.1	79.6	78.9	75.4	73.9	71.4	69.7	69.8	69.7	70.1	70.5	71.3	74.7	77.0	76.6	75.8	73.2
63.	78.3	79.8	78.1	75.6	74.1	73.4	72.5	73.2	73.2	73.1	72.4	74.1	76.1	80.1	81.0	78.8	75.5
80.	80.4	80.3	78.5	76.4	75.3	74.3	74.0	74.8	75.1	74.8	75.0	77.8	80.2	82.5	83.7	82.0	76.5
100.	82.3	80.5	78.5	76.7	76.8	76.4	76.4	76.2	76.5	76.8	77.2	78.8	81.3	84.5	85.2	83.6	77.2
125.	82.4	80.8	79.1	78.8	78.7	78.4	79.1	79.0	79.1	78.8	79.0	81.1	83.8	87.8	87.7	86.1	79.7
160.	81.9	82.0	81.5	81.6	81.5	81.2	81.1	80.5	80.4	80.1	80.7	82.4	84.8	87.3	87.4	86.7	79.2
200.	83.1	84.9	84.7	84.1	83.7	82.9	82.3	81.7	81.8	81.9	82.3	83.4	84.3	86.3	86.7	85.8	79.6
250.	87.9	88.8	88.0	87.1	85.2	84.3	83.5	83.5	83.5	83.5	83.4	84.7	85.2	86.5	86.0	84.6	78.2
315.	90.2	96.3	96.9	95.4	92.6	89.9	87.8	86.3	86.2	86.4	85.9	86.4	86.0	85.7	84.6	84.3	79.4
400.	97.7	104.4	106.1	105.9	104.5	101.9	97.8	93.0	91.6	90.8	89.3	88.6	87.2	86.2	84.4	81.0	77.6
500.	94.3	100.2	102.3	102.8	102.6	101.7	100.5	98.1	96.6	95.1	92.8	92.3	89.6	87.9	85.3	80.7	75.9
630.	86.4	94.2	96.0	96.0	94.6	93.3	93.1	94.5	94.9	95.3	94.5	94.2	91.6	89.2	85.9	80.1	73.6
800.	90.0	97.7	99.5	99.1	97.0	94.3	91.7	89.7	89.6	90.4	92.0	92.8	91.2	88.3	84.7	77.9	71.7
1000.	84.7	93.0	95.6	96.1	95.3	93.8	92.6	91.1	90.2	88.9	87.9	89.6	88.8	86.4	82.0	74.5	65.8
1250.	82.0	91.8	94.4	94.5	93.2	91.3	90.0	88.5	88.1	87.7	87.3	86.9	85.0	82.2	78.7	70.7	60.2
1600.	77.2	87.9	90.7	91.3	90.6	89.1	87.5	85.4	84.9	83.9	83.5	84.6	81.2	78.1	73.7	65.2	65.4
2000.	70.6	82.5	85.6	86.4	85.6	84.2	82.6	81.2	80.4	79.6	78.6	78.2	75.1	71.1	66.1	58.7	64.2
2500.	64.6	77.3	80.6	81.4	80.4	78.7	76.6	74.9	74.2	73.4	72.1	71.8	69.1	63.6	58.7	54.2	59.0
3150.	61.4	72.1	75.2	75.7	74.5	72.3	69.1	67.5	66.8	66.1	65.3	65.3	62.7	60.6	59.4	59.7	64.0
4000.	56.0	66.4	70.8	71.6	70.2	67.4	60.6	59.3	57.9	57.3	56.9	57.5	56.5	55.1	54.5	54.3	59.4
5000.	55.4	62.8	68.0	68.4	67.4	63.7	57.8	57.1	55.8	55.5	55.3	56.2	55.7	54.7	54.4	54.2	57.8
6300.	55.3	60.4	66.3	66.2	65.6	60.2	57.5	57.1	55.8	55.6	55.2	56.0	55.7	54.9	54.4	54.2	57.8
8000.	56.6	60.4	65.2	66.0	65.7	62.4	58.2	57.8	57.0	56.7	56.5	57.0	56.7	56.2	55.9	55.8	59.1
10000.	58.0	60.9	64.4	65.8	65.3	63.3	59.0	58.6	58.0	57.9	57.8	58.1	57.8	57.5	57.4	57.4	59.9
PNL	107.4	114.0	115.8	115.8	114.5	112.3	110.6	108.7	107.8	107.0	106.4	106.5	104.9	103.5	101.2	98.1	94.1
PNLT	108.9	115.4	117.0	116.9	115.9	113.9	112.7	110.1	108.9	107.7	106.4	106.5	104.9	103.5	102.1	99.9	95.7
OASPL	101.2	107.6	109.3	109.2	108.1	106.2	104.1	102.0	101.2	100.7	99.9	100.1	98.6	97.9	96.6	94.4	88.6

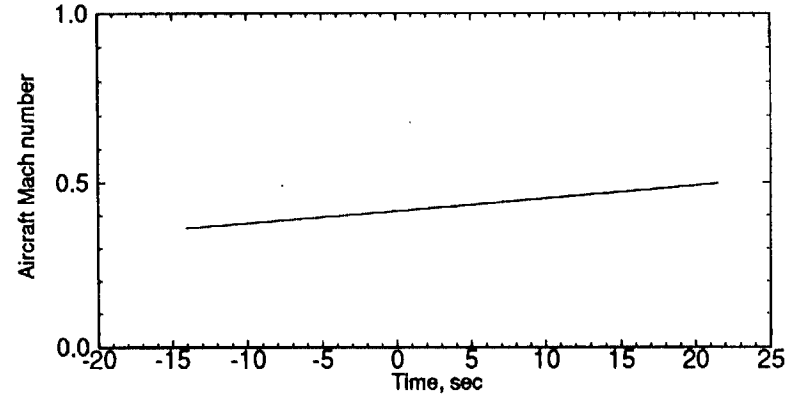
APPENDIX C

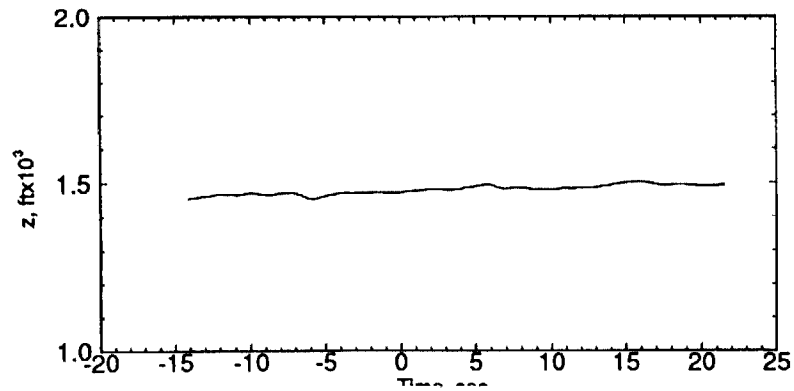
FLIGHT TRACKING DATA









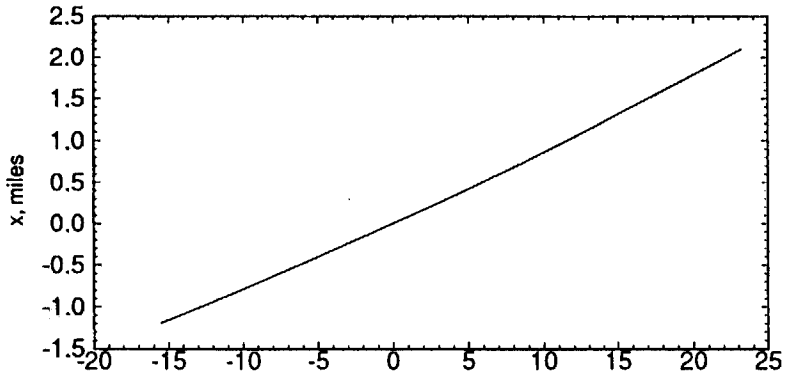


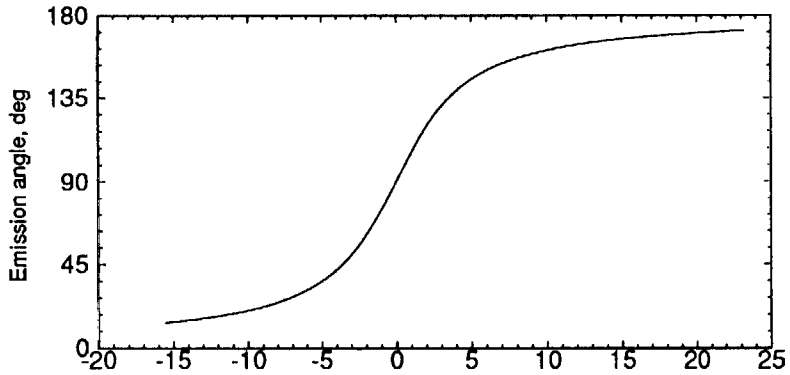
RUN 103

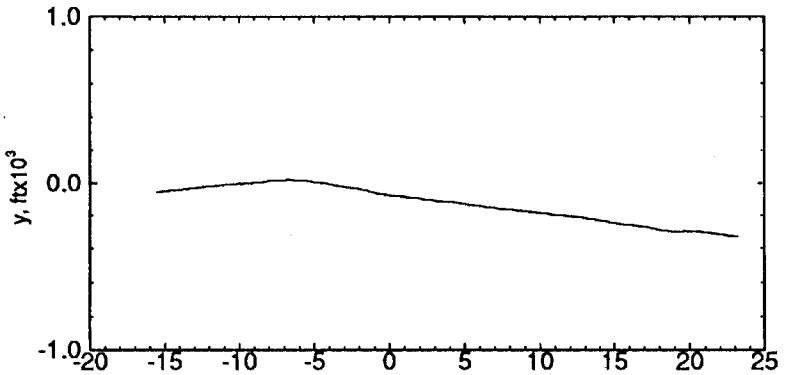
Average Mach number = 0.43

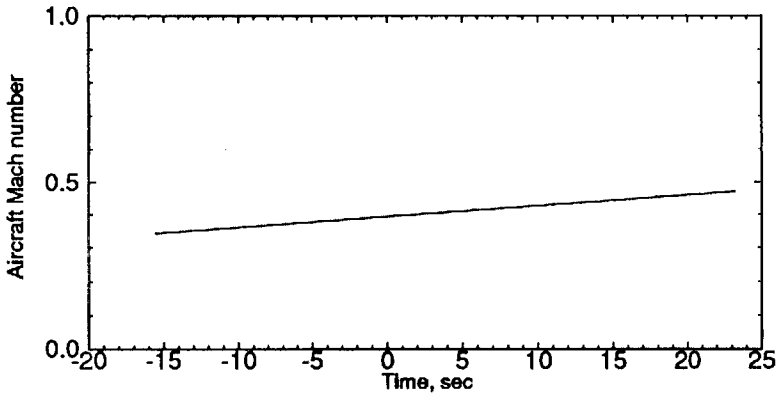
Average acceleration = 0.14 g

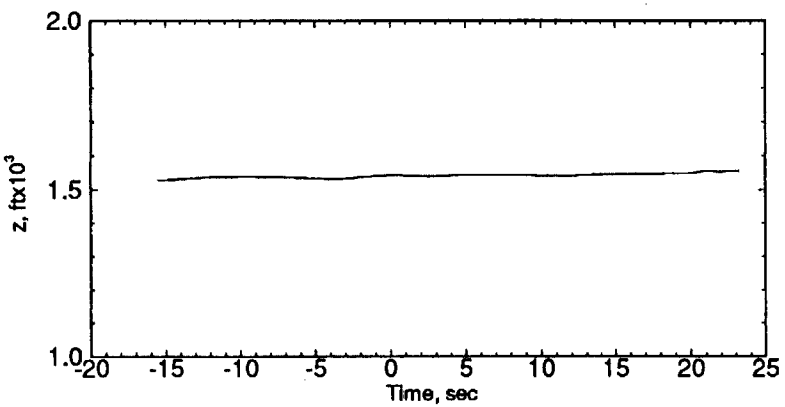
Average altitude = 1480 ft









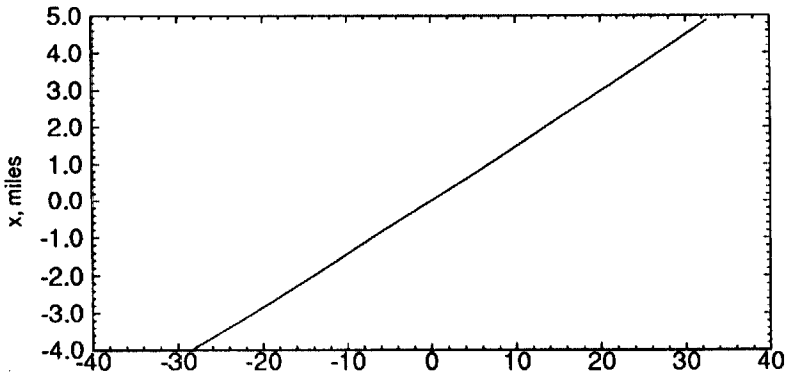


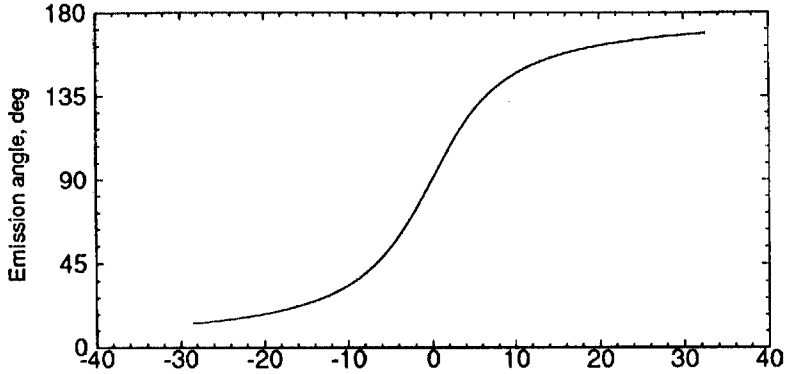
RUN 105

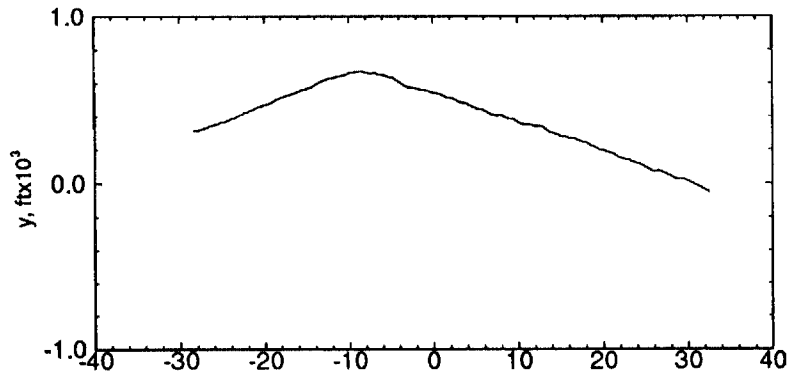
Average Mach number = 0.41

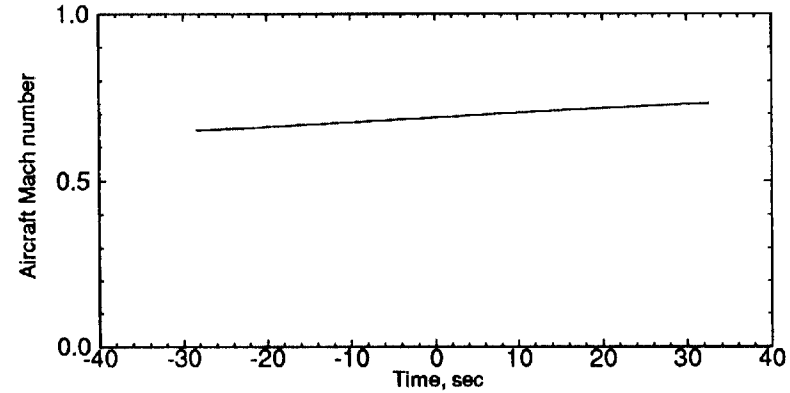
Average acceleration = 0.12 g

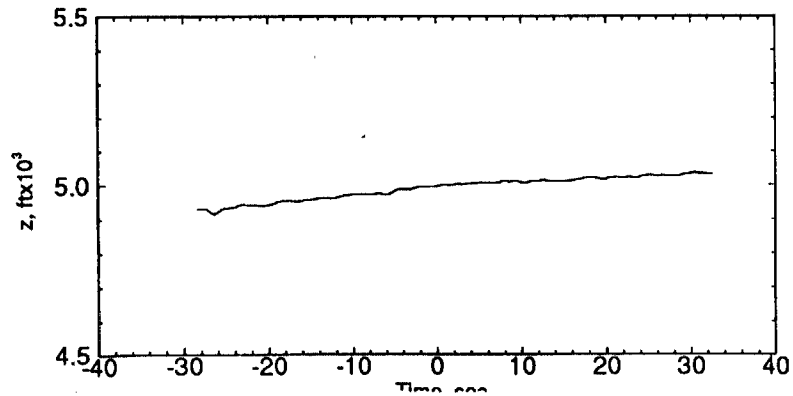
Average altitude = 1541 ft









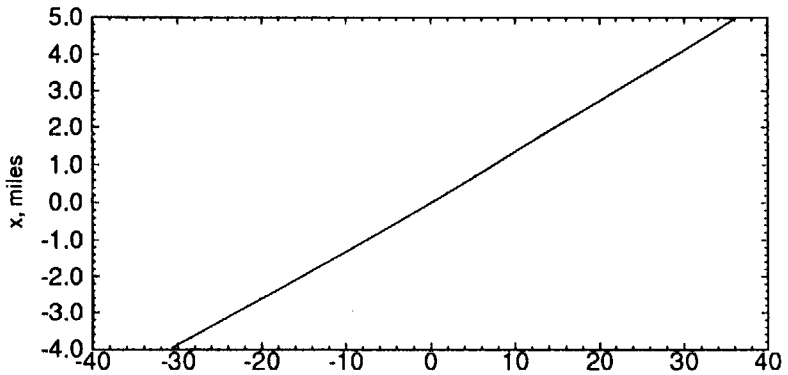


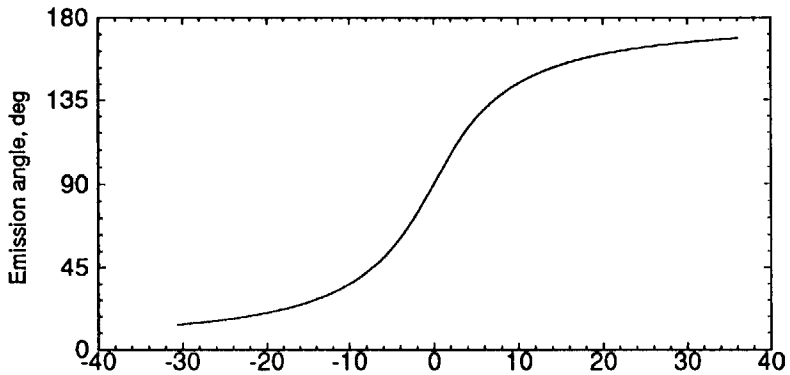
RUN 205

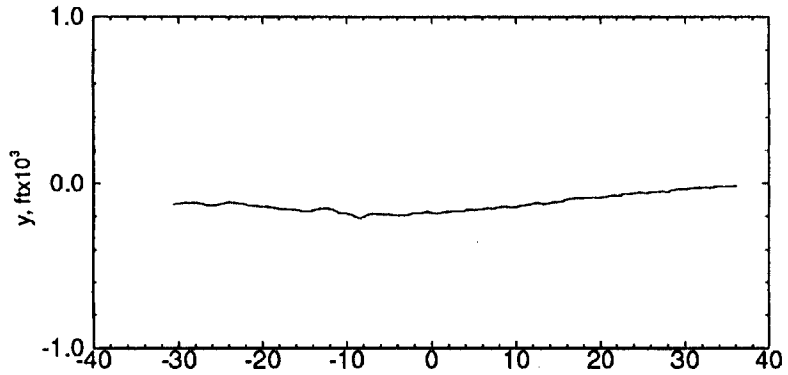
Average Mach number = 0.69

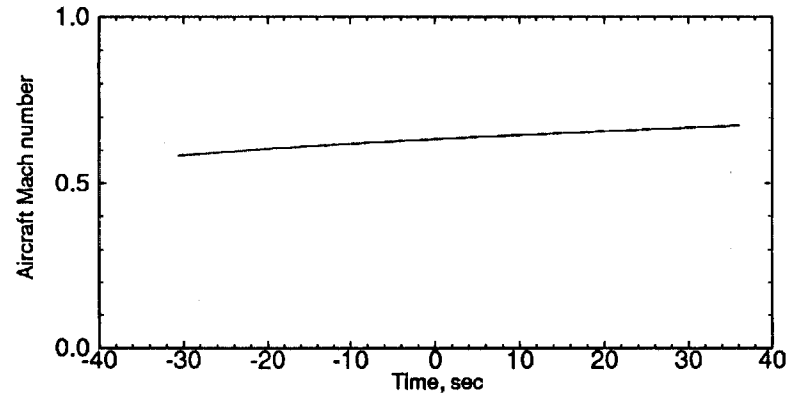
Average acceleration = 0.03 g

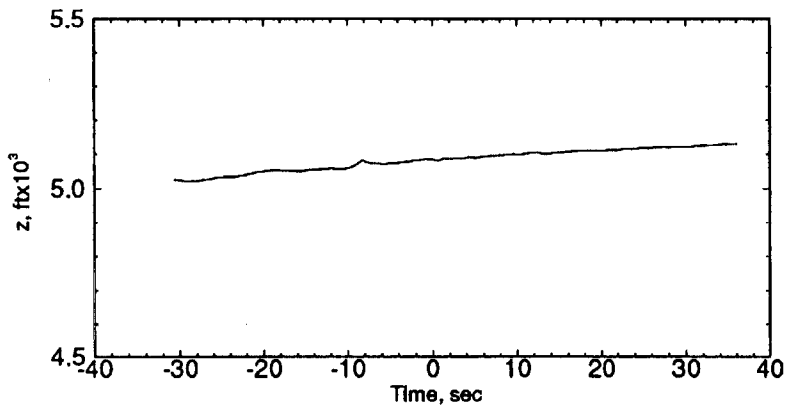
Average altitude = 4990 ft









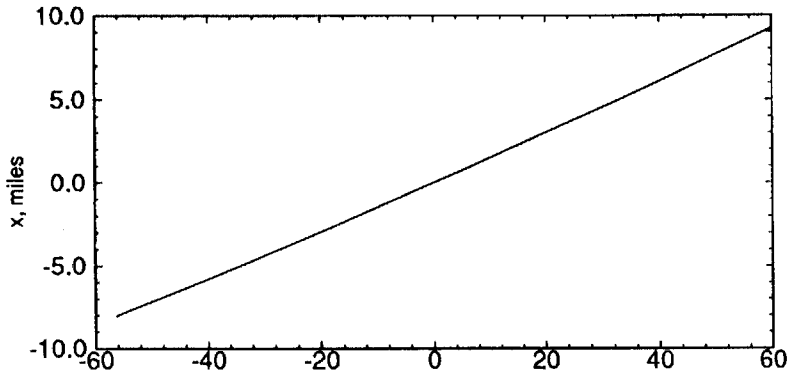


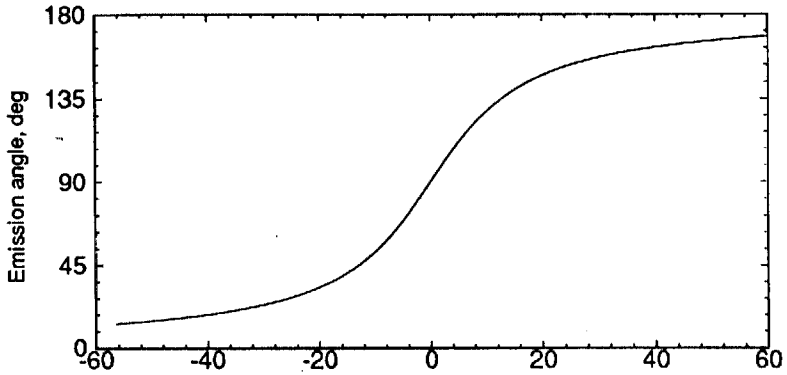
RUN 211

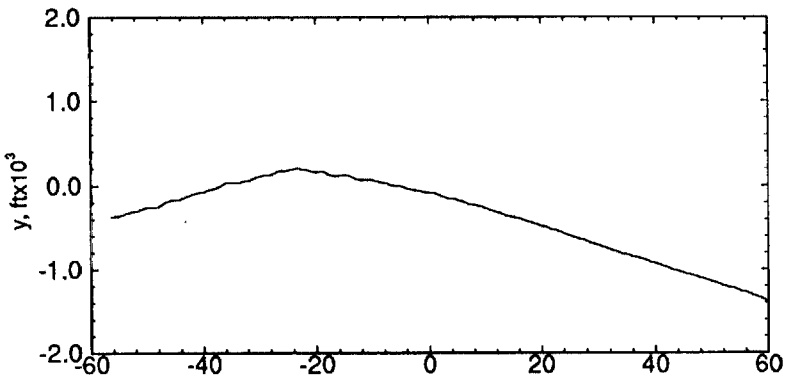
Average Mach number = 0.64

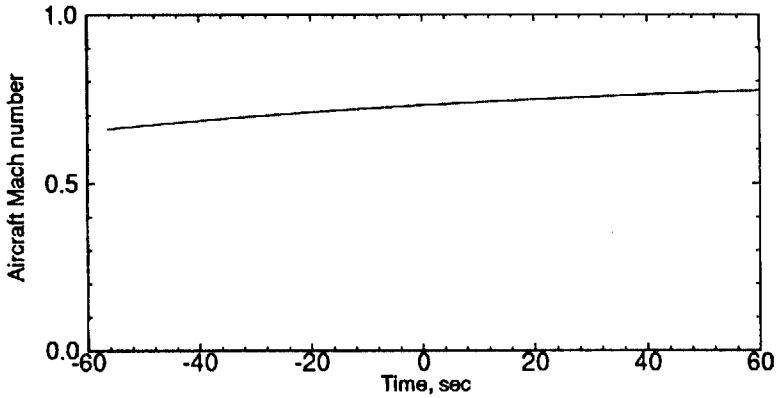
Average acceleration = 0.05 g

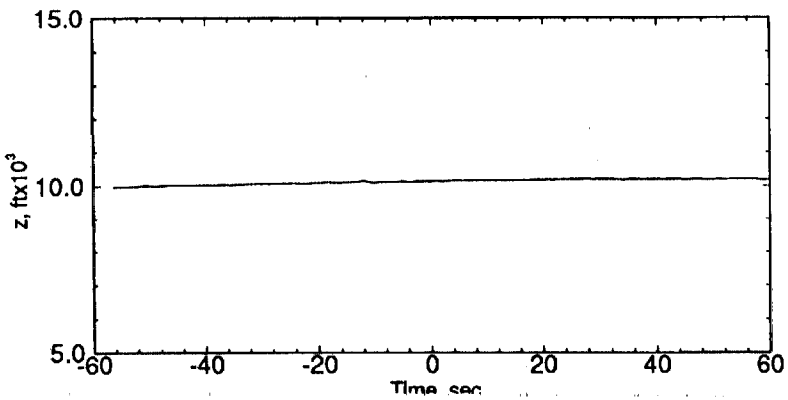
Average altitude = 5083 ft









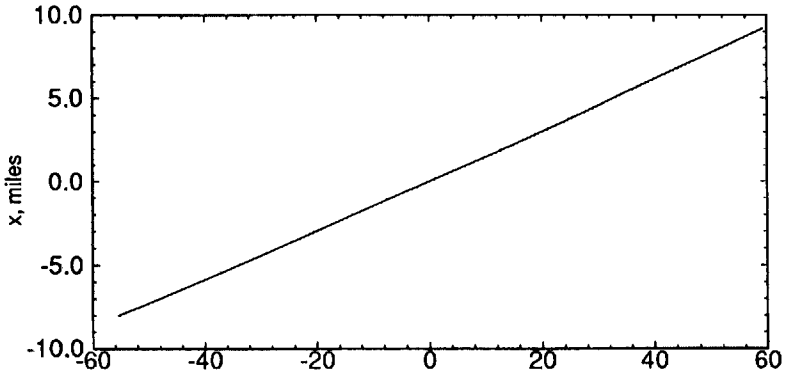


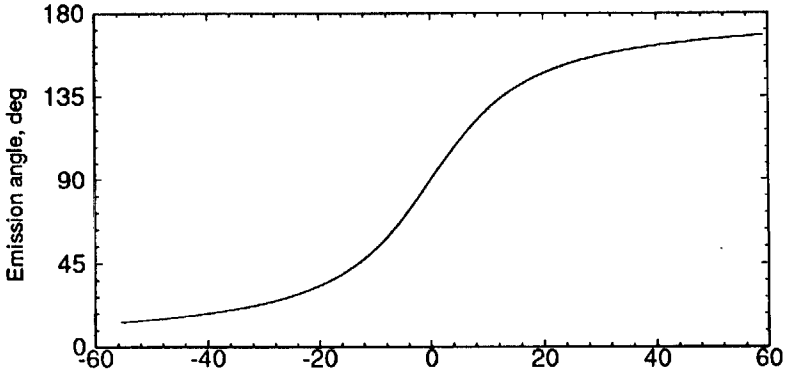
RUN 305

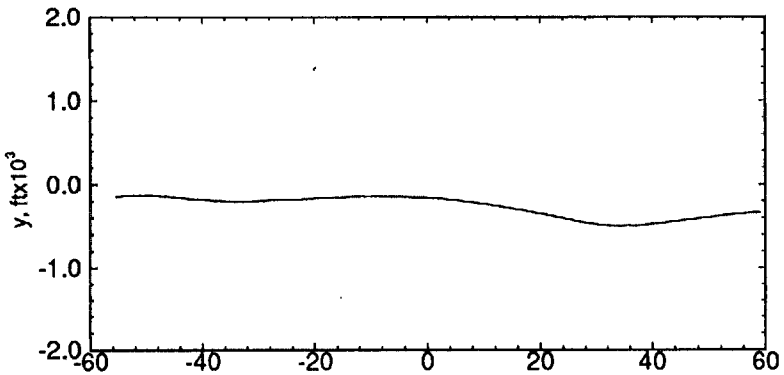
Average Mach number = 0.73

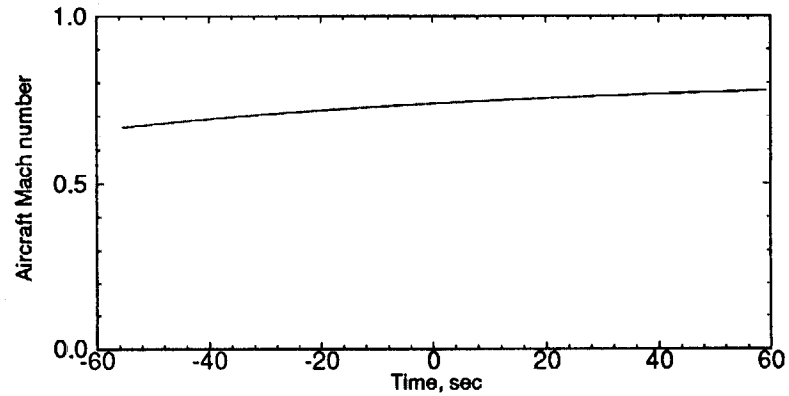
Average acceleration = 0.03 g

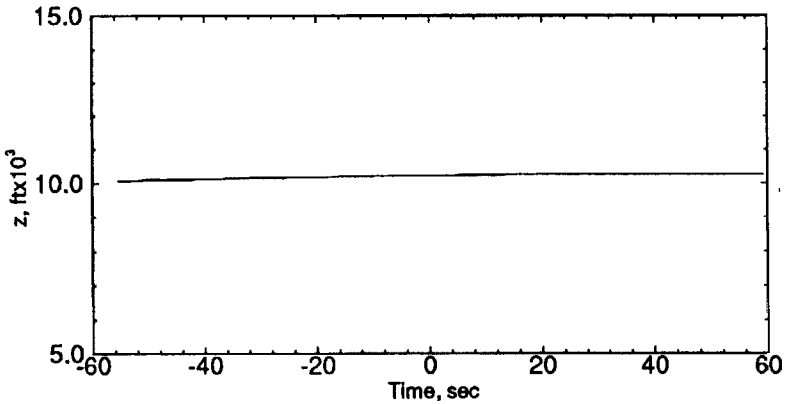
Average altitude = 10128 ft









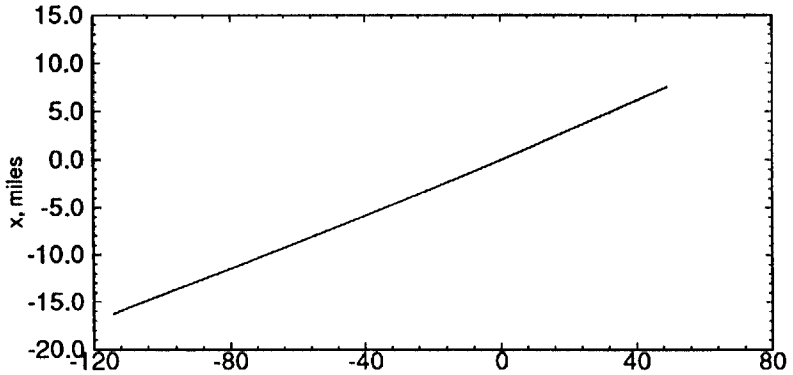


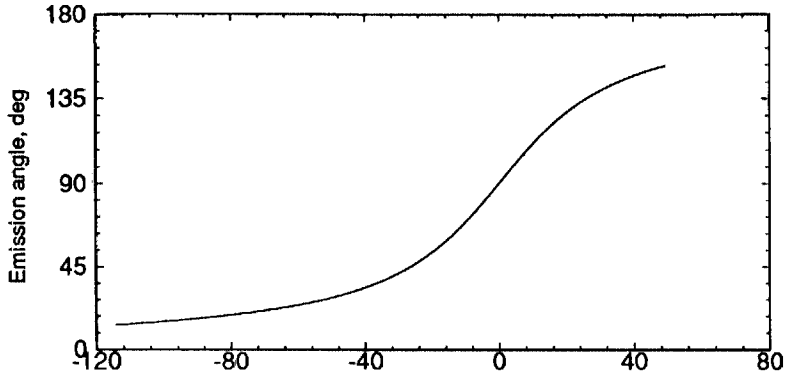
RUN 315

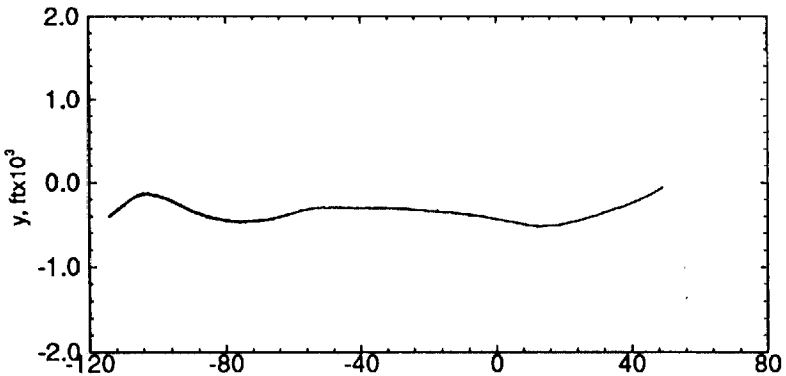
Average Mach number = 0.73

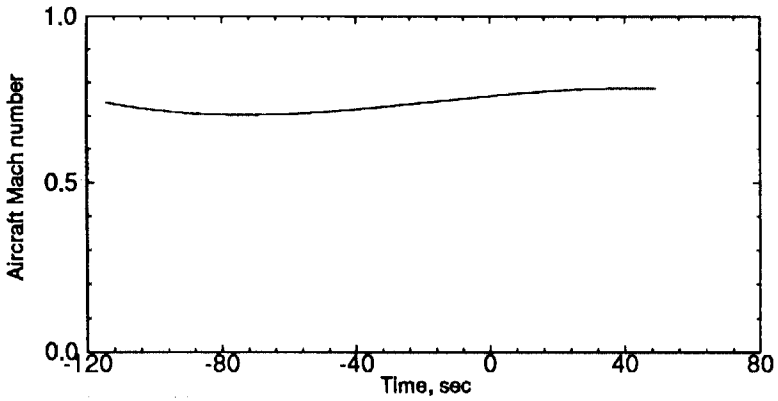
Average acceleration = 0.03 g

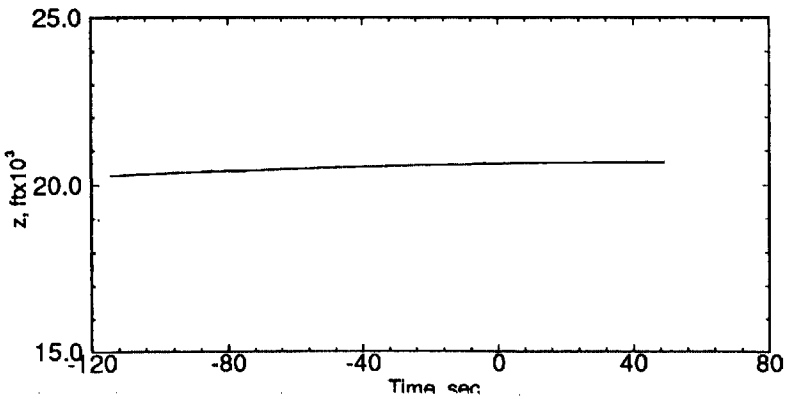
Average altitude = 10205 ft









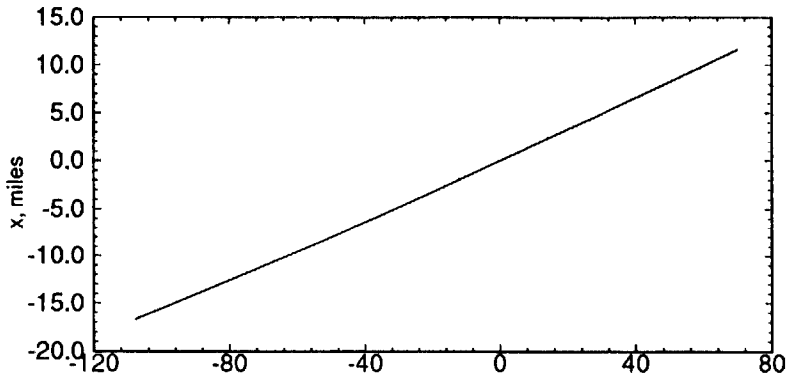


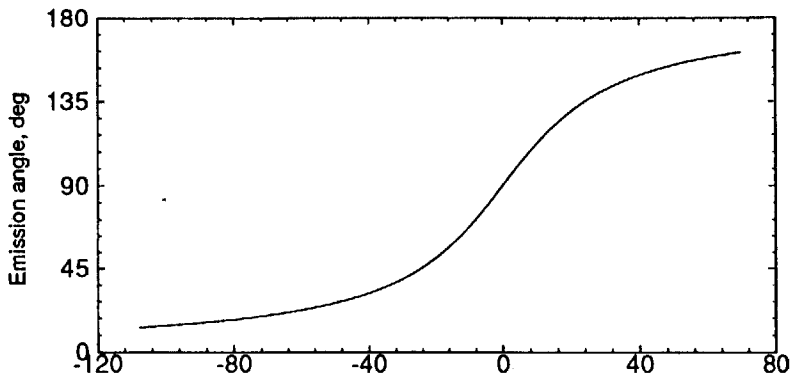
RUN 409

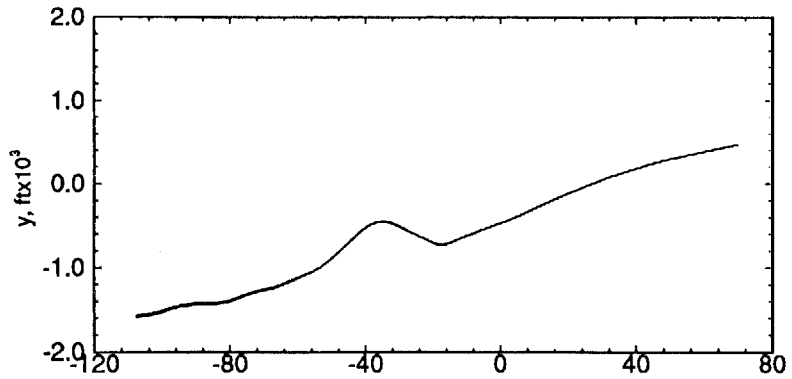
Average Mach number = 0.74

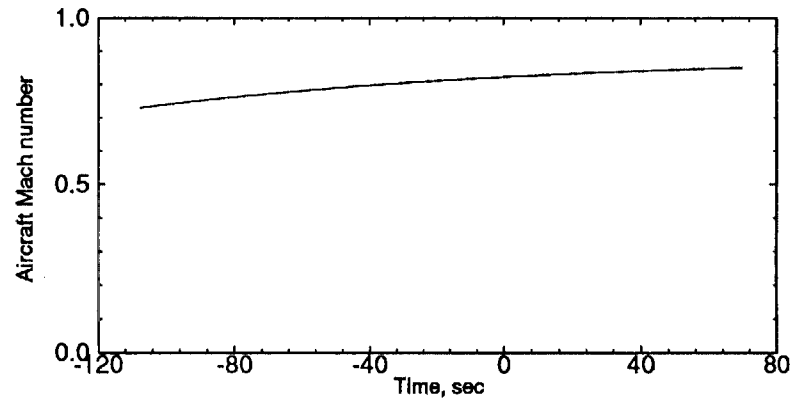
Average acceleration = 0.01 g

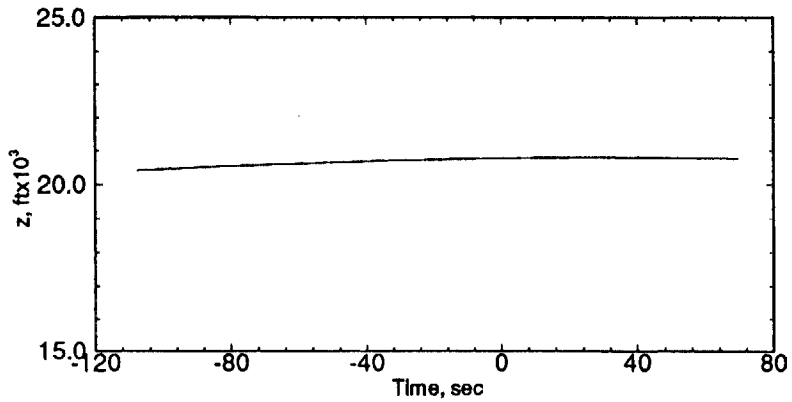
Average altitude = 20528 ft









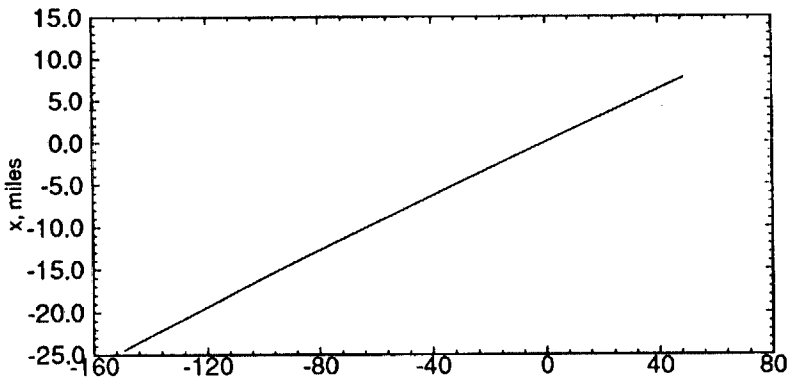


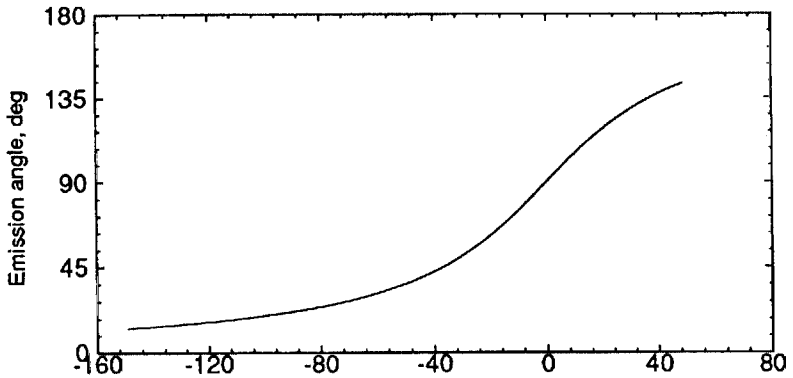
RUN 411

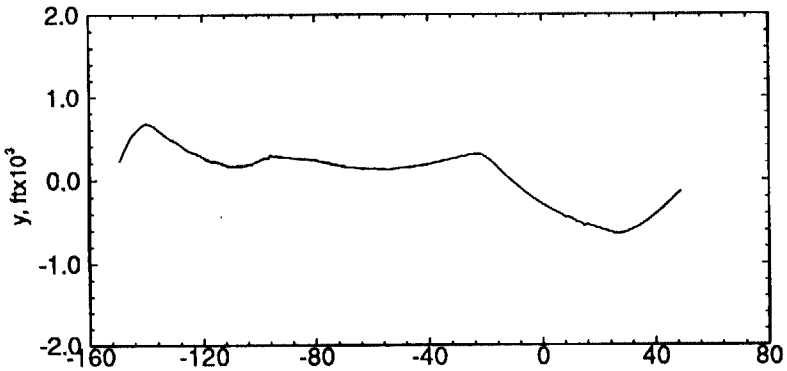
Average Mach number = 0.80

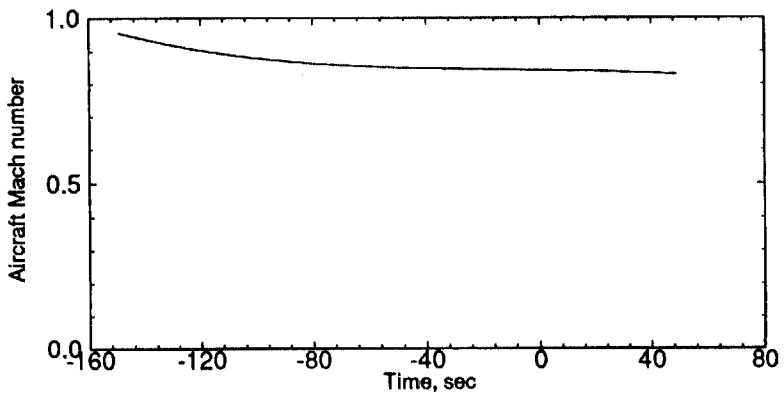
Average acceleration = 0.02 g

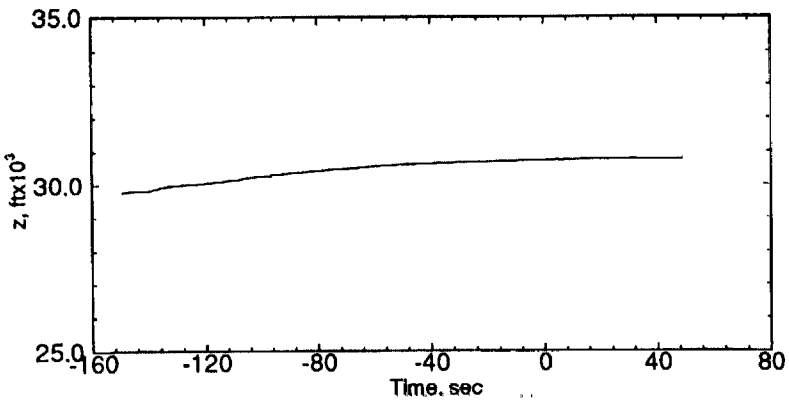
Average altitude = 20692 ft









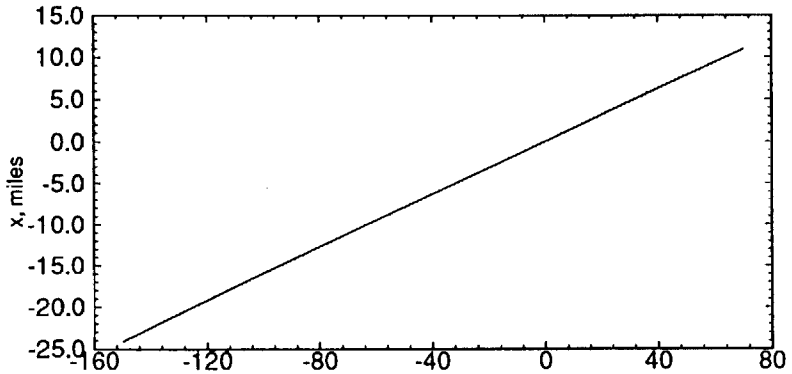


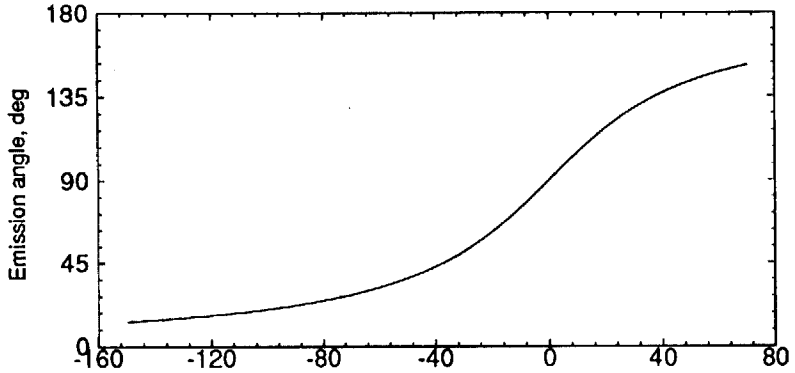
RUN 504

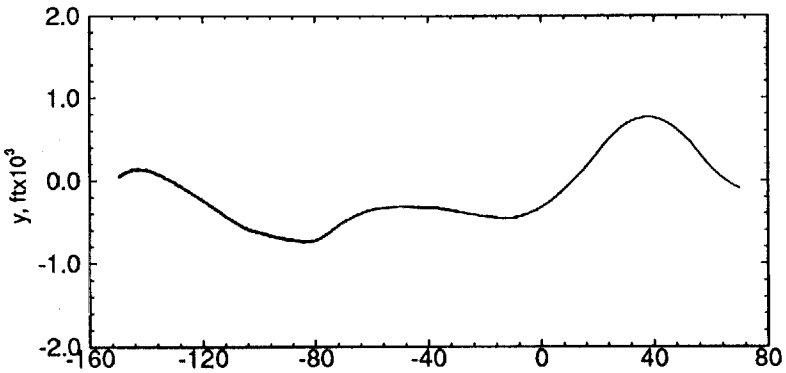
Average Mach number = 0.87

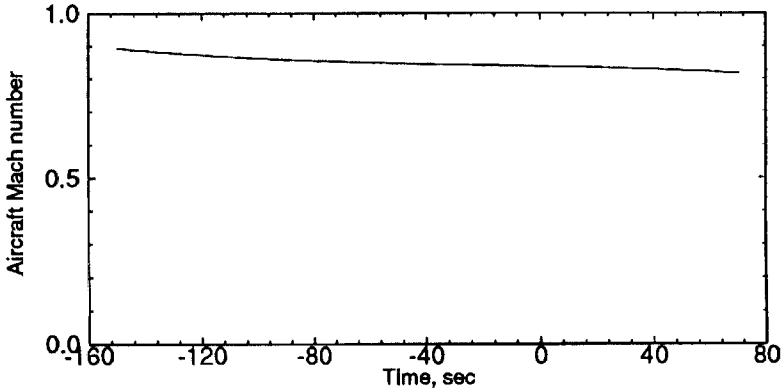
Average acceleration = 0.02 g

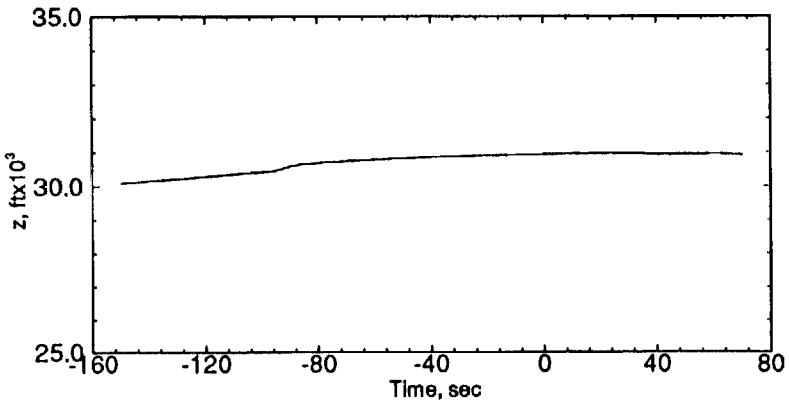
Average altitude = 30483 ft









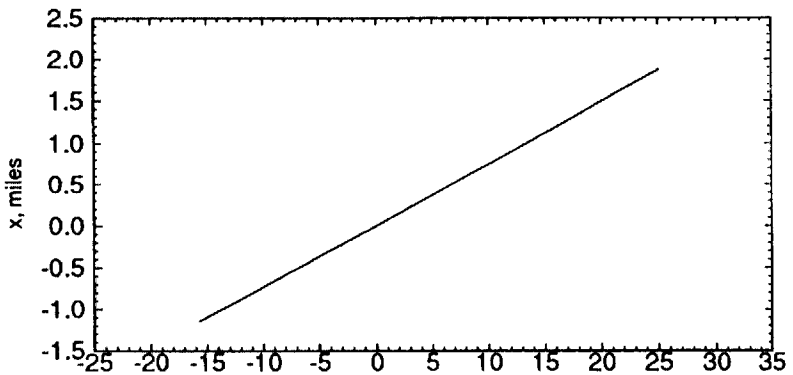


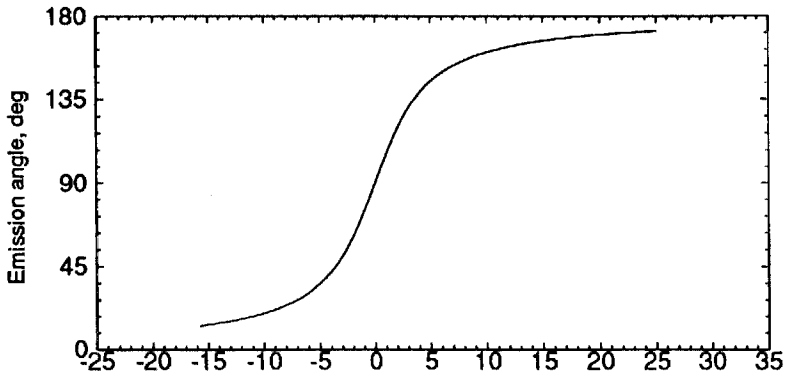
RUN 505

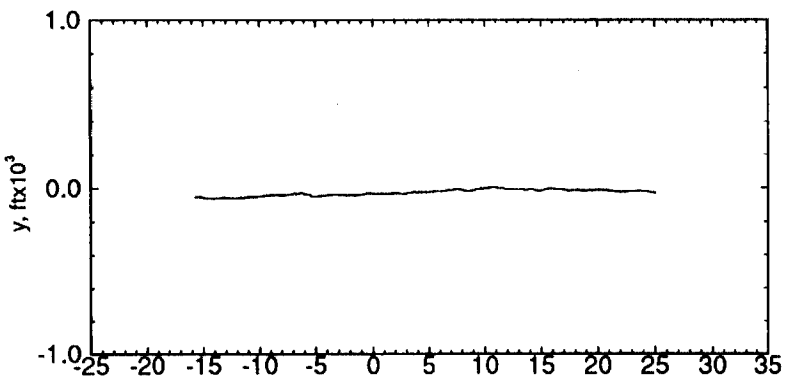
Average Mach number = 0.85

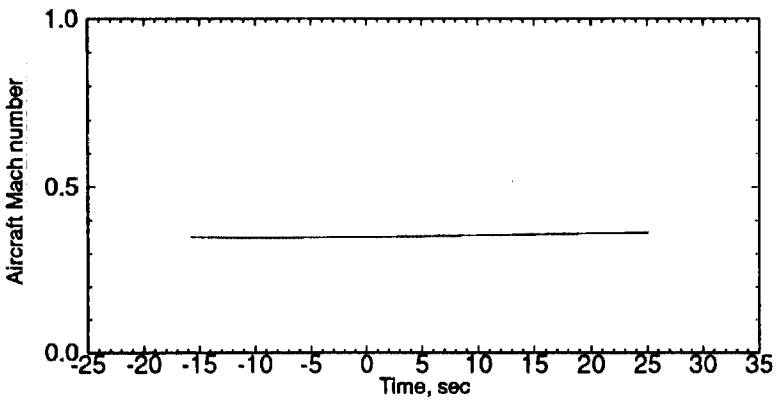
Average acceleration = 0.01 g

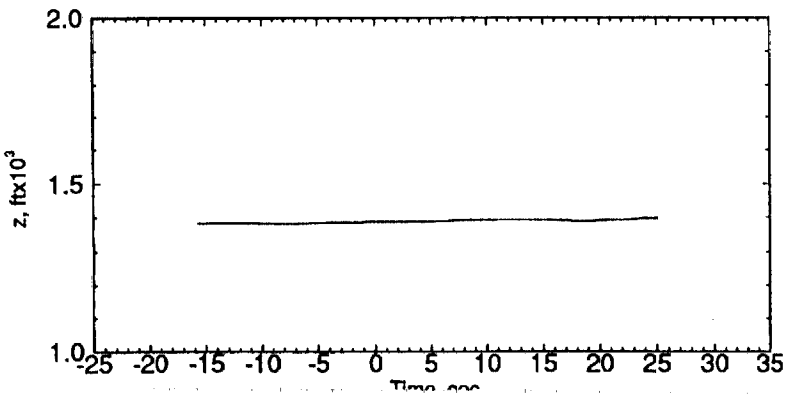
Average altitude = 30722 ft









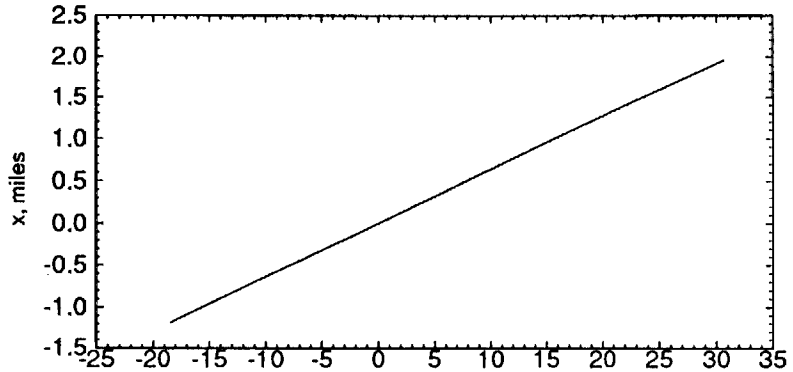


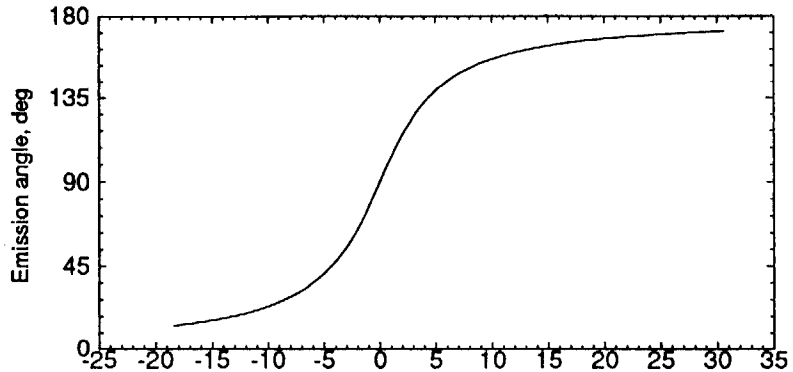
RUN 600

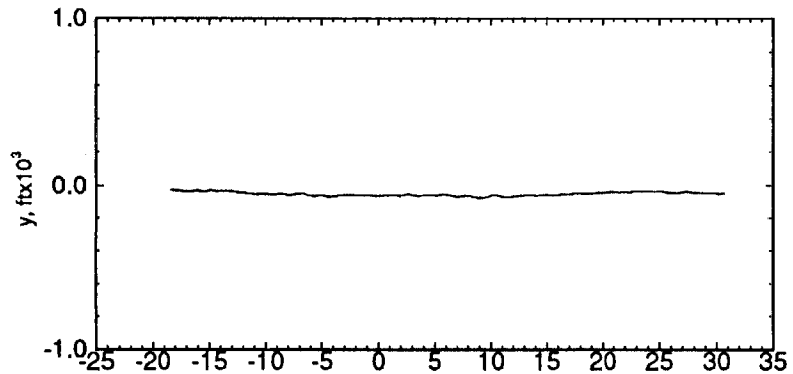
Average Mach number = 0.35

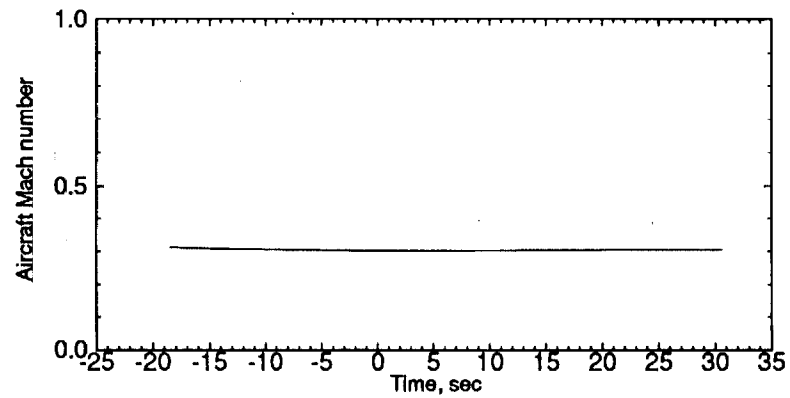
Average acceleration = 0.04 g

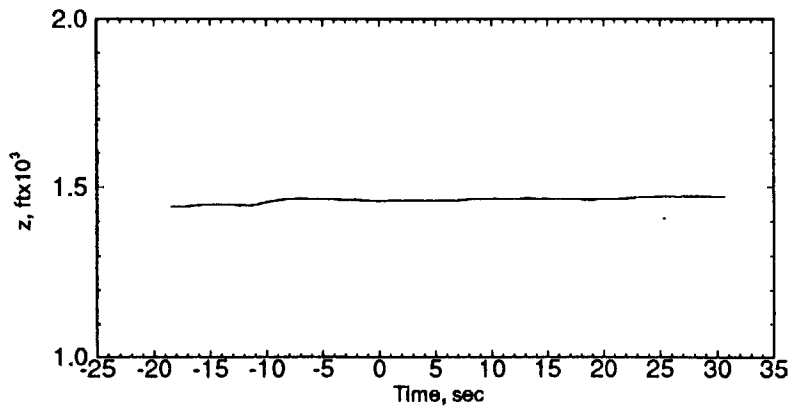
Average altitude = 1389 ft









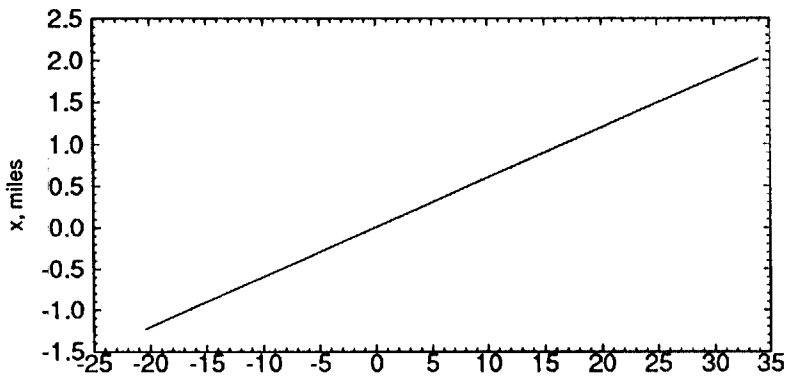


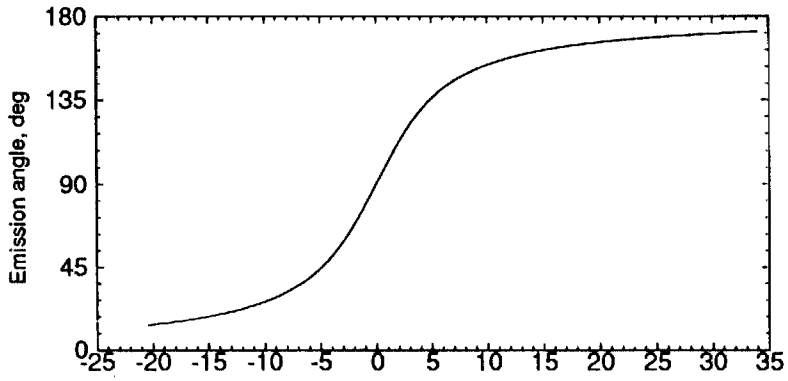
RUN 601

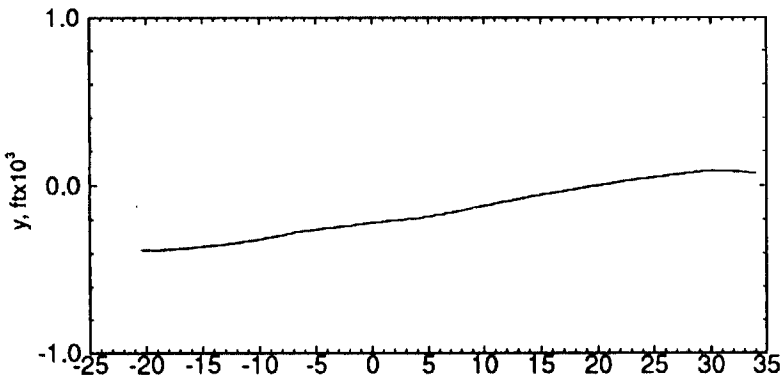
Average Mach number = 0.30

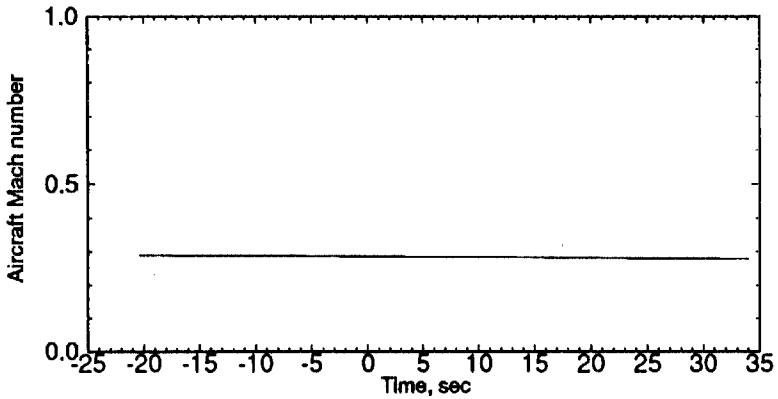
Average acceleration = 0.01 g

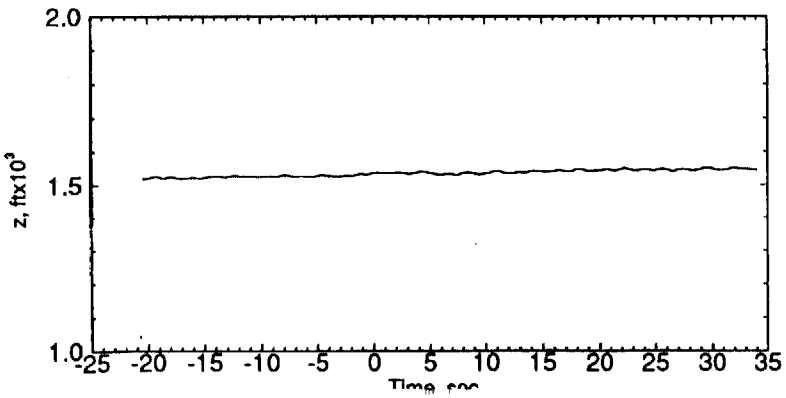
Average altitude = 1462 ft









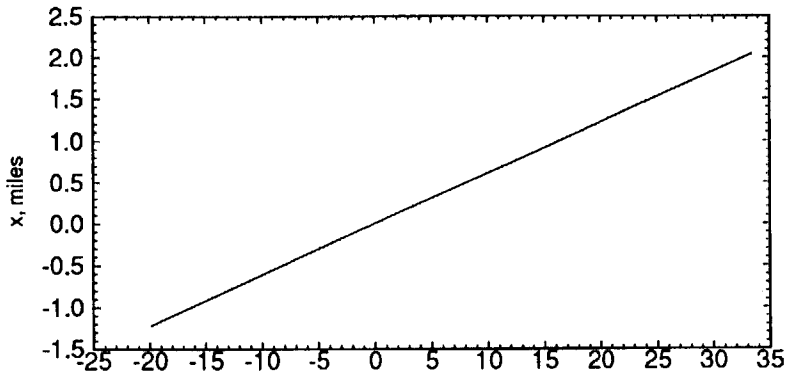


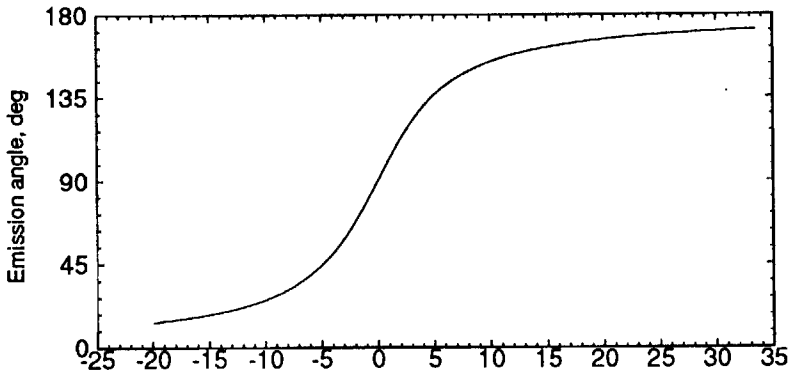
RUN 603

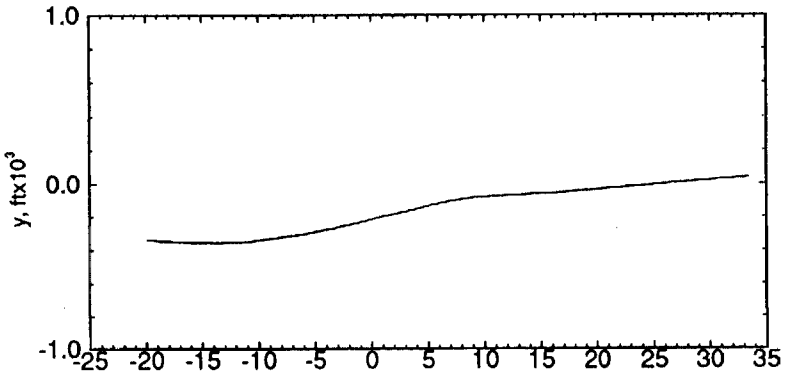
Average Mach number = 0.28

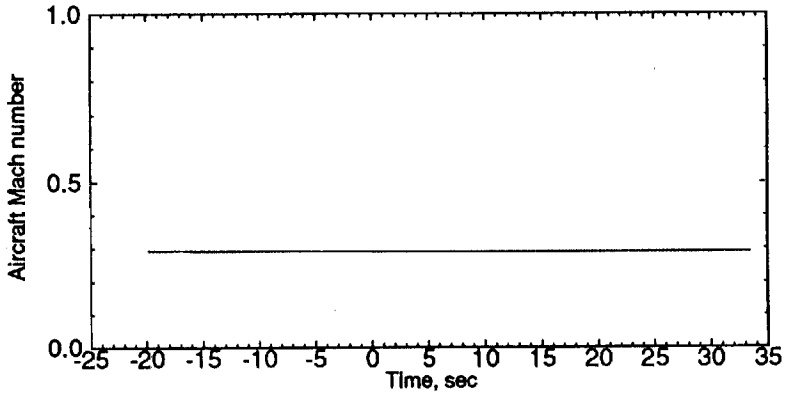
Average acceleration = 0.00 g

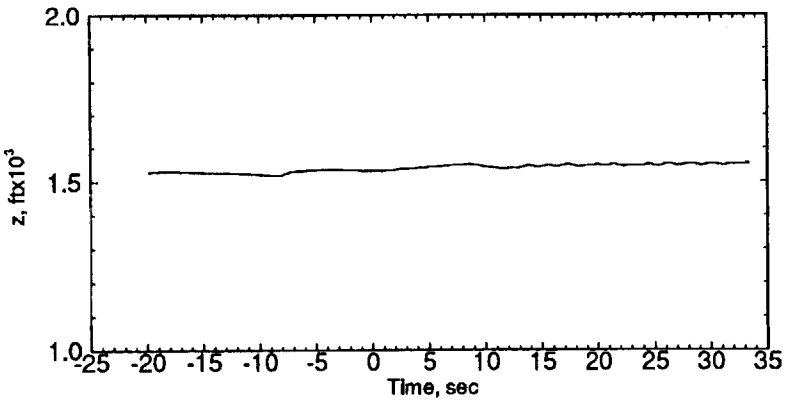
Average altitude = 1535 ft









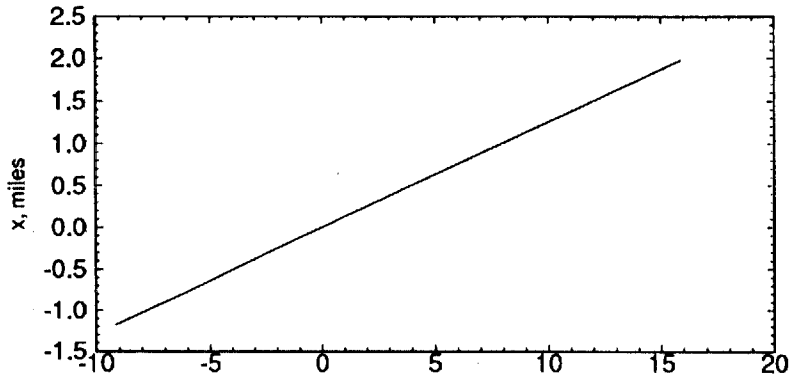


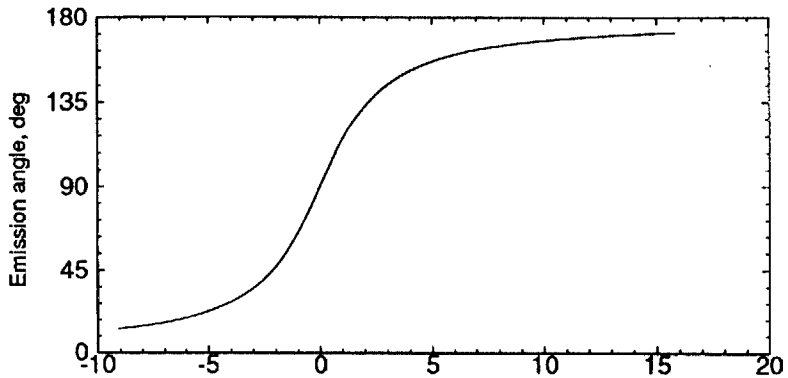
RUN 604

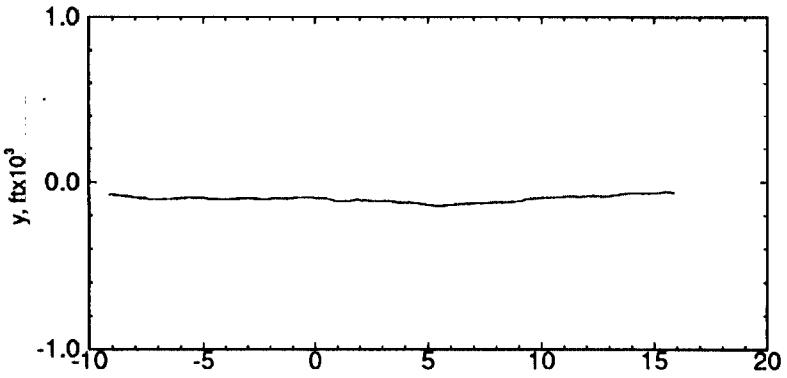
Average Mach number = 0.29

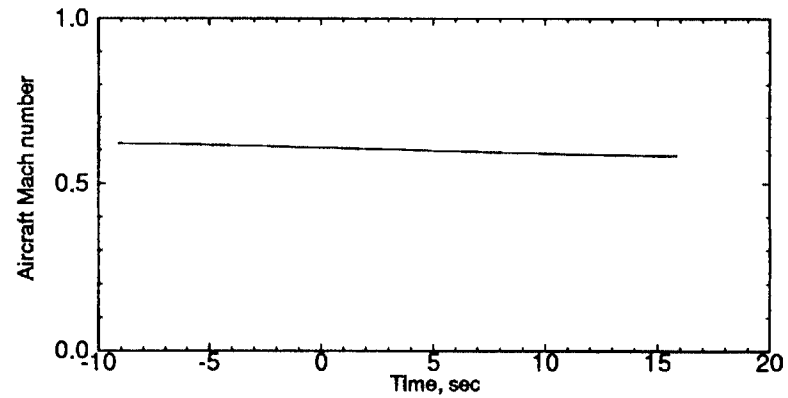
Average acceleration = 0.00 g

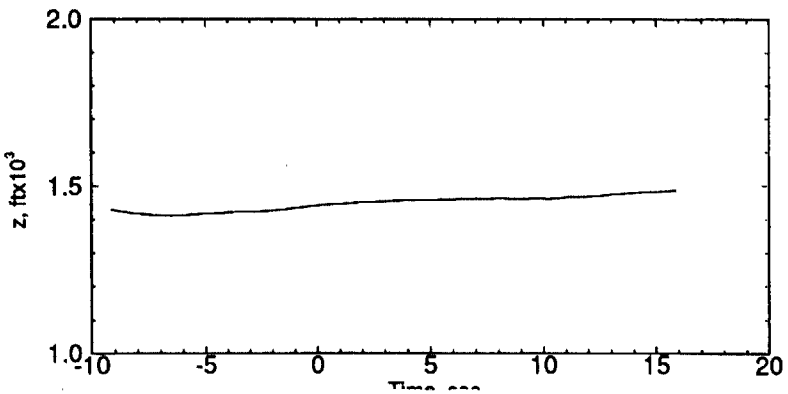
Average altitude = 1539 ft









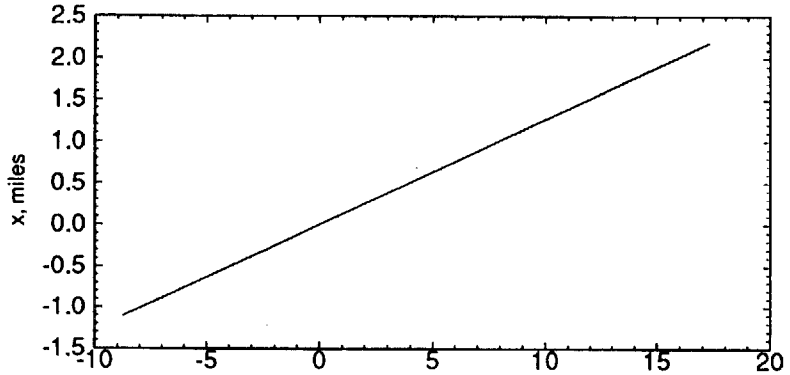


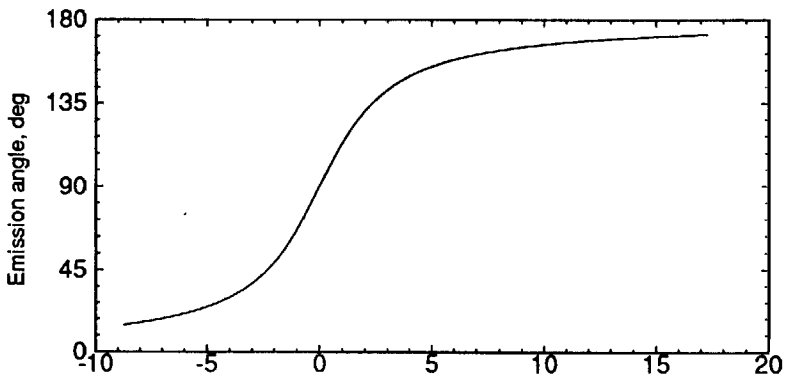
RUN 610

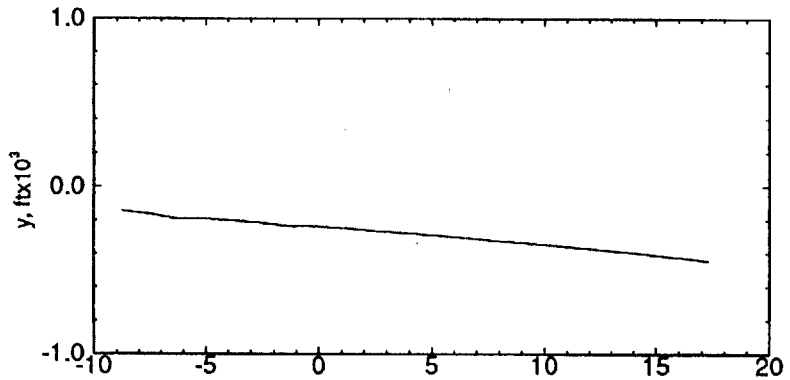
Average Mach number = 0.60

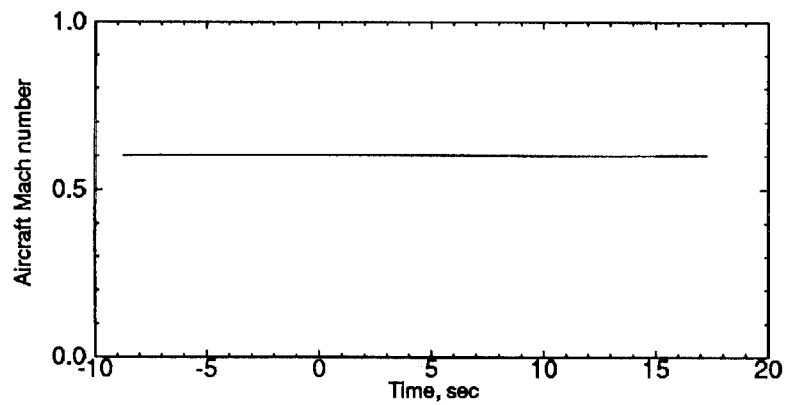
Average acceleration = 0.02 g

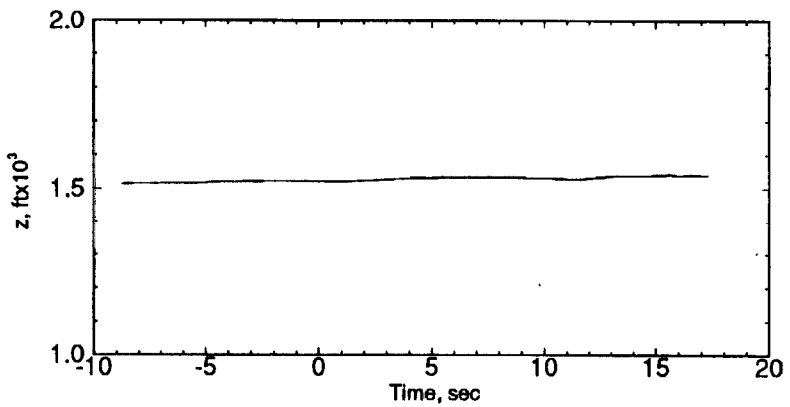
Average altitude = 1447 ft









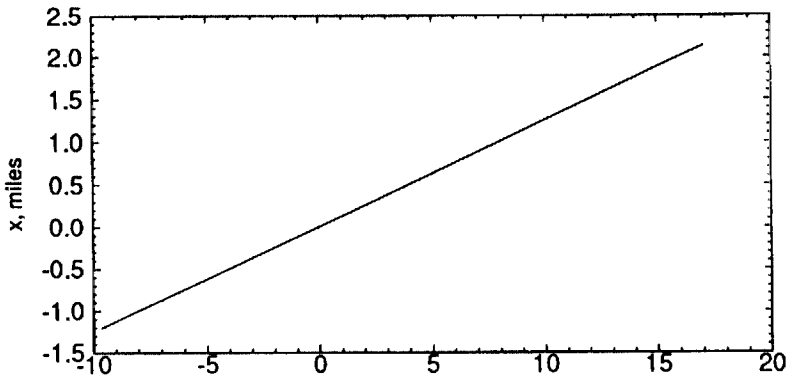


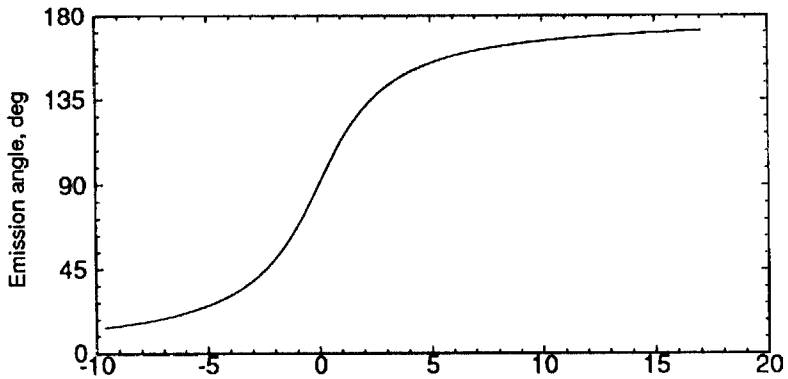
RUN 612

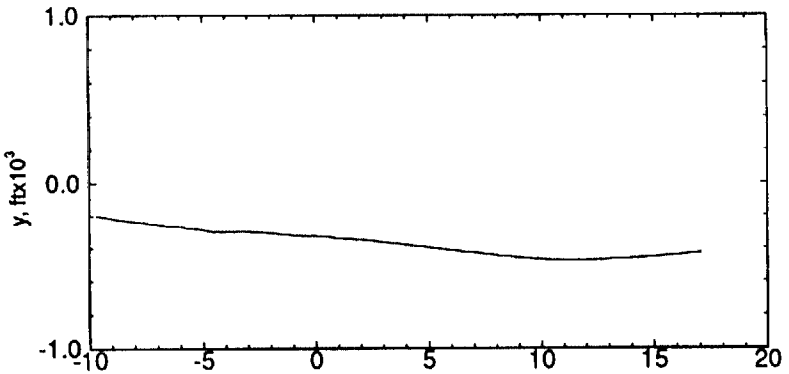
Average Mach number = 0.60

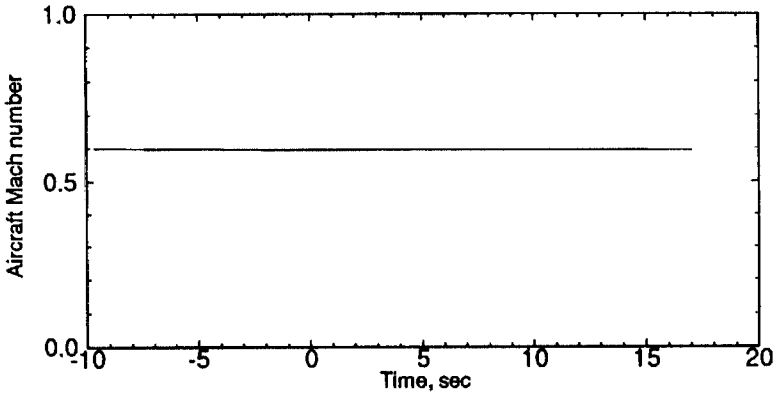
Average acceleration = 0.01 g

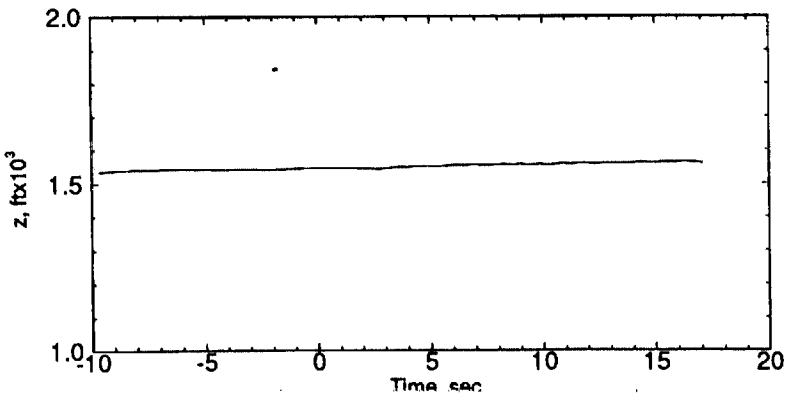
Average altitude = 1528 ft









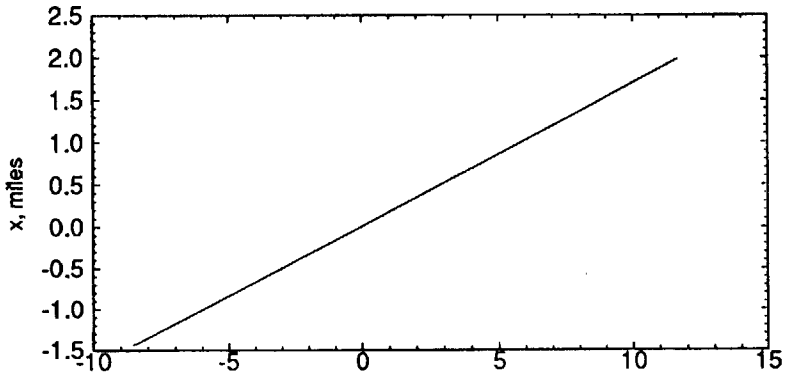


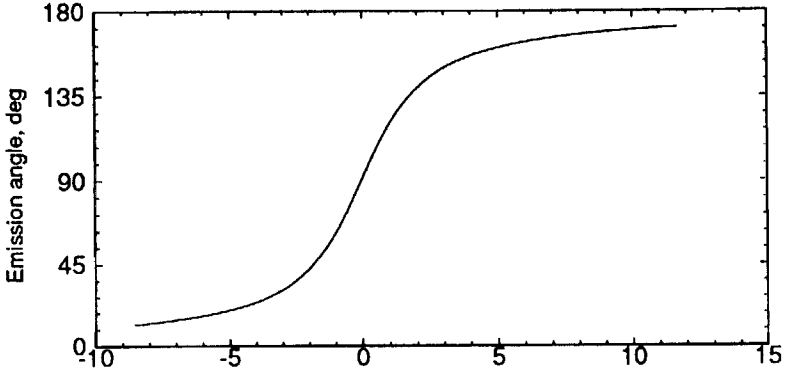
RUN 613

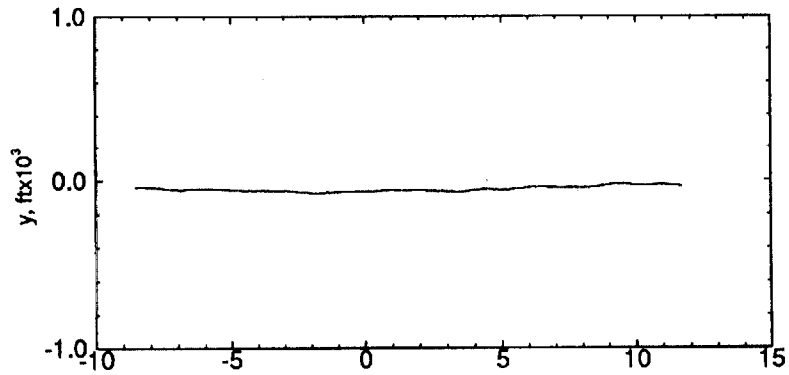
Average Mach number = 0.60

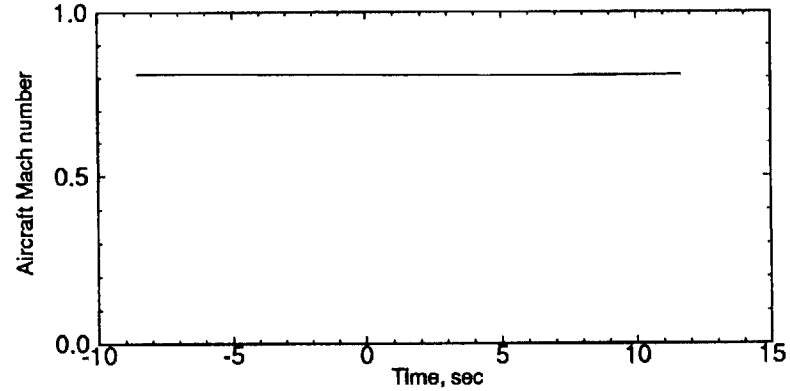
Average acceleration = 0.01 g

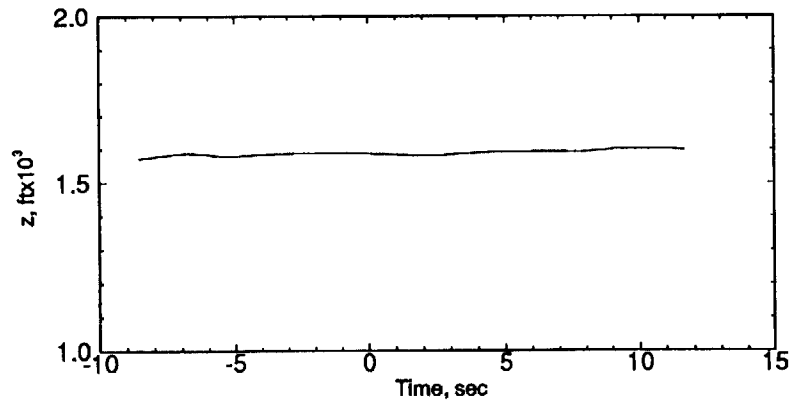
Average altitude = 1550 ft









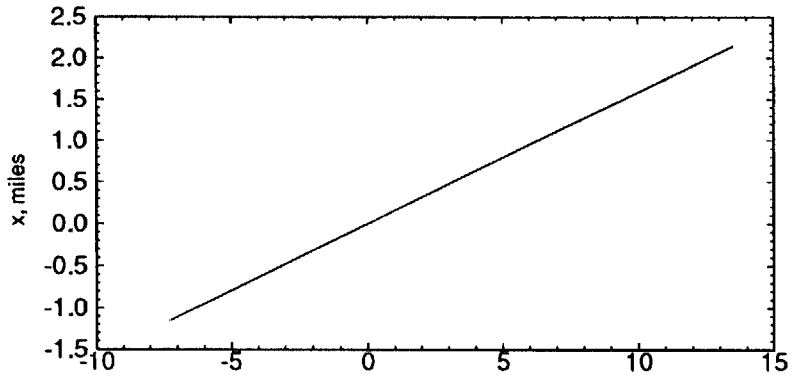


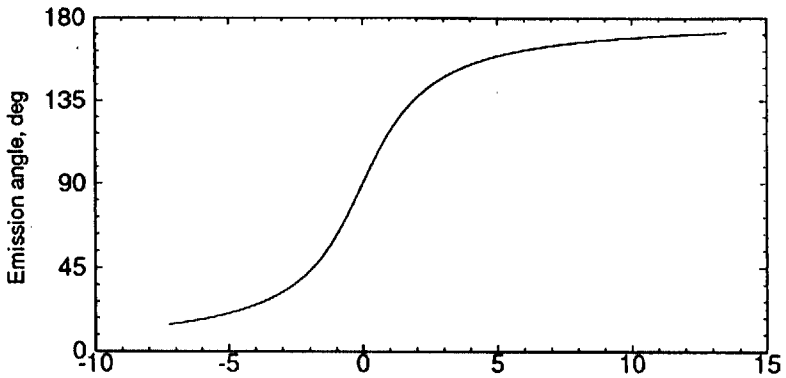
RUN 621

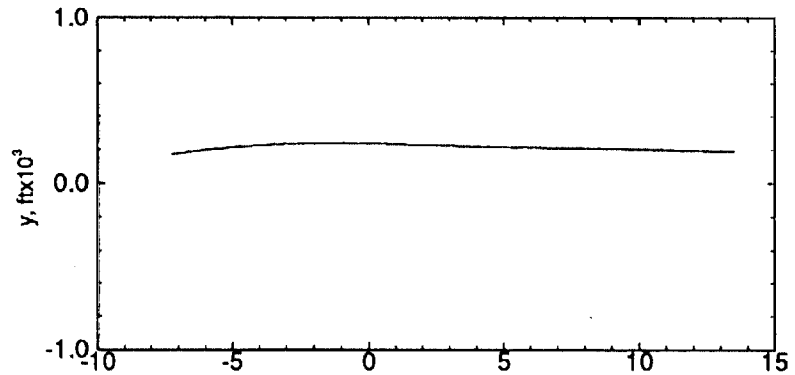
Average Mach number = 0.81

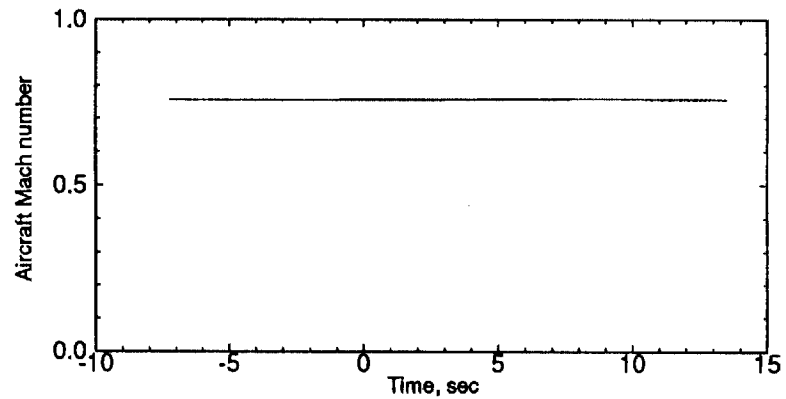
Average acceleration = 0.03 g

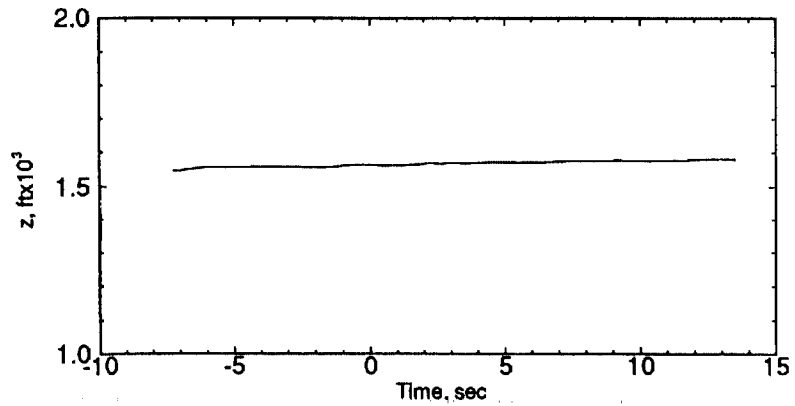
Average altitude = 1589 ft









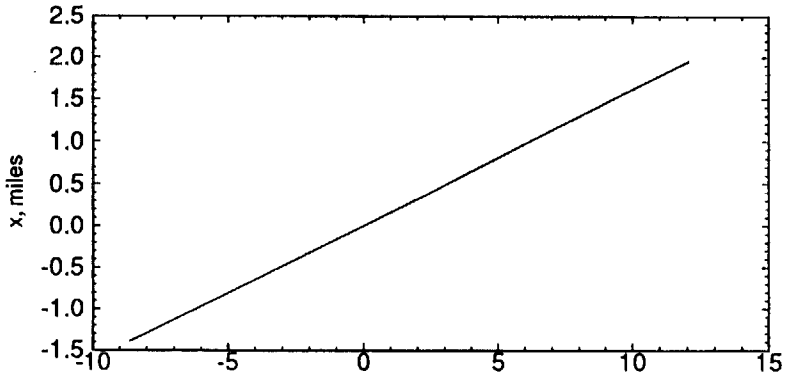


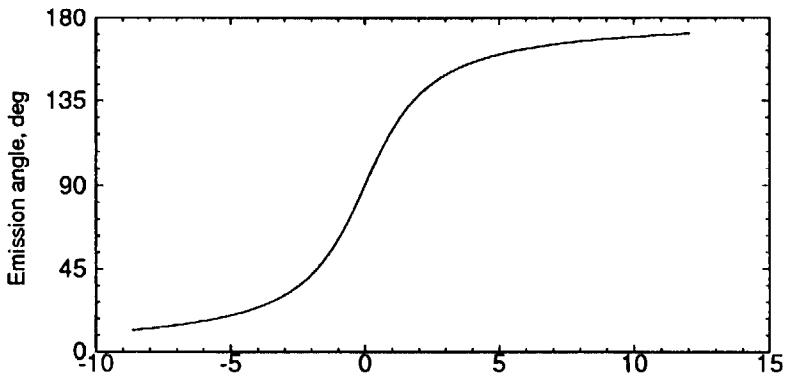
RUN 622

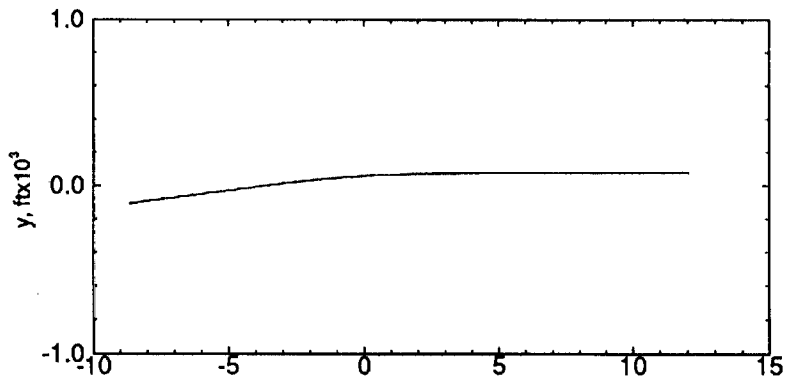
Average Mach number = 0.76

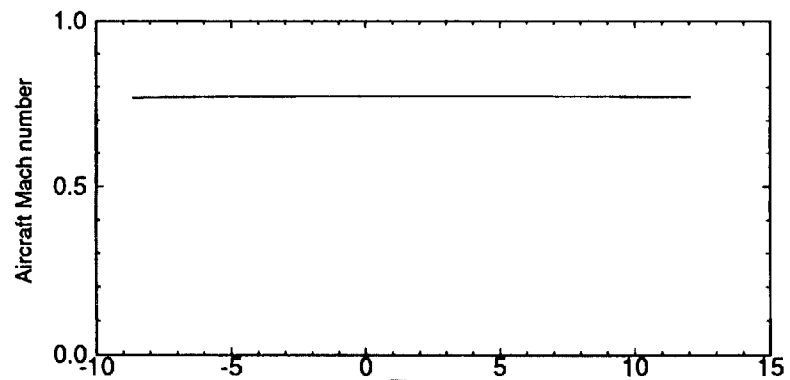
Average acceleration = 0.02 g

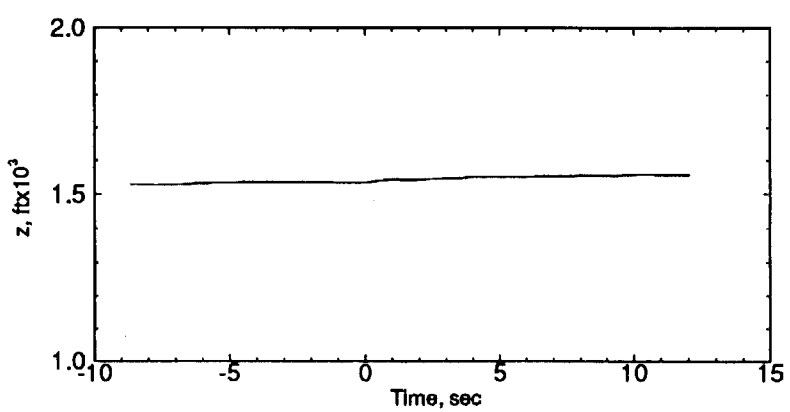
Average altitude = 1567 ft









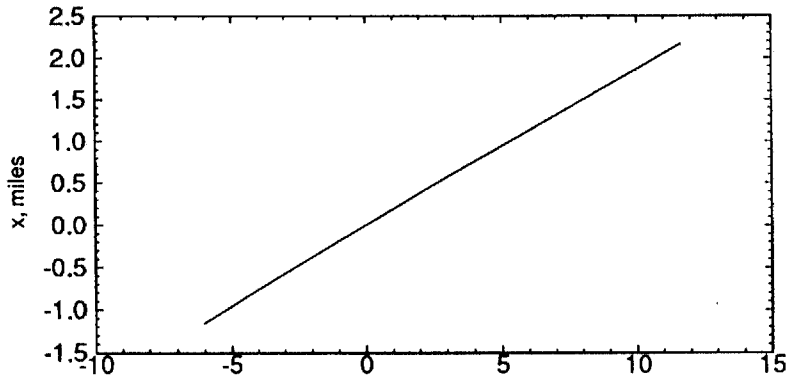


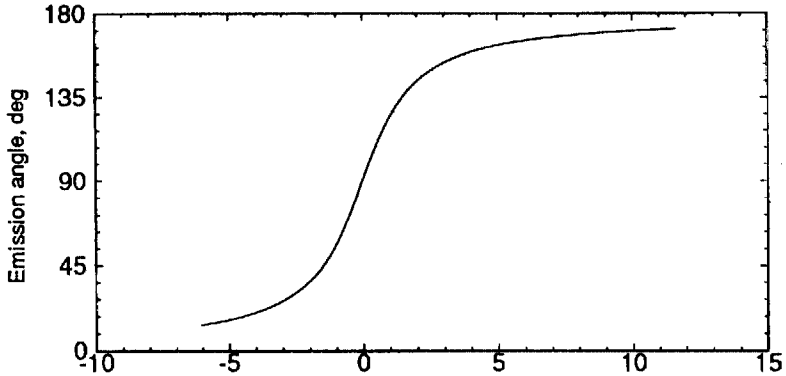
RUN 623

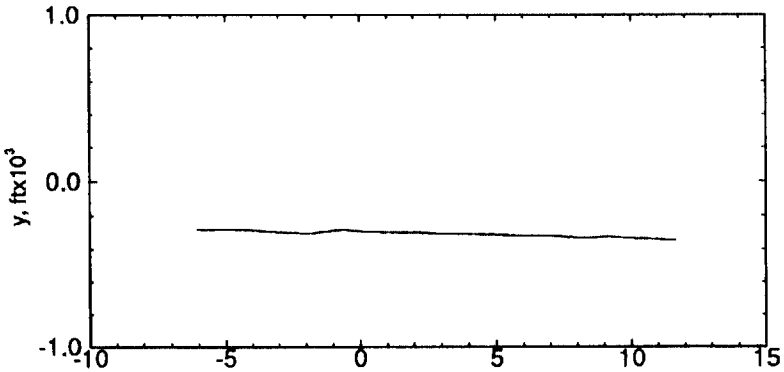
Average Mach number = 0.77

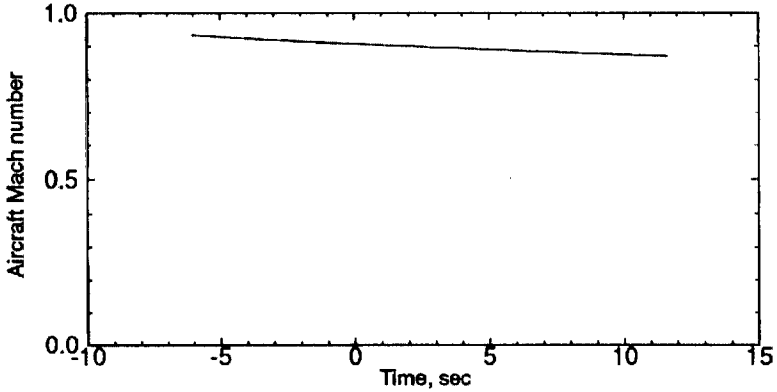
Average acceleration = 0.02 g

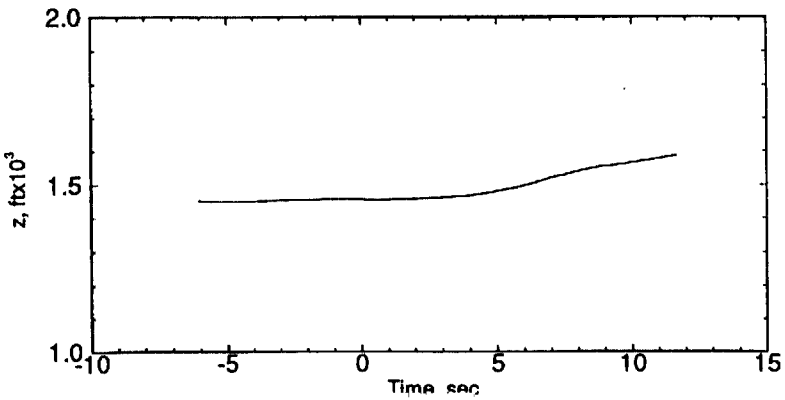
Average altitude = 1543 ft









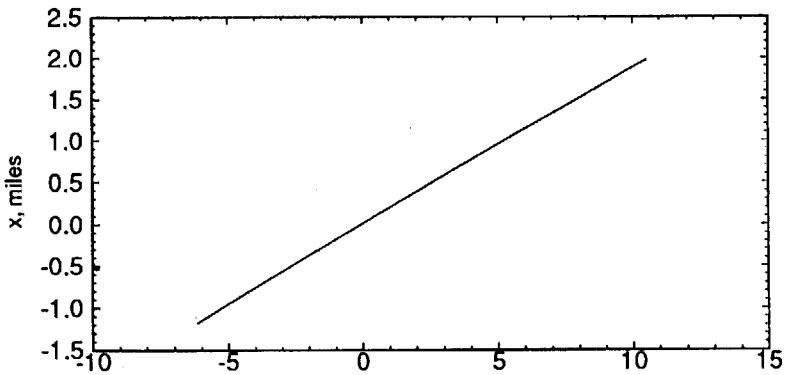


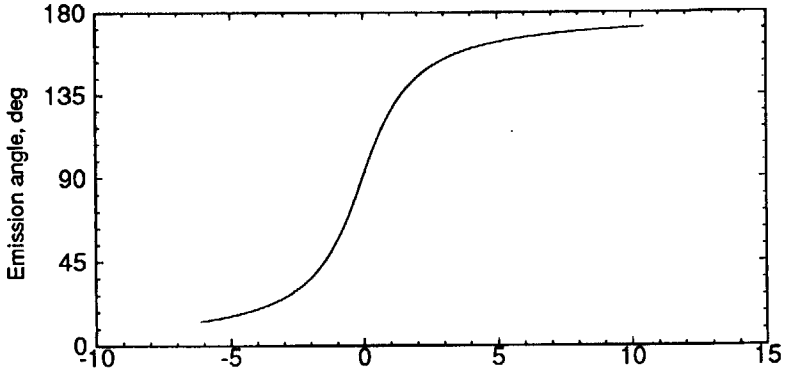
RUN 630

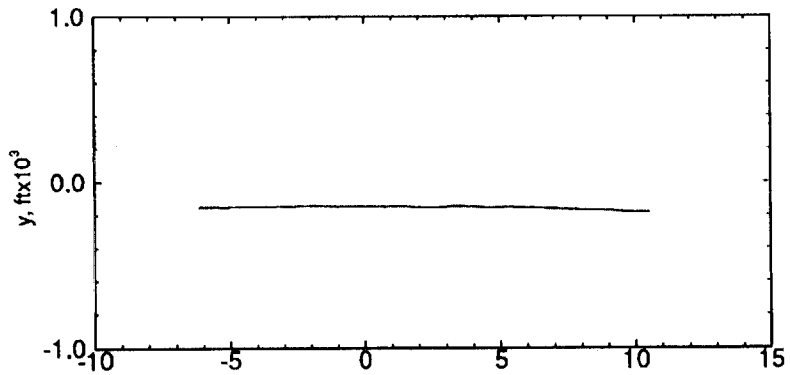
Average Mach number = 0.90

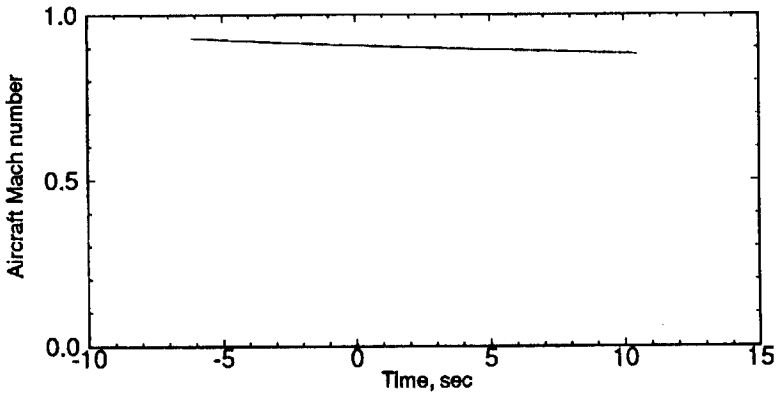
Average acceleration = 0.12 g

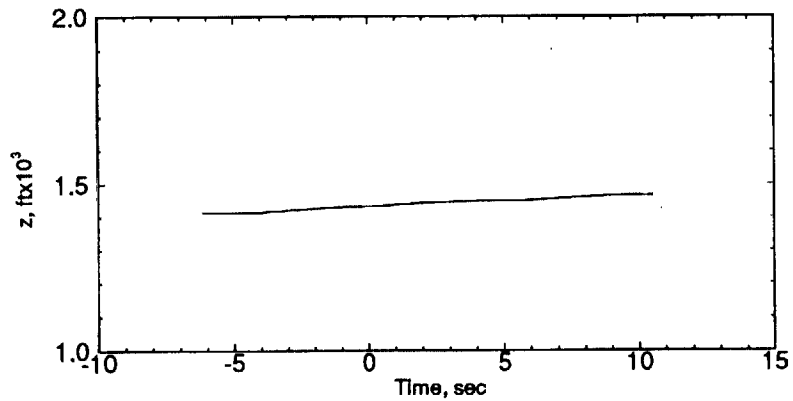
Average altitude = 1488 ft









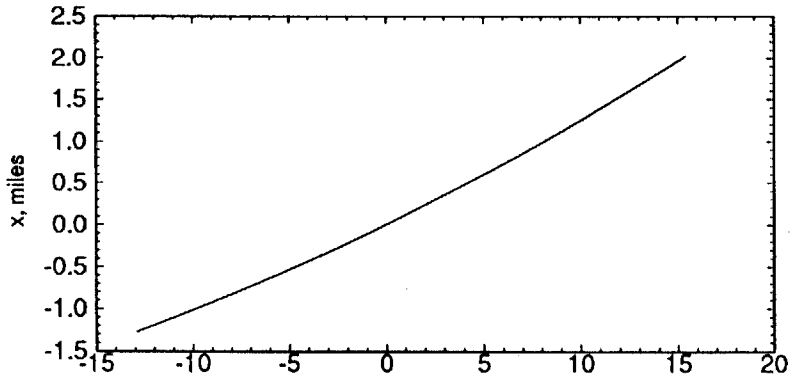


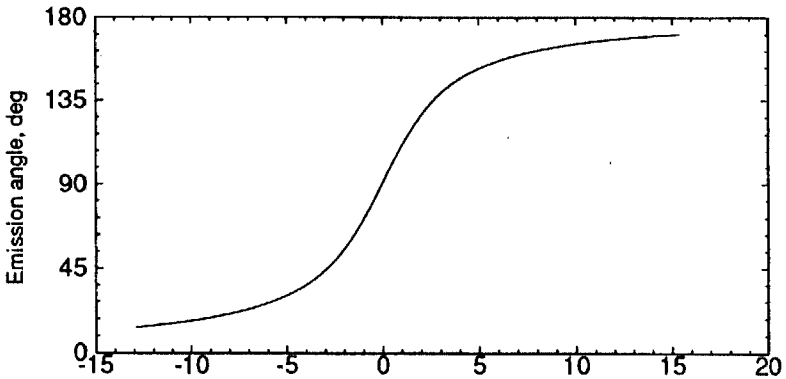
RUN 631

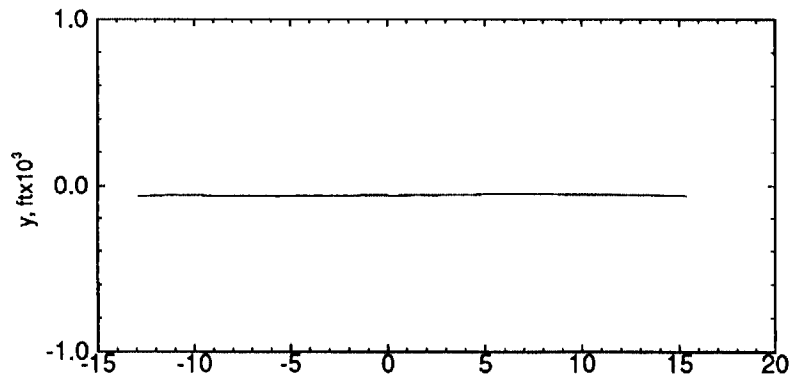
Average Mach number = 0.90

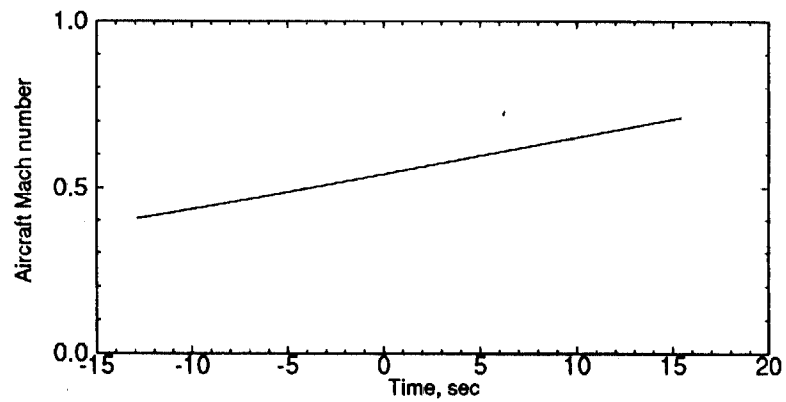
Average acceleration = 0.09 g

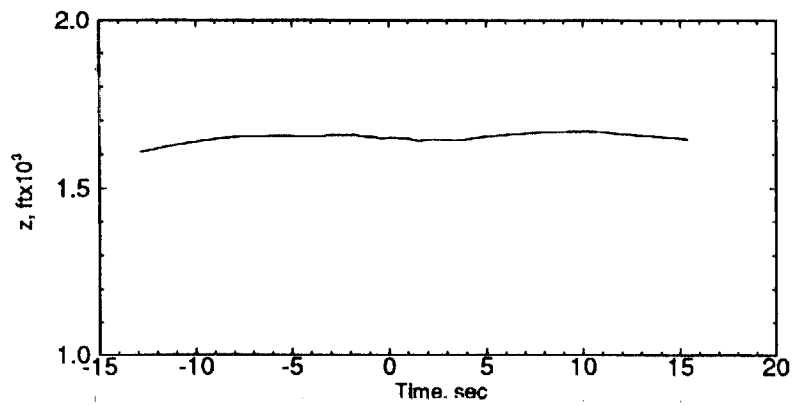
Average altitude = 1440 ft









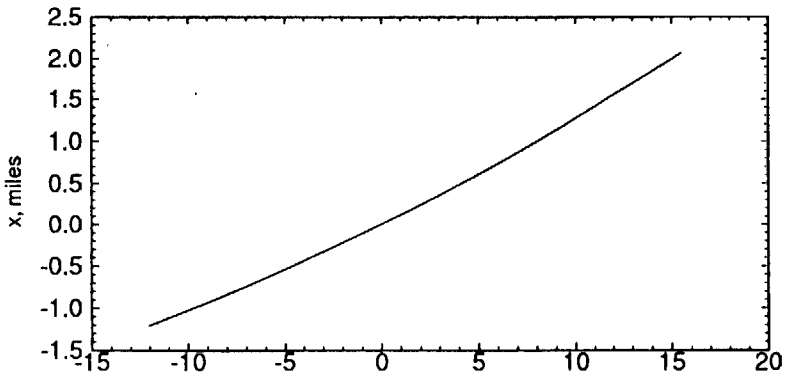


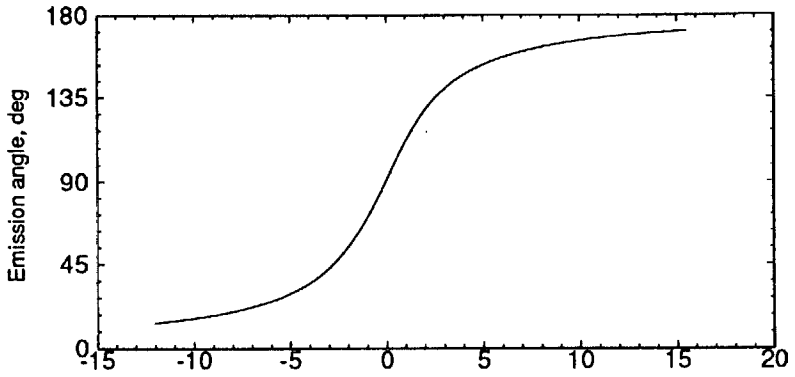
RUN 1101

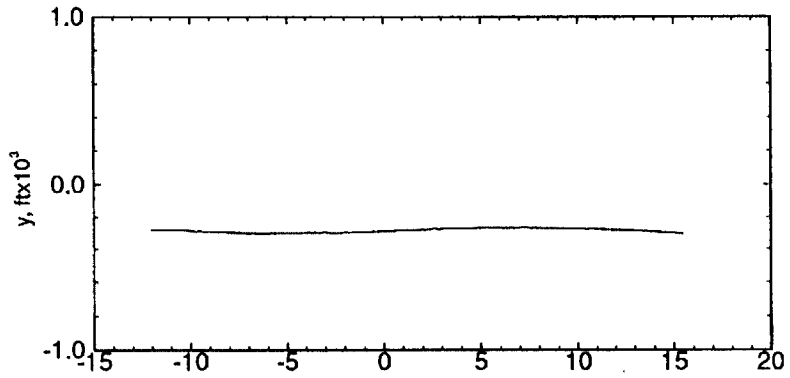
Average Mach number = 0.56

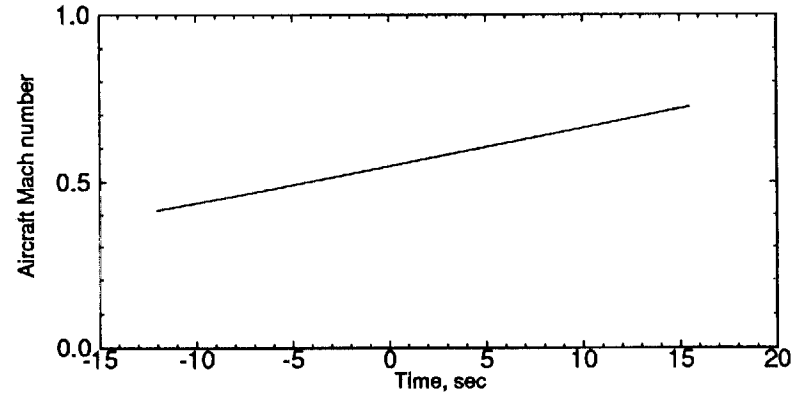
Average acceleration = 0.37 g

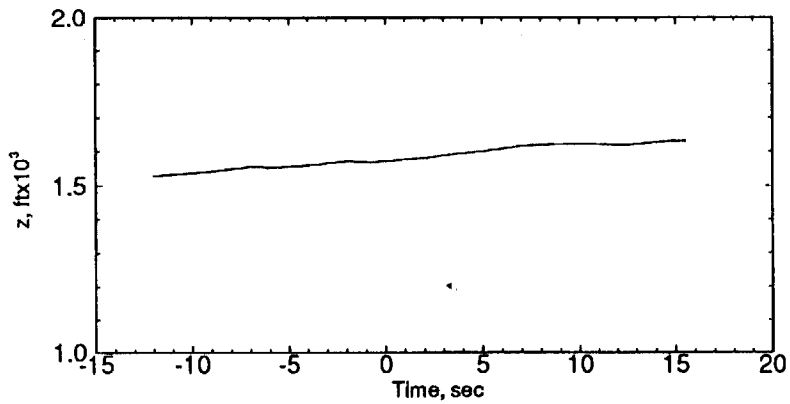
Average altitude = 1650 ft









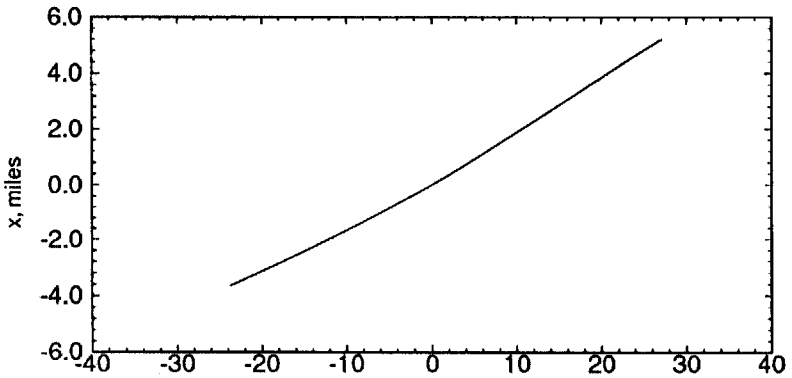


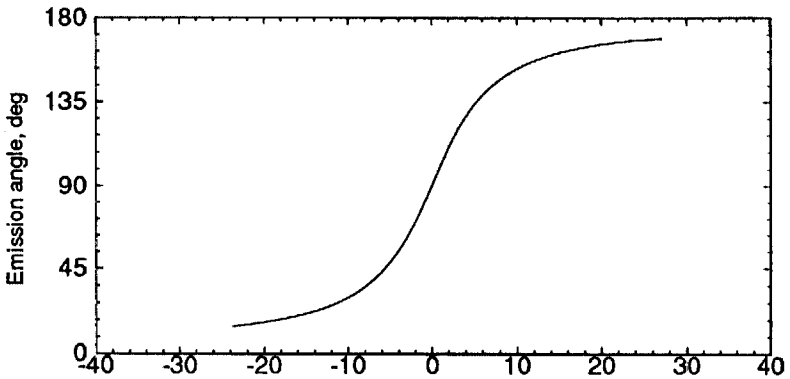
RUN 1102

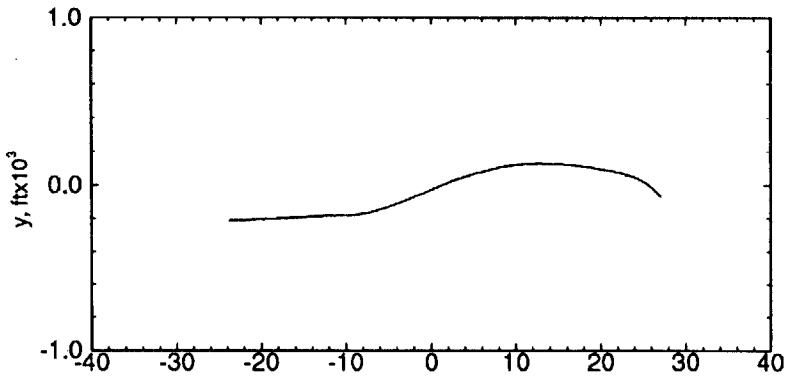
Average Mach number = 0.57

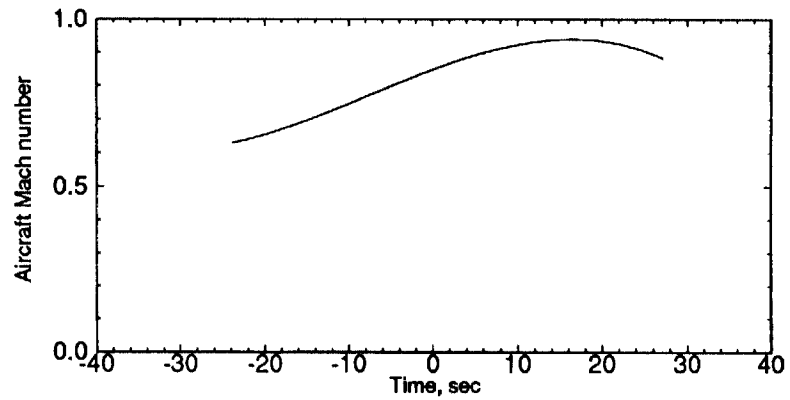
Average acceleration = 0.38 g

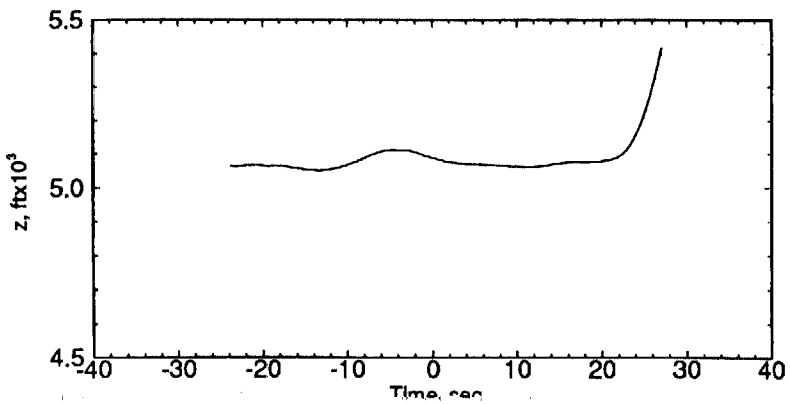
Average altitude = 1585 ft









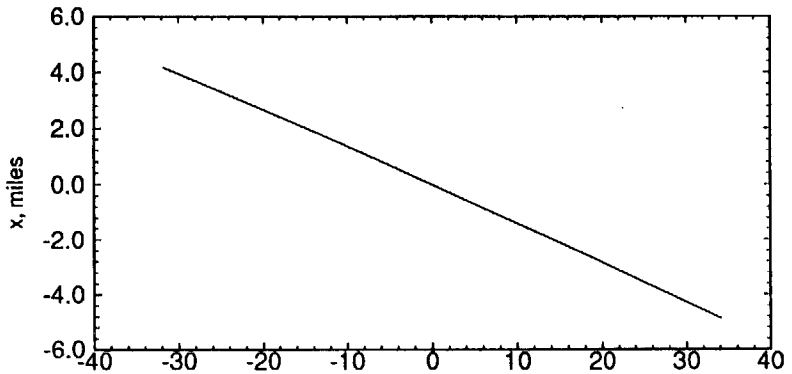


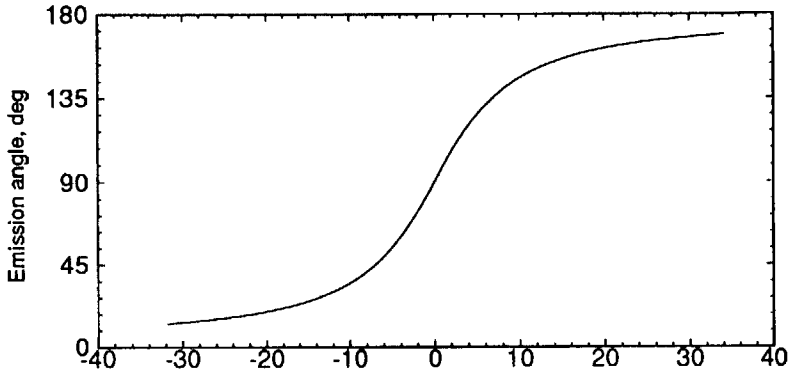
RUN 1201

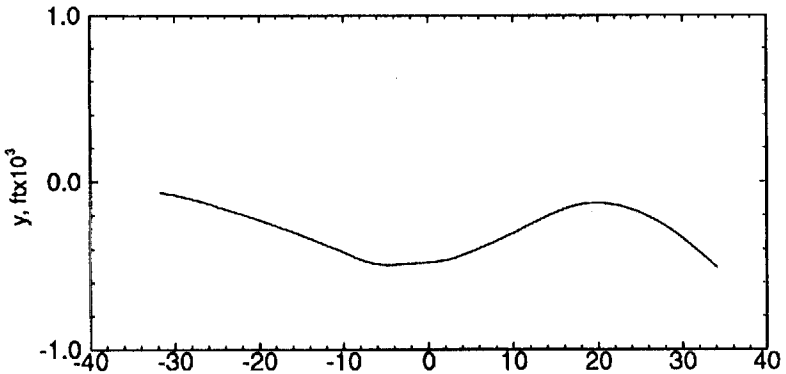
Average Mach number = 0.83

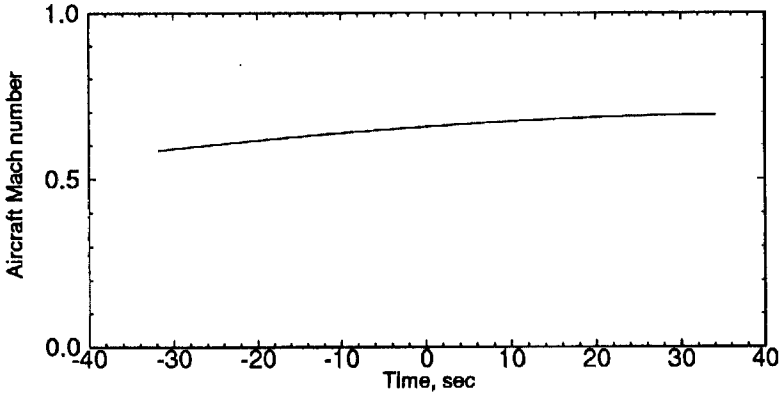
Average acceleration = 0.19 g

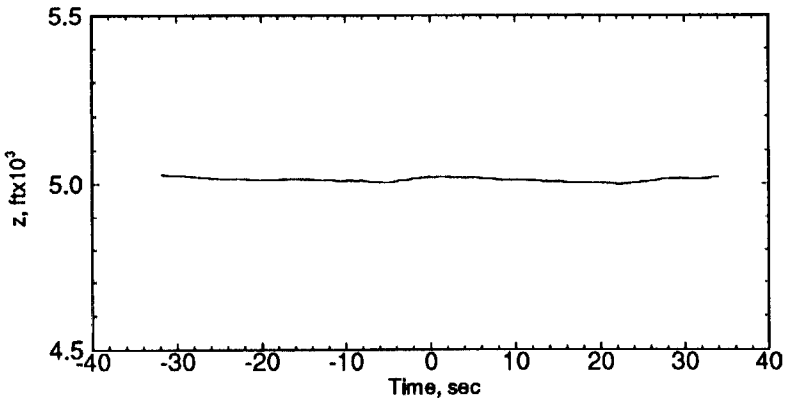
Average altitude = 5088 ft









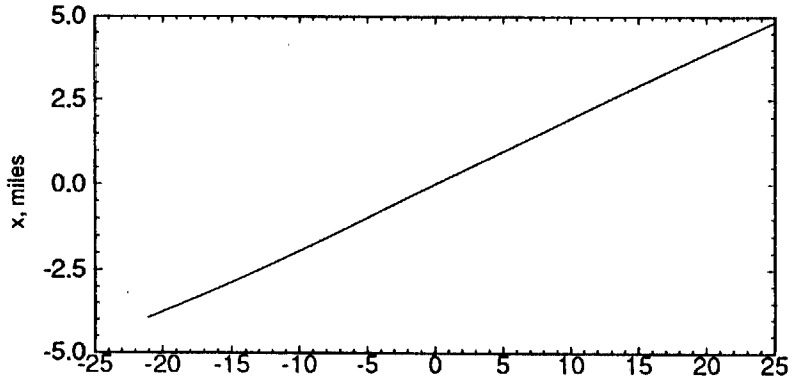


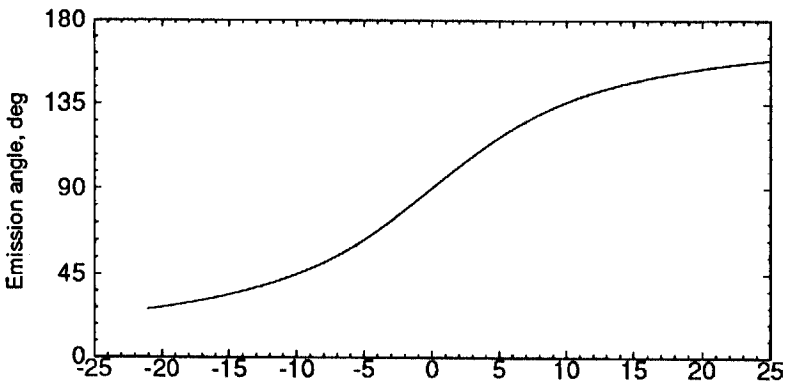
RUN 1202

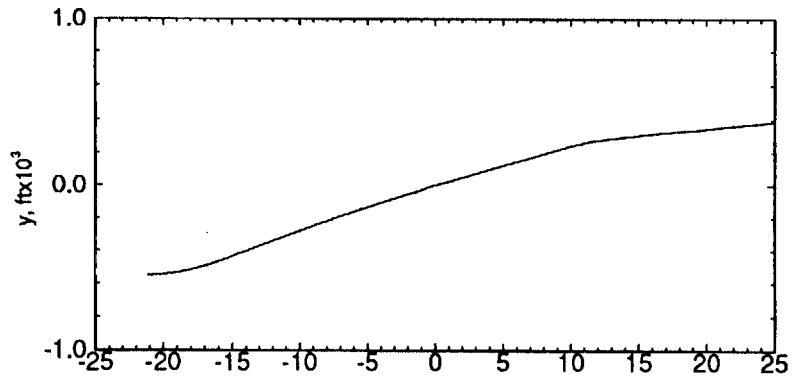
Average Mach number = 0.65

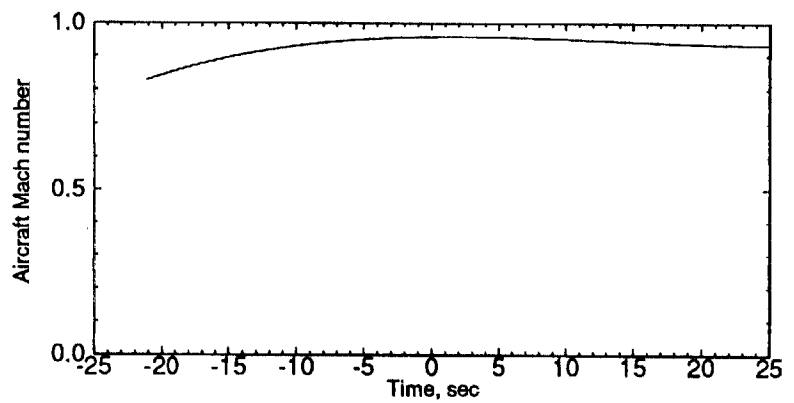
Average acceleration = 0.06 g

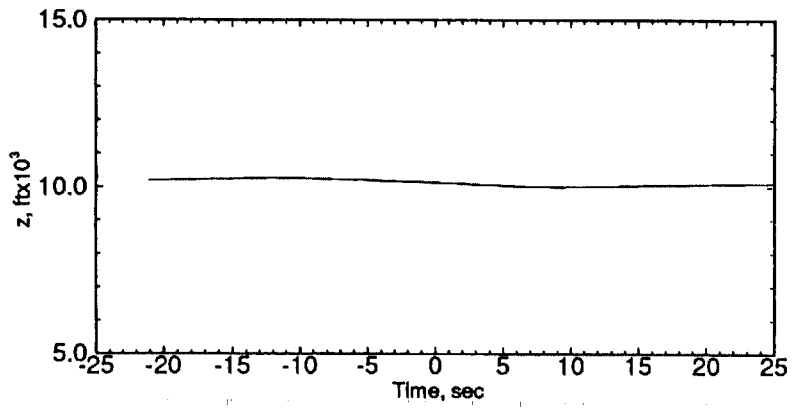
Average altitude = 5012 ft









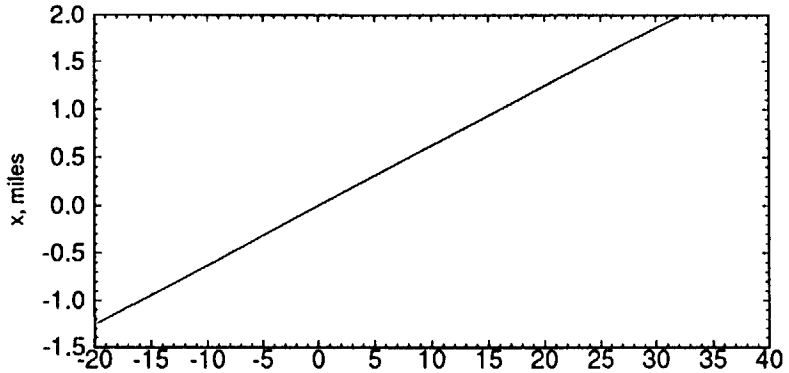


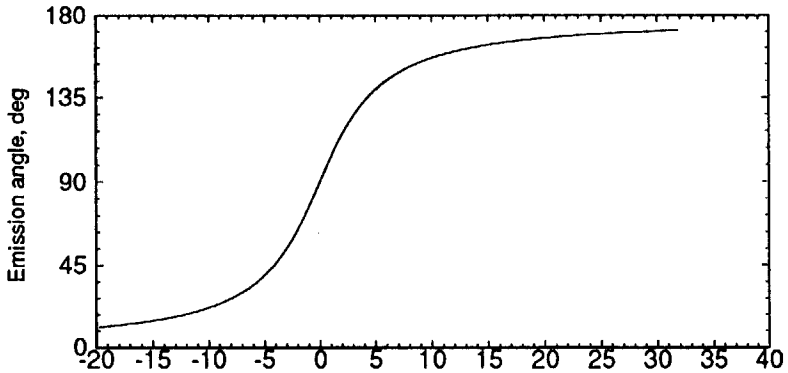
RUN 1301

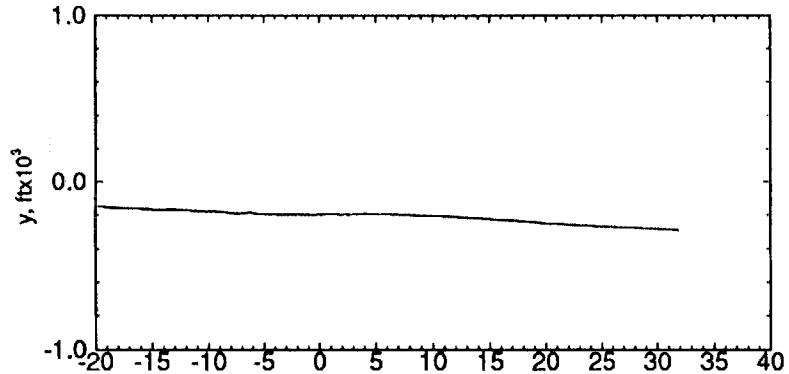
Average Mach number = 0.93

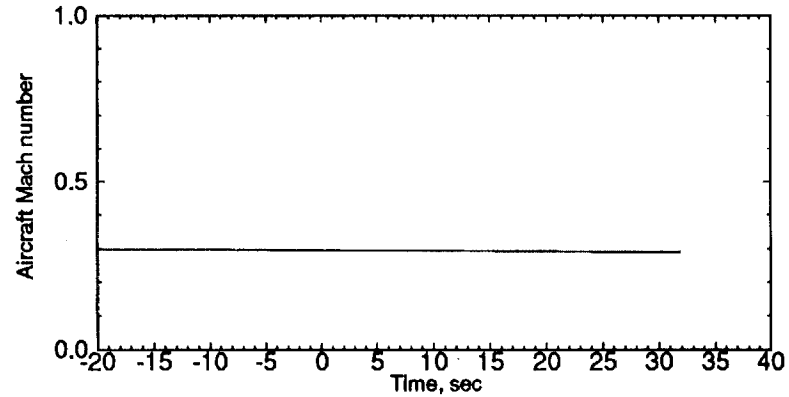
Average acceleration = 0.07 g

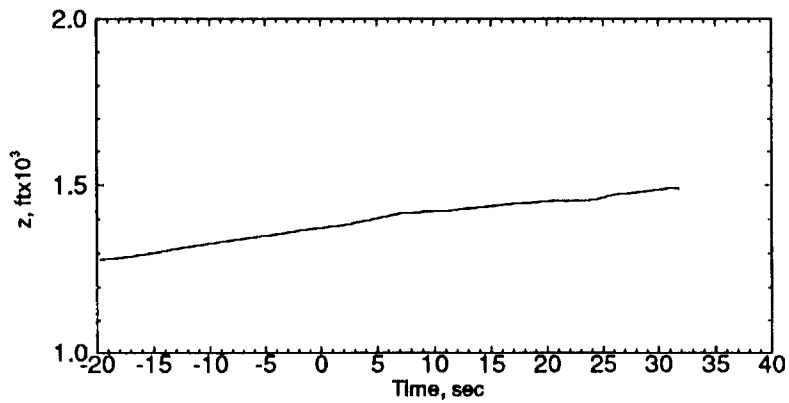
Average altitude = 10135 ft









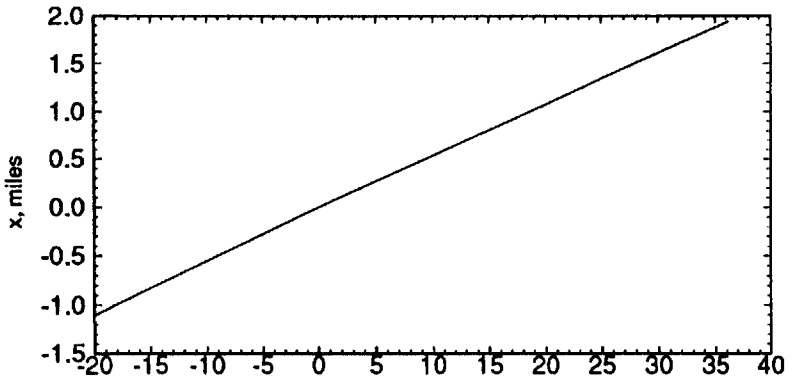


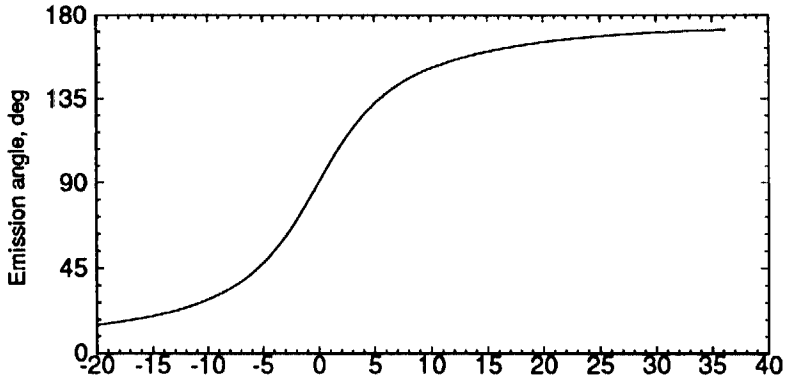
RUN 800

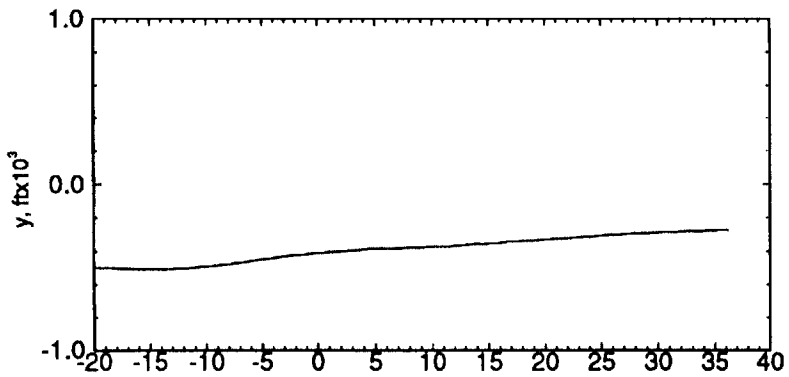
Average Mach number = 0.29

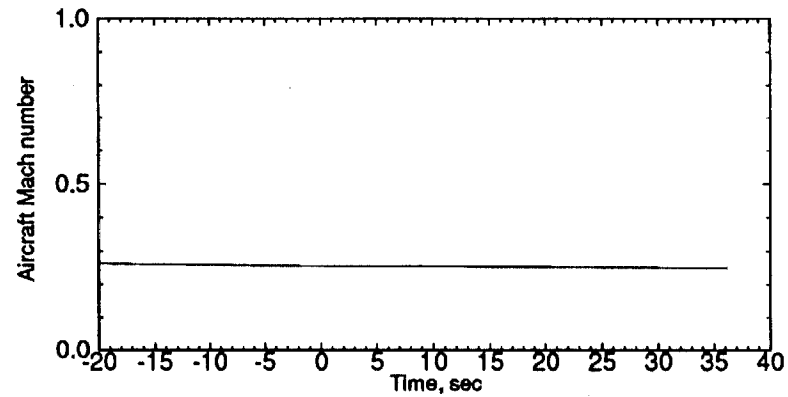
Average acceleration = 0.01 g

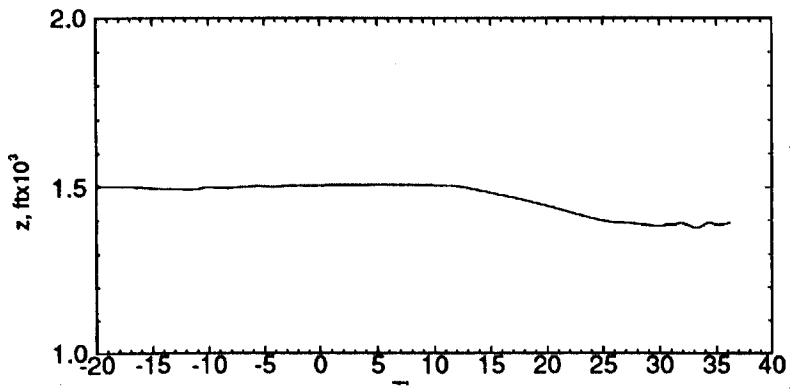
Average altitude = 1396 ft









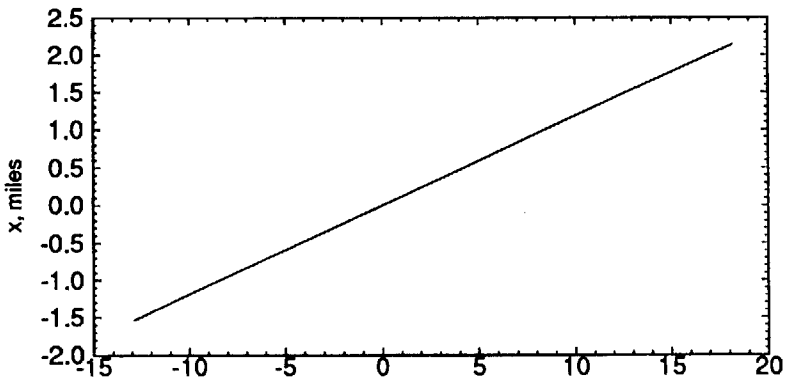


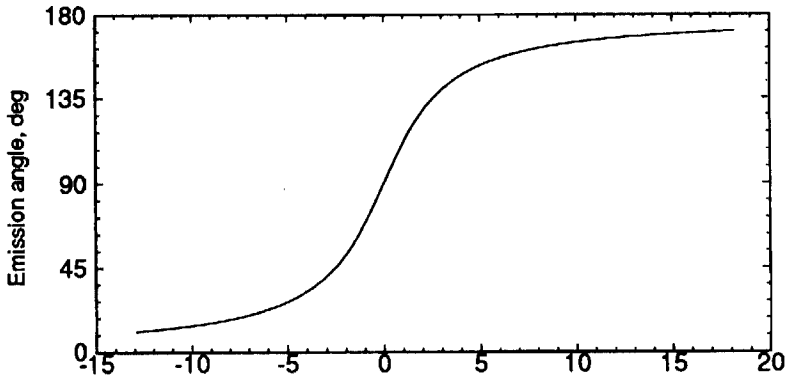
RUN 801

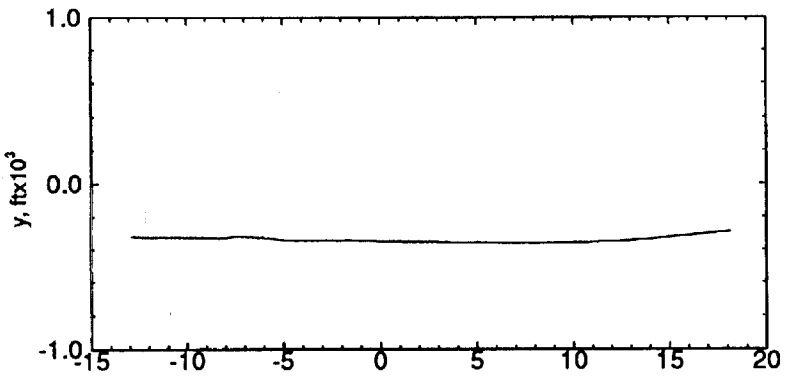
Average Mach number = 0.26

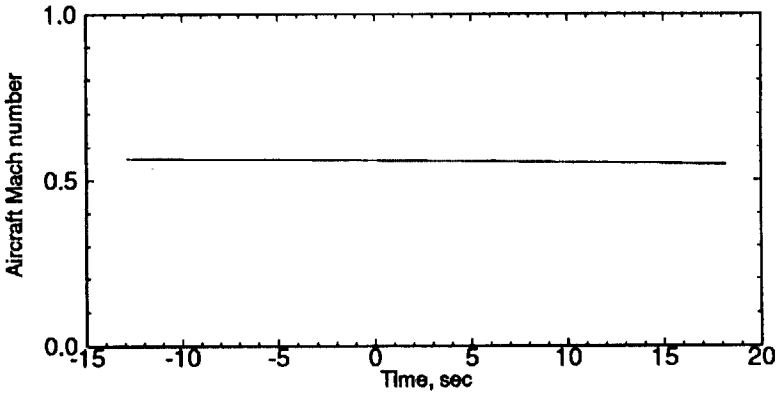
Average acceleration = 0.01 g

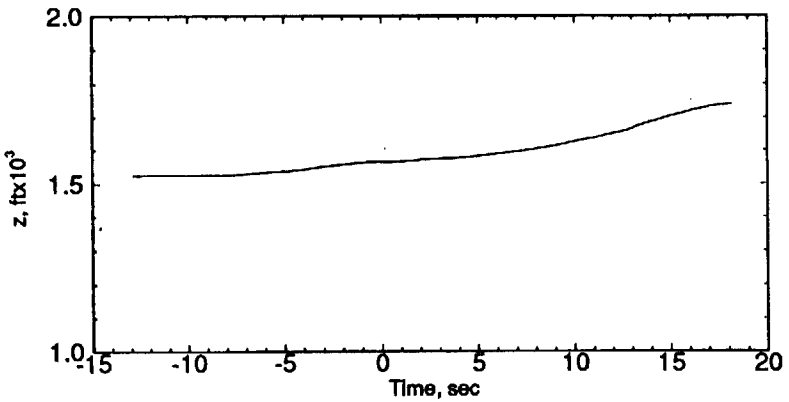
Average altitude = 1469 ft









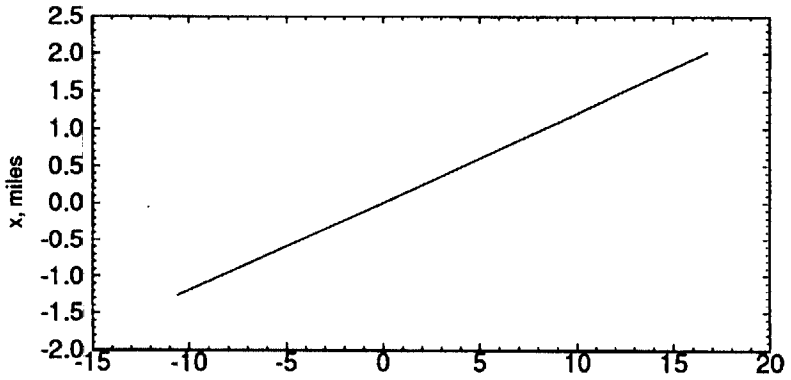


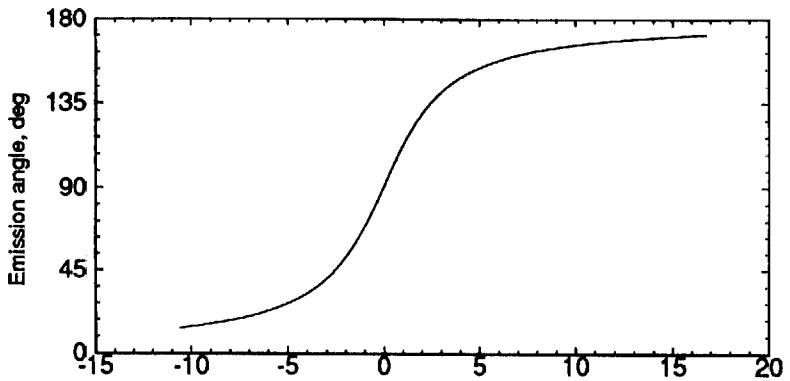
RUN 810

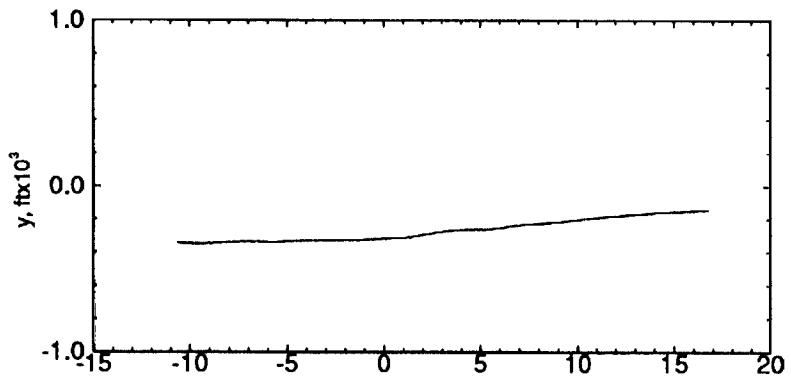
Average Mach number = 0.56

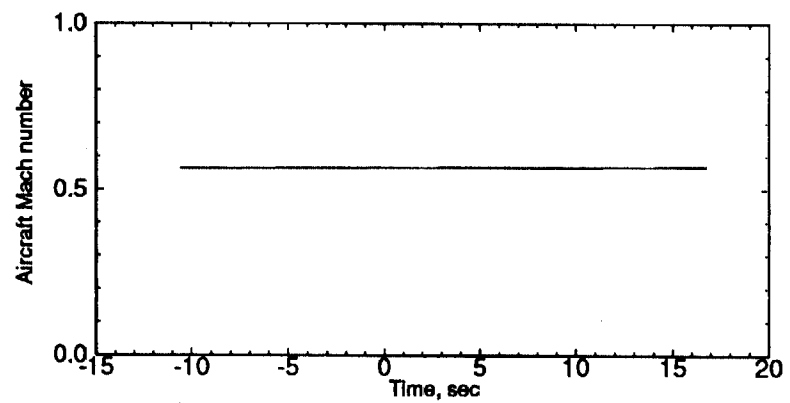
Average acceleration = 0.02 g

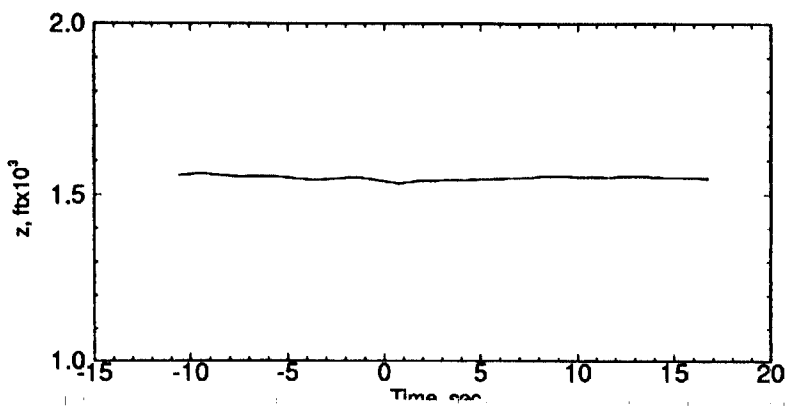
Average altitude = 1592 ft









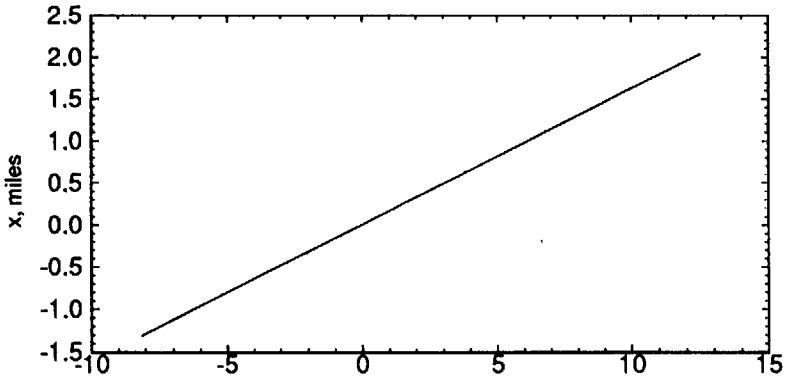


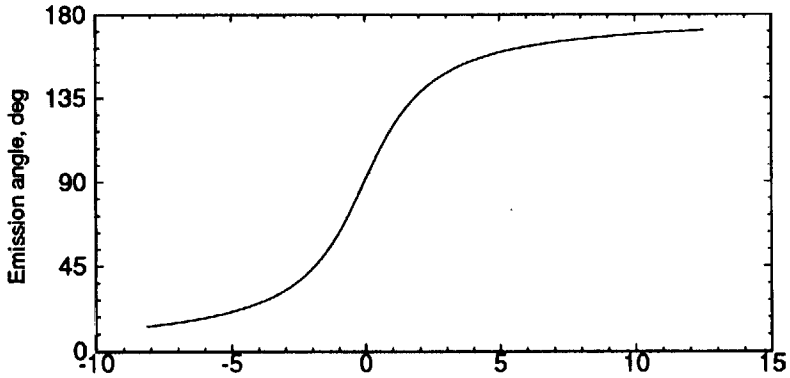
RUN 811

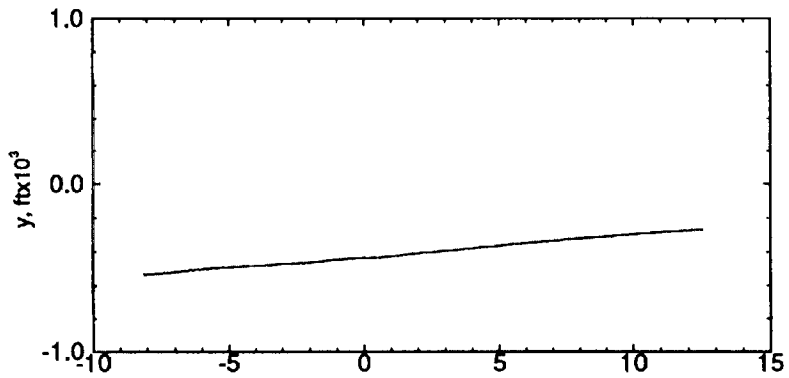
Average Mach number = 0.57

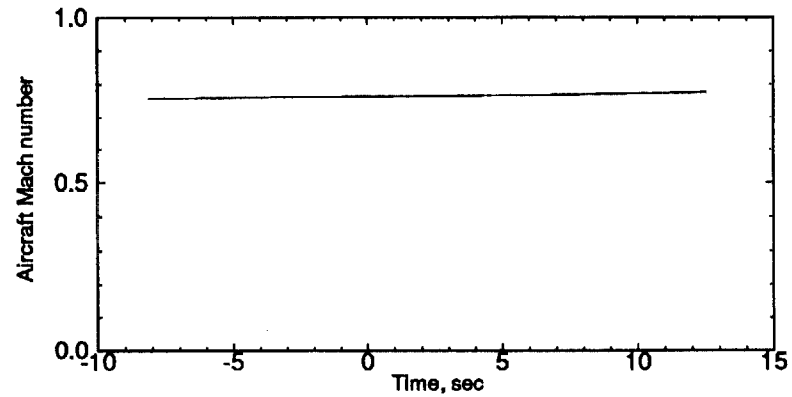
Average acceleration = 0.01 g

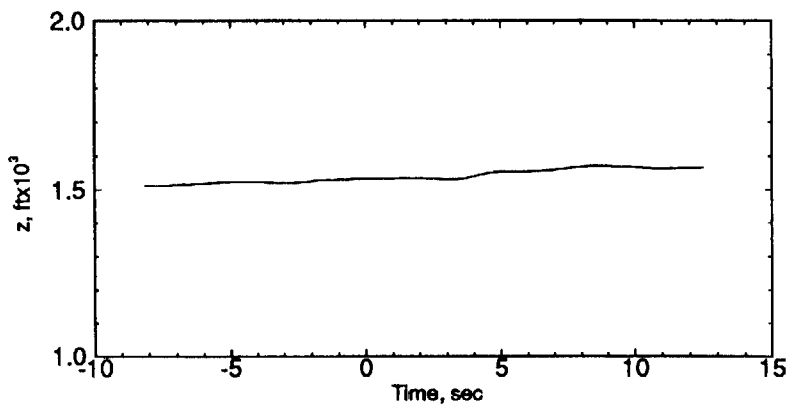
Average altitude = 1550 ft









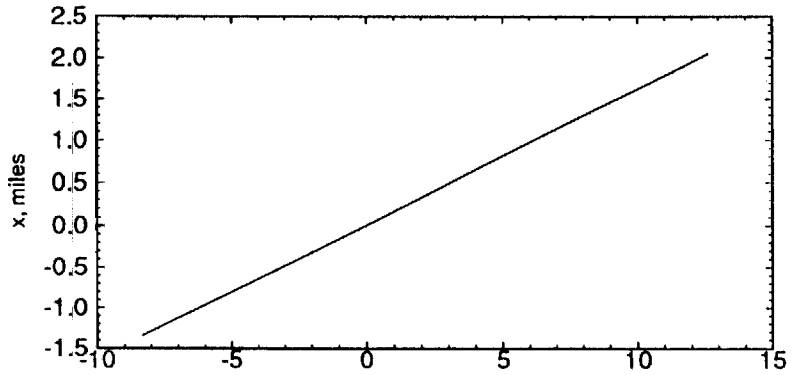


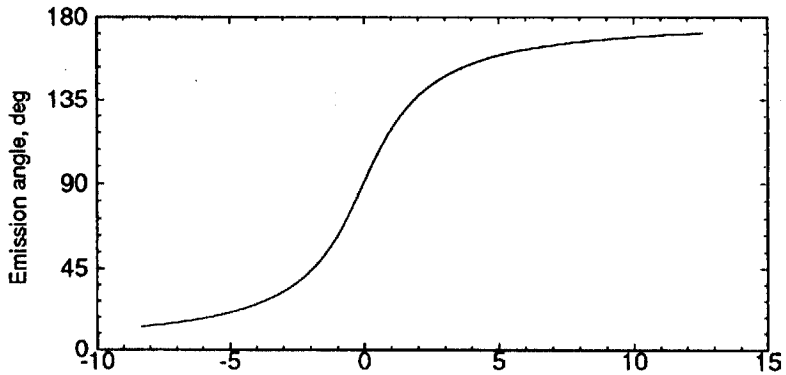
RUN 820

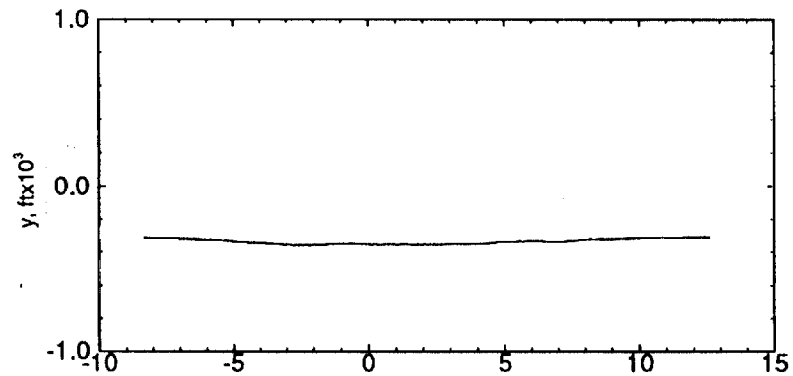
Average Mach number = 0.77

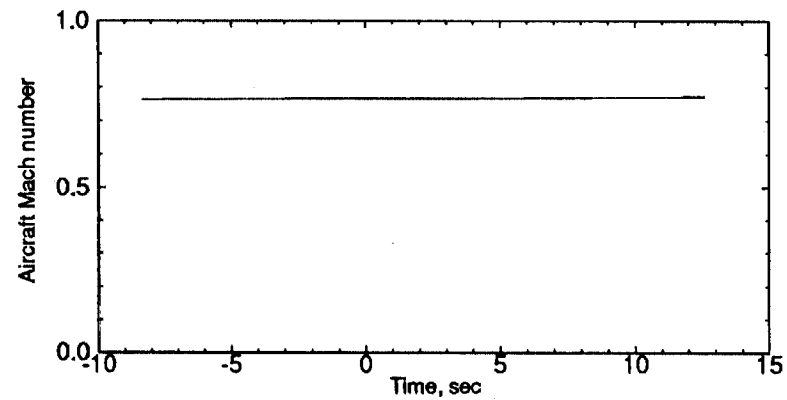
Average acceleration = 0.02 g

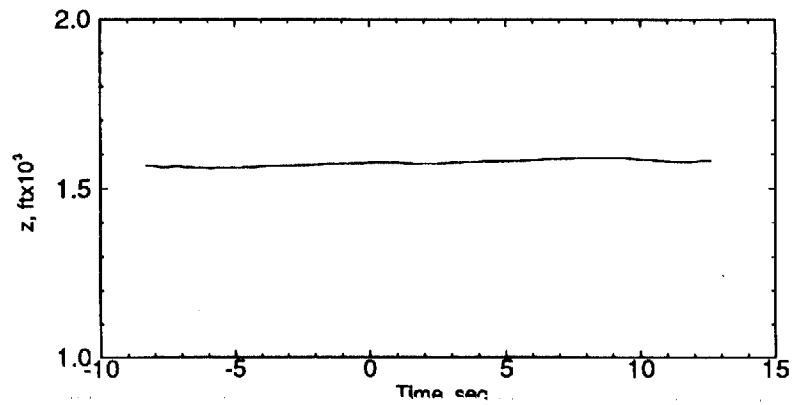
Average altitude = 1541 ft









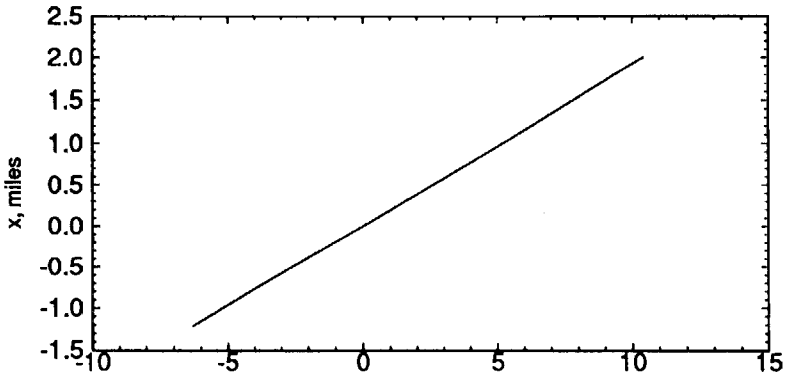


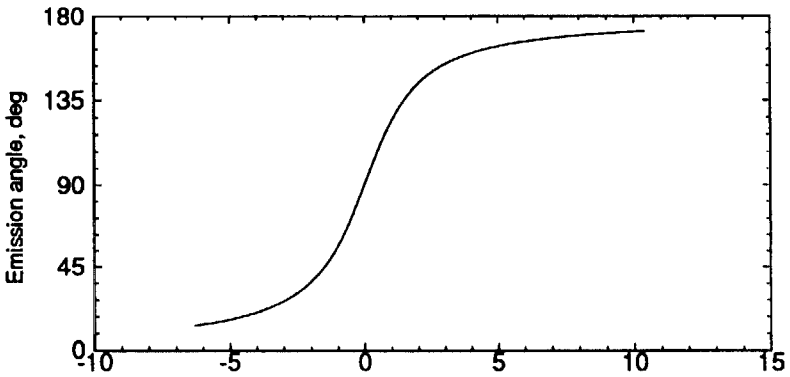
RUN 821

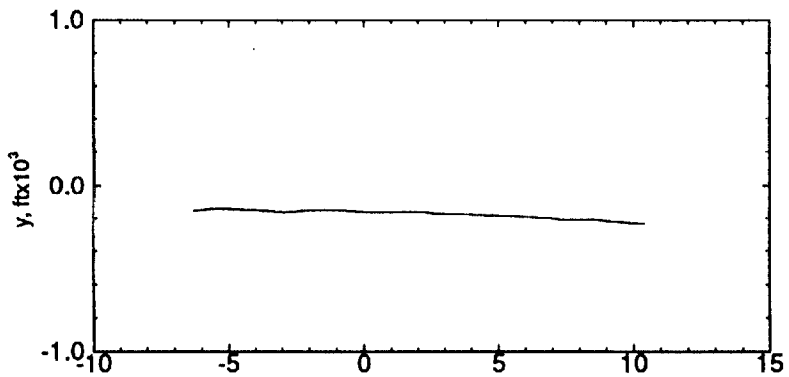
Average Mach number = 0.77

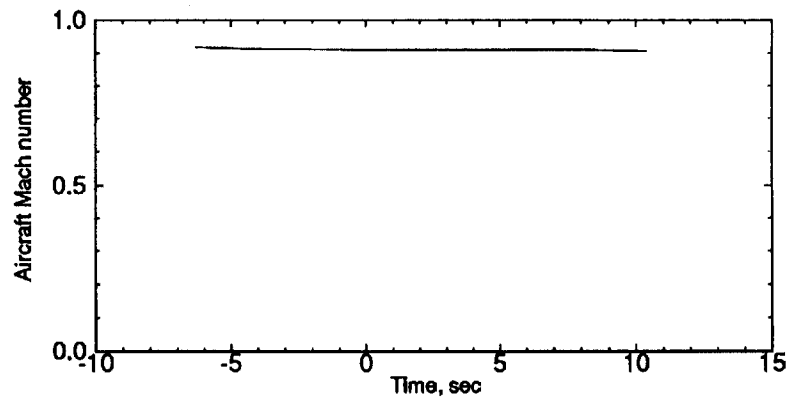
Average acceleration = 0.02 g

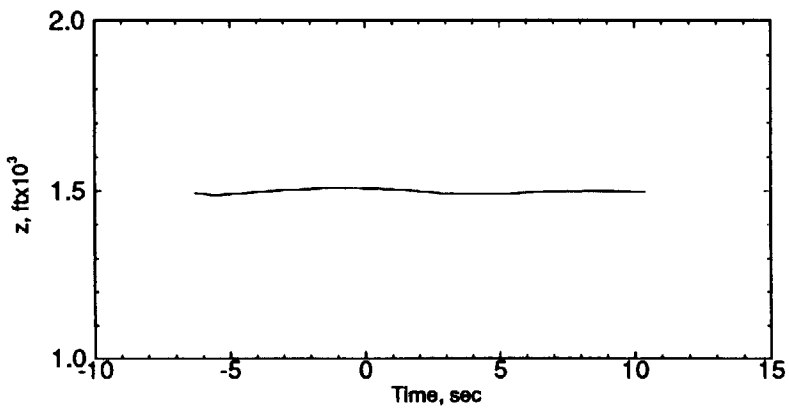
Average altitude = 1575 ft









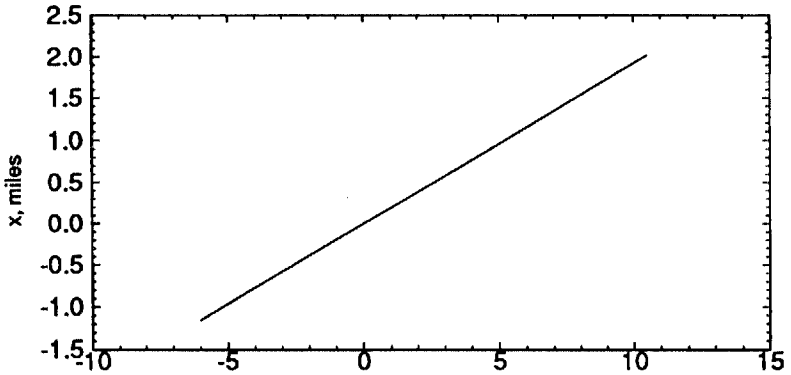


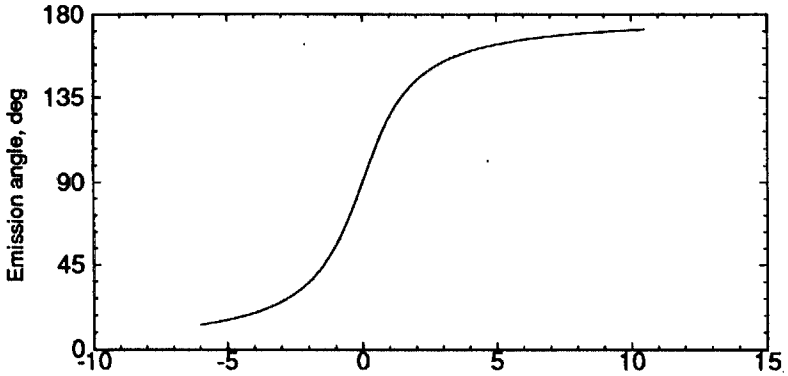
RUN 830

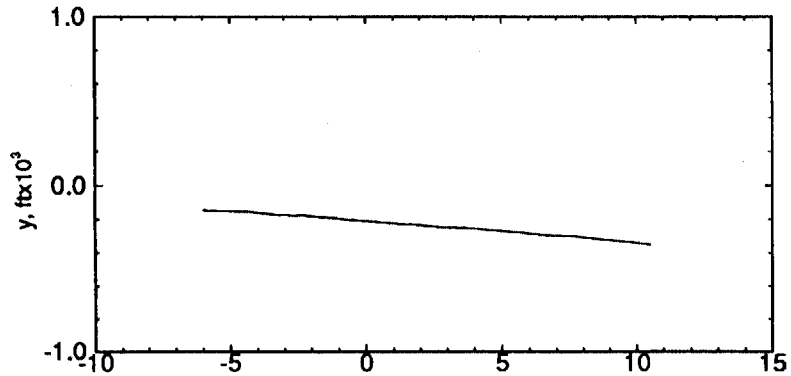
Average Mach number = 0.91

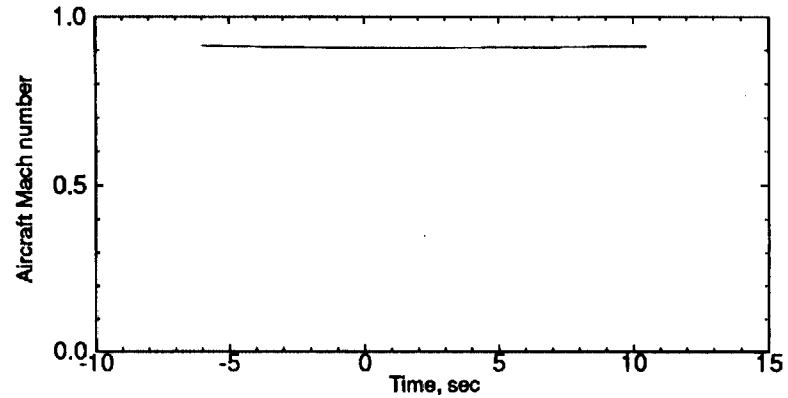
Average acceleration = 0.04 g

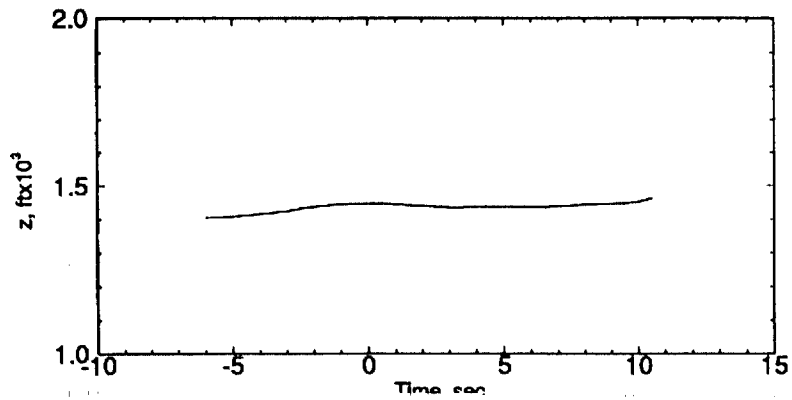
Average altitude = 1498 ft











RUN 831

Average Mach number = 0.91

Average acceleration = 0.04 g

Average altitude = 1435 ft

APPENDIX D

WEATHER DATA

Table D1
F-18 Flight Test Dates

Climb-to-Cruise	Tethered balloon data	Date
103		19 Nov 91
205		19 Nov 91
305		19 Nov 91
409	yes	22 Nov 91
504	yes	22 Nov 91
505	yes	22 Nov 91
ANOPP Validation		
600	yes	20 Nov 91
601	yes	20 Nov 91
603	yes	21 Nov 91
604	yes	21 Nov 91
610	yes	20 Nov 91
612	yes	21 Nov 91
613	yes	21 Nov 91
621	yes	20 Nov 91
622	yes	21 Nov 91
623	yes	21 Nov 91
630	yes	21 Nov 91
631	yes	25 Nov 91

Table D2
F-16XL Flight Test Dates

Climb-to-Cruise	Tethered balloon data	Date
1101	yes	22 Nov 91
1102	yes	22 Nov 91
1201	yes	22 Nov 91
1202	yes	23 Nov 91
1301	yes	22 Nov 91
ANOPP Validation		
800	yes	27 Nov 91
801	yes	27 Nov 91
810	yes	27 Nov 91
811	yes	27 Nov 91
820	yes	27 Nov 91
821	yes	27 Nov 91
830	yes	27 Nov 91
831	yes	27 Nov 91

Table D3 Rawinsonde Data for 19 NOV 91

ALT GEOMFT	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT	ABHUM G/M3	DENSITY G/M3
2372	30	2.0	-2.4	944.70	65	2.86	1209.35
3000	92	16.0	8.3	922.78	36	3.06	1140.28
4000	79	15.5	6.5	889.21	34	2.53	1106.28
5000	61	19.7	4.3	856.64	33	2.13	1074.23
6000	57	18.2	3.5	825.08	27	1.67	1038.10
7000	51	20.4	3.0	794.57	21	1.27	1001.51
8000	40	24.3	4.7	765.25	19	1.30	958.55
9000	40	24.4	3.8	737.13	26	1.66	926.10
10000	27	16.5	3.0	709.91	27	1.63	894.53
11000	11	8.3	1.5	683.62	25	1.35	866.17
12000	346	12.3	.2	658.16	25	1.23	837.96
13000	345	19.9	.6	633.55	23	1.05	809.27
14000	349	21.4	-1.9	609.77	22	0.93	782.50
15000	338	17.4	-3.9	586.74	21	0.77	758.77
16000	323	26.1	-6.4	564.40	22	0.67	736.70
17000	320	29.2	-8.6	542.72	23	0.59	714.34
18000	310	29.9	-10.6	521.71	22	0.50	692.09
19000	314	25.7	-13.5	501.32	25	0.45	672.34
20000	331	21.2	-15.6	481.54	30	0.45	651.01
21000	319	28.6	-17.8	462.40	32	0.41	630.58
22000	323	34.4	-20.6	443.84	35	0.36	612.14
23000	332	36.5	-21.7	425.87	29	0.27	589.83
24000	343	38.3	-24.3	408.51	33	0.25	571.85
25000	350	42.7	-26.1	391.72	32	0.20	552.29
26000	347	55.7	-27.6	375.48	29	0.16	532.57
27000	345	59.3	-28.0	359.90	26	0.14	511.42
28000	341	58.5	-30.5	344.87	26	0.11	495.08
29000	336	57.7	-33.3	330.30	29	0.09	479.76
30000	333	63.9	-36.2	316.19	31	0.08	464.77
31000	334	66.7	-38.9	302.53	32	0.06	449.88
32000	337	63.3	-40.7	289.32	31	0.05	433.65
33000	340	60.5	-43.5	276.56	32	0.04	419.61
34000	341	61.8	-46.5	264.23	33	0.03	406.12
35000	341	63.1	-49.0	252.30	33	0.02	392.13
36000	335	63.3	-51.2	240.79	33	0.02	377.91
37000	322	67.1	-52.0	229.72	33	0.02	361.85
38000	313	74.6	-53.6	219.13	33	0.01	347.64
39000	313	77.5	-56.0	208.93	33	0.01	335.13
40000	319	66.4	-58.3	199.10	33	0.01	322.79

Table D4 Rawinsonde Data for 20 NOV 91

ALT GEOMFT	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT	ABHUM G/M3	DENSITY G/M3
2372	30	2.0	-1.2	944.90	43	1.92	1209.25
3000	48	4.0	7.2	922.87	34	2.68	1145.35
4000	88	9.2	8.9	889.44	28	2.45	1097.29
5000	76	1.5	7.6	857.19	26	2.11	1062.30
6000	312	10.4	10.2	826.13	18	1.68	1014.84
7000	308	15.8	9.8	796.36	18	1.67	979.65
8000	310	16.4	9.3	767.61	27	2.38	945.46
9000	300	14.1	8.0	739.80	27	2.22	915.43
10000	298	14.0	6.6	712.88	32	2.40	886.34
11000	310	18.5	5.3	686.82	33	2.27	857.80
12000	306	20.5	4.0	661.59	28	1.77	830.55
13000	303	20.2	1.3	637.11	32	1.71	807.57
14000	305	20.1	-1.3	613.32	49	2.14	784.76
15000	308	21.5	-3.4	590.23	54	2.06	761.01
16000	314	22.9	-4.5	567.86	41	1.45	735.47
17000	323	23.8	-5.3	546.25	32	1.08	709.88
18000	333	23.9	-7.8	525.36	28	0.77	689.31
19000	333	24.0	-10.6	505.05	33	0.73	669.80
20000	329	24.2	-12.7	485.35	34	0.66	648.88
21000	320	22.7	-15.6	466.24	38	0.58	630.34
22000	306	20.5	-17.7	447.69	37	0.47	610.38
23000	294	21.4	-20.5	429.73	48	0.49	592.20
24000	286	24.6	-22.7	412.31	41	0.35	573.35
25000	291	26.1	-24.9	395.47	48	0.34	554.82
26000	300	24.7	-27.3	379.15	41	0.23	537.17
27000	303	24.1	-30.1	363.35	43	0.19	520.76
28000	301	24.2	-32.8	348.03	46	0.16	504.31
29000	300	26.7	-35.3	333.21	41	0.11	487.92
30000	297	31.3	-37.5	318.87	41	0.09	471.40
31000	296	36.2	-39.7	305.02	42	0.07	455.20
32000	299	40.9	-42.3	291.65	48	0.06	440.03
33000	300	43.7	-44.9	278.72	54	0.06	425.37
34000	300	47.2	-47.1	266.23	55	0.04	410.33
35000	302	50.1	-49.6	254.18	52	0.03	396.11
36000	304	54.2	-52.4	242.54	50	0.02	382.68
37000	305	58.4	-54.0	231.33	49	0.02	367.69
38000	305	62.3	-56.2	220.54	48	0.01	354.17
39000	305	64.2	-58.5	210.15	47	0.01	341.07
40000	304	65.2	-60.7	200.15	46	0.01	328.22

Table D5 Rawinsonde Data for 21 NOV 91

ALT GEOMFT	DIR DEG	SPD KTS	TEMP DEG C	DPT DEG C	PRESS MBS	RH PCT	ABHUM G/M3	DENSITY G/M3
2372	45	5.0	15.8	1.9	936.10	39	5.23	1125.41
3000	16	9.2	13.4	.2	915.11	39	4.53	1109.96
4000	332	4.2	11.3	.3	882.41	45	4.53	1078.04
5000	271	12.8	10.6	.3	850.69	47	4.56	1041.79
6000	275	15.9	12.1	-9.0	820.15	22	2.34	1000.39
7000	276	14.8	9.5	-11.8	790.65	21	1.89	973.41
8000	303	15.4	10.0	-13.8	762.15	17	1.61	936.60
9000	313	22.3	8.5	-14.4	734.60	18	1.54	907.60
10000	313	25.5	6.7	-10.5	707.89	28	2.13	880.02
11000	304	32.3	5.1	-9.2	682.01	35	2.37	852.49
12000	295	33.4	3.3	-8.2	656.93	43	2.58	826.16
13000	294	32.2	1.2	-10.1	632.61	43	2.24	801.96
14000	294	33.3	-1.2	-12.2	608.98	43	1.91	779.02
15000	291	37.9	-3.3	-13.7	586.05	44	1.70	755.59
16000	286	38.3	-6.0	-15.2	563.79	48	1.51	734.35
17000	283	36.8	-7.2	-19.2	542.20	37	1.08	709.51
18000	289	37.3	-9.7	-21.4	521.31	38	0.91	688.93
19000	291	38.1	-12.3	-22.7	501.02	41	0.81	668.63
20000	293	36.2	-14.5	-25.6	481.36	38	0.64	648.05
21000	293	37.2	-16.9	-27.7	462.29	38	0.52	628.13
22000	296	41.0	-19.2	-30.4	443.81	36	0.41	608.61
23000	299	43.2	-21.4	-31.4	425.92	40	0.38	589.27
24000	300	41.2	-23.9	-31.5	408.59	49	0.38	570.83
25000	297	46.2	-26.0	-34.4	391.80	45	0.29	552.09
26000	291	44.9	-28.5	-38.6	375.57	37	0.19	534.76
27000	289	38.9	-31.2	-42.1	359.83	33	0.13	518.13
28000	288	43.8	-33.6	-43.6	344.61	35	0.11	501.00
29000	287	52.0	-36.0	-44.5	329.89	40	0.10	484.51
30000	290	44.7	-38.0	-46.6	315.66	40	0.08	467.65
31000	296	40.7	-40.6	-49.1	301.92	39	0.06	452.32
32000	294	49.9	-42.9	-51.4	288.64	38	0.05	436.63
33000	290	64.0	-45.5	-54.0	275.81	37	0.04	422.15
34000	288	67.4	-48.1	-56.3	263.41	38	0.03	407.76
35000	285	56.5	-50.9	-58.7	251.43	38	0.02	394.02
36000	279	47.2	-53.5	-61.2	239.86	38	0.01	380.44
37000	275	49.3	-55.9	-63.5	228.70	38	0.01	366.78
38000	275	62.5	-58.5	-65.9	217.94	37	0.01	353.71
39000	277	72.7	-61.2	-68.4	207.56	37	0.01	341.09
40000	277	68.9	-63.1	-70.2	197.56	36	0.00	327.60

Table D6 Rawinsonde Data for 22 NOV 91

ALT GEOMFT	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT	ABHUM G/M3	DENSITY G/M3
2372	305	1.0	2.8	939.70	73	4.28	1183.74
3000	81	16.4	9.4	918.07	35	3.14	1129.91
4000	67	15.8	8.9	884.95	30	2.58	1091.61
5000	67	16.0	6.9	852.80	33	2.54	1059.41
6000	68	11.6	5.4	821.64	40	2.80	1025.77
7000	58	7.8	3.4	791.44	45	2.77	995.35
8000	30	3.0	6.7	762.35	18	1.33	948.19
9000	319	7.4	6.4	734.54	16	1.20	914.71
10000	328	10.5	4.6	707.61	16	1.07	887.03
11000	337	13.2	2.2	681.47	16	0.89	861.64
12000	325	15.0	0.4	656.12	25	1.25	834.73
13000	333	14.7	0.3	631.58	18	0.86	805.92
14000	340	15.7	-2.5	607.85	18	0.74	782.08
15000	328	19.1	-4.3	584.84	17	0.62	757.55
16000	330	25.0	-5.7	562.59	18	0.59	732.42
17000	330	30.9	-6.9	541.07	19	0.57	707.60
18000	326	36.4	-8.4	520.29	19	0.49	684.36
19000	322	40.7	-9.8	500.16	18	0.44	661.46
20000	316	42.1	-12.5	480.67	19	0.37	642.34
21000	308	42.3	-14.6	461.78	18	0.30	622.03
22000	300	43.8	-17.5	443.46	18	0.24	604.22
23000	304	42.9	-20.3	425.68	18	0.19	586.36
24000	306	42.2	-23.0	408.42	19	0.16	568.60
25000	309	38.7	-25.5	391.69	20	0.13	550.88
26000	310	39.1	-28.5	375.47	20	0.11	534.50
27000	310	39.1	-31.2	359.75	21	0.08	517.92
28000	309	39.4	-33.8	344.52	21	0.07	501.36
29000	304	41.1	-36.6	329.77	22	0.05	485.66
30000	301	40.8	-39.0	315.50	22	0.04	469.37
31000	300	40.6	-41.7	301.71	22	0.03	454.05
32000	302	42.7	-44.3	288.37	23	0.03	439.04
33000	307	47.1	-46.9	275.47	24	0.02	424.09
34000	314	50.5	-49.1	263.02	25	0.02	409.00
35000	317	51.7	-51.8	251.01	25	0.01	394.98
36000	318	52.1	-53.9	239.43	25	0.01	380.44
37000	318	55.1	-56.8	228.25	26	0.01	367.56
38000	323	60.5	-59.2	217.47	26	0.01	354.15
39000	328	63.7	-60.2	207.11	27	0.00	338.87

Table D7 Rawinsonde Data for 23 NOV 91

ALT GEOMFT	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT	ABHUM G/M3	DENSITY G/M3
2372	20	5.0	2.8	947.30	42	2.46	1194.40
3000	84	16.0	6.8	925.34	25	1.89	1150.42
4000	94	19.5	6.1	891.57	21	1.52	1111.42
5000	83	18.6	5.3	858.92	22	1.51	1073.70
6000	77	19.1	2.7	827.28	23	1.32	1043.89
7000	70	16.2	1.3	796.56	25	1.33	1010.17
8000	88	14.0	2.5	766.96	19	1.10	968.70
9000	95	7.2	5.1	738.73	17	1.17	924.36
10000	11	1.5	3.8	711.55	18	1.10	894.52
11000	341	7.5	3.4	685.27	17	1.04	862.62
12000	350	9.4	2.2	659.95	19	1.06	834.21
13000	350	9.4	.2	635.38	20	0.94	810.51
14000	336	14.6	-2.5	611.52	26	1.04	786.58
15000	323	18.7	-4.5	588.38	35	1.23	762.33
16000	325	12.0	-6.7	565.95	35	1.04	739.32
17000	345	10.5	-9.1	544.18	35	0.88	717.54
18000	331	18.3	-11.4	523.05	35	0.74	695.78
19000	318	22.8	-13.5	502.58	37	0.67	673.92
20000	310	20.9	-15.9	482.75	36	0.54	653.35
21000	302	21.1	-18.3	463.53	36	0.44	633.29
22000	301	21.5	-21.1	444.89	50	0.49	614.63
23000	315	16.4	-24.0	426.79	56	0.43	596.48
24000	313	20.3	-25.7	409.26	71	0.47	575.90
25000	303	29.1	-27.8	392.34	74	0.40	556.80
26000	302	29.2	-29.9	375.97	73	0.33	538.28
27000	303	26.8	-32.3	360.15	68	0.25	520.76
28000	303	26.7	-34.7	344.85	62	0.18	503.71
29000	299	29.5	-37.0	330.04	61	0.14	486.90
30000	295	32.4	-39.5	315.73	60	0.11	470.78
31000	293	35.0	-42.1	301.90	59	0.08	455.06
32000	297	35.4	-44.4	288.54	56	0.06	439.35
33000	304	33.8	-47.2	275.63	55	0.04	424.93
34000	307	32.4	-49.7	263.15	55	0.03	410.18
35000	309	32.3	-52.1	251.11	52	0.02	395.82
36000	312	33.6	-54.7	239.49	51	0.02	381.99
37000	314	34.5	-57.0	228.29	49	0.01	367.86
38000	313	35.6	-58.7	217.51	48	0.01	353.42
39000	307	37.4	-59.0	207.19	48	0.01	337.00
40000	304	40.5	-59.6	197.34	47	0.01	321.98

Table D8 Rawinsonde Data for 25 NOV 91

ALT GEOMFT	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT	ABHUM G/M3	DENSITY G/M3
2372	120	3.0	19.4	935.90	21	3.50	1112.34
3000	87	7.5	16.4	915.11	19	2.63	1099.57
4000	50	5.6	15.1	882.76	20	2.54	1065.32
5000	100	4.3	13.4	851.40	22	2.57	1033.38
6000	319	4.6	12.4	821.03	27	2.93	999.87
7000	325	12.9	10.7	791.58	26	2.54	970.00
8000	330	14.7	10.6	763.12	31	2.98	935.12
9000	329	15.5	9.1	735.62	31	2.74	906.30
10000	340	16.0	7.1	708.92	25	1.92	879.96
11000	346	17.4	5.8	683.06	22	1.54	852.21
12000	337	15.2	3.7	657.97	22	1.34	827.29
13000	326	15.4	1.6	633.62	22	1.18	802.84
14000	317	18.6	0.7	609.97	22	1.01	779.45
15000	307	22.2	-2.0	587.08	19	0.81	753.76
16000	303	23.6	-4.5	564.87	18	0.64	732.10
17000	303	25.2	-6.8	543.32	20	0.59	710.30
18000	306	25.5	-8.6	522.43	19	0.50	687.70
19000	311	25.6	-11.2	502.18	21	0.45	667.64
20000	314	25.2	-13.7	482.52	18	0.33	647.81
21000	314	25.4	-16.2	463.46	20	0.29	628.22
22000	317	25.0	-19.0	444.97	22	0.26	609.76
23000	320	23.0	-21.8	427.02	24	0.22	591.69
24000	318	22.6	-24.4	409.60	26	0.20	573.45
25000	323	25.3	-27.0	392.74	30	0.17	555.67
26000	327	27.8	-29.5	376.40	34	0.16	538.05
27000	323	29.0	-31.9	360.58	38	0.14	520.53
28000	321	31.0	-34.6	345.27	47	0.14	504.11
29000	319	32.9	-36.9	330.46	46	0.11	487.19
30000	323	32.6	-39.5	316.14	45	0.08	471.27
31000	329	31.9	-42.4	302.28	45	0.06	456.43
32000	337	33.3	-45.0	288.87	44	0.04	441.16
33000	344	36.9	-47.5	275.91	42	0.03	425.89
34000	347	38.6	-50.4	263.38	41	0.02	411.88
35000	345	45.5	-52.1	251.31	41	0.02	396.04
36000	344	52.1	-54.7	239.68	40	0.01	382.21
37000	341	59.7	-57.2	228.46	40	0.01	368.51
38000	338	60.9	-59.0	217.67	40	0.01	354.15
39000	333	64.9	-60.9	207.29	39	0.01	340.24
40000	331	55.1	-62.9	197.32	39	0.00	326.99

Table D9 Rawinsonde Data for 27 NOV 91

ALT GEOMFT	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT	ABHUM G/M3	DENSITY G/M3
2372	165	1.0	3.8	932.50	35	2.19	1171.63
3000	258	22.7	16.3	911.44	27	3.70	1094.76
4000	267	18.2	15.3	879.27	20	2.61	1060.42
5000	287	21.1	13.8	848.03	19	2.32	1027.99
6000	294	19.0	12.5	817.78	20	2.23	995.97
7000	283	17.7	11.3	788.49	20	2.03	964.63
8000	274	21.7	9.3	760.09	21	1.87	936.44
9000	274	24.2	7.2	732.50	20	1.59	909.32
10000	276	26.8	5.0	705.73	23	1.57	883.07
11000	267	29.0	2.6	679.71	27	1.58	857.69
12000	264	33.2	0.4	654.46	24	1.22	832.67
13000	273	33.5	-2.1	629.93	27	1.12	808.86
14000	278	34.7	-4.5	606.12	30	1.05	785.30
15000	270	35.1	-7.1	582.99	30	0.89	762.89
16000	270	36.2	-8.7	560.55	25	0.65	738.19
17000	262	37.5	-11.0	538.83	26	0.56	715.59
18000	254	39.9	-12.3	517.82	22	0.43	691.32
19000	251	44.2	-13.8	497.49	20	0.36	668.18
20000	253	46.8	-15.7	477.85	20	0.30	646.47
21000	252	47.6	-18.5	458.80	20	0.24	627.57
22000	253	49.6	-19.7	440.37	20	0.22	605.16
23000	255	57.3	-21.7	422.58	21	0.20	585.29
24000	251	47.8	-24.0	405.36	21	0.16	566.77
25000	256	56.9	-26.6	388.69	22	0.13	549.14
26000	257	73.3	-29.1	372.54	23	0.11	531.77
27000	255	58.9	-31.4	356.92	23	0.09	514.34
28000	254	51.3	-33.9	341.80	24	0.07	497.70
29000	255	70.2	-36.6	327.16	30	0.07	481.89
30000	256	78.1	-39.5	313.00	38	0.07	466.63
31000	255	59.9	-40.9	299.30	36	0.06	448.94
32000	256	53.5	-42.5	286.14	35	0.05	432.22
33000	259	73.3	-44.7	273.46	35	0.04	416.95
34000	259	92.1	-47.1	261.22	36	0.03	402.54
35000	260	82.9	-49.3	249.41	35	0.02	388.13
36000	259	67.3	-51.8	238.01	36	0.02	374.54
37000	258	72.1	-54.5	227.01	35	0.01	361.70
38000	258	71.9	-57.4	216.39	35	0.01	349.33
39000	258	74.8	-60.2	206.13	35	0.01	337.18
40000	258	77.0	-60.2	196.28	35	0.01	321.12

Table D10 Tethered Balloon Data for 20 Nov 91
(Runs 600, 601, 610, 621)

ALT AGL	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT
0.	248.	1.0	1.1	1030.00	47.
100.	328.	3.6	2.3	1025.60	41.
200.	36.	2.3	3.4	1022.40	43.
300.	208.	1.7	4.0	1017.90	45.
400.	59.	2.5	5.1	1014.80	42.
500.	328.	5.5	6.3	1010.40	43.
600.	321.	3.8	6.9	1007.10	42.
700.	290.	3.1	7.3	1002.80	42.
800.	157.	0.8	7.4	999.70	42.
900.	83.	2.3	7.7	995.80	41.
1000.	38.	5.8	8.6	991.70	40.
1100.	15.	4.8	8.6	988.30	41.
1200.	18.	4.3	8.6	985.10	42.
1300.	36.	4.3	8.5	981.00	43.
1400.	34.	4.1	8.3	978.00	44.
1500.	30.	3.8	8.1	973.90	45.

Table D11 Tethered Balloon Data for 21 Nov 91
(Runs 603, 604, 612, 613, 622, 623, 630)

ALT AGL	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT
0.	184.	3.7	9.0	1020.00	46.
100.	197.	8.3	10.9	1016.20	40.
200.	173.	7.3	10.8	1012.50	43.
300.	206.	7.6	10.9	1008.50	44.
400.	205.	4.6	11.2	1004.70	44.
500.	235.	4.7	11.1	1001.20	45.
600.	292.	4.7	11.4	997.40	44.
700.	279.	7.4	11.3	994.20	46.
800.	275.	12.6	12.1	990.20	45.
900.	294.	11.5	12.7	986.70	45.
1000.	294.	11.6	12.7	983.20	47.

Table D12 Tethered Balloon Data for 22 Nov 91
(Runs 409, 504, 505)

ALT AGL	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT
0.	305.	4.7	0.8	1023.20	43.
100.	24.	8.8	5.3	1019.20	33.
200.	41.	8.6	6.7	1015.40	35.
300.	87.	9.9	8.1	1011.80	33.
400.	75.	15.3	9.0	1008.00	33.
500.	25.	18.8	9.2	1004.30	34.
600.	17.	21.0	9.0	1000.80	35.
700.	9.	21.0	9.9	996.20	31.
800.	11.	18.4	10.1	993.30	31.
900.	16.	15.7	10.1	989.40	31.
1000.	15.	13.3	9.9	986.20	32.

Table D13 Tethered Balloon Data for 22 Nov 91
(Runs 1101, 1102, 1201, 1301)

ALT AGL	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT
0.	53.	7.9	11.7	1024.40	21.
100.	67.	10.0	11.5	1020.80	21.
200.	80.	12.9	11.2	1017.10	22.
300.	69.	12.5	11.0	1013.00	21.
400.	67.	11.3	10.7	1009.40	21.
500.	57.	10.1	10.5	1006.30	22.
600.	74.	12.5	10.3	1002.40	21.
700.	52.	12.1	10.1	998.60	22.
800.	71.	13.8	9.8	994.70	22.
900.	73.	12.4	9.6	991.50	21.
1000.	70.	14.2	9.3	987.80	22.

Table D14 Tethered Balloon Data for 23 Nov 91
(Run 1202)

ALT AGL	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT
0.	7.	2.4	-0.2	1032.10	19.
100.	6.	5.6	2.8	1027.80	9.
200.	35.	7.8	3.4	1023.70	16.
300.	36.	9.5	3.6	1020.70	18.
400.	43.	11.8	4.2	1016.70	18.
500.	55.	14.1	6.3	1012.80	17.
600.	20.	16.5	6.6	1009.10	18.
700.	33.	15.6	6.8	1005.50	19.
800.	10.	16.5	6.9	1001.40	20.
900.	13.	17.4	6.9	997.70	18.
1000.	5.	20.1	6.9	994.50	17.

Table D15 Tethered Balloon Data for 25 Nov 91
(Run 631)

ALT AGL	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT
0.	127.	2.3	17.7	1020.90	20.
100.	189.	2.1	17.8	1016.30	20.
200.	179.	2.5	17.6	1013.60	20.
300.	135.	1.9	17.2	1009.70	20.
400.	198.	2.3	16.9	1005.90	20.
500.	32.	1.0	16.7	1002.30	20.
600.	98.	1.0	16.4	998.50	20.
700.	79.	3.9	16.5	994.90	20.
800.	58.	4.8	16.2	992.10	20.
900.	52.	4.3	16.2	988.50	20.
1000.	28.	4.8	16.0	984.90	21.

Table D16 Tethered Balloon Data for 27 Nov 91
(Runs 800, 801,810,811,820,821,830,831)

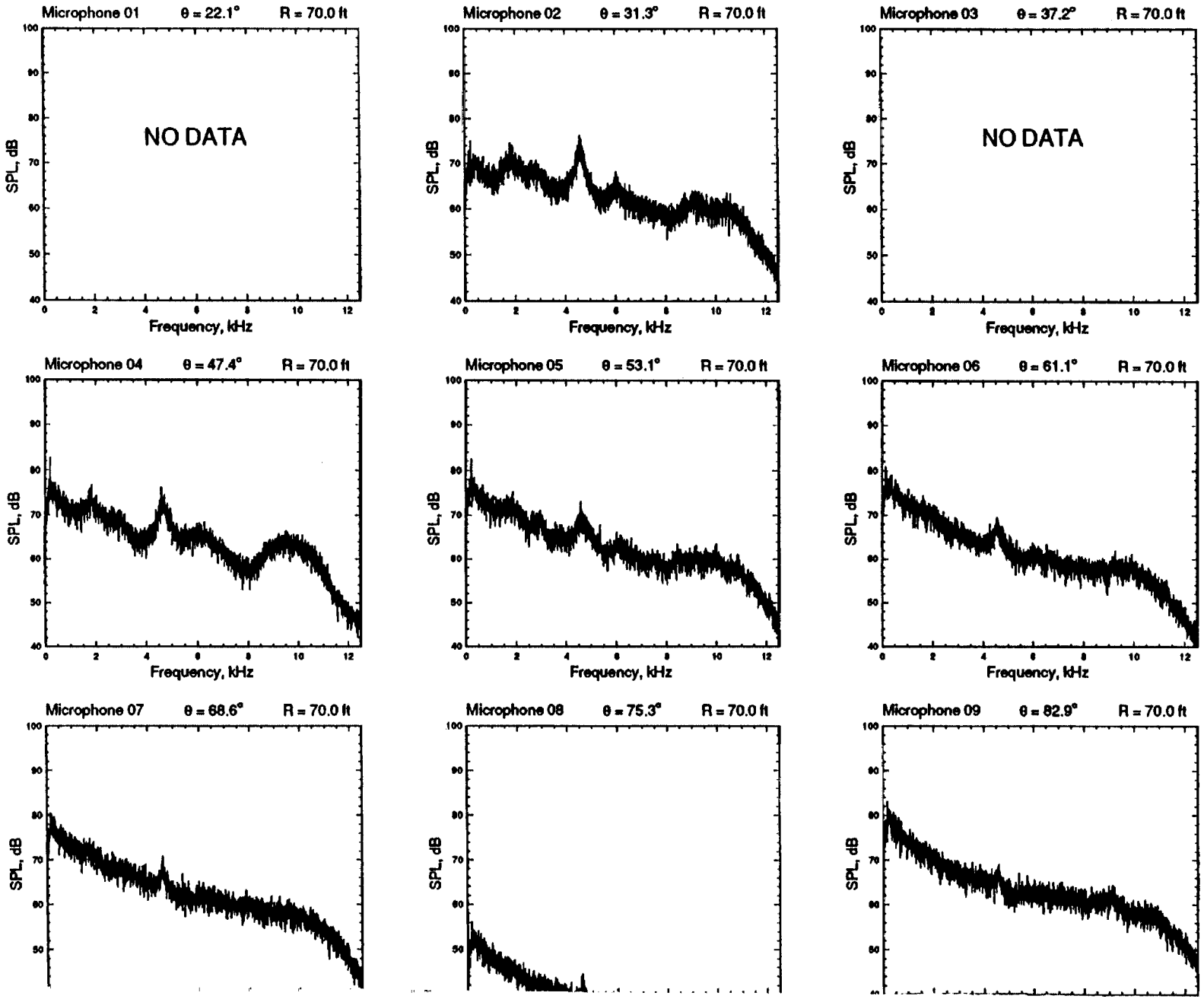
ALT AGL	DIR DEG	SPD KTS	TEMP DEG C	PRESS MBS	RH PCT
0.	61.	0.8	-2.1	1019.80	19.
100.	167.	1.7	2.6	1015.80	13.
200.	177.	6.9	5.3	1012.10	20.
300.	191.	11.0	9.6	1008.10	20.
400.	217.	14.7	11.8	1004.70	18.
500.	224.	20.1	14.0	1000.90	17.
600.	234.	23.2	15.5	997.20	16.
700.	230.	26.3	16.1	993.00	15.
800.	236.	26.8	16.4	990.50	14.
900.	241.	24.6	17.0	986.90	9.
1000.	240.	24.0	17.1	983.20	7.

APPENDIX E

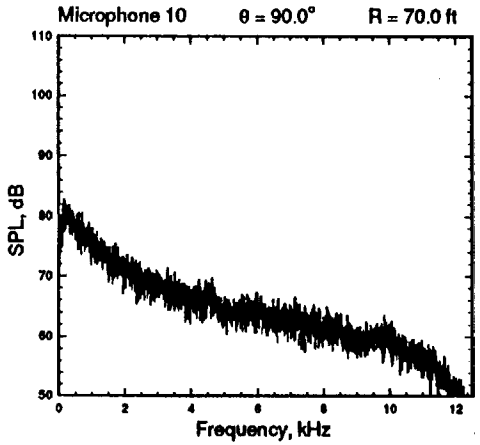
NARROW-BAND SPECTRA DATABASE FOR STATIC TESTS

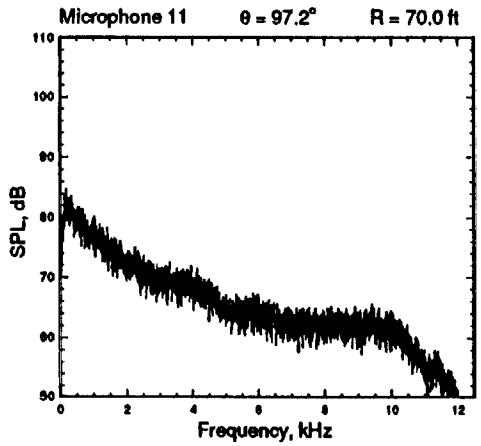
(Sound pressure levels in 2 Hz bandwidth)

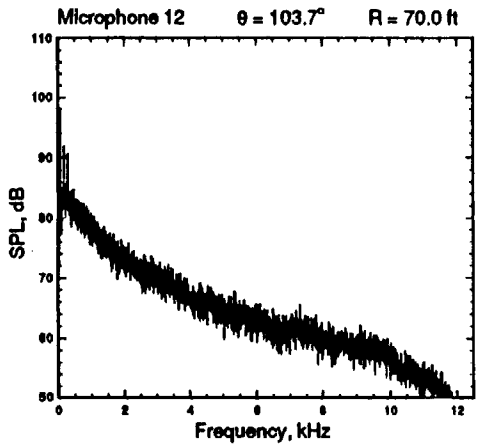
F-18 Static Narrowband Acoustic Data - Run 5

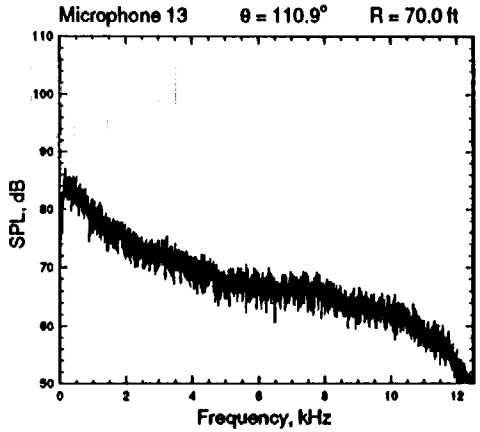


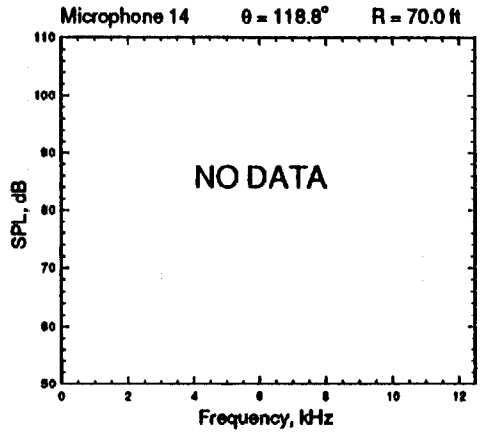
F-18 Static Narrowband Acoustic Data - Run 5

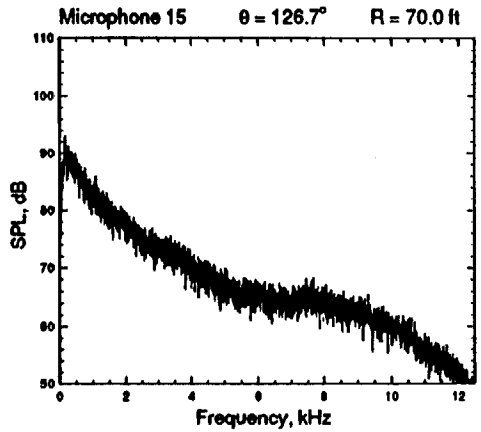


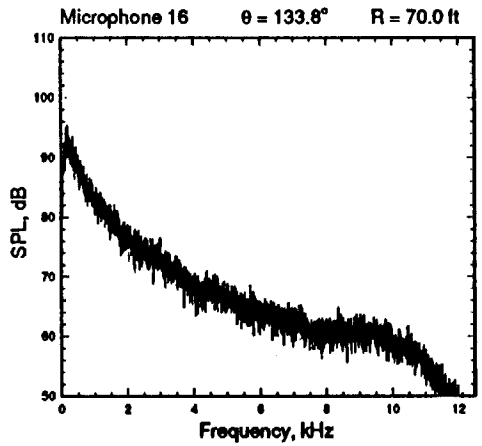


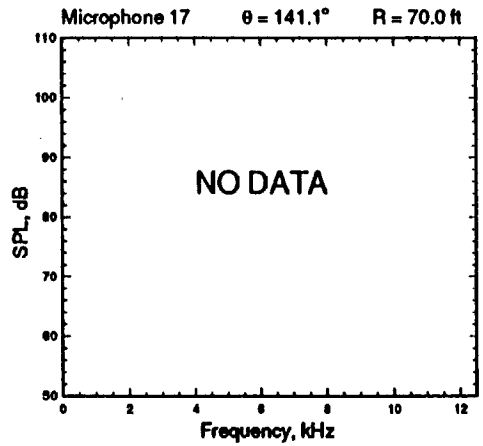


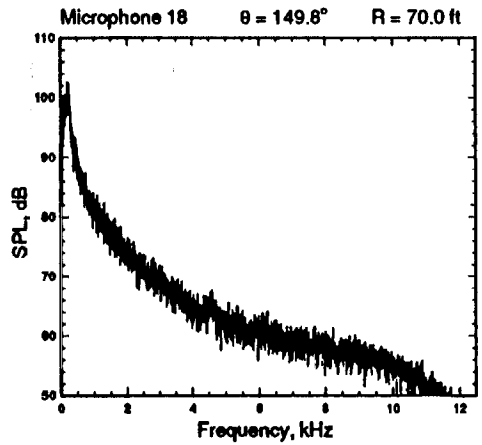




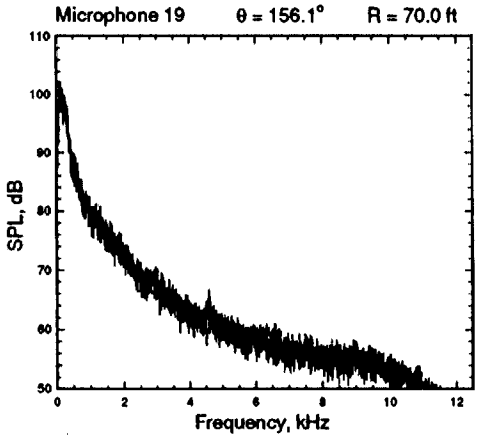


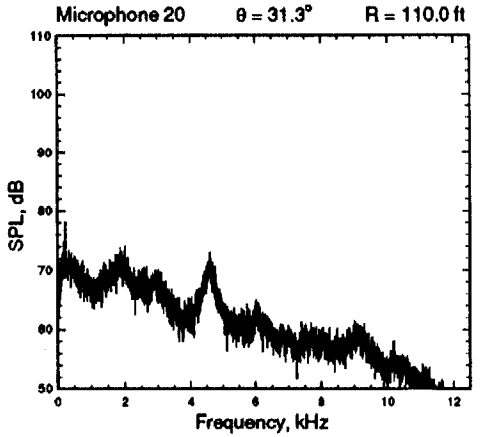


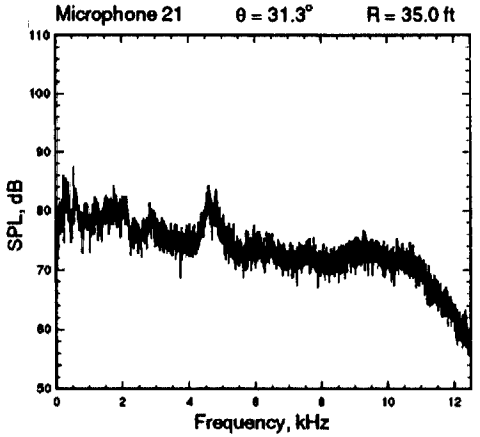


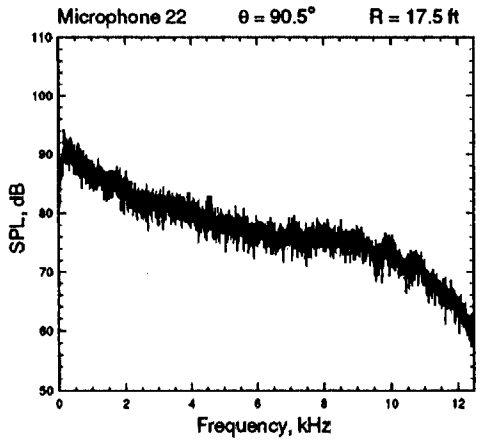


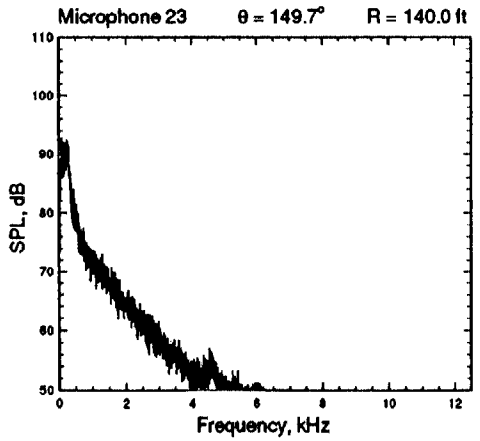
F-18 Static Narrowband Acoustic Data - Run 5



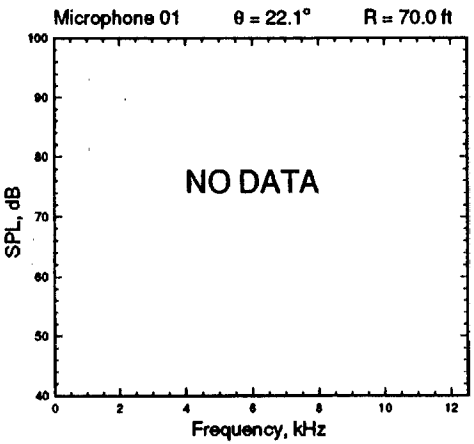


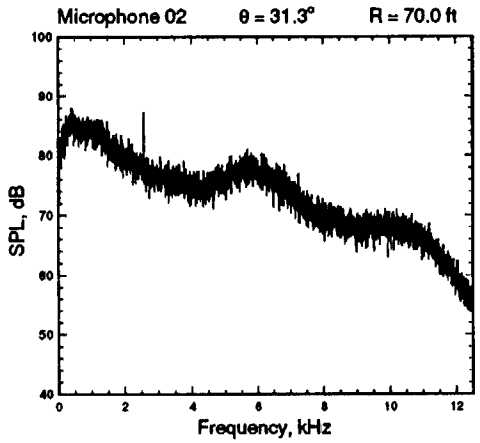


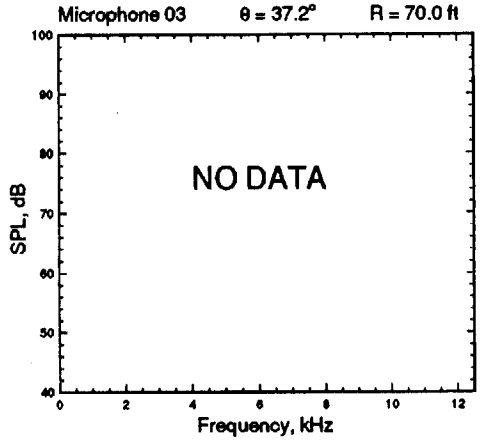


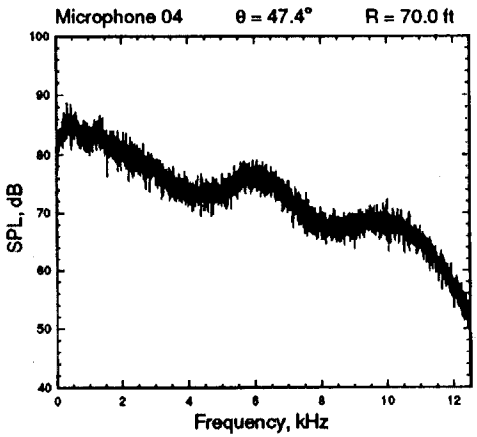


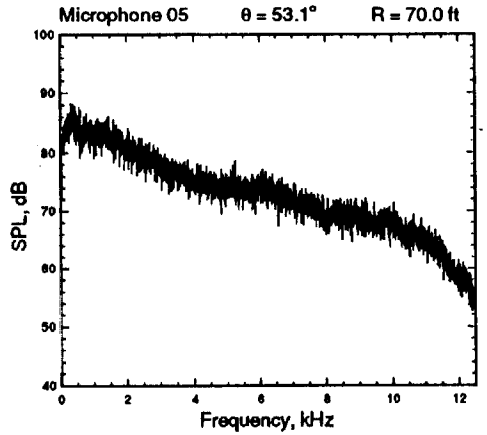
F-18 Static Narrowband Acoustic Data - Run 9

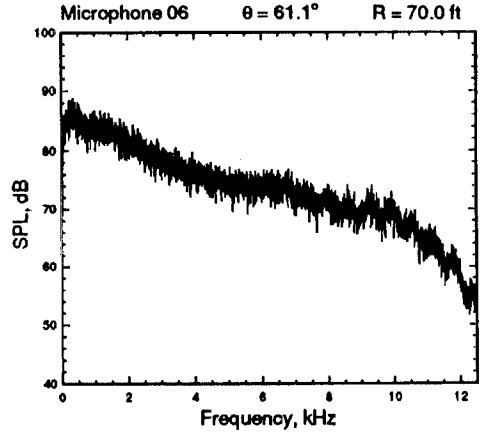


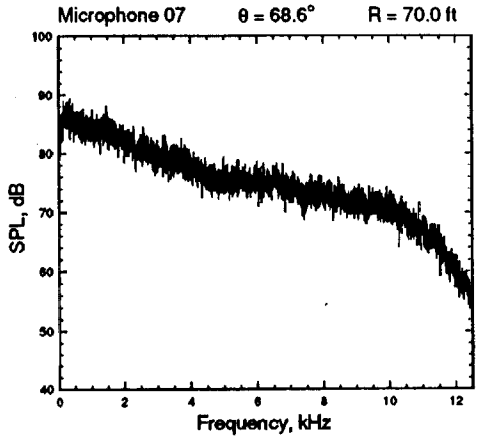


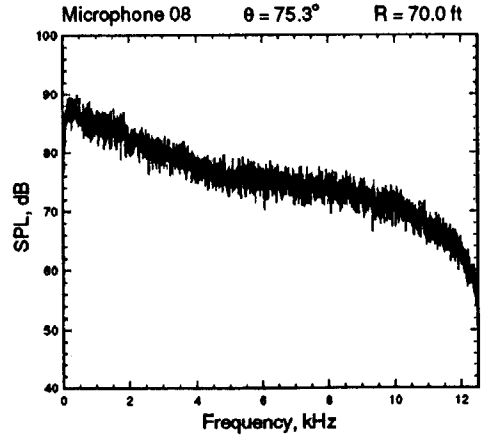


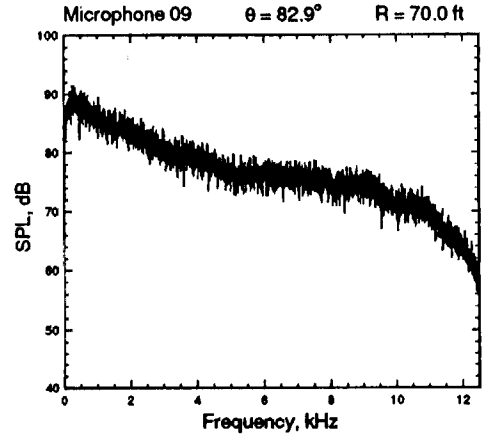




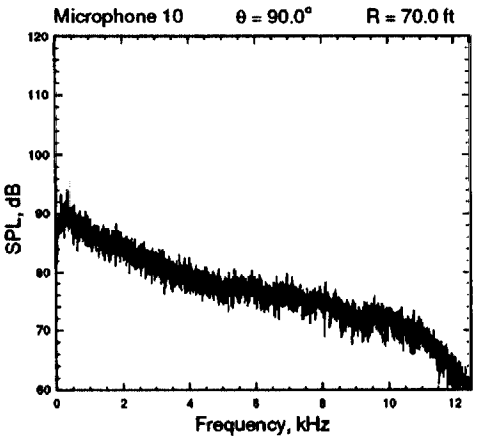


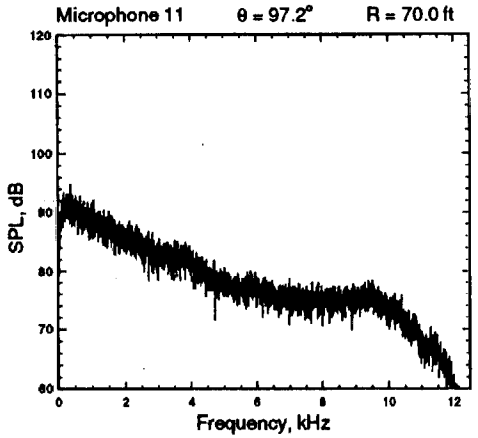


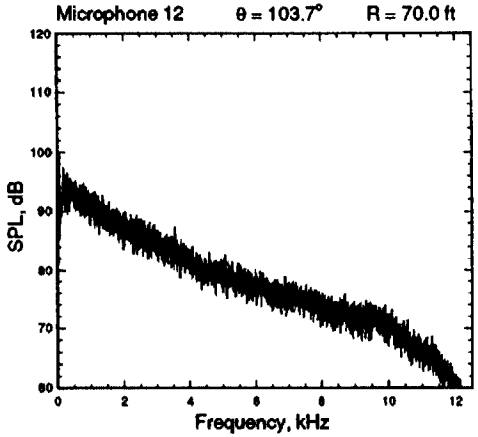


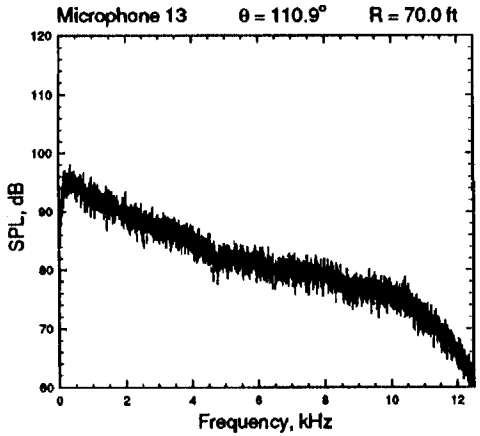


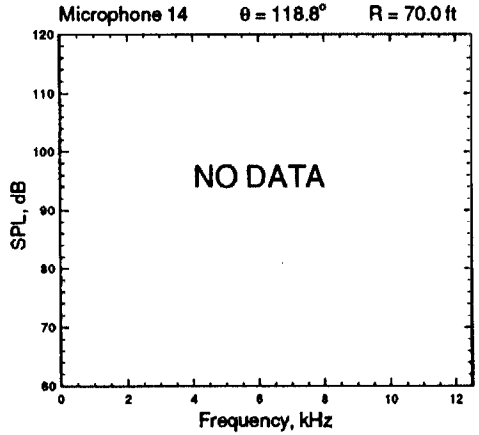
F-18 Static Narrowband Acoustic Data - Run 9

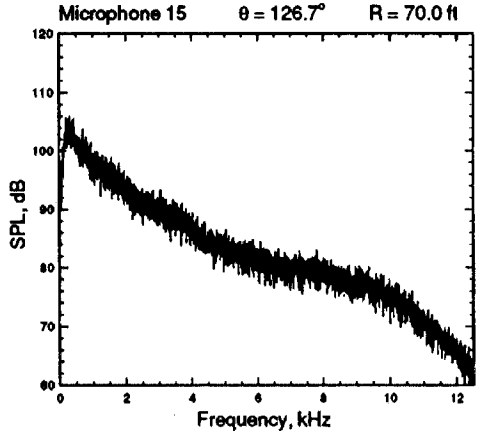


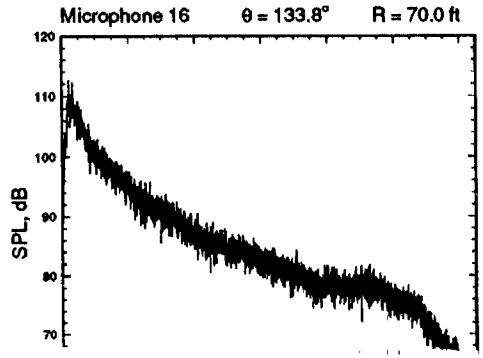


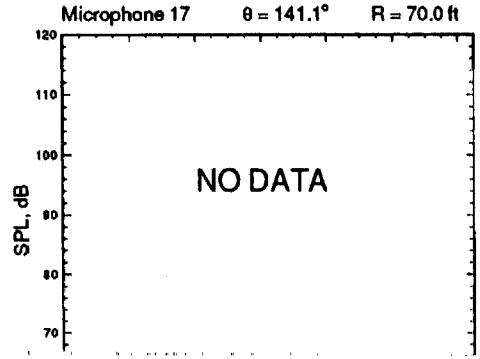


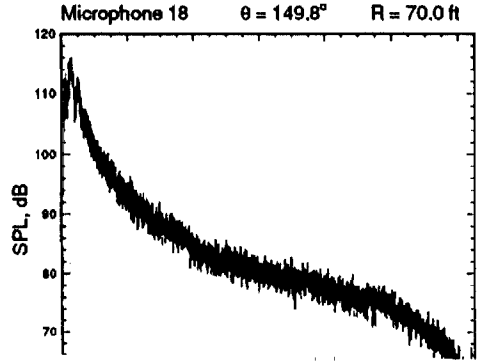




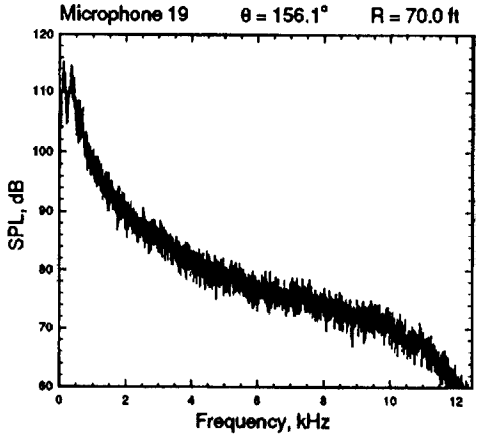


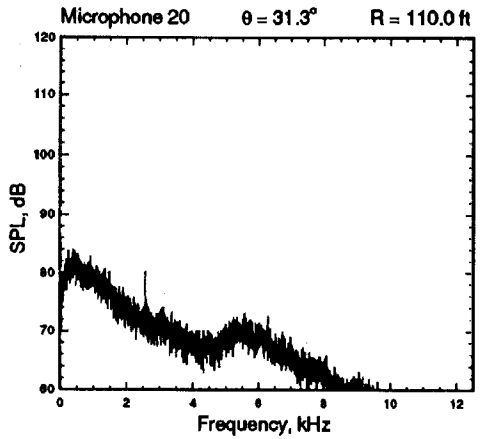


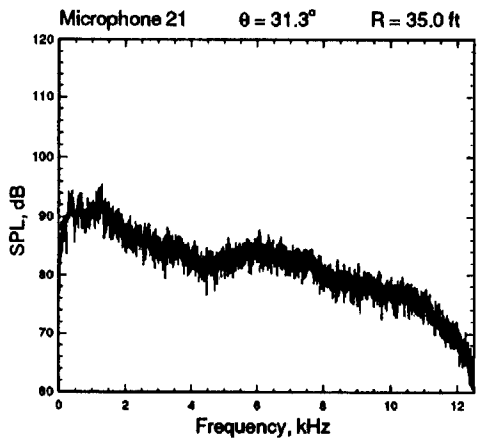


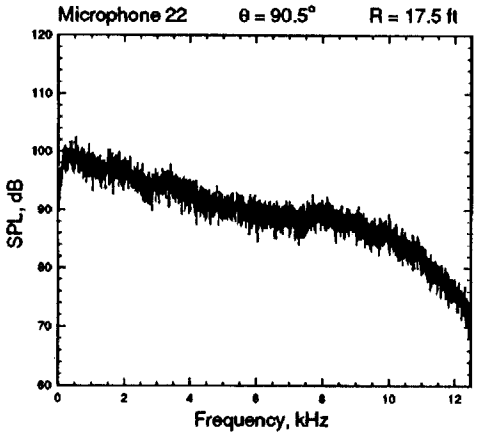


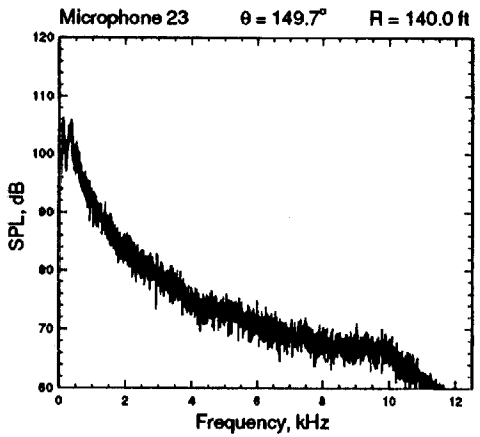
F-18 Static Narrowband Acoustic Data - Run 9



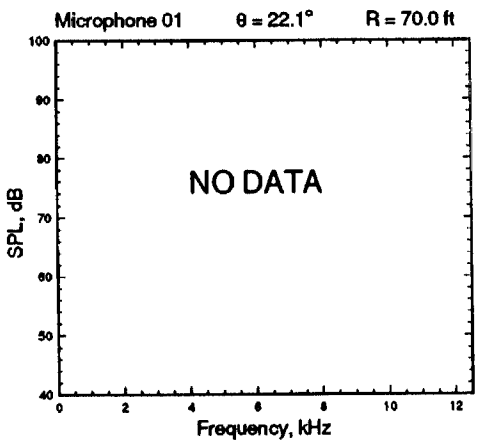


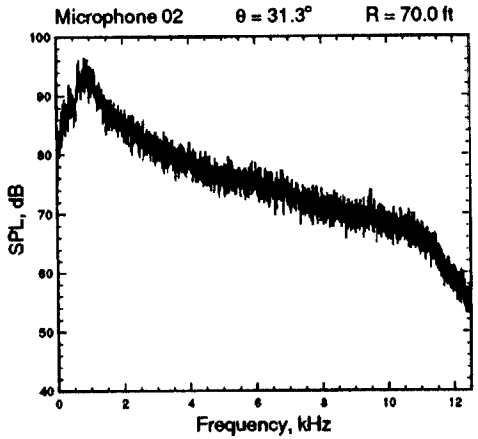


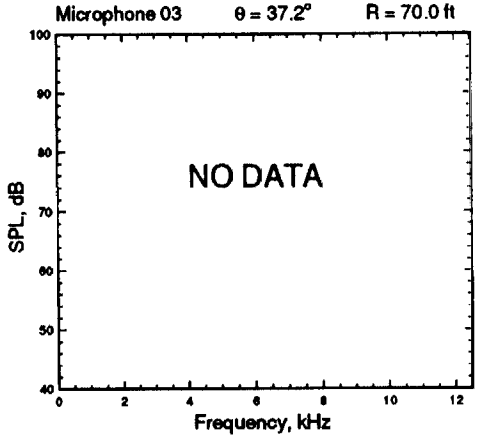


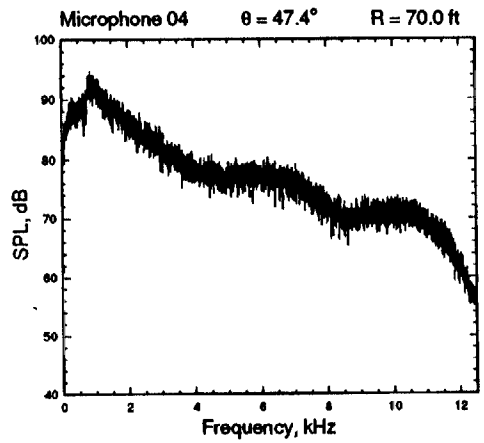


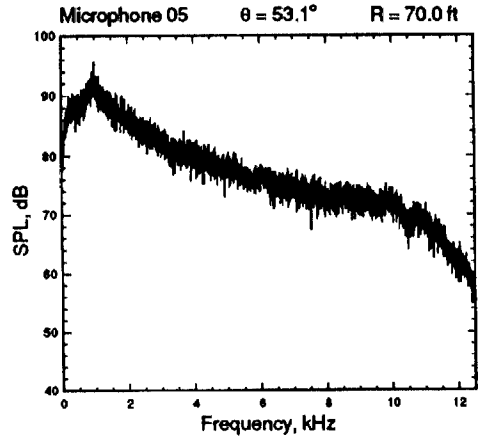
F-18 Static Narrowband Acoustic Data - Run 12

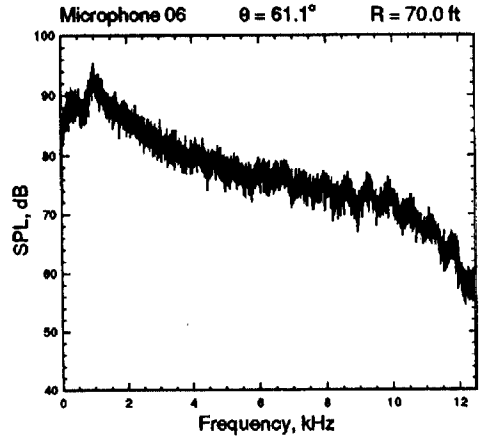


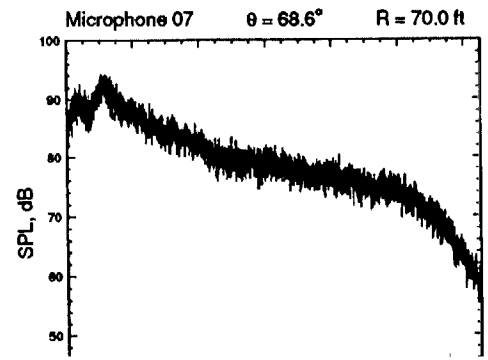


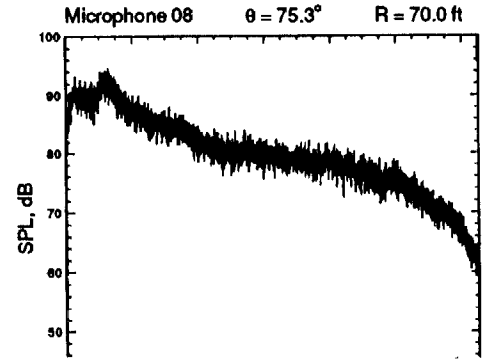


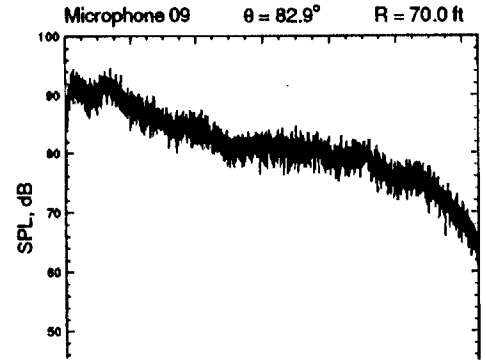


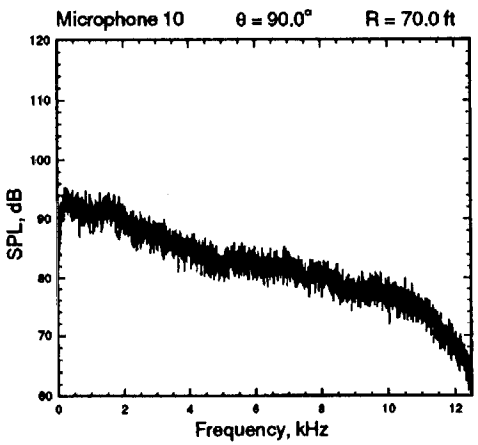


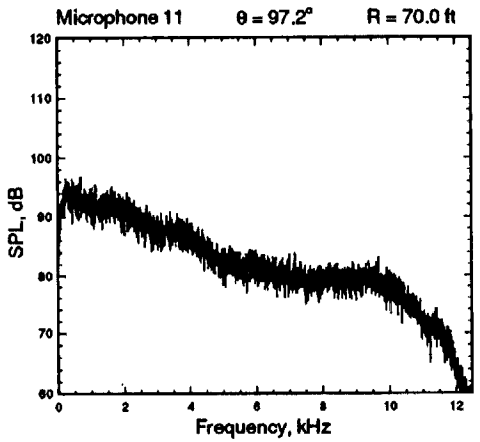


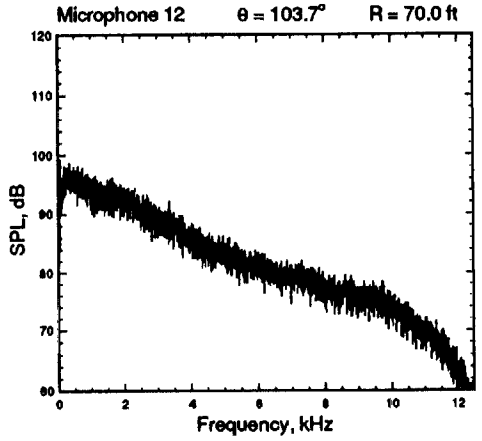


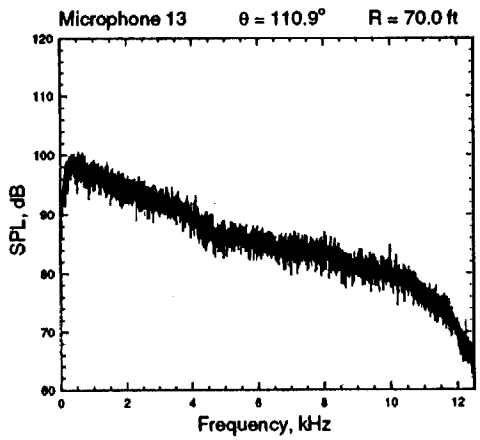


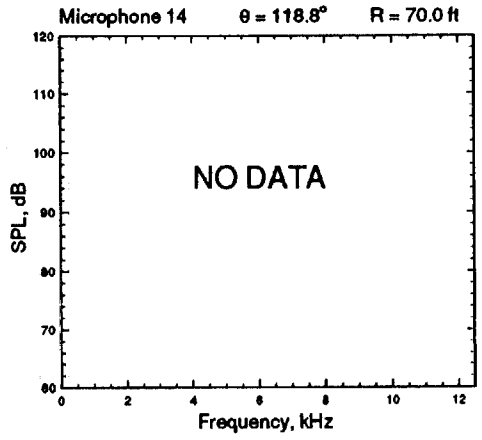


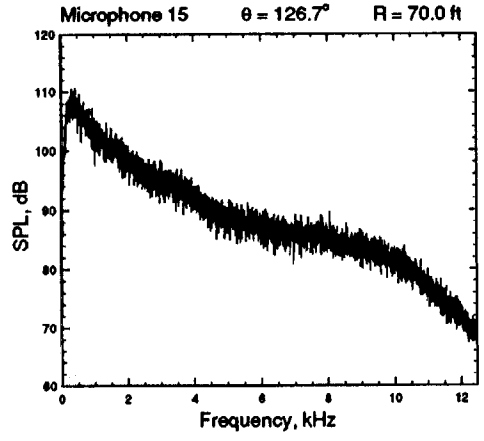

Microphone 10 θ = 90.0° R = 70.0 ft
SPL, dB
Frequency, kHz

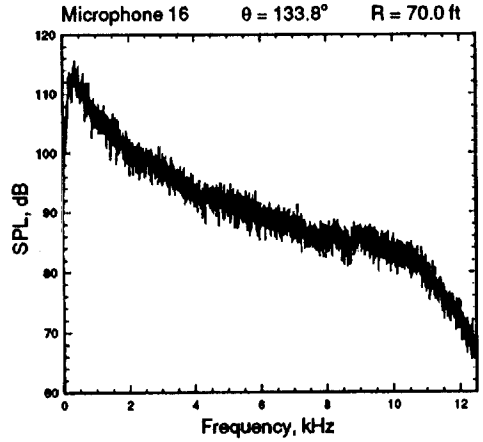

Microphone 11 θ = 97.2° R = 70.0 ft
SPL, dB
Frequency, kHz

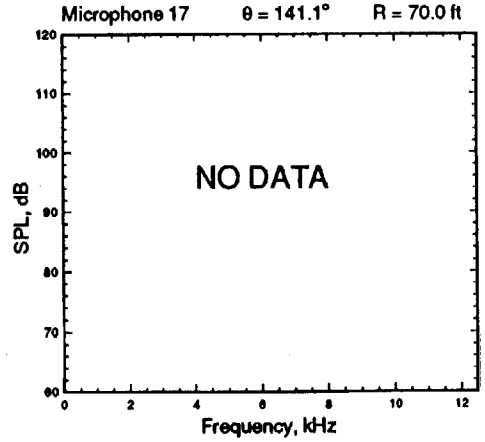

Microphone 12 θ = 103.7° R = 70.0 ft
SPL, dB
Frequency, kHz

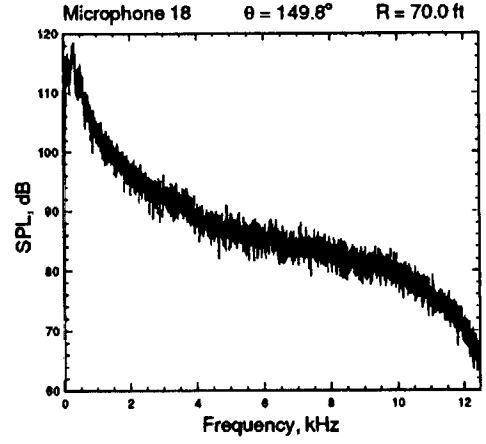

Microphone 13 θ = 110.9° R = 70.0 ft
SPL, dB
Frequency, kHz


Microphone 14 θ = 118.8° R = 70.0 ft
NO DATA
SPL, dB
Frequency, kHz

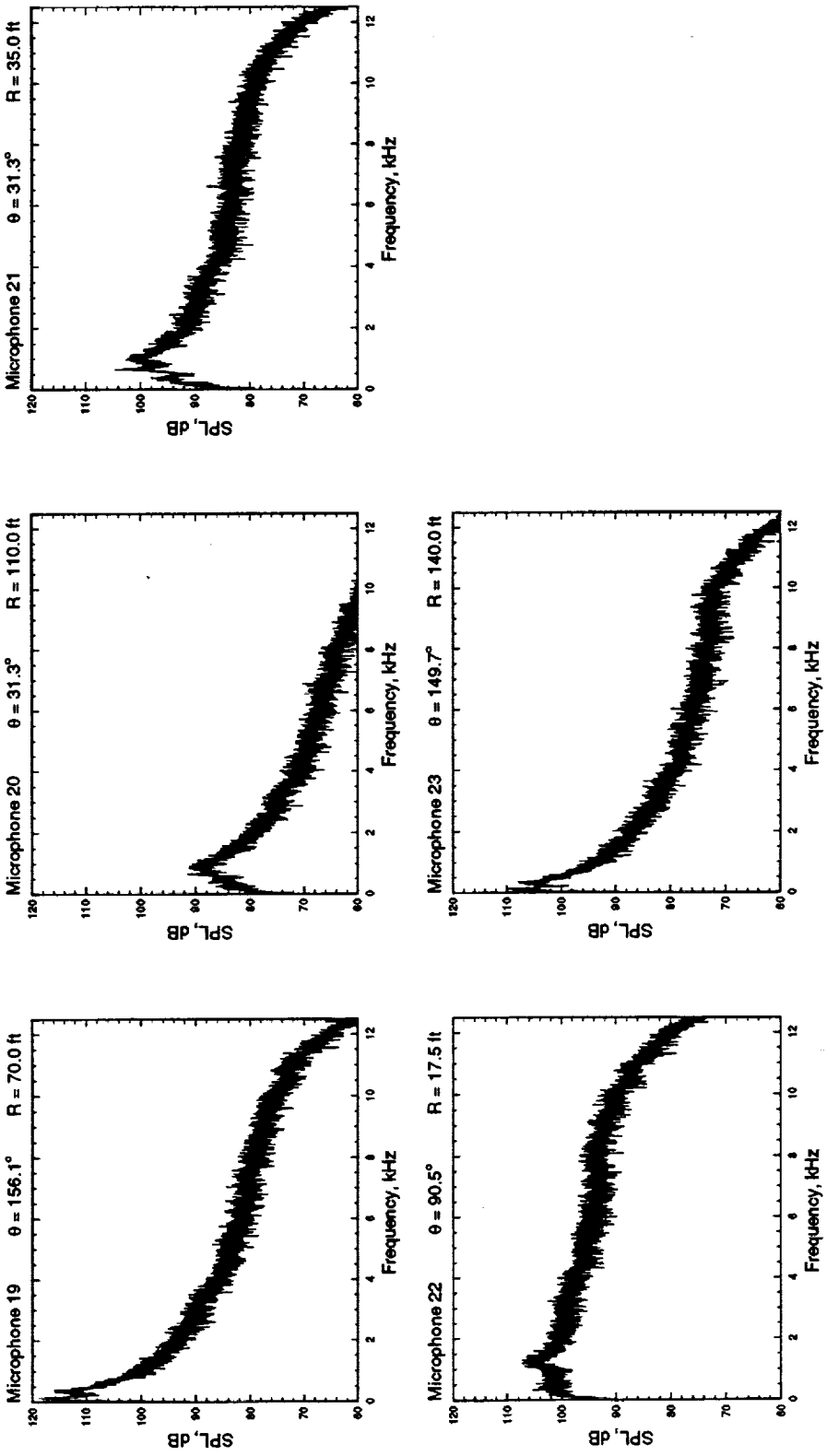

Microphone 15 θ = 126.7° R = 70.0 ft
SPL, dB
Frequency, kHz

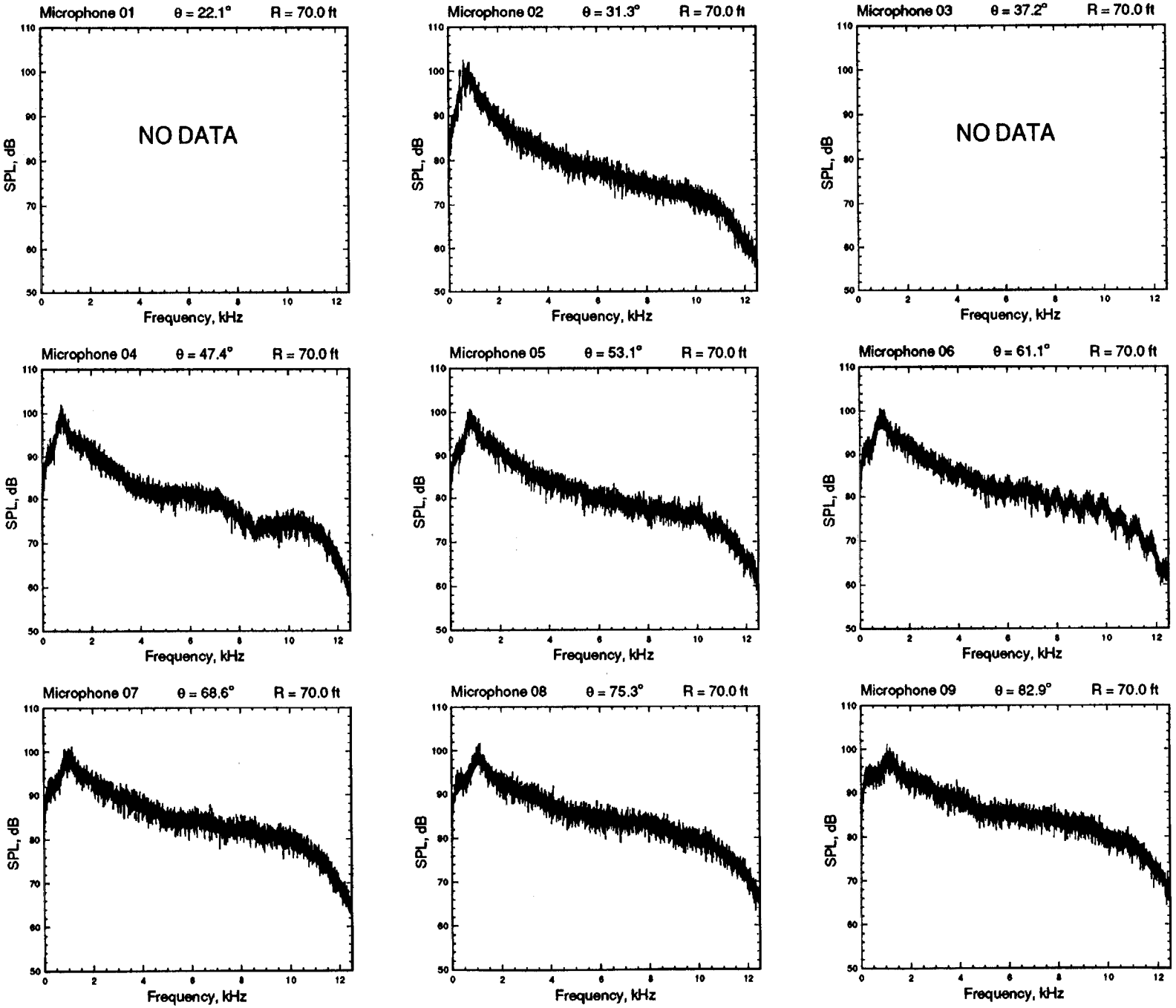

Microphone 16 θ = 133.8° R = 70.0 ft
SPL, dB
Frequency, kHz


Microphone 17 θ = 141.1° R = 70.0 ft
NO DATA
SPL, dB
Frequency, kHz

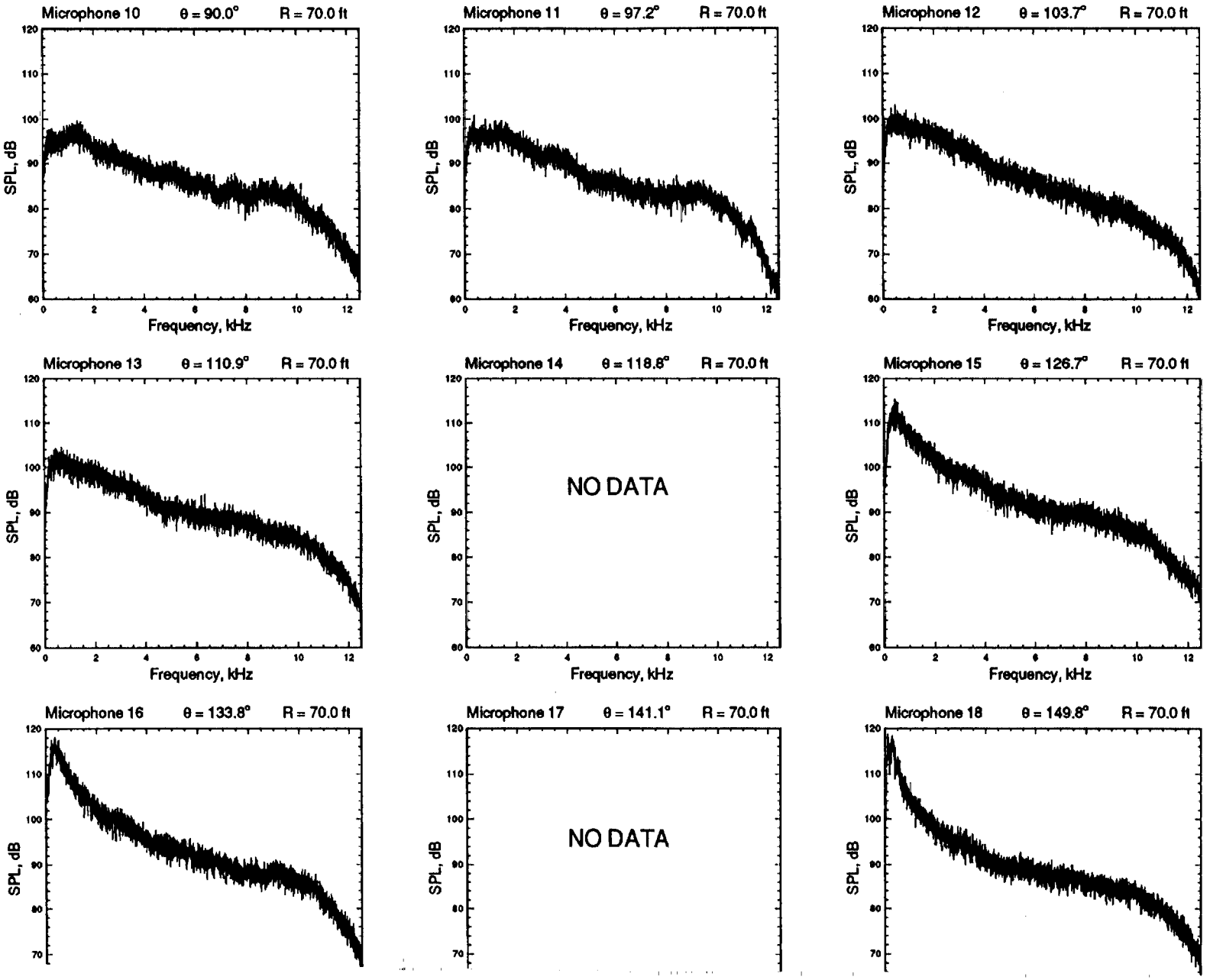

Microphone 18 θ = 149.8° R = 70.0 ft
SPL, dB
Frequency, kHz

F-18 Static Narrowband Acoustic Data - Run 12

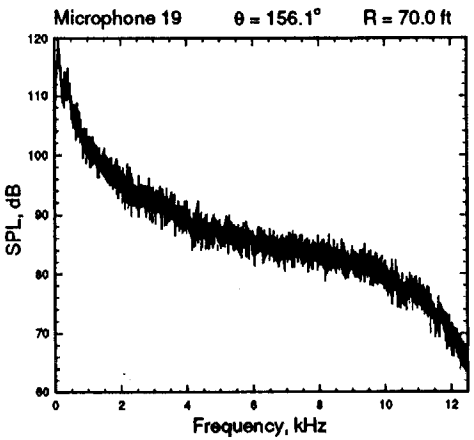


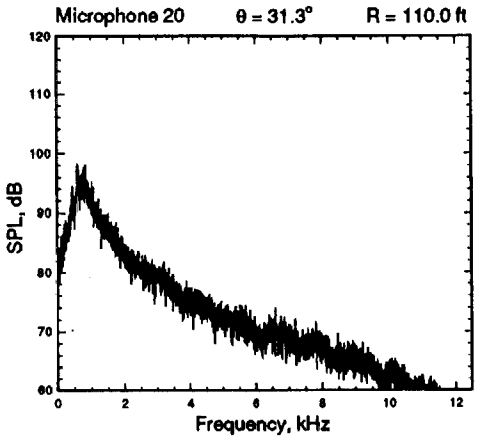

Microphone 01 θ = 22.1° R = 70.0 ft
NO DATA
Microphone 02 θ = 31.3° R = 70.0 ft
Microphone 03 θ = 37.2° R = 70.0 ft
NO DATA
Microphone 04 θ = 47.4° R = 70.0 ft
Microphone 05 θ = 53.1° R = 70.0 ft
Microphone 06 θ = 61.1° R = 70.0 ft
Microphone 07 θ = 68.6° R = 70.0 ft
Microphone 08 θ = 75.3° R = 70.0 ft
Microphone 09 θ = 82.9° R = 70.0 ft
SPL, dB
Frequency, kHz

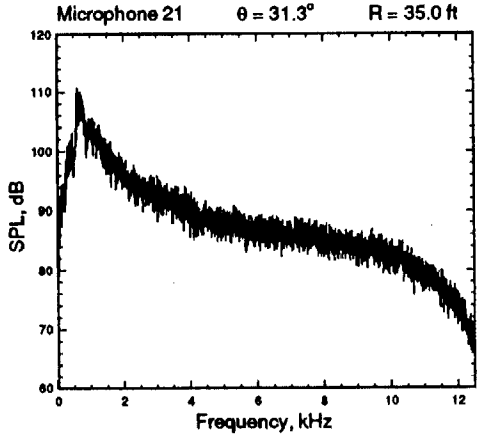
F-18 Static Narrowband Acoustic Data - Run 15

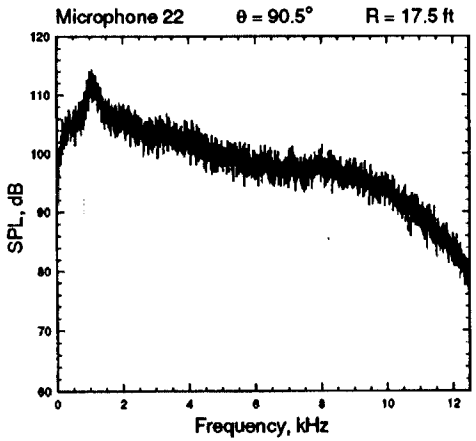


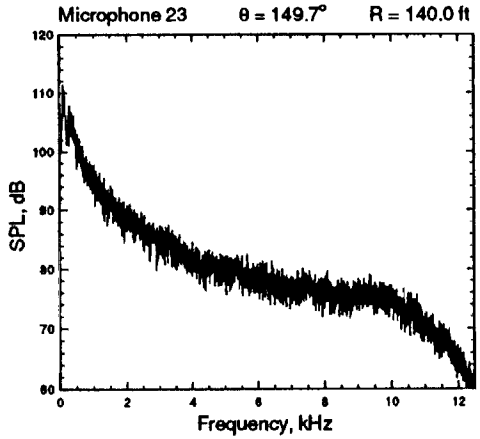
F-18 Static Narrowband Acoustic Data - Run 15



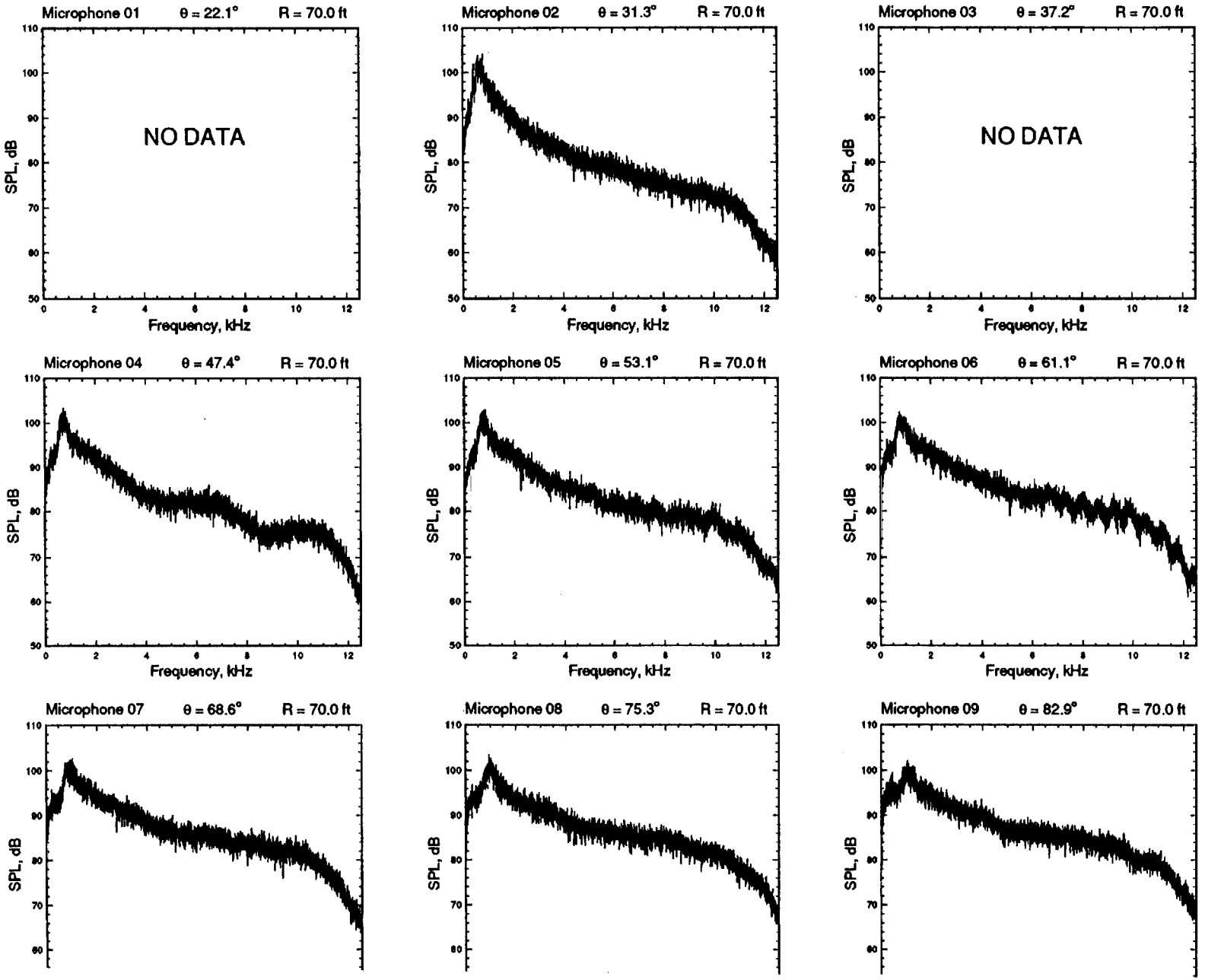




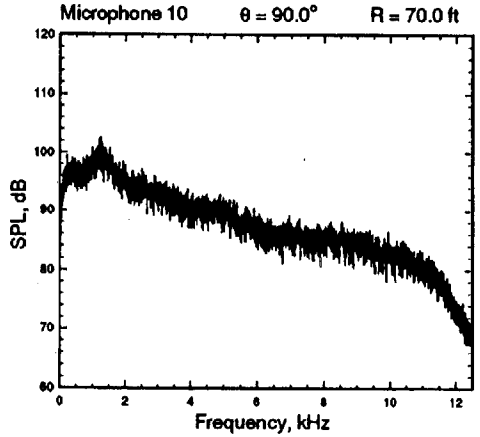


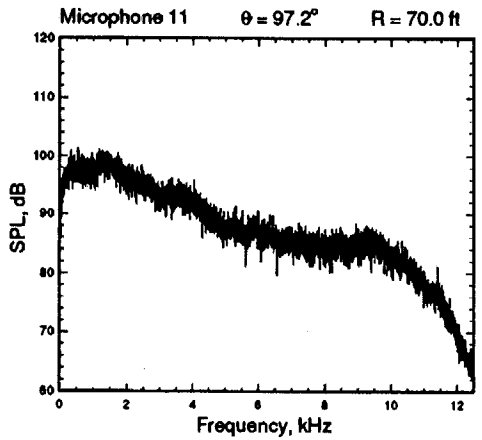


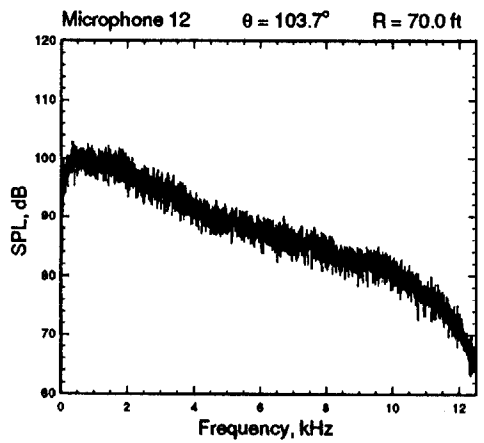
F-18 Static Narrowband Acoustic Data - Run 17

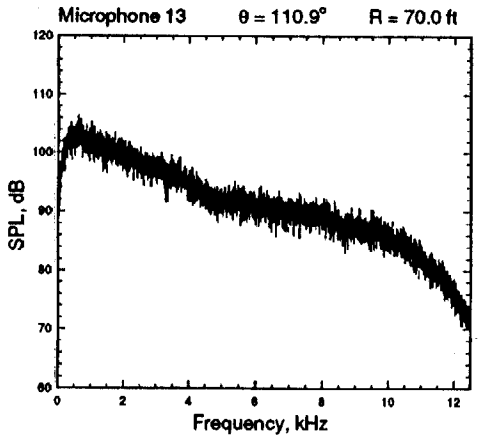


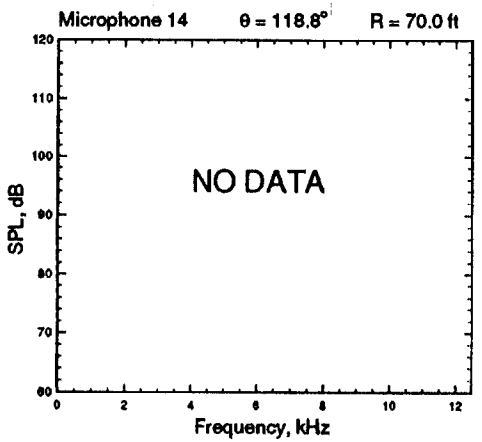
F-18 Static Narrowband Acoustic Data - Run 17

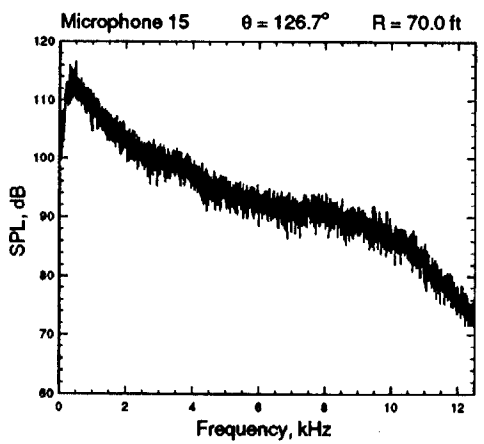


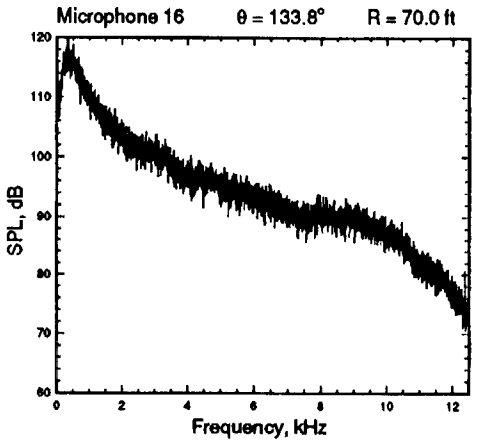


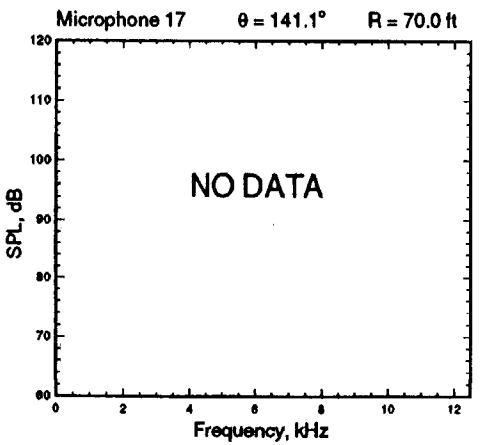


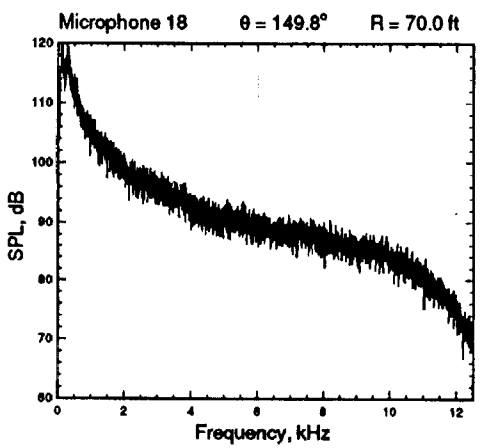




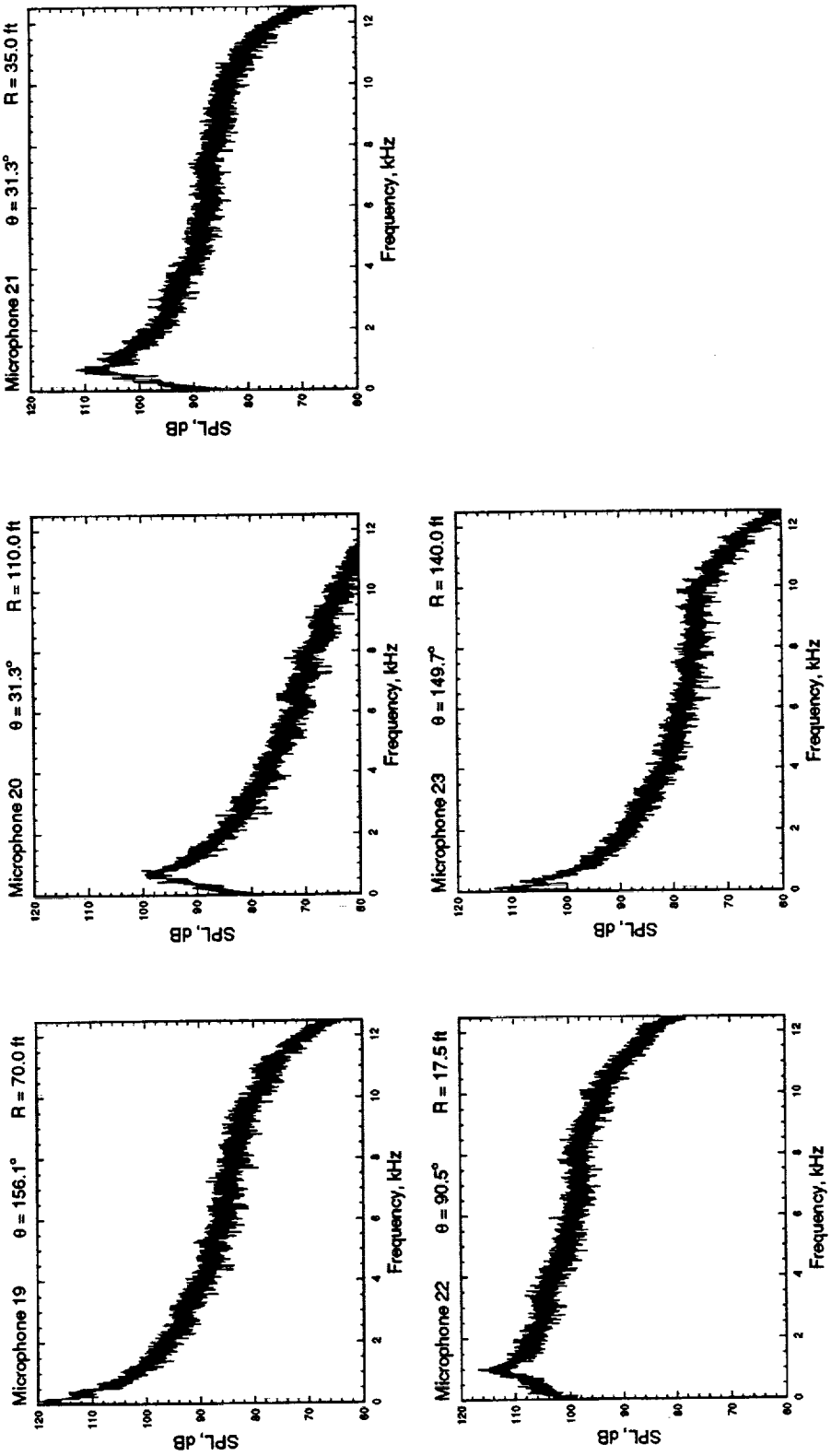




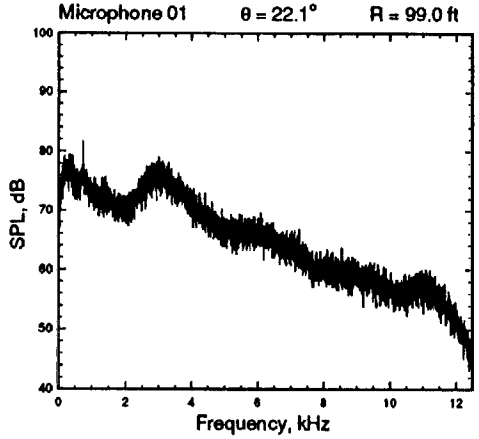


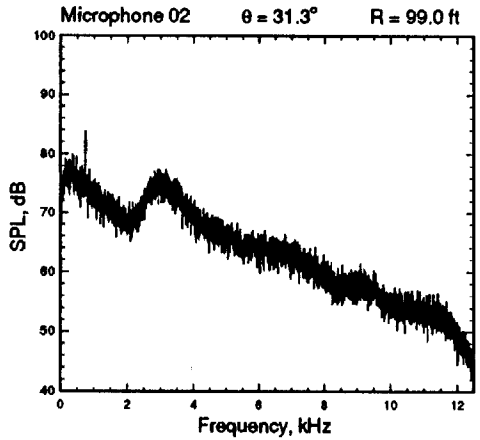


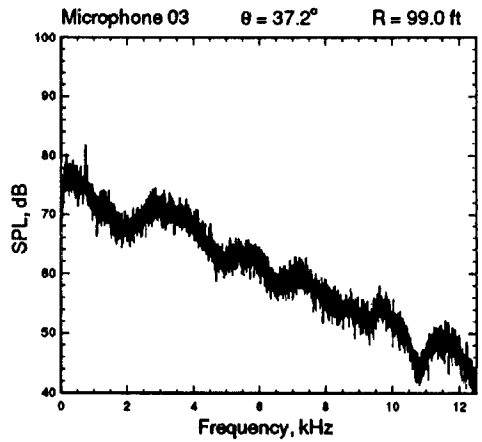
F-18 Static Narrowband Acoustic Data - Run 17

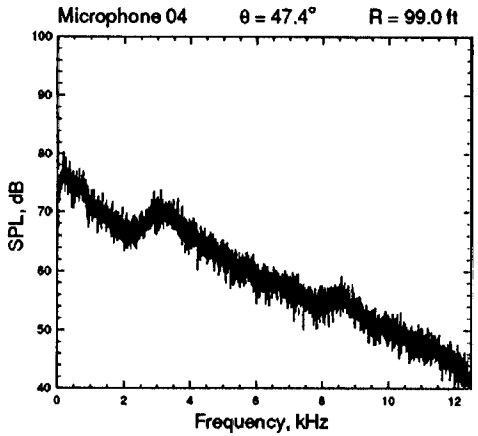


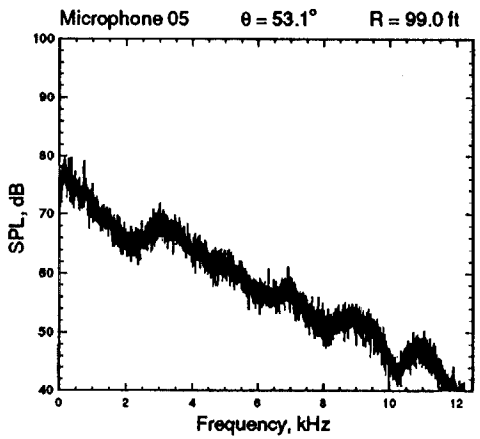
F-16XL Static Narrowband Acoustic Data - Run 5

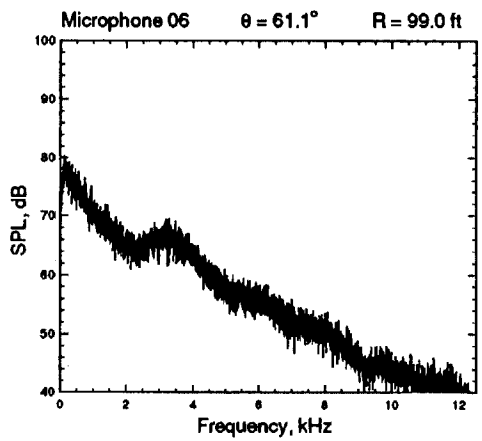


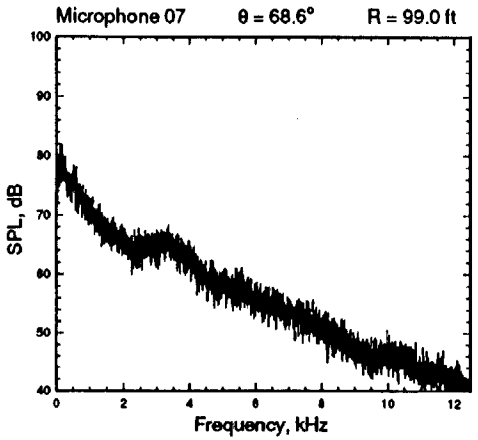


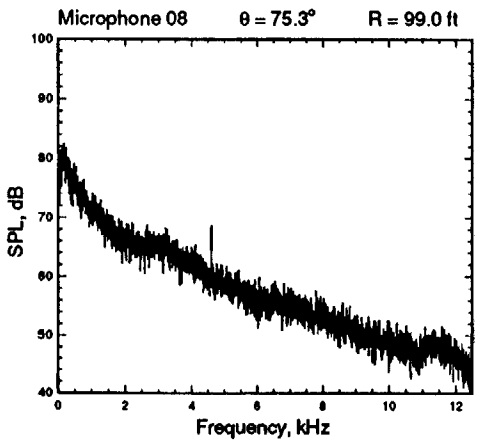


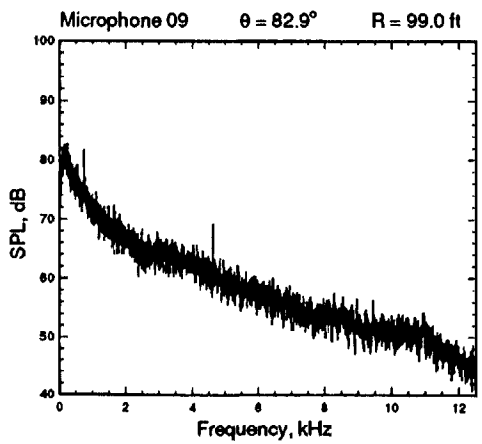




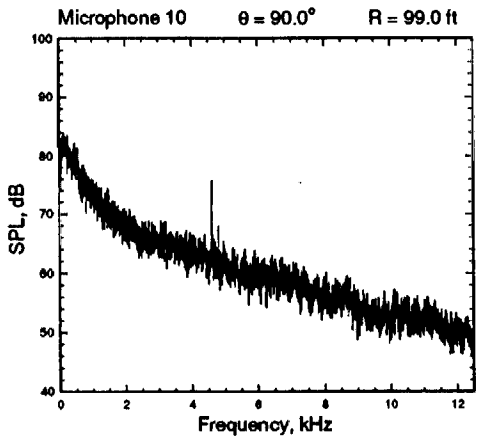


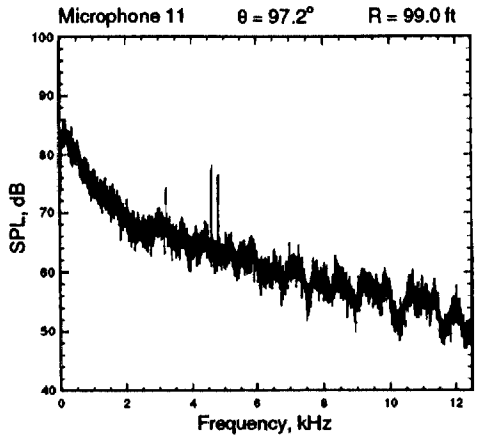


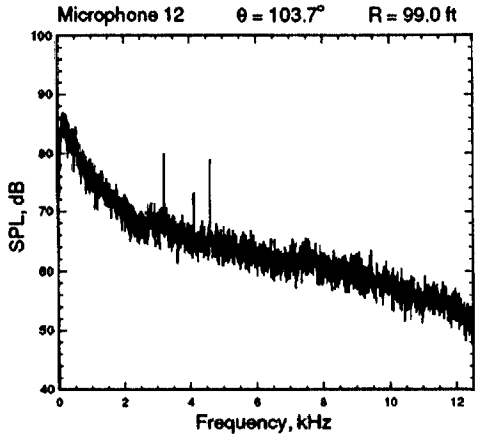


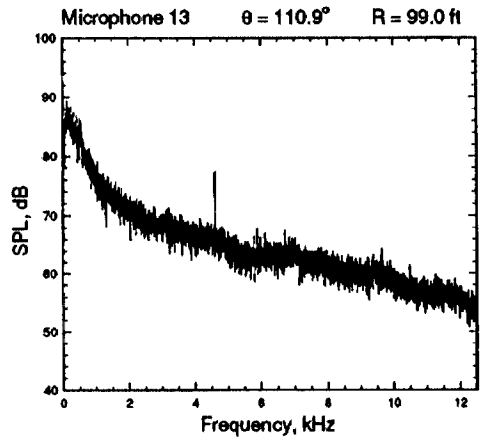


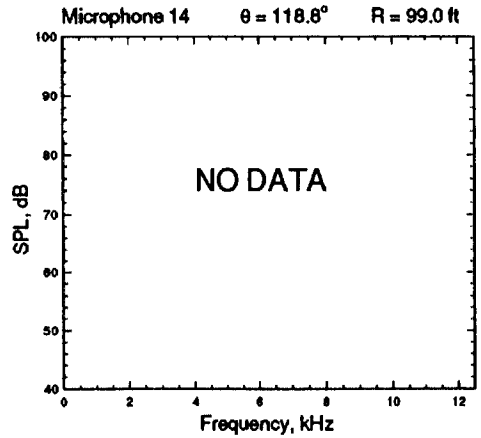
F-16XL Static Narrowband Acoustic Data - Run 5

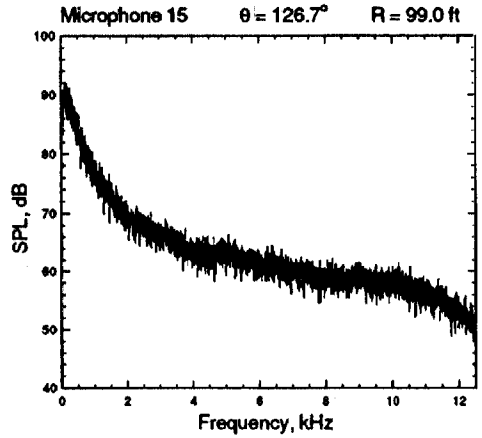


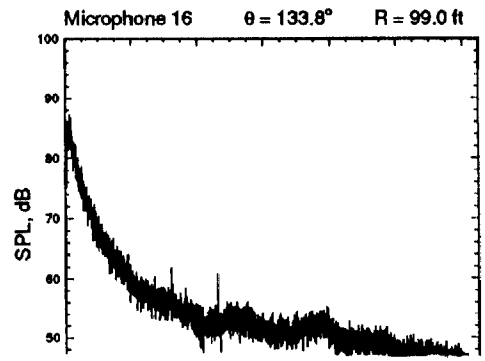


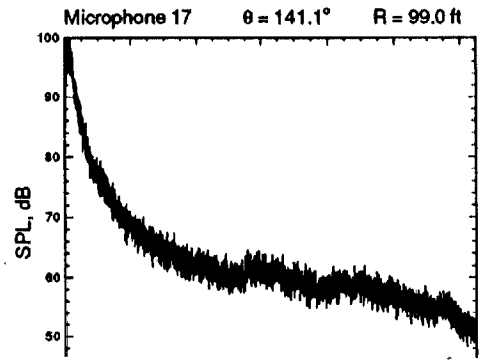


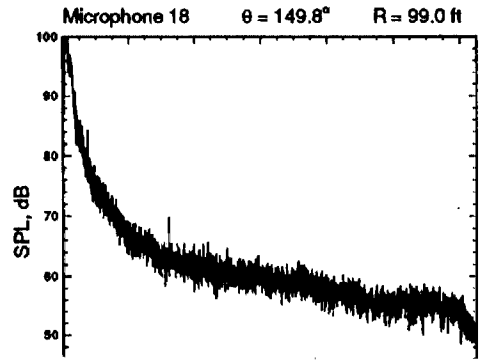




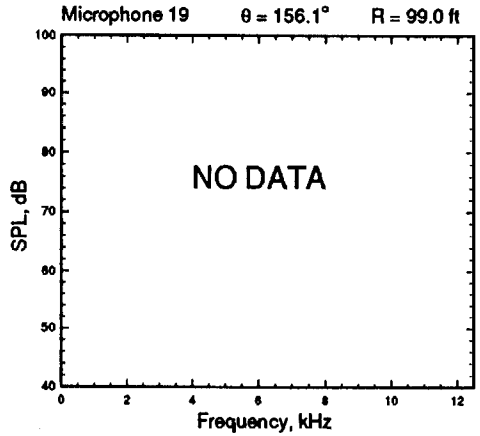


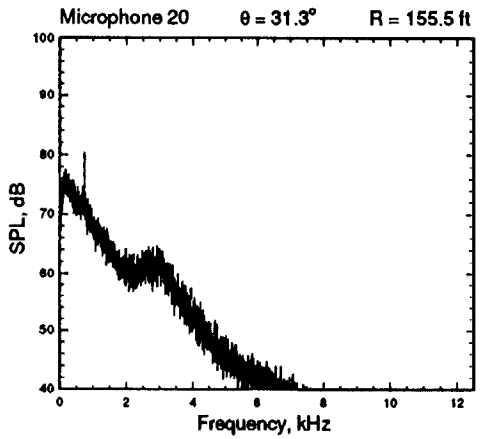


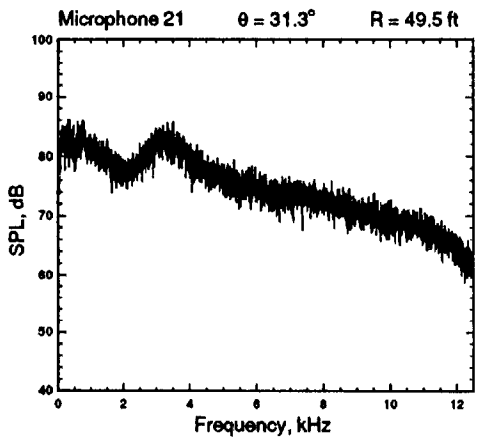


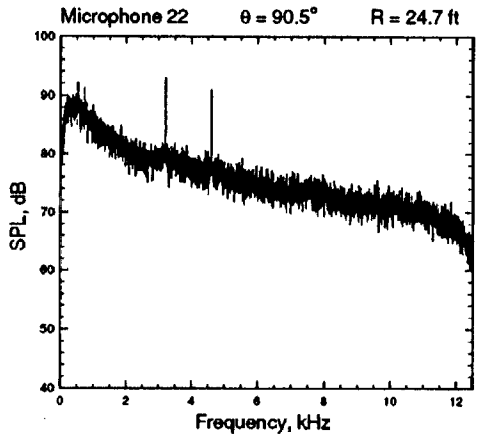


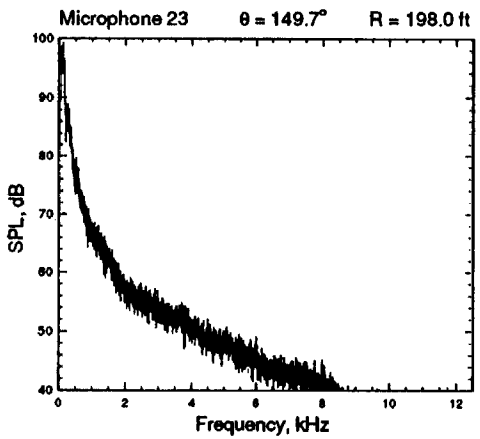
F-16XL Static Narrowband Acoustic Data - Run 5



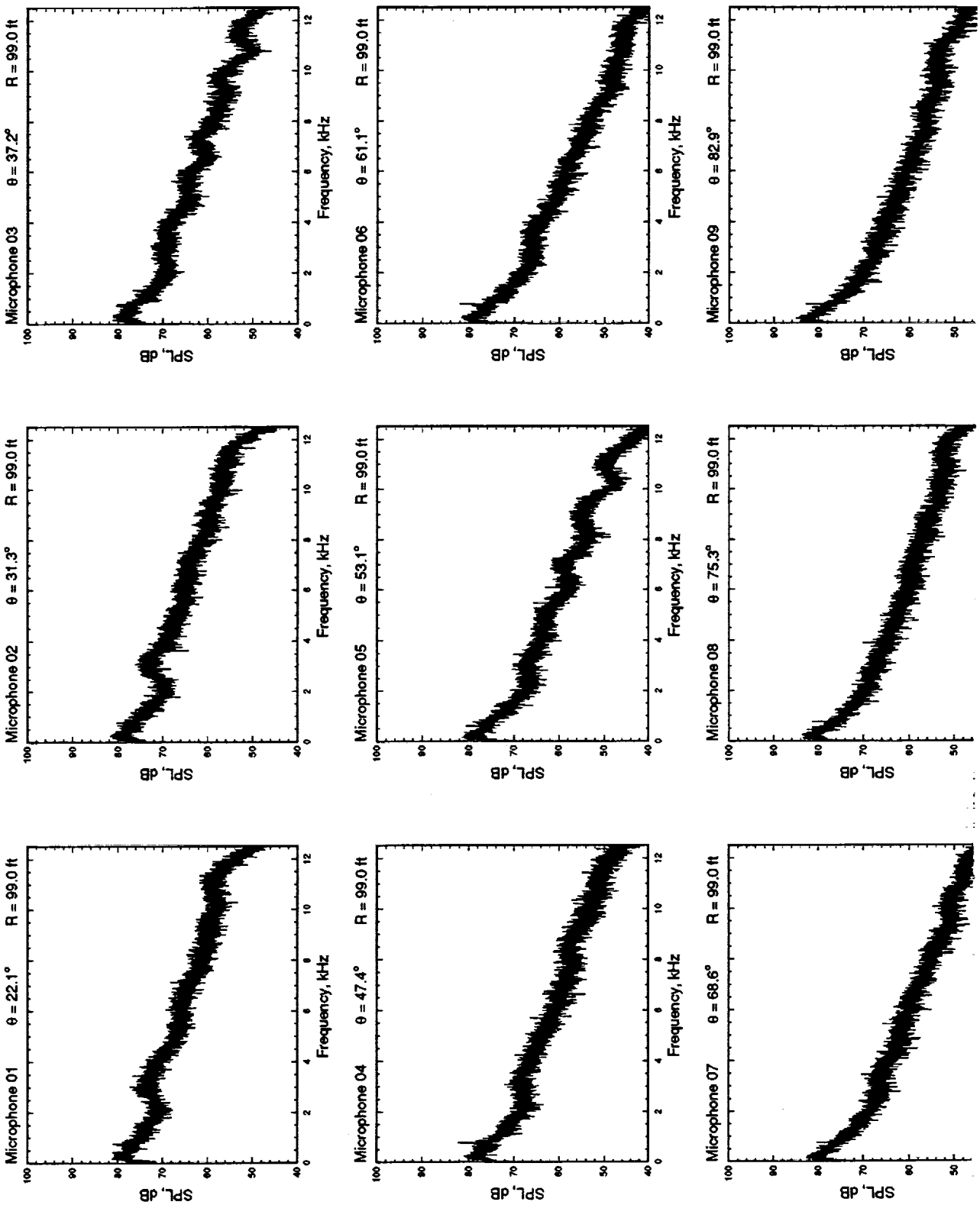




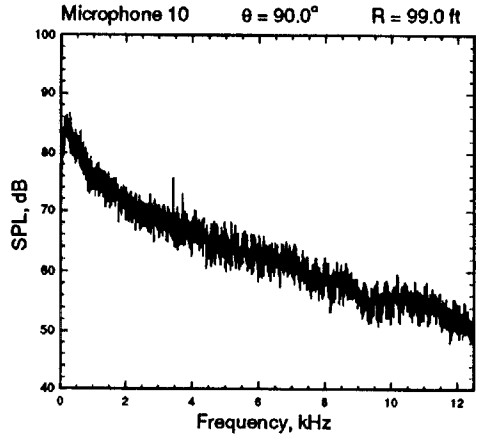


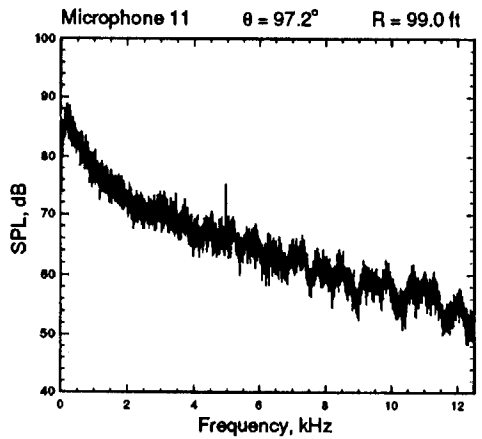


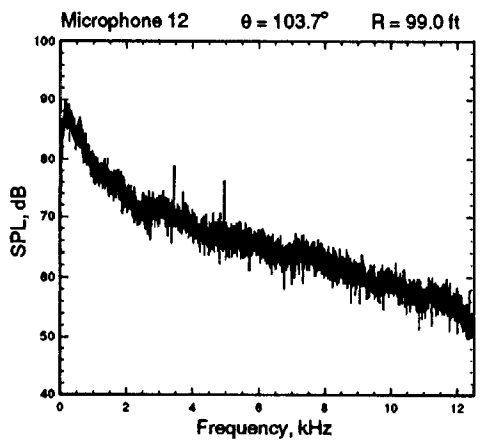
F-16XL Static Narrowband Acoustic Data - Run 6

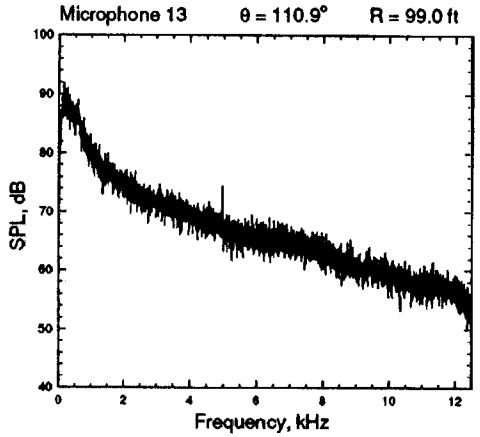


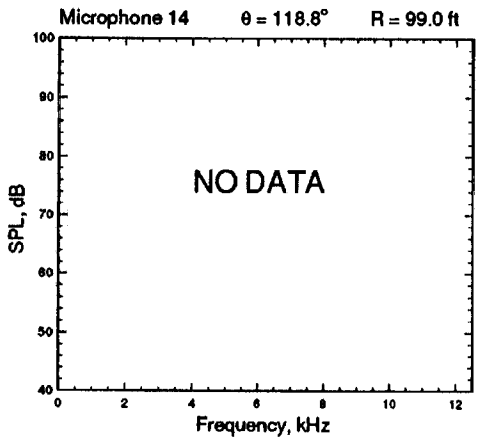
F-16XL Static Narrowband Acoustic Data - Run 6

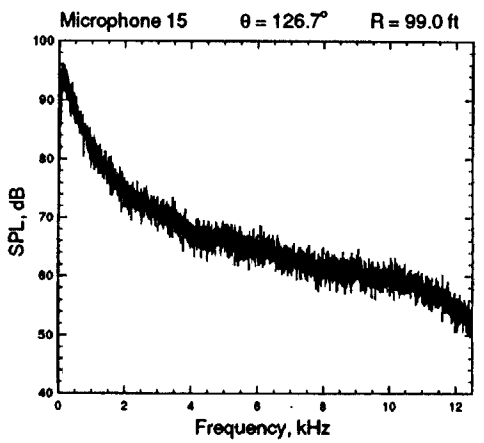


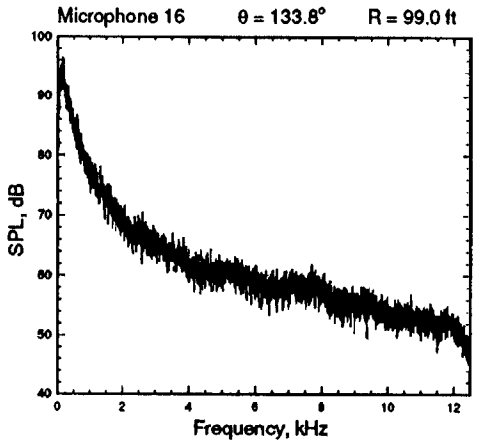


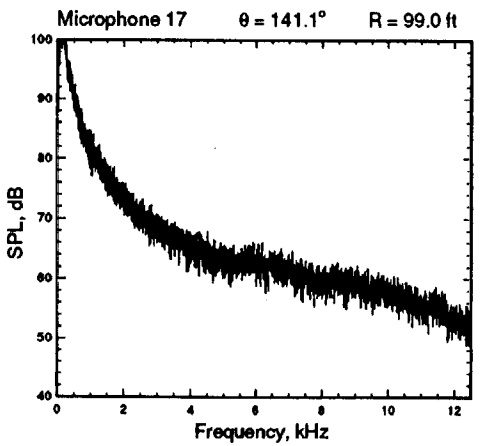


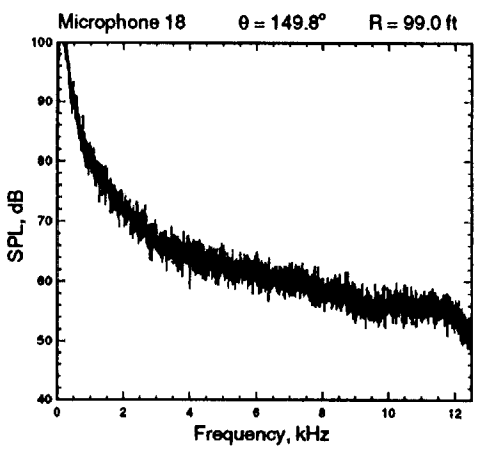




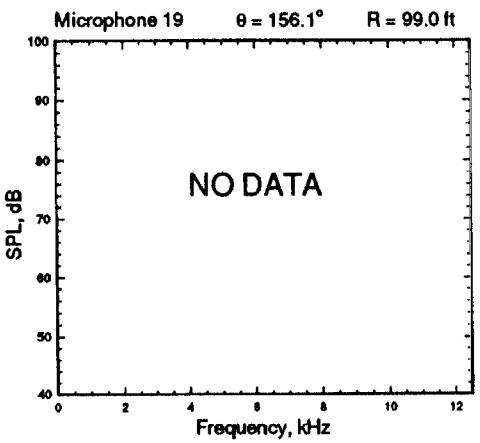


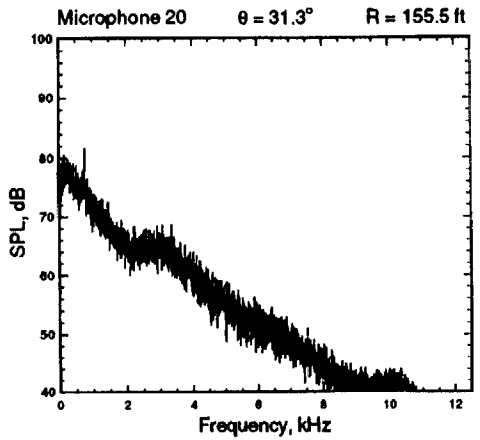


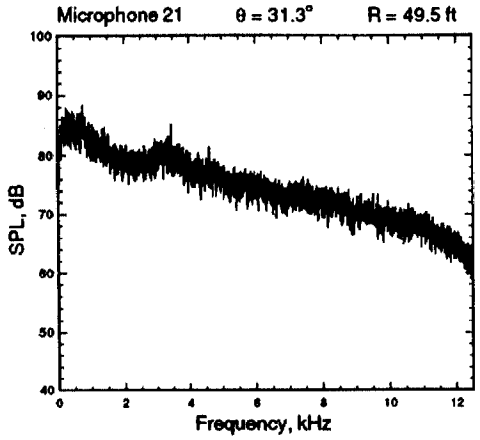


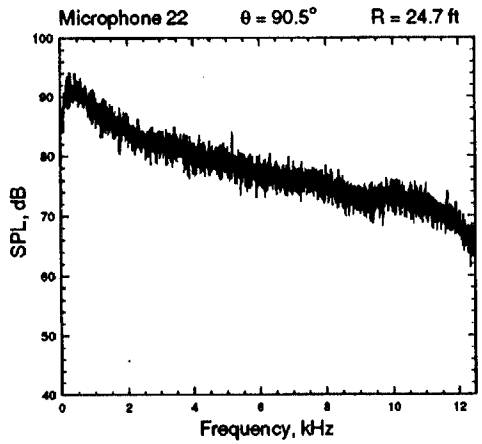


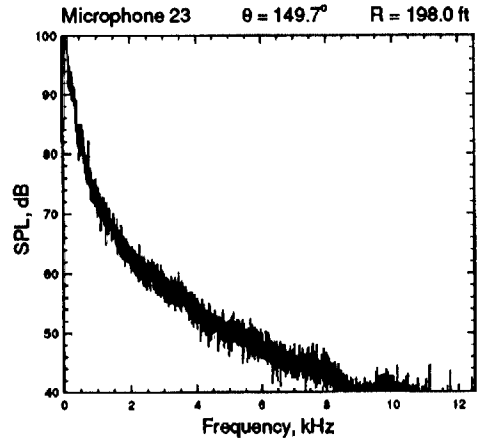
F-16XL Static Narrowband Acoustic Data - Run 6



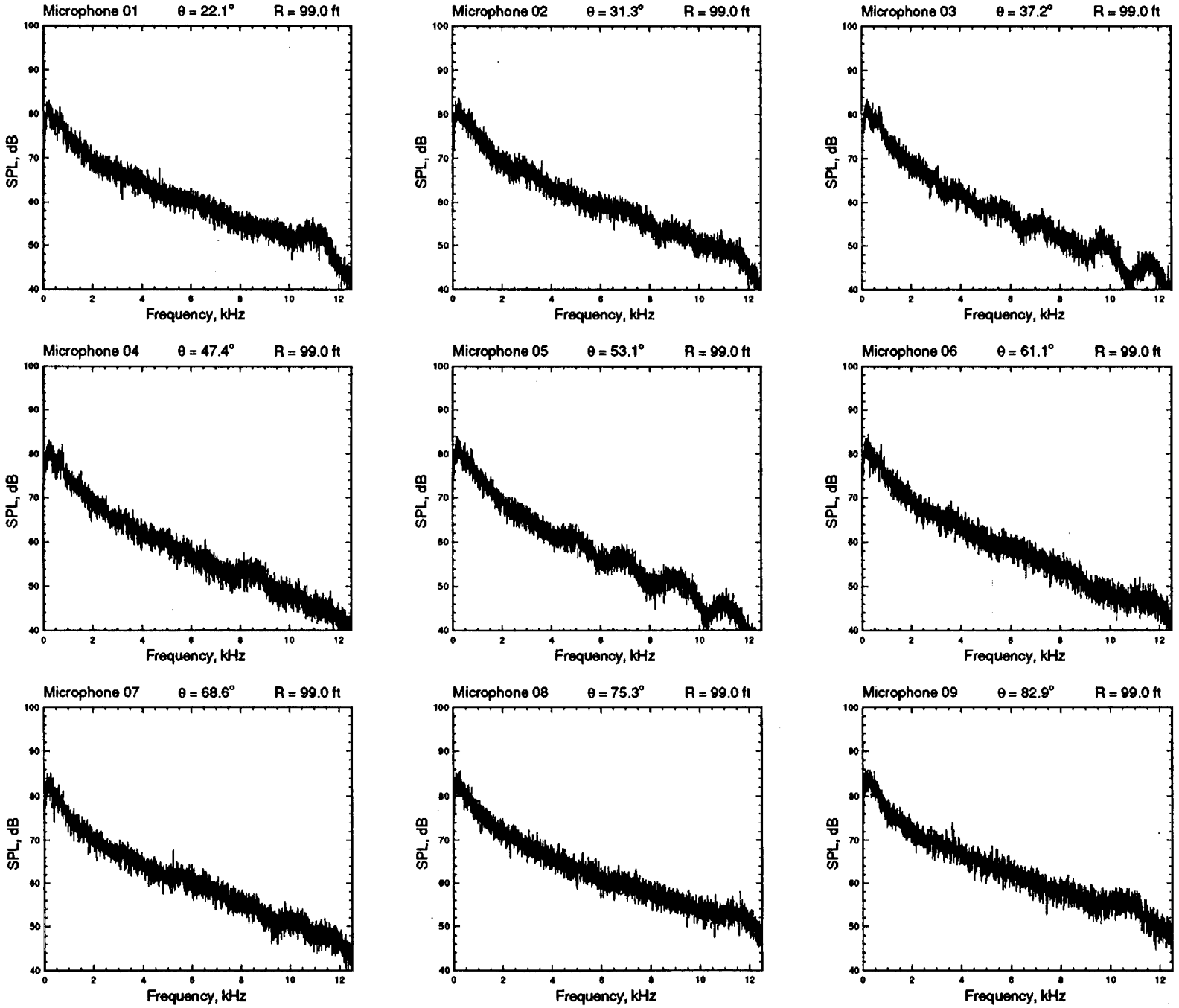




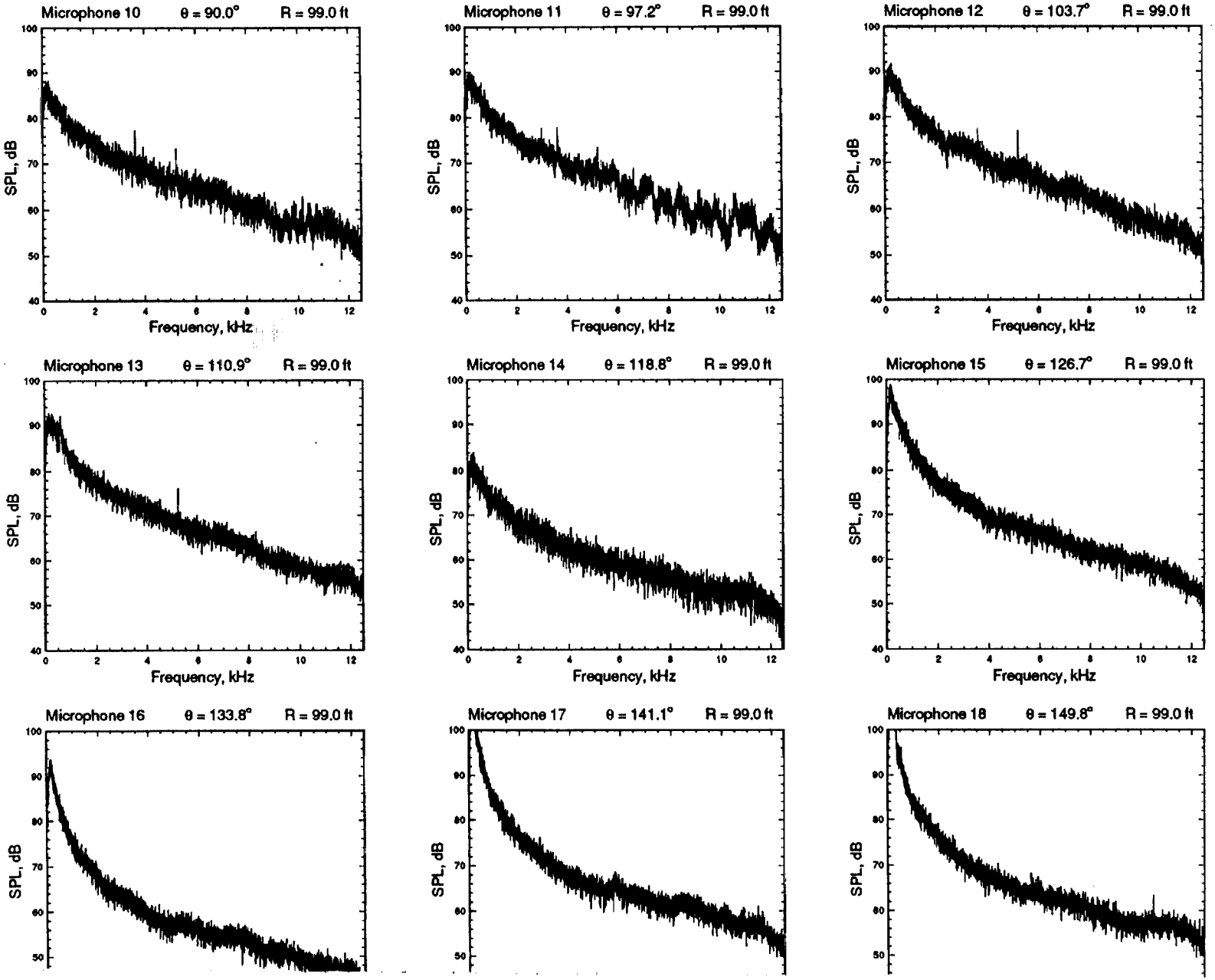


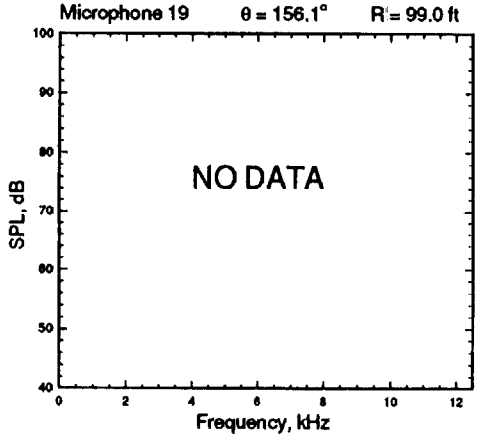


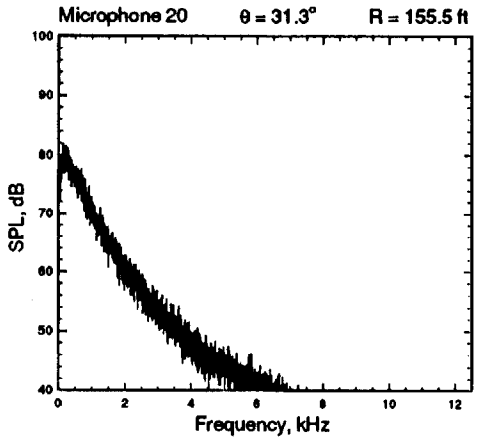
F-16XL Static Narrowband Acoustic Data - Run 7

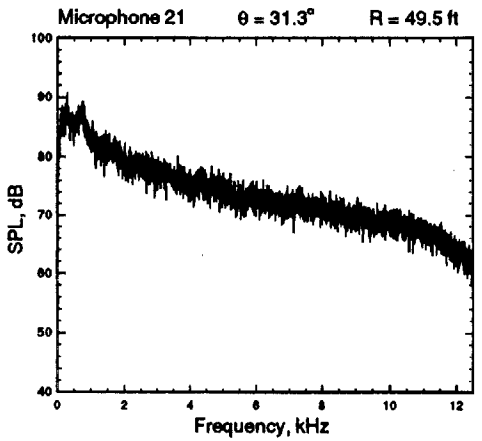


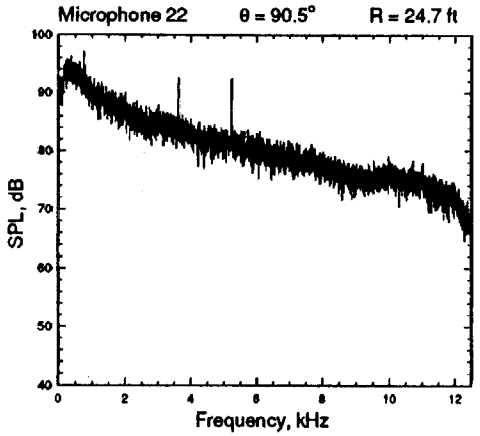
F-16XL Static Narrowband Acoustic Data - Run 7

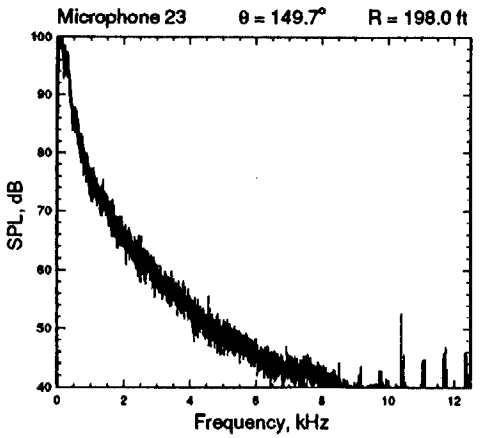



Microphone 19 θ = 156.1° R = 99.0 ft
NO DATA
SPL, dB
Frequency, kHz

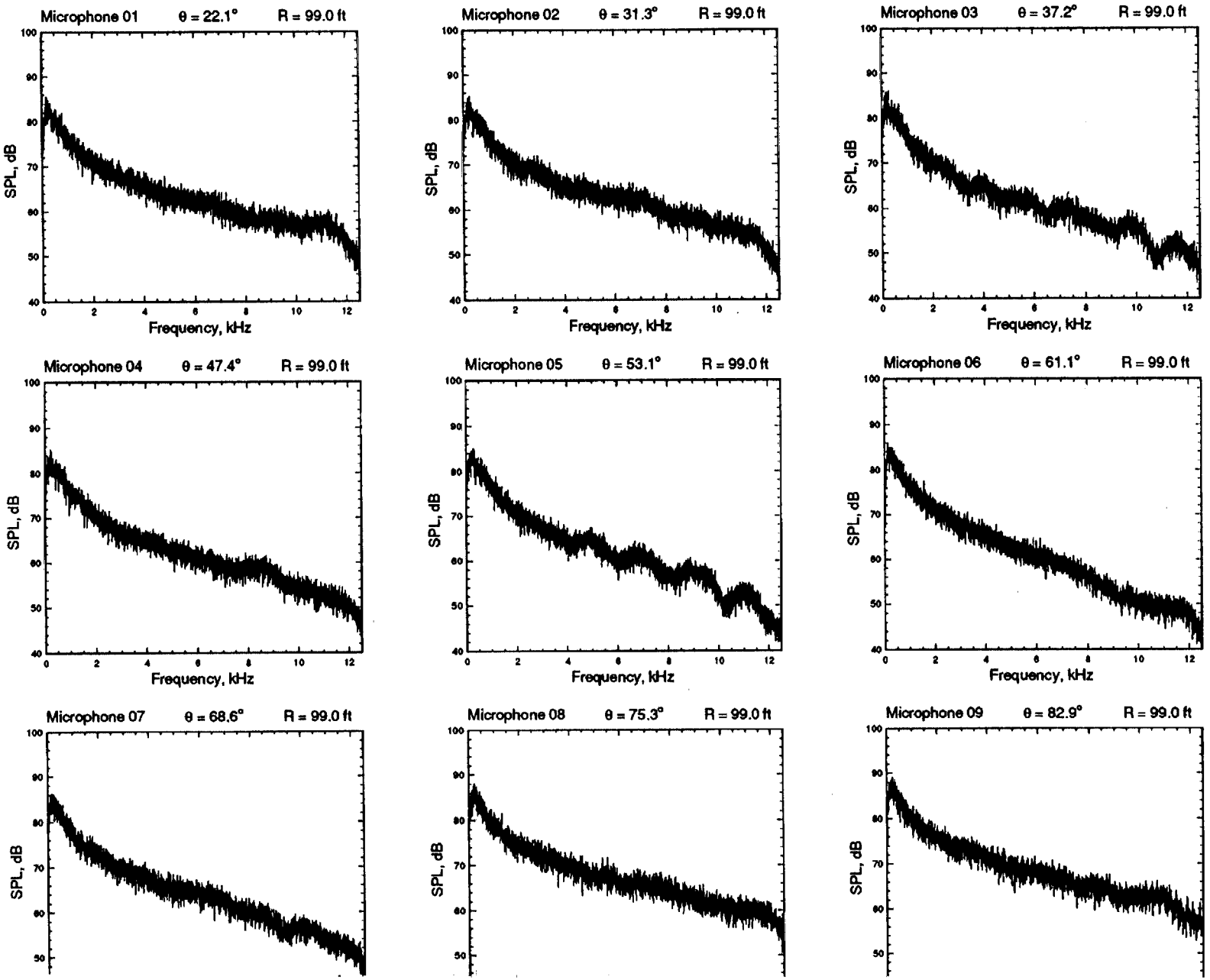

Microphone 20 θ = 31.3° R = 155.5 ft
SPL, dB
Frequency, kHz


Microphone 21 θ = 31.3° R = 49.5 ft
SPL, dB
Frequency, kHz

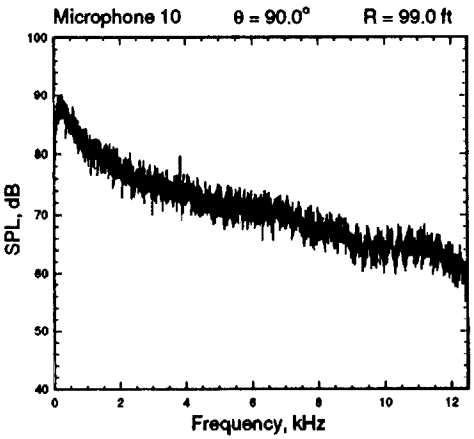

Microphone 22 θ = 90.5° R = 24.7 ft
SPL, dB
Frequency, kHz

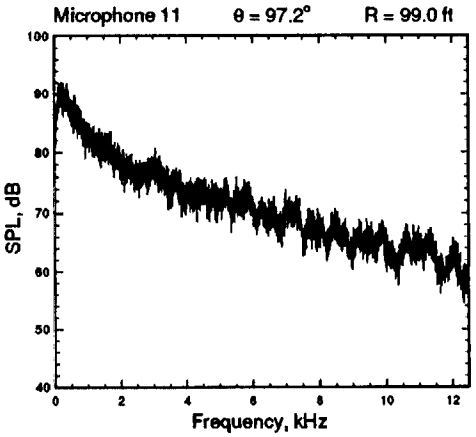

Microphone 23 θ = 149.7° R = 198.0 ft
SPL, dB
Frequency, kHz

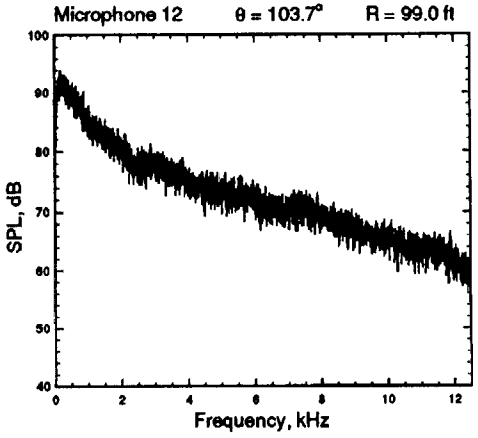
F-16XL Static Narrowband Acoustic Data - Run 8

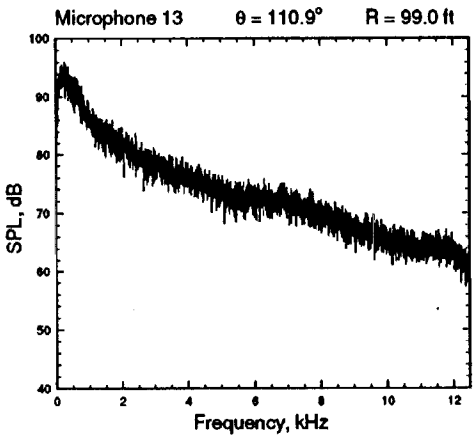


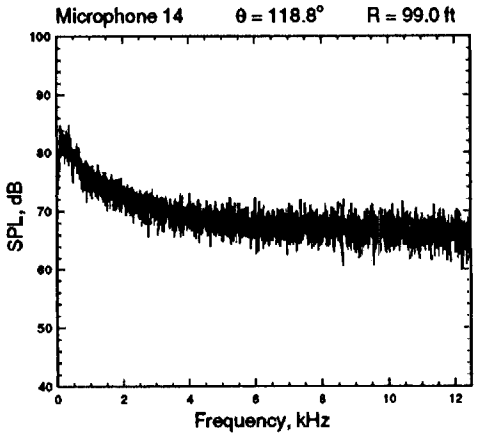
F-16XL Static Narrowband Acoustic Data - Run 8

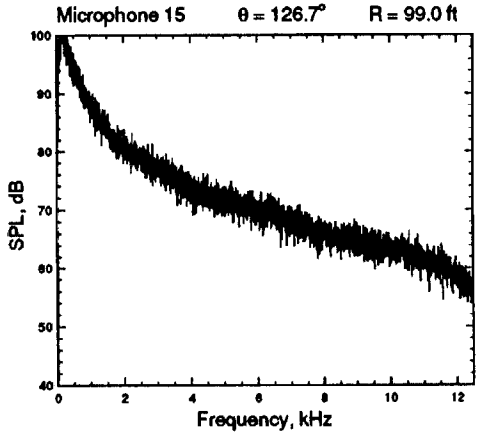


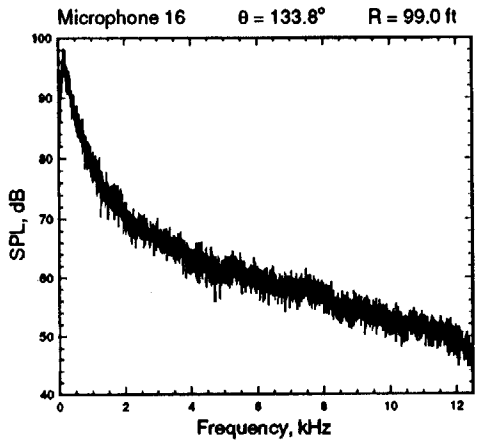


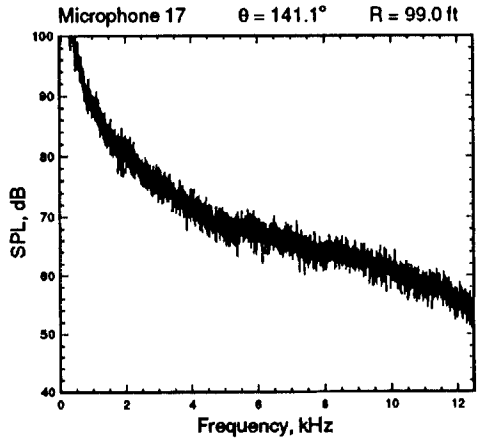


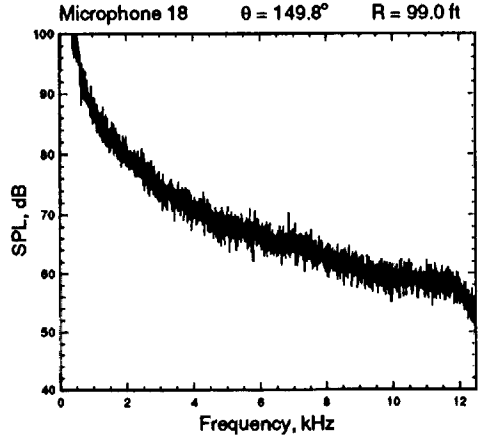




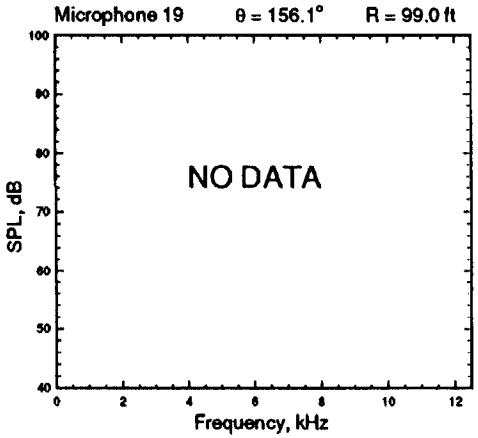


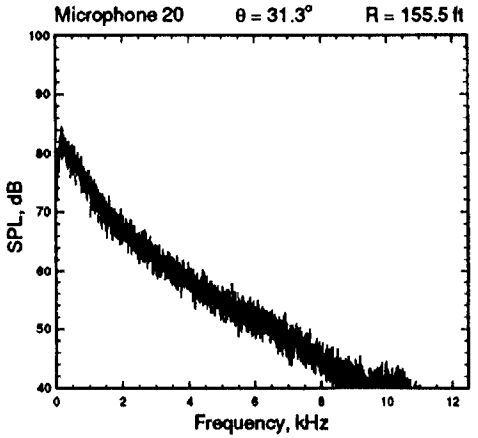


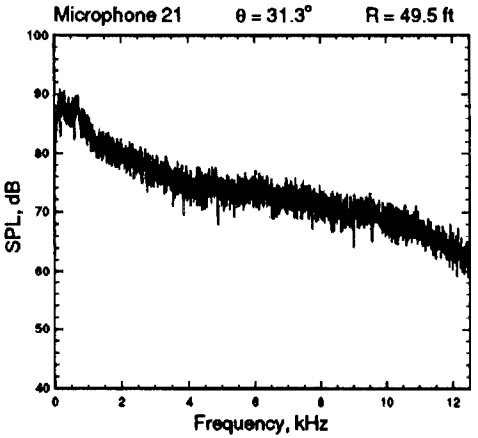


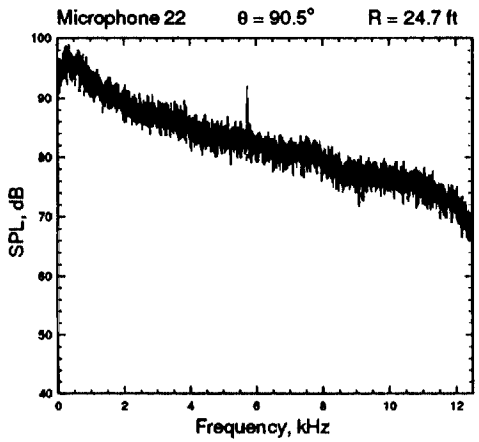


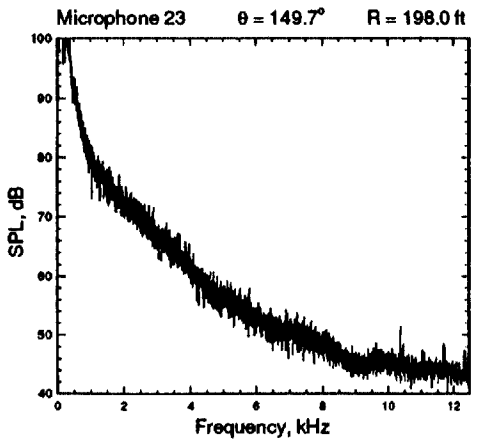
F-16XL Static Narrowband Acoustic Data - Run 8



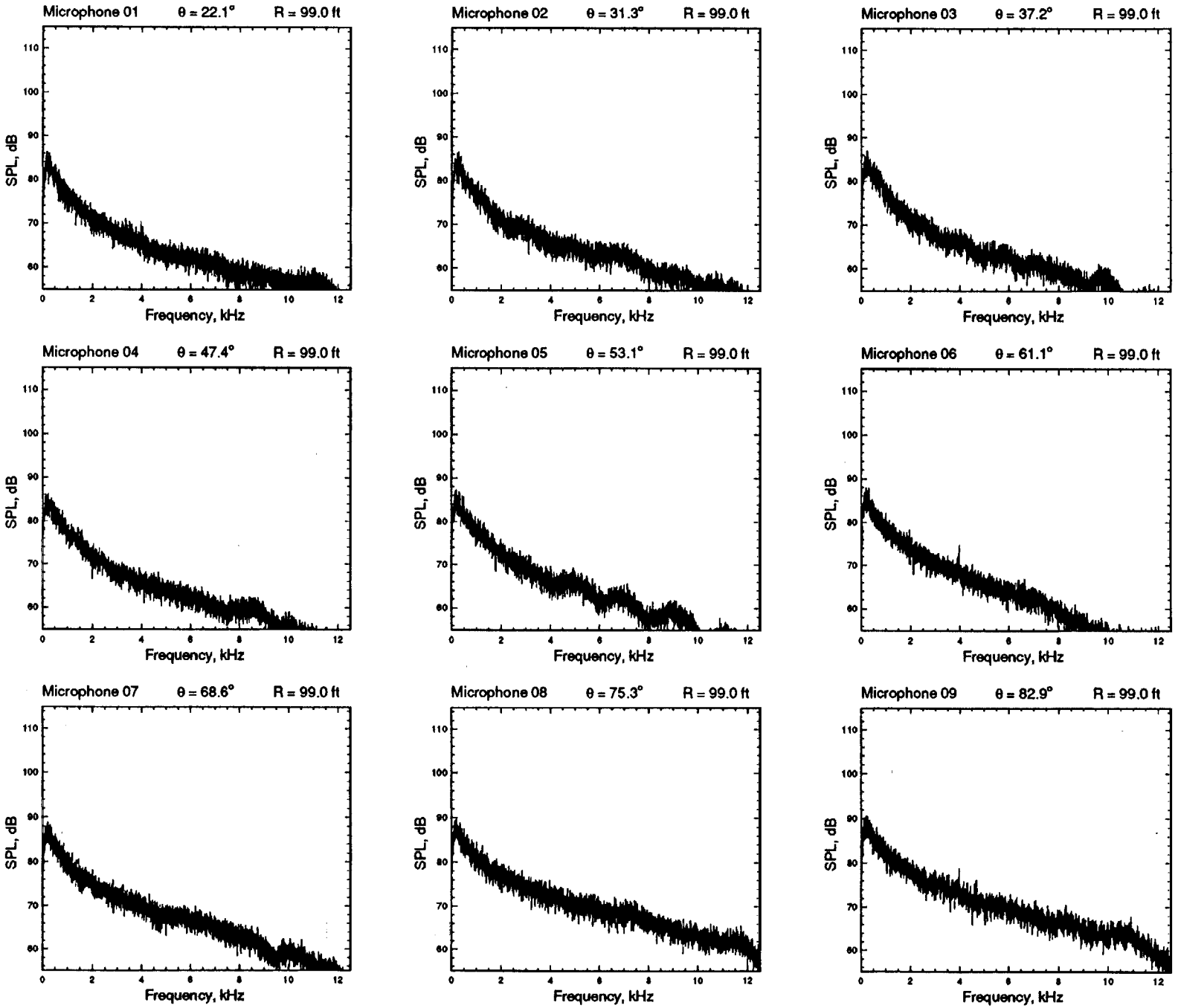




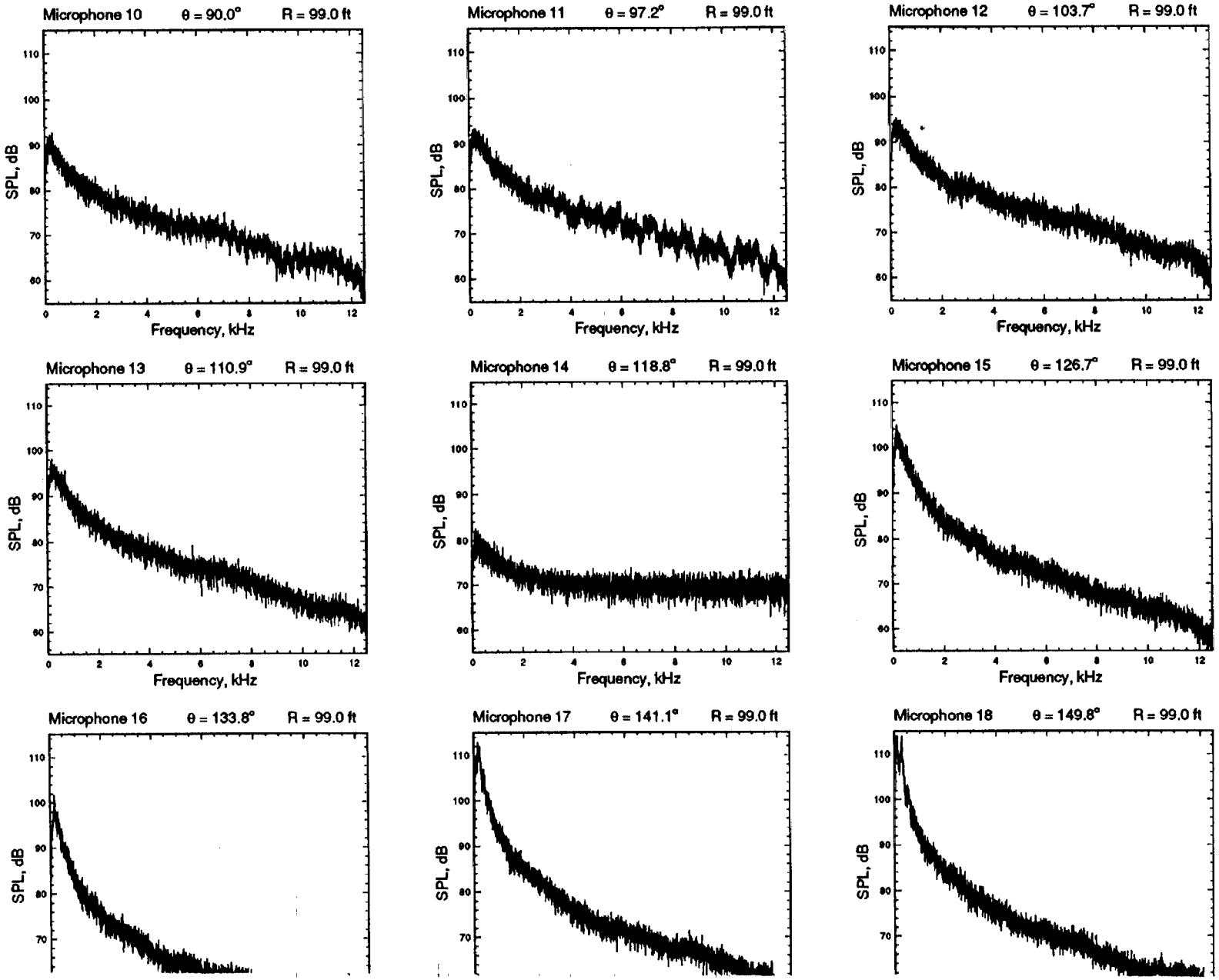




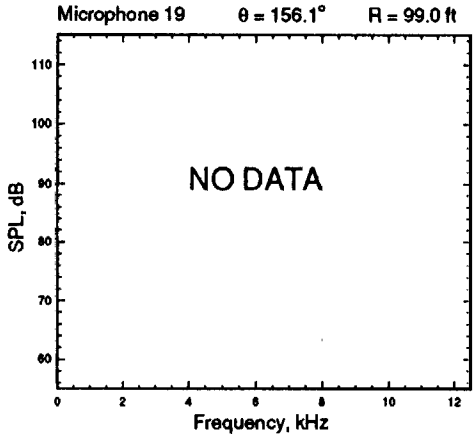
F-16XL Static Narrowband Acoustic Data - Run 9

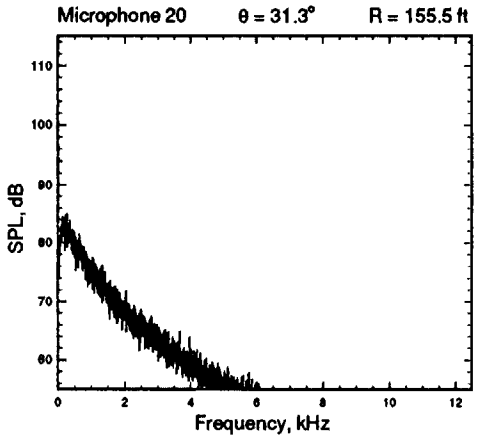


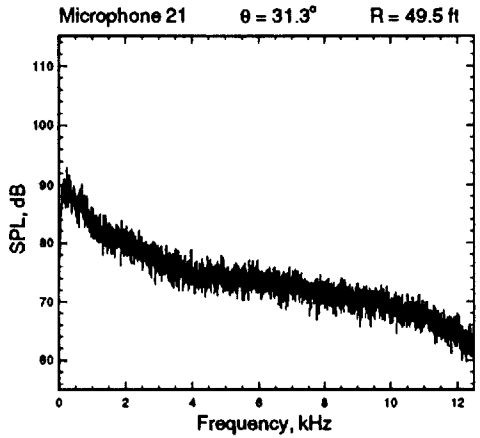
F-16XL Static Narrowband Acoustic Data - Run 9

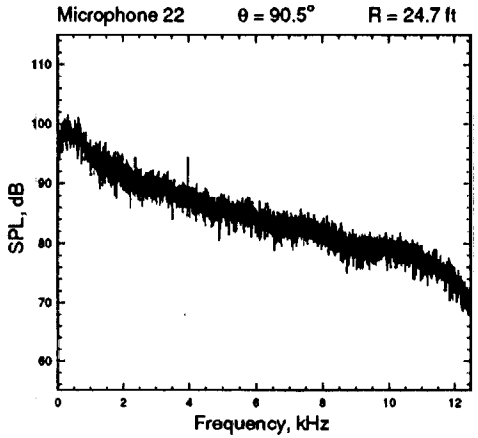


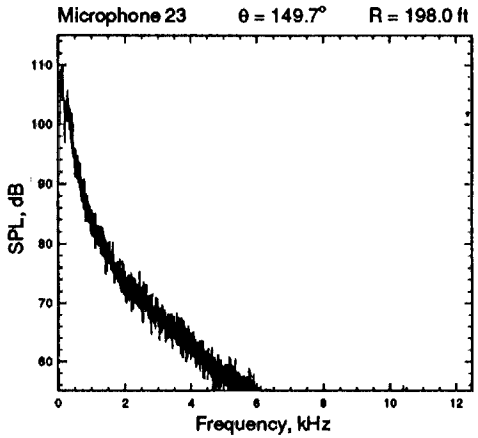
F-16XL Static Narrowband Acoustic Data - Run 9



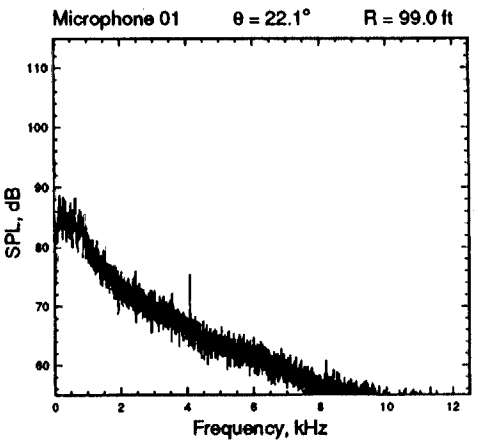


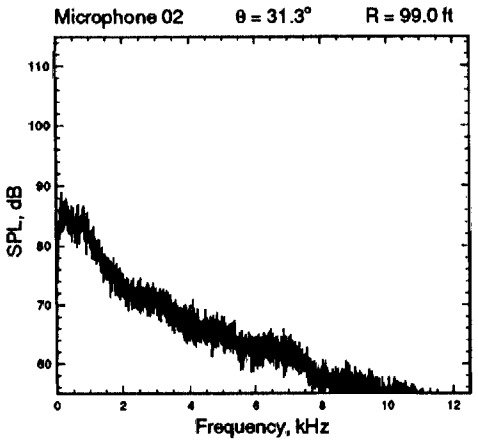


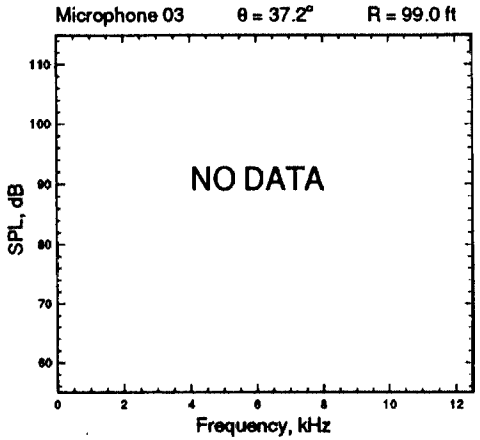


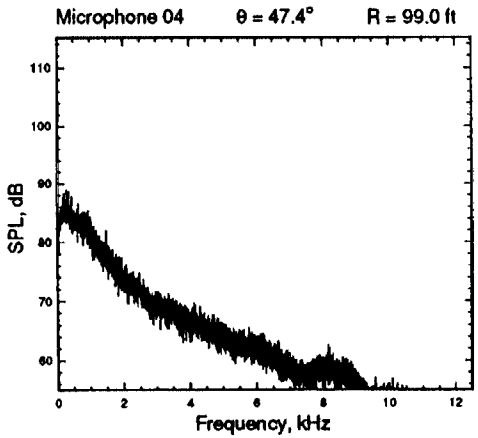


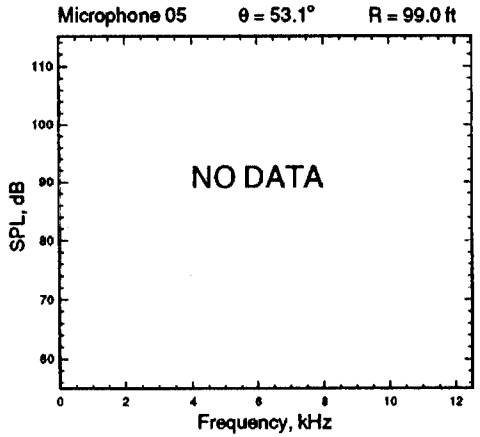
F-16XL Static Narrowband Acoustic Data - Run 10

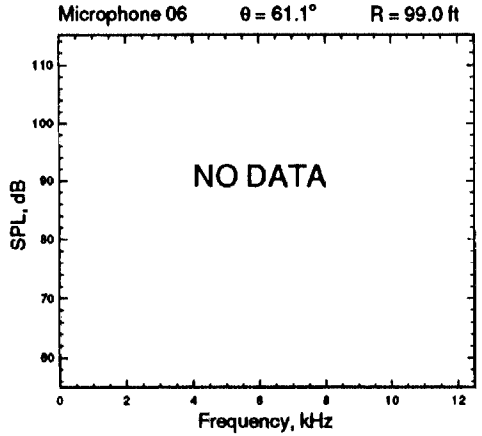


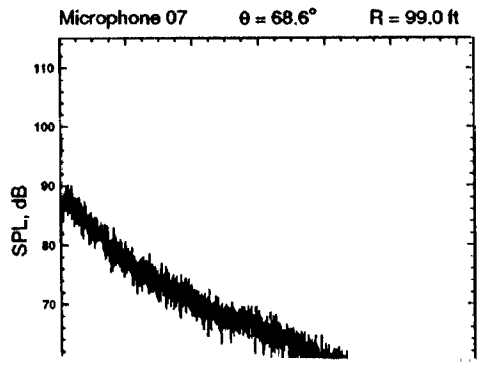


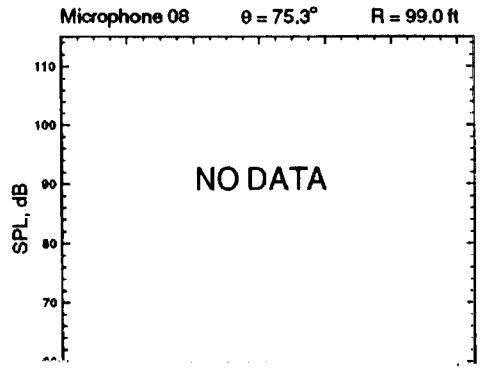


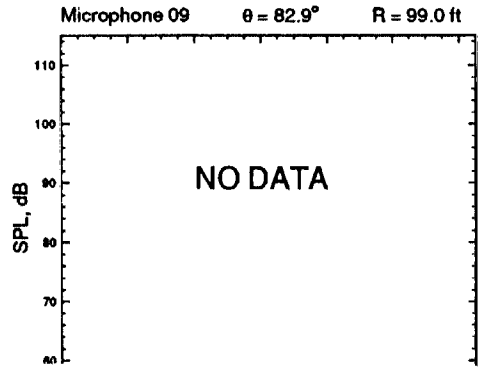




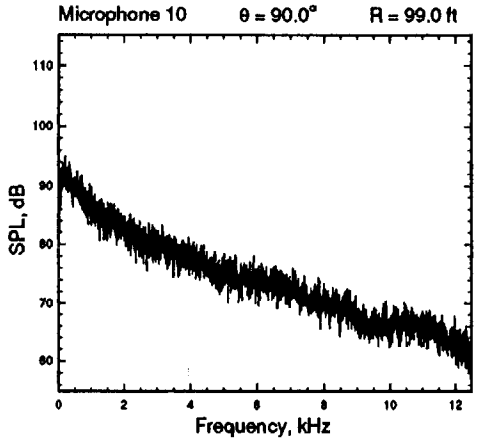


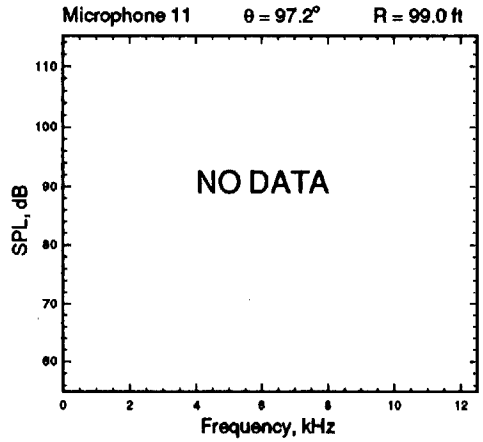


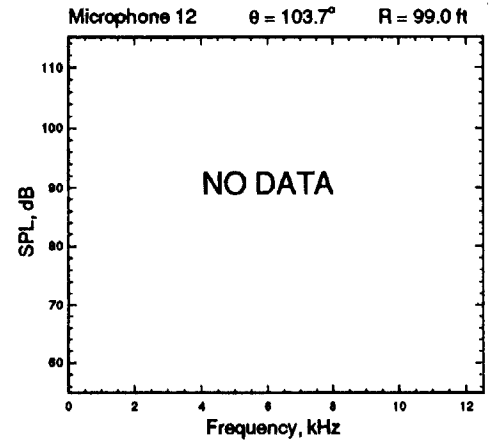


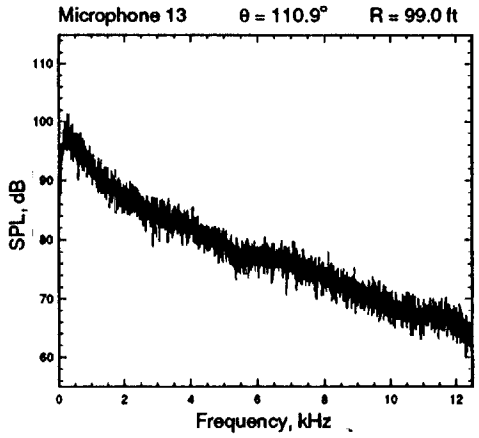


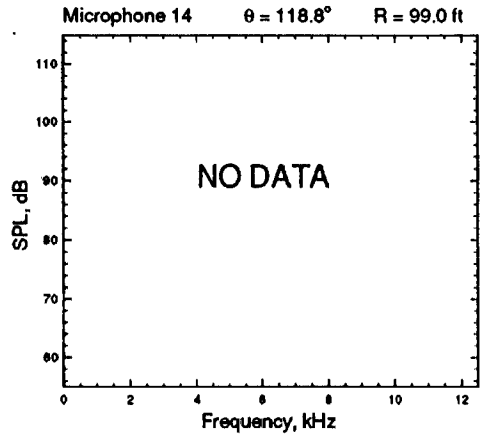
F-16XL Static Narrowband Acoustic Data - Run 10

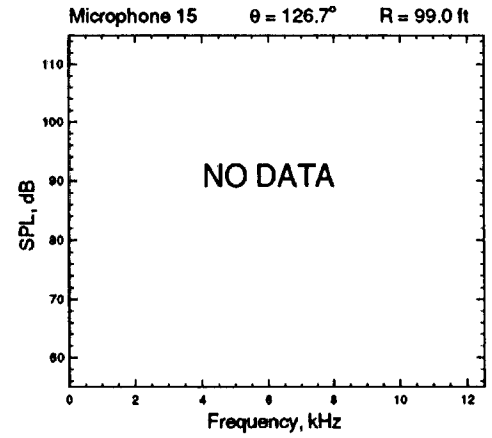


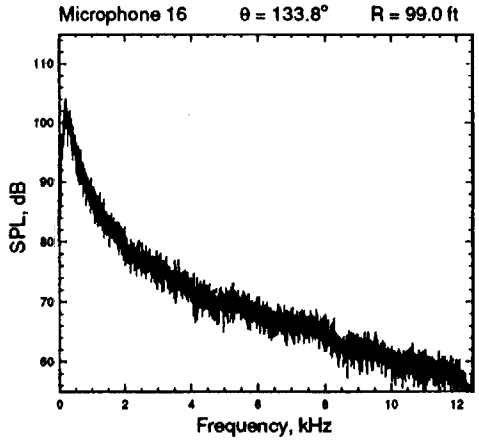


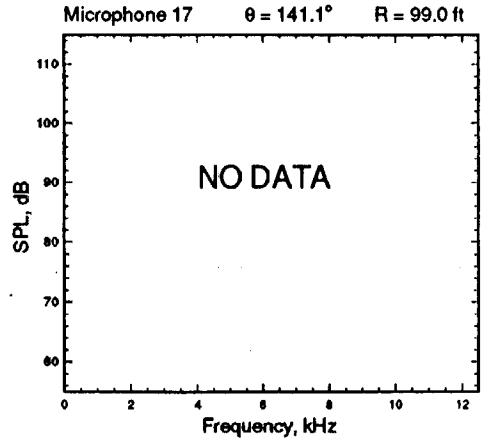


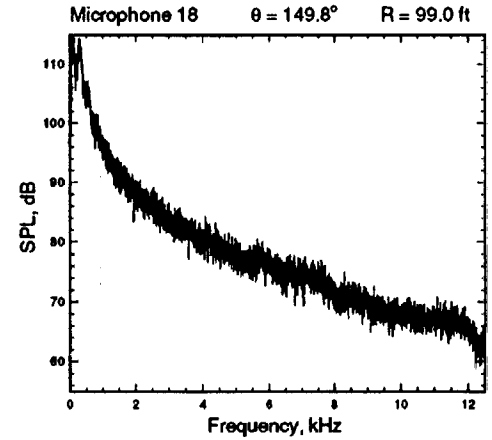




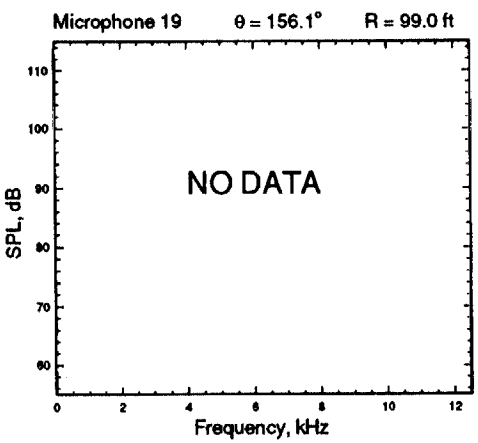


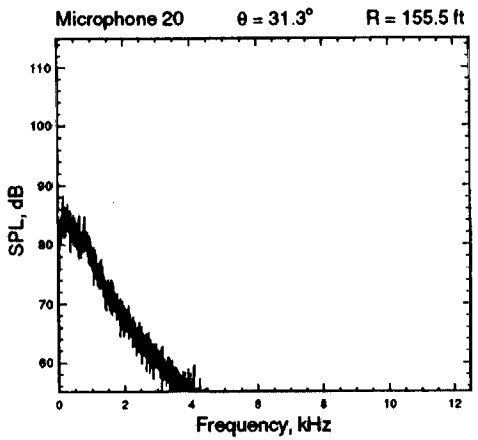


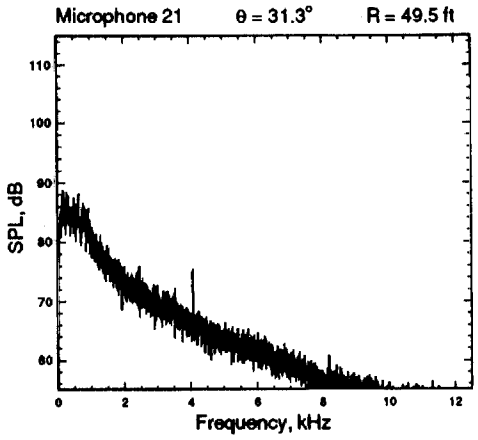


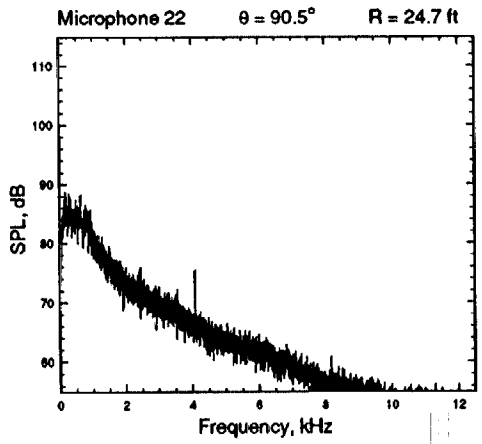


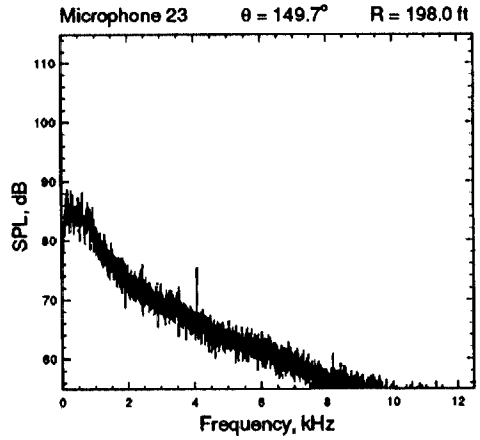
F-16XL Static Narrowband Acoustic Data - Run 10



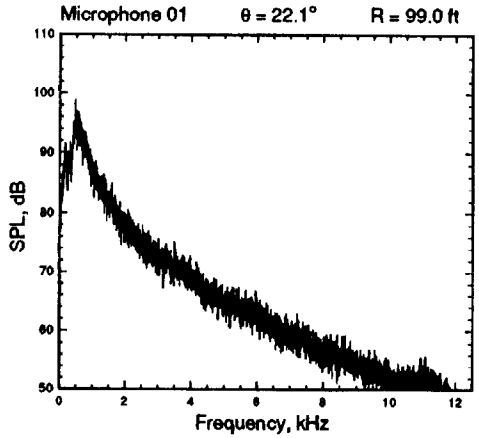


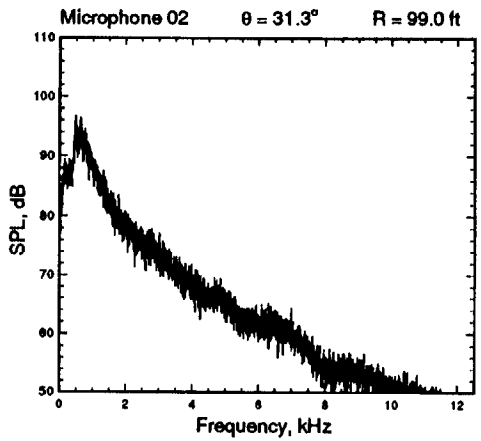


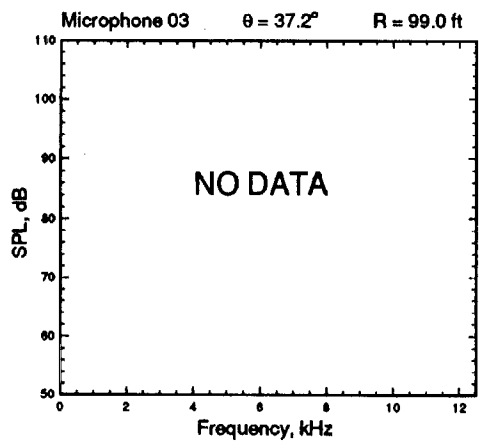


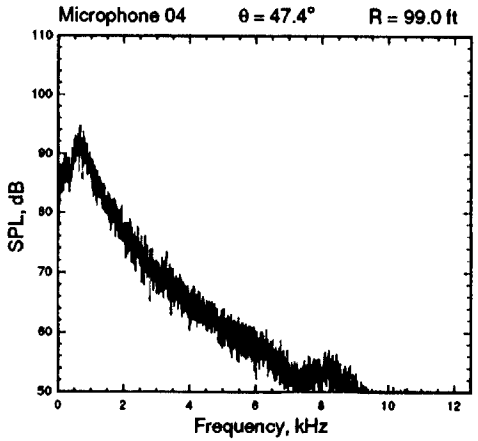


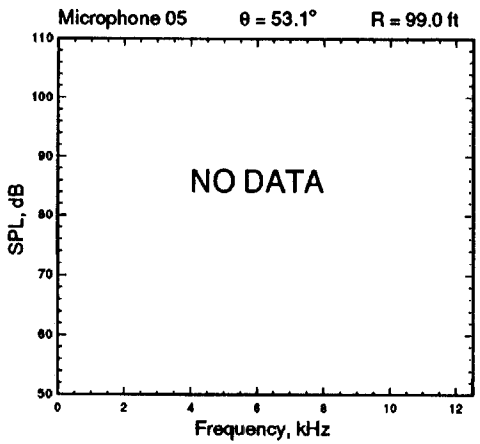
F-16XL Static Narrowband Acoustic Data - Run 11

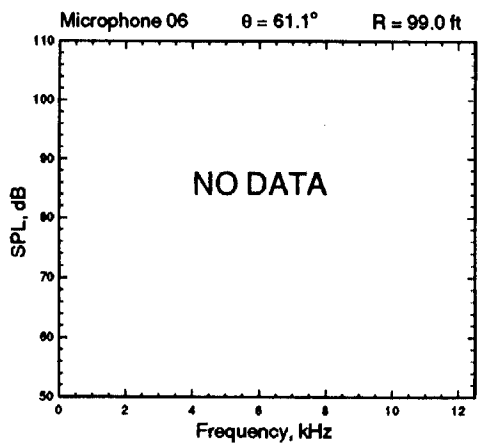


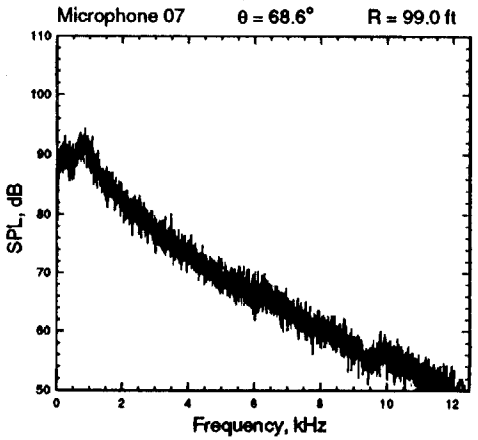


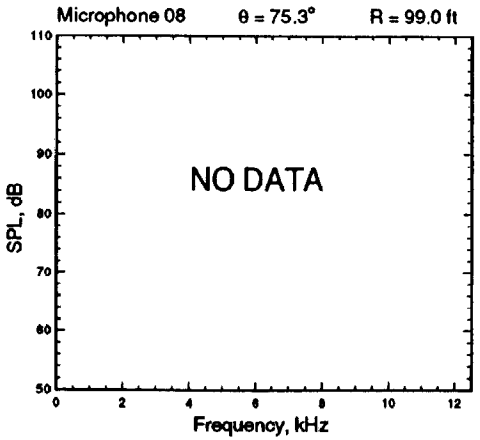


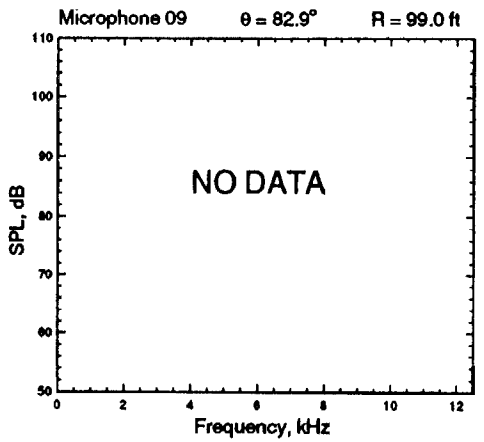




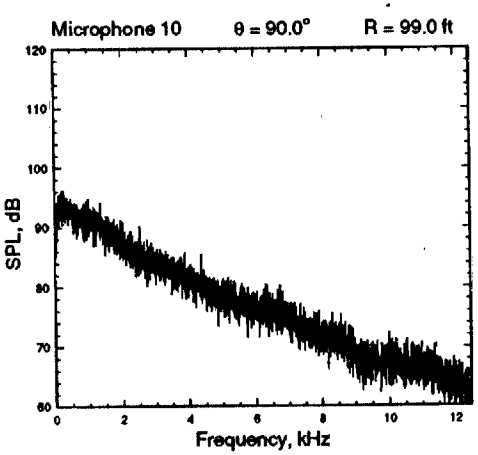


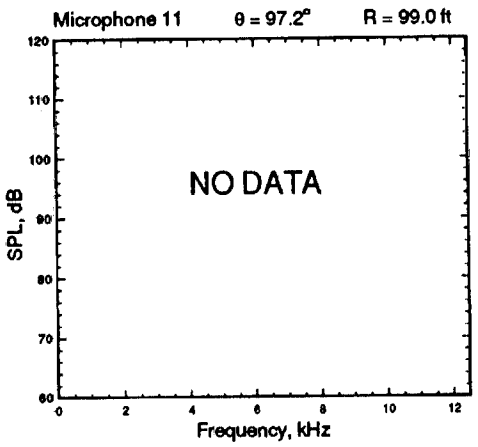


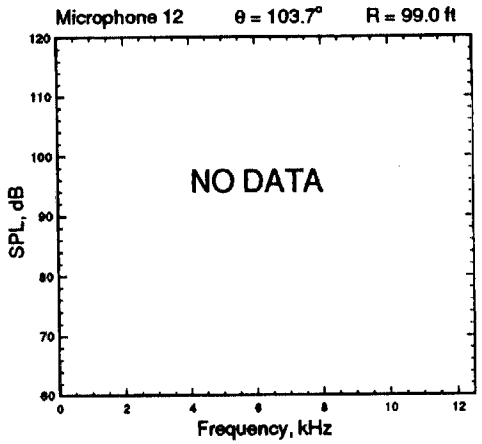


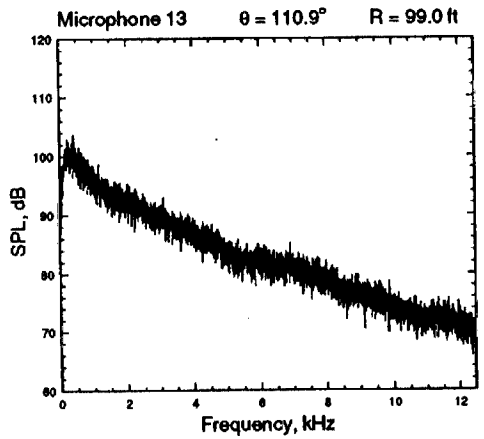


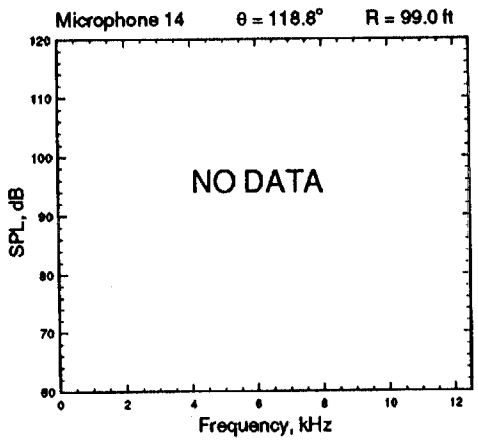
F-16XL Static Narrowband Acoustic Data - Run 11

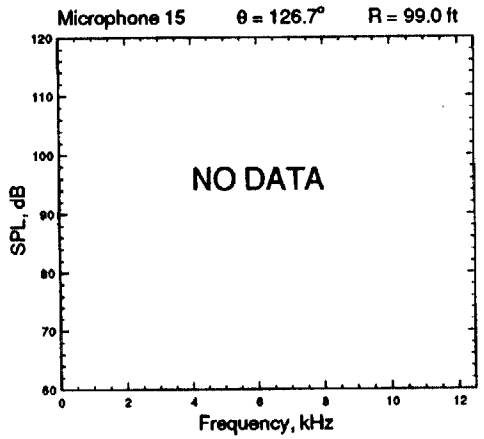


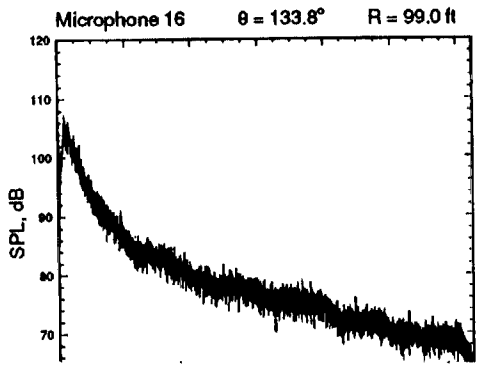


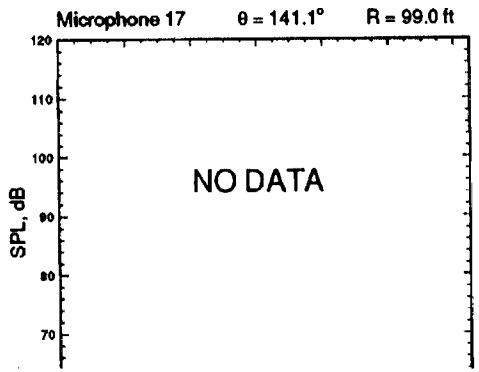


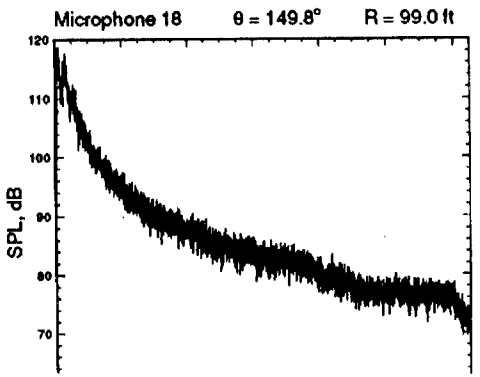




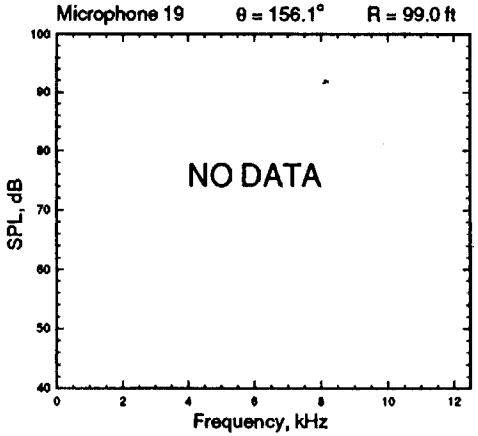


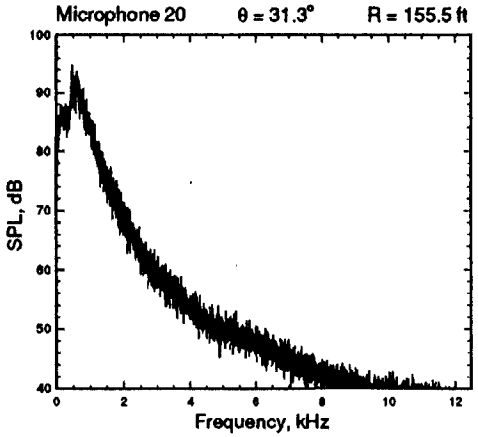


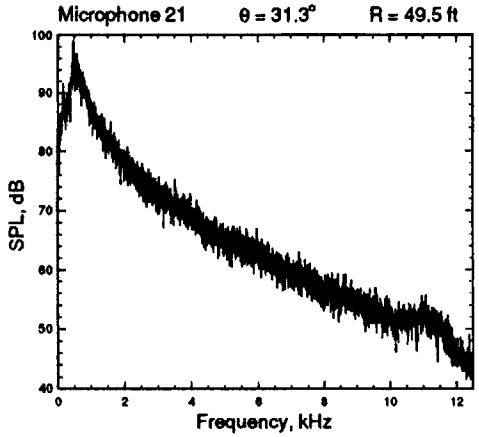


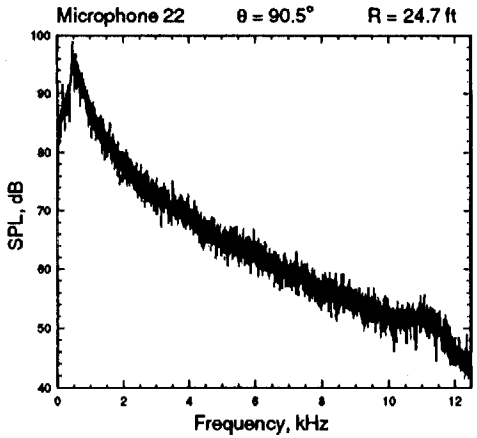


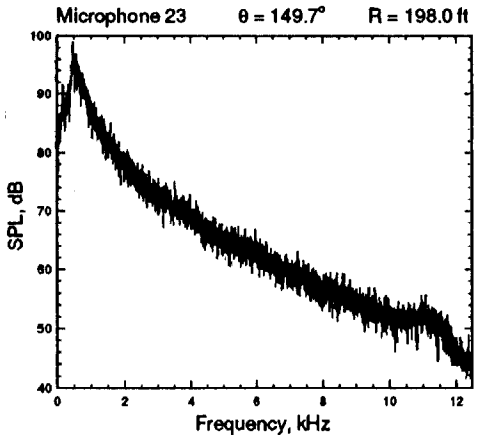
F-16XL Static Narrowband Acoustic Data - Run 11



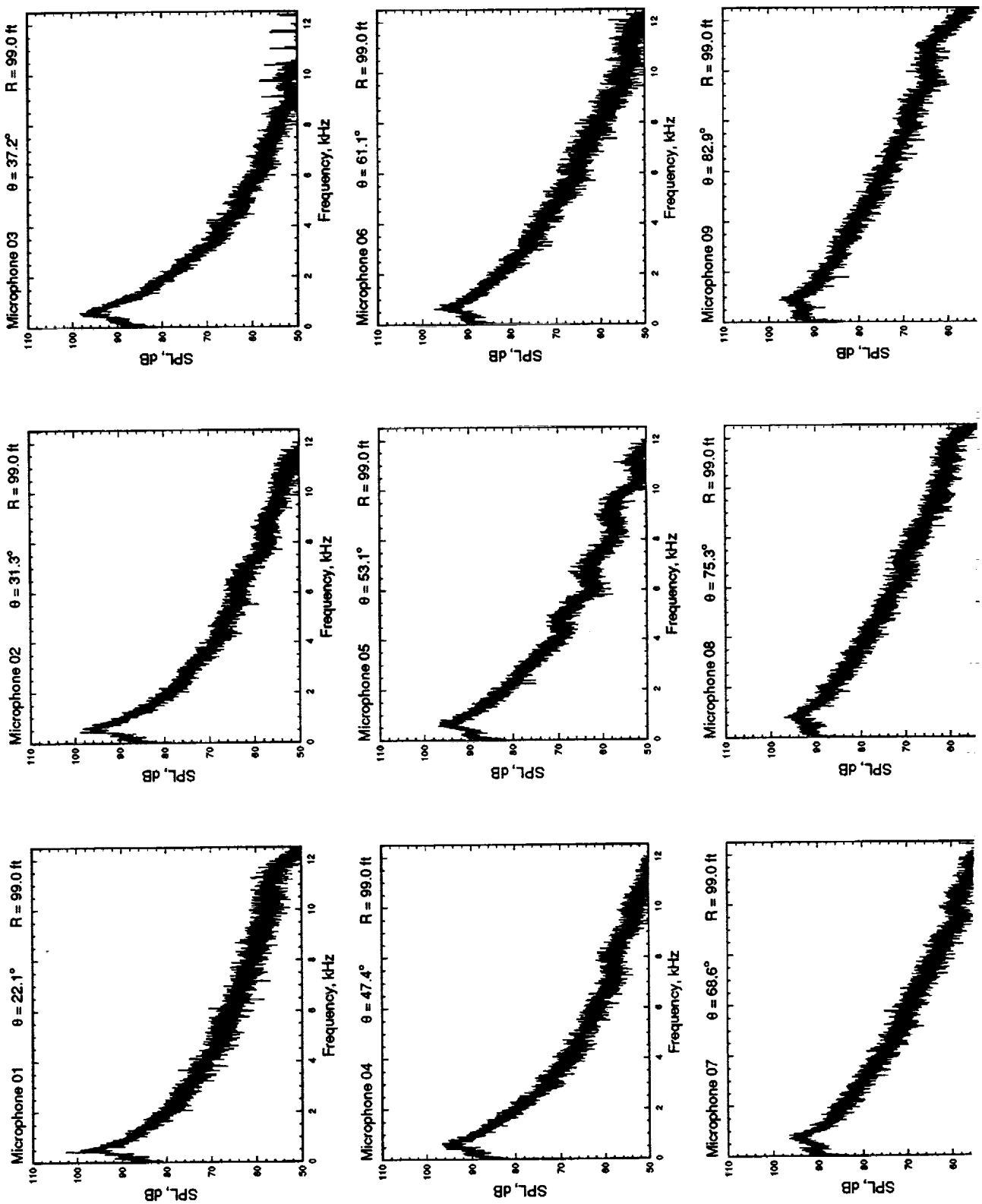




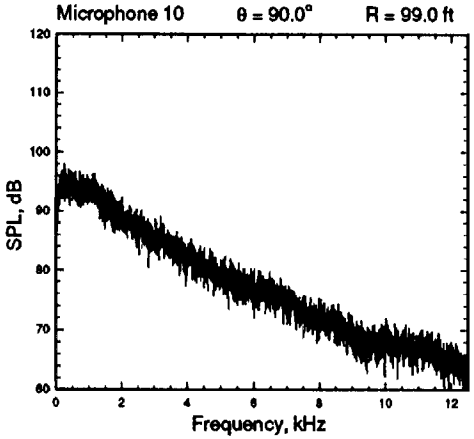


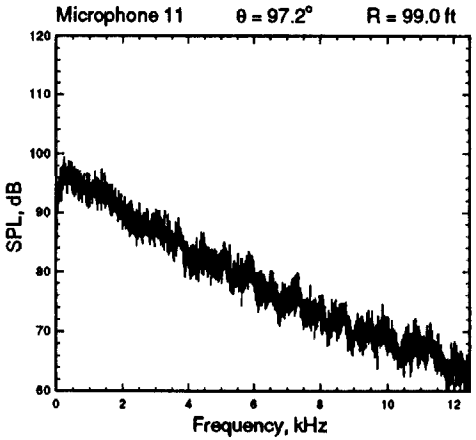


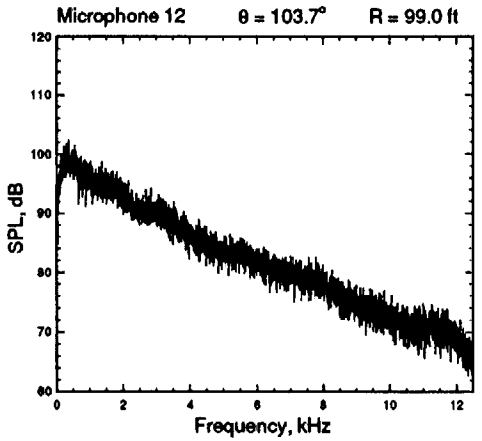
F-16XL Static Narrowband Acoustic Data - Run 12

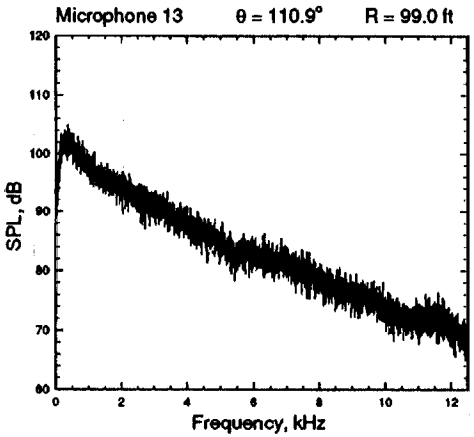


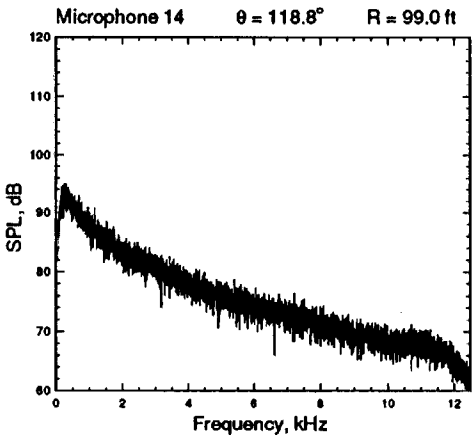
F-16XL Static Narrowband Acoustic Data - Run 12

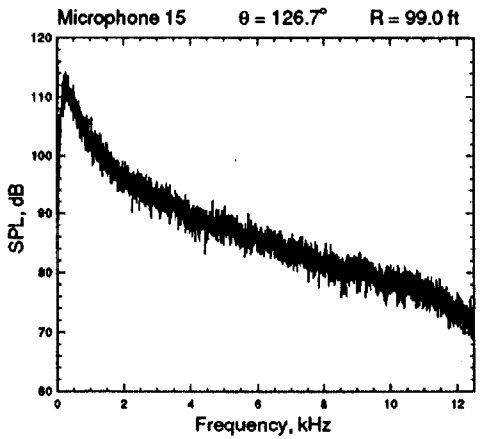


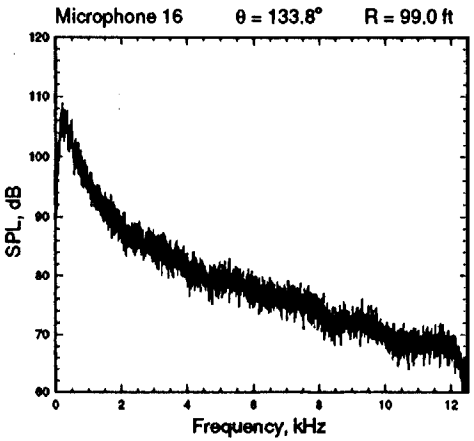


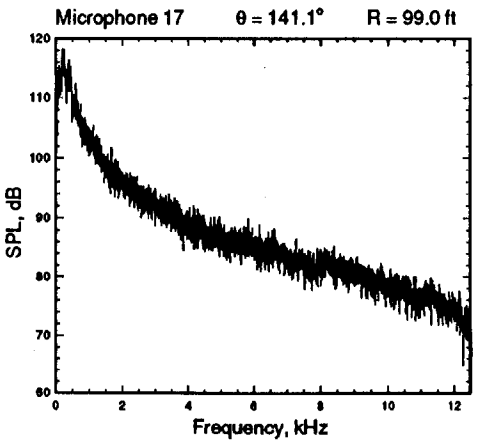


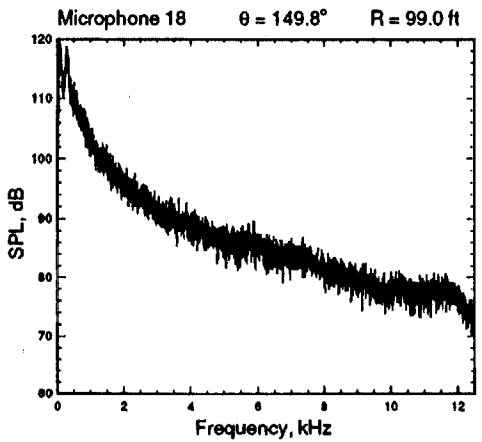




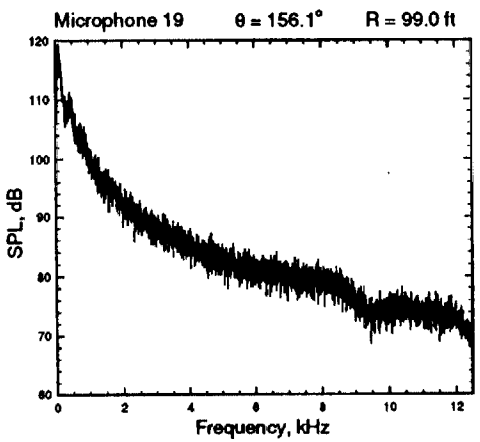


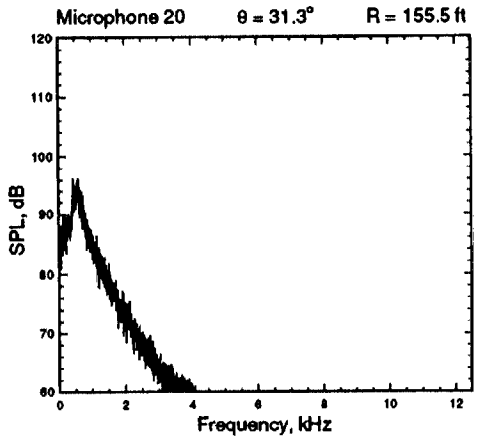


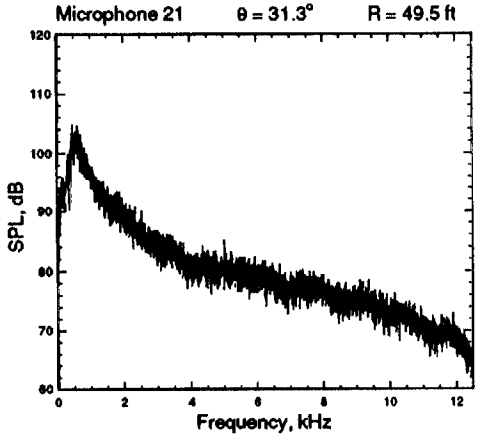


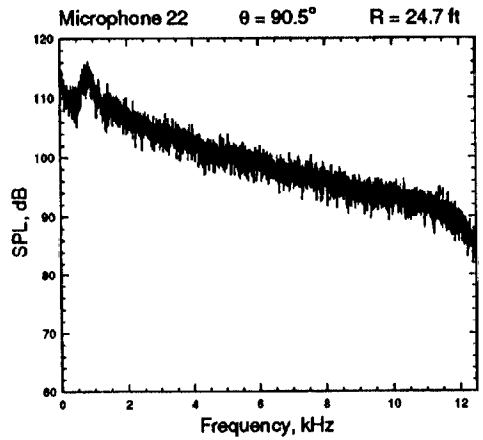


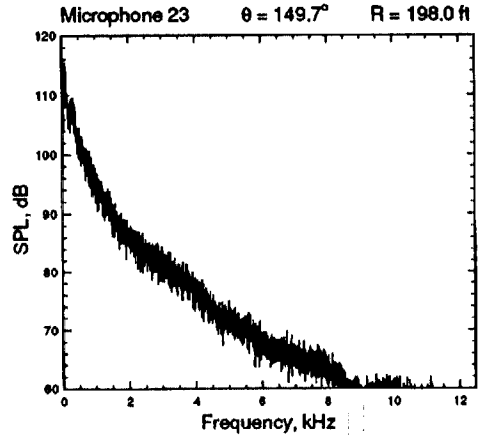
F-16XL Static Narrowband Acoustic Data - Run 12



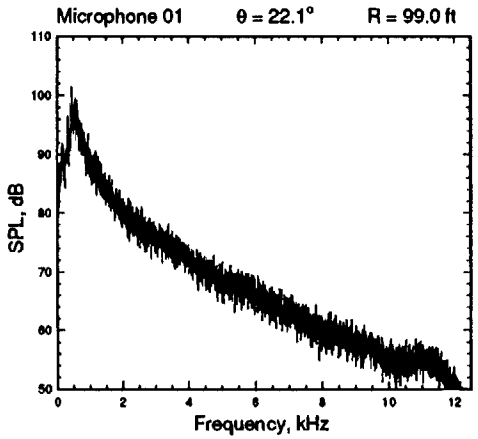


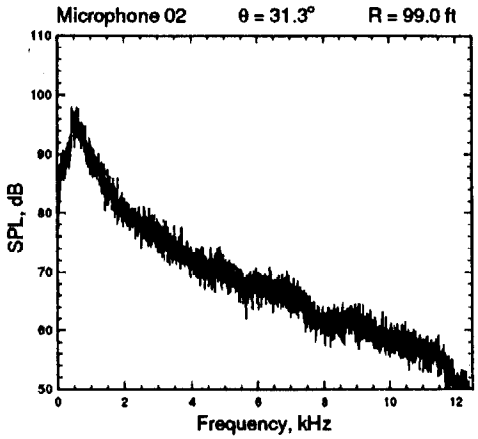


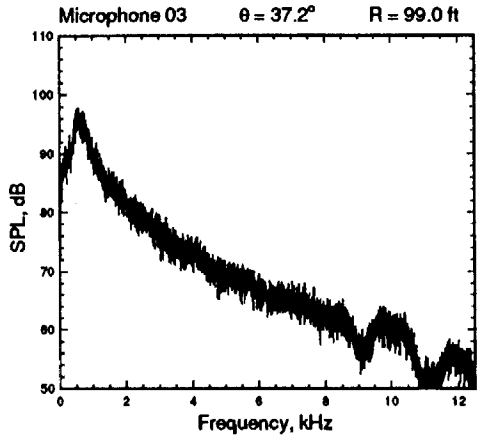


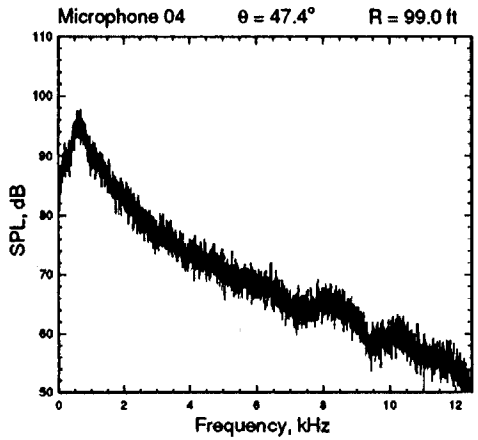


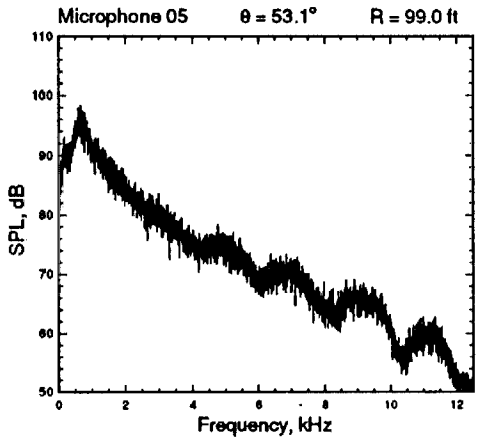
F-16XL Static Narrowband Acoustic Data - Run 13

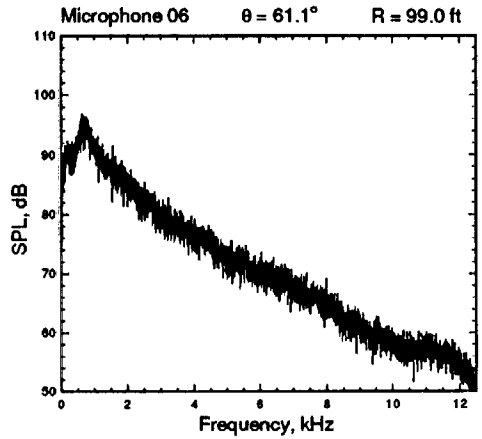


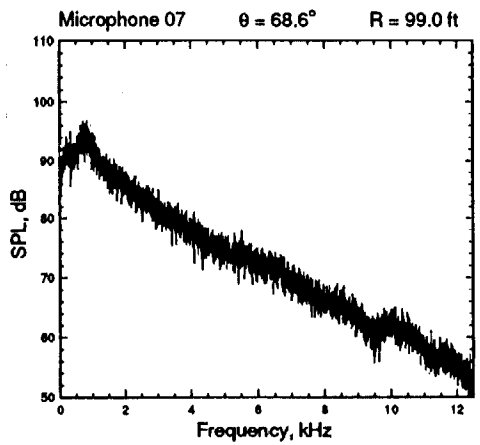


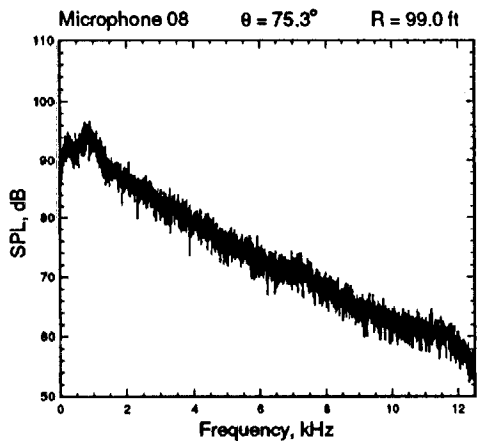


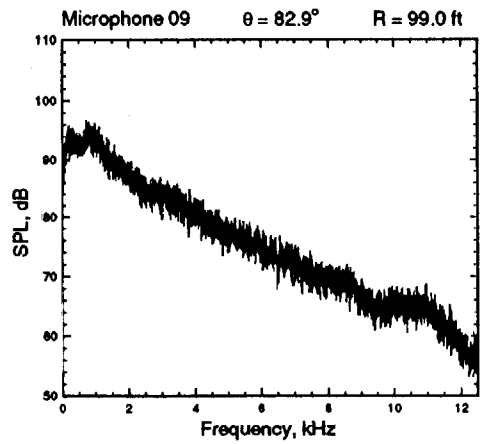




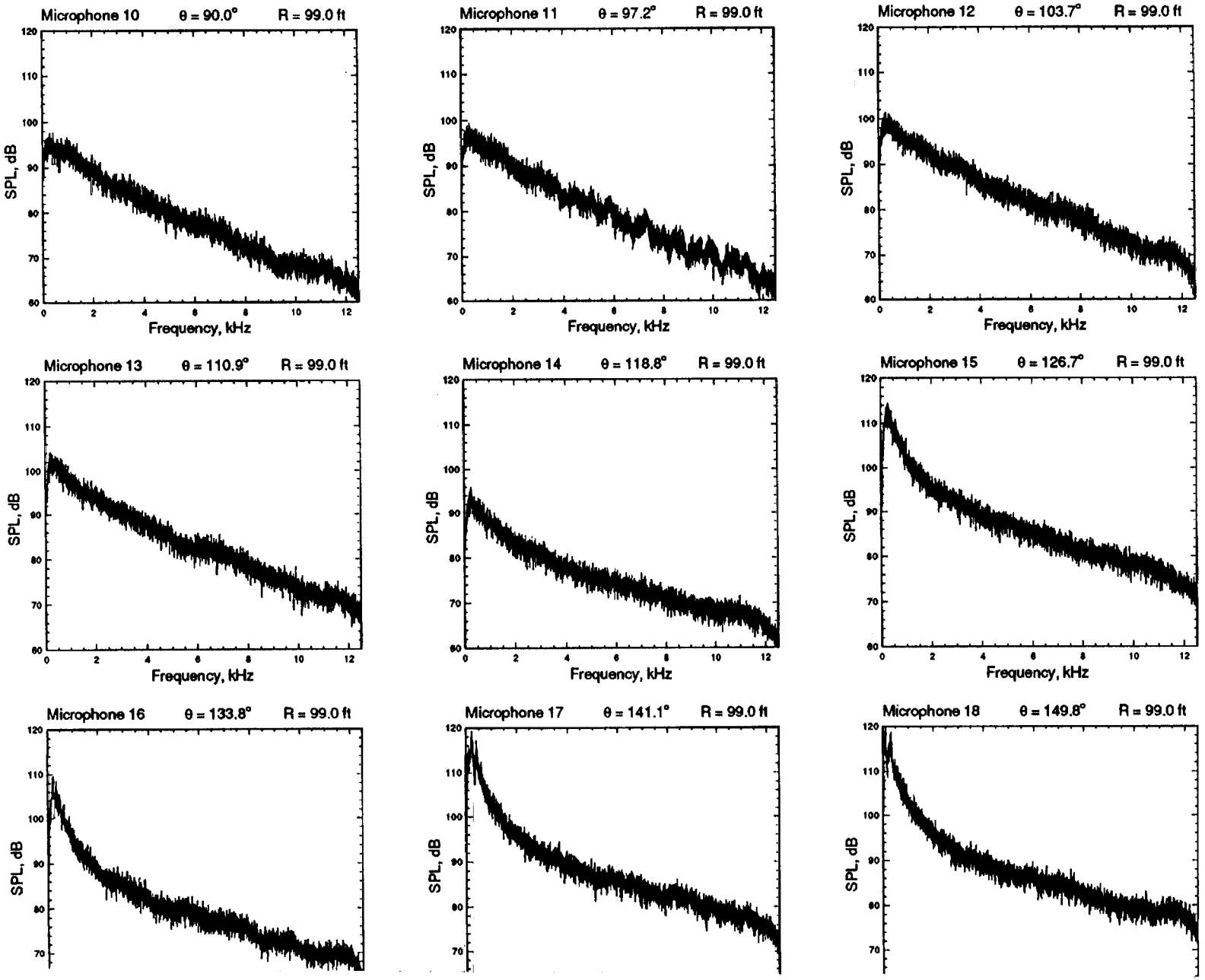




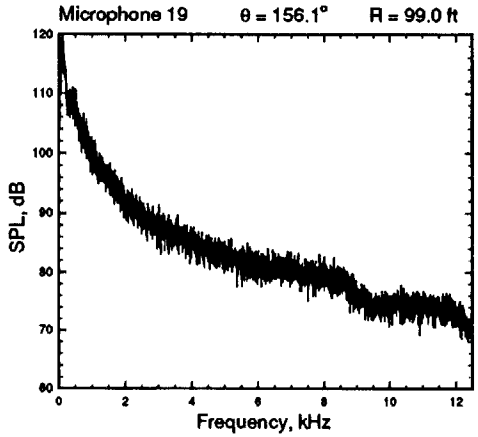


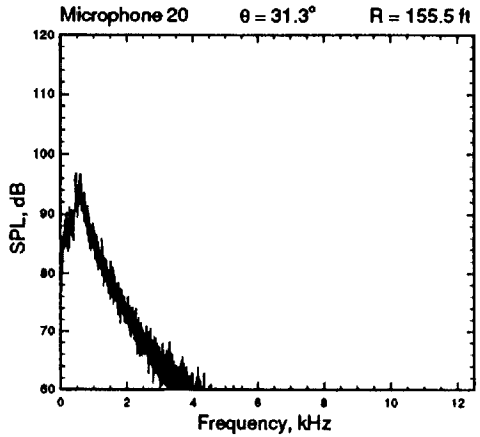


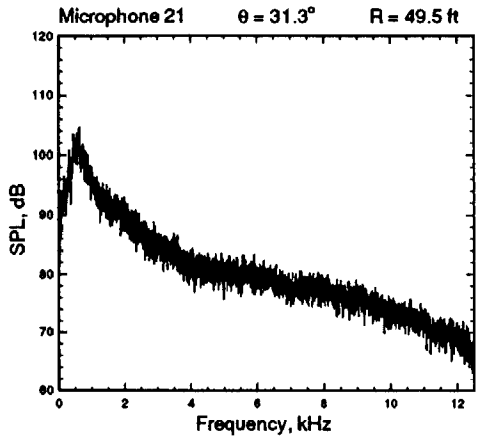
F-16XL Static Narrowband Acoustic Data - Run 13

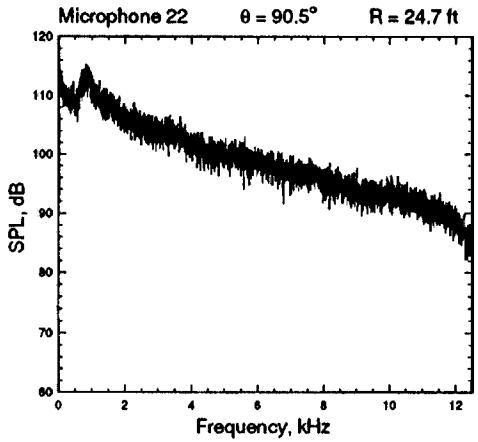


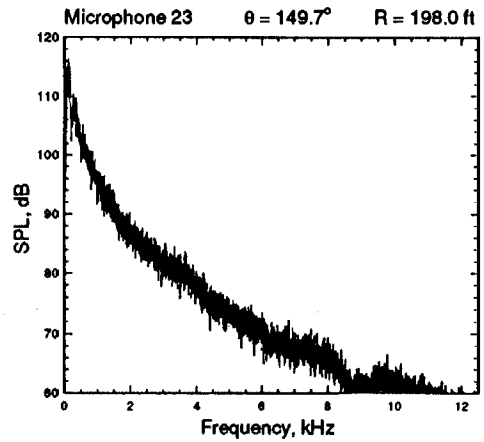
F-16XL Static Narrowband Acoustic Data - Run 13











APPENDIX F

1/3-OCTAVE BAND SOUND PRESSURE LEVELS FOR STATIC TESTS

F-18 Static Run 5

1/3-Octave Sound Pressure Levels

Microphone	2	4	5	6	7	8	9	10	11	12	13	15	16	18	19	20	21
θ	31.3	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	126.7	133.8	149.8	156.1	31.3	31.3
Frequency																	
50.	74.3	77.9	80.8	79.3	80.6	54.4	81.7	82.7	83.4	88.3	84.9	89.7	93.2	100.4	102.2	76.0	83.8
63.	76.0	80.2	81.7	82.7	83.5	58.2	85.4	86.7	87.7	101.2	88.9	93.5	96.4	104.1	106.2	77.6	86.0
80.	77.5	82.4	83.7	84.9	85.4	60.3	87.0	87.4	88.1	90.1	90.6	95.9	99.0	106.8	108.8	79.9	89.0
100.	78.3	83.4	84.4	85.6	85.8	61.0	87.5	88.5	90.1	91.8	92.2	97.2	100.8	108.3	110.3	80.0	90.4
125.	81.8	85.7	86.8	87.7	87.9	63.5	90.1	91.2	92.3	94.1	95.0	99.5	102.9	109.9	111.9	82.4	91.1
160.	83.4	88.7	88.7	90.5	91.3	65.8	92.4	93.6	95.4	98.4	98.3	103.6	106.3	111.9	112.4	85.4	92.5
200.	82.9	89.3	90.1	90.0	90.8	66.0	92.4	93.8	95.5	98.1	97.9	102.7	106.5	112.8	111.1	85.2	93.1
250.	84.2	89.9	90.5	91.0	91.5	66.7	93.7	94.5	95.9	97.6	98.2	103.6	106.1	113.7	112.7	86.1	94.9
315.	85.9	91.1	92.0	92.5	93.3	68.2	94.6	96.3	97.5	100.1	99.8	104.4	106.8	110.7	112.2	86.9	98.5
400.	86.6	91.3	92.0	92.7	92.5	67.7	94.9	95.9	97.1	99.0	100.4	104.9	106.5	108.0	108.1	87.6	97.6
500.	86.6	91.5	91.8	92.2	93.2	68.1	94.7	95.8	97.4	99.1	100.6	105.0	106.1	106.3	105.2	87.7	97.5
630.	87.4	92.1	92.9	93.6	93.6	68.4	95.6	96.2	97.7	99.1	101.0	104.8	105.8	104.7	104.3	88.2	99.6
800.	87.5	92.2	92.8	93.1	93.7	68.5	95.5	96.7	97.9	99.8	100.7	104.0	104.9	103.1	101.7	88.2	98.4
1000.	87.7	91.6	92.3	93.0	93.9	68.5	94.9	96.1	97.6	98.9	99.7	103.4	103.5	101.7	100.5	87.3	98.9
1250.	88.6	92.3	92.8	93.3	94.0	68.6	94.7	95.8	97.5	98.4	99.5	102.7	103.0	100.8	99.7	89.2	100.5
1600.	92.7	95.1	94.7	94.2	94.9	69.2	94.8	95.9	97.5	98.2	99.5	102.5	102.4	100.1	98.6	92.7	103.2
2000.	93.6	95.6	94.4	93.6	93.8	68.3	94.0	94.9	96.0	96.8	98.3	101.0	99.9	97.7	96.4	93.5	103.2
2500.	92.7	93.8	92.8	91.9	93.0	67.3	93.0	94.0	95.6	95.9	97.6	99.5	99.0	95.9	93.8	92.0	101.3
3150.	92.5	93.3	92.6	91.7	93.2	67.4	92.7	94.1	95.3	95.6	97.7	99.0	98.2	94.5	92.6	92.2	102.4
4000.	93.3	92.6	92.4	91.1	92.1	66.4	92.5	93.3	95.4	93.9	96.8	97.4	95.6	92.0	89.8	91.2	102.7
5000.	95.7	96.4	93.6	91.2	91.5	65.7	91.2	92.4	92.7	92.4	95.2	94.5	94.0	90.3	88.4	93.1	105.3
6300.	91.6	93.4	90.6	89.1	90.2	65.1	91.3	92.4	92.3	91.2	95.5	93.8	92.4	89.0	86.6	89.0	102.1
8000.	89.4	89.7	89.2	87.9	89.3	64.6	91.1	91.6	92.1	90.1	95.2	93.9	90.9	87.9	85.6	87.4	102.1
10000.	90.6	92.7	89.4	87.2	87.5	62.4	89.2	89.2	91.1	87.3	92.5	90.4	89.4	85.4	83.7	85.7	102.8
OASPL	103.4	105.7	105.2	105.0	105.6	80.4	106.7	107.8	109.1	110.9	111.7	115.3	116.8	120.7	121.0	102.7	113.9

F-18 Static Run 5

1/3-Octave Sound Pressure Levels

Microphone	22	23
θ	90.5	149.7
Frequency		
50.	91.5	92.5
63.	95.8	96.5
80.	97.6	99.2
100.	97.9	100.7
125.	100.7	101.6
160.	104.3	102.3
200.	104.3	102.7
250.	105.0	104.8
315.	106.6	103.0
400.	107.4	97.7
500.	107.1	97.6
630.	107.8	95.1
800.	108.0	93.7
1000.	107.5	92.4
1250.	107.9	91.6
1600.	108.4	90.5
2000.	107.6	88.0
2500.	106.6	85.9
3150.	107.3	83.5
4000.	107.0	80.5
5000.	105.8	79.0
6300.	105.3	76.8
8000.	105.8	75.5
10000.	103.2	74.5
OASPL	119.7	111.8

F-18 Static Run 9

1/3-Octave Sound Pressure Levels

Microphone	2	4	5	6	7	8	9	10	11	12	13	15	16	18	19	20	21
θ	31.3	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	126.7	133.8	149.8	156.1	31.3	31.3
Frequency																	
50.	88.4	88.6	89.2	90.0	90.9	91.9	92.8	93.3	94.1	95.8	95.8	100.3	103.8	112.3	114.5	84.5	92.7
63.	89.5	90.0	90.9	91.6	92.3	93.4	94.9	96.5	97.9	103.5	99.5	102.6	106.7	114.9	117.0	86.4	94.1
80.	90.8	92.2	92.3	93.8	94.9	95.7	96.7	97.6	98.4	99.8	100.3	106.9	110.9	119.2	121.0	87.4	96.9
100.	92.0	93.2	93.5	94.2	95.1	96.5	97.9	99.1	100.6	102.3	102.8	108.2	112.0	120.5	122.5	88.7	97.6
125.	95.0	94.5	95.0	96.2	97.2	98.1	99.1	100.7	101.8	103.6	104.8	111.5	115.4	122.6	124.8	90.9	99.1
160.	96.6	96.9	96.9	98.5	99.6	100.9	102.2	103.2	104.2	106.5	107.8	115.3	119.5	123.0	124.4	93.2	101.0
200.	96.4	97.7	97.9	98.5	99.6	100.6	102.3	103.2	104.9	107.2	108.4	116.8	122.4	124.9	121.9	93.2	101.5
250.	98.7	99.4	99.0	100.1	101.4	102.2	103.5	104.0	105.9	107.5	108.8	117.8	122.5	128.2	122.8	95.3	104.6
315.	101.0	101.4	102.0	102.5	102.9	103.3	104.7	106.6	107.4	109.5	111.2	119.2	124.7	129.5	126.6	96.7	108.1
400.	102.5	102.0	102.7	103.0	103.3	104.2	105.3	106.6	108.1	110.5	112.0	120.0	124.3	126.0	128.0	98.6	108.4
500.	102.5	102.4	102.7	103.1	103.0	104.1	105.4	106.9	108.1	110.7	112.7	118.9	123.7	127.8	124.6	98.5	107.9
630.	103.3	103.4	102.8	103.5	104.0	104.8	106.2	107.3	109.0	111.2	113.4	119.3	123.5	125.1	123.7	99.1	110.5
800.	103.9	103.5	103.6	103.9	104.7	105.3	106.6	108.1	109.4	111.8	113.4	119.5	122.5	123.9	120.9	99.4	110.0
1000.	104.6	103.7	103.7	104.6	105.0	105.4	106.8	107.5	109.5	111.6	113.3	118.8	121.3	121.3	118.7	99.8	111.4
1250.	105.3	105.2	105.1	105.1	106.0	106.4	106.9	107.6	109.5	112.0	113.5	118.6	120.6	120.2	117.3	99.8	113.5
1600.	104.6	105.3	105.6	106.3	107.0	107.3	107.8	108.4	110.1	112.0	114.4	118.9	120.6	119.1	116.1	99.2	112.7
2000.	103.6	104.2	104.5	105.2	106.0	106.2	107.4	107.8	109.2	111.2	113.3	117.3	118.4	116.6	113.8	97.5	111.0
2500.	103.0	103.5	104.1	104.8	105.5	105.8	107.0	107.3	109.1	110.8	113.0	116.0	117.1	115.1	112.0	96.7	110.8
3150.	102.3	102.7	103.3	103.9	105.6	105.7	106.1	107.2	108.6	110.3	113.0	115.5	116.4	113.9	111.0	96.4	110.5
4000.	102.3	100.9	102.5	103.2	105.0	104.8	106.2	106.1	108.4	108.7	111.9	113.9	114.0	111.7	108.6	94.9	109.9
5000.	104.1	102.1	101.8	102.1	103.3	103.7	104.3	105.1	105.4	106.7	109.6	111.0	112.4	109.7	106.6	96.5	110.2
6300.	105.5	104.4	102.3	102.6	104.0	104.1	105.1	105.5	105.2	105.6	109.6	109.9	110.9	108.9	105.3	96.8	112.6
8000.	100.4	99.1	100.1	100.9	102.9	103.9	104.9	104.5	104.9	103.7	108.8	109.0	108.6	107.7	104.1	92.4	110.7
10000.	98.3	98.3	97.9	98.8	100.7	101.1	102.6	101.9	103.8	100.5	105.9	105.5	106.8	104.6	100.8	87.8	107.6
OASPL	115.7	115.5	115.6	116.1	117.1	117.5	118.6	119.4	120.8	122.7	124.8	130.1	133.7	136.6	135.2	110.2	122.9

F-18 Static Run 9

1/3-Octave Sound Pressure Levels

Microphone	22	23
θ	90.5	149.7
Frequency		
50.	101.3	105.2
63.	103.9	108.1
80.	105.5	112.1
100.	105.9	113.4
125.	108.7	115.7
160.	111.7	114.7
200.	112.0	112.9
250.	113.3	116.6
315.	115.1	119.6
400.	116.1	118.6
500.	116.7	117.0
630.	117.5	116.3
800.	117.9	114.1
1000.	118.1	112.4
1250.	118.6	111.0
1600.	120.3	109.9
2000.	120.2	107.4
2500.	119.6	106.1
3150.	120.3	104.6
4000.	119.8	102.2
5000.	118.4	100.5
6300.	118.2	99.1
8000.	118.7	97.8
10000.	115.8	95.9
OASPL	130.8	127.2

F-18 Static Run 12

1/3-Octave Sound Pressure Levels

Microphone	2	4	5	6	7	8	9	10	11	12	13	15	16	18	19	20	21
θ	31.3	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	126.7	133.8	149.8	156.1	31.3	31.3
Frequency																	
50.	89.1	89.2	90.0	90.8	91.8	93.0	94.0	94.7	95.5	97.1	98.2	104.3	107.6	114.9	116.9	85.5	93.3
63.	90.7	91.0	91.5	92.6	93.7	95.0	96.4	98.0	98.8	103.5	101.1	106.8	111.2	119.6	121.2	87.8	95.4
80.	92.4	93.3	94.0	95.2	96.4	97.7	98.8	100.0	100.7	102.1	103.1	109.3	114.0	122.9	124.8	89.2	98.3
100.	93.7	95.0	95.8	96.7	97.7	98.7	99.7	100.9	101.7	103.7	105.1	111.5	115.4	123.7	125.7	90.7	98.5
125.	96.7	96.6	97.1	98.2	99.6	100.9	101.9	102.9	103.9	106.0	107.3	114.5	118.8	126.5	128.6	92.9	101.3
160.	99.2	99.2	99.5	100.1	101.1	102.1	103.4	104.7	106.2	108.6	110.2	119.1	123.7	126.1	127.7	95.9	103.3
200.	99.8	100.6	100.9	101.6	102.2	103.5	105.3	105.7	106.6	108.9	110.6	120.3	125.6	127.5	124.4	96.5	104.6
250.	101.2	102.6	102.4	103.0	103.9	105.0	106.1	107.4	108.8	110.7	112.5	121.8	126.1	130.2	125.3	98.2	106.9
315.	103.4	103.8	104.1	105.1	104.9	106.2	107.6	108.8	110.1	112.2	113.9	123.6	128.8	131.6	128.6	99.4	110.8
400.	105.8	104.6	104.6	105.6	106.1	107.0	108.2	109.3	110.5	112.7	115.1	124.8	129.4	128.7	129.5	101.7	111.6
500.	105.8	105.6	105.7	106.1	106.3	107.1	108.6	110.0	111.0	113.5	115.6	124.3	129.4	129.6	126.2	102.0	110.9
630.	111.0	107.6	107.5	106.8	107.1	108.4	109.4	110.8	112.0	114.2	116.8	124.9	129.2	127.7	125.1	106.5	118.7
800.	113.2	111.5	110.3	109.8	109.3	109.3	110.0	111.4	112.3	114.9	117.0	124.4	128.6	126.0	122.6	108.6	118.1
1000.	113.3	112.6	112.5	112.6	112.3	111.7	111.1	111.7	113.1	114.9	117.3	123.7	127.2	124.3	120.8	108.6	120.6
1250.	112.0	111.7	111.4	112.2	113.4	113.6	113.5	113.1	113.4	115.1	117.8	123.5	126.9	122.8	119.9	106.9	119.2
1600.	110.6	111.1	111.2	111.0	112.5	112.9	113.7	114.8	115.1	116.2	118.6	123.7	126.4	122.2	118.9	105.5	118.0
2000.	108.9	109.7	109.9	110.0	111.3	111.0	112.1	113.7	114.6	116.0	117.7	122.3	124.1	120.1	117.1	102.8	115.7
2500.	107.9	108.8	108.7	109.0	110.4	110.6	111.6	113.0	114.1	115.4	117.9	121.1	123.3	118.8	115.8	101.4	115.2
3150.	106.7	107.4	107.7	108.0	110.0	110.6	111.1	112.9	113.5	114.7	117.9	120.5	122.9	118.1	115.3	100.5	114.9
4000.	105.6	105.4	106.9	106.9	109.1	109.4	111.1	112.0	113.5	112.8	116.7	119.3	120.6	116.3	113.0	98.2	113.8
5000.	104.0	104.7	105.5	105.7	107.1	108.1	109.1	110.6	110.2	110.7	114.2	116.6	119.3	114.3	111.2	96.5	112.2
6300.	103.7	105.9	104.5	105.4	107.5	108.4	109.9	111.2	109.8	109.4	114.0	115.9	117.9	113.9	110.2	95.6	112.3
8000.	101.3	102.5	103.3	104.0	106.5	108.1	109.8	110.0	109.4	107.6	113.2	115.1	115.9	112.9	109.2	93.6	112.0
10000.	99.0	101.3	101.6	102.2	104.1	105.2	107.4	107.4	108.1	104.2	110.2	111.9	114.1	109.9	106.0	89.4	109.7
OASPL	121.0	120.7	120.6	120.8	121.8	122.2	123.1	124.1	124.8	126.2	128.7	135.0	138.9	139.1	137.7	116.0	128.1

F-18 Static Run 12

1/3-Octave Sound Pressure Levels

Microphone	22	23
θ	90.5	149.7
Frequency		
50.	102.1	107.4
63.	105.3	112.4
80.	107.2	115.8
100.	108.7	116.8
125.	110.6	119.6
160.	113.0	118.0
200.	114.1	115.2
250.	115.7	118.6
315.	117.6	121.2
400.	118.3	120.2
500.	119.3	118.8
630.	120.5	117.6
800.	121.4	116.0
1000.	123.1	114.4
1250.	126.4	113.3
1600.	125.7	112.6
2000.	124.2	110.7
2500.	124.2	109.6
3150.	125.0	108.3
4000.	124.5	106.5
5000.	123.2	105.2
6300.	122.9	104.4
8000.	123.2	103.5
10000.	120.2	102.1
OASPL	135.4	129.5

F-18 Static Run 15

1/3-Octave Sound Pressure Levels

Microphone	2	4	5	6	7	8	9	10	11	12	13	15	16	18	19	20	21
θ	31.3	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	126.7	133.8	149.8	156.1	31.3	31.3
Frequency																	
50.	91.8	91.8	93.3	93.9	94.6	95.8	96.8	97.8	98.1	99.0	100.0	106.1	112.9	117.2	119.1	88.0	96.38
63.	92.8	94.1	94.7	95.5	96.3	97.7	98.9	100.0	100.3	104.2	102.5	109.9	116.0	121.6	123.1	89.9	97.39
80.	95.1	96.3	96.9	97.3	97.9	98.7	99.4	100.4	101.2	103.3	104.8	112.0	116.7	123.8	125.0	92.1	100.44
100.	96.6	98.1	99.1	99.5	100.2	100.7	102.1	103.6	104.5	105.9	107.1	114.2	118.3	127.1	128.8	93.4	101.36
125.	99.4	99.3	99.9	100.7	101.5	102.4	103.6	105.1	106.2	107.6	108.9	117.5	121.8	128.5	130.1	95.4	103.26
160.	101.0	101.8	102.5	103.2	104.1	105.0	106.2	107.3	108.1	110.5	112.1	121.6	125.1	127.1	129.5	97.5	105.49
200.	101.9	103.2	103.4	103.7	104.8	106.0	107.3	108.2	109.9	112.0	113.5	123.5	128.2	127.7	126.7	98.4	106.95
250.	104.3	105.2	105.1	105.9	106.7	107.2	108.5	109.6	111.1	113.2	115.3	124.9	129.1	130.7	125.5	101.1	110.42
315.	107.4	106.8	107.3	107.9	108.0	108.5	109.9	111.3	112.6	114.9	116.9	128.0	131.8	132.4	127.8	103.2	114.88
400.	111.6	108.5	108.5	108.9	109.3	110.3	111.6	112.1	113.5	115.9	118.6	128.8	132.1	130.2	128.8	106.9	116.63
500.	113.1	110.9	110.3	110.1	110.3	110.6	111.7	112.7	113.7	116.8	119.3	129.4	132.7	129.0	126.6	108.7	117.58
630.	118.0	116.0	114.9	113.7	112.7	112.7	113.4	114.0	115.1	118.1	120.7	129.4	131.7	127.9	125.4	113.9	126.18
800.	119.3	118.6	118.2	118.0	117.2	116.1	115.0	115.1	116.3	118.7	121.0	128.8	130.9	126.4	123.8	114.9	125.79
1000.	117.5	117.2	117.7	118.4	118.9	119.0	117.7	116.8	116.7	118.8	121.1	128.1	129.5	125.1	122.5	112.8	124.08
1250.	115.7	116.0	116.1	116.9	118.5	118.9	119.0	118.7	118.1	119.5	121.6	127.6	128.5	124.1	121.8	110.7	123.50
1600.	115.0	116.0	116.3	116.8	117.8	117.8	118.2	119.2	119.6	120.8	122.7	127.4	127.9	123.4	121.1	110.0	122.01
2000.	112.9	114.8	114.8	115.6	116.8	116.4	116.8	117.3	118.7	120.3	122.2	125.6	125.9	121.7	119.3	107.0	119.81
2500.	111.2	113.6	113.6	114.5	116.2	116.2	116.5	117.2	118.3	119.7	122.1	124.4	124.9	120.8	118.2	105.3	118.66
3150.	110.3	112.0	112.3	113.6	115.5	116.0	115.9	117.0	117.8	119.3	121.9	124.3	124.9	120.3	118.0	104.6	118.57
4000.	108.8	109.6	111.2	112.3	114.6	114.8	115.5	115.9	117.6	117.4	120.6	123.2	122.7	118.7	116.2	102.1	117.04
5000.	107.0	108.8	109.7	110.6	112.7	113.3	113.4	115.3	114.4	115.3	118.4	120.7	121.5	117.1	114.7	100.1	115.73
6300.	106.6	109.6	108.7	110.4	113.1	113.4	113.9	114.1	113.9	114.2	118.3	119.8	120.3	116.9	114.1	98.8	115.38
8000.	104.6	106.6	107.7	109.0	112.1	113.0	113.7	113.5	113.2	112.2	117.5	119.3	118.3	116.1	113.4	97.0	115.35
10000.	102.2	104.7	105.9	107.0	110.2	109.9	111.0	112.0	112.0	108.7	114.4	116.0	116.8	113.5	110.4	93.2	112.93
OASPL	125.9	125.9	125.9	126.4	127.4	127.5	127.6	128.1	128.7	130.2	132.6	139.0	141.4	140.0	138.7	121.2	133.0

F-18 Static Run 15

1/3-Octave Sound Pressure Levels

Microphone	22	23
θ	90.5	149.7
Frequency		
50.	105.7	109.8
63.	108.7	113.9
80.	109.2	116.0
100.	111.2	119.7
125.	112.9	120.9
160.	116.2	120.3
200.	117.3	117.1
250.	118.6	118.5
315.	120.0	121.5
400.	121.9	120.8
500.	122.9	118.8
630.	124.9	118.3
800.	127.5	116.7
1000.	131.7	115.7
1250.	131.7	114.8
1600.	129.9	114.0
2000.	129.3	112.2
2500.	129.1	111.4
3150.	129.6	110.6
4000.	129.1	108.8
5000.	127.4	107.6
6300.	127.1	106.9
8000.	127.3	106.2
10000.	124.0	104.9
OASPL	140.3	130.6

F-18 Static Run 17

1/3-Octave Sound Pressure Levels

Microphone	2	4	5	6	7	8	9	10	11	12	13	15	16	18	19	20	21
θ	31.3	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	126.7	133.8	149.8	156.1	31.3	31.3
Frequency																	
50.	92.8	93.3	94.2	94.7	95.5	96.2	96.7	98.3	98.9	100.8	101.9	110.5	116.4	118.1	119.9	89.7	96.6
63.	93.2	94.6	95.8	96.9	97.9	99.2	100.1	100.8	101.7	104.8	104.1	111.8	116.9	122.7	124.4	91.0	97.8
80.	96.6	97.6	97.9	98.7	99.5	100.6	101.9	102.9	103.8	105.4	106.5	114.3	119.5	126.6	128.2	93.8	102.0
100.	97.5	98.4	99.2	99.7	100.0	101.3	102.4	103.7	104.6	106.4	108.2	116.6	120.7	128.7	130.0	94.5	102.5
125.	100.1	99.9	100.4	101.7	102.7	104.1	104.8	106.1	107.2	109.0	110.1	118.5	122.8	130.4	131.8	97.0	104.3
160.	102.4	102.6	103.0	104.0	105.2	105.9	107.0	108.6	109.6	111.4	113.3	122.9	126.4	128.4	130.0	99.2	106.4
200.	104.0	104.6	104.4	105.0	106.4	107.0	108.6	109.8	110.2	112.3	114.0	125.3	129.6	128.7	128.0	100.8	108.9
250.	105.7	107.0	106.8	107.4	107.2	108.2	108.7	110.3	111.5	113.4	115.8	125.6	129.6	130.9	126.5	103.0	111.5
315.	108.4	108.3	108.4	108.9	109.0	109.8	111.4	112.4	113.7	115.8	118.2	129.2	132.5	132.8	128.1	104.8	115.6
400.	114.5	110.0	110.3	110.3	110.1	111.3	112.4	113.7	114.6	116.9	119.5	129.9	133.0	130.7	128.8	110.2	119.5
500.	115.9	112.9	112.6	111.8	111.3	111.9	112.9	113.6	115.5	117.4	120.4	130.4	133.7	129.5	127.1	112.2	120.2
630.	119.9	118.8	118.1	116.6	115.1	114.6	114.2	115.1	116.5	119.0	122.1	130.7	133.1	128.7	125.7	116.4	127.1
800.	120.0	119.9	119.8	119.9	119.8	118.7	117.2	116.8	117.5	119.6	122.1	130.3	132.1	127.0	124.3	116.5	126.7
1000.	118.0	117.8	118.4	119.6	120.0	120.6	120.0	118.8	118.4	119.8	122.5	129.3	130.8	126.1	123.0	114.0	124.5
1250.	116.7	117.2	117.4	117.9	119.2	119.4	120.1	120.7	120.4	121.1	123.0	128.8	129.9	124.9	122.1	112.5	124.1
1600.	115.9	117.1	117.4	117.9	119.3	119.0	118.9	120.3	121.1	122.2	123.9	128.3	129.0	124.5	121.6	111.8	123.1
2000.	113.6	116.0	116.4	116.9	118.0	117.6	118.1	118.5	119.9	121.6	123.3	126.8	127.0	122.6	119.9	108.8	120.9
2500.	112.1	114.7	115.1	116.3	117.4	117.2	117.5	118.5	119.6	120.5	123.1	125.6	126.2	121.7	118.7	107.4	119.7
3150.	111.0	113.0	113.8	115.2	116.9	117.1	117.1	118.5	119.0	120.4	122.9	125.5	126.1	121.2	118.6	106.5	119.6
4000.	109.7	110.7	112.7	114.0	115.8	116.0	116.6	117.7	118.9	118.6	121.8	124.4	124.1	119.8	116.8	104.3	118.1
5000.	107.8	109.9	111.3	112.5	114.1	114.5	114.5	117.0	115.7	116.9	119.6	121.8	122.9	118.3	115.3	102.0	116.5
6300.	107.3	111.0	110.3	112.3	114.6	114.8	115.0	115.5	115.2	116.0	119.7	121.1	121.7	118.0	114.6	100.6	116.3
8000.	105.3	108.0	109.4	111.1	113.5	114.3	114.6	115.1	114.8	114.3	119.0	120.6	120.1	117.2	113.9	98.5	116.5
10000.	103.0	106.3	107.9	109.2	111.7	111.5	111.9	113.2	113.5	111.2	116.1	117.2	117.7	114.4	110.9	94.2	114.1
OASPL	127.1	127.2	127.4	127.9	128.7	128.8	128.9	129.6	130.1	131.3	133.8	140.2	142.5	140.9	139.6	123.2	134.1

F-18 Static Run 17

1/3-Octave Sound Pressure Levels

Microphone	22	23
θ	90.5	149.7
Frequency		
50.	107.6	111.1
63.	109.6	115.2
80.	110.6	118.9
100.	111.3	121.2
125.	114.8	123.0
160.	116.8	121.1
200.	118.5	119.0
250.	119.0	119.3
315.	121.2	121.6
400.	122.6	120.8
500.	124.1	119.0
630.	126.4	118.5
800.	130.8	116.8
1000.	133.7	115.9
1250.	132.0	114.8
1600.	131.2	114.3
2000.	130.7	112.5
2500.	130.1	111.7
3150.	130.6	110.7
4000.	130.2	108.9
5000.	128.4	107.7
6300.	128.0	106.9
8000.	128.1	106.3
10000.	124.8	104.9
OASPL	141.6	131.4

F-16XL Static Run 5

1/3-Octave Sound Pressure Levels

Microphone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
θ	22.1	31.3	37.2	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	118.8	126.7	133.8	141.1
Frequency																	
50.	79.4	81.6	82.7	80.9	81.7	82.7	83.2	83.7	84.4	86.2	87.7	88.2	89.5	23.9	93.9	88.7	102.5
63.	82.0	82.8	83.3	82.8	83.7	84.8	86.4	87.1	87.8	89.5	90.8	91.3	92.9	27.7	97.1	91.9	105.8
80.	84.8	85.6	86.5	85.0	86.1	86.8	88.0	89.1	89.8	91.1	92.8	93.2	94.7	26.3	99.7	94.3	108.2
100.	85.5	85.4	86.6	85.8	87.3	87.7	87.9	89.2	90.0	92.5	94.5	94.9	96.5	27.1	100.0	94.3	108.0
125.	87.1	88.4	87.9	87.3	88.8	89.6	91.4	91.5	92.0	93.8	95.9	96.3	97.9	32.2	102.0	96.3	109.2
160.	90.1	89.8	90.5	89.8	90.9	91.1	91.8	93.1	93.7	95.3	97.1	98.0	100.0	33.6	102.8	97.1	109.9
200.	90.6	89.8	90.6	90.5	90.4	90.7	91.7	92.4	93.2	95.3	97.1	98.3	99.7	32.2	102.0	96.2	109.6
250.	91.5	91.3	91.4	91.0	91.2	91.5	92.4	93.3	94.3	96.0	97.3	98.9	100.1	33.4	103.1	95.3	107.8
315.	92.9	93.1	92.5	91.4	92.3	92.1	92.1	93.5	93.9	95.8	97.5	98.9	100.9	32.8	103.1	96.0	106.5
400.	93.5	93.1	92.6	91.7	91.7	91.6	92.5	93.0	94.1	95.9	97.8	98.9	100.3	32.6	102.6	94.5	104.8
500.	93.0	92.8	92.9	92.0	92.1	92.5	93.0	93.8	94.4	96.2	98.2	99.4	101.0	33.3	101.7	93.2	102.7
630.	94.0	94.3	94.1	93.3	92.5	92.3	92.8	93.0	94.0	95.1	97.1	98.6	99.9	32.3	100.4	91.7	101.4
800.	95.1	94.8	94.7	93.5	93.4	92.4	92.6	93.2	94.1	94.9	97.0	97.7	98.9	32.9	99.6	90.6	98.8
1000.	93.8	93.7	92.9	92.0	92.2	91.5	91.5	92.0	92.5	94.0	95.4	96.5	97.0	35.5	97.8	88.5	97.7
1250.	94.1	93.5	92.8	91.9	91.4	90.8	90.8	91.9	91.8	93.2	95.0	95.8	96.2	36.8	96.5	86.9	96.2
1600.	94.6	93.7	92.6	91.9	91.3	90.7	90.5	91.2	91.8	93.5	94.9	95.7	96.1	32.8	95.7	85.8	94.6
2000.	94.6	92.5	91.5	90.5	89.2	88.9	89.1	90.1	90.3	91.8	92.8	93.7	94.8	33.8	93.2	83.2	92.3
2500.	98.7	97.0	94.9	92.5	90.8	89.7	89.2	90.0	89.5	90.9	91.8	92.5	94.2	33.8	92.6	81.9	91.1
3150.	101.3	100.4	96.8	95.7	93.8	92.0	91.1	90.8	90.1	91.2	93.3	94.2	94.0	35.2	92.0	81.7	90.2
4000.	98.4	97.0	95.1	93.4	91.5	90.5	89.5	89.3	89.5	90.8	92.0	92.7	93.7	37.3	90.7	80.4	89.3
5000.	94.7	93.5	90.6	90.1	88.7	85.7	86.0	86.8	87.2	89.4	91.6	92.4	92.6	38.4	90.5	80.4	88.4
6300.	94.3	92.8	89.7	87.6	85.8	83.8	84.3	84.9	85.7	88.6	90.0	91.3	92.2	34.7	90.0	80.1	89.8
8000.	90.6	89.9	86.9	85.3	82.8	80.0	81.1	83.2	83.6	86.6	88.4	91.0	91.2	36.7	89.2	80.9	88.7
10000.	88.0	86.1	82.1	80.9	79.0	74.3	76.4	79.5	81.6	83.8	86.9	88.3	89.3	39.0	88.4	78.7	87.4
OASPL	108.0	107.2	105.8	104.7	104.2	103.8	104.1	104.8	105.4	107.1	108.8	109.8	111.1	48.2	113.0	105.9	118.2

F-16XL Static Run 5

1/3-Octave Sound Pressure Levels

Microphone	18	19	20	21	22	23
θ	149.8	156.1	31.3	31.3	90.5	149.7
Frequency						
50.	105.41	24.6	80.1	89.0	89.0	100.2
63.	108.96	29.3	81.6	89.4	91.1	104.6
80.	111.44	29.9	84.6	92.3	93.8	107.0
100.	111.45	32.0	84.5	93.2	94.7	107.4
125.	111.75	36.2	87.1	94.6	98.1	107.5
160.	109.83	36.7	88.6	95.6	100.3	103.8
200.	109.20	32.8	88.1	95.7	101.5	100.7
250.	109.16	31.4	89.1	97.0	103.0	101.1
315.	106.67	32.8	90.1	98.5	103.8	100.7
400.	103.08	34.6	90.7	99.1	105.2	97.3
500.	101.23	34.2	90.0	99.1	106.6	94.3
630.	99.65	33.7	90.7	101.4	106.1	92.7
800.	97.72	34.6	90.9	102.8	106.5	90.0
1000.	95.51	36.9	88.6	102.1	106.0	87.7
1250.	94.24	38.5	87.9	102.0	105.6	86.3
1600.	93.19	36.6	86.6	102.4	105.7	84.6
2000.	90.67	36.4	84.4	101.4	104.6	81.1
2500.	89.86	36.5	85.8	104.1	104.0	80.0
3150.	89.11	38.2	85.8	108.2	105.4	79.3
4000.	88.98	39.8	80.1	106.9	104.6	77.9
5000.	88.17	40.8	73.7	104.0	104.3	75.4
6300.	88.63	42.6	70.2	103.4	103.3	73.4
8000.	87.97	45.1	65.5	102.6	103.0	70.8
10000.	86.15	45.0	61.7	100.0	101.7	67.8
OASPL	119.6	52.2	100.9	115.6	117.5	114.4

F-16XL Static Run 6

1/3-Octave Sound Pressure Levels

Microphone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
θ	22.1	31.3	37.2	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	118.8	126.7	133.8	141.1
Frequency																	
50.	81.7	83.2	83.4	82.6	84.3	85.5	86.1	86.8	87.7	88.4	89.2	90.4	92.3	61.2	98.0	97.6	106.1
63	84.4	85.3	84.9	84.6	86.5	86.9	88.5	89.5	90.6	91.9	93.1	93.9	94.9	67.9	99.9	100.0	109.5
80.	86.3	86.9	87.2	86.2	87.6	88.0	89.3	90.5	91.1	92.8	94.0	95.2	97.2	63.2	102.9	102.9	111.7
100.	86.5	87.1	87.5	87.6	88.2	89.0	89.8	90.4	91.4	92.9	95.3	97.0	98.5	65.9	104.4	104.0	112.5
125.	89.2	90.0	89.3	89.2	90.7	91.4	92.6	93.1	93.6	95.8	97.7	98.7	99.6	68.2	105.6	106.0	113.6
160.	92.7	91.9	91.7	91.8	92.6	93.1	93.9	94.4	95.7	97.6	99.4	101.3	102.5	74.9	107.3	107.4	115.3
200.	92.3	91.8	92.5	92.3	92.6	92.8	93.6	95.1	96.5	97.6	99.4	100.2	102.0	71.1	106.5	106.5	115.2
250.	93.4	93.9	93.6	93.3	93.5	93.8	95.0	95.9	96.8	98.5	100.4	101.5	103.0	70.7	106.9	104.9	112.9
315.	94.5	95.0	94.9	94.0	94.4	94.4	95.1	96.5	96.9	98.7	100.8	102.2	103.4	75.5	107.2	105.4	111.0
400.	95.3	95.2	94.7	94.1	94.2	94.5	95.3	96.1	97.0	98.4	100.5	101.9	103.8	72.8	106.8	104.2	110.0
500.	95.0	94.9	95.1	94.4	94.3	94.6	95.4	96.4	96.9	98.2	100.3	102.0	103.6	69.4	106.0	102.7	107.8
630.	96.3	96.3	96.4	95.4	95.3	95.2	95.8	96.4	97.4	98.9	100.6	102.6	104.2	74.0	105.4	101.8	106.6
800.	96.6	96.5	96.7	95.8	95.4	95.0	95.5	96.0	97.0	97.9	100.0	101.0	102.3	69.1	104.2	100.1	104.0
1000.	95.6	95.5	94.8	94.0	93.9	94.0	94.4	95.1	95.7	96.7	98.3	99.5	100.6	69.4	102.5	98.0	102.3
1250.	95.9	95.4	94.6	93.7	93.6	93.5	93.9	95.0	95.0	96.7	97.8	99.1	99.7	67.6	101.4	96.7	100.8
1600.	96.3	95.2	94.2	93.9	93.3	93.3	93.7	94.5	95.0	96.7	98.1	99.1	99.6	69.7	100.5	95.5	99.5
2000.	95.0	93.6	93.0	92.1	91.4	91.8	92.4	93.5	93.7	95.1	96.4	97.4	98.4	66.7	98.2	92.9	97.1
2500.	96.9	95.7	94.3	92.6	91.5	91.3	91.9	93.3	92.9	94.3	95.4	96.1	97.6	66.7	97.3	91.6	95.2
3150.	99.4	98.8	95.4	94.3	92.9	92.1	92.5	93.1	93.2	94.5	96.4	97.2	97.4	65.0	96.6	90.9	93.9
4000.	98.0	96.6	95.3	93.4	91.3	91.3	91.5	92.0	92.3	93.5	94.8	95.6	96.4	63.6	94.7	89.1	92.5
5000.	94.9	94.5	92.1	91.4	90.3	88.3	89.6	90.3	90.4	92.0	93.9	94.6	95.0	62.6	94.0	88.2	91.0
6300.	94.5	93.8	91.5	89.4	87.7	86.7	88.5	89.1	89.3	91.3	92.8	93.8	94.5	63.1	93.2	87.5	91.4
8000.	91.7	91.6	89.7	87.6	85.5	83.4	85.2	87.4	86.7	89.0	90.7	92.7	93.1	61.8	91.7	87.2	90.0
10000.	89.8	88.4	85.9	84.1	82.2	78.3	81.2	84.1	84.4	85.9	88.7	89.3	89.8	59.0	90.2	84.6	88.3
OASPL	108.4	108.0	107.1	106.2	106.0	106.0	106.7	107.6	108.2	109.7	111.5	112.8	114.1	83.4	117.2	115.6	123.0

F-16XL Static Run 6

1/3-Octave Sound Pressure Levels

Microphone	18	19	20	21	22	23
θ	149.8	156.1	31.3	31.3	90.5	149.7
Frequency						
50.	109.0	27.5	82.5	89.4	94.6	104.6
63.	112.9	31.9	84.9	90.6	95.7	108.3
80.	115.2	34.4	86.0	92.7	96.8	111.2
100.	116.0	37.2	86.7	93.8	97.7	112.2
125.	115.6	39.7	89.0	96.3	100.6	111.8
160.	114.9	42.0	91.0	97.4	103.3	109.2
200.	114.5	39.9	90.9	97.5	104.7	106.2
250.	114.5	36.3	92.5	99.4	105.2	106.7
315.	112.5	37.5	93.2	100.8	107.3	106.8
400.	108.4	40.4	93.4	101.6	107.9	103.4
500.	107.6	40.1	92.9	101.5	108.6	100.2
630.	105.9	39.0	94.0	103.6	109.7	99.1
800.	102.9	38.8	94.1	104.2	109.3	95.7
1000.	100.9	39.6	92.1	103.1	108.7	93.2
1250.	99.5	40.9	91.4	103.3	108.6	91.6
1600.	98.4	40.3	90.7	103.6	108.7	89.8
2000.	95.8	40.1	89.0	102.6	108.0	86.5
2500.	94.2	39.8	89.5	103.6	107.3	85.0
3150.	92.5	40.6	90.3	105.9	107.9	83.4
4000.	91.6	41.6	87.4	105.2	107.3	81.0
5000.	90.2	42.2	83.1	103.7	106.6	78.0
6300.	90.1	43.7	79.9	103.1	105.9	75.9
8000.	88.9	45.5	75.0	102.3	105.0	73.2
10000.	86.8	45.0	70.5	99.9	103.4	70.2
OASPL	124.3	54.5	104.1	115.7	120.3	119.2

F-16XL Static Run 7

1/3-Octave Sound Pressure Levels

Microphone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
θ	22.1	31.3	37.2	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	118.8	126.7	133.8	141.1
Frequency																	
50.	83.7	83.7	84.1	84.4	85.9	85.9	86.9	88.2	88.6	90.4	91.9	91.8	92.8	85.5	99.2	94.1	107.9
63	86.6	87.2	86.9	87.4	88.8	88.7	90.5	91.5	91.7	93.0	94.4	95.0	96.6	86.8	101.4	96.6	110.6
80.	87.6	88.6	88.7	87.8	88.8	89.1	90.1	91.1	92.5	94.6	96.0	96.9	98.2	88.7	103.7	99.0	112.5
100.	88.4	89.2	90.0	89.8	90.9	91.4	91.9	93.4	94.5	96.3	98.0	98.9	100.5	90.7	106.0	101.2	114.5
125.	91.4	92.1	91.5	91.8	92.5	92.9	94.0	94.7	95.1	97.4	99.6	100.8	102.2	92.6	108.1	103.4	115.7
160.	94.1	93.6	93.4	93.4	94.3	94.8	95.7	96.6	97.4	99.5	101.1	101.9	104.0	94.9	109.8	105.3	117.9
200.	94.3	94.1	94.6	94.5	94.7	95.0	96.1	96.8	97.1	99.1	101.4	102.7	104.3	94.5	109.6	104.9	118.5
250.	94.6	95.5	95.7	95.3	95.5	95.9	96.6	97.6	98.2	100.2	102.3	103.8	104.7	95.4	109.7	103.8	116.9
315.	95.7	96.6	96.3	95.9	96.4	96.6	97.4	98.4	99.2	100.5	103.2	104.0	106.0	95.8	109.7	103.6	113.9
400.	95.8	96.1	96.0	96.0	96.0	96.0	97.2	98.1	99.0	100.8	102.8	104.3	106.2	95.4	109.7	102.1	113.4
500.	96.4	96.4	96.1	95.4	96.3	95.9	97.1	97.7	99.4	100.5	102.8	104.0	105.9	95.8	108.5	100.6	111.1
630.	97.3	97.5	97.8	97.2	97.2	97.3	97.9	98.6	99.6	101.3	103.4	104.8	107.0	96.5	107.8	99.8	110.0
800.	97.2	97.3	97.7	97.3	97.5	97.2	97.4	98.0	98.8	100.3	102.1	103.4	104.9	94.8	107.0	97.9	107.3
1000.	95.6	96.1	95.1	95.0	95.5	95.4	96.1	97.3	97.7	99.2	101.0	102.3	103.4	94.4	105.1	95.9	105.2
1250.	95.2	95.4	94.8	94.8	95.4	95.3	95.6	97.0	97.2	98.9	100.9	101.7	102.7	94.4	104.2	94.5	104.0
1600.	95.2	94.6	94.1	94.8	94.8	95.0	95.4	96.7	97.4	99.2	100.7	101.8	102.4	94.0	103.2	93.7	102.1
2000.	93.3	93.1	92.6	92.7	92.5	93.4	94.0	95.4	95.9	97.9	99.1	99.9	101.1	92.0	100.6	91.0	99.9
2500.	92.9	92.6	91.9	91.8	91.7	92.2	93.1	95.0	95.1	97.0	97.9	98.7	100.3	92.1	99.7	89.4	98.6
3150.	92.5	92.9	90.0	90.9	91.1	91.7	92.6	94.3	95.1	96.7	98.5	99.4	99.6	91.1	98.6	88.7	96.9
4000.	91.7	90.7	89.0	89.3	89.0	90.9	91.2	93.0	94.1	95.9	96.9	97.7	98.6	89.6	96.6	86.5	94.8
5000.	89.4	88.9	86.5	87.4	88.2	88.2	89.6	90.9	92.0	94.1	95.7	96.3	96.6	88.2	95.3	85.0	92.8
6300.	88.6	88.0	85.1	85.4	85.6	87.3	88.8	89.8	90.7	93.4	94.2	94.6	95.4	87.6	94.3	84.3	93.0
8000.	85.7	85.4	82.6	83.2	82.5	84.0	85.5	88.0	88.2	91.0	91.7	92.8	93.3	86.0	91.9	83.3	91.4
10000.	83.4	81.8	78.9	78.8	78.7	79.2	81.5	84.8	86.0	87.9	89.2	88.4	89.2	83.7	89.7	80.2	89.2
OASPL	107.3	107.5	107.2	107.0	107.4	107.6	108.4	109.4	110.1	111.9	113.8	114.9	116.4	106.8	119.7	113.5	125.7

F-16XL Static Run 7

1/3-Octave Sound Pressure Levels

Microphone	18	19	20	21	22	23
θ	149.8	156.1	31.3	31.3	90.5	149.7
Frequency						
50.	111.3	28.4	83.4	89.6	99.3	106.3
63.	114.5	33.0	87.0	92.2	100.1	109.9
80.	116.1	33.8	87.7	94.5	100.5	111.6
100.	118.1	38.4	88.5	96.7	101.1	113.9
125.	118.2	42.0	91.1	98.0	103.0	113.8
160.	117.3	44.0	92.3	99.1	106.1	111.2
200.	117.5	42.5	92.5	99.8	107.1	108.9
250.	118.7	40.1	93.9	101.5	108.0	110.2
315.	117.3	42.4	94.2	103.1	109.7	110.8
400.	111.6	45.2	93.7	102.5	110.4	106.7
500.	111.4	43.4	93.6	103.0	110.8	103.6
630.	109.3	42.2	94.0	105.3	112.0	102.3
800.	107.0	42.9	93.1	106.3	111.3	99.2
1000.	104.3	43.2	91.2	104.0	110.5	96.1
1250.	103.1	44.0	89.3	103.4	110.6	94.6
1600.	102.3	44.8	87.5	104.3	111.1	92.6
2000.	99.8	44.1	84.3	103.0	110.2	89.4
2500.	97.9	43.7	81.5	103.3	109.7	86.9
3150.	96.0	43.7	78.6	103.2	110.3	84.2
4000.	94.4	43.7	75.0	102.5	109.9	80.8
5000.	92.5	44.2	71.6	101.9	109.3	76.6
6300.	92.1	45.5	69.3	101.5	108.5	73.9
8000.	90.3	46.9	65.2	101.1	107.4	71.5
10000.	87.7	45.9	61.8	99.3	105.8	69.3
OASPL	127.0	57.1	103.9	115.9	122.7	121.2

F-16XL Static Run 8

1/3-Octave Sound Pressure Levels

Microphone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
θ	22.1	31.3	37.2	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	118.8	126.7	133.8	141.1
Frequency																	
50.	84.2	85.8	87.4	86.9	87.4	88.5	89.3	89.8	90.9	92.0	93.4	94.6	96.1	86.4	101.6	96.3	110.2
63	87.7	88.3	88.9	88.9	89.0	89.2	90.1	92.0	93.5	94.5	96.0	97.1	98.3	87.6	104.8	100.2	113.8
80.	89.6	89.9	90.8	89.9	90.9	91.3	92.0	93.5	94.5	95.9	97.7	99.5	101.1	90.0	106.9	102.2	116.0
100.	90.6	91.0	91.5	91.3	91.8	92.6	93.8	95.5	96.9	98.6	100.0	101.0	102.5	92.0	109.3	104.2	117.2
125.	93.0	93.7	93.3	93.5	94.3	95.6	96.4	97.1	98.1	99.5	101.3	103.0	104.5	92.7	111.2	106.6	118.5
160.	96.3	96.0	95.8	95.4	95.9	96.5	97.4	98.4	99.7	101.3	103.0	104.5	106.8	95.0	113.8	109.8	121.8
200.	95.9	95.2	96.2	96.2	96.2	96.6	97.9	99.2	100.3	101.5	103.8	105.8	107.3	95.8	113.4	109.1	122.2
250.	96.5	97.3	97.9	97.6	97.6	98.0	98.9	100.3	101.5	102.7	104.2	106.4	108.0	96.0	113.2	107.8	120.9
315.	98.0	98.0	97.5	97.3	98.5	98.2	99.7	101.0	101.9	103.2	105.1	107.1	109.3	96.9	113.7	108.0	117.8
400.	97.7	97.5	97.9	97.8	98.0	98.3	99.6	100.6	102.0	103.4	105.4	107.1	109.1	97.6	113.3	106.4	118.6
500.	98.3	97.8	98.4	98.0	98.0	98.4	99.4	100.4	101.5	102.9	104.7	107.1	108.9	96.9	112.3	105.0	114.9
630.	98.3	98.3	99.0	98.7	99.1	98.8	99.8	100.8	102.2	103.5	105.6	107.9	109.9	97.4	111.9	104.3	114.1
800.	98.0	98.2	98.5	97.8	98.3	97.9	99.0	100.2	101.4	102.8	104.9	106.9	108.5	96.5	110.3	102.2	111.0
1000.	96.8	96.7	96.9	96.6	97.2	97.1	98.2	99.5	100.8	102.0	103.6	105.7	107.0	96.4	108.9	99.7	109.1
1250.	96.4	96.1	95.6	96.4	96.7	96.8	97.4	99.4	100.4	102.0	103.2	105.4	106.3	96.7	107.6	98.0	107.6
1600.	96.0	95.5	95.6	96.0	96.1	96.5	97.3	99.1	100.4	102.3	103.7	105.1	106.2	96.9	106.5	96.9	106.2
2000.	94.7	94.1	94.0	94.2	94.2	94.8	96.2	98.2	99.5	101.2	102.0	103.8	105.3	96.1	104.5	94.4	104.3
2500.	94.2	93.8	93.6	93.2	93.7	94.1	95.4	98.0	98.9	100.7	101.3	102.7	104.3	96.1	103.6	93.0	102.5
3150.	93.6	93.9	91.8	92.5	93.0	93.2	95.1	97.7	99.2	101.0	102.2	103.5	103.8	96.3	102.9	92.4	101.1
4000.	92.8	92.3	91.7	91.9	91.6	92.4	94.2	96.8	98.5	100.7	100.9	102.3	103.0	96.1	100.8	90.6	98.8
5000.	91.1	91.7	89.6	90.4	91.7	90.4	92.8	95.5	96.9	99.4	100.0	101.0	101.4	96.1	99.5	89.0	96.4
6300.	91.0	91.7	89.3	89.6	89.9	89.2	92.6	95.1	96.6	99.9	99.4	100.5	101.3	96.6	98.5	88.2	96.0
8000.	89.1	89.9	88.1	88.6	88.0	86.1	90.0	94.4	95.0	98.0	97.5	99.5	99.9	97.3	96.2	86.9	94.2
10000.	88.1	87.2	84.8	85.2	85.0	81.3	86.4	91.6	93.2	95.4	95.2	95.9	96.3	97.3	94.0	83.4	91.4
OASPL	108.9	108.8	108.9	108.8	109.1	109.3	110.5	112.0	113.2	114.8	116.3	118.2	119.7	109.7	123.4	117.5	129.4

F-16XL Static Run 8

1/3-Octave Sound Pressure Levels

Microphone	18	19	20	21	22	23
θ	149.8	156.1	31.3	31.3	90.5	149.7
Frequency						
50.	113.6	36.3	85.4	92.7	101.9	109.0
63.	117.1	39.2	87.7	94.1	102.2	112.9
80.	119.8	40.8	89.5	96.4	103.8	115.8
100.	120.7	43.6	90.2	97.8	104.6	116.9
125.	120.7	46.4	93.1	99.8	106.1	117.7
160.	120.2	49.2	95.1	101.4	108.6	115.5
200.	119.7	46.6	94.5	101.5	109.7	112.3
250.	123.1	45.8	96.0	103.0	111.0	116.1
315.	122.1	47.0	96.7	104.4	111.9	115.8
400.	116.5	50.0	96.4	103.9	113.1	113.3
500.	115.8	49.7	96.6	104.6	113.0	109.0
630.	112.9	47.1	97.0	106.7	114.4	107.1
800.	110.7	47.1	96.1	106.1	114.3	103.7
1000.	108.3	46.7	94.8	104.6	113.3	101.0
1250.	106.6	47.1	93.6	103.7	113.6	99.3
1600.	105.7	47.8	92.7	104.1	113.9	98.4
2000.	103.6	47.7	90.9	103.5	112.9	96.3
2500.	102.1	48.1	89.4	103.2	112.4	94.6
3150.	100.0	47.8	87.6	102.7	113.0	92.2
4000.	98.2	47.7	85.3	101.7	112.2	88.8
5000.	95.7	47.4	82.5	101.5	111.0	84.0
6300.	95.0	48.1	79.9	102.0	110.8	81.2
8000.	92.9	49.1	75.3	101.3	109.4	78.4
10000.	90.2	47.7	70.7	99.6	107.1	75.7
OASPL	130.5	61.1	106.9	116.6	125.3	125.4

F-16XL Static Run 9

1/3-Octave Sound Pressure Levels

Microphone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
θ	22.1	31.3	37.2	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	118.8	126.7	133.8	141.1
Frequency																	
50.	86.1	87.4	87.7	87.8	89.9	90.4	91.3	92.6	93.11	94.0	95.1	96.5	97.8	83.3	103.7	99.1	112.4
63	88.4	89.2	89.2	89.3	90.3	91.2	92.5	93.9	94.45	96.1	97.4	99.0	100.6	86.0	106.6	101.9	115.4
80.	91.1	91.7	92.2	92.3	92.7	93.9	95.1	96.0	96.71	98.3	99.9	101.2	103.0	88.6	108.9	104.1	118.2
100.	92.6	92.8	93.2	92.8	93.7	94.2	95.7	96.6	97.89	99.2	101.0	102.4	104.0	88.6	110.2	105.7	119.0
125.	94.9	95.3	94.7	95.1	95.7	96.8	97.8	98.7	99.48	101.6	103.0	104.4	106.3	91.4	113.3	108.1	120.0
160.	97.8	96.4	96.3	97.2	98.2	98.1	99.0	100.3	101.46	103.2	104.5	106.3	108.9	92.5	116.2	112.1	123.4
200.	97.0	96.3	97.4	97.5	98.1	98.9	100.2	101.3	102.20	103.4	105.1	106.9	108.9	92.0	115.3	111.4	124.0
250.	97.6	98.5	98.9	98.3	98.8	99.6	100.5	101.2	102.69	104.2	105.9	108.1	110.0	94.4	115.8	110.6	124.2
315.	99.0	98.6	99.0	99.4	100.1	100.4	101.4	102.4	103.61	105.5	106.8	108.9	110.9	94.5	116.7	111.5	121.0
400.	98.0	98.2	98.6	99.4	99.3	99.9	101.5	102.0	103.60	105.3	107.1	108.9	110.8	94.9	115.9	109.5	121.5
500.	98.9	97.9	99.2	99.2	99.5	100.0	101.4	102.1	103.20	105.1	107.2	108.9	111.0	95.5	115.2	108.5	118.1
630.	98.4	98.7	99.4	99.5	99.6	100.1	101.5	102.7	103.88	105.6	107.4	109.6	111.5	95.8	115.0	107.6	117.6
800.	97.6	98.4	99.6	99.1	99.5	100.0	101.1	102.2	103.83	105.0	106.7	108.9	110.6	95.8	113.7	106.1	115.1
1000.	97.0	97.7	97.8	98.0	98.8	99.3	100.5	101.6	103.07	104.2	105.8	107.8	109.5	95.8	112.3	103.6	113.4
1250.	96.8	97.4	97.0	98.0	98.5	99.0	99.7	101.8	102.72	104.1	105.6	107.2	108.7	96.0	110.9	102.0	112.0
1600.	96.4	96.4	96.8	97.8	98.0	99.0	100.0	101.5	102.91	104.2	105.7	107.4	108.6	96.4	109.9	101.3	110.5
2000.	94.8	94.7	95.3	95.6	96.3	97.5	98.6	100.8	101.74	103.3	104.1	105.8	107.4	95.9	107.6	99.0	108.7
2500.	94.1	94.4	94.7	94.7	95.4	96.8	98.0	100.5	100.82	102.2	103.3	104.8	106.2	96.3	106.8	97.4	107.4
3150.	93.5	94.4	93.2	93.6	94.6	95.9	97.8	100.1	101.09	102.4	103.8	105.9	105.7	96.9	105.6	96.6	105.6
4000.	92.7	92.7	92.9	92.8	93.1	95.2	96.9	99.5	100.17	101.6	102.7	104.5	105.0	97.3	103.3	94.4	103.0
5000.	90.9	92.1	91.0	91.6	93.2	93.3	95.4	98.0	98.56	100.1	101.5	103.1	103.3	97.7	102.0	92.5	100.4
6300.	90.8	92.1	90.9	90.7	91.3	92.4	95.4	97.8	98.24	100.4	101.0	102.5	102.8	98.7	100.7	91.4	99.7
8000.	89.0	90.2	89.5	89.6	89.3	89.6	92.9	96.8	96.55	98.4	99.1	101.3	101.1	99.6	98.1	89.9	97.6
10000.	87.7	87.5	86.4	86.1	86.2	84.8	89.1	93.8	94.65	95.2	96.7	97.4	97.2	100.0	95.4	86.4	94.7
OASPL	109.4	109.6	109.9	110.1	110.6	111.3	112.6	114.0	115.0	116.6	118.1	120.0	121.6	109.6	126.0	120.2	131.9

F-16XL Static Run 9

1/3-Octave Sound Pressure Levels

Microphone	18	19	20	21	22	23
θ	149.8	156.1	31.3	31.3	90.5	149.7
Frequency						
50.	116.0	39.2	86.8	92.3	105.6	111.5
63.	118.8	41.0	88.9	94.2	106.0	114.1
80.	122.2	43.8	91.4	97.7	107.5	117.6
100.	122.8	46.2	92.0	99.3	107.4	118.4
125.	123.1	49.1	94.6	101.1	109.7	119.6
160.	121.3	51.0	95.8	102.6	111.0	117.0
200.	121.2	49.4	95.5	102.3	112.7	113.4
250.	124.8	49.0	97.6	104.2	113.3	117.3
315.	125.6	49.9	97.5	105.3	115.1	118.1
400.	119.7	52.4	97.5	104.6	115.3	116.0
500.	118.7	52.6	97.1	104.6	115.6	111.4
630.	116.8	50.7	97.9	106.0	116.8	110.5
800.	115.0	50.7	97.0	105.5	116.5	107.4
1000.	112.6	50.2	95.9	104.4	115.6	104.6
1250.	110.8	50.5	95.2	104.0	115.8	102.7
1600.	110.2	51.9	94.1	104.5	116.3	100.6
2000.	107.9	51.6	91.9	104.1	115.2	97.2
2500.	106.7	51.8	90.4	103.3	114.9	95.5
3150.	104.5	51.8	88.7	102.7	115.3	93.2
4000.	102.8	51.4	86.4	101.8	114.6	90.1
5000.	100.0	50.7	83.3	101.8	113.2	85.6
6300.	99.0	51.6	80.9	102.4	112.8	82.1
8000.	96.6	52.0	76.0	101.5	111.6	78.7
10000.	92.9	49.9	71.4	99.8	109.3	75.6
OASPL	132.9	64.2	108.0	116.8	127.7	127.3

F-16XL Static Run 10

1/3-Octave Sound Pressure Levels

Microphone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
θ	22.1	31.3	37.2	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	118.8	126.7	133.8	141.1
Frequency																	
50.	87.8	89.0		89.9			93.7			96.2			98.9			99.8	
63.	91.0	91.9		92.2			95.3			97.9			101.7			103.6	
80.	92.7	93.5		93.7			96.5			100.1			103.8			104.9	
100.	93.7	94.8		94.8			97.6			101.4			105.2			108.3	
125.	96.3	97.3		96.5			99.5			103.2			108.6			110.5	
160.	99.9	98.7		98.5			101.2			105.1			110.9			114.6	
200.	99.0	98.4		100.0			101.4			105.7			111.5			115.7	
250.	99.4	100.3		100.5			102.6			106.1			112.4			114.2	
315.	101.5	101.4		101.4			103.4			107.5			113.9			115.5	
400.	101.0	101.1		101.7			103.3			107.1			113.8			113.8	
500.	102.0	101.5		101.4			103.4			107.6			113.8			112.5	
630.	103.1	102.3		102.6			103.6			108.3			114.3			112.0	
800.	103.7	103.8		102.7			103.7			107.8			114.1			110.0	
1000.	101.5	102.5		102.5			103.5			107.3			112.9			108.1	
1250.	100.0	100.8		100.9			103.2			106.8			112.2			106.6	
1600.	99.1	99.1		100.0			102.5			107.6			112.1			105.5	
2000.	96.9	96.9		97.7			101.1			106.4			111.1			103.1	
2500.	96.0	96.2		96.3			99.9			105.6			110.5			101.7	
3150.	95.1	96.0		94.9			99.1			105.7			109.9			101.0	
4000.	93.6	94.0		93.6			97.6			104.6			109.0			99.1	
5000.	91.0	92.6		91.6			95.3			102.8			106.7			97.4	
6300.	90.0	91.7		90.0			94.2			102.6			105.9			96.5	
8000.	86.7	88.5		88.0			90.5			100.3			103.8			94.6	
10000.	84.2	85.4		83.7			85.6			96.9			99.7			91.2	
OASPL	112.4	112.5		112.6			114.6			119.2			124.7			123.9	

F-16XL Static Run 10

1/3-Octave Sound Pressure Levels

Microphone	18	19	20	21	22	23
θ	149.8	156.1	31.3	31.3	90.5	149.7
Frequency						
50.	116.3		88.7	94.0	108.8	111.6
63.	121.2		91.2	96.6	110.6	116.7
80.	122.1		92.7	98.9	111.3	117.8
100.	124.9		93.9	99.9	111.5	120.8
125.	124.4		96.2	102.4	113.9	121.3
160.	122.5		97.8	104.0	115.4	119.0
200.	123.6		97.5	103.6	116.3	116.1
250.	126.7		99.0	105.7	116.7	119.7
315.	128.0		99.8	107.7	118.3	120.7
400.	123.8		99.8	106.9	119.3	119.2
500.	123.0		99.7	107.6	119.2	115.7
630.	120.9		100.2	109.5	120.1	114.9
800.	119.1		101.2	110.5	120.2	112.3
1000.	116.8		99.2	109.0	119.9	110.0
1250.	115.2		96.8	107.6	120.4	108.3
1600.	114.2		94.5	107.5	120.9	106.4
2000.	112.0		91.2	106.9	119.3	103.8
2500.	110.6		88.3	105.7	119.1	102.3
3150.	109.0		85.6	105.4	119.4	101.1
4000.	107.7		81.8	104.5	118.5	99.1
5000.	105.4		77.7	104.0	117.3	95.7
6300.	104.5		74.8	104.0	116.8	93.8
8000.	102.2		69.9	103.0	115.4	91.2
10000.	98.6		65.6	100.9	113.1	87.5
OASPL	135.1		110.1	119.7	131.7	129.6

F-16XL Static Run 11

1/3-Octave Sound Pressure Levels

Microphone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
θ	22.1	31.3	37.2	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	118.8	126.7	133.8	141.1
Frequency																	
50.	90.0	91.1		91.9			93.9			97.2			100.8			101.0	
63.	91.9	92.6		93.5			96.2			99.8			104.3			105.5	
80.	94.2	94.7		95.4			98.5			102.0			106.7			108.8	
100.	95.2	95.8		96.0			99.8			103.6			106.5			110.8	
125.	99.0	99.4		98.1			101.2			104.9			109.8			113.4	
160.	102.4	100.6		100.7			103.1			107.1			113.2			116.6	
200.	101.0	100.2		101.6			103.4			107.3			113.8			118.6	
250.	101.7	102.0		102.0			104.9			108.9			115.3			117.9	
315.	105.0	103.6		103.1			105.3			109.4			116.1			120.0	
400.	109.0	107.1		105.0			106.4			109.8			117.2			118.2	
500.	112.5	110.7		108.0			106.6			110.4			116.7			118.1	
630.	112.0	112.1		110.4			109.8			111.1			117.5			117.3	
800.	110.7	111.2		110.0			111.7			111.6			117.5			115.8	
1000.	107.8	109.0		107.8			110.7			112.3			116.5			113.9	
1250.	106.0	106.9		105.7			109.0			112.7			116.3			112.8	
1600.	104.6	104.7		104.1			108.1			112.5			116.5			112.2	
2000.	101.7	101.7		100.8			106.1			111.3			115.9			109.8	
2500.	99.8	100.3		98.2			104.6			110.0			115.4			108.6	
3150.	98.2	98.9		95.3			102.8			109.8			115.0			108.5	
4000.	96.1	95.4		92.2			100.4			108.4			113.9			106.7	
5000.	92.8	92.7		88.8			97.1			106.0			111.4			105.5	
6300.	90.7	90.4		85.5			95.1			105.1			110.6			105.1	
8000.	87.1	85.8		82.5			90.7			101.9			108.8			103.8	
10000.	83.2	81.7		77.8			85.9			98.0			104.9			101.2	
OASPL	119.0	118.7		117.3			119.3			122.7			128.2			128.1	

F-16XL Static Run 11

1/3-Octave Sound Pressure Levels

Microphone	18	19	20	21	22	23
θ	149.8	156.1	31.3	31.3	90.5	149.7
Frequency						
50.	118.0		90.5	96.1	117.8	113.4
63.	123.1		91.9	96.9	119.2	118.2
80.	126.6		94.3	100.1	120.2	122.2
100.	127.3		95.0	101.7	120.2	122.9
125.	126.0		98.1	104.7	120.9	122.3
160.	125.0		99.8	106.3	122.2	120.8
200.	125.7		99.4	105.5	121.9	118.8
250.	128.9		100.8	107.6	122.6	121.6
315.	130.9		101.9	110.9	123.7	123.0
400.	127.9		104.7	113.4	124.4	123.0
500.	127.3		108.4	117.0	125.2	120.0
630.	126.8		109.5	118.9	126.8	120.2
800.	125.1		107.9	117.7	129.7	117.9
1000.	123.1		104.4	115.9	130.3	115.7
1250.	121.3		100.9	114.0	129.5	114.3
1600.	120.5		97.5	113.3	128.7	112.6
2000.	118.3		92.5	112.4	127.8	110.1
2500.	116.9		88.2	110.8	127.4	109.0
3150.	115.5		84.6	110.0	127.4	108.2
4000.	114.6		81.2	108.7	126.8	106.7
5000.	112.7		77.6	108.1	125.3	103.7
6300.	112.2		76.0	107.7	124.7	102.2
8000.	110.5		72.6	106.0	123.2	100.4
10000.	107.5		70.1	103.5	120.8	97.5
OASPL	138.5		115.6	126.0	139.6	132.4

F-16XL Static Run 12

1/3-Octave Sound Pressure Levels

Microphone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
θ	22.1	31.3	37.2	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	118.8	126.7	133.8	141.1
Frequency																	
50.	90.2	91.3	91.9	91.9	93.1	93.4	94.4	95.9	97.1	99.0	99.3	99.8	101.0	92.6	107.2	103.0	116.1
63.	92.9	93.6	94.0	94.3	95.2	95.9	96.9	98.3	99.3	101.5	102.3	103.7	105.4	95.9	111.6	107.7	120.1
80.	95.1	96.1	97.0	96.8	97.8	98.2	99.2	100.1	101.5	103.2	103.9	104.9	106.6	97.7	114.6	110.5	123.6
100.	96.6	97.6	97.6	97.4	98.9	99.3	100.5	101.5	102.5	103.9	105.1	106.4	109.1	100.1	116.1	111.0	122.6
125.	99.6	100.5	99.5	99.6	100.8	100.8	101.9	103.2	104.6	106.5	107.5	109.4	112.1	102.6	120.1	114.9	124.9
160.	103.1	101.5	101.8	102.0	103.0	103.0	104.2	104.9	106.4	108.1	109.2	111.2	114.1	105.5	123.9	118.8	127.1
200.	100.8	100.9	103.0	103.1	103.7	103.6	104.9	105.6	106.7	108.5	109.7	112.4	115.1	105.9	124.7	120.4	129.7
250.	102.6	103.5	104.3	104.0	104.7	104.5	105.9	106.2	108.0	109.6	111.3	113.9	116.4	107.6	126.0	119.4	130.2
315.	107.0	105.6	106.1	105.1	105.5	105.8	106.8	107.8	108.5	110.3	112.1	115.2	117.7	108.8	127.3	121.7	128.3
400.	112.6	111.2	109.3	108.3	107.1	106.5	107.3	108.2	110.0	111.2	113.4	115.7	118.5	108.8	126.8	120.1	130.3
500.	113.7	112.9	113.2	111.3	110.7	109.7	109.2	109.1	109.9	112.0	113.7	116.2	118.8	108.9	126.4	119.8	127.3
630.	113.1	114.4	114.6	113.3	113.5	112.8	112.6	112.1	111.8	112.7	114.1	116.6	119.3	109.4	126.2	119.1	127.3
800.	111.3	112.2	112.8	112.0	113.1	112.6	113.9	113.9	114.0	113.6	114.5	116.7	119.1	108.9	124.9	117.9	125.2
1000.	108.8	109.7	110.6	109.5	111.2	110.9	111.9	113.6	114.5	114.5	114.8	116.6	118.6	108.5	123.4	116.4	123.8
1250.	107.5	107.8	107.7	108.0	109.7	109.4	110.3	112.6	113.4	114.6	115.5	116.9	118.1	108.5	122.5	115.0	122.8
1600.	106.4	105.7	105.8	106.7	108.6	108.6	109.7	111.6	112.9	114.2	116.1	117.7	118.6	108.2	121.6	114.3	121.4
2000.	103.8	102.5	102.8	103.7	105.9	106.3	107.8	110.3	111.3	112.8	114.1	116.6	118.0	106.8	119.8	112.1	119.7
2500.	101.9	100.7	100.1	101.1	103.7	104.4	106.9	109.1	110.0	111.8	112.9	115.4	117.2	106.6	119.2	111.1	118.6
3150.	100.6	99.3	96.4	98.2	101.5	102.2	105.2	107.9	109.4	111.1	112.9	115.7	116.5	106.3	118.5	110.6	117.7
4000.	98.4	96.0	93.4	95.5	97.8	100.3	102.8	105.7	107.7	109.4	110.8	113.6	115.0	104.9	116.7	108.7	116.2
5000.	95.5	93.8	90.1	92.5	96.1	96.8	99.7	102.7	104.6	106.7	108.8	111.4	112.3	103.5	115.3	107.1	114.2
6300.	94.0	92.3	87.5	90.0	92.3	94.4	97.9	100.5	102.5	105.3	106.6	110.1	111.3	102.8	114.1	106.1	113.8
8000.	91.3	88.3	84.6	87.8	89.3	90.7	93.6	97.8	99.0	102.1	103.4	107.9	108.8	101.2	111.7	104.1	112.0
10000.	88.4	85.0	81.4	83.7	85.9	85.6	88.9	92.9	95.3	98.5	99.6	103.2	104.6	99.1	109.4	100.8	109.2
OASPL	120.5	120.5	120.6	119.8	120.6	120.2	121.1	122.2	123.1	124.2	125.6	127.9	129.8	120.1	136.3	130.0	138.7

F-16XL Static Run 12

1/3-Octave Sound Pressure Levels

Microphone	18	19	20	21	22	23
θ	149.8	156.1	31.3	31.3	90.5	149.7
Frequency						
50.	120.4	120.6	90.4	95.7	121.2	115.4
63.	124.6	124.5	92.5	98.1	122.5	119.9
80.	128.1	127.9	95.1	101.1	122.6	123.1
100.	127.2	127.9	96.3	102.4	122.0	123.1
125.	127.5	128.8	99.0	105.3	123.1	123.3
160.	125.3	128.2	100.6	107.1	123.9	121.4
200.	126.4	125.9	100.0	106.0	123.9	119.7
250.	129.8	124.1	102.3	109.0	124.8	121.9
315.	131.8	124.8	104.0	112.8	126.0	123.7
400.	128.0	125.7	108.7	116.8	126.4	122.0
500.	127.4	125.0	110.5	119.0	127.1	119.6
630.	127.0	123.3	112.2	120.6	130.8	119.5
800.	126.0	123.3	108.8	118.9	133.0	118.1
1000.	124.1	120.9	105.8	116.8	132.5	115.9
1250.	122.3	119.2	103.5	115.1	131.0	114.4
1600.	121.6	118.3	100.9	114.6	131.4	112.8
2000.	119.5	116.1	96.7	113.1	130.3	109.9
2500.	118.4	114.8	92.8	111.1	129.9	108.2
3150.	117.0	113.6	89.1	109.9	130.0	106.8
4000.	115.9	112.2	85.6	108.2	129.3	103.9
5000.	114.1	110.4	81.8	107.9	128.0	99.4
6300.	113.7	109.9	79.6	107.5	127.5	96.3
8000.	111.8	109.0	75.4	106.5	126.0	93.1
10000.	108.7	105.1	71.4	103.8	123.8	89.4
OASPL	139.3	137.5	117.8	127.4	142.2	132.8

F-16XL Static Run 13

1/3-Octave Sound Pressure Levels

Microphone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
θ	22.1	31.3	37.2	47.4	53.1	61.1	68.6	75.3	82.9	90.0	97.2	103.7	110.9	118.8	126.7	133.8	141.1
Frequency																	
50.	90.8	91.6	92.3	92.3	93.9	94.7	96.0	97.2	97.9	99.0	99.9	101.1	102.8	94.8	108.5	103.7	116.3
63.	93.5	94.1	94.7	95.2	96.3	96.7	97.8	98.8	99.8	101.4	102.1	102.8	104.5	95.5	112.9	108.2	120.2
80.	95.6	96.0	96.5	96.4	97.5	98.2	99.2	100.5	101.6	102.9	103.4	105.1	107.5	98.4	114.7	110.4	123.0
100.	96.5	96.9	96.8	96.7	97.8	98.5	99.7	101.2	102.6	104.7	105.8	106.8	108.9	99.8	117.9	112.8	124.3
125.	100.0	100.3	99.2	99.6	100.6	101.0	102.3	103.1	104.4	106.3	107.4	109.0	111.3	102.1	120.0	114.9	124.6
160.	103.0	101.6	101.5	102.3	103.2	103.1	104.0	105.2	106.7	108.1	109.3	111.2	113.9	105.3	124.1	119.2	127.2
200.	101.9	101.0	102.4	103.1	104.0	104.1	105.2	105.2	106.7	108.1	109.8	112.0	115.9	106.3	125.1	120.8	130.2
250.	103.4	103.7	103.9	103.7	104.5	104.7	106.1	106.8	107.9	109.5	110.9	113.9	116.5	108.1	126.4	119.2	130.1
315.	107.3	106.1	106.2	105.8	106.0	106.1	107.2	108.1	109.4	110.8	112.7	114.8	117.4	108.3	127.3	121.4	127.4
400.	112.3	110.8	109.3	108.7	108.1	107.2	107.9	108.4	109.6	111.7	112.9	115.8	118.3	108.4	127.1	120.5	130.2
500.	114.3	112.6	112.8	111.6	111.1	109.6	109.6	109.5	110.3	111.7	113.3	115.9	118.5	108.9	126.1	120.4	128.0
630.	113.9	114.0	114.4	114.0	114.0	113.0	112.5	112.1	111.9	112.7	114.0	116.4	119.2	109.4	126.2	119.0	127.2
800.	112.0	112.4	113.5	113.4	114.1	113.6	114.0	114.2	114.1	113.5	114.6	116.5	119.2	108.7	124.8	118.1	125.2
1000.	109.7	110.3	110.9	111.2	112.0	112.0	113.0	113.8	114.1	114.5	114.7	116.3	118.4	108.8	123.1	116.2	123.7
1250.	108.3	108.7	108.6	110.1	111.2	110.9	111.4	112.4	113.3	114.4	115.3	116.4	118.3	108.6	121.8	114.9	122.6
1600.	106.8	107.0	107.6	108.9	110.3	110.5	111.0	111.5	112.5	114.1	115.9	117.3	118.3	108.2	121.1	114.2	121.4
2000.	104.3	104.1	105.4	106.7	107.9	108.8	109.7	110.2	111.0	113.0	113.8	116.1	117.6	106.8	119.2	112.1	119.6
2500.	102.5	102.8	103.8	104.7	106.5	107.3	108.4	109.4	109.8	111.8	113.0	115.3	116.8	106.7	118.7	111.1	118.4
3150.	101.4	101.9	101.7	102.7	105.1	105.2	106.9	108.1	109.6	111.3	113.1	115.6	116.3	106.2	117.9	110.6	117.6
4000.	99.4	99.4	99.9	100.8	102.4	103.6	105.0	106.3	107.8	110.1	111.1	113.5	114.9	104.8	116.1	109.0	116.4
5000.	96.3	97.6	97.1	98.5	101.8	100.6	102.3	103.3	104.9	107.5	109.3	111.6	112.2	103.4	114.7	107.5	114.5
6300.	94.4	96.3	95.4	96.7	99.1	98.6	100.8	101.2	103.1	106.2	107.5	110.0	111.2	102.8	113.6	106.7	114.2
8000.	90.4	92.8	92.7	94.6	96.4	94.9	96.6	98.4	99.6	103.1	104.4	108.1	108.9	101.2	111.4	104.9	112.5
10000.	86.6	89.5	89.2	89.9	92.9	89.2	91.7	93.3	95.8	99.0	100.5	103.2	104.5	99.0	109.1	101.9	110.1
OASPL	121.0	120.7	121.0	121.0	121.6	121.3	121.9	122.4	123.1	124.3	125.5	127.6	129.7	120.0	136.3	130.1	138.8

F-16XL Static Run 13

1/3-Octave Sound Pressure Levels

Microphone	18	19	20	21	22	23
θ	149.8	156.1	31.3	31.3	90.5	149.7
Frequency						
50.	120.5	120.9	91.2	96.0	120.2	115.6
63.	124.7	124.7	93.5	98.7	121.1	120.0
80.	127.6	127.3	95.3	101.2	122.3	122.7
100.	128.8	129.0	95.9	102.2	122.0	124.6
125.	127.9	129.7	99.1	105.0	122.1	124.6
160.	125.6	128.8	100.7	107.1	123.6	122.2
200.	126.7	126.2	100.1	106.0	123.2	119.6
250.	129.5	123.6	102.6	109.2	124.2	122.2
315.	131.4	124.5	104.3	113.2	125.2	123.4
400.	128.4	125.5	108.7	116.6	126.1	122.1
500.	127.3	125.2	110.5	118.8	126.7	120.2
630.	126.9	123.6	111.8	120.0	130.0	119.7
800.	125.5	122.7	109.4	118.8	132.7	118.2
1000.	123.9	120.7	106.3	116.5	132.1	116.2
1250.	122.4	119.1	103.6	115.1	130.9	114.6
1600.	121.6	118.5	101.1	114.5	131.1	113.1
2000.	119.5	116.0	96.8	113.3	129.8	110.4
2500.	118.4	114.5	93.4	111.7	129.6	108.8
3150.	117.2	113.5	89.9	110.4	129.7	107.4
4000.	116.4	112.1	86.3	108.7	128.9	105.1
5000.	114.7	110.5	82.3	108.2	127.6	101.1
6300.	114.4	110.0	80.2	108.1	127.1	98.3
8000.	112.8	109.1	75.9	107.1	125.7	95.3
10000.	110.0	105.2	71.7	104.3	123.5	91.8
OASPL	139.3	137.8	117.8	127.2	141.8	133.2

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	December 1999	Technical Memorandum

4. TITLE AND SUBTITLE
F-16XL and F-18 High Speed Acoustic Flight Test Databases

5. FUNDING NUMBERS
WU 537-09-21-21

6. AUTHOR(S)
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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
NASA Langley Research Center
Hampton, VA 23681-2199

8. PERFORMING ORGANIZATION REPORT NUMBER
L-17899

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
National Aeronautics and Space Administration
Washington, DC 20546-0001

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
NASA/TM-1999-209529

11. SUPPLEMENTARY NOTES
Kelly, Wilson, and Rawls: Lockheed Martin Engineering and Sciences Co., Hampton, VA; Norum and Golub: Langley Research Center, Hampton, VA.

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Unclassified–Unlimited
Subject Category 71 Distribution: Nonstandard
Availability: NASA CASI (301) 621-0390

12b. DISTRIBUTION CODE

13. ABSTRACT ***(Maximum 200 words)***

This report presents test databases resulting from both an F-18 and an F-16XL aircraft in subsonic flight over an acoustic microphone array. The far-field acoustic results presented are ensembled-averaged narrow-band and 1/3-octave band spectra. Both broadband-shock noise and turbulent mixing noise are observed in the spectra. The databases also include the on-board recorded engine operating parameters, the radar and c-band tracking data used to determine the aircraft position and velocity, and the local weather conditions during each test. The acoustic data described in the report has application to community noise analysis, noise source characterization and validation of jet noise prediction models. A detailed description of the signal processing procedures is provided. Follow-on static tests of each aircraft were also conducted for which engine data and far-field acoustic data are presented.

14. SUBJECT TERMS	15. NUMBER OF PAGES
High speed jets; HSCT; F-18; F-16XL; Acoustic flight test; Climb to cruise acoustics; Jet noise code validation	268
	16. PRICE CODE A12

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL