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HIGH TIP SPEED FAN INLET NOISE REDUCTION USING TREATED INLET SPLITTERS AND ACCELERATING INLETS

(Quiet Engine Program Fan C Scale Model)

by

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I. SUMMARY

A series of inlet tests were run to determine the effects on noise of varying:

- the number of inlet splitters
- inlet acceleration with one splitter
- inlet acceleration with no splitters.

Each test was run with acoustic treatment which consisted of Scottfelt covered with a perforated plate. A total of eight suppressed configurations and an untreated baseline were run (see Figures 2-7).

The inlets were identified by their design takeoff average throat Mach number. Thus a 0.55 inlet implies a design intent of an average throat Mach number of 0.55 at 90% corrected fan speed. The fan was the scale model of the outer flowpath of the Quiet Engine Program's Fan C. This fan has a design point tip speed of 1550 ft/sec (472.44 m/sec) and a pressure ratio of 1.6.

A summary of the forward maximum PNL, throat Mach number, and total pressure recovery at takeoff and approach fan speeds is shown in Table 1. Some salient features of this table are:

- The 3 splitter inlet with Mach number acceleration from 0.46 (untreated baseline) to 0.67 reduced the noise 17.2 PNdB at takeoff with an inlet recovery loss of 2.9%. At approach, acceleration was from 0.26 to 0.35 with a noise reduction of 12.8 PNdB and a recovery loss of 0.7%.
- With one splitter the 0.79 inlet shows a reduction of 18.1 PNdB at takeoff with an acceleration of 0.46 to 0.72 and a recovery loss of 2.3%.
- When no splitters are employed, the reduction at takeoff in going from the untreated to the 0.55 inlet is 11.0 PNdB. With acceleration from 0.54 to 0.72 (see note f in the Table) a further reduction of 3.9 PNdB is realized. The total noise reduction, 14.9 PNdB, was obtained at a cost of 1.5% in recovery.

- Moderate levels of acceleration (i.e. from the 0.55 to the 0.65 inlet) increased the noise level.

In some instances more refined aerodynamic designs may reduce the losses measured with this test hardware.

Table 1. Inlet Noise[a], Mach Number[b], and Recovery[c] Summary

Configuration	Takeoff[d]			Approach[e]		
	PNL	M_{TH}	η_r	PNL	M_{TH}	η_r
Unsuppressed	122.9	0.46	0.997	105.1	0.26	0.998
0.55 no split.	111.9	0.54	0.994	98.5	0.30	0.998
0.55 one split.	110.2	0.57	0.982	95.0	0.31	0.991
0.55 two split.	108.6	0.61	0.982	94.7	0.33	0.996
0.55 three split.	105.7	0.67	0.968	92.3	0.35	0.991
0.65 no split.	112.9	0.62	0.992	99.4	0.33	0.997
0.65 one split.	109.3	0.68	0.977	96.8	0.35	0.992
0.79 no split[f].	108.0	0.71	0.988	99.8	0.37	0.996
0.79 one split.	104.8	0.72	0.974	96.7	0.37	0.995

a. 200-foot sideline maximum forward angle full-scale PNL.

b. Average throat Mach number based on flow and total pressure recovery.

c. Average total pressure recovery.

d. Takeoff is defined as 90% correc d fan speed.

e. Approach is defined as 57.5% corrected fan speed.

f. Data at 88% fan speed.

II. INTRODUCTION

A. Background

The benefits of acoustically treating the inlet walls of turbofan engines has been clearly demonstrated.[1,2] In fact, the inclusion of such treatment is an accepted part of any new commercial turbofan design. The continuing pressure for still lower noise levels, however, will require still greater efforts in inlet noise suppression.

There are at present two inlet noise suppression concepts being actively investigated. They are

- Multiple acoustically treated inlet splitters
- Choking the inlet flow

The latter is the newer of the two and as a result encompasses many as yet unexplored areas of operation. In general, the choked inlet will require some type of variable geometry.

The program whose results are examined in this report was designed to marry the two concepts in principle (i.e. treatment and high inlet Mach number-hybrid) while maintaining a fixed geometry inlet. In this manner the high Mach number exists at takeoff with the upper limit fixed by the requirement that the inlet be able to pass the altitude cruise flow. At lower power settings the Mach number is, of course, lower and the inlet treatment is then the sole means of suppression.

To cover the various design combinations, a test matrix was set up around three basic inlet cowl and lip combinations. Each such inlet was designated according to its ideal average throat Mach number at takeoff conditions. The Mach numbers chosen were 0.55, 0.65, and 0.79.

The 0.55 Mach number is representative of conventional design practices and forms the baseline for the test series. A 0.65 Mach number represents about the upper limit for a conventional takeoff and landing aircraft since such an inlet will just pass the altitude cruise flow. Finally, the 0.79 inlet could be used for a STOL aircraft where the engine is sized at takeoff rather than at the altitude cruise or with some variable geometry feature.

A single inlet splitter was also designed for each of these cowls. And to fully examine the splitter concept, two and three splitter arrangements were designed for the 0.55 cowl and inlet lip.

Thus three basic geometric arrangements over a range of Mach numbers were investigated.

- 0.55, 0.65, and 0.79 average throat Mach numbers in a wall treated inlet
- The above three cowls with single treated splitters
- The 0.55 cowl with 0, 1, 2, and 3 treated splitters.

B. Vehicle Description

As a basic test vehicle the scale model Fan C of the Quiet Engine Program was utilized. Some of the basic characteristics of this fan are listed below.

Design P/P - 1.6
Design tip speed - 1550 ft/sec (472.44 m/sec)
Number of blades - 26
Number of vanes - 60
Rotor - OGV spacing - 2 rotor tip chords
Takeoff % corrected speed - 90
Approach % corrected speed - 57.5
Tip diameter - 36 inches (91.44 cm)
Radius ratio - 0.57

The high radius ratio results since the scale model fan represents only the bypass flowpath portion of a turbofan engine with a design bypass ratio of 5.0. Figure 1 is the performance map of the fan as determined with a clean inlet bellmouth (no stall line testing was done on this vehicle).

For these tests a blade shape designated "Mod II Blade" was employed. A series of tests with different blade shapes will be the subject of a later report.

A cross section of the basic vehicle is shown in Figure 2. This sketch shows the fan with the 0.55 cowl and bell lip installed. The acoustic treatment consists of one-half inch 2-900 Scottfelt covered by a perforated plate with an open area of 22-1/2%. The holes are 1/16 inch (1.53 mm) in diameter and the faceplate is 0.03 inches (0.76 mm) thick.

Since this test series was to be an evaluation of front end noise, the long suppressor was added to the rear to remove rear radiated fan noise from the front farfield quadrant.

Figures 3-5 show the various inlets. In each case the cowl treatment extends 29 inches upstream of the leading edge of the fan rotor. In full scale (22,000 pound thrust engine) this would represent 53 inches (134.62 cm) of treatment. The acoustically treated splitter sets for the 0.55 inlet were optimized for each of the configurations. That is, the one splitter case was set where it would intercept the most acoustic energy and yet not be too far away or close to the outer wall for good suppression characteristics. The same holds true for the two and three splitter arrangements. In other words the decreasing numbers of splitters were not obtained by removing splitters from the 3 splitter inlet, but rather by designing new splitters and support struts.

The cowl for the 0.65 and 0.79 inlets was the same. The higher Mach number was obtained by a change in the bell lip. This is the reason that the 0.79 inlet is slightly longer than the other two inlets. As a result of this, the same single splitter was used for the 0.65 and 0.79 inlets.

It should be noted that the splitters actually extend into the throat so that the inclusion of splitters also raises the average throat Mach number. This resulted from application of the design criteria that the inlet should contain as much acoustic treatment as possible. It is possible, however, as the results will show that this added acoustic benefit was paid for in higher inlet losses.

C. Test Program and Data Analysis

The test vehicle is shown set up on the test stand in Figure 6. The facility is driven by an LM1500 gas generator connected to the fan vehicle through an inlet shaft. The inlet bell lip is about 28 inches (71.1 cm) away from the first shaft bearing pedestal. It is possible that this arrangement has an effect on the absolute level of noise; however, since each configuration was run under the same conditions the relative evaluation of the inlets is valid.

Figure 7 is a view of the test facility. The sound field consists of a 100-foot arc of microphones spaced at 10 degree increments from 20 to 160 degrees. The microphones were placed at the fan centerline height - 12.5 ft. (3.81 m) off the ground. The field itself is covered with asphalt.

Data is FM recorded on magnetic tape at 60 inches per second (152.4 cm/sec) in the control room. These data are then analyzed on a General Radio 1/3 - octave analyzer using a 32 second averaging time. The analyzed data is corrected to standard day. At this point the data is still in scale model size. However, a more realistic evaluation can be made if the data is scaled to full size. This is done by shifting the spectrum down in the same ratio as the ratio of the scale model's blade passing frequency to the full scale's blade passing frequency. In addition, an adjustment for the size is made by adding 10 log of the weight flow ratio to all of the data. The linear scale factor is .527.

Unless otherwise noted all data presented in this report is scaled to full scale and projected to the 200-foot (60.96 m) sideline.

The typical test program sequence consisted of running along the fan's nominal operating line taking farfield noise data at various intervals for one and one-half to two minutes at each speed point. This process was then repeated so that all data represents the average of a run and repeat.

Aerodynamic testing was done on separate runs so that all aerodynamic instrumentation could be removed during acoustic testing. Aerodynamic instrumentation consisted of boundary layer rakes, static pressures, and total and static pressure traverses. From these data and calculations the recovery and Mach number distributions were determined.

III. INLET WITH MULTIPLE SPLITTERS

A. Acoustic Data

1. Static 200-Foot (60.96 m) Sideline Results

In order to assess the effects of the addition of splitters to the inlet along with increasing the throat average Mach number, splitters were added to the 0.55 design Mach number inlet. The splitters were added one at a time up to 3 splitters. Cross-sections of these inlets are shown in Figure 4. In each case the same cowl and bellmouth were used but the splitters were placed so as to provide the maximum suppression for the number of splitters being employed.

Figure 8 shows the resulting reduction at takeoff (90% corrected fan speed) for the treated cowl and successive addition of splitters. One of the more noteworthy aspects of these data is the small difference between one and two splitters - about 1-1/2 PNdB at 70 degrees - compared to the overall reduction of 6 PNdB. Figure 9 contains a comparison of the 1/3-octave spectra at 70 degrees referenced to the inlet with no splitters. The blade passing frequency is at 2000 Hz. Clearly the reduction obtained from 2 to 3.15 KHz accounts for the success of the three splitters. The one and two splitter data show very little difference all across the spectrum. The hump in suppression at 316 Hz is multiple pure tones (MPT) suppression. These data indicate that the inclusion of the first splitter gets the MPT suppression and that there is essentially no change with the addition of more splitters.

As a point of reference Figure 10 shows the 0 and 3 splitter absolute levels. The total suppression is maximum at the 2 to 2.5 KHz frequencies - about 10 dB. Also included is the 120 degree spectra for 0 and 3 splitters in Figure 11. The flat characteristic of this spectrum and the small level of reduction indicates that the rear angles are probably dominated by aft radiated noise caused by the jet and the air flowing over the internal aft splitter.

Figures 12-17 contain similar data for 84 and 72% corrected fan speed. At 84% speed the results have the same characteristics as at takeoff. At 72% speed, Figure 15 shows a peak at 50 degrees and a corresponding large noise reduction as splitters are added. This particular speed is the speed at which the rotor tip relative Mach number exceeds one. A characteristic of the onset of supersonic relative fan tip speed is an increase in the blade passing frequency (BPF) level as shown in Figure 17. (At slightly higher fan speeds multiple pure tone noise develops.) Figure 16 indicates that the relatively large noise reduction obtained at 50 degrees is due to suppression of the high BPF level.

The data at approach fan speed is contained in Figures 18-21. Figure 18 indicates that the largest improvement was obtained with the addition of the single splitter; although successive improvements with additional splitters were obtained at 50 degrees. The spectral details contained in Figures 19 and 20 at 50 degrees shows that the most suppression has been obtained at the BPF in the 1250 Hz band.

It can be seen in Figure 18 that the suppression has extended around to the rear more than in the higher speed cases. This is probably due to the lower jet and internal scrubbing noise at 57.5% speed. The spectra for the 0 and 3 splitter cases are shown in Figure 21. Clearly the suppression at the BPF and its second harmonic account for the observed PNL decrease at 120 degrees.

Figures 22 and 23 show the progression of the 200-foot (60.96 m) sideline PNL with fan speed. The forward maximum PNL, Figure 22, shows the "jump" in level with no splitters at 70 to 72% speed is removed when the splitters are employed. In the rear quadrant, Figure 23 shows a family of data which progresses almost linearly with speed in all cases. The inlet data, however, shows a considerable flattening at high speeds particularly with the 3 splitters.

As was previously mentioned one of the design criteria was to place as much treatment in the inlet as possible. This resulted in a throat area decrease and corresponding throat Mach number increase in each case. At higher power settings therefore noise reduction was not only a result of treatment but also inlet Mach number increases. This is, in some measure, the reason for the leveling off at high speeds seen in Figure 22. That is, as the fan speed increases so does the inlet Mach number. At speeds above 85%, particularly with 3 splitters, the increasing source level and increasing Mach number tend to offset each other resulting in no appreciable noise increase.

2. Flight Noise Results

In order to obtain a view of the noise reduction capabilities of these configurations in flight, the scaled data was "flown" through level flyovers at approach (57.5% fan speed) and takeoff (90% fan speed) power. The takeoff flight altitude was at 1000 feet (304.8 m) and the approach at 370 feet (112.8 m). A flight Mach number of 0.22, temperature of 77° F, and a 70% relative humidity were employed.

A core jet was also added to the noise spectrum by using the method of SAE AIR 876. The SAE relative velocity correction was also applied to the low frequency noise. For the purpose of these comparisons this method is deemed acceptable. However, it is recognized that a greater degree of sophistication may be required to more accurately describe the absolute level of jet noise.

Figures 24 and 25 show, respectively, the takeoff PNL and PNLT for each configuration. The tone corrected data show approximately the same reduction as the uncorrected levels for 3 splitters. Figure 26 contains the spectra at 70 degrees for 0 and 3 splitters. The linear region below 315 Hz is the result of linearly extending the fan noise over the region of the spectrum where the relative velocity correction has reduced the jet noise.

The PNL and PNLT data at approach are shown in Figures 27 - 29. In this case the tone corrected data indicates a larger reduction. The spectra in Figure 29 clearly show the large BPF tone with no splitters which results in a tone correction that adds 4.7 PNdB at 40 degrees.

B. Aerodynamic Results

1. Mach Number and Recovery

As was previously mentioned the splitters were added such that the inlet throat was smaller in each case. Figure 30 shows the average throat Mach number trend with corrected fan speed. This Mach number was computed from the total measured flow and the measured inlet recovery. At higher speeds the Mach number is considerably higher than the conventional inlet (usually .5 to .55). As will be shown in Section VI Mach numbers of about .65 and higher result in noise reduction solely because of the acceleration.

The average throat Mach number is a convenient correlating parameter; however, also of interest is the outer cowl surface Mach number. Figure 31 shows the trend in this parameter for each inlet. In the region of the throat all the configurations show a peak; although it tends to be lower as the splitters are introduced. This is due primarily to the loss of recovery at the takeoff corrected fan speed. In the case of the 3 splitter inlet, however, a "second throat" has appeared in the region of the splitter support struts.

The inclusion of splitters resulted in noise reduction at the cost of inlet recovery. Figure 32 shows the recovery versus corrected speed. With no splitters the inlet behaves in the normal manner with recovery at .994 at 90% speed. As splitters are added recovery drops with a low being measured with 3 splitters at .962 (Mach number is about .7). The one splitter inlet shows lower recovery than the 2 splitter inlet except at high speed. It is believed that this loss in recovery was the result of a misalignment of the single splitter with respect to the flow. The effect of this on the noise reduction obtained is unknown; although it does not appear to have caused any discontinuities in the acoustic data.

2. Aero-Acoustic Summary

Finally, Figure 33 shows the recovery and noise trend at takeoff fan speed. As would be expected the noise decrease is paid for in inlet recovery loss. Roughly, a 1% decrease in recovery results in a 2% thrust loss on the Engine C cycle. Therefore, recovery levels as shown in Figure 33 will have to be carefully considered in the engine suppression design.

IV. INLETS WITH ONE SPLITTER

A. Acoustic Data

1. Static 200-Foot (60.96 m) Sideline Results

In this section data from a series of tests on the 3 cowl designs is examined with one acoustically treated splitter in the inlet (see Figure 5).

Figure 34 shows the takeoff PNL directivity for the 3 inlets. The 0.55 and 0.65 cowls produce maximum front levels which are about one PNdB apart; however, the 0.79 cowl shows a marked drop in level. This drop is due to the higher Mach number in the 0.79 inlet (0.72 versus 0.57 and 0.68 for, respectively, the 0.55 and 0.65 cowls) since all three inlets contain the same amount of treatment. At 70 degrees the difference between the 0.79 inlet and the other two configurations is 4 PNdB. The spectra, Figure 35, shows a hierarchy of noise level at frequencies between 2 KHz and 6350 Hz which is indicative of the Mach number effect.

As speed is decreased from takeoff Figures 36 through 38 show a marked change in this picture. When the Mach number decreases from the level at takeoff the 0.55 cowl produces the lowest noise and the 0.79 inlet produces the most noise. This is particularly true at approach (Figure 38, 57.5% speed). At the front maximum, 70 degrees, the 0.79 inlet is about one PNdB higher than the 0.65 inlet which is in turn about 2 PNdB higher than the 0.55 inlet. For the approach case the average throat Mach numbers are:

Inlet	$M_{TH_{av.}}$
0.55	0.31
0.65	0.35
0.79	0.37

Although the Mach number range is small, it is possible that higher Mach numbers are generating higher inlet turbulence levels which create more noise without an attendent acceleration effect.

Figure 39 shows the spectral characteristics at 70 degrees. The noise increase spreads all across the spectrum including the blade passing frequency (1250 Hz).

In summary the 200-foot (60.96 m) sideline results show a marked acceleration effect at takeoff. However at approach the higher Mach number has acted to increase the noise level.

2. Flight Noise Results

The scaled static results were extrapolated to flight conditions and a core jet added to the spectrum (see Section IV.A.2). Figures 40 and 41 show the takeoff PNL and PNLT at 1000 feet (304.8 m). The tone corrected data show a still greater effect or Mach number than PNL. Spectral comparisons, Figure 42, show that the 0.79 inlet has no significant tone content as well as a lower level.

At approach power at 370 feet (112.8 m) the PNL and PNLT directivities are shown in Figures 43 and 44. To some extent the altitude accentuates the higher Mach number inlet problems. The spectra at 60 degrees, Figure 45, shows a very high tone content at this angle (other angles indicate a somewhat smaller increase).

B. Aerodynamic Results

1. Mach Number and Recovery

As has been noted the Mach number has played an important part in the noise reduction obtained with the 0.79 inlet. Figure 46 contains the average throat Mach number variation with corrected fan speed. At 95% speed the 0.79 inlet line "falls over". This is indicative of choking in at least part of the inlet. Figure 47 clearly shows that the wall Mach number is supersonic in the region of the throat with a rapid deceleration in the passage containing the splitter.

Figure 48 shows the inlet total pressure recovery versus corrected fan speed. At high speeds the 0.79 inlet is dropping rapidly. This is probably due to the choked outer flow passage and attendent shock and boundary layer losses.

2. Aero-Acoustic Summary

It is obvious that the Mach number effect which reduces the noise has come at the cost of inlet recovery. Figure 49 shows the noise trend with inlet recovery at 90% speed. The noise decrease due to the higher Mach number is about 5-1/2 PNdB but it was obtained at the cost of about 0.7% in inlet recovery. The absolute level of recovery for even the 0.55 inlet is also somewhat low - about 98.1%. It is, however, possible that some clean-up could be achieved by further iterations on the aerodynamic design. This is particularly true for the 0.79 inlet where some reduction in Mach number might be in order.

Figure 50 shows a "map" of the Mach number and inlet noise at various speeds. The tendency for the noise to increase with Mach number at lower speeds can be seen. At 88% speed the 0.55 and 0.65 inlet produce about the same noise level. Above this speed the 0.65 inlet is lower in noise. At 95% speed the 0.65 and 0.79 inlets produce about the same noise level at about the same Mach number.

V. INLETS WITHOUT SPLITTERS

A. Acoustic Data

1. Static 200-Foot (60.96 m) Sideline Results

This test series provides data on the effects of higher inlet Mach numbers without acoustic splitters but with a treated nacelle wall. The cowl wall hardware was the same as in previous tests with splitters.

Figure 51 shows the PNL at 88% fan speed. The normal takeoff speed, 90%, was not used since the 0.79 inlet showed signs of flow separation at this speed. However these data are representative of high speed fan operation. The 0.79 inlet is clearly the lowest noise in Figure 51. However, the problem with the 0.65 inlet cited in the previous section is again apparent. The average throat Mach number for each inlet at this speed is:

Inlet	$M_{TH_{av.}}$
0.55	0.52
0.65	0.60
0.79	0.71

At 70 degrees the 0.79 inlet shows a reduction of 2-1/2 PNdB over the 0.55 inlet; but the 0.65 inlet exceeds the 0.55 inlet by 2-1/2 PNdB at this angle. The spectra at 70 degrees are shown in Figure 52. With the 0.79 inlet the noise has decreased from the BPF at 2000 Hz to 6300 Hz while the 0.65 inlet noise shows increases over most of the spectrum relative to the 0.55 inlet.

As the fan speed is decreased to the approach speed (57.5%) the noise of the 0.79 inlet increases relative to the other two inlets until at approach the 0.79 inlet exceeds the other inlets at some angles (Figures 53-55). The spectra at 50 degrees (Figure 56) shows the hierarchy at the BPF (1250 Hz) to be 0.79, 0.55, and 0.65; however the 0.55 inlet produced the lowest noise at higher frequencies. The spectra at 120 degrees, Figure 57, shows about the same characteristics as the 50 degree spectra.

This increase in noise up to about 0.6 Mach number was also seen with the 0.65 inlet with a single splitter. Again it appears that moderately high Mach numbers increase noise rather than decreasing it.

2. Flight Noise Results

The flight noise data for 88% speed is contained in Figures 58 - 60. Generally the flight noise follows the conclusions drawn from the sideline; although the 0.55 and 0.65 inlets are nearly equal (in Figure 51 the 0.65 inlet was higher).

For approach power, Figures 61 - 63, the 200-foot (60.96 m) sideline conclusions also hold. Figure 63 shows the 60 degree spectra with the direct Mach number-noise hierarchy at frequencies above the BPF.

B. Aerodynamic Results

1. Mach Number and Recovery

Figure 64 contains the corrected fan speed versus average throat Mach number characteristics for the 3 inlets. The outer wall Mach number distributions are shown in Figure 65. Generally these results are as would be expected.

In this case the recovery versus fan speed from inlet-to-inlet (Figure 66) follows the trend of higher Mach number lower recovery. The data for the 0.79 inlet do not go beyond 88% speed due to data acquisition problems at higher speeds. Extrapolation of this line may be misleading as it is suspected that the recovery is dropping at an accelerating rate.

2. Aero-Acoustic Summary

Figure 67 shows the noise and average throat Mach number characteristics of each inlet. These curves show the trend to higher noise with Mach number at lower fan speeds. Above 72%, however, the 0.79 inlet begins to produce lower noise.

VI. CONCLUSIONS

1. Multiple acoustically treated splitters and high average throat Mach number (0.67) result in appreciable takeoff noise reduction [17.2 PNdB on the 200-foot (60.96 m) sideline]; however inlet recovery at takeoff fan speed is down to 0.968.

2. The use of high inlet Mach number (0.72) with one acoustically treated splitter shows a takeoff noise reduction of 18.1 PNdB with a recovery of 0.974. Thus reduction in the number of splitters slightly improves both noise and inlet aerodynamic performance when higher Mach number is employed.

3. With an acoustically treated cowl, high inlet Mach number (0.71) shows a high fan speed noise reduction of 14.9 PNdB. Examination of these data indicate that at least 3.7 PNdB of this reduction is due to acceleration. Inlet recovery was 0.982. Thus the inlet without splitters showed the best ratio of recovery loss - to PNL reduction - 0.1% loss in recovery per PNdB.

4. Moderate increases in average throat Mach number ($\leq$0.6) with treated inlets results in a noise increase. Noticeable acceleration effects appear at Mach numbers $\leq$ 0.65.

VII. NOMENCLATURE

BPF	Blade passing frequency
Hz	Hertz
M	Mach number
$M_{th_{av.}}$	Average throat Mach number
M_o	Flight Mach number
MPT	Multiple pure tone (shock noise)
OGV	Outlet guide vane
P/P	Pressure ratio
PNdB	Perceived noise decibel
PNL	Perceived noise level
PNLT	Tone corrected perceived noise level
RE	"referenced to"
SL	Sideline
SPL	Sound pressure level
W/O	"without"
η_r	Total pressure recovery

APPENDIX A - FIGURES

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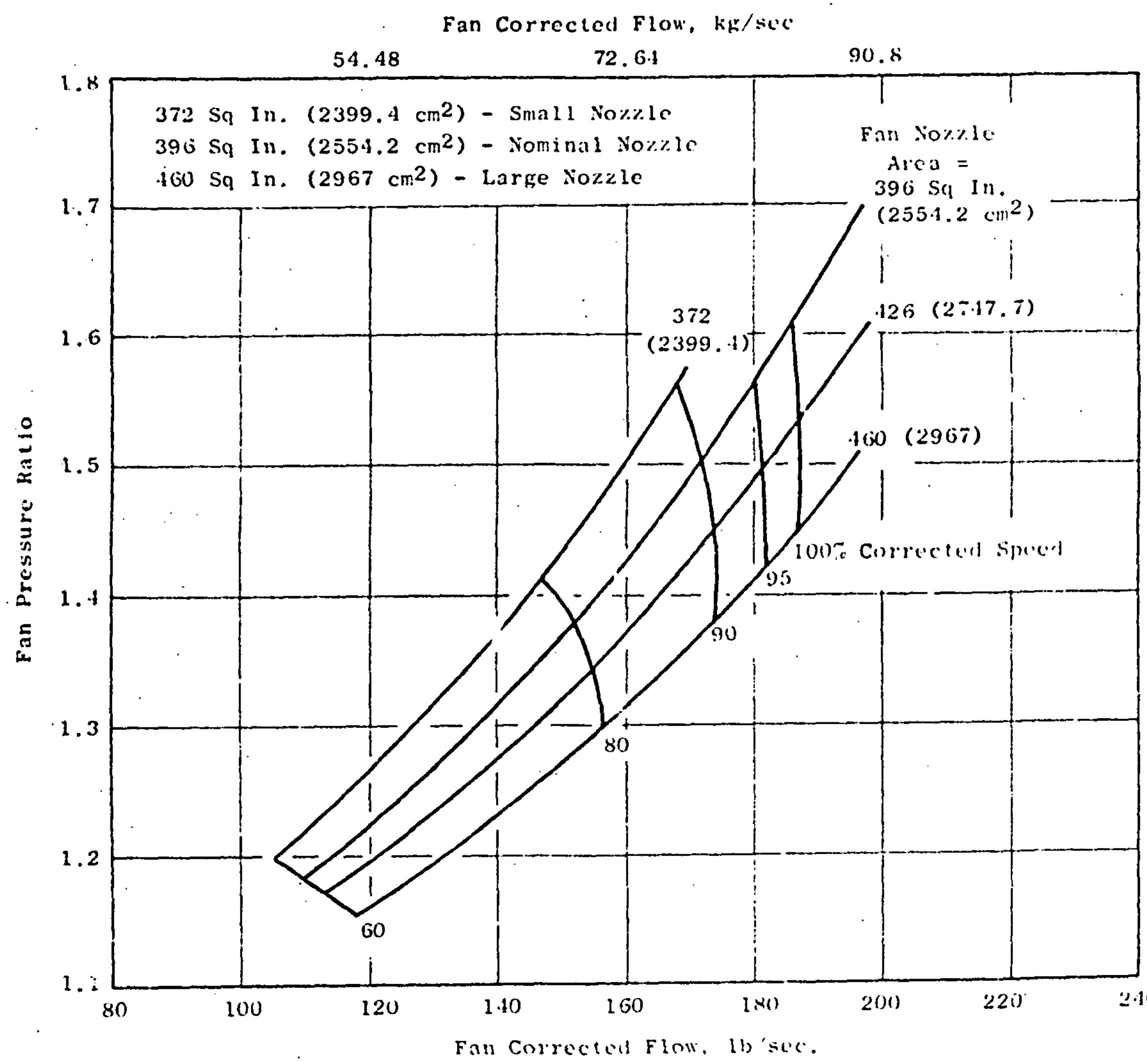

Figure 1. Performance Map, Baseline Bellmouth Inlet.

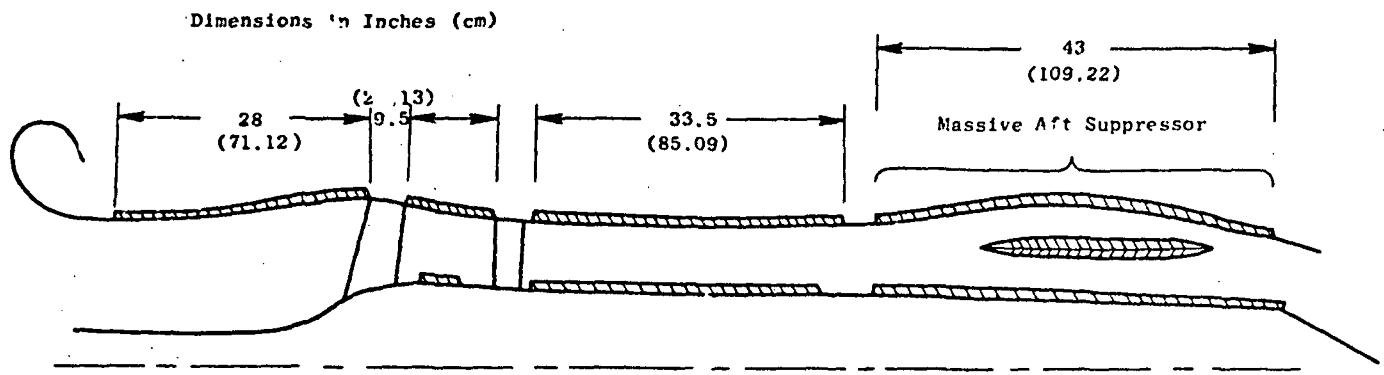

Figure 2. Fan Vehicle Cross Section.

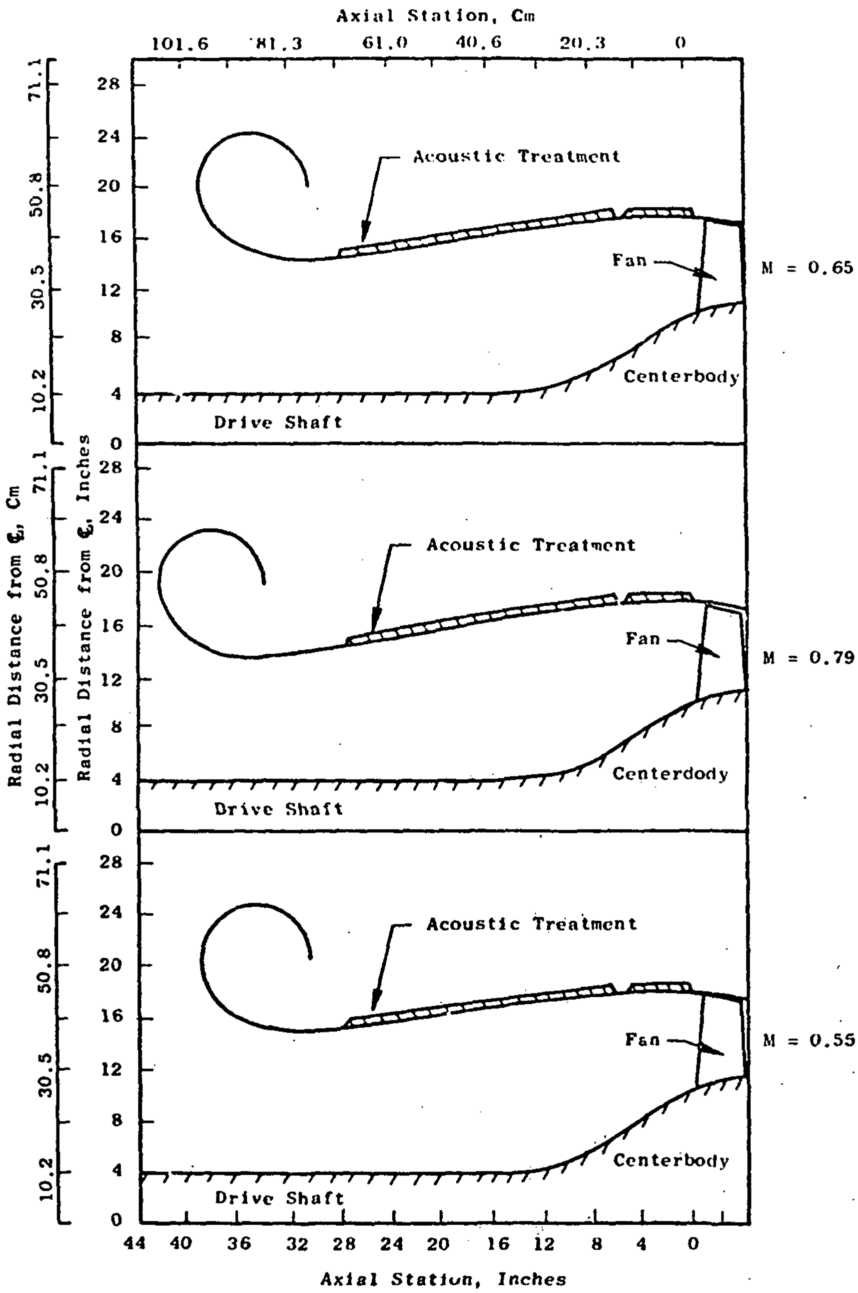

Figure 3. Inlets Without Splitters.

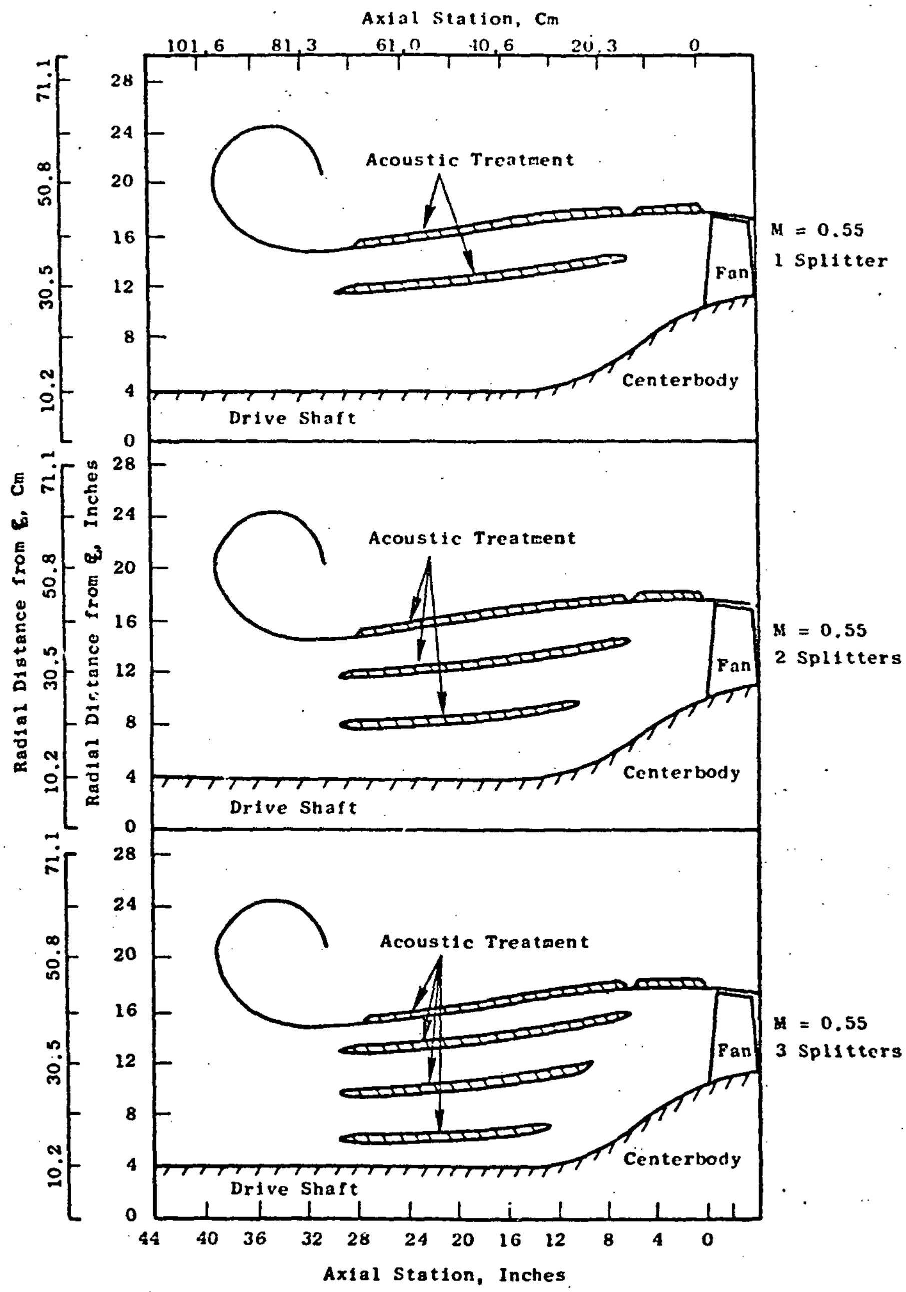

Figure 4. Inlets with Varying Splitters.

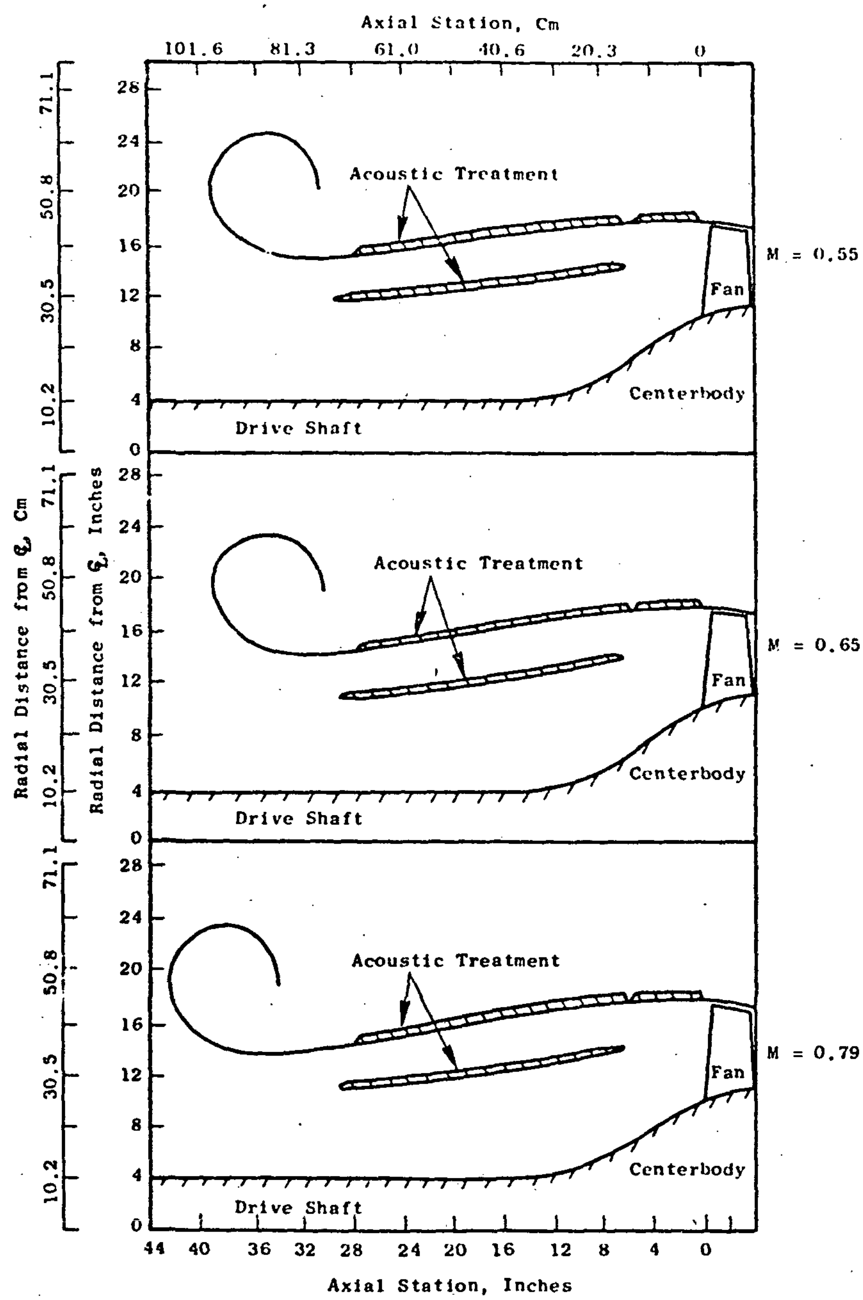

Figure 5. Inlets with One Splitter.

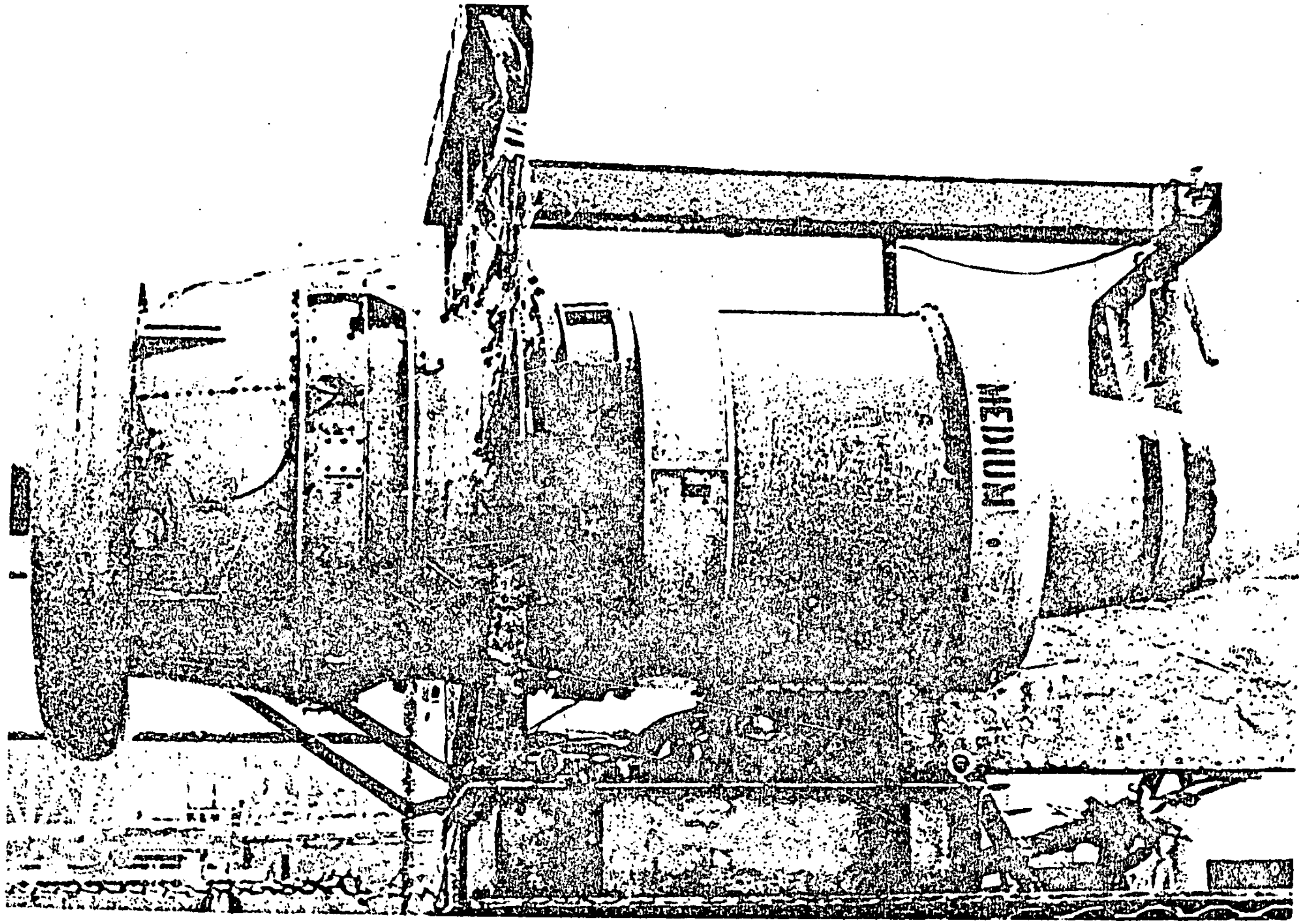

Figure 6. Fan Test Vehicle.

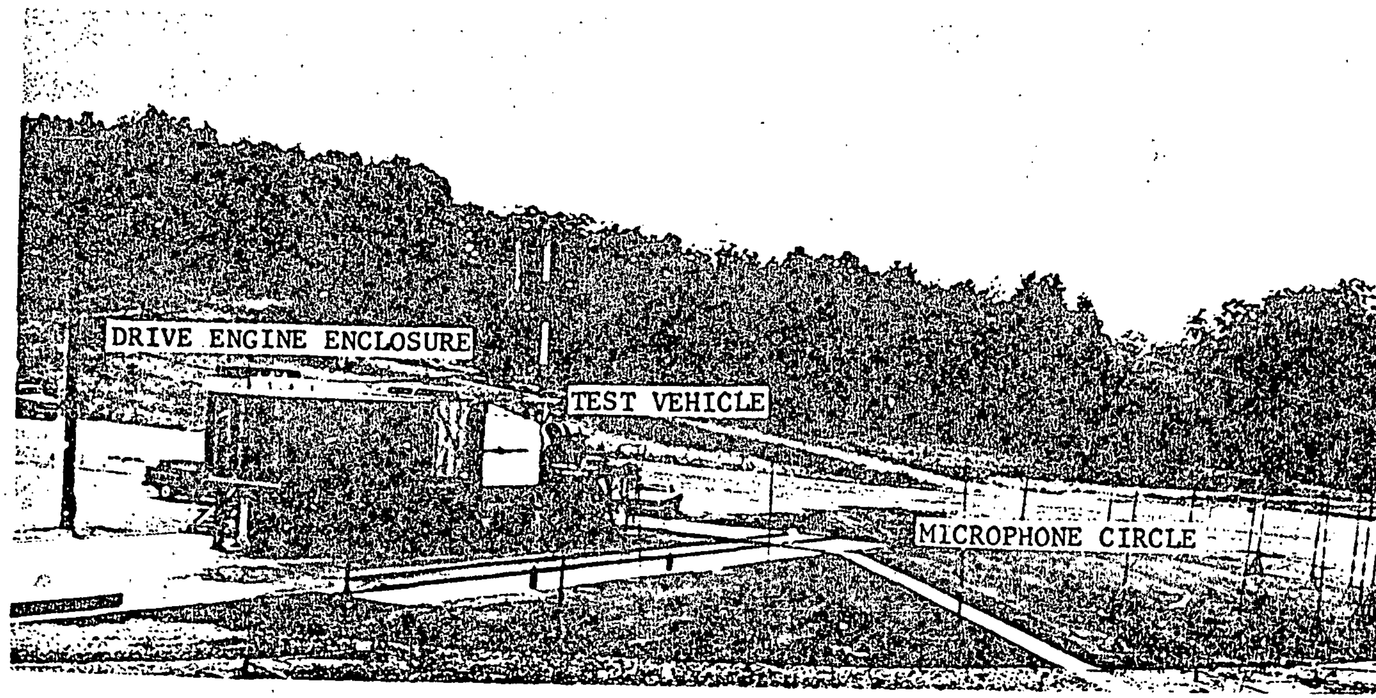

Figure 7. Fan Test Facility.

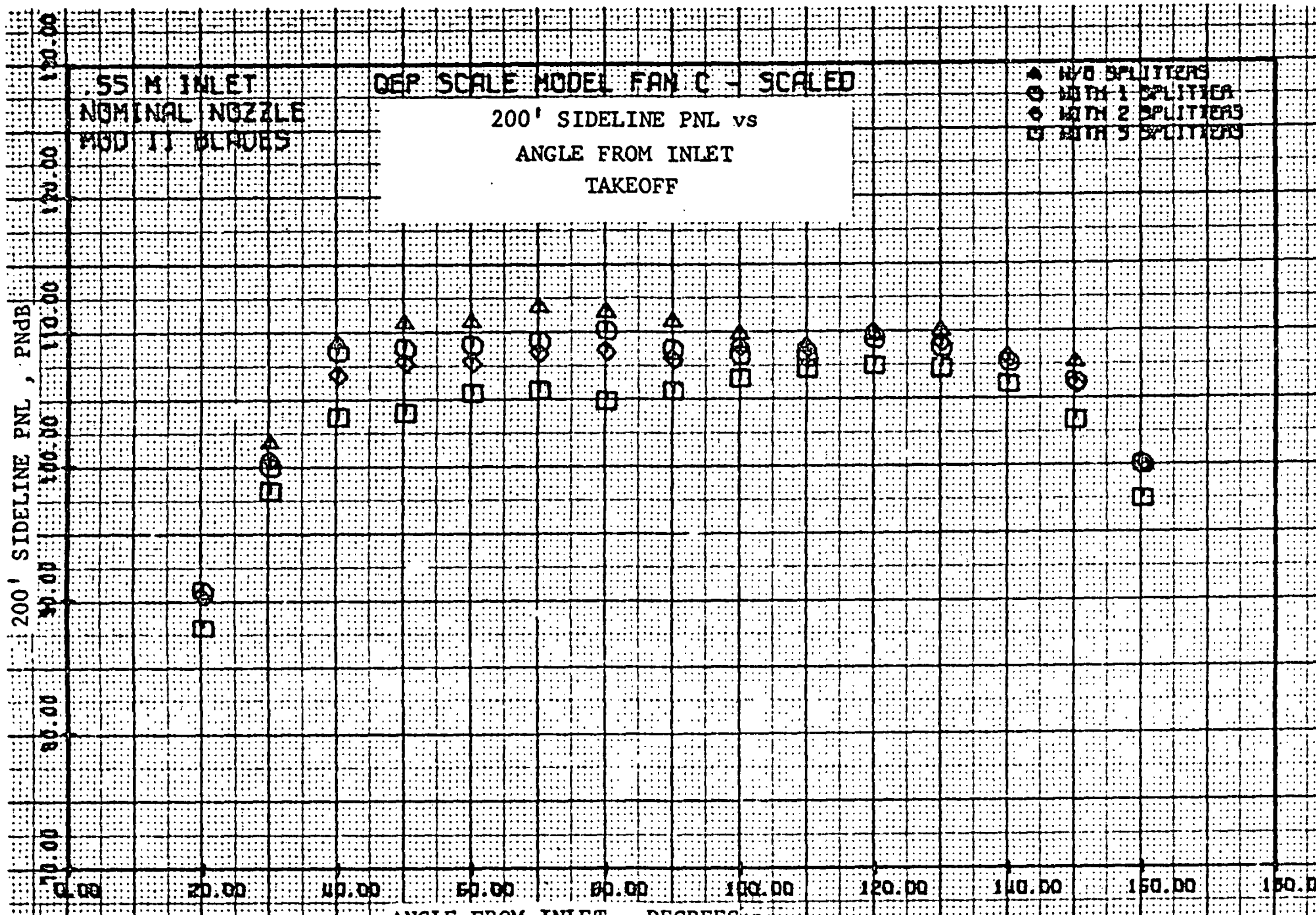

Figure 8. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet, Takeoff.

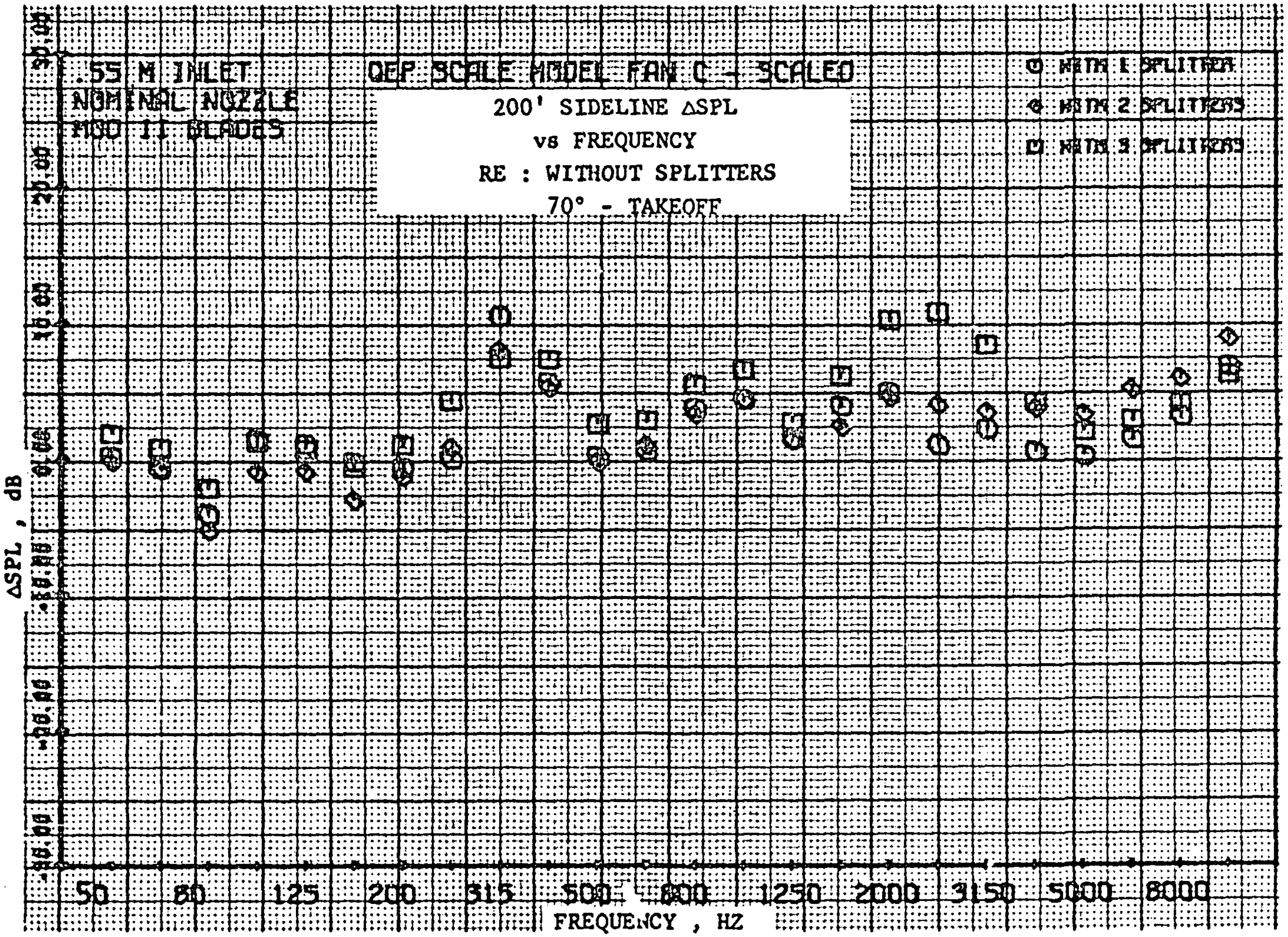

Figure 9. 200-ft (60.96 m) Sideline ΔSPL Vs. Frequency, 70°, Takeoff, Referenced to Inlet with no Splitter.

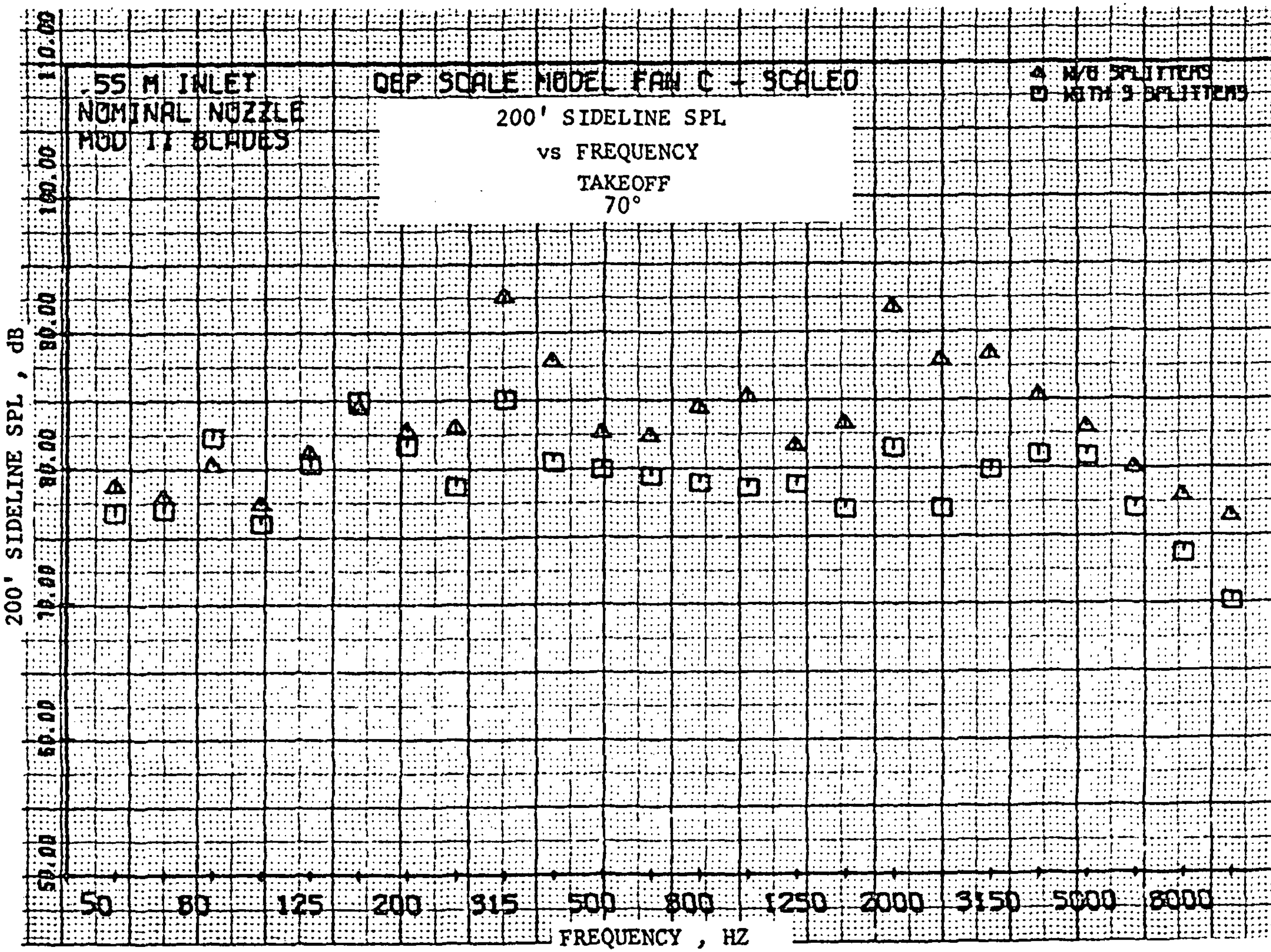

Figure 10. 200-ft (60.96 m) Sideline SPL Vs. Frequency, 70°, Takeoff.

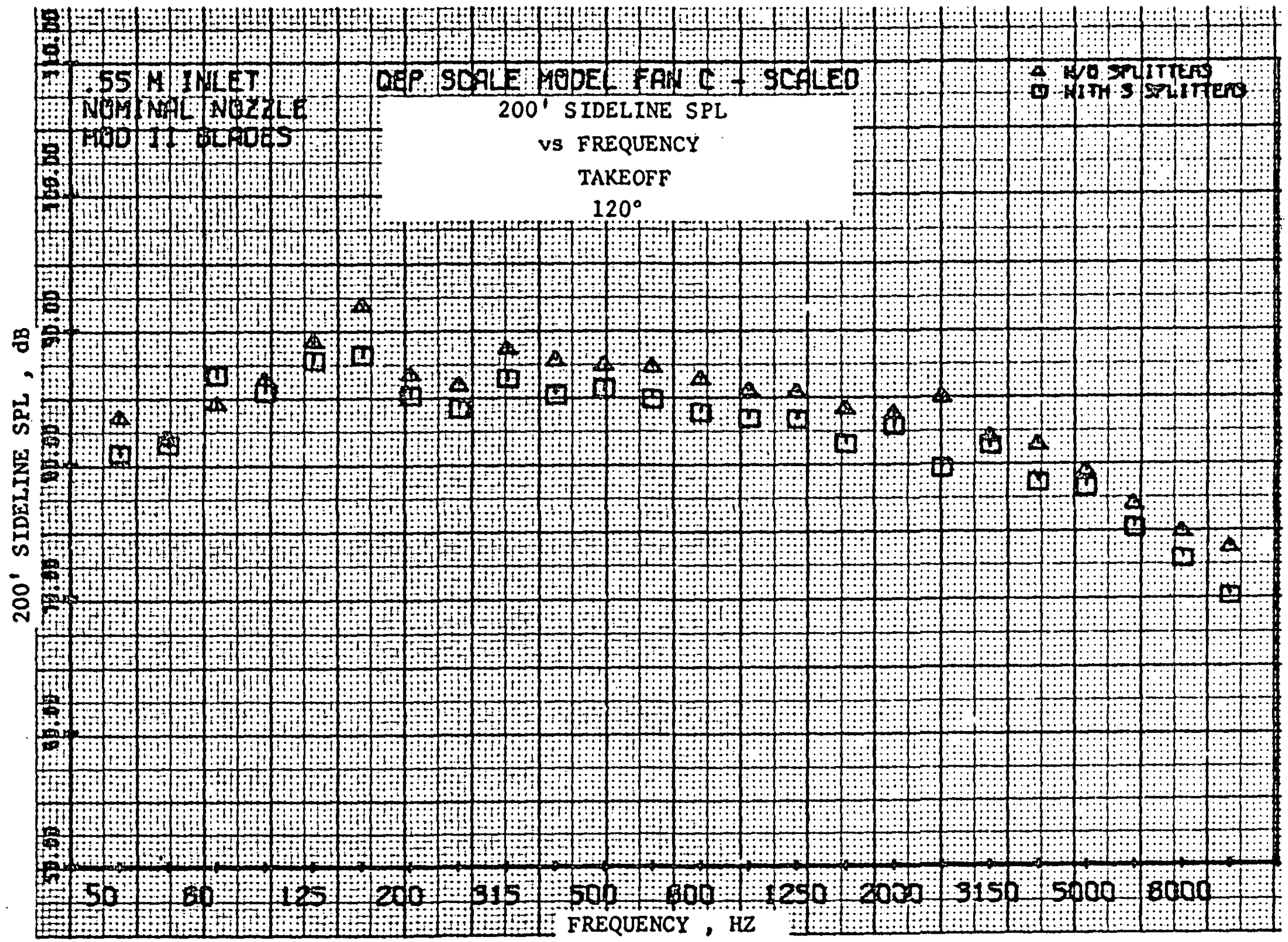

Figure 11. 200-ft (60.96 m) Sideline SPL Vs. Frequency, 120°, Takeoff.

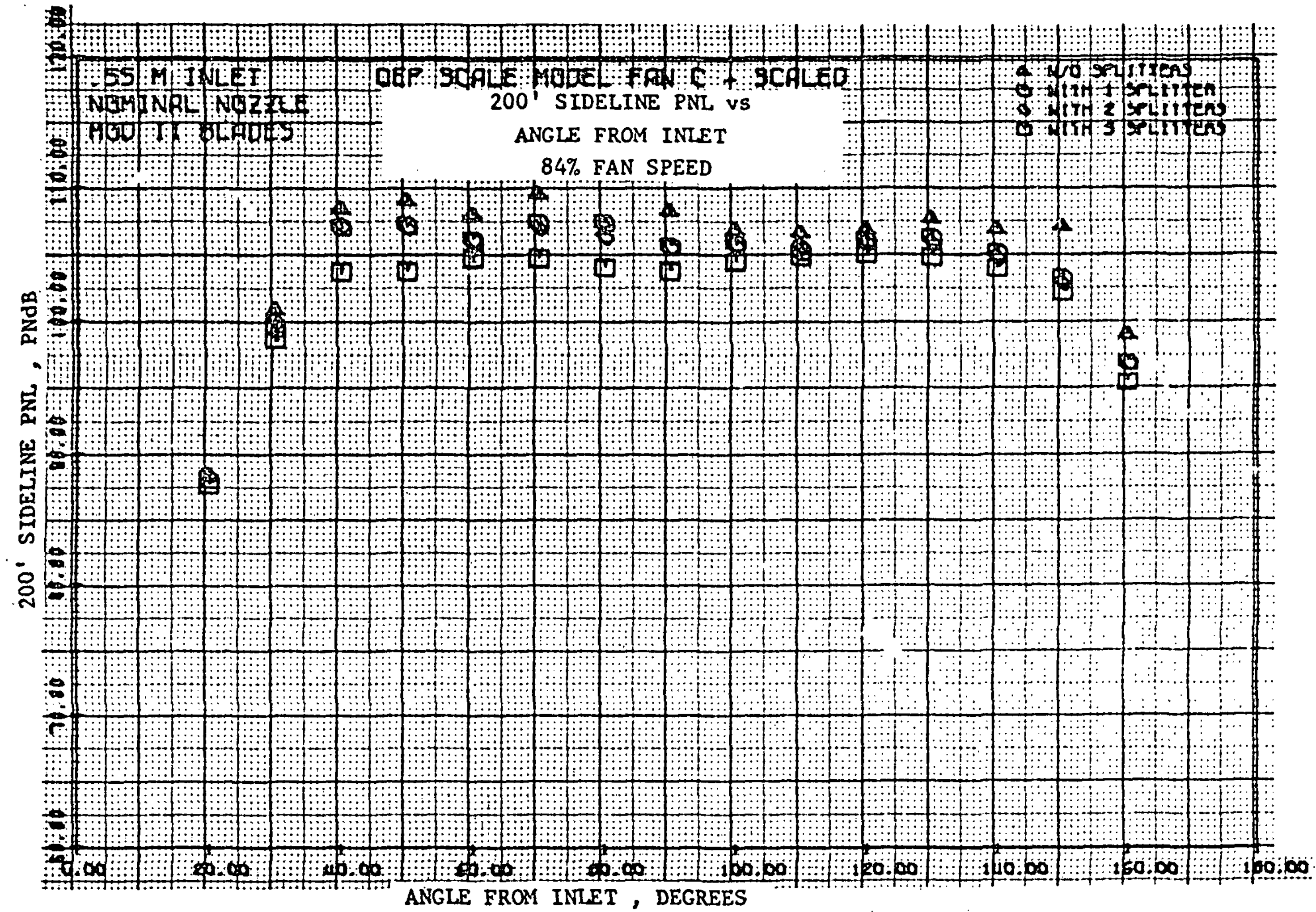

Figure 12. 200-ft (60.96 m) Sideline SPN Vs. Angle from Inlet, 84% Fan Speed.

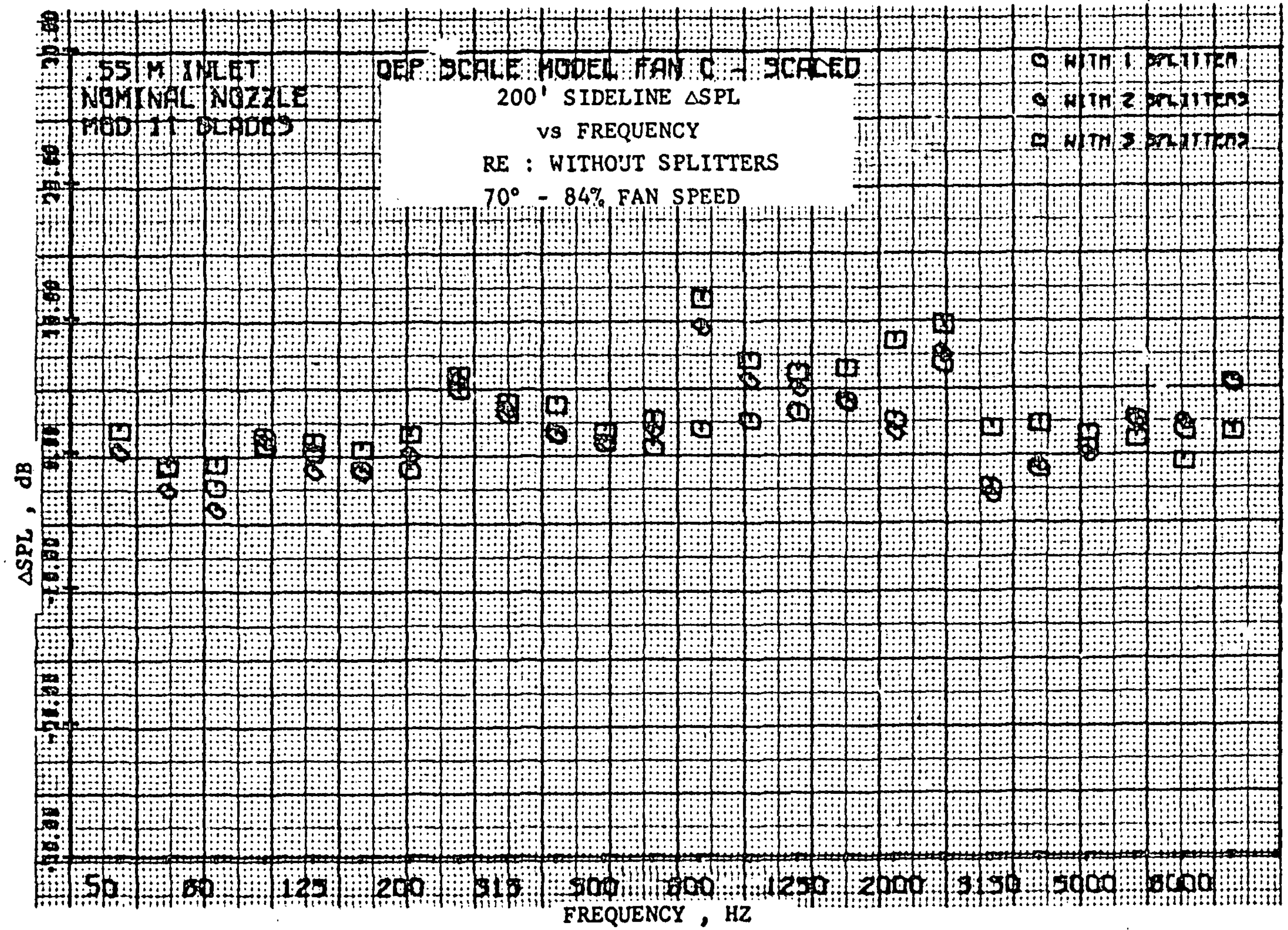

Figure 13. 200-ft (60.96 m) Sideline ΔSPL Vs. Frequency, 70°, 84% Fan Speed, Referenced to Inlet with no Splitter.

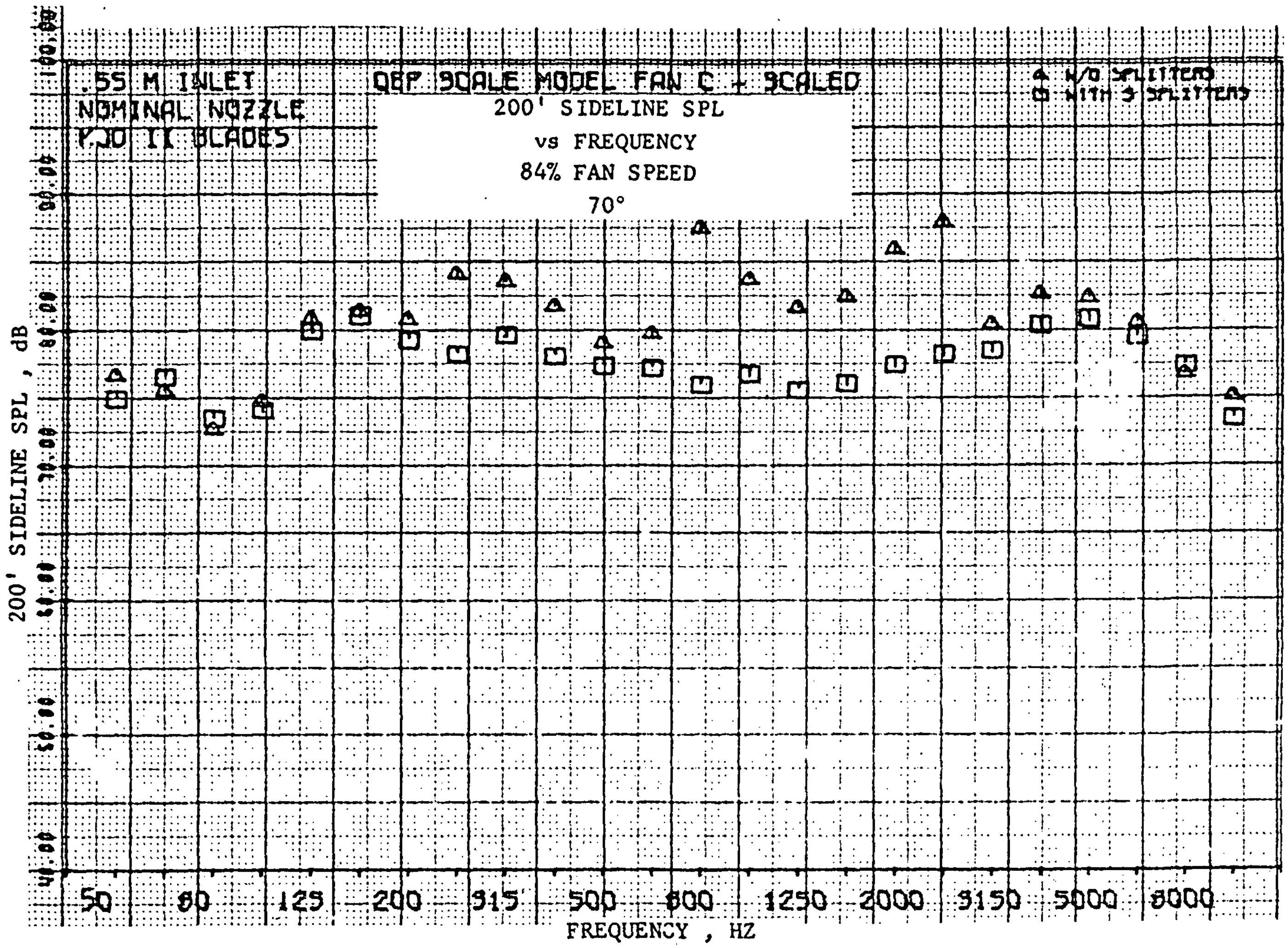

Figure 14. 200-ft (60.96 m) Sideline SPL Vs. Frequency, 70°, 84% Fan Speed.

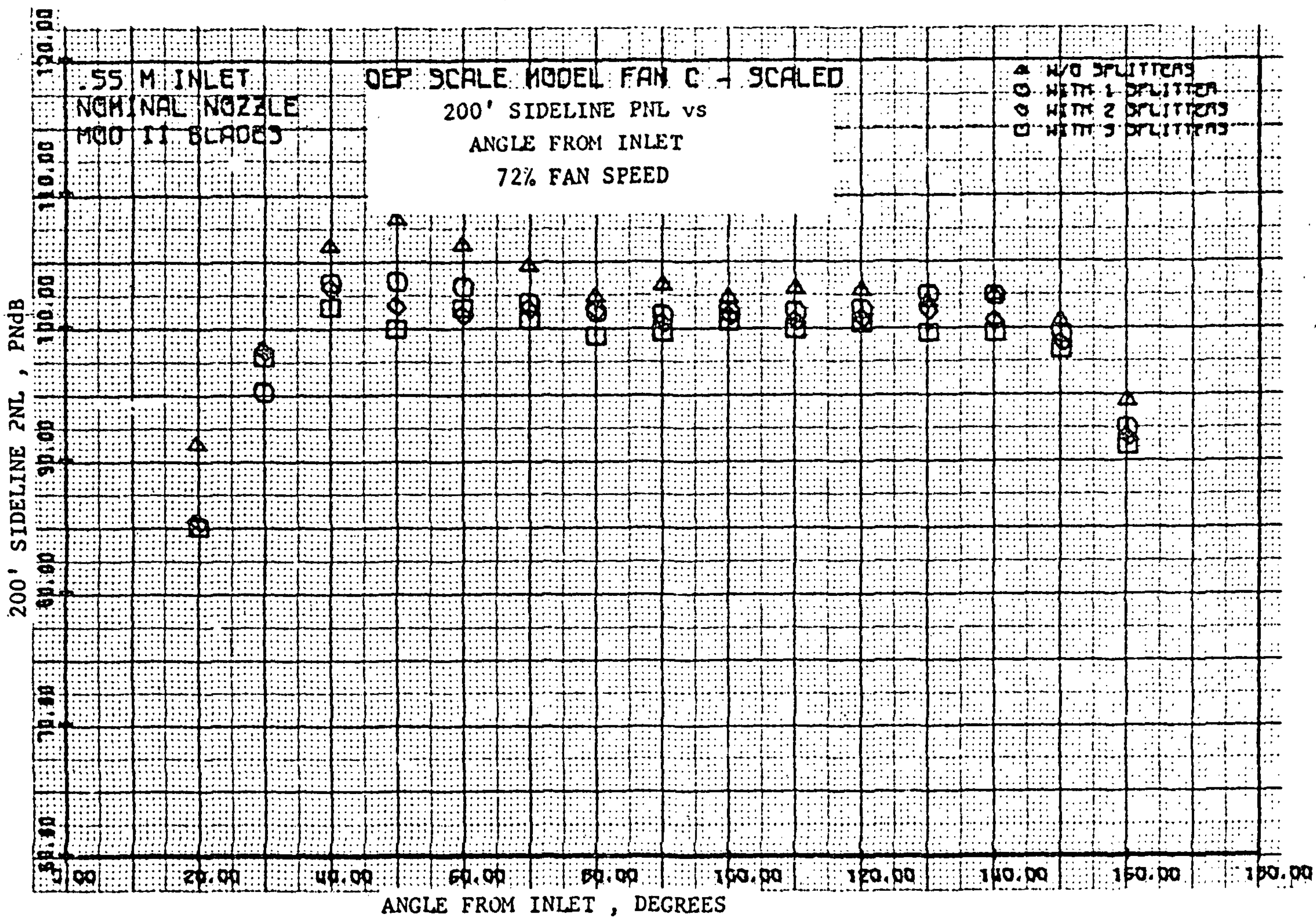

Figure 15. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet, 72% Fan Speed.

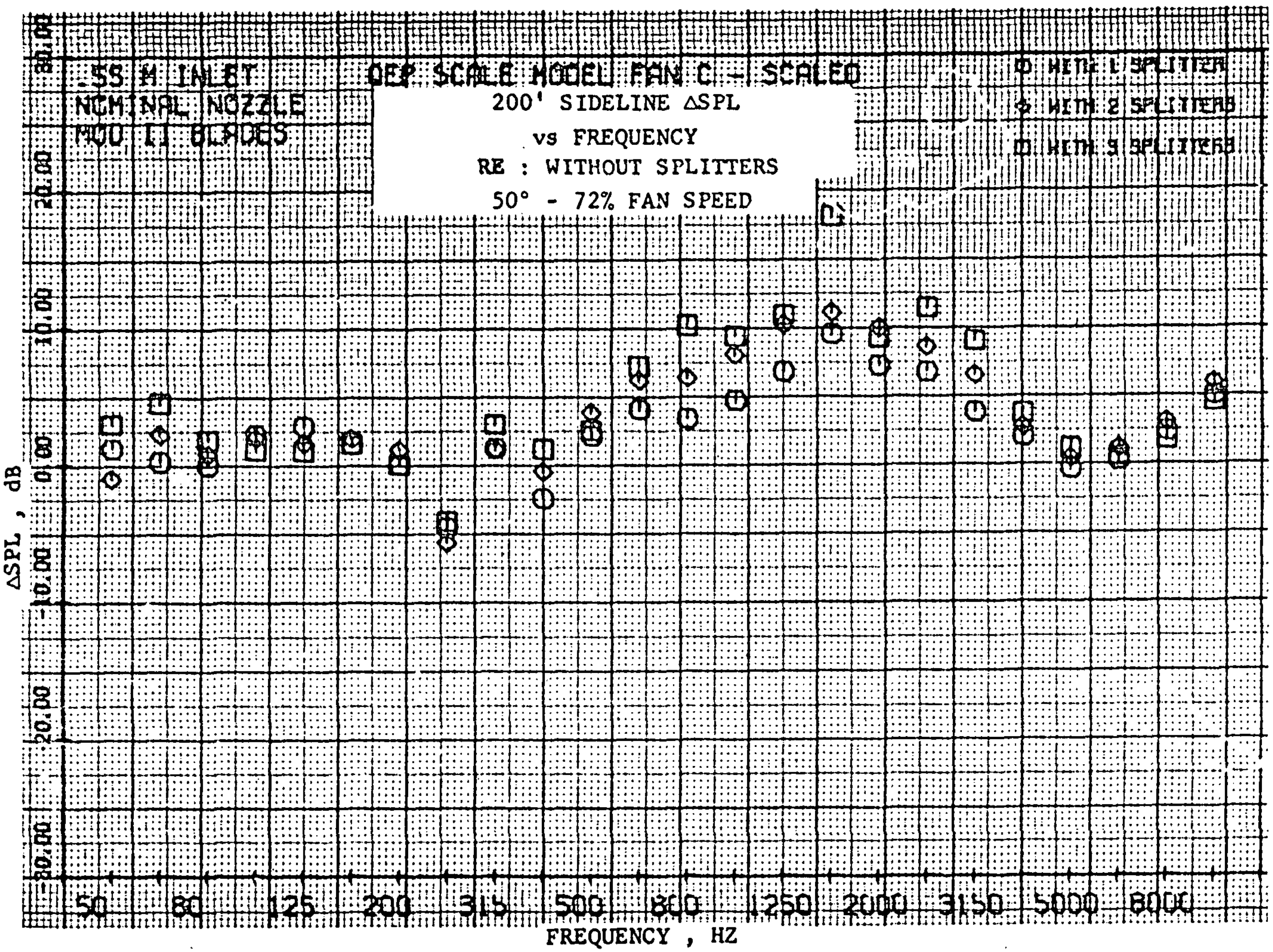

Figure 16. 200-ft (60.96 m) Sideline ΔSPL Vs. Frequency, 50°, 72% Fan Speed, Referenced to Inlet with no Splitter.

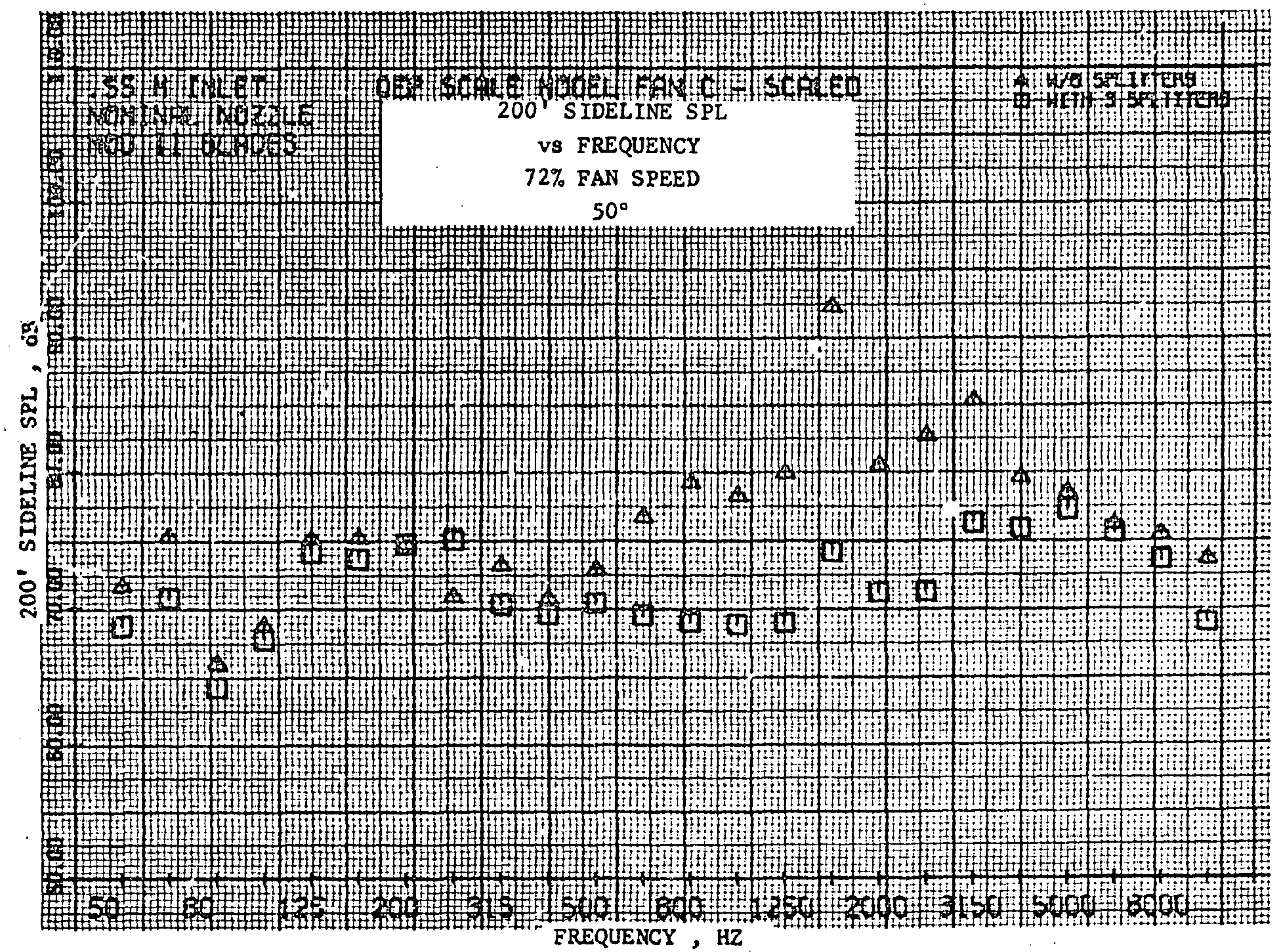

Figure 17. 200-ft (60.96 m) Sideline SPL Vs. Frequency, 50°, 72% Fan Speed.

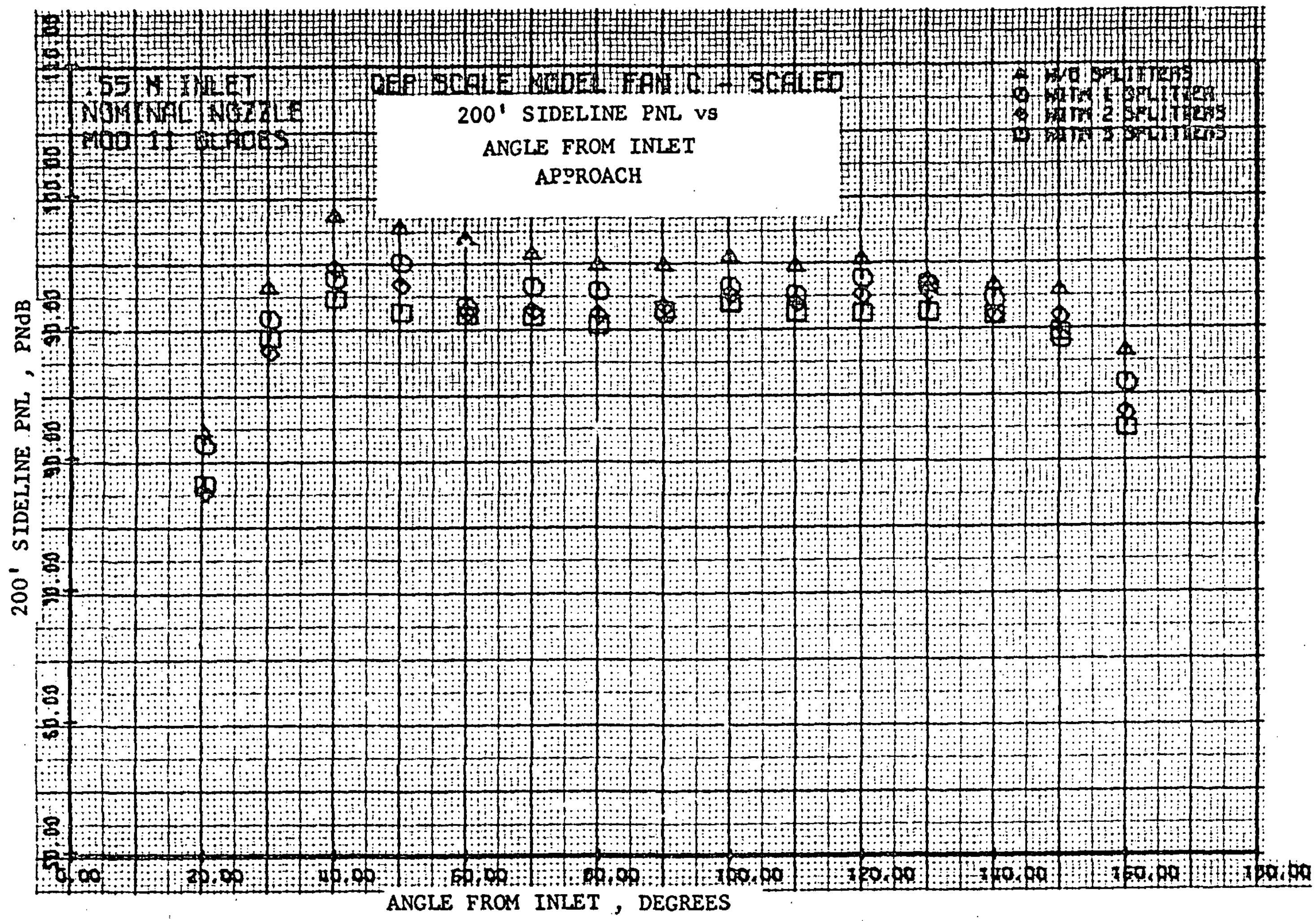

Figure 18. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet Approach.

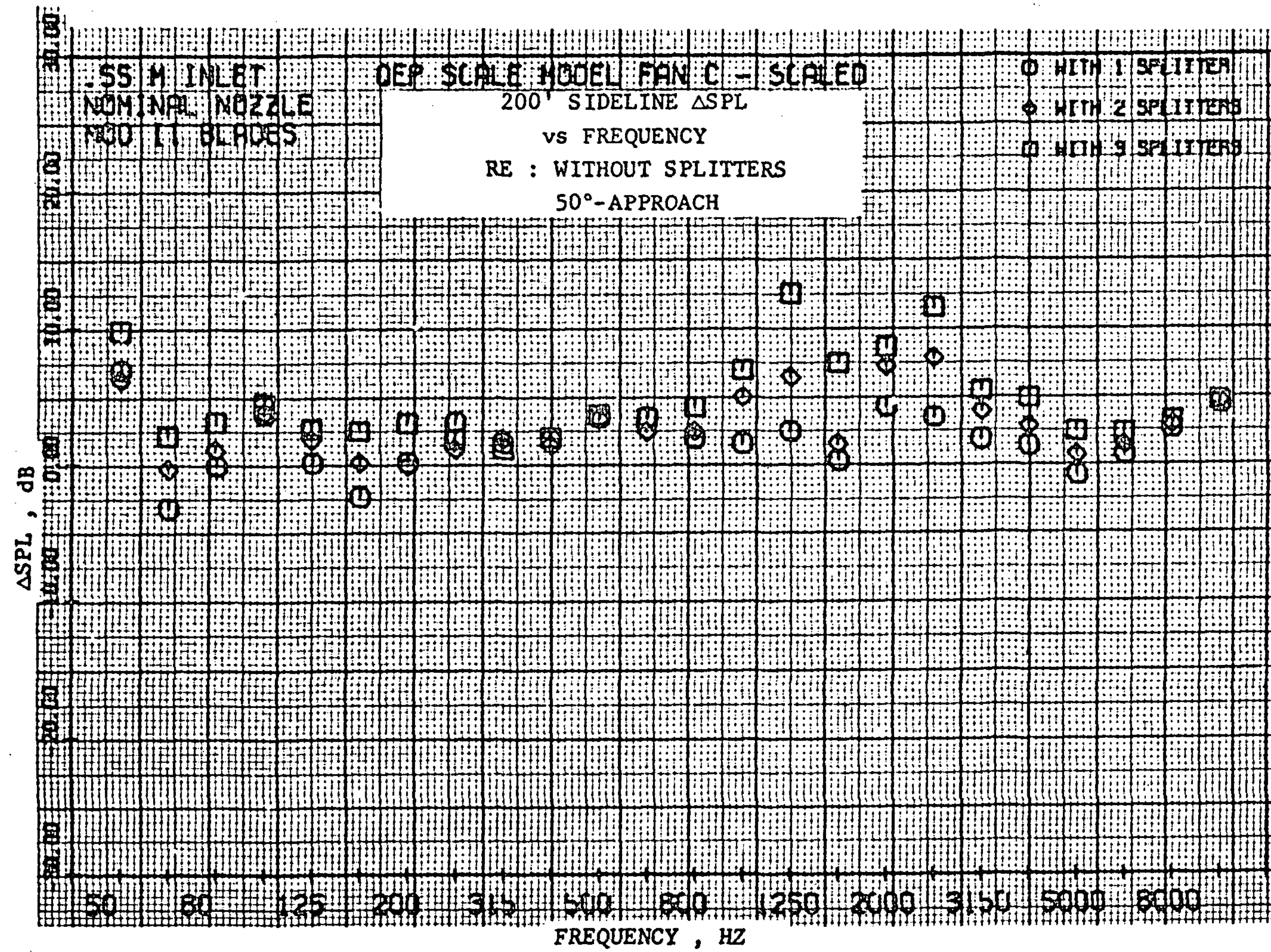

Figure 19. 200-ft (60.96 m) Sideline ΔSPL Vs. Frequency, 50°, Approach, Referenced to Inlet with no Splitter.

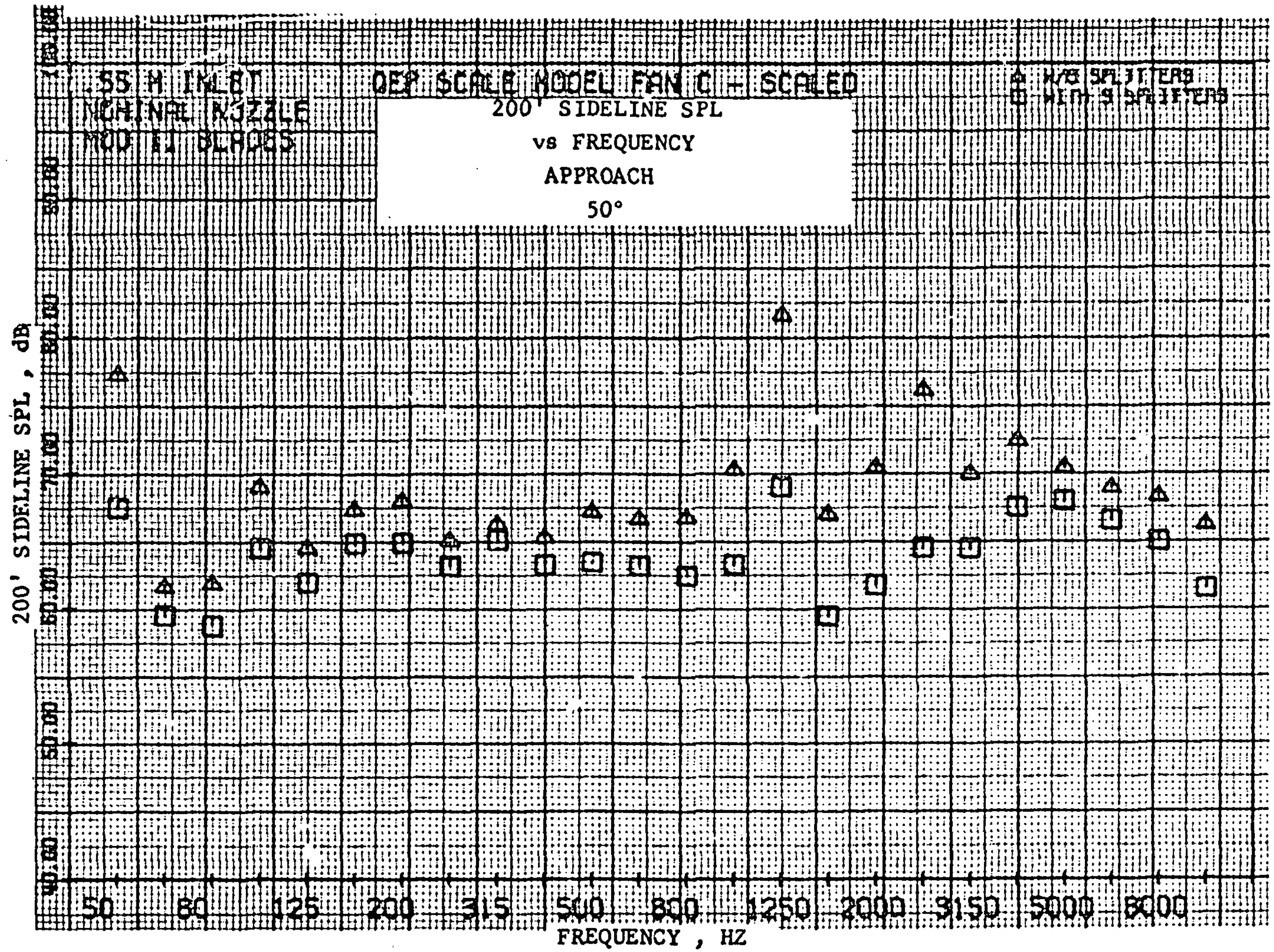

Figure 20. 200-ft (60.96 m) Sidleine SPL Vs. Frequency, 50°, Approach.

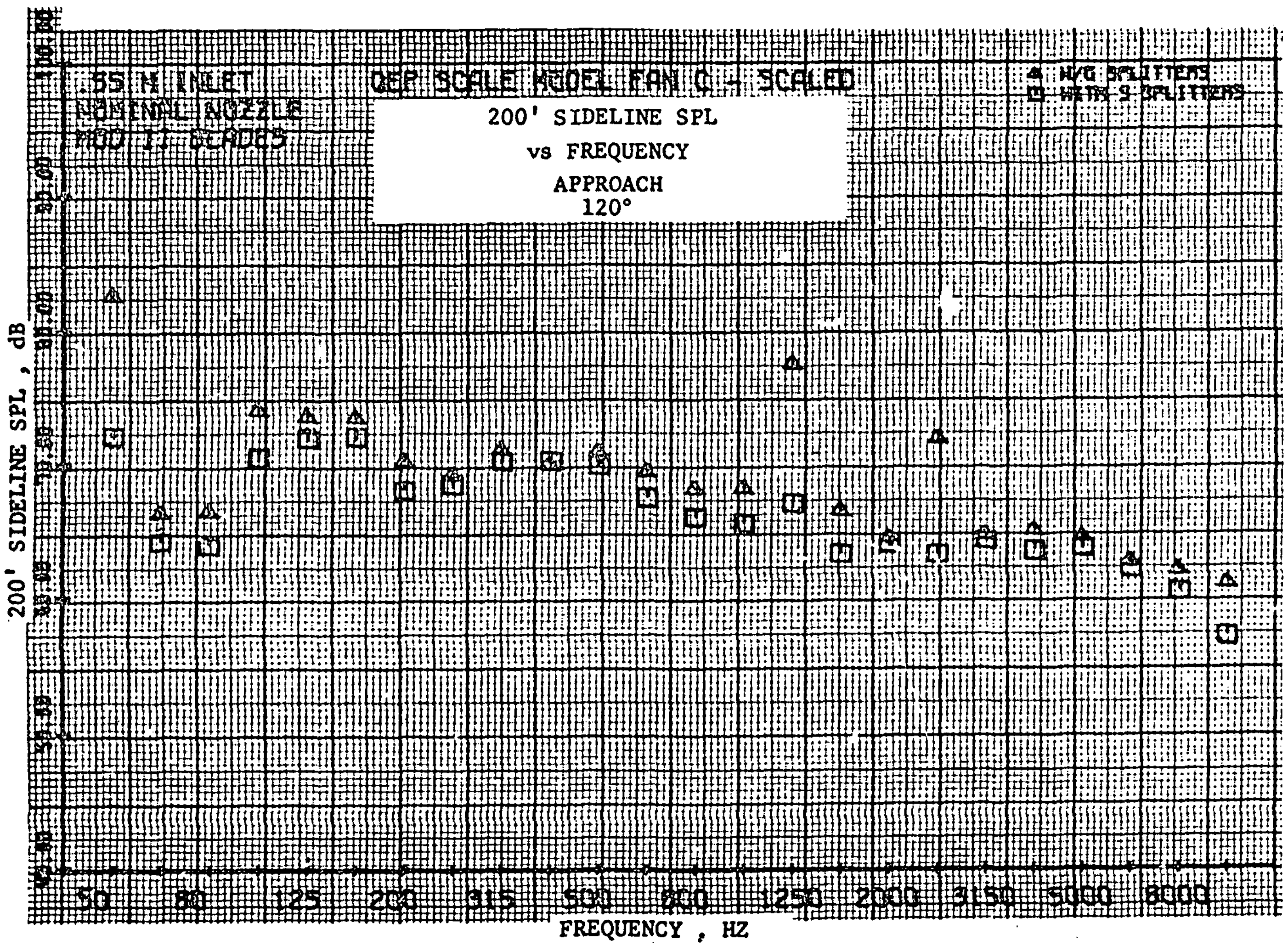

Figure 21. 200-ft (60.96 m) Sideline SPL Vs. Frequency, 120°, Approach.

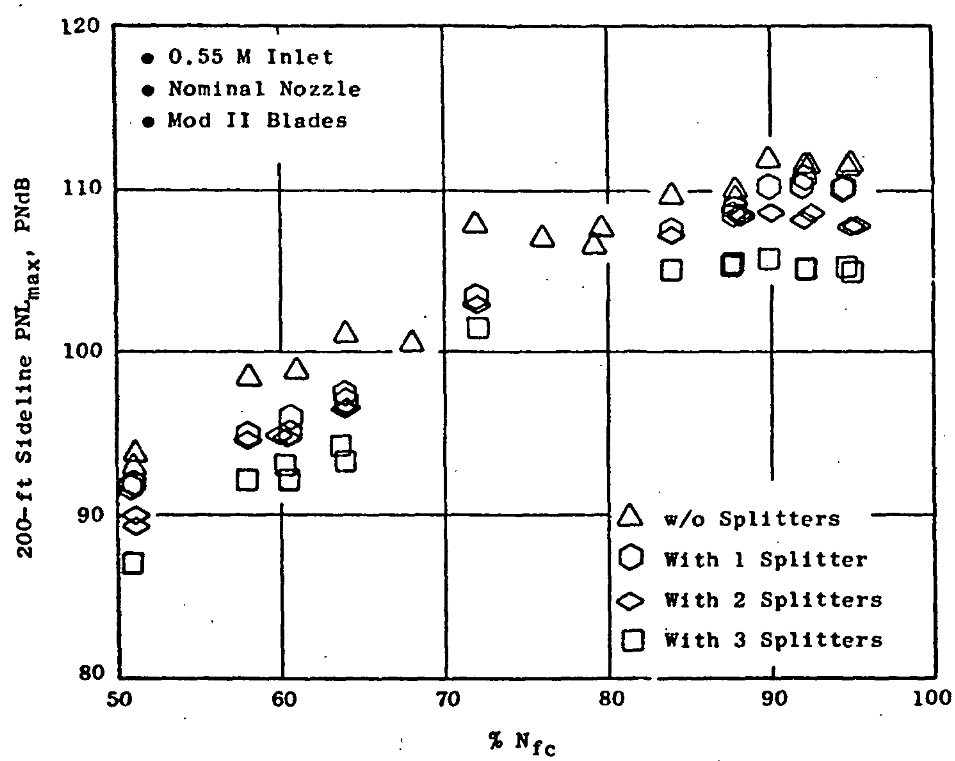

Figure 22. Forward Maximum PNL.

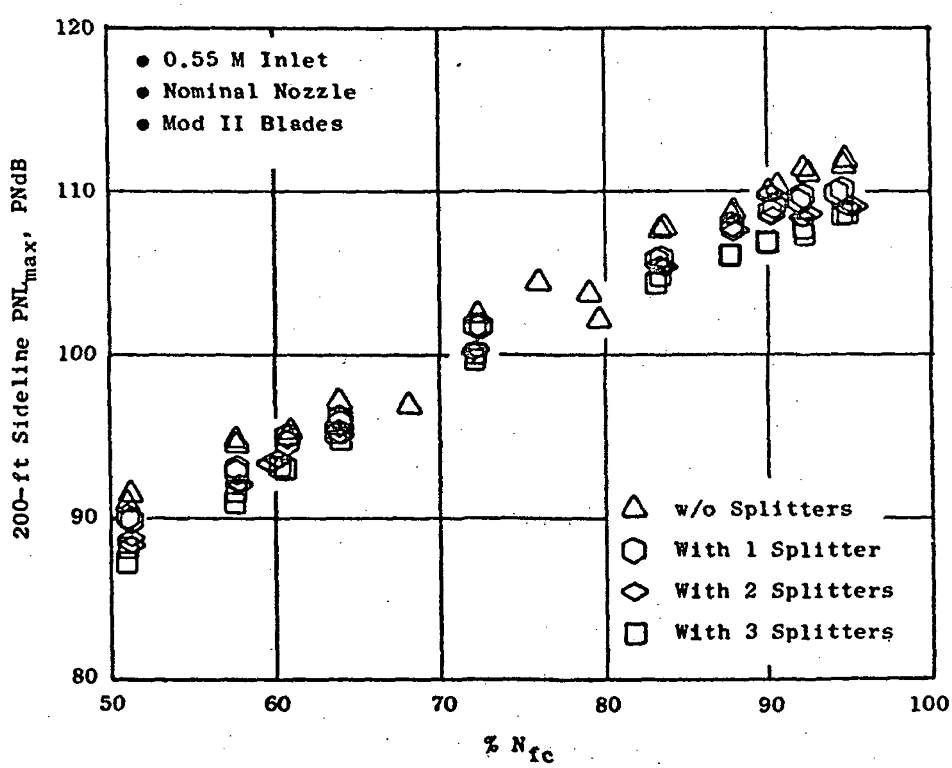

Figure 23. Aft Maximum PNL.

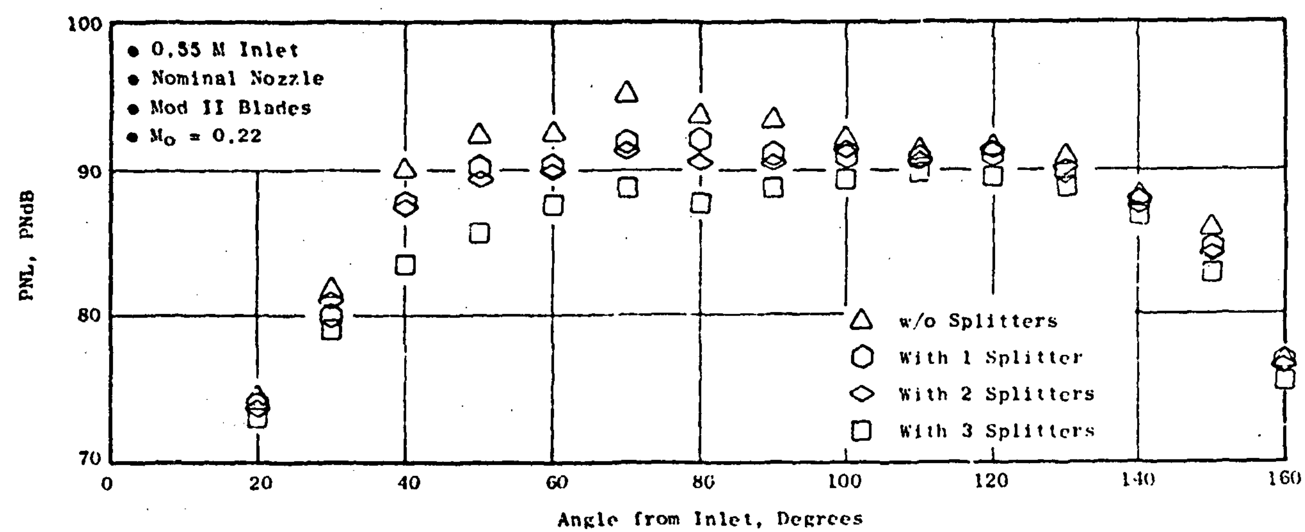

Figure 24. 1000-ft (304.8 m) Level Flyover PNL, Fan plus Jet Noise (Takeoff).

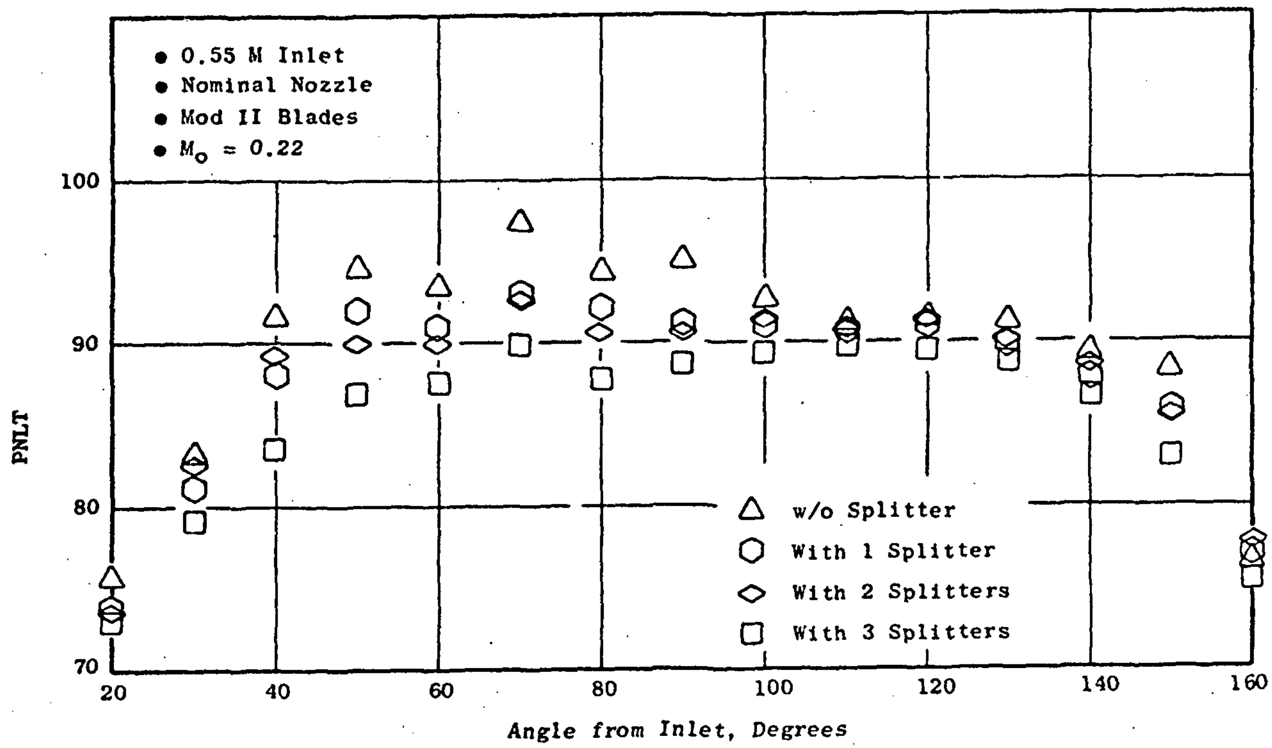

Figure 25. 1000-ft (304.8 m) Level Flyover PNLT, Fan plus Jet Noise (Takeoff).

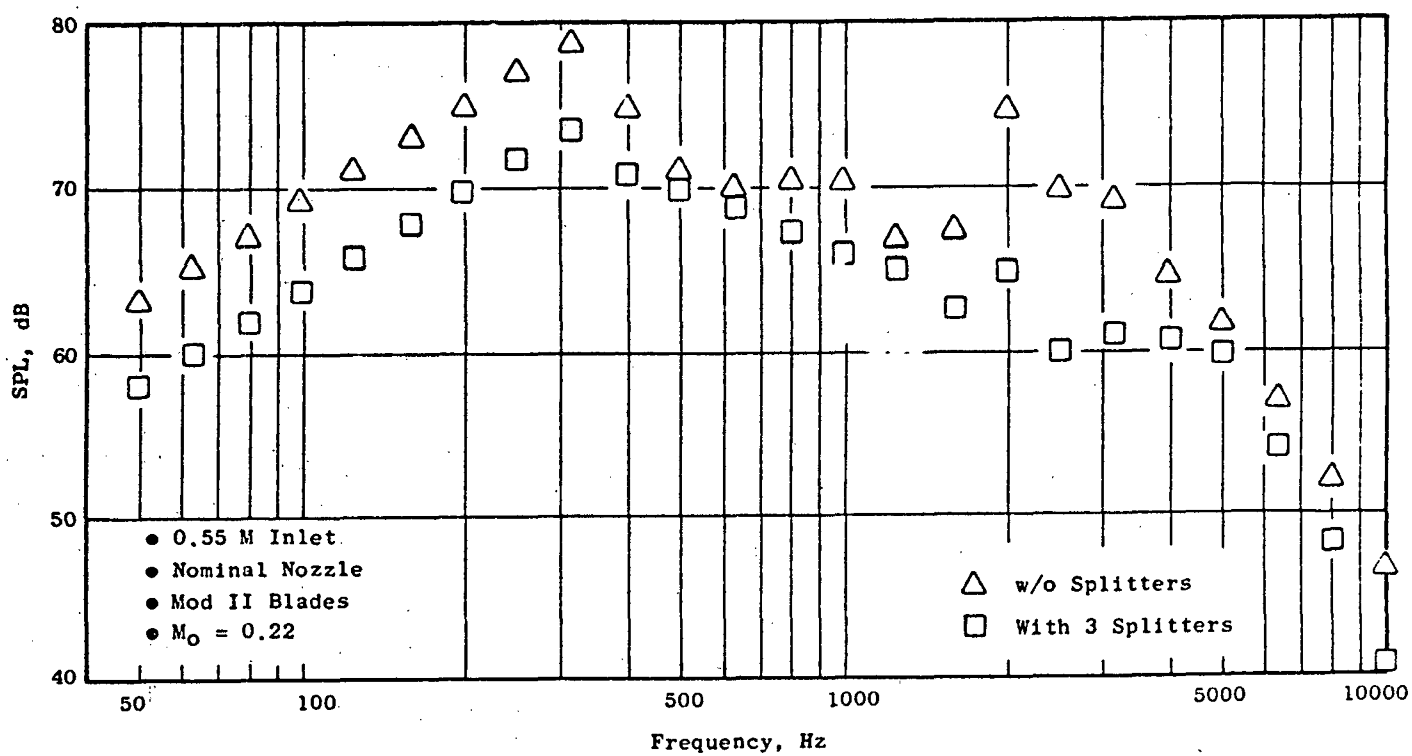

Figure 26. 1000-ft (304.8 m) Level Flyover SPL, Fan plus Jet Noise (Takeoff, 70°).

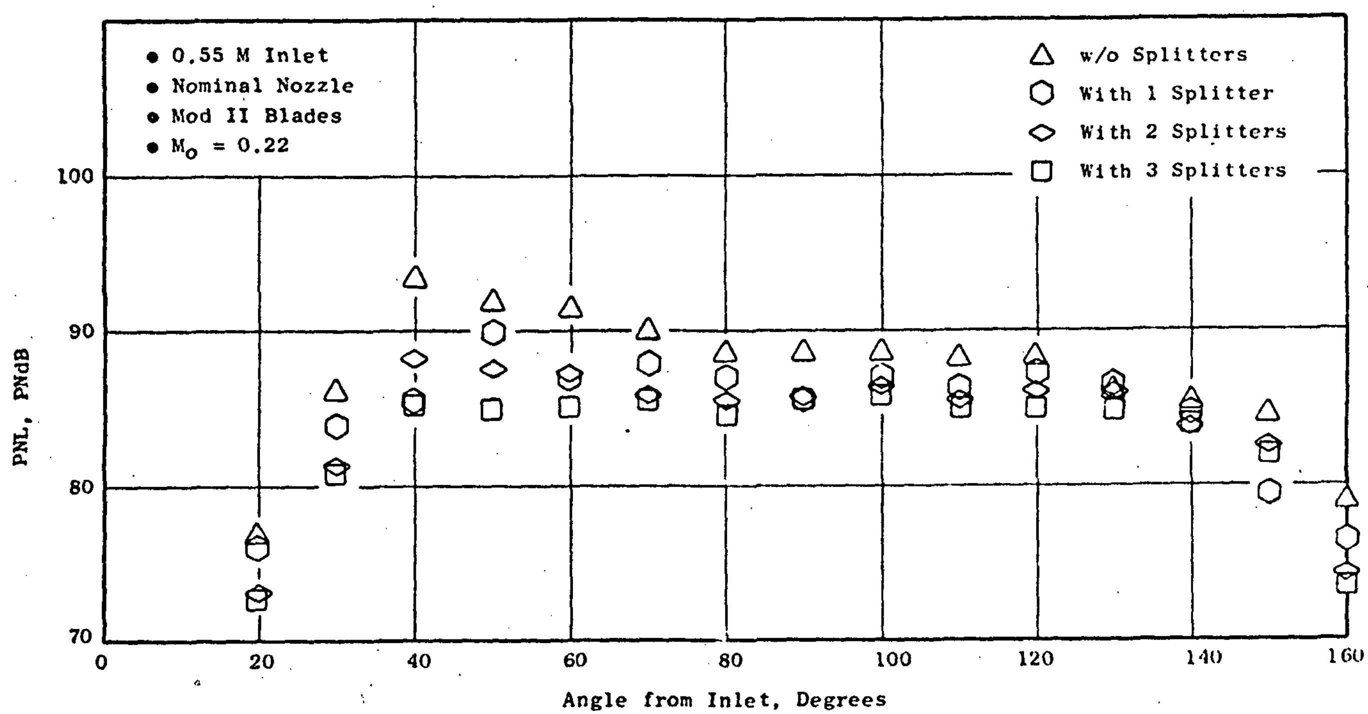

Figure 27. 370 ft (112.8 m) Level Flyover, Fan plus Jet Noise (Approach).

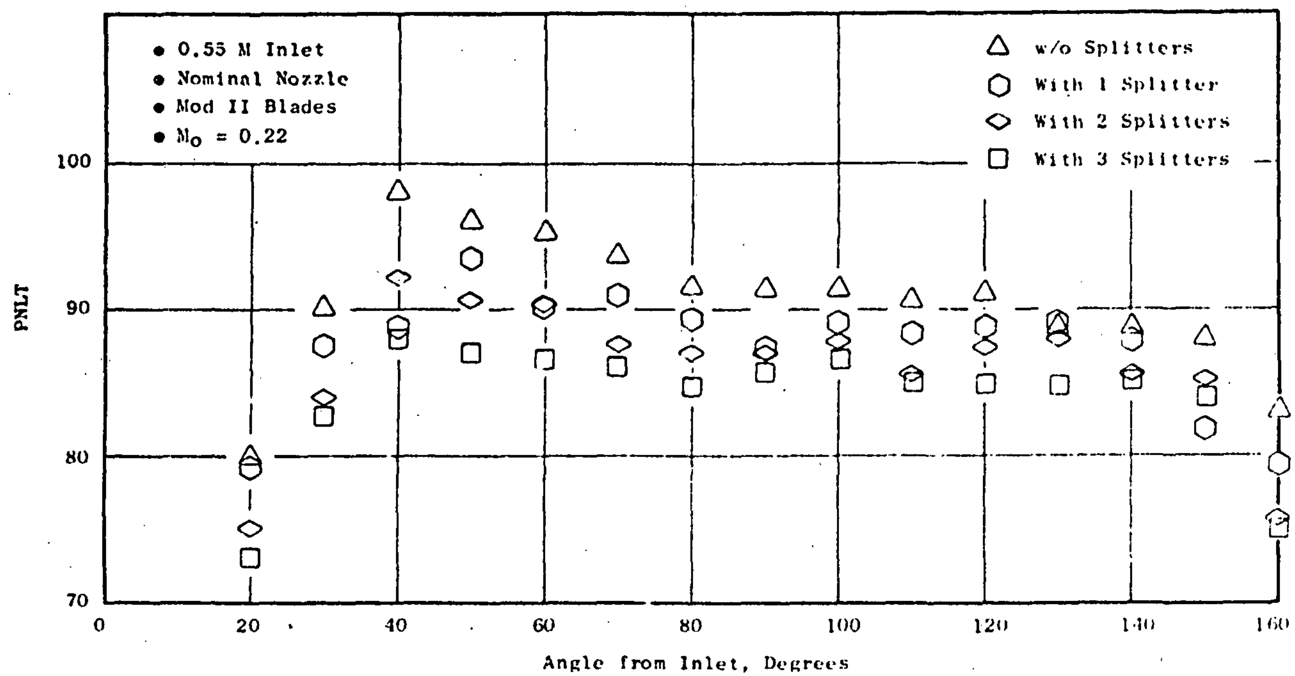

Figure 28. 370-ft (112.8 m) Level Flyover PNLT, Fan plus Jet Noise (Approach).

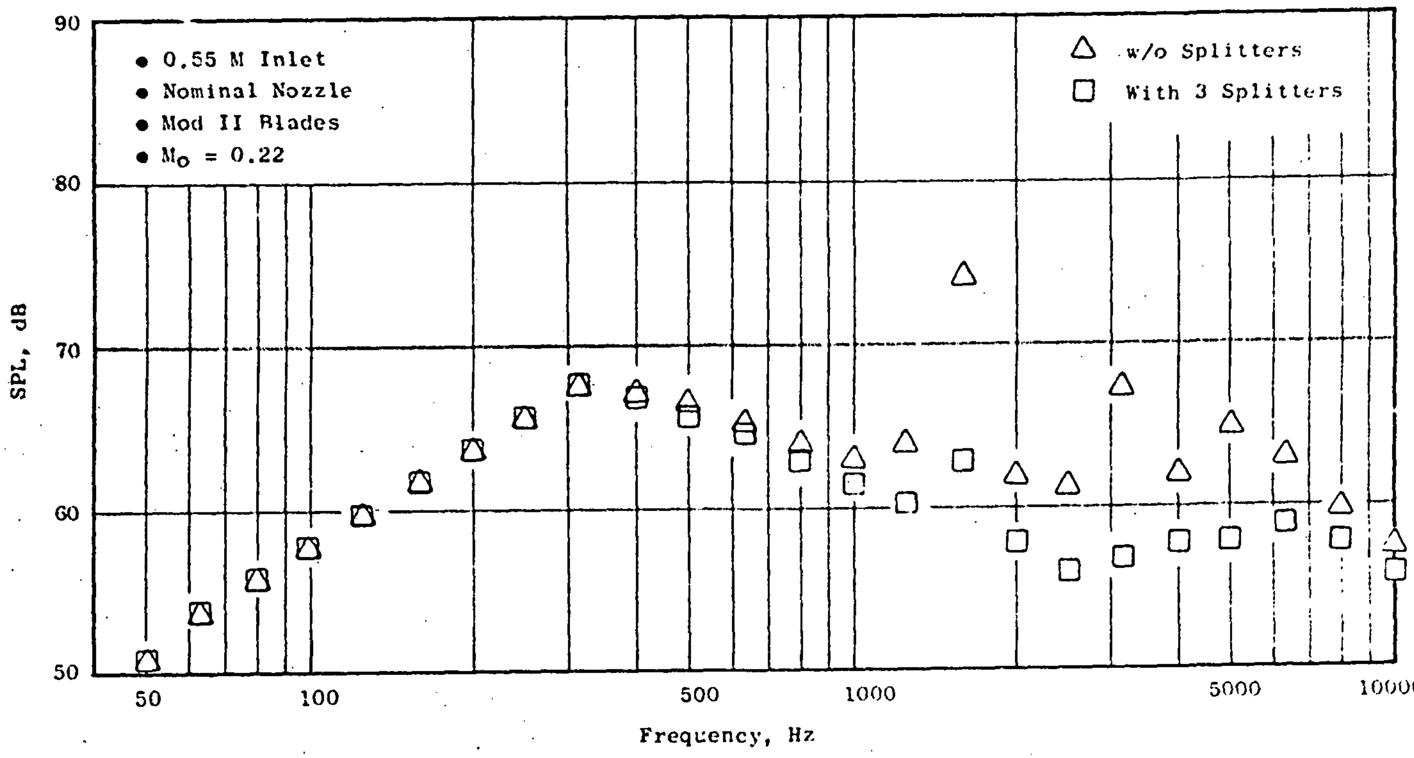

Figure 29. 370-ft (112.8 m) Level Flyover SPL, Fan plus Jet Noise (Approach, 60°).

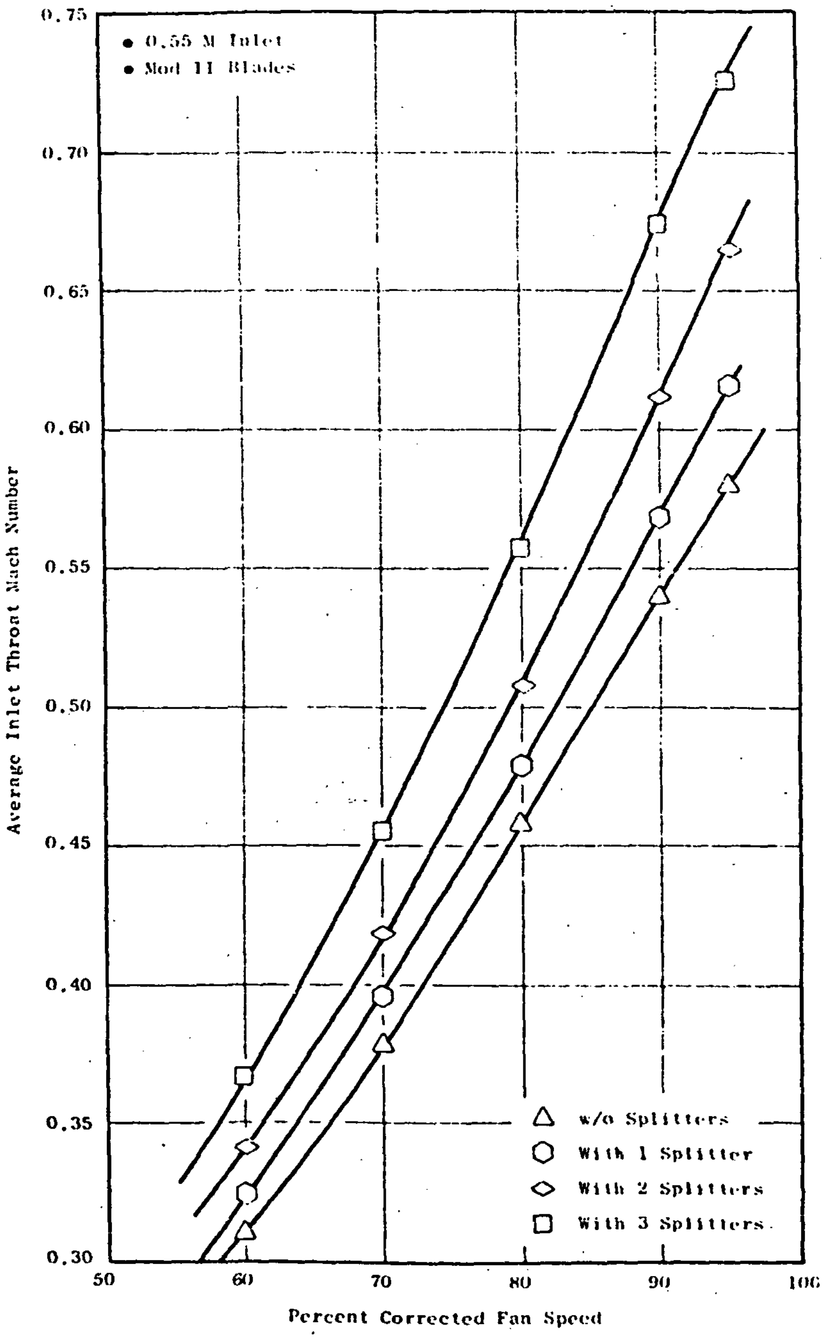

Figure 30. Average Inlet Throat Mach Number Vs. Corrected Fan Speed.

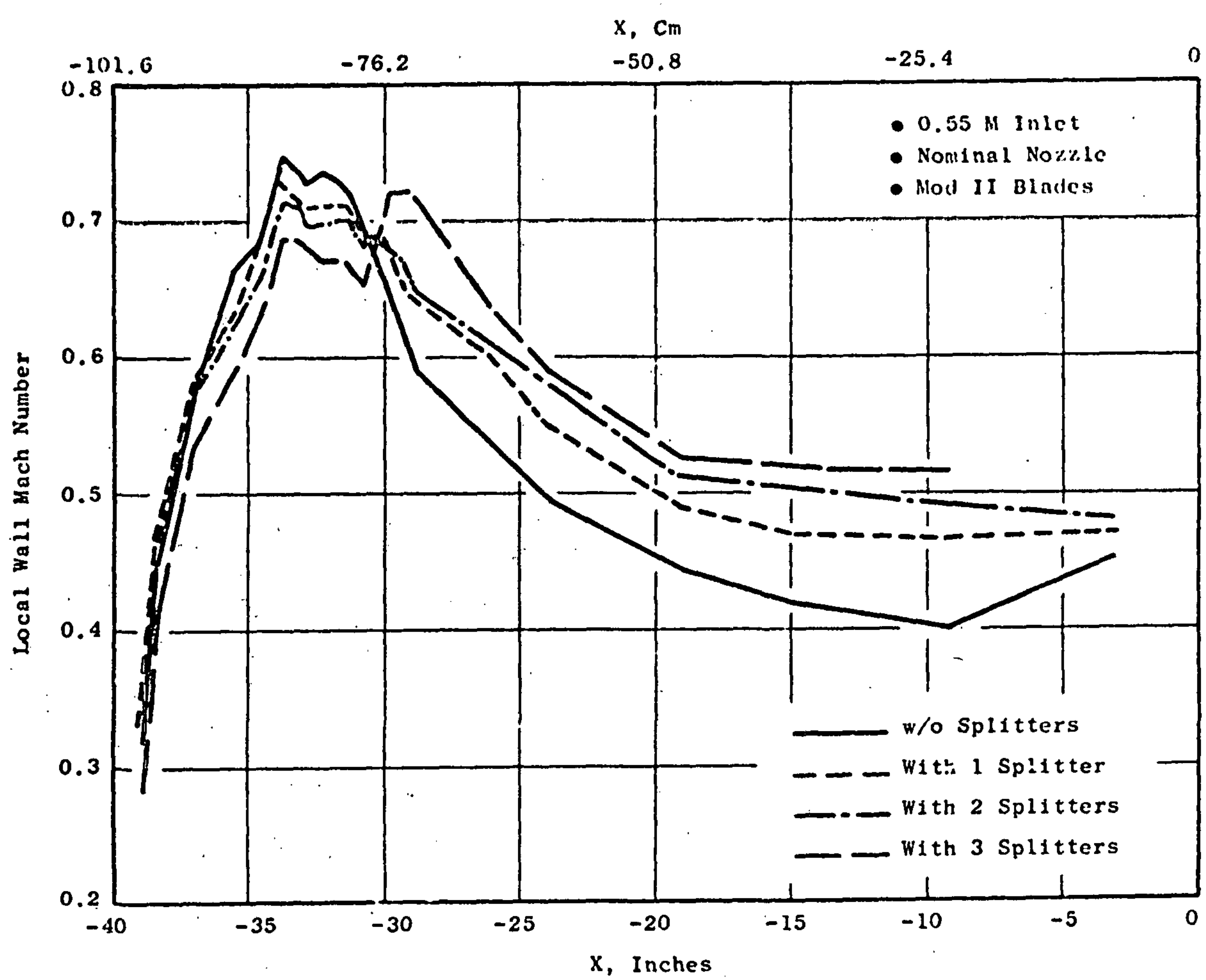

Figure 31. Outer Wall Mach Distribution, Takeoff.

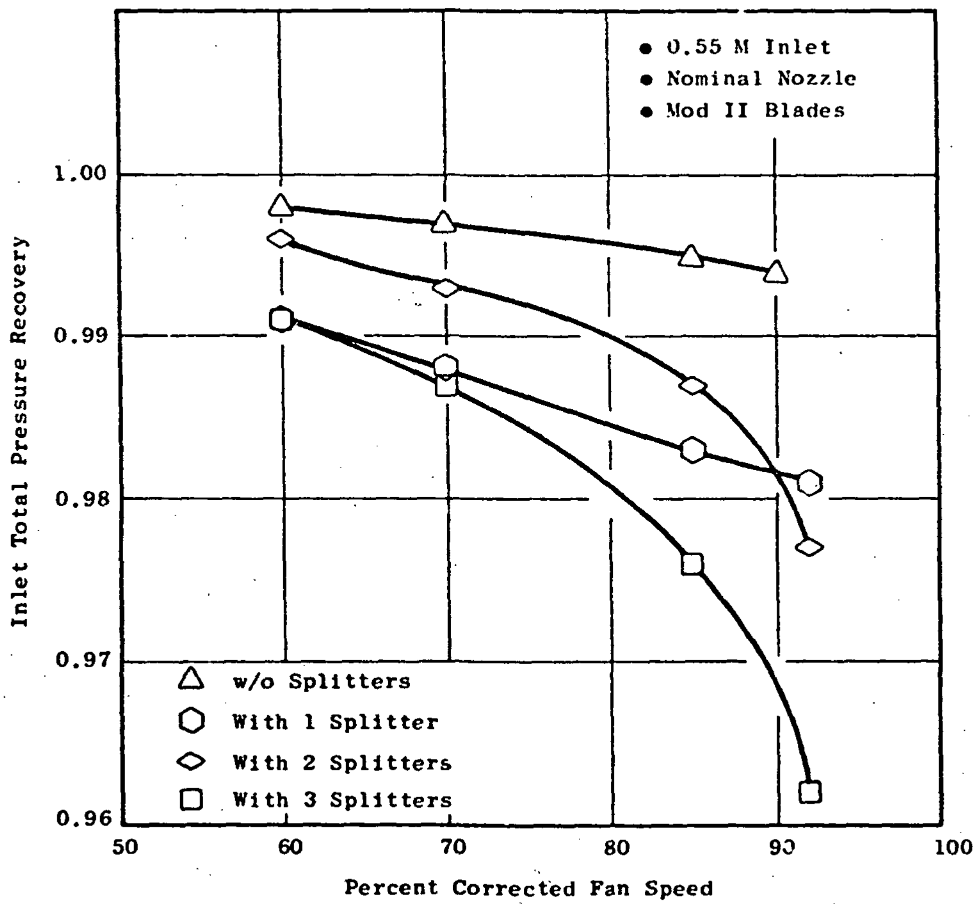

Figure 32. Inlet Total Pressure Recovery Vs. Corrected Fan Speed.

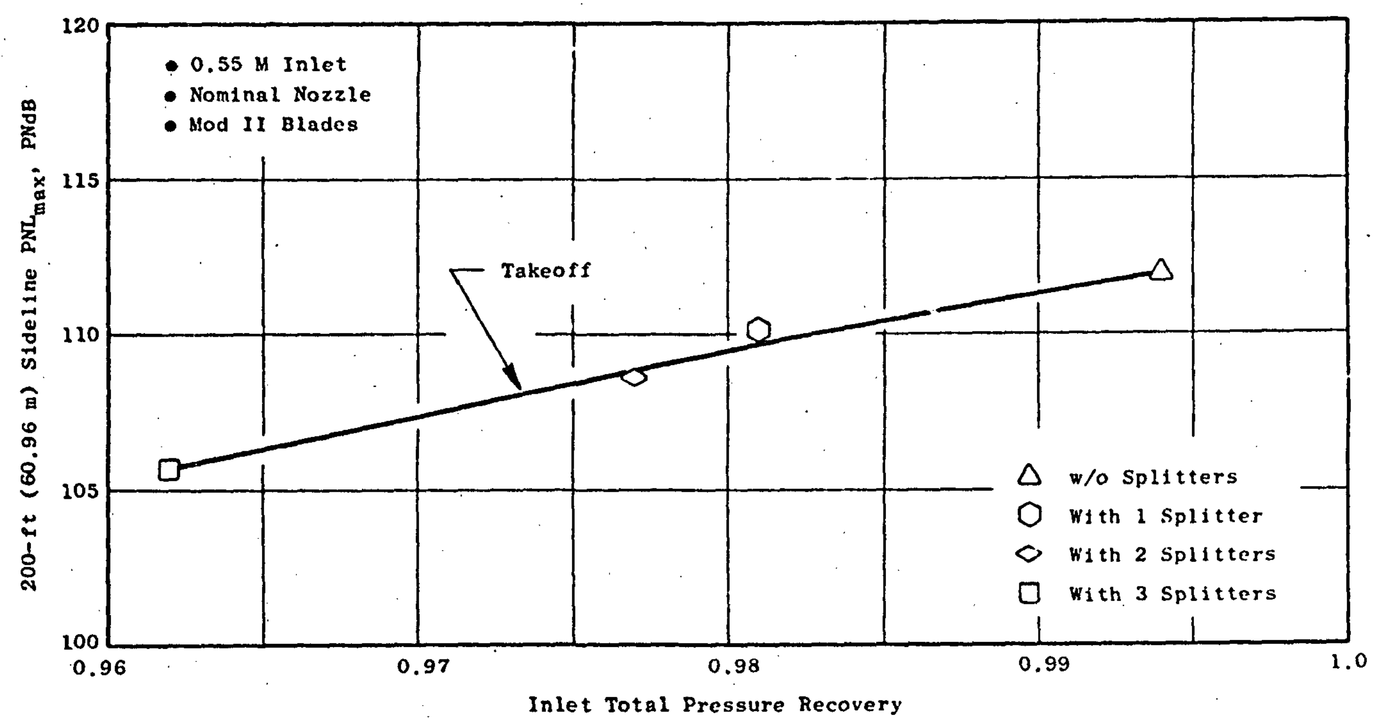

Figure 33. 200-ft (60.96 m) Sideline Front Maximum PNL.

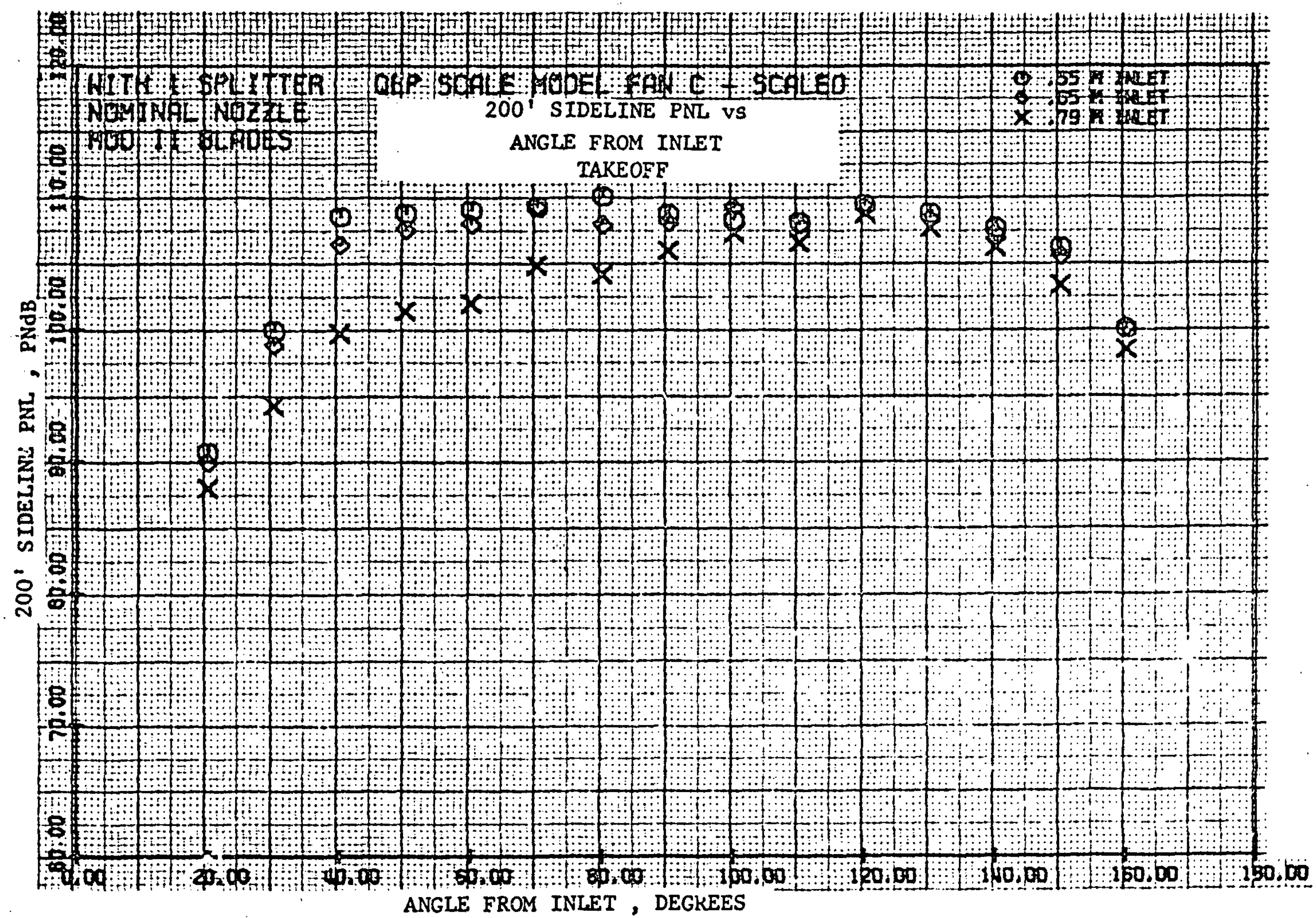

Figure 34. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet, Takeoff.

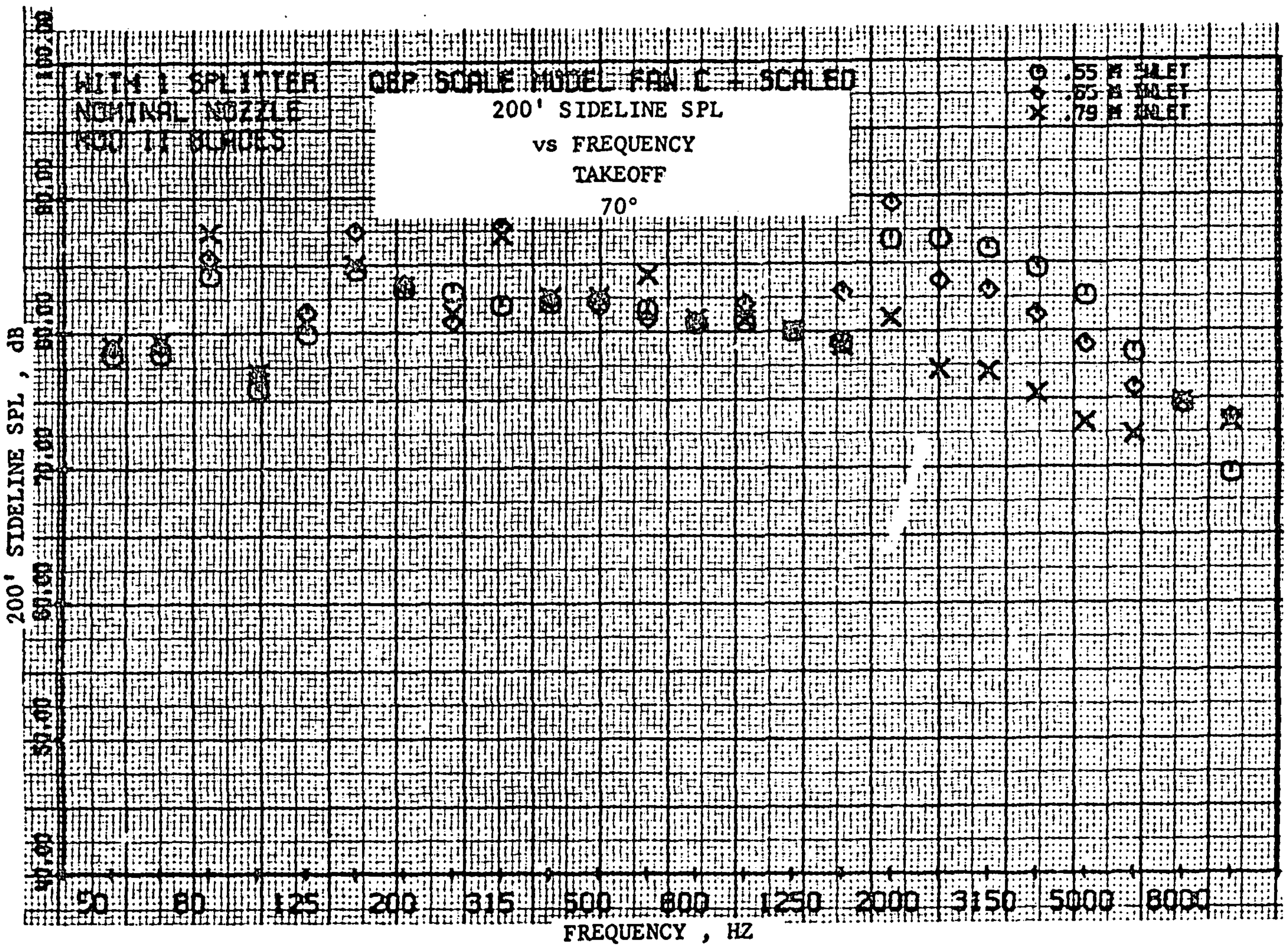

Figure 35. 200-ft (60.96 m) Sideline SPL Vs. Frequency, Takeoff, 70°.

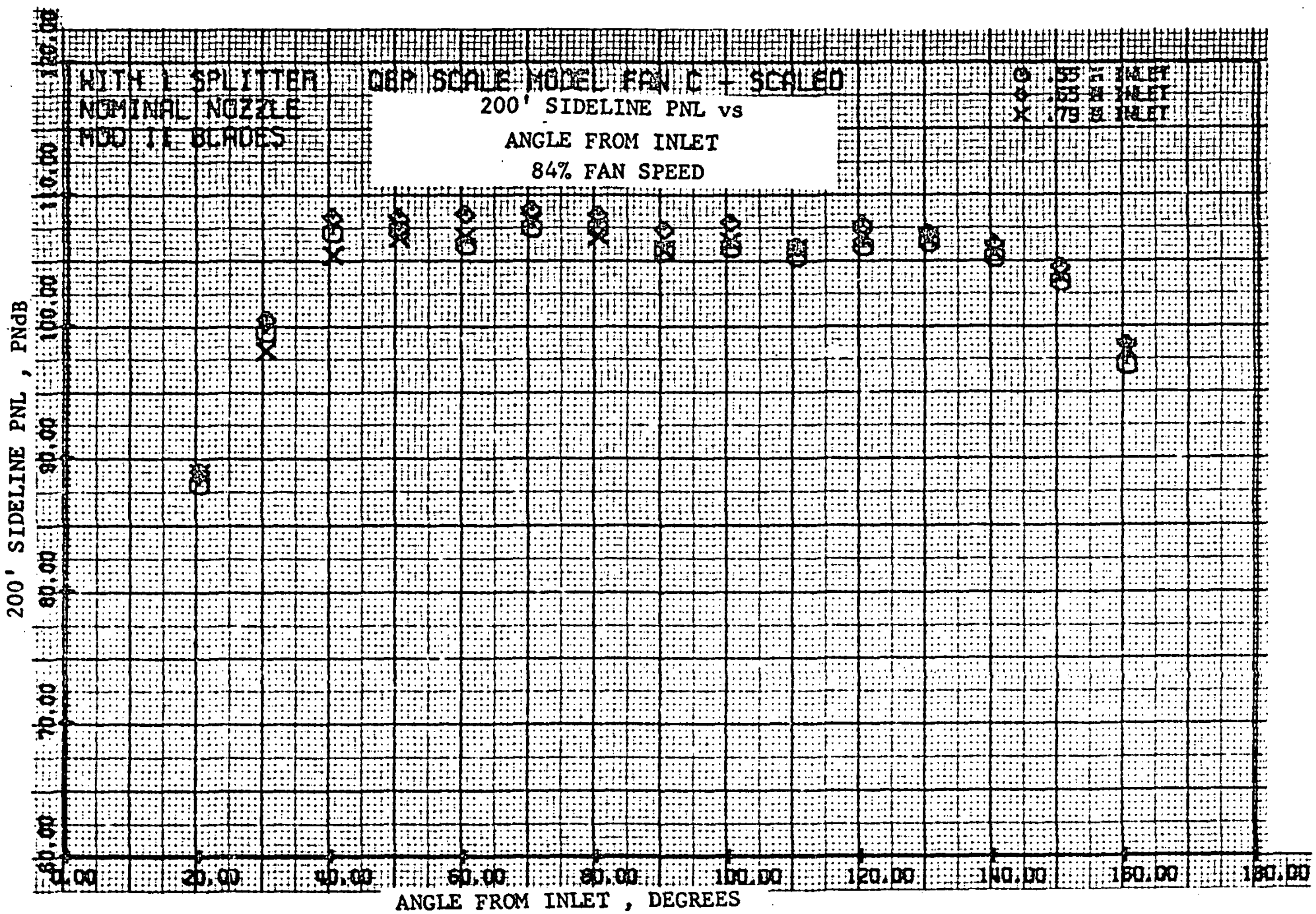

Figure 36. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet, 84% Fan Speed.

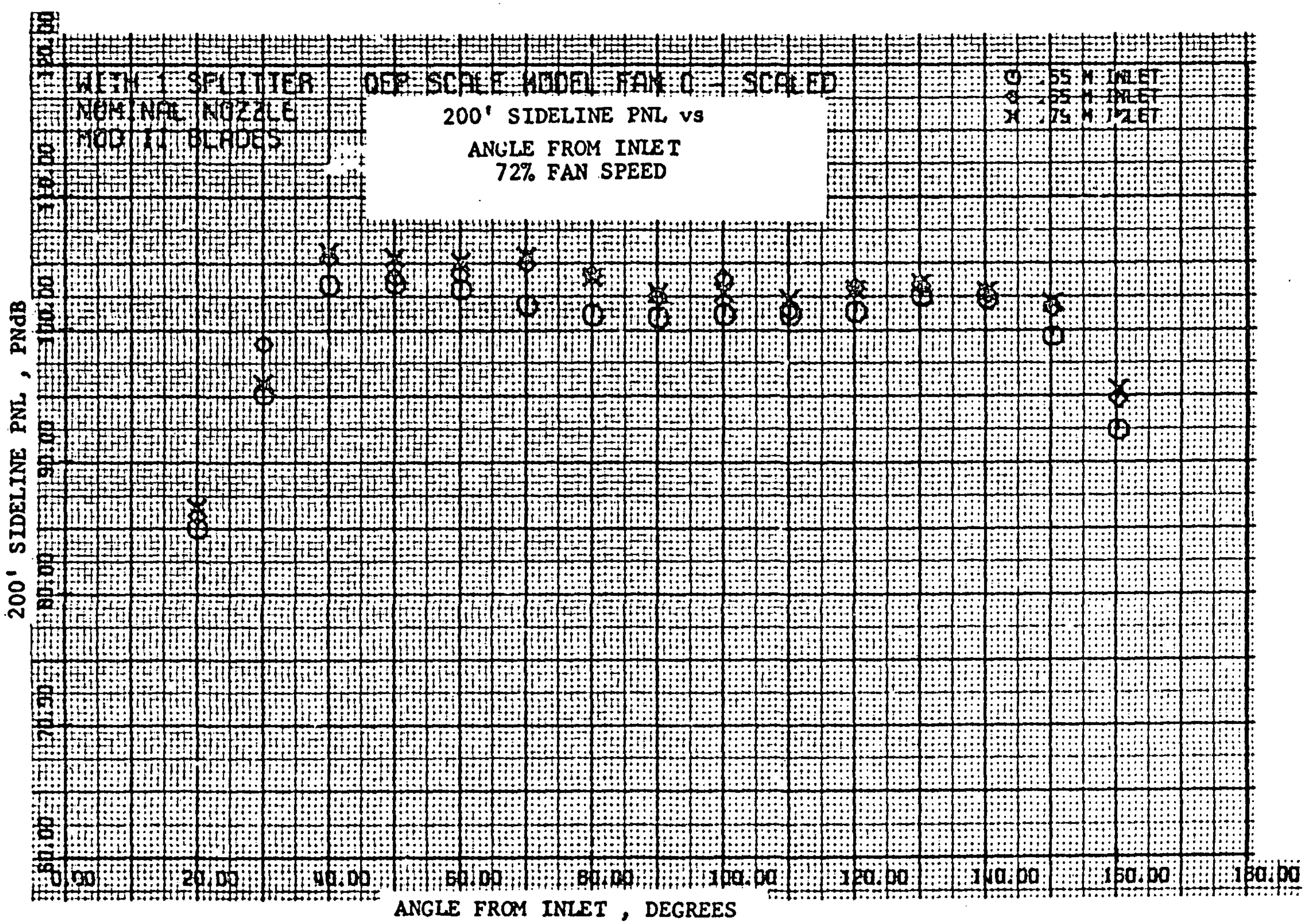

Figure 37. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet, 72% Fan Speed.

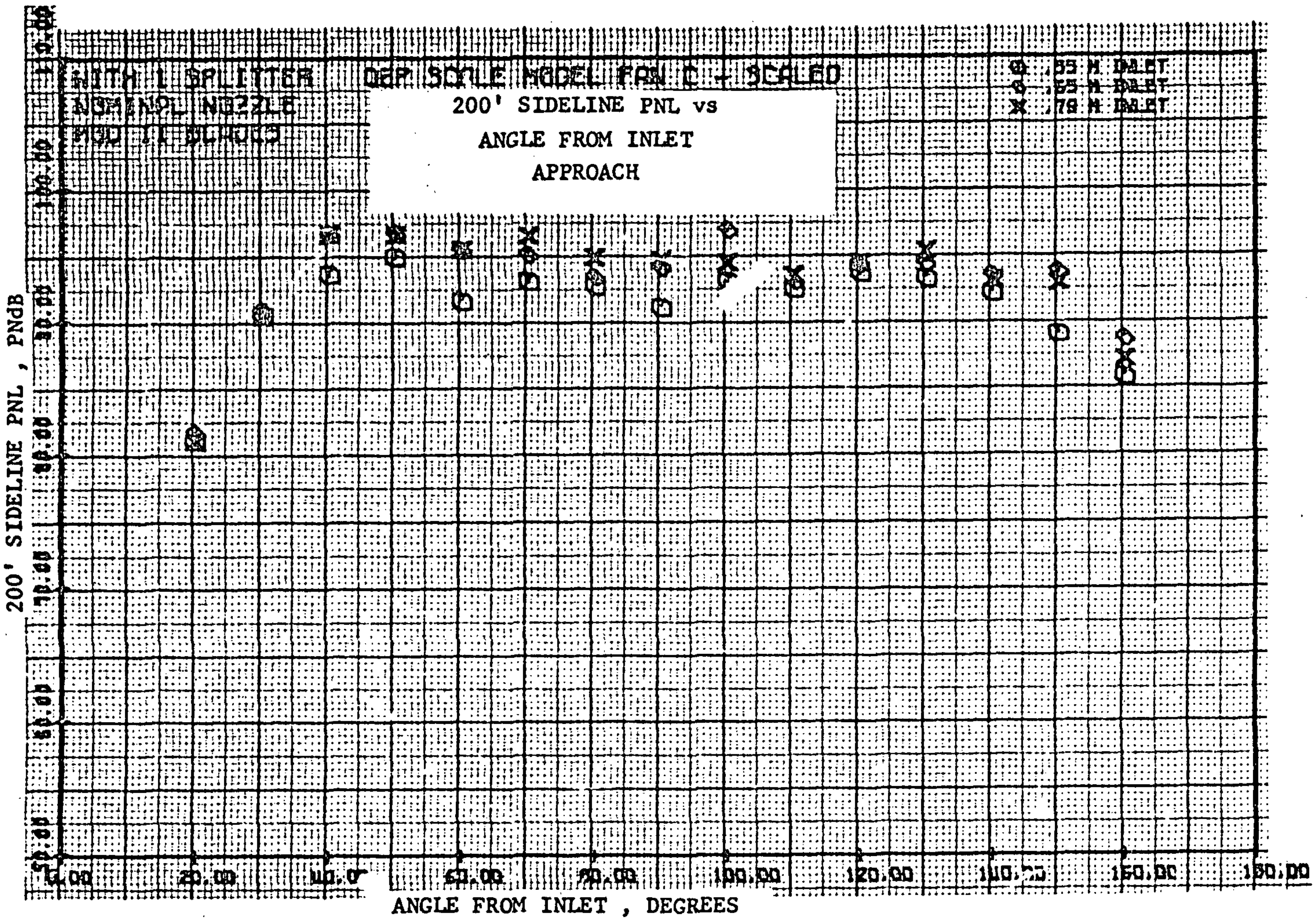

Figure 38. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet, Approach.

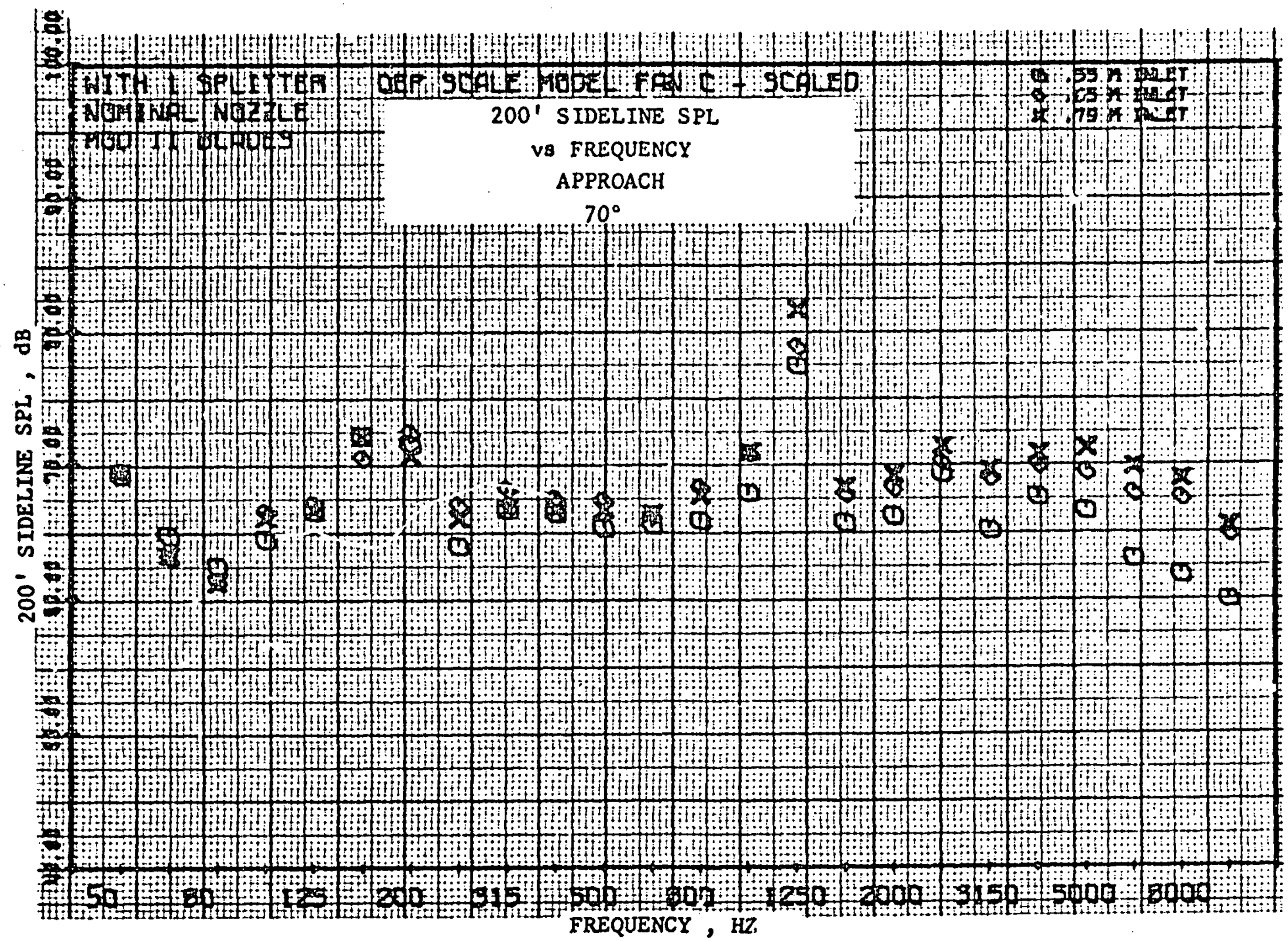

Figure 39. 200-ft (60.96 m) Sideline SPL Vs. Frequency, Approach, 70°.

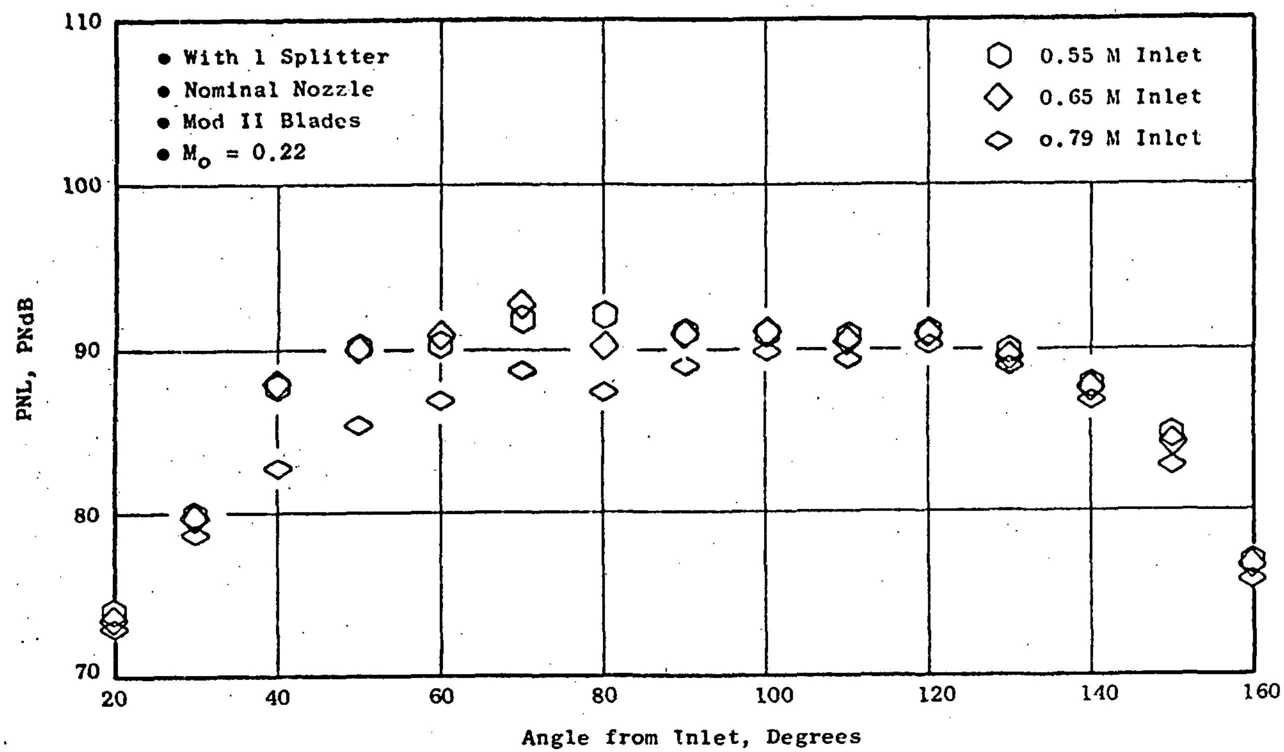

Figure 40. 1000-ft (304.8 m) Level Flyover PNL, Fan plus Jet Noise (Takeoff).

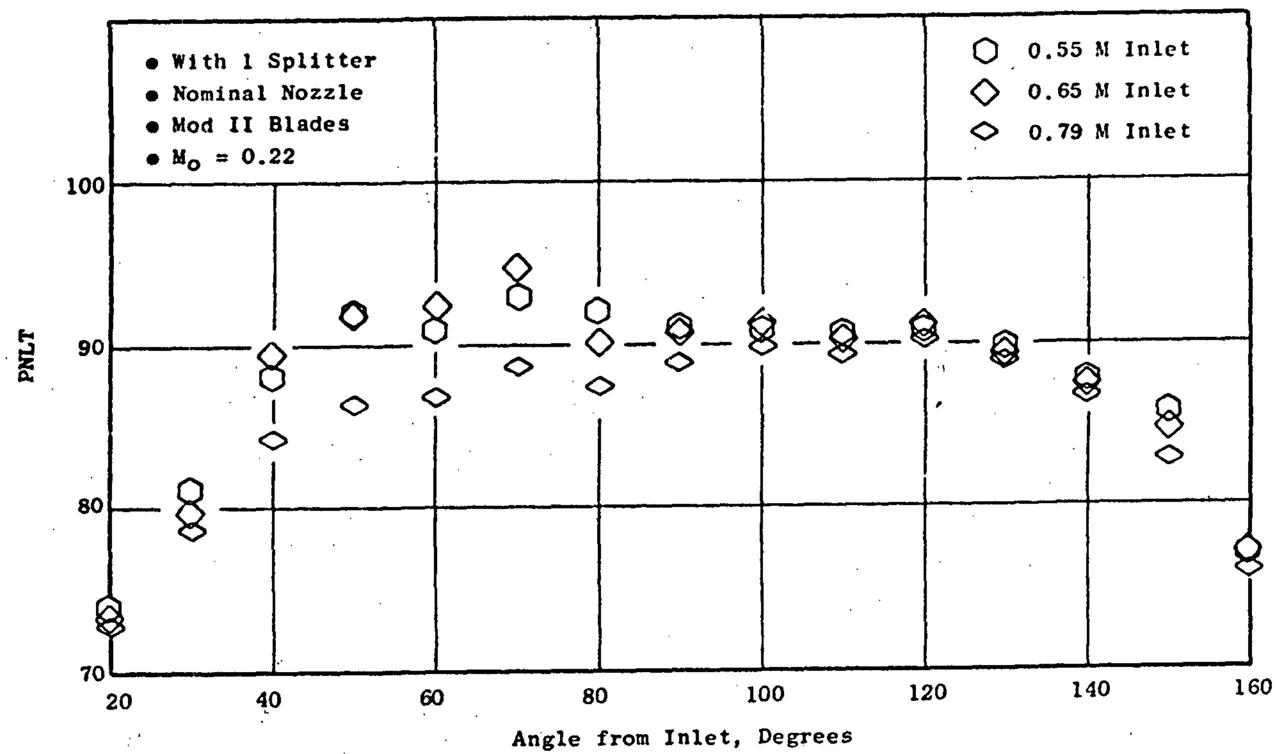

Figure 41. 1000-ft (304.8 m) Level Flyover PNLT, Fan plus Jet Noise (Takeoff).

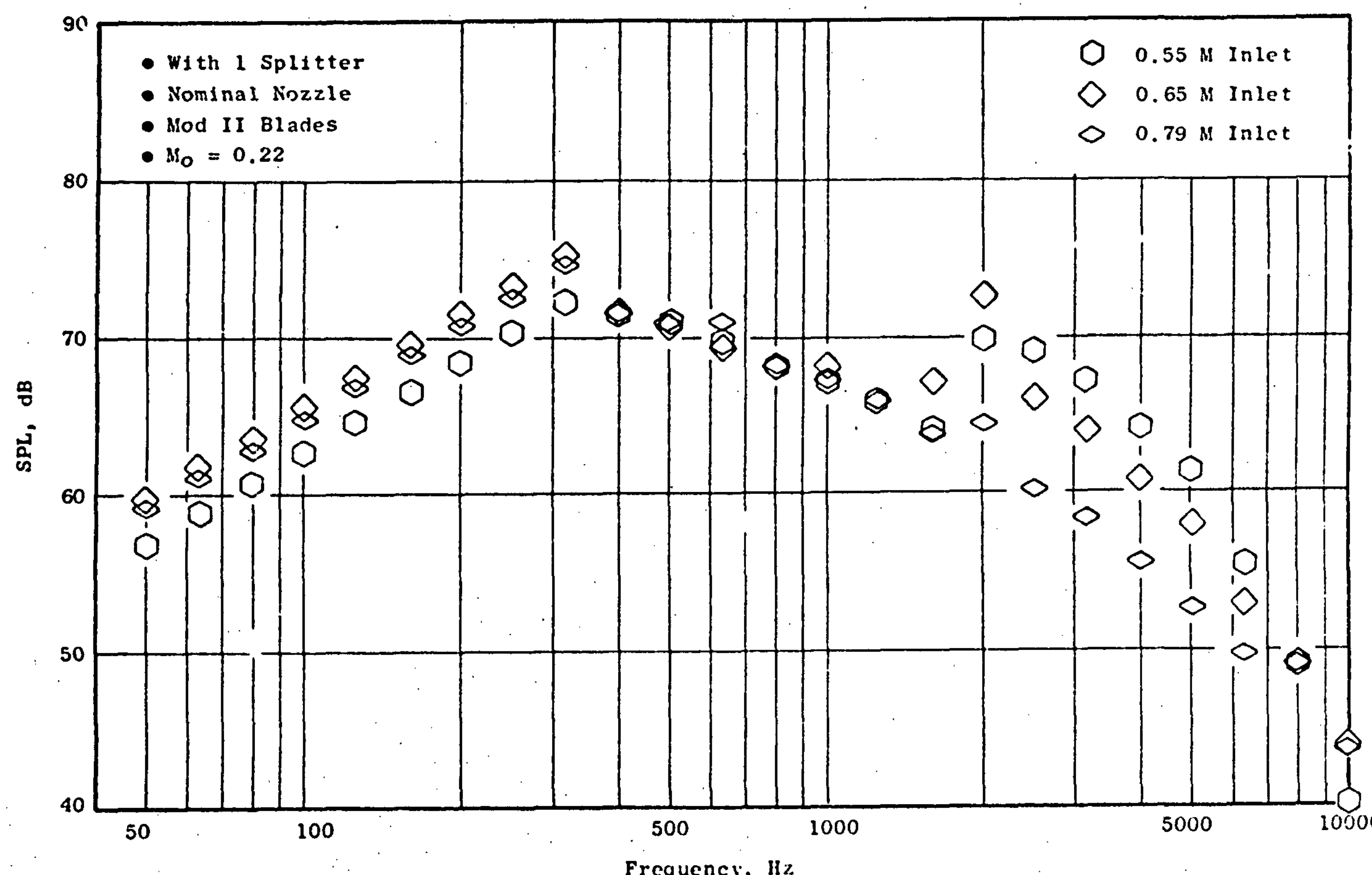

Figure 42. 1000-ft (304.8 m) Level Flyover SPL, Fan plus Jet Noise (Takeoff, 70°).

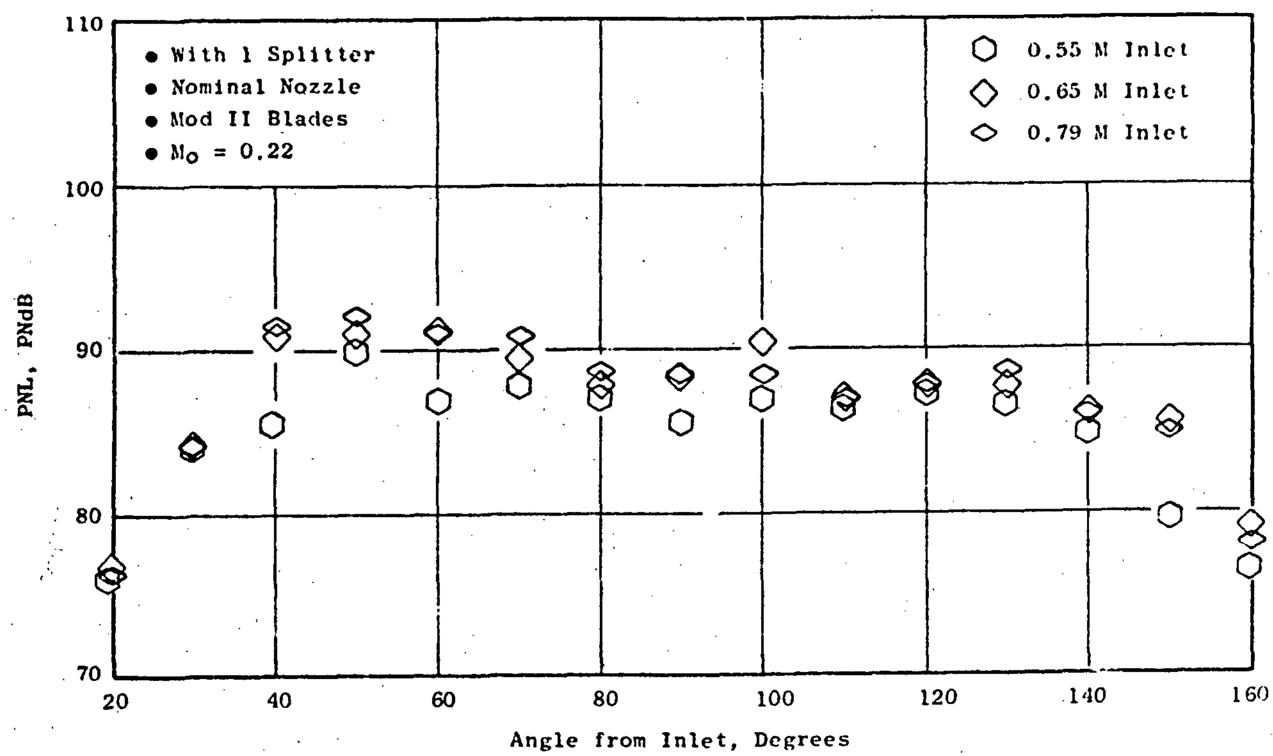

Figure 43. 370-ft (112.8 m) Level Flyover PNL, Fan plus Jet Noise (Approach).

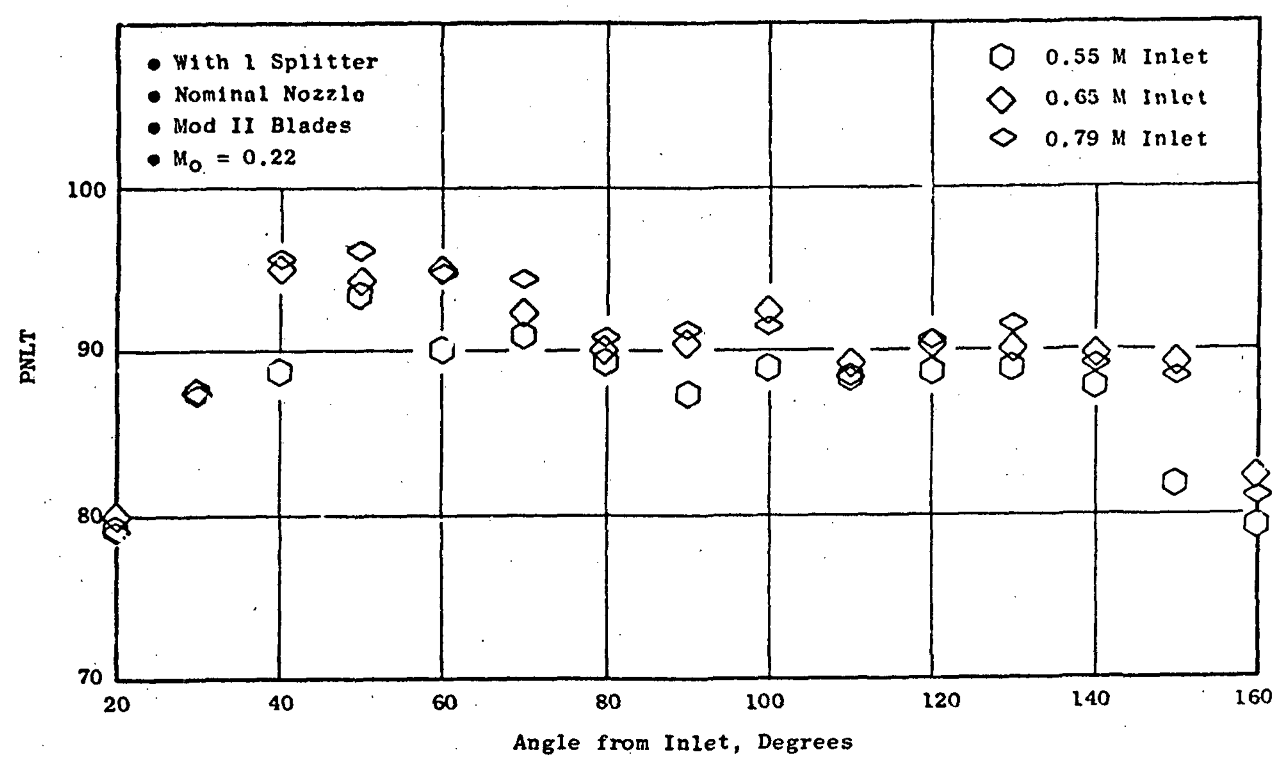

Figure 44. 370-ft (112.8 m) Level Flyover PNLT, Fan plus Jet Noise (Approach).

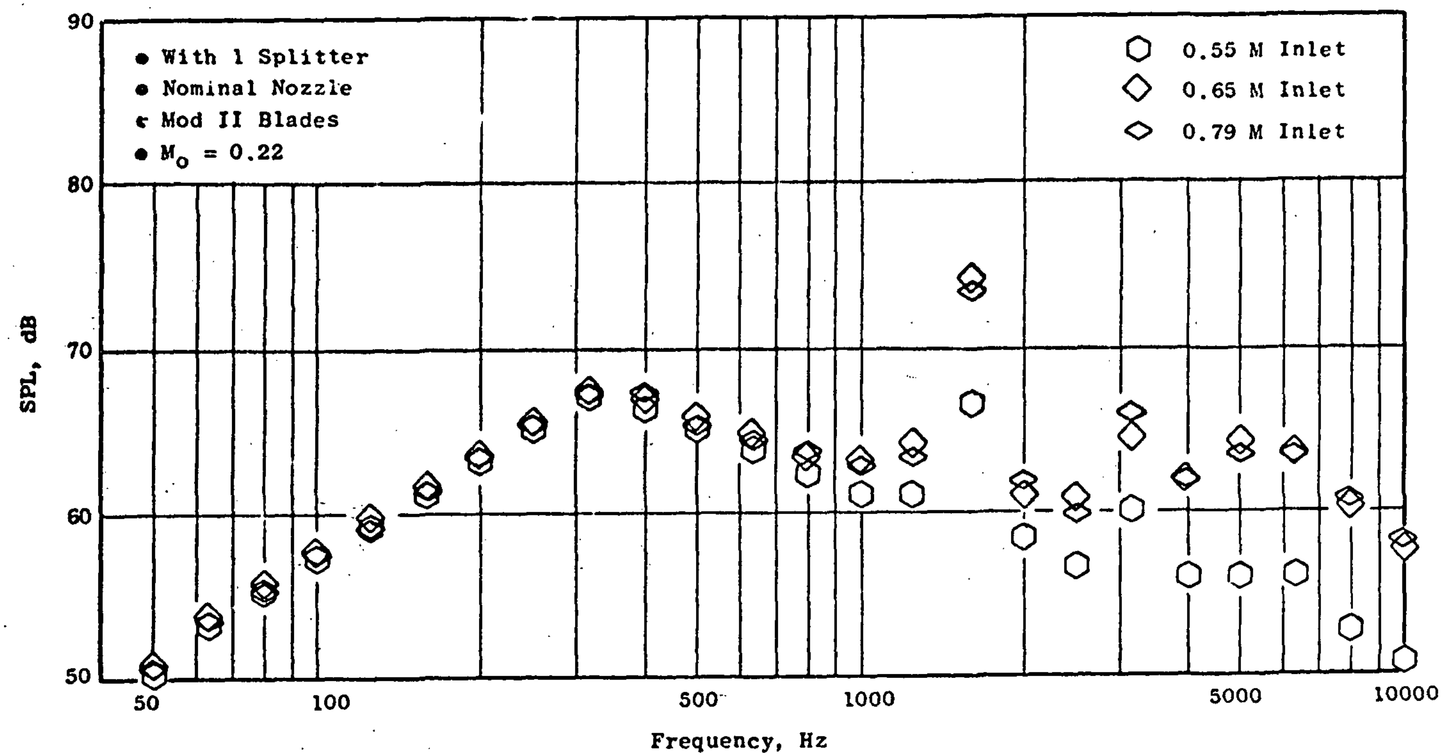

Figure 45. 370-ft (112.8 m) Level Flyover SPL, Fan plus Jet Noise (Approach, 60°).

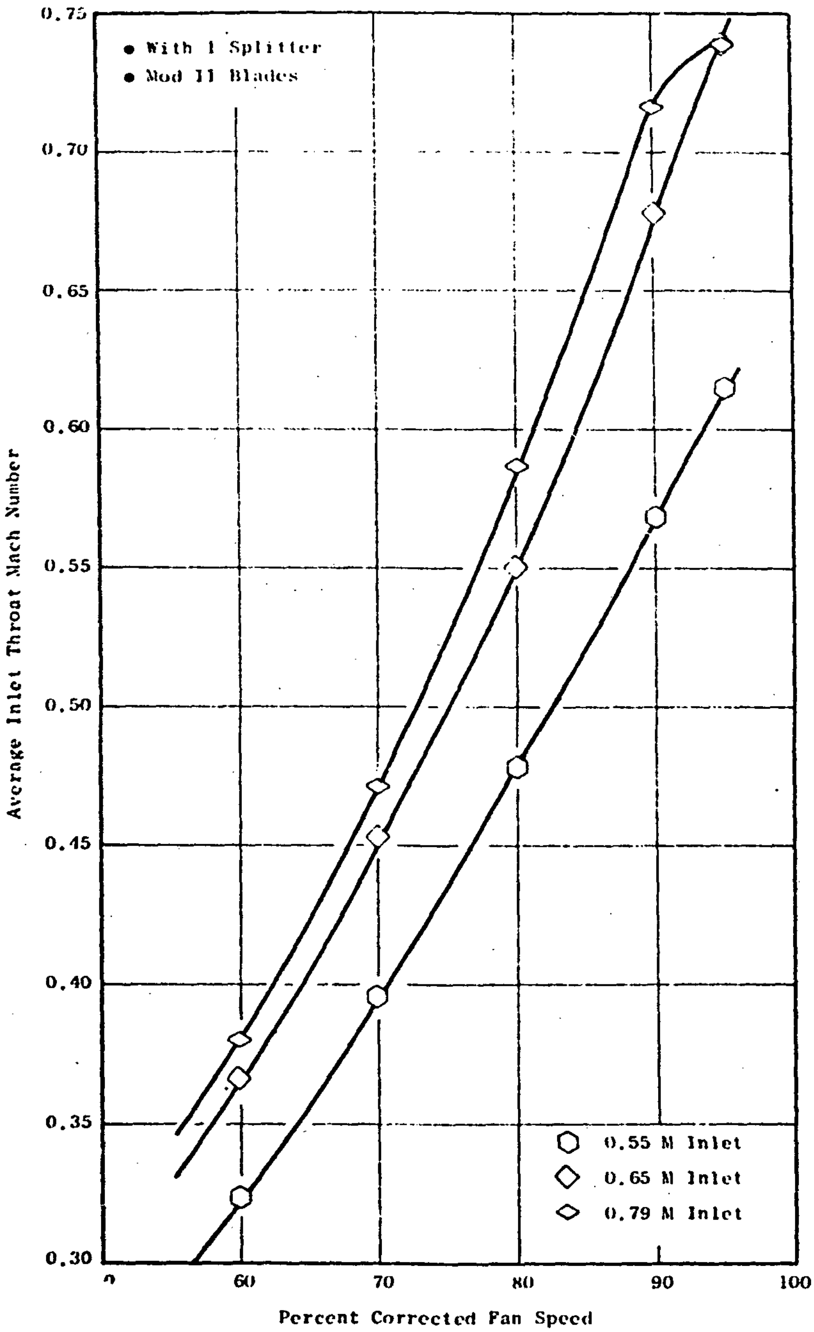

Figure 46. Average Throat Mach Number Vs. Corrected Fan Speed for Inlets with One Splitter.

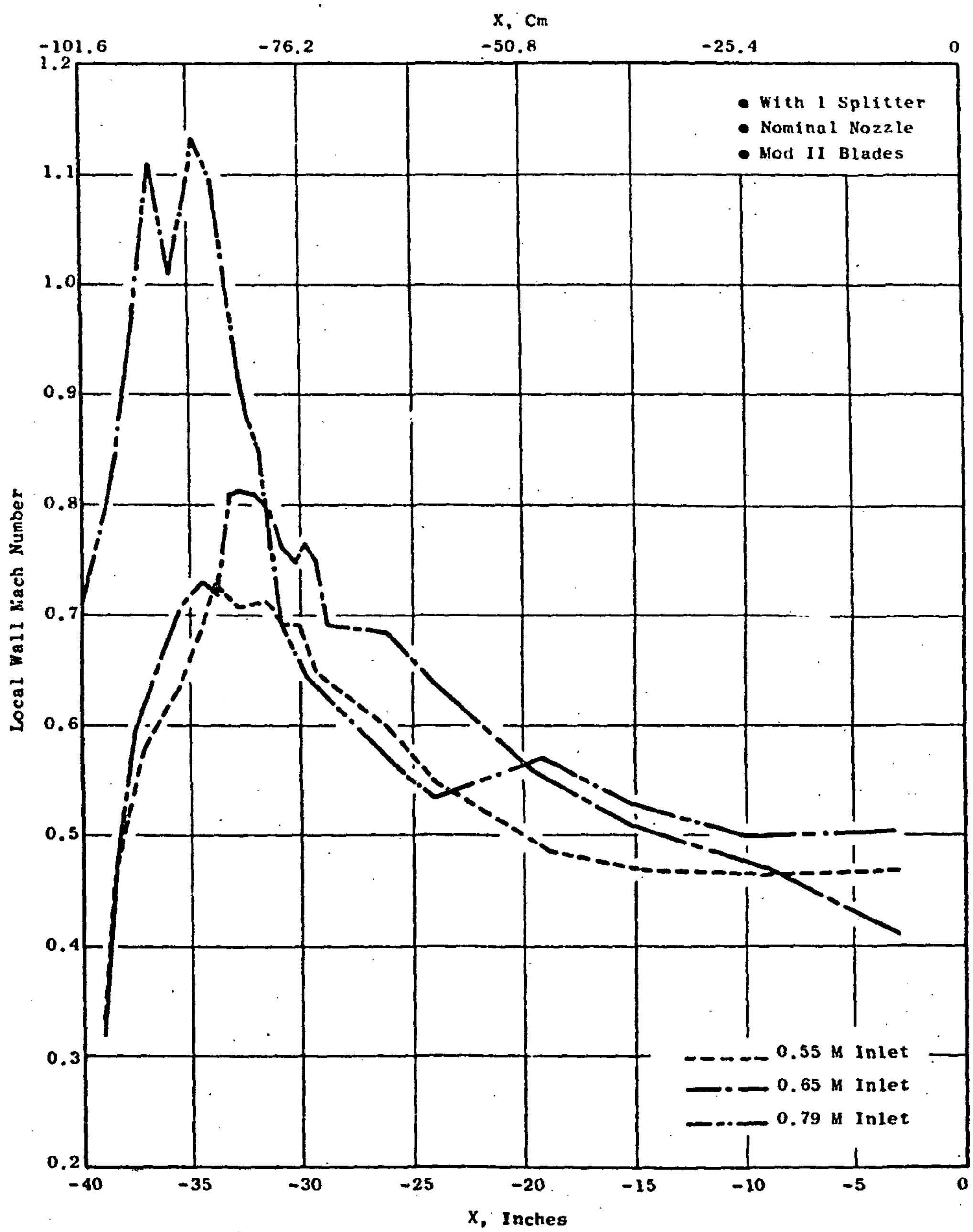

Figure 47. Outer Wall Mach Distribution, Takeoff.

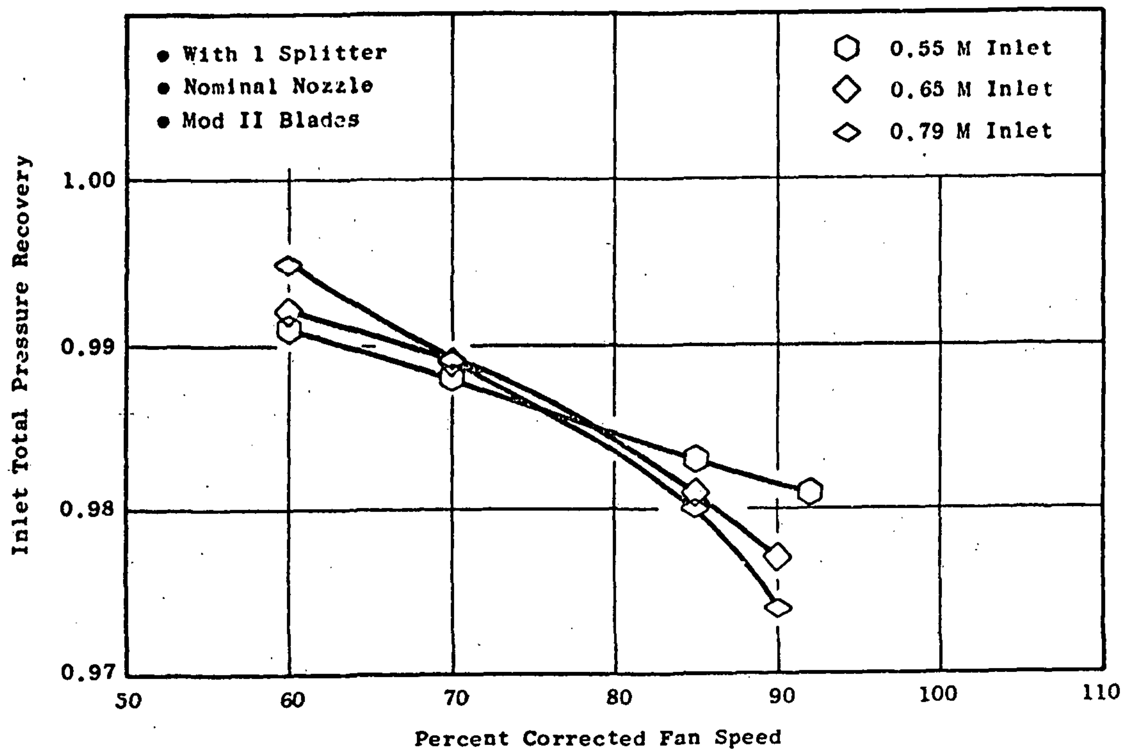

Figure 48. Inlet Total Pressure Recovery Vs. Corrected Fan Speed.

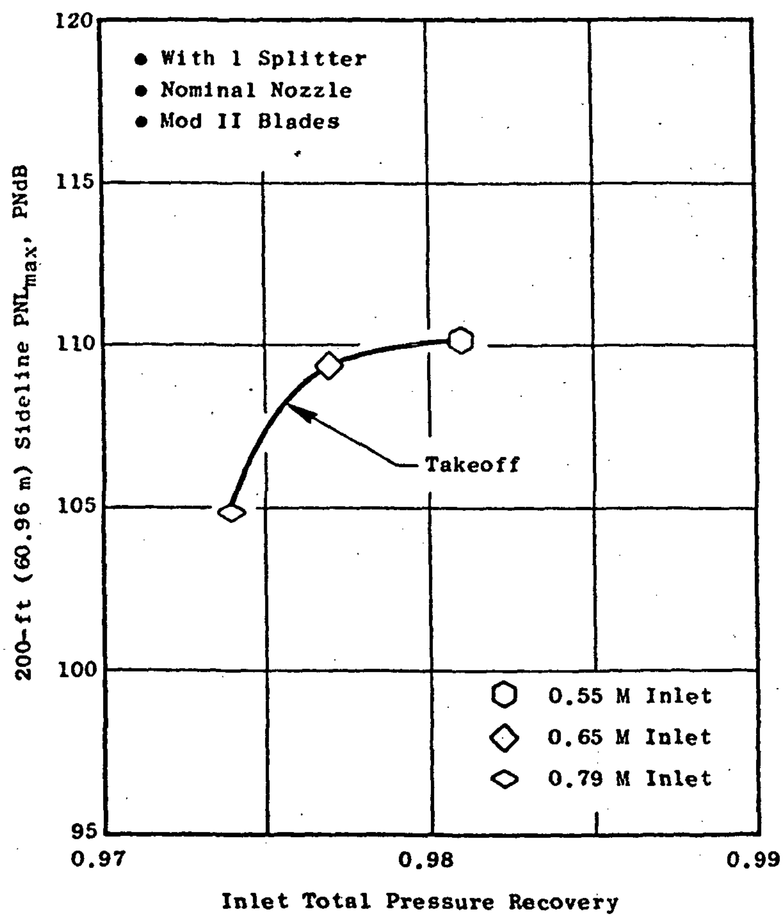

Figure 49. 200-ft (60.96 m) Sideline Front Maximum PNL, 90% Fan Speed.

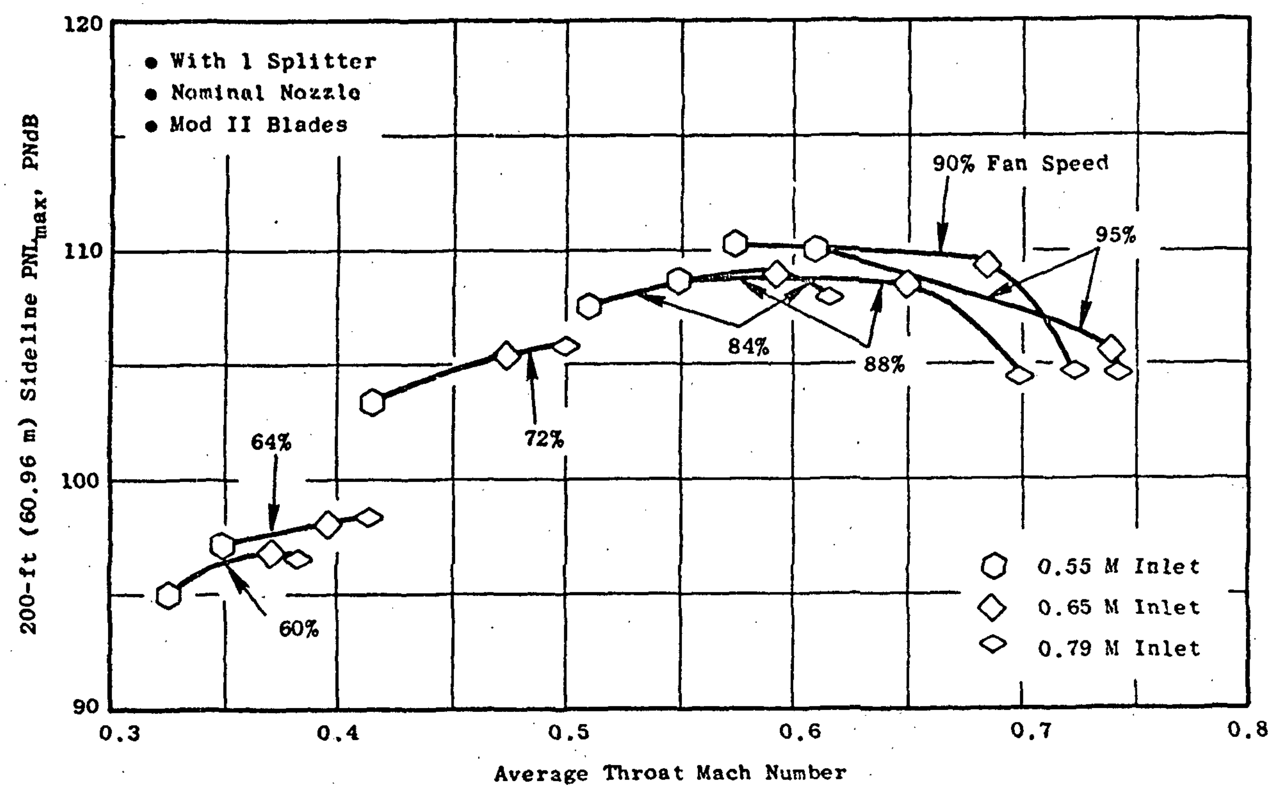

Figure 50. 200-ft (60.96 m) Sideline Front Maximum PNL, Various Fan Speeds.

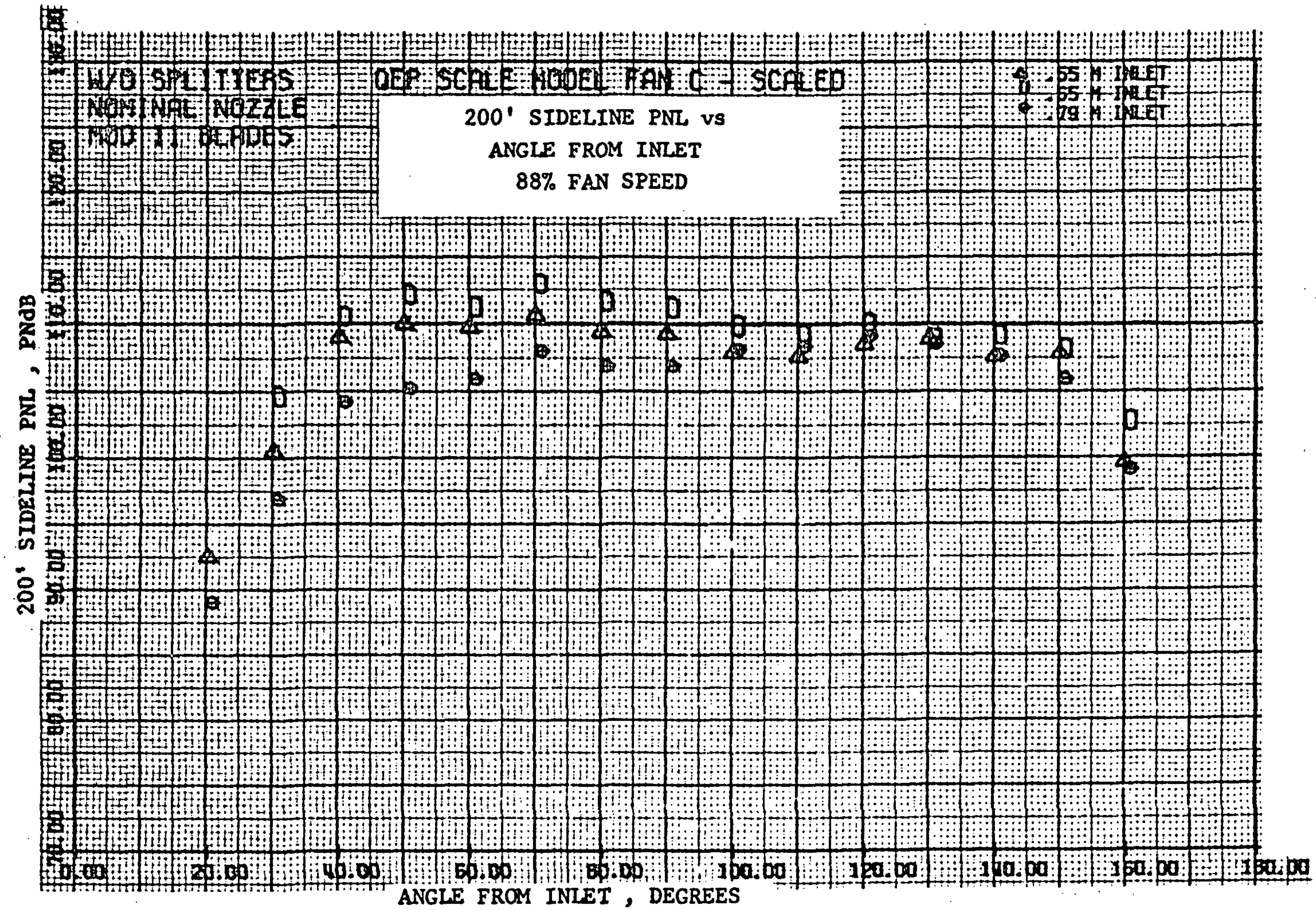

Figure 51. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet, 88% Fan Speed.

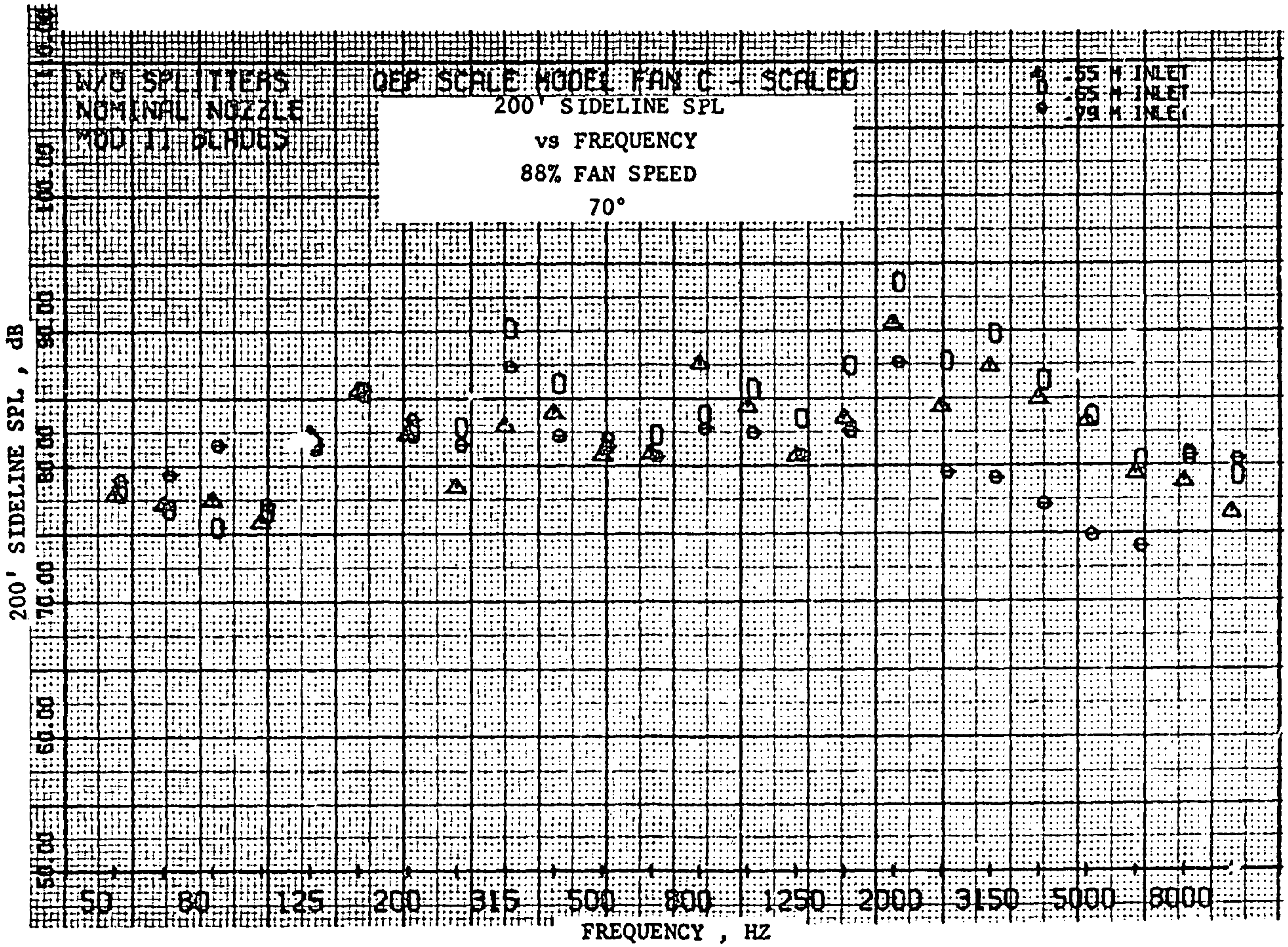

Figure 52. 200-ft (60.96 m) Sideline SPL Vs. Frequency, 88% Fan Speed, 70°.

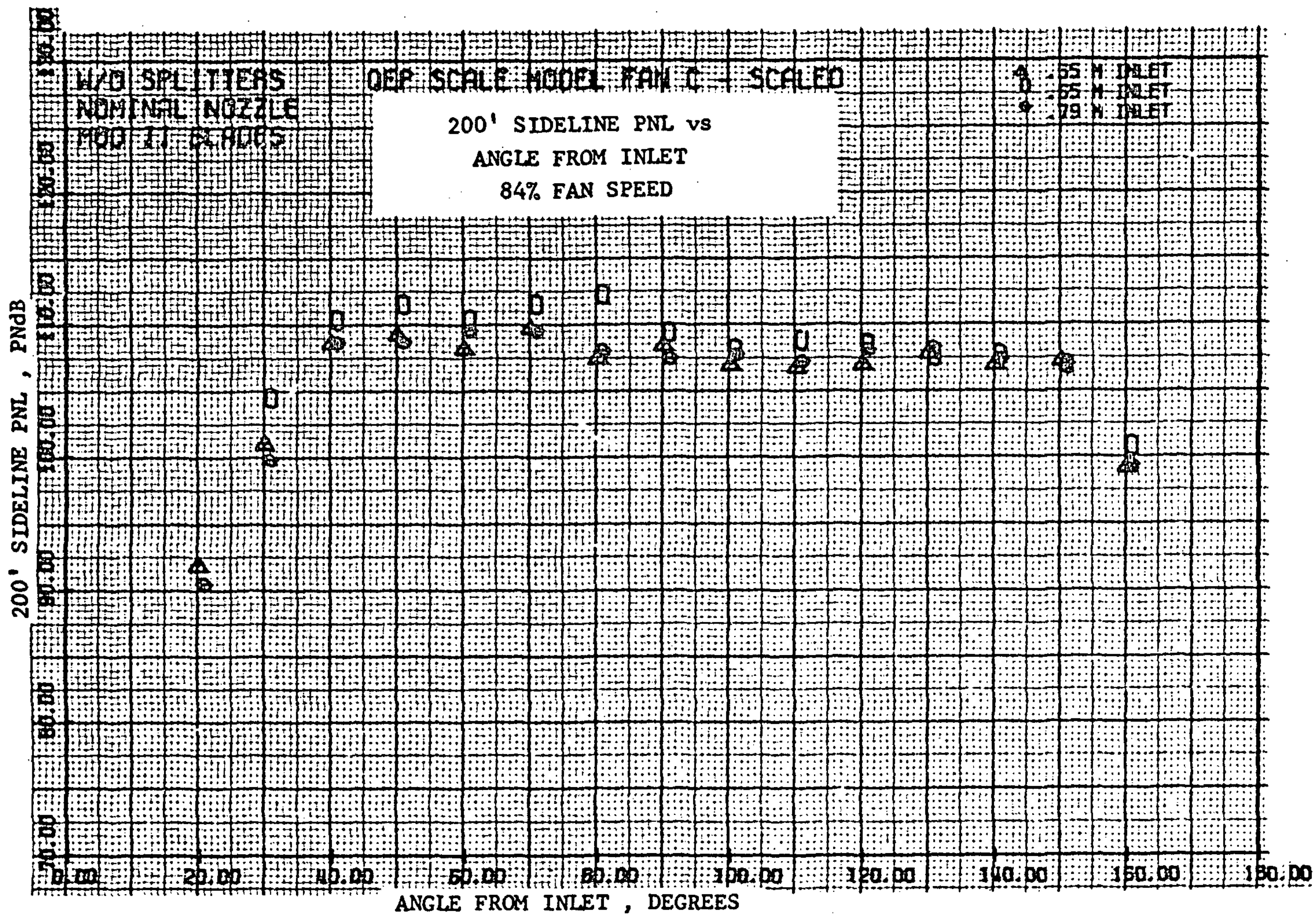

Figure 53. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet, 84% Fan Speed.

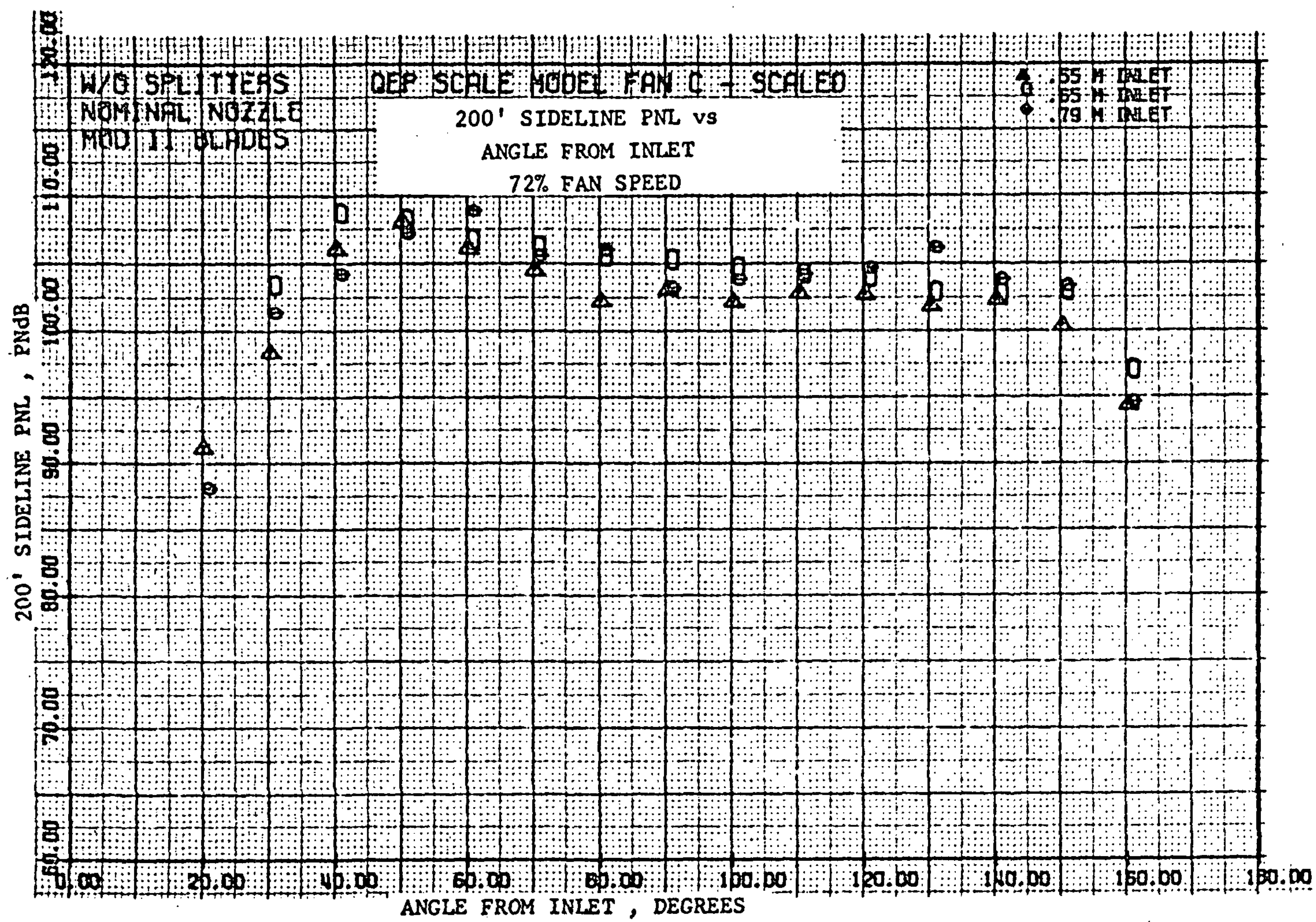

Figure 54. 200-ft (60.16 m) Sideline PNL Vs. Angle from Inlet, 72% Fan Speed.

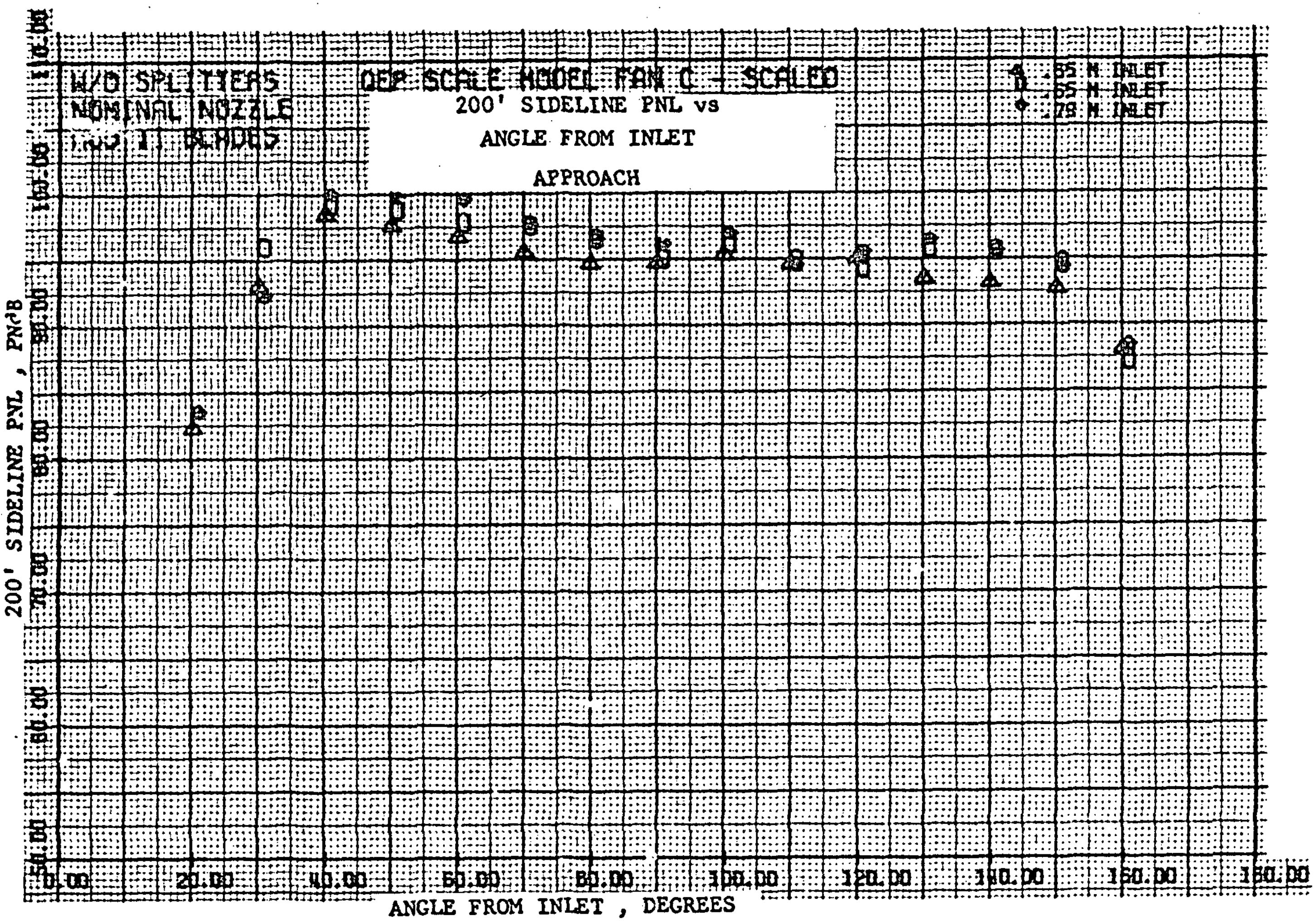

Figure 55. 200-ft (60.96 m) Sideline PNL Vs. Angle from Inlet, Approach.

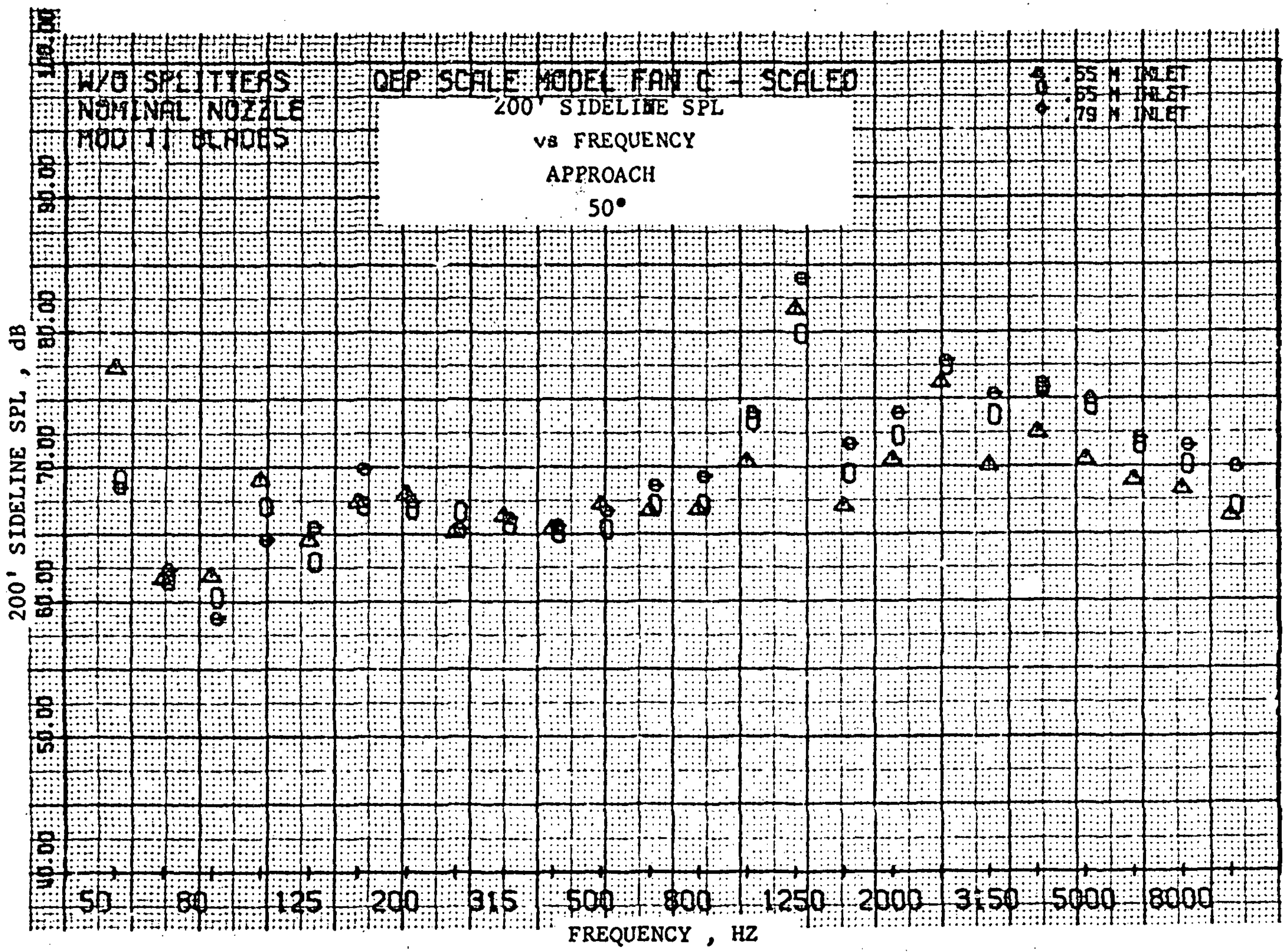

Figure 56. 200-ft (60.96 m) Sideline SPL Vs. Frequency, Approach, 50°.

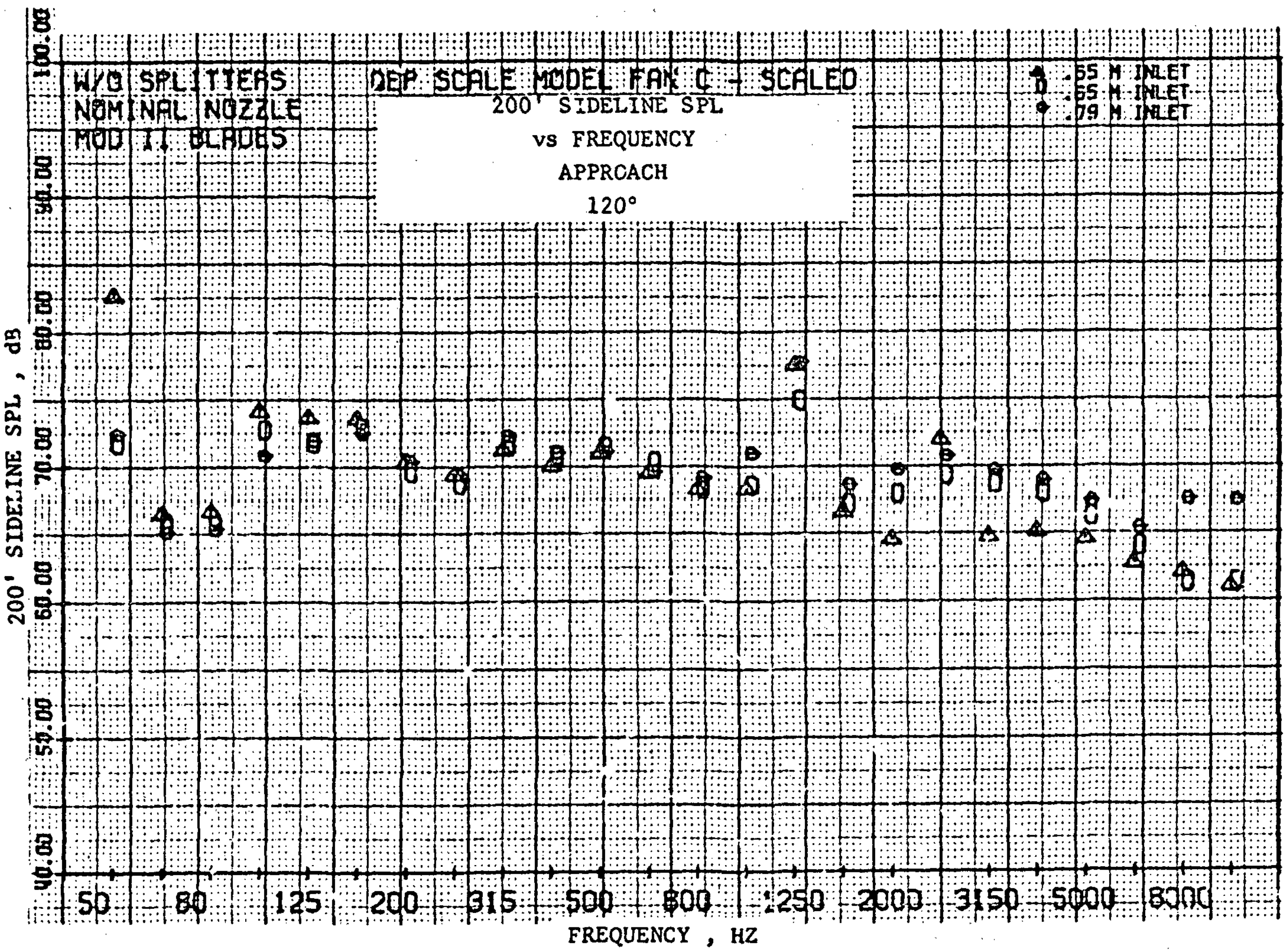

Figure 57. 200-ft (60.96 m) Sideline SPL Vs. Frequency, Approach, 120°.

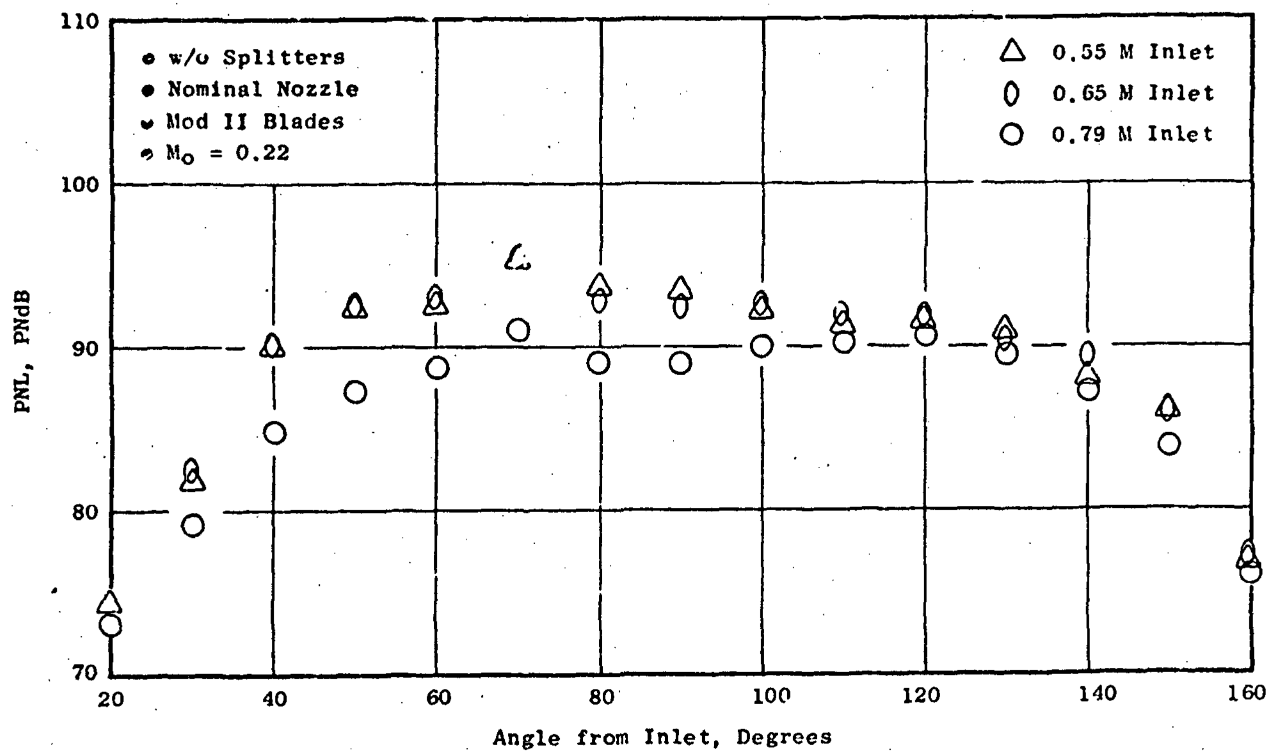

Figure 58. 1000-ft (304.8 m) Level Flyover PNL, Fan plus Jet Noise, 88% Fan Speed.

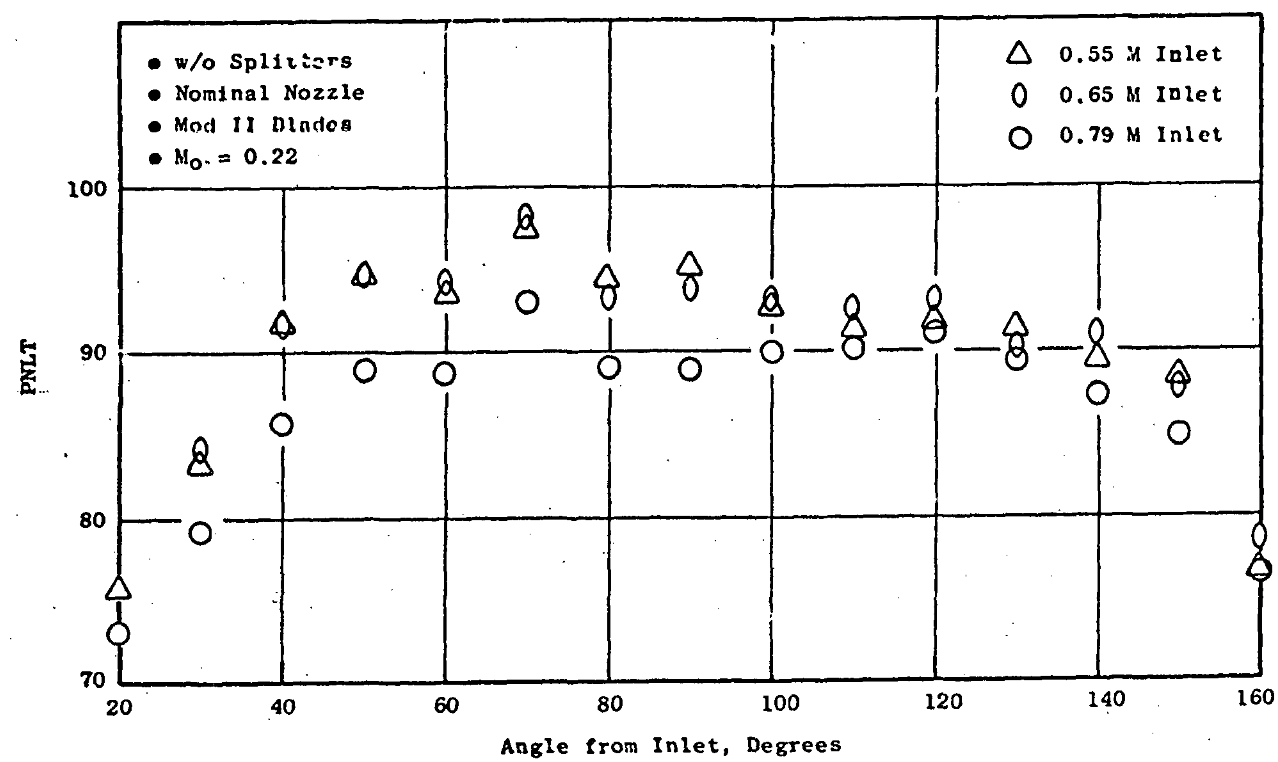

Figure 59. 1000-ft (304.8 m) Level Flyover PNLT, Fan plus Jet Noise, 88% Fan Speed.

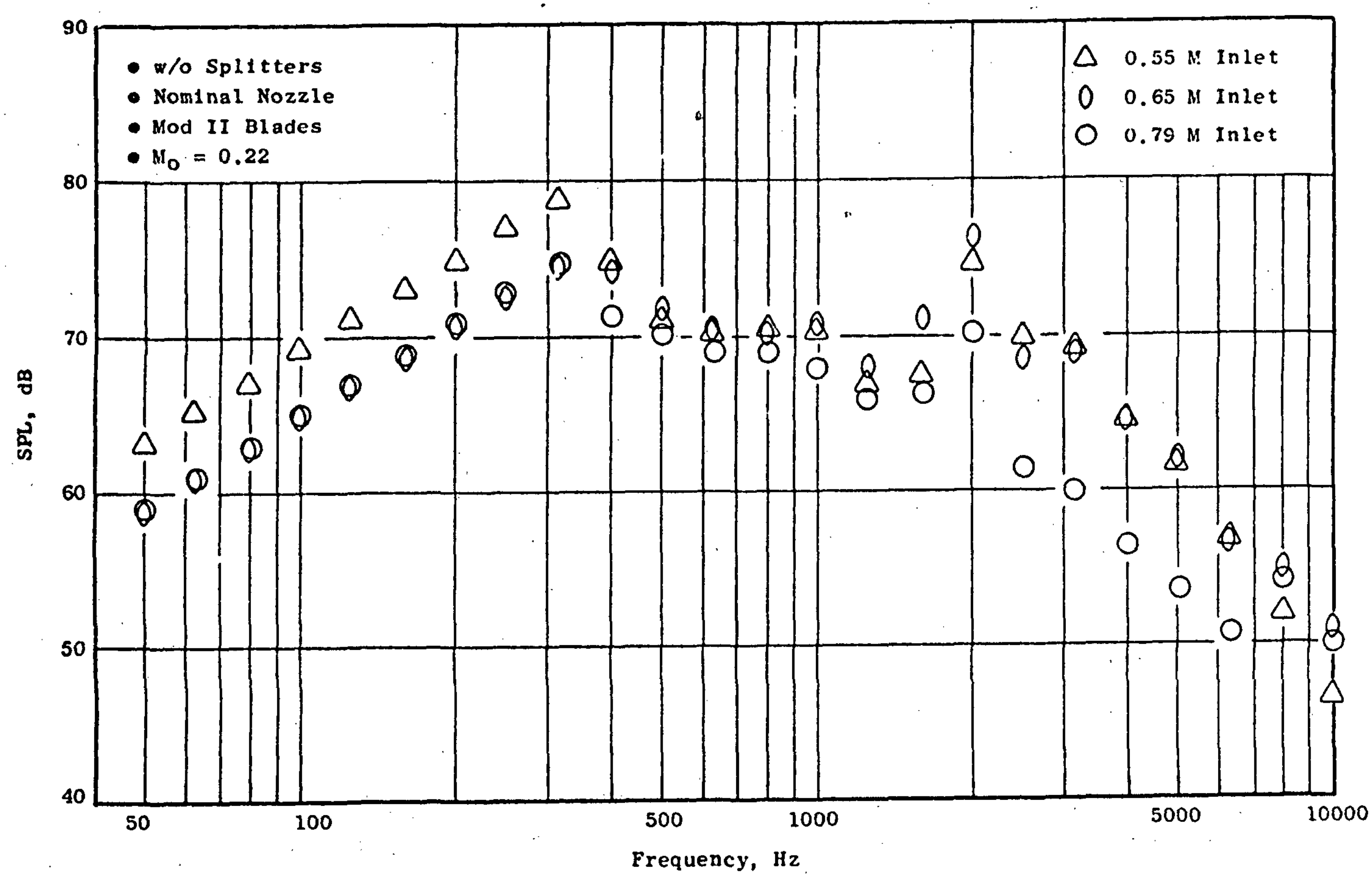

Figure 60. 1000-ft (304.8 m) Level Flyover SPL, Fan plus Jet Noise, 88% Fan Speed, 70°.

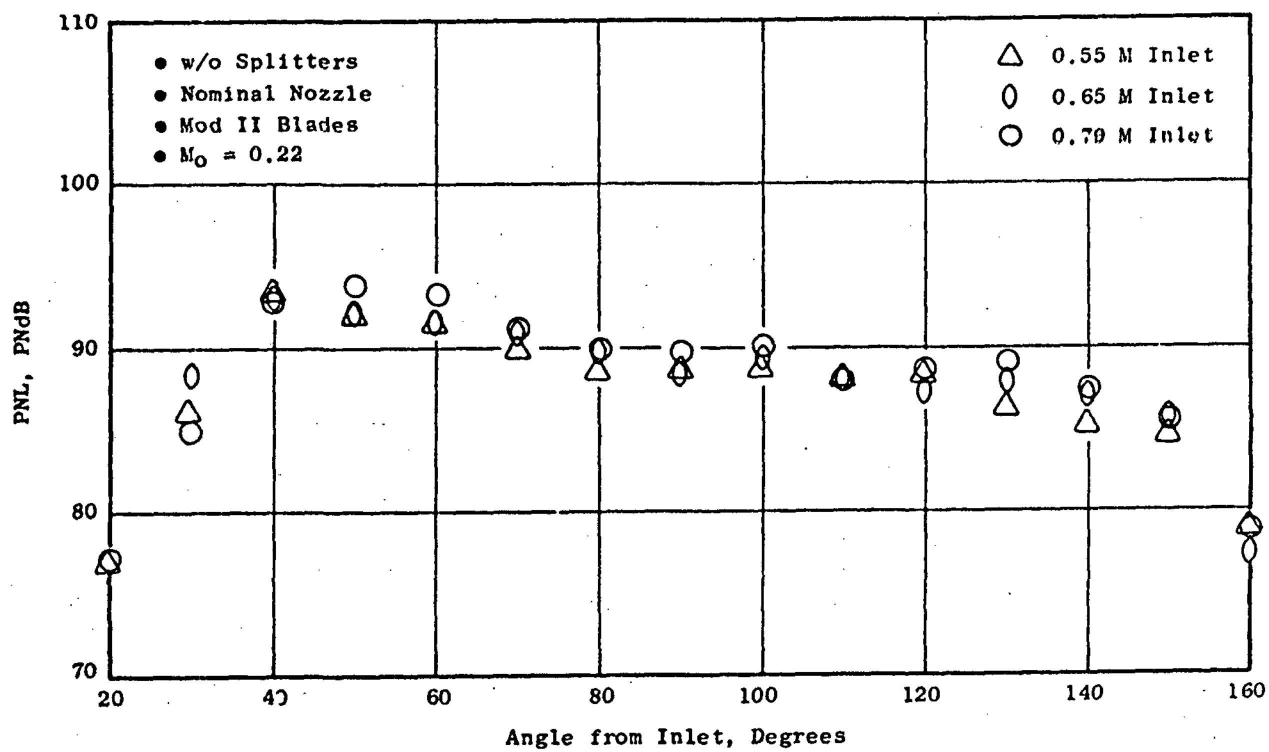

Figure 61. 370-ft (112.8 m) Level Flyover PNL, Fan plus Jet Noise, Approach.

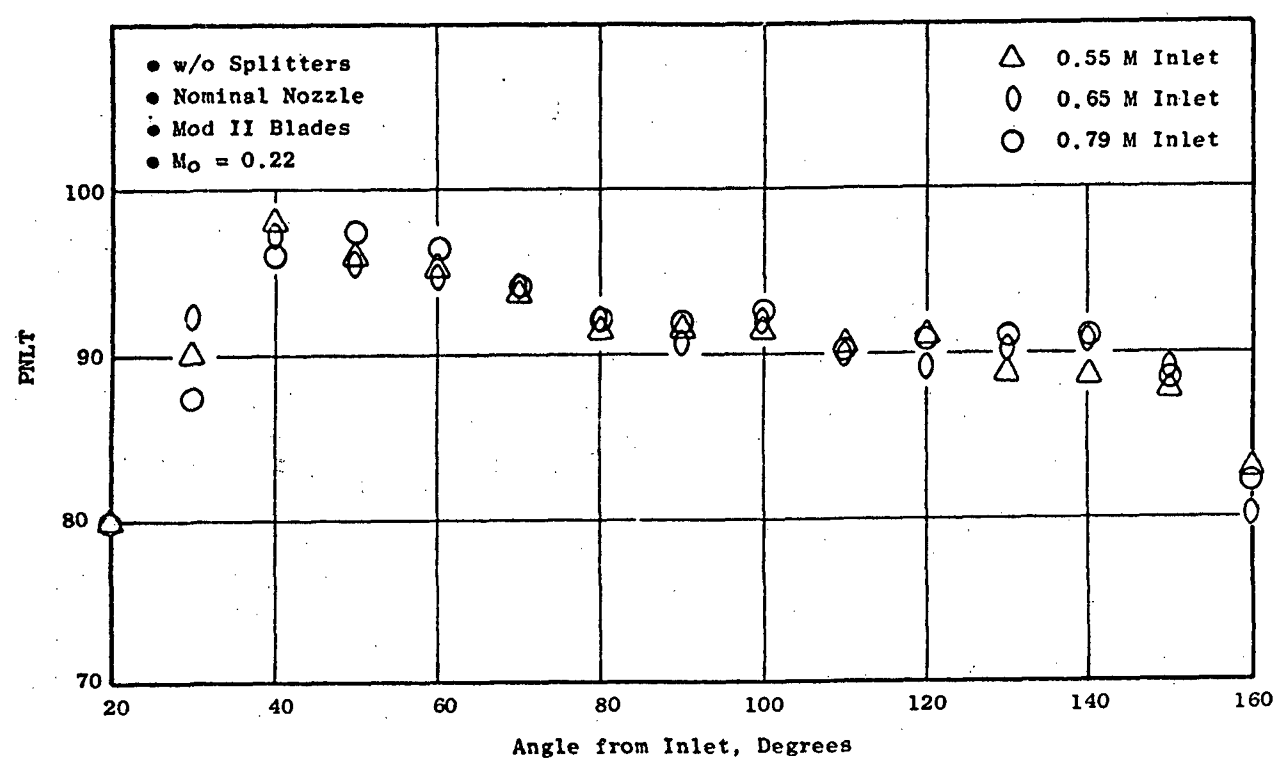

Figure 62. 370-ft (112.8 m) Level Flyover PNLT, Fan plus Jet Noise, Approach.

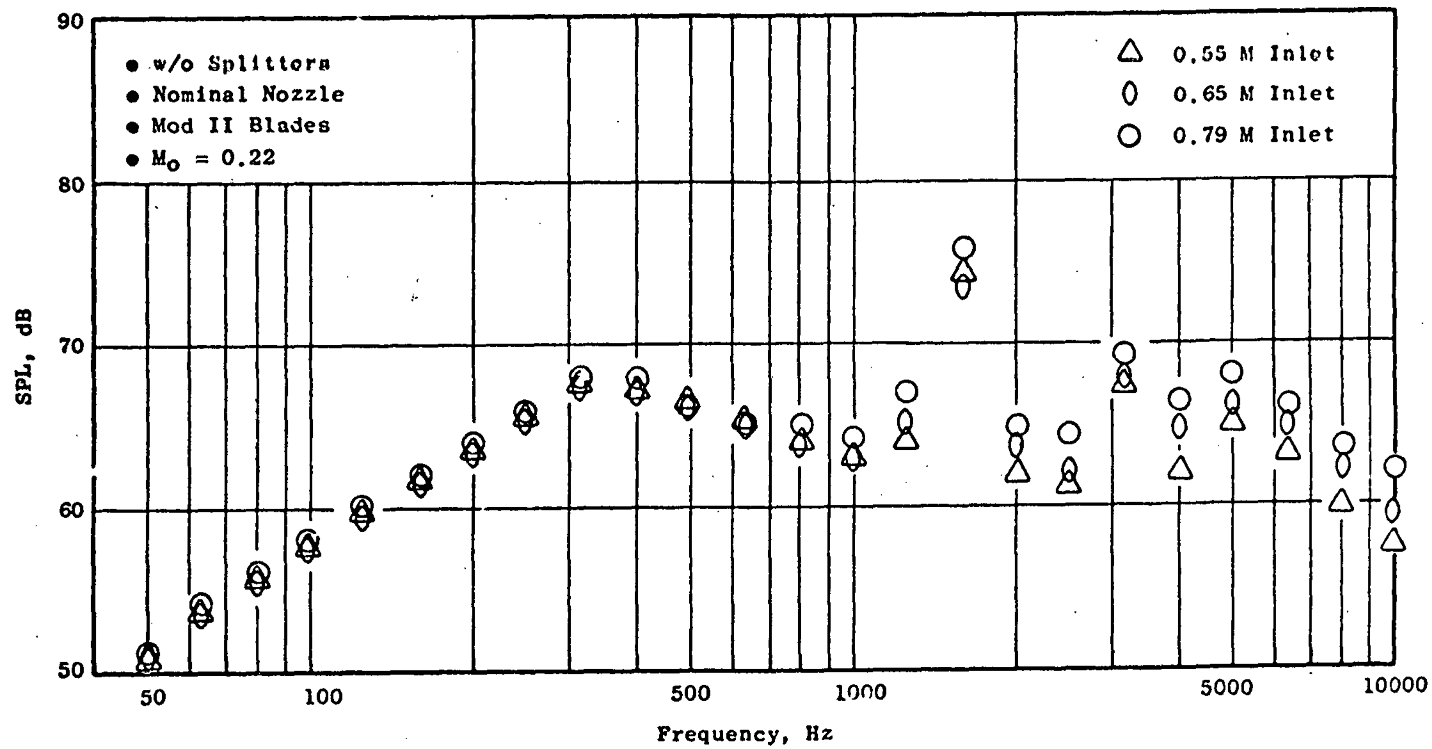

Figure 63. 370-ft (112.8 m) Level Flyover SPL, Fan plus Jet Noise, Approach, 60°.

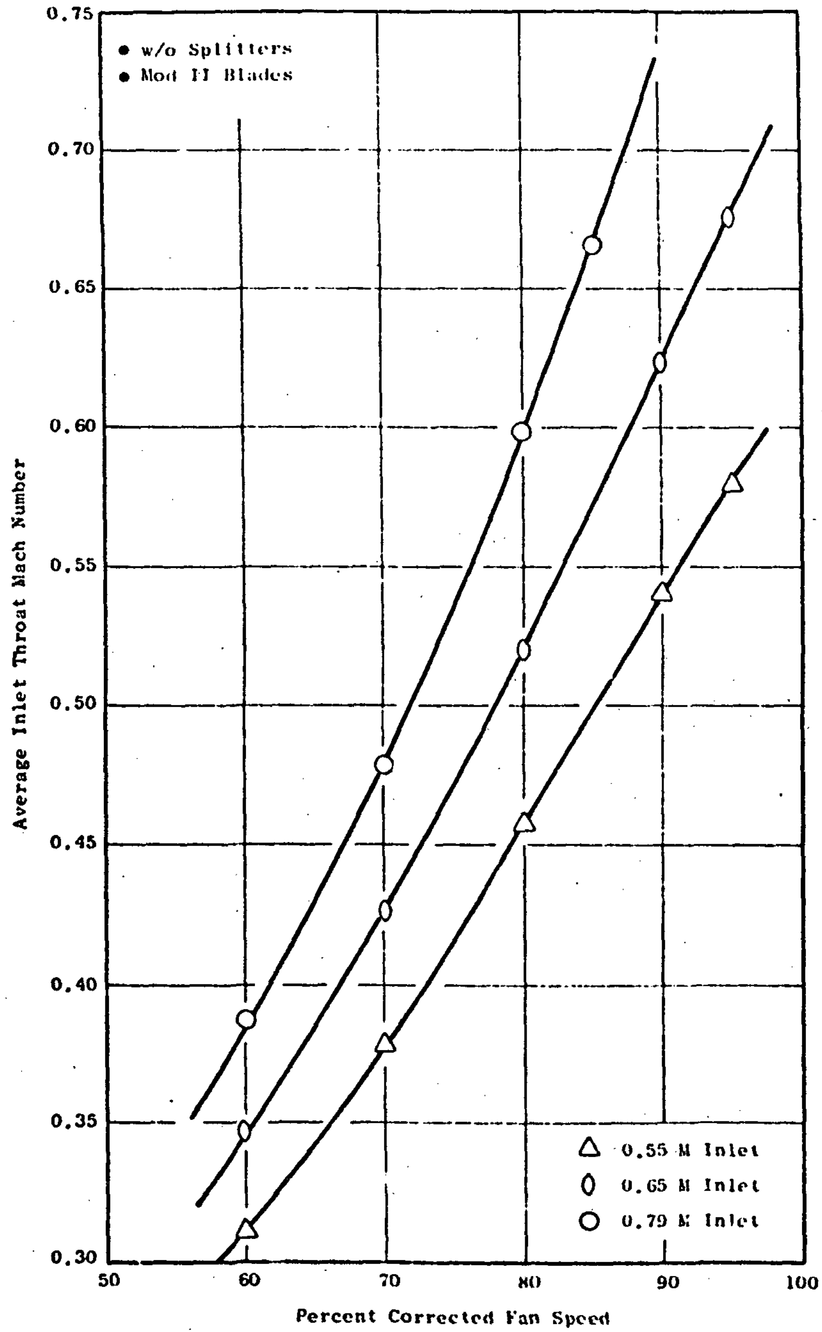

Figure 64. Average Inlet Throat Mach Number Vs. Corrected Fan Speed for Inlets Without Splitters.

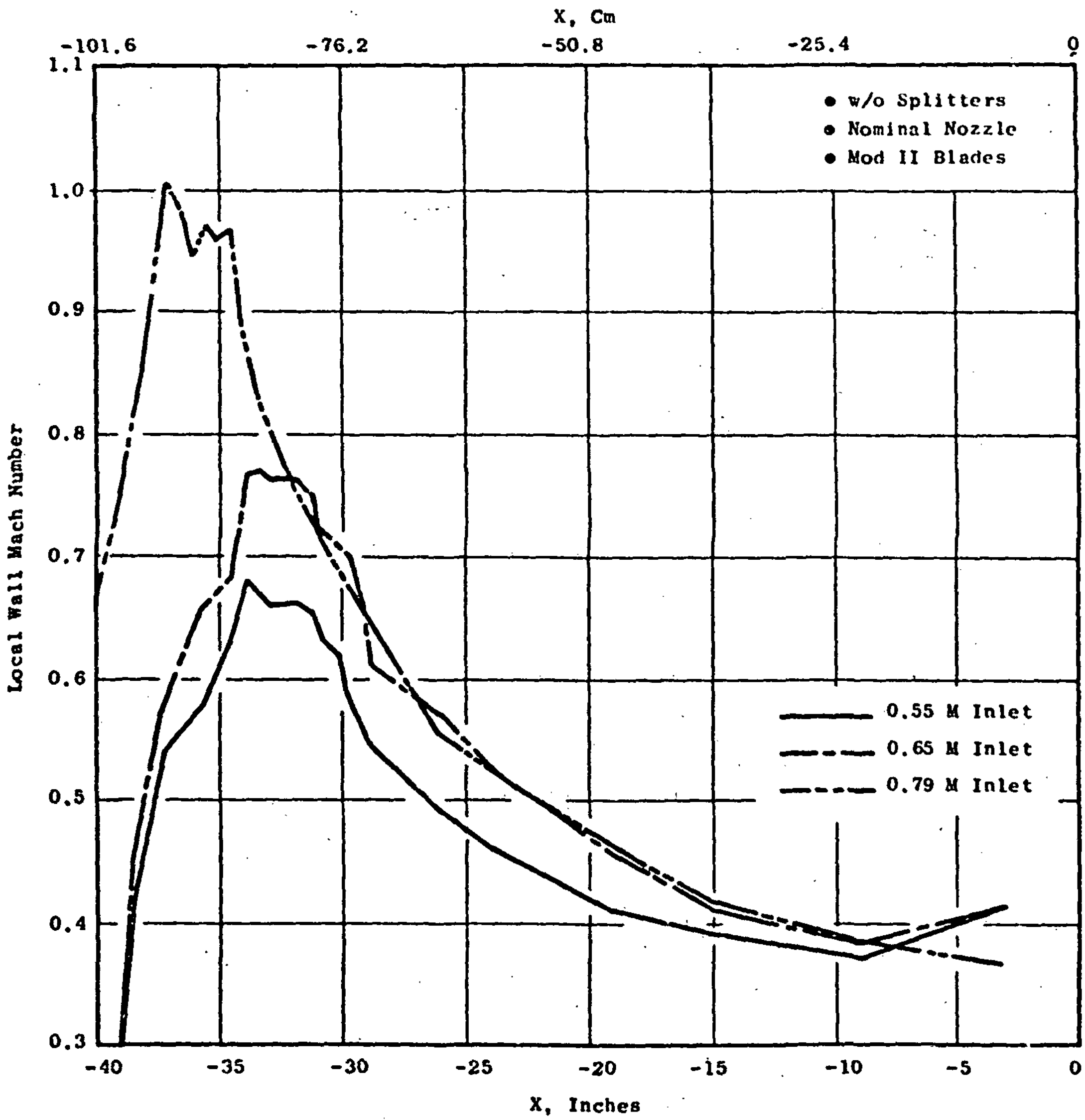

Figure 65. Outer Wall Mach Distribution, 85% Fan Speed.

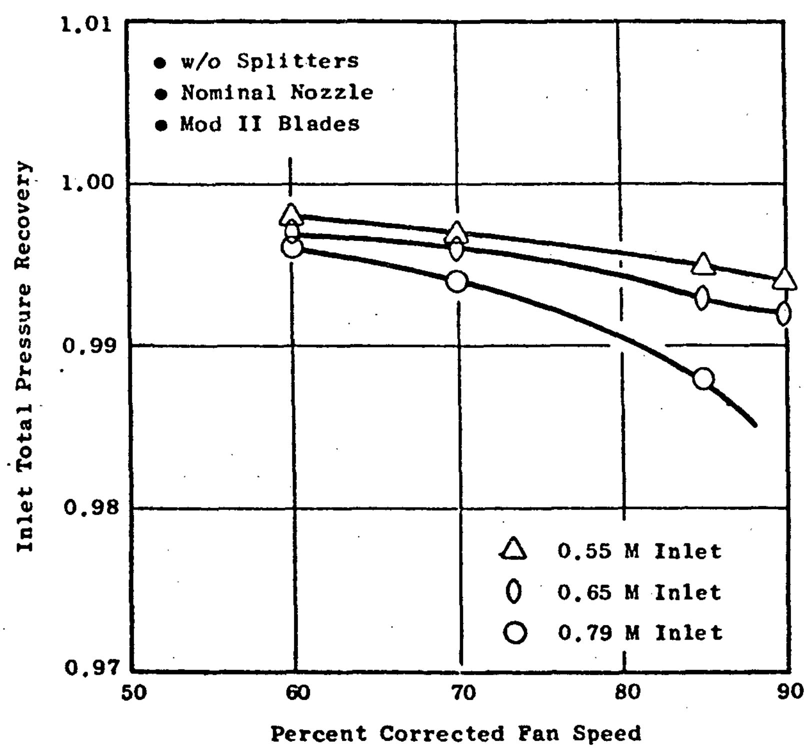

Figure 66. Inlet Total Pressure Recovery Vs. Corrected Fan Speed.

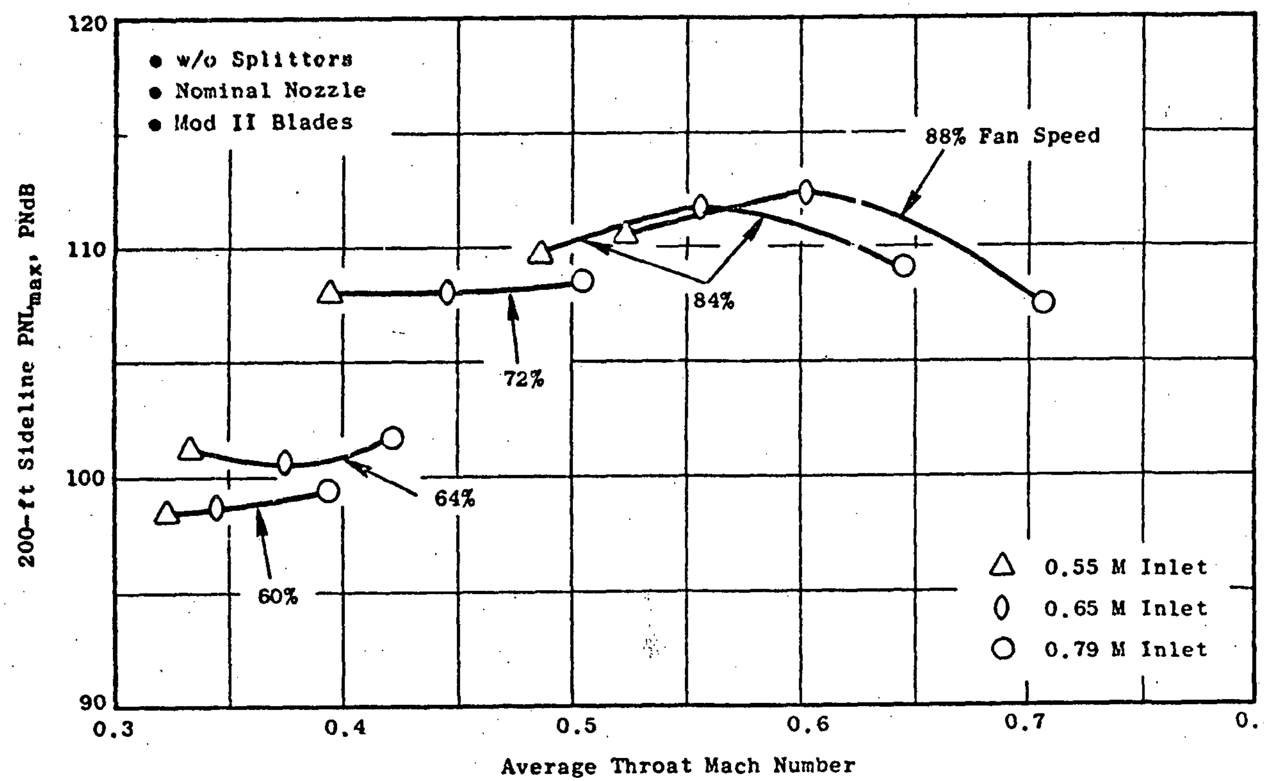

Figure 67. 200-ft (60.96 m) Sideline Front Maximum PNL.

APPENDIX B - ONE-THIRD OCTAVE DATA

This Appendix contains 1/3-octave data for high and low speed for each inlet. The data have been corrected to standard day, 59° F, 70% relative humidity. Data scaled to full scale are presented on the 200-foot (60.96 m) sideline and for reference scale model data is presented on a 100-foot (30.48 m) arc.

QEP FAN C SCALE MODEL

.55 M INLET

WITHOUT SPLITTERS

90% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	PWL
50	79.9	78.8	79.4	77.8	78.1	78.5	81.8	73.4	82.1	83.9	85.8	86.9	88.0	93.7	97.9		138.4
63	73.7	75.6	76.5	78.7	79.1	78.9	81.0	74.8	83.3	84.7	89.7	87.3	89.0	93.9	98.0		136.7
80	77.8	77.4	77.2	80.0	80.0	79.2	81.0	76.4	83.8	84.3	80.3	87.9	89.9	93.5	96.4		138.4
100	76.7	78.8	77.9	81.0	80.2	79.8	81.2	77.7	83.2	83.6	84.6	86.2	88.9	91.0	93.1		134.8
125	78.2	78.2	78.1	80.8	79.6	78.9	79.2	76.8	80.2	81.1	83.9	85.3	86.1	89.1	90.0		132.8
160	83.8	83.6	82.0	84.6	81.9	81.8	83.1	80.6	83.1	81.5	86.6	86.9	88.2	91.8	93.8		135.7
200	75.8	76.8	77.7	77.9	78.1	78.7	80.9	81.7	84.0	89.6	80.8	91.2	93.0	96.0	94.9		137.9
250	81.2	80.7	81.9	85.0	82.4	82.7	84.2	80.0	80.0	88.7	90.7	94.1	95.3	97.0	95.9		140.2
315	87.2	83.8	84.9	92.8	87.1	86.0	87.0	90.0	94.1	91.7	93.0	97.2	95.1	97.0	95.9		148.5
400	82.9	83.9	82.9	83.7	84.1	83.9	84.2	84.9	86.0	85.6	87.6	89.3	90.2	90.6	89.8		136.6
500	81.0	82.0	81.7	80.8	82.2	83.5	83.0	82.8	85.1	85.4	87.5	91.1	91.8	92.0	89.6		134.9
630	82.6	86.1	85.9	86.2	89.4	93.2	91.4	88.9	91.2	89.0	90.2	92.5	92.2	92.3	90.3		[illegible]
800	80.9	84.0	83.7	83.8	85.1	89.0	88.0	85.7	89.0	87.9	89.7	90.4	90.2	89.9	87.1		138.1
1000	79.4	81.9	80.9	82.0	83.8	83.9	83.4	89.0	89.5	87.1	89.2	90.6	98.2	89.3	85.3		136.7
1250	80.8	81.0	82.8	83.0	84.4	83.7	84.0	83.7	85.3	86.9	89.8	90.1	89.0	87.9	84.9		138.4
1600	80.1	80.1	87.9	84.9	85.3	85.0	84.1	83.9	84.2	86.0	87.8	89.2	88.3	87.0	85.9		136.5
2000	78.2	82.0	87.2	86.0	84.4	87.0	84.3	85.2	83.5	84.2	87.0	88.6	88.2	87.2	86.1		136.5
2500	78.1	80.1	85.9	85.2	82.5	82.9	81.2	82.9	83.4	83.9	86.9	88.9	87.2	86.3	85.3		135.4
3150	76.9	82.1	87.1	84.4	84.5	84.1	81.6	83.3	83.4	84.1	86.1	87.4	86.3	87.4	83.2		135.0
4000	81.5	87.8	93.1	93.3	89.4	93.0	87.3	90.0	86.0	90.2	85.3	89.7	89.6	94.2	86.1		141.1
5000	77.8	83.7	89.4	89.5	89.8	89.7	90.0	87.7	85.7	85.6	86.4	88.0	84.9	85.8	84.5		138.9
6300	76.1	82.8	89.1	89.0	89.2	90.1	89.4	87.1	83.4	82.0	83.8	86.1	85.3	86.2	84.1		138.0
8000	74.1	85.1	89.4	88.2	87.8	86.3	86.4	89.1	83.6	82.0	83.3	82.5	83.3	84.4	80.4		137.7
10000	71.8	81.0	87.7	85.6	86.2	83.5	82.1	82.5	79.6	78.3	80.7	81.1	80.7	82.7	79.8		135.9
12500	71.2	80.1	84.9	82.0	82.3	80.1	79.3	79.0	77.3	75.6	[illegible]	78.2	78.3	78.9	75.1		134.0
16000	75.6	76.7	82.6	79.6	79.8	76.7	77.0	76.5	75.0	73.6	74.4	76.0	74.9	75.7	74.5		133.4
20000	78.4	75.8	79.0	77.0	75.7	74.2	74.9	74.2	73.6	72.2	72.0	74.9	72.5	73.1	72.1		133.5
OVERALL MEASURED	95.1	96.6	99.8	99.9	99.0	99.6	90.0	97.9	100.3	100.5	101.8	102.9	103.0	105.8	105.9		
OVERALL CALCULATED	94.3	96.4	100.8	100.4	99.3	100.5	99.4	98.9	100.2	99.8	101.5	103.9	103.8	105.8	106.8		151.9
PNDB	105.8	109.7	114.3	114.5	112.5	114.3	112.2	112.4	111.4	111.3	112.5	114.9	114.7	117.1	113.4		

QEP FAN C FULL SCALE
.55 M INLET
WITHOUT SPLITTERS
90% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	66.6	72.2	73.1	78.2	78.5	79.8	80.6	77.3	82.7	82.6	82.9	83.4	84.6	85.2	83.0
63	67.9	71.5	73.7	77.1	77.8	77.8	78.6	76.3	79.6	80.1	82.2	82.5	81.7	82.4	79.7
80	73.8	76.7	78.3	81.7	80.1	80.7	82.5	80.1	82.5	80.4	84.8	84.0	83.7	85.0	83.3
100	65.1	69.9	73.1	74.9	76.3	77.6	79.3	81.2	83.3	84.5	86.1	88.3	80.4	89.0	84.2
125	70.5	73.7	77.3	81.9	80.5	81.5	83.5	85.4	87.3	87.5	88.8	91.1	90.6	89.9	85.0
160	76.1	76.6	80.2	89.7	85.1	84.8	86.2	89.4	93.3	90.5	91.0	94.1	90.3	89.6	84.8
200	71.6	76.6	78.0	88.6	82.1	82.6	83.4	84.3	85.2	84.3	85.6	86.1	85.4	83.5	78.5
250	69.5	75.3	76.8	77.0	80.1	82.3	82.2	82.1	84.3	84.1	85.5	87.9	86.9	84.6	78.1
315	70.6	78.6	80.9	83.0	87.3	91.0	90.5	88.2	90.3	88.9	88.1	89.3	87.2	84.6	78.6
400	68.9	76.3	78.6	79.7	83.0	87.6	87.1	89.0	88.1	86.6	87.6	87.0	85.1	82.2	75.1
500	67.2	74.8	75.8	78.6	81.4	82.5	82.5	84.2	84.5	85.7	87.0	87.2	85.0	81.5	73.1
630	67.5	73.0	76.7	79.6	82.1	82.3	83.0	82.9	84.3	85.4	86.7	86.6	83.7	79.9	72.4
800	67.3	72.0	82.5	81.3	83.0	84.3	83.1	83.0	83.1	84.5	85.5	85.7	83.0	78.8	73.2
1000	65.2	73.7	81.7	82.4	82.1	85.4	83.2	84.3	82.4	82.7	84.6	85.0	82.8	78.8	73.0
1250	64.8	71.7	80.3	81.5	80.1	81.3	80.1	82.0	82.4	82.3	84.5	84.9	81.6	77.8	71.9
1600	62.8	73.4	81.4	80.7	82.1	82.5	80.6	82.4	82.3	82.5	83.7	83.7	80.6	78.6	69.5
2000	67.9	78.2	87.3	89.6	87.0	91.5	86.3	89.2	85.5	84.7	82.9	85.9	83.8	85.4	72.1
2500	63.2	74.6	83.5	85.6	87.4	88.1	88.9	86.0	84.7	84.0	83.9	82.2	79.0	76.6	70.1
3150	61.2	73.5	83.1	85.1	86.8	88.6	88.4	86.2	82.4	80.5	81.3	82.3	79.3	77.0	67.2
4000	58.9	75.5	83.2	85.3	85.4	84.9	89.5	84.4	82.7	80.6	81.0	78.6	77.2	74.9	64.8
5000	56.2	72.5	82.0	82.2	84.3	82.6	81.7	82.4	79.3	77.4	78.9	77.7	75.1	73.4	64.2
6300	54.0	70.5	79.2	78.8	80.8	79.6	79.4	79.3	77.4	75.1	76.2	75.0	72.6	69.3	58.4
8000	57.5	66.7	77.0	76.9	78.9	78.9	77.9	77.5	75.9	73.8	73.5	73.3	69.4	65.7	56.4
10000	56.1	64.3	73.5	74.7	75.4	75.3	76.3	76.3	75.4	73.3	71.8	72.2	66.9	62.4	51.8
OVERALL CALCULATED	82.2	88.2	94.4	96.8	97.0	99.0	98.3	98.2	99.1	98.1	99.0	100.3	98.5	97.5	92.5
PNDB	90.2	99.9	107.6	109.5	110.1	111.5	111.1	110.3	109.2	108.4	108.9	109.2	107.0	106.2	97.2

QEP FAN C SCALE MODEL

.55 M INLET

WITHOUT SPLITTERS

58% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DRY) = ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	PWL
50	71.0	69.8	61.6	75.6	70.2	67.6	60.9	66.5	70.8	72.4	73.8	74.9	75.0	77.7	81.6		122.7
63	68.3	65.7	68.8	72.8	68.1	65.8	68.0	69.9	71.6	71.9	72.8	75.1	75.2	76.9	80.1		123.2
80	68.7	69.7	71.3	72.4	71.8	68.5	68.6	70.5	77.6	76.5	76.5	76.9	75.6	76.5	77.7		124.2
100	78.1	80.8	81.6	82.7	64.3	77.9	75.1	81.7	80.9	87.7	86.8	87.2	81.8	79.0	73.0		134.3
125	64.2	62.8	64.1	64.9	65.2	64.8	65.0	65.8	67.4	67.9	69.0	69.5	69.2	73.5	71.0		117.4
160	62.7	62.5	62.4	64.8	63.2	62.7	62.9	65.4	64.7	65.7	68.8	71.3	71.1	73.0	74.0		117.5
200	66.0	67.7	67.9	72.0	67.0	66.6	69.1	70.6	73.2	70.6	74.7	74.3	75.9	76.9	77.0		122.3
250	64.0	63.8	65.9	66.8	60.2	66.6	69.0	70.7	72.9	72.9	76.0	76.0	77.0	76.9	76.8		122.8
315	67.8	66.6	67.8	69.0	70.5	68.7	70.9	70.9	73.0	72.6	75.7	75.3	75.2	75.1	73.9		122.5
400	67.7	68.8	69.9	69.7	70.3	73.6	71.1	70.6	73.0	68.8	69.6	71.0	73.1	71.8	71.9		121.3
500	67.7	67.8	68.8	67.8	66.8	65.4	66.8	67.6	68.9	68.4	70.5	72.9	72.8	72.9	71.6		119.6
630	68.3	63.9	70.9	69.9	66.3	69.1	69.4	71.1	71.2	71.1	72.8	73.3	74.2	73.2	73.0		121.5
800	66.8	67.7	69.8	67.0	69.4	67.8	67.8	69.7	69.0	69.6	71.7	74.1	73.0	73.9	72.8		120.6
1000	66.0	66.8	68.8	69.9	69.6	68.1	69.2	69.9	69.4	70.8	73.1	73.2	72.2	71.2	70.1		120.7
1250	67.0	66.8	69.6	68.8	68.4	67.9	68.1	67.5	68.1	69.6	71.7	72.0	72.0	70.9	71.1		119.9
1600	67.2	67.8	69.8	68.9	68.5	67.8	66.9	67.6	67.2	68.9	70.0	70.2	70.4	71.2	71.0		119.4
2000	69.1	71.8	75.3	73.1	70.4	71.2	67.3	68.9	68.1	68.1	70.0	70.6	72.5	75.2	74.3		121.8
2500	77.4	83.2	89.2	84.0	81.6	81.9	77.2	77.1	77.1	76.7	79.2	78.2	82.1	84.5	86.0		132.6
3150	65.9	70.4	74.2	69.3	68.8	67.2	66.2	66.2	66.5	67.1	66.2	69.7	69.4	72.3	70.5		119.7
4000	66.0	71.1	74.3	73.0	68.9	69.2	66.0	67.8	66.1	66.8	66.1	70.6	70.5	74.2	69.1		120.9
5000	69.7	81.6	81.4	78.5	75.8	71.4	72.5	71.3	71.6	72.5	73.6	70.9	72.6	75.6	75.7		126.7
6300	64.7	72.8	75.7	72.8	70.5	68.7	66.1	66.8	65.9	64.8	65.8	69.1	69.3	72.9	70.1		121.2
8000	63.3	75.3	78.0	75.2	73.4	69.2	68.3	67.8	68.1	66.8	67.0	67.2	69.5	72.5	65.0		123.7
10000	62.7	73.7	76.6	72.7	71.9	67.5	65.7	65.5	65.9	64.3	65.4	66.8	67.8	71.5	67.3		122.8
12500	62.9	71.1	73.7	70.8	69.0	64.8	63.8	63.8	63.9	61.9	63.6	63.2	64.1	67.7	63.8		121.4
16000	67.6	69.6	72.3	69.7	66.9	65.5	63.7	64.2	63.7	61.3	62.3	62.5	62.7	65.5	63.3		122.4
20000	65.1	68.0	69.7	67.0	64.4	62.7	64.9	61.9	62.0	59.6	59.9	61.3	62.2	62.9	62.1		123.0
OVERALL MEASURED	86.8	88.7	91.6	88.7	87.4	85.8	85.7	84.5	89.9	89.5	89.6	89.9	88.9	91.0	90.9		
OVERALL CALCULATED	83.8	88.5	91.8	89.0	88.2	85.8	84.0	89.8	90.4	89.4	89.7	90.1	88.9	89.8	90.6		139.3
PNLB	96.7	101.9	106.1	102.5	100.7	100.0	97.3	97.7	96.3	98.0	99.9	99.9	101.8	103.7	104.0		

QEP FAN C FULL SCALE
.55 M INLET
WITHOUT SPLITTERS
58% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	68.0	74.2	77.3	80.0	82.6	78.9	74.5	81.3	88.3	86.7	85.1	84.5	77.5	72.4	67.9
63	53.9	56.1	59.7	62.1	63.4	63.7	64.4	65.3	66.8	66.9	67.3	66.7	64.8	66.6	60.7
80	52.2	55.6	57.9	61.9	61.4	61.6	62.3	64.9	64.1	64.6	67.0	68.4	66.6	66.2	63.5
100	55.3	60.7	63.3	69.0	65.2	65.4	68.4	70.1	72.5	69.5	72.8	71.3	71.3	69.9	66.3
125	53.1	56.8	61.3	63.7	66.3	69.4	69.1	70.1	72.2	71.7	74.1	73.0	72.3	69.0	65.9
160	55.9	59.4	63.0	65.9	68.5	67.5	70.1	70.3	72.2	71.4	73.8	72.2	70.5	67.9	62.8
200	56.4	61.5	65.0	66.5	68.3	72.4	70.3	69.9	73.1	67.5	67.6	67.8	68.3	64.5	60.6
250	56.2	60.3	63.9	64.6	64.8	64.1	66.0	66.9	68.0	67.1	68.5	69.7	67.9	65.5	60.1
315	56.6	62.4	65.9	65.7	67.2	67.8	68.5	70.4	70.3	69.8	70.8	70.0	69.2	65.7	61.3
400	54.1	60.0	63.9	63.6	67.2	66.4	66.9	68.9	68.1	68.3	69.6	70.7	67.9	66.2	60.8
500	53.8	59.0	63.6	66.5	67.4	66.7	68.2	69.1	68.5	69.4	71.0	69.8	67.0	63.3	57.9
630	54.5	58.8	64.3	65.3	66.1	66.5	67.1	66.7	67.1	68.2	69.4	68.5	66.7	62.9	58.6
800	54.5	59.7	64.4	65.3	66.2	66.3	65.9	66.8	66.2	67.3	67.7	66.6	65.0	63.1	58.2
1000	56.1	62.6	69.8	69.4	68.1	69.7	66.3	68.0	67.0	66.6	67.6	66.9	67.0	66.6	61.3
1250	64.0	74.7	83.6	80.3	79.2	80.4	76.1	76.2	76.1	75.2	76.8	74.5	76.5	75.0	72.7
1600	51.8	61.7	68.9	65.5	66.4	65.7	65.1	65.2	65.4	65.6	65.8	66.0	63.8	63.6	56.8
2000	52.8	62.3	68.5	69.3	66.1	67.7	65.0	66.9	65.1	65.3	63.7	66.8	64.8	65.3	55.1
2500	55.3	72.5	75.5	74.6	73.3	70.0	71.4	70.4	70.6	70.9	71.1	67.1	66.7	66.7	61.0
3150	49.8	63.5	69.8	69.0	68.0	67.2	65.1	65.9	64.9	63.3	63.4	65.2	63.3	63.7	55.2
4000	47.6	65.7	71.9	71.4	71.1	67.8	67.5	67.1	67.3	65.4	64.6	63.4	63.4	62.7	52.3
5000	47.1	64.4	70.9	69.3	70.0	66.6	65.4	65.3	65.2	63.4	63.6	63.4	62.1	62.2	51.7
6300	46.3	61.5	68.0	67.6	67.5	64.4	63.9	64.1	64.0	61.0	62.0	60.0	58.4	58.1	47.1
8000	49.5	59.6	66.7	66.9	66.0	65.7	64.6	65.3	64.6	61.6	61.3	59.8	57.2	55.5	45.2
10000	45.8	57.3	64.2	64.7	64.2	63.7	66.8	64.0	63.8	60.7	59.7	59.0	56.7	52.2	41.8
OVERALL CALCULATED	71.4	80.1	86.2	85.3	85.9	84.3	82.7	84.9	89.5	88.0	87.4	86.6	83.3	81.2	76.9
PNDB	79.1	92.1	96.8	96.2	95.7	94.8	94.0	94.0	94.5	93.8	94.3	92.6	92.1	90.9	85.6

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QEP FAN C SCALE MODEL
.55 M INLET
WITH 1 SPLITTER
90% FAN SPEED
100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	( )	PWL
50	80.1	77.8	74.0	77.8	79.0	79.1	80.7	80.7	81.7	83.5	84.6	85.3	88.0	92.9	97.8			136.2
63	76.2	76.1	76.0	78.0	78.0	79.0	80.8	80.9	82.9	83.7	85.8	85.8	89.0	93.9	98.3			136.9
80	77.9	75.7	76.3	78.4	77.6	78.6	81.4	81.7	82.7	84.5	86.4	87.4	89.6	93.5	97.8			136.9
100	74.8	76.8	76.7	79.7	78.8	79.9	81.0	81.1	82.8	83.9	85.7	86.4	89.1	93.0	94.1			135.6
125	76.3	77.4	77.3	79.3	80.1	79.5	80.1	80.1	81.4	82.2	84.4	85.7	87.2	90.3	90.2			133.6
160	79.9	79.9	80.7	82.9	84.8	84.1	82.7	79.8	82.8	86.7	88.0	87.8	88.1	91.8	93.9			136.3
200	74.9	76.2	75.8	77.0	76.8	77.3	79.1	80.2	82.2	83.9	87.1	89.6	92.2	96.1	96.2			137.7
250	79.0	79.2	80.8	81.0	80.2	81.0	83.1	84.9	86.2	88.0	90.8	92.6	95.2	97.0	97.0			140.0
315	83.1	83.3	87.2	88.0	85.9	85.0	88.1	88.9	91.0	90.2	91.9	93.9	95.3	97.0	97.0			141.4
400	82.2	82.9	83.1	84.0	84.8	84.7	85.0	84.8	86.8	87.1	88.8	89.8	91.9	92.9	91.1			137.8
500	80.8	83.8	82.7	81.6	82.7	83.8	83.9	83.0	84.0	83.8	86.9	89.7	91.8	91.9	90.0			136.7
630	80.3	82.2	83.1	84.0	86.3	84.2	83.0	86.1	87.1	89.1	90.0	90.8	92.2	93.4	90.4			138.5
800	80.1	81.2	81.9	81.1	83.2	83.1	85.1	84.9	85.2	86.9	88.8	89.7	90.8	90.2	87.2			136.8
1000	79.3	81.2	80.4	81.0	82.4	83.5	84.1	84.1	85.2	87.1	89.3	90.2	90.2	90.1	86.3			136.8
1250	79.1	80.3	80.9	80.8	82.9	83.1	84.1	83.2	85.0	86.0	88.1	88.7	89.3	87.9	85.1			135.9
1600	77.4	78.4	81.0	82.2	82.3	82.1	82.2	82.3	84.1	85.9	87.2	86.8	88.3	87.0	85.2			135.1
2000	76.2	77.5	84.1	84.0	82.1	81.3	81.1	81.1	83.	84.2	87.4	86.0	87.5	87.1	85.1			134.8
2500	76.1	76.9	81.1	80.0	80.9	81.0	80.0	80.1	81.8	82.9	86.8	86.6	87.2	86.9	84.0			134.0
3150	76.4	78.5	82.4	82.3	81.4	80.2	81.1	81.3	81.2	83.2	86.1	87.1	85.3	85.2	82.0			134.1
4000	78.2	84.0	89.8	91.0	87.1	88.2	84.8	85.1	82.9	85.0	85.8	86.8	87.9	90.1	85.8			138.2
5000	76.4	84.3	89.4	87.1	85.4	88.3	86.1	83.2	84.4	83.2	85.1	85.0	85.1	86.3	84.3			137.0
6300	75.6	82.4	91.4	88.4	88.3	86.5	87.2	85.6	82.6	82.4	84.2	84.9	85.3	86.2	82.5			138.0
8000	73.4	84.3	90.5	88.3	86.5	85.3	87.1	83.2	82.4	81.3	84.4	84.8	84.1	86.0	83.0			137.8
10000	71.4	82.5	88.4	86.0	83.1	83.3	83.0	80.4	79.4	78.9	81.1	82.0	81.1	83.0	80.0			133.9
12500	67.8	79.0	84.9	81.1	78.9	78.3	78.8	75.8	76.8	75.7	78.0	78.5	78.1	78.7	77.0			133.2
16000	64.8	73.7	81.7	77.9	74.9	73.6	74.5	71.9	71.6	71.5	73.5	74.6	74.9	75.8	73.6			131.4
20000	61.7	69.3	75.3	71.4	70.5	67.4	70.2	66.3	68.5	67.2	70.4	70.3	70.3	70.5	70.5			128.9
OVERALL MEASURED	93.9	96.2	99.0	97.9	97.8	97.1	97.7	96.8	98.8	99.0	100.9	102.5	103.9	105.7	106.8			
OVERALL CALCULATED	92.4	95.0	99.1	98.3	97.5	97.5	97.7	97.3	98.4	99.3	101.3	102.3	103.8	105.8	106.6			151.1
PNDB	103.5	107.6	112.1	112.4	110.5	110.9	109.9	109.5	109.5	110.6	112.4	113.2	114.1	115.8	113.4			

QEP FAN C FULL SCALE
.55 M INLET
WITH 1 SPLITTER
90% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	64.6	70.2	72.3	76.9	77.1	78.9	80.4	80.6	82.2	82.9	84.0	83.6	84.8	86.4	84.0
63	66.0	70.7	72.9	76.5	78.4	78.8	79.4	79.6	80.8	81.2	82.7	82.8	82.8	83.6	79.9
80	69.4	73.1	76.2	80.0	83.0	83.1	82.1	79.3	82.1	85.7	86.2	84.9	83.6	84.9	83.4
100	64.2	69.2	71.2	74.1	75.0	76.2	78.4	79.6	81.5	82.8	85.3	86.7	87.7	89.2	85.5
125	68.2	72.2	76.2	78.0	78.3	79.8	82.4	84.3	85.4	86.9	88.9	89.6	90.5	90.0	86.1
160	72.0	76.1	82.4	85.0	84.0	83.8	87.6	88.3	90.3	89.0	90.0	90.8	90.5	88.8	85.9
200	70.9	75.6	78.2	80.9	82.8	83.5	84.2	84.2	86.0	88.8	86.8	86.7	87.1	85.6	79.8
250	69.3	76.4	77.8	78.4	80.7	82.9	83.1	82.3	83.8	82.5	84.9	86.5	86.9	84.5	78.5
315	68.6	74.6	78.1	80.7	84.2	82.9	82.2	85.4	86.2	87.8	87.9	87.5	87.2	85.8	78.7
400	68.1	73.5	76.8	77.7	81.0	81.7	84.2	84.2	85.3	85.5	86.7	86.3	84.9	82.5	75.2
500	67.1	73.4	75.2	77.6	80.2	82.1	83.1	83.3	84.8	85.7	87.1	86.8	85.0	82.3	74.1
630	66.6	72.3	75.6	77.4	80.7	81.6	83.1	82.4	84.0	84.6	85.9	85.2	84.0	79.9	72.6
800	64.7	70.2	75.6	78.6	80.0	80.7	81.2	81.4	83.0	84.4	84.9	83.2	82.9	78.9	72.5
1000	63.1	69.2	78.7	80.4	79.8	79.7	80.0	80.2	82.1	82.7	85.0	82.4	82.0	78.6	72.0
1250	62.8	68.4	75.5	76.3	78.5	79.4	79.0	79.2	80.8	81.4	84.4	82.9	81.6	77.5	70.6
1600	62.7	69.8	76.7	78.5	79.0	78.6	80.0	80.4	80.1	81.6	83.6	83.3	79.6	76.6	68.4
2000	64.2	75.1	84.1	87.2	84.7	86.7	83.8	84.2	81.9	83.5	83.4	83.1	82.2	81.3	71.8
2500	62.0	75.2	83.4	83.2	82.9	86.7	85.0	82.2	83.4	81.6	82.6	81.2	79.2	77.2	69.8
3150	60.6	73.1	85.4	84.6	85.9	84.9	86.2	84.8	81.6	80.9	81.8	81.1	79.3	76.9	67.5
4000	57.8	74.7	84.4	84.4	84.1	83.9	86.2	82.5	81.6	79.9	82.0	80.9	78.0	76.5	67.4
5000	55.8	73.2	82.7	82.6	81.3	82.4	82.7	80.3	79.1	78.1	79.2	78.6	75.4	73.7	64.4
6300	51.2	69.4	79.2	77.9	77.4	77.8	78.9	76.1	76.9	75.2	76.5	75.3	72.4	69.1	60.4
8000	46.6	63.7	76.2	75.1	73.9	73.9	75.4	72.9	72.5	71.8	72.6	71.9	69.4	65.8	55.5
10000	41.4	58.6	69.8	69.1	70.3	68.4	72.0	68.4	70.3	68.3	70.2	68.0	64.8	59.8	50.2
OVERALL CALCULATED	80.0	86.7	93.5	94.7	95.2	95.9	96.6	96.3	97.2	97.6	98.9	98.8	98.5	97.0	93.3
PNDB	87.7	98.6	107.4	107.6	106.4	108.8	109.4	108.3	107.7	107.3	108.2	107.9	106.5	104.9	97.6

QEP FAN C SCALE MODEL

.55 M INLET

WITH 1 SPLITTER

58% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) @ ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	PNL
50	71.8	69.1	67.7	68.9	65.8	66.7	68.8	68.7	70.8	69.9	70.9	72.5	73.1	74.9	78.7	120.9
63	67.1	63.9	65.0	64.9	65.0	69.1	66.9	66.8	76.3	69.1	70.0	71.9	73.3	74.8	77.2	120.9
80	63.7	61.7	64.3	64.2	64.4	64.7	66.5	66.3	67.7	68.5	70.4	71.5	71.6	73.7	75.5	118.8
100	69.9	71.1	69.8	73.0	73.0	69.8	72.6	76.0	77.2	74.7	76.7	75.6	76.1	74.7	78.0	124.0
125	62.1	62.3	63.0	63.9	65.0	63.2	64.9	65.0	65.3	66.2	66.9	68.2	69.2	69.1	70.1	116.1
160	62.0	61.8	62.6	61.8	61.7	60.7	61.5	61.7	62.7	63.6	65.8	67.8	69.2	70.9	72.8	115.5
200	65.0	69.2	68.1	69.0	66.8	67.2	64.9	65.7	67.9	68.1	71.1	71.9	70.0	74.8	77.1	120.6
250	64.1	64.9	67.1	66.0	66.2	66.2	68.0	67.9	69.9	73.1	72.8	74.0	75.0	75.8	78.1	121.3
315	67.3	70.3	72.2	71.1	71.9	72.0	70.8	70.9	73.0	77.2	74.9	75.7	75.3	75.8	75.9	123.8
400	69.9	70.2	69.8	72.7	71.8	72.9	72.9	70.8	78.1	70.6	71.9	72.6	75.9	71.7	72.1	123.4
500	65.9	66.0	65.6	64.4	64.6	65.7	67.8	67.9	65.7	68.0	68.6	72.5	71.8	71.9	71.7	118.7
630	67.2	67.4	69.1	68.0	68.1	68.4	71.2	69.4	70.4	72.1	72.0	71.9	74.2	73.0	71.3	121.1
800	65.2	66.1	67.1	65.8	65.8	67.2	68.0	67.1	69.0	69.1	70.8	70.9	71.3	71.8	69.9	119.2
1000	64.3	65.4	66.2	66.0	67.0	66.2	67.1	67.1	68.2	69.4	72.0	72.2	72.2	71.0	70.1	119.4
1250	64.1	65.2	65.8	66.0	66.1	66.2	65.7	66.0	67.1	68.1	69.8	70.9	70.3	70.8	68.9	118.4
1600	64.0	64.0	64.9	66.9	69.9	66.1	65.0	65.2	67.0	67.2	68.9	69.1	69.1	69.0	68.3	117.6
2000	66.3	66.1	69.4	71.0	68.4	68.4	64.9	65.2	66.0	67.1	69.3	68.2	70.2	71.1	70.1	119.0
2500	75.9	78.9	82.8	81.9	79.8	77.1	74.0	71.8	73.8	74.8	73.8	75.6	79.9	82.7	78.8	129.1
3150	64.1	67.4	71.4	69.1	67.1	66.8	65.1	66.0	64.3	66.0	68.3	69.0	68.3	70.4	68.4	118.5
4000	63.8	66.	70.1	68.7	65.8	66.9	63.6	63.7	63.7	65.7	67.8	67.7	69.0	71.6	69.9	118.4
5000	67.2	74.	78.4	75.0	69.1	70.4	69.3	65.2	70.1	68.1	70.0	69.9	69.5	76.0	74.1	123.4
6300	66.3	69.[illegible]	74.6	70.4	68.5	66.3	65.3	65.4	65.5	65.1	68.4	69.1	69.7	71.2	68.5	120.5
8000	64.1	73.6	77.4	73.3	68.5	68.2	66.9	65.3	65.0	66.0	68.3	70.9	70.2	74.4	73.4	123.1
10000	63.1	71.2	76.4	74.0	69.1	67.1	66.9	63.2	64.0	65.2	66.9	68.0	69.2	72.0	70.4	122.8
12500	60.1	68.3	73.9	70.7	66.8	63.0	63.7	61.0	63.0	62.0	64.6	65.5	64.8	68.8	66.0	121.2
16000	59.9	65.7	70.7	67.6	64.8	61.7	60.4	57.6	62.7	58.8	65.5	62.4	61.7	64.6	63.5	120.6
20000	50.3	61.7	66.4	63.1	61.3	58.3	58.1	54.5	62.3	56.4	63.1	59.0	59.3	60.2	58.5	119.8
OVERALL MEASURED	85.2	85.9	86.8	86.8	84.7	84.0	83.9	84.6	85.9	86.1	86.0	86.8	87.9	88.9	89.0	
OVERALL CALCULATED	81.9	84.1	87.4	86.0	84.0	82.9	82.5	82.2	85.0	84.2	85.0	85.7	87.1	88.3	88.1	134.0
PNDB	95.2	98.1	101.4	100.4	98.3	96.5	95.1	93.8	95.4	96.2	96.7	97.8	100.2	102.2	100.0	

QEP FAN C FULL SCALE
.55 M INLET
WITH 1 SPLITTER
58% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	59.7	64.6	65.4	70.2	71.3	68.9	72.1	79.6	76.6	73.6	75.0	72.6	71.6	68.1	67.9
63	51.8	55.6	58.6	61.0	63.2	68.2	64.2	64.5	64.7	65.2	65.1	65.3	64.5	62.4	57.8
80	51.5	54.2	50.1	58.9	59.9	59.6	60.9	61.1	62.1	62.5	64.0	64.9	64.7	64.1	62.3
100	55.1	62.3	63.5	66.0	64.9	66.0	64.2	65.2	67.2	67.0	69.2	69.0	71.4	67.6	66.4
125	53.2	57.6	62.5	63.0	64.3	65.0	67.3	67.3	69.2	72.0	70.9	71.0	70.3	66.7	65.2
160	56.1	63.1	67.4	68.0	70.0	70.8	70.1	70.3	72.2	76.0	72.9	72.6	70.5	68.7	64.8
200	50.6	62.9	65.0	69.5	69.0	71.6	72.1	70.1	77.3	69.4	69.9	69.5	71.1	64.4	60.7
250	54.4	58.5	60.7	61.2	62.6	64.4	67.0	67.2	64.8	66.7	66.8	69.3	66.9	64.5	60.2
315	55.4	59.7	64.1	64.7	66.0	67.1	70.4	68.6	69.5	70.7	70.0	68.6	69.2	65.5	59.6
400	53.2	58.4	62.0	62.4	61.6	68.8	67.1	66.4	68.1	67.8	68.7	67.6	66.2	64.1	57.9
500	52.1	57.5	61.0	62.6	64.8	64.8	66.8	66.3	67.8	68.0	69.8	68.7	67.0	63.2	57.9
630	51.6	57.2	60.5	62.5	63.9	64.8	64.7	65.2	66.1	66.7	67.0	67.4	65.0	62.9	56.5
[illegible]	51.2	59.8	59.5	63.3	63.6	64.6	64.0	64.3	65.9	65.8	66.6	65.0	63.7	60.8	55.5
[illegible]	53.3	57.0	63.9	67.4	66.1	66.9	63.8	64.3	65.0	69.6	67.0	64.5	64.7	62.8	57.1
[illegible]	62.6	70.5	77.8	70.3	77.6	75.0	72.9	70.9	72.1	73.2	71.4	71.9	74.3	74.2	69.5
[illegible]	50.4	58.8	65.7	65.3	64.7	64.6	64.0	63.1	63.2	64.4	65.9	65.2	62.6	61.7	54.7
2000	49.8	57.3	64.4	65.0	63.4	65.4	62.8	62.9	62.7	64.2	65.4	64.0	63.2	63.0	55.9
2500	52.0	69.2	72.5	71.1	66.7	68.8	68.2	64.3	69.0	66.5	67.6	66.1	63.6	67.0	59.7
3150	51.3	60.4	68.6	66.6	68.1	64.8	64.3	64.6	64.9	63.6	66.0	65.2	63.7	62.0	53.6
4000	48.5	64.0	71.3	69.5	66.1	66.8	66.0	64.6	64.1	64.6	65.9	67.1	64.1	64.8	57.8
5000	47.5	61.9	70.7	70.6	67.3	65.3	66.5	63.1	63.7	64.3	65.0	64.0	63.5	62.8	54.8
6300	43.4	50.6	68.2	67.6	65.2	62.5	63.8	61.3	63.1	61.5	63.1	62.3	59.2	59.2	49.4
8000	41.0	55.7	65.2	64.9	63.9	61.9	61.3	58.7	63.5	59.0	64.6	59.6	56.1	54.5	45.4
10000	38.0	51.8	60.9	60.8	61.1	59.3	59.9	56.5	64.1	57.5	62.9	58.7	53.8	49.5	38.1
OVERALL CALCULATED	68.4	75.6	81.7	82.4	81.7	81.3	81.3	81.1	83.3	82.6	82.5	81.9	81.5	79.[illegible]	75.0
PNDB	77.5	87.2	94.1	93.7	92.5	92.3	92.0	90.3	92.6	91.5	92.5	92.1	90.8	90.0	83.2

QEP FAN C SCALE MODEL

.55 M INLET

WITH 2 SPLITTERS

90% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	PWL
50	80.0	78.9	75.7	79.0	76.7	79.9	81.2	82.7	83.7	84.7	85.7	86.9	89.9	94.9	100.0		138.1
63	76.1	76.2	76.9	78.9	78.6	79.1	81.4	82.9	85.1	85.2	86.9	86.9	91.3	96.4	101.1		139.2
80	75.4	75.8	77.5	79.7	78.2	79.4	82.0	82.7	84.5	85.8	87.9	88.5	91.7	99.7	100.5		139.0
100	74.9	77.9	76.8	81.1	79.9	80.8	82.4	83.0	84.1	85.1	85.8	87.0	91.0	94.0	99.9		136.8
125	76.0	78.3	78.3	80.4	79.9	80.1	80.6	81.4	83.3	83.4	85.4	87.0	88.3	90.6	92.1		134.7
160	85.1	85.8	83.9	77.8	85.7	88.0	88.3	87.8	86.0	90.0	86.1	88.9	90.2	92.9	96.0		138.6
200	75.9	78.1	78.1	77.9	77.7	80.1	81.3	83.9	85.9	87.3	90.0	92.2	94.3	97.3	98.0		139.7
250	80.1	81.0	82.9	82.8	81.9	83.8	85.4	86.8	88.8	90.0	93.0	94.9	97.2	99.0	97.9		141.9
315	84.9	87.1	88.1	89.1	87.8	90.1	88.2	89.2	91.9	92.4	94.9	95.0	97.4	98.1	98.0		143.0
400	82.9	85.0	85.3	86.2	85.7	85.8	86.3	86.8	88.1	89.3	89.9	91.2	93.3	92.3	92.1		139.0
500	82.0	86.1	84.2	82.7	82.8	84.7	83.0	85.7	85.7	86.1	89.8	92.8	93.9	92.9	91.9		138.7
630	79.4	83.3	85.6	85.1	86.0	86.3	86.4	88.1	90.2	91.3	91.4	92.2	94.6	92.3	90.1		140.0
800	80.0	84.1	84.4	83.2	84.1	84.1	85.5	86.9	88.2	88.4	91.2	91.0	92.1	90.1	88.2		138.4
1000	79.4	82.3	82.3	82.1	84.0	84.4	84.7	86.4	87.4	87.5	90.1	91.5	91.6	89.5	87.0		137.9
1250	79.0	81.2	81.1	82.2	83.0	83.2	84.3	85.2	87.2	87.1	90.2	91.0	90.4	88.3	85.0		137.3
1600	77.3	79.3	81.2	82.1	83.1	83.0	83.3	85.1	87.4	88.3	88.1	89.4	89.3	87.4	84.9		136.7
2000	76.4	79.4	81.6	82.2	80.3	82.3	81.4	84.2	85.2	87.2	87.4	88.2	88.6	86.5	85.2		135.7
2500	76.9	79.1	81.0	80.9	80.8	82.1	81.1	81.9	84.8	84.2	87.9	88.2	88.3	85.9	83.7		135.2
3150	75.3	78.3	83.5	83.2	83.0	82.3	82.7	83.6	84.4	86.5	88.2	88.5	86.5	84.4	83.1		135.8
4000	78.2	85.4	89.4	88.3	85.2	88.0	84.5	85.0	84.2	85.3	87.0	88.3	88.2	89.1	87.2		138.0
5000	76.2	83.5	87.5	87.6	85.5	84.3	83.6	84.3	85.3	83.4	85.3	86.2	85.6	87.3	83.2		136.6
6300	73.4	81.7	87.7	84.9	84.4	84.5	83.8	81.6	83.8	83.9	85.8	85.5	85.9	83.6	82.4		136.1
8000	71.5	80.0	85.8	82.9	81.5	80.5	81.1	80.6	80.8	81.9	83.6	83.6	82.9	83.8	80.7		134.5
10000	69.6	78.9	82.9	80.0	78.8	78.7	80.0	77.8	79.6	79.8	81.0	81.9	82.1	81.0	79.8		133.2
12500	66.0	75.1	78.1	76.7	74.9	73.9	76.0	73.7	75.9	76.9	78.0	78.0	78.2	78.1	76.7		130.7
16000	62.4	71.5	75.2	72.1	71.0	70.0	73.3	70.3	72.3	73.6	75.1	74.4	75.3	74.5	75.3		129.4
20000	60.4	67.8	69.8	67.6	67.3	65.4	69.9	67.3	70.3	70.7	71.4	72.6	72.8	71.8	73.3		128.9
OVERALL MEASURED	93.8	96.9	97.1	97.6	96.5	97.8	97.9	98.6	99.6	101.1	102.9	104.0	105.1	107.1	108.7		
OVERALL CALCULATED	93.2	96.2	98.0	97.5	97.1	98.1	97.9	98.9	100.3	101.2	102.9	104.0	105.6	106.8	108.5		152.2
PNDB	103.6	108.6	111.6	110.9	109.4	110.9	109.6	110.3	111.1	112.2	113.9	114.7	115.2	115.4	114.4		

QEP FAN C FULL SCALE
.55 M INLET
WITH 2 SPLITTERS
90% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	64.8	71.3	72.5	78.3	78.2	79.8	81.8	82.6	83.9	84.1	84.1	84.2	86.7	87.4	85.7
63	65.7	71.6	73.8	77.6	78.2	79.1	80.0	80.9	82.7	82.4	83.7	84.2	83.9	83.9	81.6
80	74.6	75.9	79.4	74.9	83.9	86.9	87.7	87.3	85.4	89.0	84.3	86.0	85.7	86.1	85.5
100	65.2	71.2	73.5	74.9	75.8	79.0	80.6	83.4	85.2	86.2	88.1	89.3	89.7	90.4	87.3
125	69.2	74.0	78.2	79.8	80.0	82.6	84.6	86.2	88.1	88.8	91.2	91.8	92.6	92.0	87.0
160	73.0	79.9	83.3	86.1	85.8	88.9	87.4	88.5	91.1	91.2	93.0	91.9	92.6	90.9	86.9
200	71.6	77.7	80.4	83.0	83.7	84.6	85.3	86.1	87.3	88.0	87.9	88.0	88.4	85.0	80.8
250	70.9	78.7	79.2	79.5	80.8	83.4	82.1	85.0	84.9	84.8	87.7	89.6	89.0	85.5	80.4
315	67.7	75.8	80.6	81.8	83.9	85.0	85.5	87.4	89.3	90.0	89.3	88.9	89.6	84.7	78.4
400	68.0	76.4	79.3	79.9	81.9	82.8	84.6	86.1	87.2	87.0	89.0	87.7	87.0	82.4	76.2
500	67.2	74.5	77.1	78.7	81.8	83.0	83.7	85.6	86.5	86.1	87.9	88.1	86.4	81.7	74.8
630	66.5	73.2	75.8	78.7	80.8	81.7	83.3	84.4	86.3	85.7	88.0	87.6	85.1	80.4	72.6
800	64.6	71.1	75.8	78.5	80.8	81.5	82.3	84.2	86.3	86.8	85.7	85.8	83.9	79.2	72.2
1000	63.3	71.0	76.1	78.5	77.9	80.8	80.4	83.3	84.1	85.7	85.1	84.6	83.1	78.1	72.2
1250	63.6	70.6	75.4	77.2	78.4	80.5	80.0	80.9	83.7	82.6	85.5	84.5	82.7	77.4	70.4
1600	61.[illegible]	69.7	77.3	79.5	80.6	80.8	81.6	82.6	83.3	85.0	85.8	84.7	80.8	75.8	69.4
2000	64.2	76.6	83.6	84.5	82.8	86.5	83.5	84.1	83.2	83.8	84.6	84.6	82.5	80.3	73.1
2500	61.8	74.4	81.6	83.7	83.0	82.7	82.5	83.4	84.2	81.8	82.9	82.4	79.7	78.3	68.8
3150	58.5	72.5	81.7	81.0	82.0	83.0	82.8	80.7	82.8	82.3	83.4	81.6	79.9	74.3	67.5
4000	55.8	70.4	79.7	79.0	79.1	79.1	80.2	79.9	79.9	80.4	81.2	79.7	76.8	74.3	65.0
5000	54.0	69.7	77.2	76.6	76.9	77.8	79.7	77.7	79.3	78.9	79.2	78.5	76.4	71.7	64.2
6300	49.3	65.5	72.4	73.5	73.3	73.4	76.1	74.0	76.0	76.4	76.5	74.8	72.5	68.5	60.0
8000	44.2	61.5	69.6	69.3	70.0	70.3	74.2	71.4	73.2	73.8	74.2	71.6	69.7	64.4	57.2
10000	40.1	57.1	64.3	65.3	67.0	66.4	71.7	69.3	72.1	71.8	71.1	70.3	67.3	61.1	53.0
OVERALL CALCULATED	81.2	88.3	92.5	93.9	94.8	96.6	96.8	97.8	99.1	99.6	100.5	100.4	100.2	98.4	94.6
PNDB	87.7	98.4	104.9	106.0	106.2	107.6	107.7	107.9	109.0	108.9	109.8	108.9	107.5	104.4	98.4

QEP FAN C SCALE MODEL

.55 M INLET

WITH 2 SPLITTERS

58% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	PWL
50	69.7	69.0	66.0	67.7	65.4	66.8	69.2	69.7	70.7	70.9	71.9	71.9	72.8	74.7	78.9		120.9
63	66.1	64.3	66.2	64.9	64.9	64.7	67.2	70.1	75.8	70.2	71.0	71.8	73.9	73.9	77.8		121.1
80	62.7	62.7	64.5	64.6	63.5	64.3	64.6	67.4	69.3	68.6	70.4	71.4	71.8	73.5	76.7		119.1
100	70.1	68.2	70.9	74.0	72.6	72.0	74.0	76.6	78.7	74.8	73.7	74.7	74.9	73.0	76.7		124.7
125	62.0	62.3	64.4	65.2	63.9	64.0	64.2	65.0	65.9	67.1	67.2	68.3	69.2	69.4	69.9		116.3
160	61.0	62.2	64.1	61.7	62.5	61.6	61.9	62.9	63.6	65.8	66.6	69.0	70.1	70.8	72.9		116.2
200	65.8	66.2	71.0	68.1	67.9	66.0	69.1	69.8	68.0	73.9	70.8	72.1	75.2	75.2	77.1		121.3
250	61.7	63.2	64.8	64.9	64.8	66.6	67.2	69.8	70.7	72.9	72.7	74.0	75.1	76.1	75.9		121.4
315	64.8	68.1	69.1	68.9	68.8	72.1	70.1	73.9	75.1	78.0	74.0	76.1	75.0	76.2	75.8		124.0
400	67.1	68.1	69.2	71.7	69.7	71.7	69.1	73.1	73.7	70.1	71.0	70.7	72.8	70.8	70.7		121.4
500	64.9	65.9	66.7	66.7	64.7	67.7	66.2	68.7	67.8	68.0	69.6	71.7	72.0	71.7	71.6		119.0
630	64.2	67.2	68.5	67.1	69.0	68.3	70.6	71.1	71.1	71.4	73.0	73.0	74.4	73.5	71.2		121.4
800	63.8	66.3	68.1	66.0	65.9	67.0	68.1	68.9	69.0	70.2	72.1	72.1	72.2	71.2	70.0		119.8
1000	63.3	66.4	67.1	67.1	66.9	66.9	67.2	65.3	69.2	69.4	72.3	72.3	72.2	70.4	69.2		119.8
1250	64.1	66.4	69.1	66.9	65.9	65.8	66.1	66.8	68.7	68.2	70.9	70.9	71.2	70.2	68.8		119.0
1600	62.9	65.2	68.2	67.0	66.0	65.9	65.1	66.9	67.1	68.4	69.2	69.2	70.1	69.1	67.9		118.2
2000	64.0	65.3	69.3	68.1	64.9	67.3	63.9	65.0	65.9	68.2	68.2	68.1	69.4	69.2	68.0		117.9
2500	70.8	75.1	82.2	78.0	75.7	72.8	70.3	69.8	70.8	69.9	73.0	74.7	75.2	77.9	72.9		120.0
3150	60.1	63.4	69.4	68.1	66.2	65.0	63.6	65.0	65.0	67.5	68.0	69.4	67.2	67.4	66.1		117.7
4000	62.9	66.4	68.4	66.1	62.8	64.8	63.1	63.1	63.0	66.0	66.8	67.2	68.3	70.2	68.1		117.2
5000	64.5	70.6	72.5	71.2	68.0	66.1	65.4	67.1	68.1	67.3	68.4	69.4	70.6	75.6	70.1		120.8
6300	64.4	69.0	73.0	68.5	65.3	65.6	65.6	64.3	65.4	65.4	67.3	68.7	69.8	70.8	67.6		119.5
8000	62.8	73.1	77.0	72.5	67.6	67.4	64.9	65.7	65.4	65.9	68.6	70.4	69.9	73.6	69.5		122.5
10000	61.6	73.3	76.0	72.7	68.5	65.6	65.8	63.6	64.8	64.8	66.5	69.6	68.8	71.7	67.5		122.5
12500	58.9	70.4	74.0	69.8	66.5	63.9	63.2	60.9	62.9	62.1	63.6	66.0	65.9	68.9	64.7		121.2
16000	56.4	67.3	71.4	68.1	64.2	62.0	61.2	59.1	62.0	59.5	61.2	63.1	63.5	65.2	62.0		120.8
20000	54.4	64.0	66.8	63.3	61.3	59.6	57.8	55.4	61.5	57.6	57.5	59.4	60.5	60.5	58.6		119.8
OVERALL MEASURED	83.6	85.2	85.8	84.8	83.6	83.8	83.2	84.6	86.6	86.1	86.8	86.7	86.9	88.0	88.6		
OVERALL CALCULATED	79.8	82.9	86.6	84.1	82.1	81.8	81.7	83.4	84.8	84.5	84.6	85.6	86.3	87.1	87.3		133.3
PNDB	91.8	95.8	100.7	97.0	95.6	94.4	93.0	93.6	94.5	94.6	96.2	97.4	98.0	99.6	96.9		

QEP FAN C FULL SCALE
.55 M INLET
WITH 2 SPLITTERS
58% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	57.9	61.6	66.6	71.2	70.9	71.0	73.4	76.3	78.2	73.8	72.0	71.9	70.5	66.4	66.5
63	51.7	55.6	60.0	62.4	62.1	63.0	63.6	64.9	65.3	66.1	65.4	65.4	64.7	62.7	59.6
80	50.5	55.4	59.6	58.8	60.7	60.6	61.2	62.4	63.0	64.8	64.8	66.1	65.6	64.0	62.4
100	55.1	61.2	66.5	65.1	66.1	64.9	68.4	69.2	67.3	72.8	68.9	69.1	70.7	68.2	66.4
125	50.8	56.2	60.1	61.9	62.9	65.5	66.5	69.2	70.0	71.8	70.8	70.9	70.5	69.0	65.0
160	53.6	60.9	64.3	65.8	66.8	70.9	69.3	73.3	74.3	76.8	72.1	73.0	70.2	69.0	64.6
200	55.8	60.8	64.4	68.6	67.7	70.5	68.3	72.4	72.9	68.9	69.0	67.6	68.0	63.5	59.4
250	53.4	58.4	61.8	63.5	62.7	66.4	65.3	68.0	67.0	66.7	67.6	68.4	67.1	64.3	60.1
315	52.5	59.7	63.5	63.8	66.9	67.0	69.7	70.4	70.2	70.1	70.9	69.8	69.4	65.9	59.5
400	51.8	58.6	63.0	62.7	63.7	65.7	67.2	68.2	68.1	68.8	69.9	68.8	67.1	63.5	58.0
500	51.1	58.6	62.0	63.7	64.7	65.5	66.3	68.5	68.3	68.0	70.1	68.9	67.0	62.5	57.0
630	51.7	58.4	63.8	63.4	63.6	64.3	65.1	66.0	67.7	66.8	66.6	67.4	65.9	63.2	56.4
800	50.8	57.0	62.8	63.4	63.7	64.4	64.1	66.0	66.0	66.9	66.9	65.7	64.7	60.9	55.2
1000	51.0	57.0	63.9	64.5	62.9	65.7	62.4	64.1	64.9	66.7	65.9	64.5	64.0	60.8	55.0
1250	57.5	66.6	76.6	74.4	73.3	71.3	69.3	68.9	69.7	68.3	73.6	71.0	69.6	69.5	59.6
1600	46.4	54.7	63.7	64.4	63.7	63.5	62.5	64.1	63.9	65.9	65.5	65.6	61.6	58.8	52.4
2000	48.9	57.6	62.7	62.4	60.4	63.3	62.1	62.2	62.0	64.5	64.4	63.4	62.5	61.4	54.1
2500	50.0	61.5	66.5	67.4	69.5	64.5	64.3	66.2	67.0	65.7	65.9	65.6	64.7	66.5	55.7
3150	49.5	60.6	67.0	64.6	62.8	64.0	64.6	63.5	64.4	63.9	64.9	64.8	63.8	61.5	52.7
4000	47.1	63.5	70.9	68.6	65.2	66.0	64.0	65.0	64.6	64.5	66.3	66.6	63.8	64.0	53.8
5000	46.0	64.0	70.3	69.3	66.6	64.7	65.5	63.5	64.5	63.9	64.6	66.2	63.1	62.5	51.9
6300	42.3	60.8	68.3	68.6	65.0	63.4	63.3	61.2	63.0	61.6	62.1	62.8	60.2	59.3	48.1
8000	38.2	57.3	65.9	65.4	63.3	62.2	62.1	60.1	62.9	59.7	60.3	60.4	58.0	55.2	43.9
10000	34.1	53.3	61.3	61.0	61.0	60.6	59.6	57.4	63.3	58.6	57.3	57.1	55.0	49.8	38.3
OVERALL CALCULATED	66.4	74.1	81.0	80.5	79.8	80.3	80.4	82.7	83.2	82.8	81.9	81.8	80.6	78.5	74.0
PNDB	74.8	86.6	93.4	92.3	90.6	91.0	90.4	91.1	91.9	91.4	92.0	92.0	90.0	89.3	80.7

QEP FAN C SCALE MODEL
.55 M INLET
WITH 3 SPLITTERS
90% FAN SPEED
100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) : ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	( )	PWL
50	79.2	77.8	74.8	75.8	76.6	76.5	78.0	78.0	80.8	82.8	83.0	84.9	86.6	91.6	95.7			134.6
63	72.9	73.8	75.7	76.2	70.0	77.0	78.0	79.0	80.8	81.9	83.0	84.4	86.0	91.8	93.9			134.6
80	74.0	74.3	75.3	76.0	78.2	77.6	77.9	78.0	81.6	83.5	83.4	84.9	87.4	91.4	94.8			134.5
100	73.1	74.9	74.6	70.2	77.5	77.9	70.2	79.1	80.9	81.8	82.0	84.2	86.7	89.6	91.7			132.9
125	74.1	75.8	77.8	78.2	78.0	77.9	78.2	78.4	80.0	82.1	83.3	83.3	85.2	88.0	89.0			132.0
160	77.1	80.9	85.6	83.9	83.5	83.9	83.2	77.7	83.8	87.6	89.0	85.1	86.8	90.6	92.7			136.0
200	73.0	74.8	76.0	76.0	75.9	77.0	78.1	79.0	82.8	85.2	87.2	89.4	91.8	94.8	94.9			137.0
250	78.2	80.0	81.0	80.0	81.6	81.7	82.3	82.9	86.9	87.8	89.1	91.3	93.8	95.7	94.1			138.6
315	82.4	85.1	86.8	83.3	86.6	86.1	84.4	88.4	91.1	90.2	89.9	92.1	93.9	96.1	94.9			140.2
400	81.0	82.8	81.8	81.2	82.9	82.7	82.3	83.0	84.7	85.1	86.8	88.0	88.8	89.7	88.8			135.5
500	77.9	80.9	79.6	78.9	79.5	79.7	80.0	80.1	82.7	85.0	86.8	88.9	89.9	90.7	88.9			135.2
630	78.3	82.1	83.0	82.3	82.2	80.2	83.3	84.5	87.0	89.1	88.1	89.3	91.0	91.0	88.3			137.2
800	77.3	81.1	81.1	79.4	81.8	81.1	82.4	83.3	85.0	86.2	86.9	88.1	89.8	89.8	85.9			135.6
1000	76.1	79.0	79.2	79.3	80.9	81.0	81.4	83.2	84.2	86.3	87.3	89.3	89.0	88.3	84.3			135.3
1250	77.3	78.9	79.8	79.4	80.0	80.1	81.2	82.1	83.8	85.9	86.1	88.1	88.8	88.0	84.1			134.8
1600	74.3	76.0	70.9	78.4	79.0	79.9	79.5	82.1	83.1	85.2	85.0	87.2	87.1	85.9	82.9			133.8
2000	73.0	75.8	78.1	79.2	79.1	79.9	78.2	80.1	82.2	84.0	85.0	85.5	86.2	84.9	82.0			132.9
2500	74.0	76.6	78.7	78.0	79.8	79.8	79.3	79.2	81.7	83.8	85.0	86.0	86.0	84.7	83.0			133.0
3150	72.1	75.9	79.1	77.2	79.9	78.2	78.2	80.2	80.9	81.3	83.3	85.3	84.2	83.2	81.3			132.0
4000	73.1	74.6	80.7	82.0	81.0	82.0	77.9	80.0	80.7	82.8	84.1	85.0	86.7	83.9	81.8			133.4
5000	73.2	78.3	80.4	78.7	78.0	78.0	77.6	79.6	81.4	82.5	81.3	84.5	83.4	83.4	80.4			132.1
6300	73.1	80.3	84.0	81.2	82.9	81.3	79.6	80.4	78.8	80.1	83.0	82.3	83.2	82.0	81.0			133.1
8000	72.2	80.1	85.1	83.6	83.2	81.4	79.7	79.6	80.3	80.4	80.1	82.3	82.0	82.1	79.0			133.7
10000	71.2	82.3	84.1	82.3	82.9	81.1	79.4	79.3	78.1	79.1	79.3	80.2	80.3	80.0	78.2			133.7
12500	68.0	79.9	80.9	78.4	78.8	77.0	76.1	79.2	75.9	75.1	76.0	77.3	77.0	77.9	75.0			131.5
16000	65.9	77.7	77.9	75.2	74.5	72.9	72.2	72.2	71.8	72.8	73.0	73.2	73.6	73.6	71.9			130.1
20000	63.9	71.4	72.7	69.7	69.6	68.4	70.0	67.9	68.4	69.5	69.5	71.7	69.6	69.4	68.6			128.5
OVERALL MEASURED	92.1	93.9	95.6	94.1	95.5	94.9	94.9	96.1	97.8	98.7	99.9	100.9	102.6	103.8	104.7			
OVERALL CALCULATED	90.4	93.7	95.4	94.2	95.1	95.1	94.4	95.8	97.7	98.9	99.6	101.0	102.4	104.1	104.5			149.2
PNDB	100.2	104.3	106.9	106.3	106.6	106.8	105.2	106.5	107.9	109.5	110.4	111.8	112.8	112.4	111.2			

QEP FAN C FULL SCALE
.55 M INLET
WITH 3 SPLITTERS
90% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	63.8	68.3	70.8	75.4	75.8	76.9	77.6	78.7	80.3	80.8	80.3	81.4	82.4	83.0	81.6
63	63.8	69.1	73.4	75.4	76.3	76.9	77.6	77.9	79.4	81.1	81.5	80.4	80.8	81.3	78.7
80	66.6	74.1	81.1	81.0	81.7	82.8	82.9	77.2	83.2	86.6	87.2	92.2	82.3	83.8	82.2
100	62.3	67.8	71.4	73.1	74.0	75.9	77.4	78.9	82.2	84.1	85.3	86.5	87.2	87.9	84.2
125	67.3	72.9	76.3	77.0	79.7	80.6	81.6	82.4	86.2	86.7	87.2	88.2	89.1	88.7	83.2
160	71.3	77.9	82.1	80.3	84.7	84.9	83.7	87.7	90.3	89.0	88.0	89.0	89.1	88.9	83.8
200	69.7	75.5	77.0	78.1	80.9	81.5	81.5	82.3	83.9	83.9	84.8	84.9	84.0	82.4	77.5
250	68.4	73.5	74.7	75.7	77.5	78.4	79.2	79.5	81.8	83.7	83.9	85.7	85.0	83.2	77.4
315	66.6	74.5	78.0	79.0	80.1	84.9	82.4	83.8	86.1	87.8	86.0	86.3	86.0	83.4	76.5
400	65.3	73.4	76.0	76.0	79.6	79.8	81.5	82.6	84.1	84.8	84.7	84.6	84.7	82.1	73.9
500	63.9	71.2	74.0	75.9	78.7	79.6	80.4	82.4	83.3	84.9	85.1	85.9	83.9	80.4	72.1
630	64.9	70.9	74.5	75.9	78.5	79.6	80.2	81.3	82.8	84.5	83.9	84.7	83.6	80.0	71.7
800	61.5	67.9	73.5	74.8	76.7	78.4	78.9	81.3	82.1	83.8	82.7	83.6	81.7	77.7	70.2
1000	60.0	67.5	72.6	75.6	76.7	78.4	77.1	79.2	81.1	82.5	82.7	81.9	80.7	76.5	68.9
1250	60.7	68.1	73.1	74.3	77.4	78.2	78.2	78.3	80.6	82.2	82.6	82.3	80.4	76.2	69.6
1600	58.4	67.2	73.4	73.8	77.5	76.6	77.1	79.3	79.9	80.1	80.9	81.5	78.5	74.9	67.6
2000	59.1	65.6	75.0	78.2	78.6	80.5	76.9	79.1	79.7	81.3	81.7	81.3	80.9	75.1	67.8
2500	58.8	69.2	74.5	74.8	75.5	76.4	76.5	78.7	80.3	80.9	78.9	80.6	77.5	74.3	66.0
3150	58.2	71.0	78.0	77.4	80.4	79.7	78.6	79.6	77.8	78.6	80.6	78.4	77.3	72.7	66.1
4000	56.5	70.5	79.0	79.7	80.9	79.9	78.8	78.9	79.4	79.0	77.8	78.5	75.9	72.5	63.4
5000	55.6	73.1	78.4	78.9	81.1	80.2	79.1	79.2	77.8	78.3	77.5	76.8	74.6	70.7	62.6
6300	51.4	70.3	75.2	75.2	77.2	76.5	76.2	75.5	76.0	74.6	74.5	74.1	71.3	68.2	58.3
8000	47.8	67.7	72.4	72.5	73.0	73.2	73.1	73.2	72.7	73.0	72.0	70.4	68.0	63.6	53.8
10000	43.5	60.7	67.5	67.3	69.3	69.5	71.8	69.9	70.2	70.6	69.3	69.4	64.1	58.7	48.3
OVERALL CALCULATED	78.1	85.5	90.1	90.7	92.8	93.6	93.3	94.6	96.6	97.3	97.2	97.5	97.1	96.0	91.3
PNDB	85.2	96.6	102.4	103.1	104.9	104.9	104.3	105.2	106.0	106.7	106.7	106.5	105.1	101.8	95.5

QEP FAN C SCALE MODEL
.55 M INLET
WITH 3 SPLITTERS
58% FAN SPEED
100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	PNL
50	69.9	70.7	68.5	70.1	68.4	66.7	68.1	70.9	68.8	69.7	69.9	72.2	72.9	74.8	78.7	120.8
63	64.9	62.9	66.0	66.2	65.9	63.7	65.3	70.4	67.7	68.8	70.1	72.2	72.1	74.1	77.2	119.5
80	62.8	62.3	64.5	64.0	64.2	63.3	69.6	69.7	68.3	69.5	69.5	70.7	71.7	73.6	75.8	118.9
100	68.9	69.9	70.9	71.1	71.8	67.8	70.0	78.2	76.9	74.8	73.9	76.2	75.6	72.9	76.8	123.4
125	61.2	61.9	62.9	62.4	63.8	63.1	63.3	69.3	64.1	65.0	65.9	67.2	68.2	72.2	70.3	116.3
160	60.8	61.8	61.7	61.2	61.6	62.7	64.8	68.9	63.9	64.8	65.8	67.9	69.8	71.6	72.9	116.5
200	65.9	69.8	67.9	67.2	64.9	72.8	79.2	73.3	70.8	70.1	72.8	72.1	75.0	76.0	76.1	122.4
250	63.1	65.6	66.6	64.2	68.6	65.8	68.0	70.0	72.9	72.8	73.8	74.3	75.0	75.7	76.8	121.6
315	66.2	68.0	68.0	67.2	70.8	67.9	69.4	70.4	74.1	73.9	73.9	74.4	73.8	74.7	74.9	122.2
400	67.2	69.8	67.9	68.2	71.9	71.7	70.1	70.0	72.0	69.1	69.8	70.3	74.0	72.9	72.0	121.0
500	66.9	66.5	67.5	65.9	66.6	64.8	66.9	68.1	67.5	69.7	69.7	72.4	72.6	72.8	71.7	119.3
630	67.2	69.3	70.2	68.5	68.1	69.9	71.4	71.5	70.2	72.4	72.1	72.3	75.2	73.9	72.4	121.7
800	65.2	67.7	67.7	66.1	67.9	66.9	67.1	68.2	68.6	70.1	72.1	72.4	73.0	73.0	72.1	120.1
1000	64.3	67.2	67.9	66.4	68.0	67.1	68.2	68.1	68.8	70.3	72.3	72.6	72.2	71.9	70.0	120.0
1250	63.9	65.9	68.0	66.2	65.8	65.6	66.2	66.2	66.9	68.9	69.8	71.4	71.8	70.7	69.1	118.7
1600	63.9	65.8	67.0	65.5	64.9	65.7	65.1	65.0	65.7	66.8	67.8	69.4	69.9	69.8	68.0	117.5
2000	65.3	65.1	67.8	66.2	65.0	65.0	64.4	64.3	64.8	66.9	67.8	68.2	69.1	69.8	66.8	117.2
2500	66.1	72.0	75.7	72.5	69.9	68.7	66.9	64.8	67.8	69.0	69.0	70.0	72.9	74.6	71.7	121.4
3150	60.4	63.0	64.9	62.5	64.1	61.8	63.2	64.1	62.8	64.2	65.1	66.2	65.9	66.7	64.9	115.1
4000	63.8	62.9	64.6	64.3	61.8	63.6	62.2	63.2	62.5	64.7	65.8	66.2	66.9	67.8	64.6	115.6
5000	64.9	70.4	69.4	67.6	64.2	63.0	63.3	66.5	66.2	66.1	65.1	68.4	68.1	70.3	66.2	118.1
6300	65.1	70.0	71.0	67.6	66.0	64.8	64.5	64.2	63.1	64.2	66.1	66.4	68.9	69.9	67.1	118.4
8000	65.4	72.1	74.1	70.6	66.1	67.9	64.9	65.2	65.2	65.3	65.2	67.2	70.0	72.0	66.2	120.8
10000	63.6	75.3	74.1	70.6	68.1	65.1	63.5	64.5	65.1	64.3	64.9	66.2	69.0	71.0	66.9	121.7
12500	61.0	73.2	72.9	69.4	67.6	63.7	63.3	63.0	64.7	61.8	63.0	63.3	66.0	68.7	64.7	121.3
16000	57.9	71.0	71.9	67.4	65.6	61.9	62.0	60.2	61.9	60.0	60.7	61.0	63.6	65.6	62.7	121.3
20000	54.9	67.7	66.7	63.1	61.6	59.5	58.0	58.7	59.5	56.5	56.6	58.9	60.6	61.6	58.6	120.1
OVERALL MEASURED	83.8	85.7	84.9	84.1	83.8	83.5	84.1	84.9	84.6	85.7	85.6	85.9	86.8	87.5	88.6	
OVERALL CALCULATED	79.4	83.5	84.0	82.0	81.6	81.0	81.8	82.7	83.4	83.4	84.0	85.1	86.1	86.7	87.0	134.9
PNDB	90.4	94.6	96.6	94.2	92.9	92.2	91.7	92.2	92.7	93.6	94.1	95.1	96.9	98.0	96.0	

QEP FAN C FULL SCALE
.55 M INLET
WITH 3 SPLITTERS
58% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	58.8	63.3	66.6	68.4	70.1	66.8	69.5	71.8	76.3	73.8	72.2	73.4	71.3	66.3	66.6
63	50.9	55.2	58.5	59.6	62.1	62.1	62.7	68.8	63.5	64.0	64.2	64.3	63.8	65.5	60.0
80	50.3	54.9	57.2	58.3	59.8	61.6	64.2	68.4	62.8	63.7	64.0	65.0	65.3	64.8	62.4
100	55.2	62.9	63.4	64.3	63.0	71.6	74.5	72.8	70.1	69.0	71.0	69.1	70.4	69.1	65.4
125	52.2	58.6	61.9	61.2	66.7	64.7	67.3	69.4	72.2	71.7	71.9	71.3	70.3	68.6	65.9
160	55.1	60.8	63.2	64.2	68.8	66.7	68.6	69.7	73.3	72.7	72.0	71.3	69.1	67.6	63.8
200	55.9	62.5	63.0	65.1	69.9	70.4	69.3	69.4	71.2	67.8	67.8	67.1	69.1	65.6	60.7
250	55.4	59.1	62.6	62.7	64.6	63.5	66.1	67.4	66.7	68.4	67.6	69.1	67.7	65.4	60.2
315	55.5	61.7	65.2	65.2	66.0	68.6	70.5	70.8	69.3	71.1	70.0	69.0	70.2	66.3	60.6
400	53.2	60.0	62.6	62.8	65.7	65.6	66.1	67.5	67.7	68.8	70.0	69.0	67.9	65.3	60.1
500	52.1	59.3	62.7	63.0	65.9	65.7	67.2	67.3	67.9	68.9	70.1	69.1	67.0	64.1	57.8
630	51.5	58.0	62.7	62.7	63.6	64.2	65.3	65.3	65.9	67.5	67.6	67.9	66.5	62.7	56.6
800	51.2	57.6	61.6	61.9	62.6	64.2	64.1	64.2	64.7	65.4	65.5	65.9	64.5	61.7	55.3
1000	52.3	56.7	62.3	62.6	62.6	63.5	63.3	63.4	63.7	65.3	65.5	64.6	63.6	61.5	53.8
1250	52.7	63.5	70.1	68.8	67.5	67.1	65.8	63.9	66.7	67.5	66.6	66.3	67.3	66.1	58.4
1600	46.7	54.3	59.2	58.8	61.6	60.3	62.1	63.2	61.8	62.7	62.7	62.4	60.2	58.1	51.2
2000	49.8	54.1	58.8	60.5	59.4	62.1	61.2	62.3	61.5	[illegible]	63.4	62.4	61.1	59.0	50.6
2500	49.8	61.3	63.5	63.7	61.7	61.4	62.2	65.5	65.1	64.5	62.6	64.6	62.2	61.3	51.8
3150	50.2	60.8	65.0	63.7	63.5	63.3	63.5	65.3	62.1	62.7	63.7	62.6	62.9	60.7	52.2
4000	49.8	62.6	68.0	66.7	63.7	66.5	63.7	64.5	64.3	63.9	62.8	63.4	63.9	62.5	50.5
5000	47.8	66.0	68.4	67.2	66.2	64.3	63.2	64.3	64.8	63.4	63.1	62.8	63.3	61.7	51.3
6300	44.3	63.5	67.2	66.2	66.0	63.2	63.5	63.3	64.8	61.4	61.5	60.1	60.3	59.1	48.1
8000	39.8	61.0	66.3	64.6	64.7	62.1	62.9	61.3	62.7	60.2	59.8	58.2	58.1	55.6	44.6
10000	34.6	57.0	61.2	60.8	61.4	60.5	59.8	60.8	61.3	57.6	56.4	56.6	55.1	50.9	38.3
OVERALL CALCULATED	66.5	74.7	78.4	78.1	79.2	[illegible]	80.6	81.3	82.2	81.6	81.5	81.2	80.5	78.2	73.9
PNDB	75.3	87.9	91.1	90.4	90.2	90.6	90.0	90.7	90.8	90.5	90.3	90.1	89.8	87.8	79.5

QEP FAN C SCALE MODEL

.65 M INLET

WITHOUT SPLITTERS

90% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	( )	( )	PWL
50	76.6	74.8	77.0	77.3	78.5	80.8	81.0	81.9	83.8	83.8	85.7	87.7	92.0	95.6				135.1
63	75.5	74.8	79.0	77.8	77.6	80.0	81.3	83.1	84.0	84.7	85.8	88.0	92.0	97.1				135.8
80	75.2	76.4	78.7	79.2	78.6	80.4	81.9	83.7	84.4	85.4	87.4	88.6	92.7	95.7				135.9
100	76.5	75.0	79.0	79.9	80.6	82.0	81.8	83.0	83.7	84.0	86.7	88.1	90.8	92.0				134.3
125	76.7	76.2	78.4	79.8	79.8	81.2	80.4	81.5	81.9	82.8	84.9	87.1	88.2	89.4				132.9
160	81.0	79.1	80.9	83.6	85.9	86.7	84.2	84.2	82.9	85.7	87.7	88.1	90.9	93.0				136.0
200	73.6	77.2	77.3	77.8	79.0	80.8	82.1	84.1	86.8	80.1	91.1	93.2	95.3	94.3				137.9
250	80.9	81.6	82.2	82.6	83.9	84.7	85.2	87.3	88.0	90.7	93.0	94.9	96.8	95.2				139.7
315	83.9	85.9	90.0	87.7	86.7	86.0	87.3	90.4	90.8	91.6	93.8	96.0	96.3	94.1				141.1
400	84.6	82.8	83.9	84.5	84.6	84.6	85.1	85.9	86.9	87.7	89.6	90.8	89.9	89.1				136.9
500	82.6	81.8	82.9	82.6	80.9	82.6	82.9	85.0	85.7	87.9	90.9	92.0	90.9	88.9				136.8
630	83.1	89.3	92.4	90.2	89.9	89.3	88.2	89.6	93.3	90.3	93.0	92.4	90.5	88.2				140.6
800	83.8	83.3	82.4	84.8	86.8	87.1	85.1	88.2	87.9	89.1	89.8	90.0	89.1	86.3				137.5
1000	81.9	81.2	80.5	83.9	84.0	85.1	85.3	86.5	88.3	89.0	90.0	90.2	88.3	84.5				136.9
1250	81.7	83.0	83.0	83.8	83.0	84.1	84.1	86.4	86.7	87.9	90.1	89.3	87.3	84.0				136.4
1600	80.1	85.1	86.5	84.2	85.1	83.2	82.8	84.5	85.9	86.9	88.2	88.4	85.4	84.2				135.9
2000	82.9	86.2	87.5	82.2	87.0	83.1	82.9	83.6	86.0	86.0	87.1	88.5	86.3	85.2				136.1
2500	80.7	86.2	83.3	84.0	83.8	80.8	82.2	83.1	85.0	85.9	86.8	87.9	86.2	83.0				135.7
3150	84.3	88.3	87.3	80.0	88.3	85.1	83.6	83.6	85.4	86.1	87.4	86.3	86.6	86.5				137.2
4000	87.7	93.3	93.3	91.0	93.9	88.9	88.4	87.4	88.1	88.1	87.9	91.3	92.3	89.1				141.6
5000	86.4	89.5	88.5	87.2	87.3	86.3	83.8	85.6	83.3	83.3	86.7	86.4	86.8	84.5				137.5
6300	83.5	90.7	88.1	88.7	88.5	85.6	84.8	83.1	83.5	84.8	83.8	85.7	86.0	84.8				138.0
8000	86.9	89.9	88.0	86.7	85.7	85.7	82.0	83.0	81.7	82.7	83.7	85.1	85.9	82.2				137.6
10000	83.1	86.1	84.4	84.1	82.8	81.2	80.2	80.1	79.1	79.9	80.1	81.3	82.4	79.1				135.1
12500	80.0	82.5	80.3	80.0	79.3	78.3	77.2	76.5	75.9	77.2	76.2	77.4	78.3	75.4				132.7
16000	78.6	82.0	79.2	77.5	79.6	75.6	78.1	76.1	74.6	74.8	74.6	76.0	77.1	74.1				133.7
20000	77.1	80.5	78.6	74.9	78.9	73.2	78.9	75.5	74.1	72.2	74.2	74.2	74.2	72.2				135.1
OVERALL MEASURED	96.7	99.8	99.8	98.5	99.5	98.9	97.8	98.9	100.6	100.6	102.6	103.9	104.7	104.7				
OVERALL CALCULATED	96.9	100.2	100.3	99.3	99.8	98.7	98.1	99.4	100.6	101.1	102.9	104.1	104.8	105.0				151.6
PNDB	110.4	114.5	114.4	113.1	114.5	111.0	111.2	111.5	112.4	112.8	113.8	115.6	115.9	114.0				

QEP FAN C FULL SCALE
.65 M INLET
WITHOUT SPLITTERS
90% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	69.9	70.6	76.2	78.2	79.6	81.4	80.8	82.4	82.7	82.3	83.9	83.8	83.4	81.8
63	70.0	71.8	75.5	78.1	78.8	80.6	80.0	80.9	80.8	81.1	82.1	82.7	81.9	79.1
80	75.0	74.6	78.0	31.8	84.8	86.1	83.6	83.9	81.9	83.9	84.8	83.6	84.1	82.5
100	69.7	72.6	74.3	76.0	77.9	80.1	81.0	83.4	85.7	86.2	88.1	88.6	88.3	83.6
125	73.8	76.9	79.2	80.7	81.7	84.0	84.6	86.5	87.6	88.8	90.0	90.2	89.0	84.3
160	76.7	81.2	86.9	85.8	85.9	85.3	86.7	89.6	89.6	89.9	90.7	91.2	89.2	83.0
200	77.3	78.0	80.7	82.6	83.4	83.8	84.9	85.1	85.6	85.7	86.5	86.0	82.6	77.8
250	75.1	76.9	79.7	80.5	79.6	81.8	82.2	84.1	84.4	85.9	87.7	87.1	83.4	77.4
315	75.6	84.4	89.2	80.1	84.8	80.5	87.5	88.7	91.9	88.2	89.8	87.4	82.9	76.5
400	76.1	78.2	79.0	82.6	85.4	86.2	84.3	87.3	86.5	86.9	86.5	84.9	81.4	74.3
500	74.1	76.0	77.1	81.7	82.6	84.1	84.5	85.6	86.9	86.8	86.6	85.0	80.4	72.3
630	73.7	77.7	79.6	81.5	81.6	83.1	83.2	85.4	85.3	85.6	86.7	84.0	79.3	71.6
800	71.9	79.7	82.9	81.9	83.6	82.2	81.3	83.4	84.4	84.6	84.7	83.0	77.3	71.4
1000	74.6	80.7	83.9	79.8	85.4	82.0	81.6	82.5	84.5	83.7	83.4	83.0	78.0	72.2
1250	72.3	80.6	79.6	81.6	82.2	79.7	81.3	82.0	83.5	83.5	83.1	82.3	77.8	69.7
1600	75.6	82.4	83.6	85.6	86.8	84.0	82.7	82.6	83.8	83.7	83.6	80.6	77.9	72.9
2000	78.9	87.6	89.6	88.6	92.3	87.8	87.5	86.3	86.6	85.8	84.1	85.6	83.5	75.1
2500	77.4	83.6	84.7	84.7	85.7	85.2	82.9	84.6	81.7	80.8	82.8	80.5	77.8	73.1
3150	74.2	84.7	84.2	86.3	87.0	84.6	84.0	82.1	82.0	82.4	80.0	79.7	76.8	69.8
4000	77.3	83.8	84.1	84.3	84.3	84.9	81.3	82.2	80.3	80.3	79.8	79.0	76.4	66.5
5000	73.8	80.4	81.0	82.2	81.9	80.9	80.0	79.8	78.2	78.1	76.8	75.7	73.1	63.5
6300	70.4	76.8	77.2	78.4	78.8	78.4	77.5	76.6	75.4	75.6	73.0	71.7	68.7	58.7
8000	68.6	76.4	76.4	76.6	79.9	76.4	79.2	77.0	74.8	73.9	71.9	70.4	67.1	56.0
10000	66.4	75.0	76.3	74.7	80.0	75.0	80.5	77.3	75.1	72.0	71.9	68.7	63.5	51.8
OVERALL CALCULATED	88.5	94.6	96.8	97.0	98.3	97.6	97.2	98.3	98.9	98.7	99.3	98.7	96.5	91.6
PNDB	101.8	107.7	109.3	109.7	111.6	109.5	109.0	107.1	109.0	108.6	108.3	107.9	105.2	97.8

QEP FAN C SCALE MODEL

.65 M INLET

WITHOUT SPLITTERS

58% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	( )	( )	PWL
50	67.4	67.8	70.0	69.7	67.8	68.8	68.7	69.7	70.5	70.5	71.8	74.0	75.0	78.0				120.8
63	63.9	65.1	70.3	67.9	64.8	66.6	71.0	71.2	68.8	68.7	71.9	72.3	74.1	78.0				120.2
80	62.2	64.5	69.5	69.2	64.4	66.3	68.9	68.7	69.3	69.3	71.7	72.9	73.7	75.9				119.0
100	66.0	60.2	71.1	72.8	68.4	69.9	74.0	70.1	74.9	72.9	76.8	76.9	74.0	76.2				123.9
125	61.7	63.0	64.8	64.7	64.0	64.1	63.9	65.0	65.7	66.7	67.9	69.3	72.4	70.2				116.3
160	60.5	62.0	62.7	62.7	62.8	62.5	62.7	65.7	65.7	66.5	68.8	70.2	71.2	73.2				116.2
200	63.6	64.9	67.2	66.6	70.8	67.8	69.8	72.8	71.9	73.8	73.9	76.3	75.0	76.3				121.9
250	64.5	66.1	64.8	67.0	66.5	68.7	69.0	70.9	72.6	72.7	75.0	75.9	76.3	75.9				121.7
315	68.0	68.9	69.0	71.6	70.7	70.8	70.0	73.9	74.9	74.0	74.8	75.3	75.0	74.0				122.8
400	68.5	68.9	68.9	70.5	70.6	70.1	69.1	74.0	70.8	70.6	71.9	73.1	71.9	70.8				121.1
500	67.6	66.8	68.1	69.7	68.7	65.9	67.0	69.9	68.8	69.0	72.6	72.9	71.9	71.8				119.2
630	68.9	69.2	67.2	68.8	69.9	70.3	70.2	71.9	72.8	72.2	73.3	75.5	73.2	71.4				121.6
800	68.8	67.0	67.8	68.7	68.8	68.9	69.2	70.8	70.0	72.0	73.1	73.1	72.1	71.3				120.5
1000	66.8	67.5	67.5	68.9	69.0	68.3	68.4	70.2	70.2	72.9	74.1	73.5	71.2	69.5				120.7
1250	69.8	70.3	69.3	68.9	68.8	68.1	67.8	67.0	69.0	71.7	72.1	72.3	71.1	70.3				120.2
1600	70.1	70.2	69.4	68.1	68.9	67.2	66.0	67.0	68.1	68.9	71.0	71.2	71.4	70.5				119.5
2000	73.0	75.3	75.5	72.2	73.2	68.3	68.2	69.2	70.0	70.0	70.0	73.3	74.5	72.5				122.6
2500	86.8	89.1	82.1	81.7	81.8	76.8	76.2	76.9	77.0	76.0	78.8	82.5	85.1	81.2				132.7
3150	74.2	75.4	71.8	71.4	68.3	67.2	66.9	65.4	68.3	68.1	70.3	70.5	73.7	71.4				121.4
4000	73.9	75.4	74.4	69.0	70.9	67.9	68.1	66.2	68.0	68.8	70.2	72.1	76.4	71.3				122.5
5000	82.3	80.6	79.8	76.2	74.3	73.7	69.5	71.5	70.3	70.3	75.4	76.8	78.9	74.8				127.5
6300	75.8	79.2	75.9	73.5	71.6	68.7	68.8	68.7	68.5	69.6	68.9	71.9	74.2	71.3				124.3
8000	79.1	81.3	78.2	75.0	73.7	72.1	68.0	70.2	67.9	69.0	70.9	74.1	76.1	71.1				126.9
10000	76.3	78.3	76.3	74.0	70.0	68.1	66.1	68.4	69.8	66.1	67.3	70.3	73.3	68.5				125.1
12500	74.3	75.8	72.5	71.3	68.4	66.2	64.6	65.6	63.4	64.4	64.2	66.4	68.6	65.6				123.6
16000	73.1	74.3	71.3	68.8	68.9	65.9	68.3	66.1	63.8	63.8	64.2	66.4	65.5	64.4				124.7
20000	69.7	71.0	67.7	65.4	67.3	64.4	66.9	64.8	62.3	60.4	62.7	63.9	63.1	61.9				124.7
OVERALL MEASURED	90.9	91.1	88.0	86.5	85.6	84.9	84.7	85.9	86.5	85.5	87.6	88.6	89.9	88.8				
OVERALL CALCULATED	90.0	91.7	87.9	86.6	85.9	83.8	83.7	85.5	84.9	85.0	86.9	88.6	89.8	88.3				138.3
PNDB	104.3	106.1	101.8	100.8	100.5	97.4	96.8	98.0	97.9	97.7	100.0	102.5	104.2	101.4				

QEP FAN C FULL SCALE
.65 M INLET
WITHOUT SPLITTERS
58% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	60.2	63.8	66.4	71.1	67.6	69.4	74.9	77.9	73.9	71.2	73.2	72.6	67.4	66.1
63	55.0	58.6	61.2	62.9	62.9	63.4	63.5	64.4	64.7	65.0	65.1	64.9	65.7	59.9
80	53.7	57.6	59.8	60.9	61.7	61.9	62.2	63.1	64.7	64.7	65.9	65.7	64.4	62.6
100	56.6	60.3	66.3	64.7	69.6	69.1	68.7	71.3	70.8	71.9	70.9	71.7	68.1	65.6
125	57.4	61.4	61.8	66.0	69.4	68.0	68.4	70.2	71.5	70.8	72.0	71.3	69.2	65.0
160	60.8	64.2	65.9	69.7	69.5	70.1	69.3	73.1	73.7	72.0	71.8	70.5	67.9	62.9
200	61.2	64.0	65.7	68.5	69.4	69.3	68.5	73.2	69.6	68.6	68.8	68.3	64.6	59.5
250	60.1	61.9	64.9	63.6	64.4	64.7	66.3	68.1	67.5	67.5	69.4	68.0	64.4	60.3
315	61.4	64.2	63.9	66.7	68.6	69.4	69.5	70.5	71.5	70.2	70.0	70.5	65.7	59.7
400	60.3	61.9	63.7	66.6	66.6	68.0	68.5	69.3	68.7	69.6	69.8	68.0	64.4	59.3
500	59.0	62.3	64.1	66.7	67.6	67.3	67.6	69.2	68.8	70.7	70.7	68.3	63.4	57.3
630	61.0	65.0	65.8	66.7	66.6	67.1	66.9	68.0	67.6	69.5	68.6	67.0	63.1	57.8
800	62.0	64.8	65.9	65.8	67.4	66.1	65.1	65.9	66.6	66.6	67.5	65.8	63.3	57.7
1000	64.7	69.8	71.9	69.8	71.7	67.3	67.3	68.2	68.4	67.6	66.4	67.8	66.2	59.5
1250	78.3	83.5	78.4	79.3	80.2	75.7	75.3	75.8	75.4	73.6	75.2	76.9	76.6	67.8
1600	65.5	69.7	67.9	68.9	66.8	66.1	65.5	65.4	66.8	65.6	66.6	64.8	65.1	57.7
2000	65.1	69.7	70.6	67.4	69.4	66.8	67.2	67.1	66.5	66.4	66.5	66.4	67.6	57.3
2500	73.2	74.7	75.9	73.8	72.7	72.6	68.0	70.4	68.7	67.8	71.5	70.9	69.8	60.3
3150	66.6	73.2	72.0	71.1	70.1	67.7	68.0	67.7	67.0	67.1	65.1	65.9	64.9	56.4
4000	69.5	75.2	74.2	72.8	72.3	71.2	67.3	69.4	66.5	66.6	67.0	68.0	66.5	55.4
5000	67.0	72.6	72.9	72.1	69.2	67.7	66.0	68.0	65.0	64.2	63.9	64.6	64.0	52.9
6300	64.6	70.1	69.3	69.8	67.9	66.3	64.9	65.7	62.9	62.8	61.0	60.0	59.0	49.0
8000	63.0	68.8	68.6	67.9	69.1	66.8	69.4	67.0	64.1	62.9	61.4	60.8	55.5	46.3
10000	59.0	65.5	65.3	65.1	68.4	66.2	68.8	66.6	63.4	60.1	60.4	58.4	52.4	41.5
OVERALL CALCULATED	81.3	86.0	84.2	84.2	84.4	82.7	82.7	84.3	83.3	82.6	83.1	83.1	81.2	75.0
PNDB	93.5	97.4	97.2	96.3	96.1	95.1	93.9	94.7	93.4	92.9	94.2	93.8	92.1	83.7

QEP FAN C SCALE MODEL

.65 M INLET

WITH 1 SPLITTER

90% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	PNL ( )
50	80.0	77.9	74.5	77.1	75.6	79.0	79.7	80.0	82.9	82.7	83.8	84.5	87.0	92.0	96.6		135.2
63	75.3	73.9	76.0	77.0	77.8	79.1	79.6	83.2	85.8	82.7	84.9	86.0	88.2	92.9	98.9		136.9
80	74.9	74.7	76.3	77.9	77.7	78.5	79.5	80.5	82.4	83.5	85.9	86.3	88.8	92.8	97.4		136.2
100	73.9	76.8	75.9	79.9	77.7	79.8	79.8	80.8	82.7	82.8	84.9	85.9	87.9	91.1	93.0		134.4
125	74.2	76.4	77.3	79.6	78.4	79.2	79.1	79.1	81.0	81.9	84.6	84.2	86.2	88.3	90.3		132.7
160	76.1	79.9	81.0	83.9	83.1	84.8	81.8	80.1	83.9	86.9	89.8	87.7	87.9	91.8	93.6		136.5
200	74.3	75.2	76.8	76.3	77.1	78.0	78.7	80.9	84.1	84.9	88.0	89.9	92.9	95.9	96.1		137.9
250	79.4	80.3	80.8	81.0	82.2	83.2	82.6	84.1	87.0	88.0	91.2	93.1	95.2	97.2	95.8		140.0
315	83.2	84.1	82.9	87.3	89.1	89.2	86.7	87.3	88.9	90.1	92.0	93.2	95.3	97.9	96.1		141.3
400	81.1	83.2	82.8	83.2	84.2	83.9	83.9	84.0	86.0	85.6	87.9	88.8	89.9	90.8	89.7		138.5
500	79.0	82.1	80.6	81.1	80.6	81.7	80.8	81.6	84.6	84.7	86.8	89.9	90.8	91.7	89.6		136.1
630	78.6	81.5	83.1	82.3	86.3	89.1	84.3	87.5	89.3	89.0	89.2	90.9	92.5	[illegible]	89.0		138.6
800	79.4	81.5	81.8	81.1	83.6	83.0	82.7	84.1	86.1	86.0	89.0	88.9	90.2	89.9	86.8		136.4
1000	78.4	80.3	79.3	80.5	82.2	83.2	82.9	83.1	85.0	86.1	89.2	89.1	90.2	89.1	85.1		136.1
1250	77.5	80.0	79.9	81.0	82.2	82.0	81.7	82.9	84.8	85.7	88.0	89.1	89.2	88.2	84.7		135.6
1600	76.5	78.1	80.0	80.2	81.3	82.3	81.0	83.0	85.2	85.0	87.1	88.2	88.1	86.1	84.8		135.0
2000	75.2	77.5	80.1	81.3	80.4	83.2	80.1	82.1	84.1	83.9	86.1	85.9	85.3	85.9	83.2		134.0
2500	76.0	77.2	80.0	80.2	79.9	81.1	79.6	79.8	82.9	83.9	86.1	85.6	86.1	84.9	83.6		133.5
3150	75.2	80.5	84.3	84.5	82.1	83.4	81.8	80.0	82.0	83.1	86.3	87.9	86.2	85.9	84.1		134.9
4000	78.0	81.2	90.7	91.0	88.1	91.0	84.5	82.0	83.0	84.6	87.1	86.7	86.9	88.8	85.9		138.5
5000	77.4	82.5	86.2	86.5	85.4	84.4	83.1	83.3	82.0	83.8	84.2	83.9	85.3	87.0	86.1		135.7
6300	73.6	81.4	86.4	85.6	84.3	83.6	83.3	81.5	83.1	82.3	85.3	84.2	83.4	85.1	83.0		135.4
8000	72.1	79.2	87.3	85.2	82.1	81.4	81.1	79.5	81.0	83.8	83.1	82.8	83.0	84.1	83.1		135.0
10000	70.3	79.3	83.9	82.4	83.1	79.0	79.0	78.2	80.1	82.7	81.3	80.8	80.2	82.1	79.8		133.7
12500	67.0	75.0	80.6	78.1	75.8	75.9	75.0	75.7	80.8	82.4	77.7	77.6	76.8	78.8	77.5		132.5
16000	67.5	73.6	77.4	75.6	73.6	73.5	73.3	76.5	85.3	79.4	74.5	75.2	74.6	75.6	74.2		134.2
20000	60.3	71.0	74.8	72.0	70.1	71.9	69.6	75.0	84.9	76.0	71.9	72.7	71.2	72.9	71.0		133.3
OVERALL MEASURED	93.3	94.9	96.7	97.9	97.1	97.8	96.6	97.2	99.6	99.7	100.3	101.7	103.1	105.8	105.9		
OVERALL CALCULATED	91.5	94.0	97.1	97.4	97.0	98.0	95.9	96.6	99.8	99.3	101.3	102.1	[illegible]	105.4	108.2		150.7
PNDB	102.8	106.2	111.5	111.9	110.3	112.1	108.5	108.0	109.5	110.4	112.6	113.3	[illegible]	114.8	113.2		

QEP FAN C FULL SCALE
.65 M INLET
WITH 1 SPLITTER
90% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	63.8	70.2	71.5	77.2	76.0	78.8	79.3	80.4	82.1	81.8	83.2	83.1	83.5	84.5	82.9
63	63.9	69.7	72.9	76.7	76.7	78.1	78.5	78.6	80.4	80.9	82.7	81.3	81.7	81.6	80.0
80	65.6	73.1	76.5	81.0	81.3	83.8	81.1	79.5	83.3	85.9	88.0	84.8	83.4	84.9	83.2
100	63.6	68.2	72.3	73.4	75.2	76.9	78.0	80.4	83.6	83.8	86.1	86.9	88.4	88.9	85.4
125	68.9	73.2	76.1	78.0	80.3	82.0	81.9	83.6	86.3	86.9	89.3	90.1	90.9	90.1	84.9
160	72.1	77.0	78.2	84.3	87.1	88.0	85.9	86.7	88.1	88.9	90.1	90.1	90.6	90.0	85.0
200	69.8	75.9	77.9	80.1	82.2	82.7	83.1	83.4	85.2	84.4	85.9	85.6	85.1	83.5	78.4
250	67.5	74.7	75.7	77.9	78.8	80.5	79.9	81.1	83.8	83.5	84.8	86.7	85.9	84.3	78.1
315	66.9	73.9	78.1	79.1	84.2	87.0	83.3	86.7	88.4	87.7	87.1	87.7	87.5	83.5	77.3
400	67.5	73.6	76.7	77.7	80.8	81.0	81.8	83.4	85.2	84.6	86.8	85.5	85.1	82.2	74.9
500	66.2	72.4	74.1	77.1	80.0	82.8	81.9	82.3	84.1	84.7	87.0	85.6	85.8	81.3	72.9
630	65.1	72.0	74.8	77.6	79.9	80.5	80.7	82.0	83.8	84.2	85.7	85.6	84.0	80.2	72.2
800	63.8	70.0	74.6	76.6	79.0	80.8	80.0	82.1	84.2	83.5	84.8	84.6	82.7	78.0	72.0
1000	62.2	69.2	74.8	77.7	78.1	81.7	79.1	81.2	83.0	82.3	83.8	82.3	79.8	77.6	70.2
1250	62.7	68.8	74.4	76.5	77.5	79.5	78.5	78.9	81.8	81.4	83.7	81.9	80.5	76.5	70.2
1600	61.5	71.8	78.6	80.7	79.7	81.8	80.7	79.1	80.9	81.5	83.9	84.2	80.5	77.2	70.4
2000	64.0	72.4	85.0	87.2	85.7	89.5	83.5	81.2	81.9	83.0	84.7	83.0	81.2	80.0	71.8
2500	62.9	73.4	80.3	82.7	82.9	82.0	82.0	82.4	80.9	82.2	81.7	80.0	79.4	78.0	71.7
3150	58.6	72.1	80.4	81.8	81.9	82.0	82.3	80.7	82.1	80.8	82.8	80.4	77.4	75.8	68.1
4000	56.5	69.6	81.2	81.3	79.7	79.9	80.2	78.6	80.1	82.4	80.7	78.9	76.9	74.6	67.4
5000	54.7	70.0	78.2	79.0	78.2	78.1	78.7	78.1	79.8	81.8	79.4	77.4	74.5	72.8	64.2
6300	50.4	65.3	74.9	74.9	74.3	75.4	75.7	76.0	80.9	81.9	76.2	74.4	71.0	69.1	60.8
8000	49.4	63.6	71.8	72.8	72.6	73.8	74.2	77.5	86.2	79.7	73.6	72.4	69.1	65.5	56.1
10000	46.8	60.3	69.3	69.7	69.9	72.9	71.4	77.0	86.7	77.1	71.7	70.4	65.7	62.2	50.7
OVERALL CALCULATED	79.1	85.9	91.5	93.8	94.7	96.6	94.8	95.6	98.0	97.7	98.9	98.5	98.2	97.3	92.6
PNDB	87.4	97.8	104.7	106.7	106.5	108.8	106.6	106.7	108.6	108.5	108.8	107.4	105.8	104.8	97.6

QEP FAN C SCALE MODEL
.65 M INLET
WITH 1 SPLITTER
58% FAN SPEED
100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	PNL ( )
50	70.2	70.1	68.6	71.1	67.6	67.7	67.7	70.2	72.8	69.8	70.0	71.9	72.8	74.8	78.8		121.2
63	65.2	63.9	64.7	65.2	65.0	69.1	65.7	79.2	83.0	66.7	70.0	70.9	73.0	74.2	77.8		125.0
80	61.8	62.5	64.3	65.5	64.2	64.6	65.1	67.7	69.4	68.4	70.6	71.7	71.6	73.5	75.5		118.9
100	69.2	66.1	71.0	72.9	73.1	70.1	71.6	76.0	77.6	79.0	78.1	77.0	77.2	73.1	77.0		124.7
125	60.4	62.1	62.9	64.1	64.3	64.0	63.0	63.5	65.8	69.1	67.3	67.1	68.2	68.4	70.3		119.5
160	60.9	62.0	62.9	61.9	61.7	61.8	61.4	67.0	64.5	63.5	66.8	68.0	69.9	71.8	74.0		116.4
200	66.3	70.8	66.1	70.3	67.0	65.5	66.5	70.4	70.8	68.7	73.1	72.1	76.3	75.2	76.8		121.4
250	64.2	63.9	64.0	66.0	65.0	67.9	66.5	68.4	72.0	72.0	74.0	74.8	75.0	76.2	79.8		121.6
315	67.1	69.9	67.1	69.1	68.9	71.0	68.6	70.5	73.1	74.0	75.1	75.1	75.0	74.0	78.2		128.4
400	66.2	67.2	67.0	69.2	69.1	73.1	67.8	69.0	69.9	68.9	71.2	71.0	70.9	72.1	72.0		120.2
500	64.7	65.7	65.8	65.0	64.6	67.0	65.3	65.8	67.4	67.6	70.1	70.6	70.8	72.8	71.6		118.4
630	65.5	67.2	68.3	67.2	67.0	68.1	67.0	69.3	71.2	71.2	73.2	73.1	73.2	72.4	71.3		120.7
800	66.3	67.0	68.1	66.8	67.9	68.0	67.8	69.4	69.8	69.8	72.2	72.9	72.1	72.2	71.8		120.2
1000	64.4	66.1	65.9	66.5	67.0	67.4	66.7	68.3	69.0	69.2	72.2	72.3	72.5	71.1	70.0		119.7
1250	64.0	65.9	66.9	67.3	66.1	67.2	65.5	67.1	68.8	68.7	71.0	71.1	71.3	70.9	70.1		119.1
1600	65.0	66.2	67.0	68.1	68.6	69.3	65.9	66.1	68.0	68.1	70.1	70.2	70.4	69.3	70.0		118.9
2000	68.6	69.2	73.0	73.2	70.4	71.4	65.7	66.5	68.1	68.0	69.1	69.1	70.4	72.3	70.3		120.6
2500	78.2	80.9	85.7	81.9	82.0	79.0	74.5	74.0	73.6	75.6	76.9	76.9	82.9	84.1	80.7		130.9
3150	64.2	69.2	70.4	69.5	67.3	68.4	64.9	64.4	65.8	66.1	68.4	70.0	69.2	72.1	69.3		119.1
4000	64.9	67.9	71.8	70.9	68.1	69.1	65.4	64.1	64.8	66.7	68.1	69.0	69.2	74.1	71.0		119.9
5000	70.5	77.0	77.2	75.2	73.0	71.1	69.8	70.6	70.0	69.2	69.4	72.0	74.4	78.2	77.3		124.7
6300	66.7	73.6	75.2	73.7	70.5	69.5	68.2	66.6	70.4	66.2	70.3	70.5	71.3	74.3	71.2		122.6
8000	65.4	73.2	79.2	76.2	73.1	70.4	69.0	67.5	68.9	67.0	69.4	72.0	71.4	76.1	73.0		124.9
10000	64.1	74.1	77.9	75.1	72.0	69.3	67.0	67.2	70.0	66.8	69.3	71.1	70.3	76.0	71.9		125.1
12500	60.8	72.1	75.6	73.1	69.7	67.7	66.6	65.8	71.5	63.6	65.6	68.6	68.0	71.7	69.6		124.2
16000	59.5	69.6	73.4	70.6	67.5	66.7	64.0	67.6	76.3	61.4	64.3	66.4	65.7	68.5	66.3		125.8
20000	57.0	66.1	69.0	66.1	63.1	63.1	59.6	65.1	75.2	58.7	60.9	62.0	61.9	63.9	62.0		125.8
OVERALL MEASURED	85.0	87.1	88.7	86.9	86.0	84.8	83.0	85.0	88.6	85.5	87.1	86.9	88.4	89.4	88.9		
OVERALL CALCULATED	82.2	85.6	89.0	86.7	85.5	84.6	82.0	84.7	87.5	83.9	85.8	86.3	88.0	89.2	88.6		137.5
PNDB	96.6	99.7	103.2	100.8	100.1	98.9	95.3	95.7	96.5	96.6	98.4	98.8	101.9	103.6	101.3		

QEP FAN C FULL SCALE

.65 M INLET

WITH 1 SPLITTER

58% FAN SPEED

200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	59.1	61.5	66.7	70.2	71.4	69.1	71.2	75.6	77.0	74.0	74.4	74.2	72.8	66.5	66.8
63	50.1	55.4	58.5	61.3	62.8	63.0	62.3	63.0	65.2	64.1	65.6	64.2	63.8	61.7	60.0
80	50.4	55.2	58.4	58.9	59.9	60.7	60.8	66.5	63.9	62.4	65.0	65.1	65.4	65.0	63.5
100	55.6	63.0	63.5	67.3	65.2	64.4	65.8	69.8	70.1	67.6	71.5	69.2	71.7	68.2	66.1
125	53.4	56.8	59.3	63.0	63.1	66.8	65.8	67.0	71.3	70.9	72.1	71.8	70.4	69.1	64.9
160	56.0	58.7	62.3	66.0	67.0	69.8	67.9	69.9	72.3	72.8	73.1	72.0	70.3	66.8	62.1
200	54.9	59.8	62.2	66.1	67.1	71.9	67.0	68.4	69.1	67.7	69.2	67.9	66.1	64.8	60.7
250	53.2	58.2	60.9	61.8	62.6	65.7	64.5	65.1	66.6	66.3	68.0	67.4	65.9	65.3	60.1
315	53.7	59.6	63.3	63.9	64.9	66.8	66.1	68.6	70.3	69.9	71.1	69.8	68.2	64.8	59.6
400	54.4	59.3	63.0	62.7	65.8	66.6	66.9	68.7	68.9	67.7	70.1	69.5	67.0	64.5	57.9
500	52.3	58.2	60.8	63.1	64.8	66.0	65.8	67.5	68.0	67.8	70.0	68.9	67.3	63.3	57.9
630	51.5	57.9	61.6	63.8	63.8	65.7	64.5	66.2	67.8	67.3	68.8	67.6	66.0	62.9	57.7
800	52.3	58.1	61.6	64.6	65.7	67.8	64.9	65.2	67.0	66.6	67.8	66.7	65.0	61.1	57.2
1000	55.5	60.9	67.5	69.6	68.0	69.8	64.6	65.6	67.1	66.5	66.8	65.5	64.9	64.0	57.3
1250	64.9	72.4	80.1	78.2	79.6	78.3	73.4	73.1	72.5	74.0	74.5	73.2	77.3	75.6	67.4
1600	50.5	60.5	64.7	65.6	64.9	66.8	63.8	63.5	64.7	64.5	66.0	66.3	63.5	63.4	55.6
2000	50.8	59.1	66.0	67.2	65.7	67.6	64.3	63.3	63.7	65.1	65.7	65.3	63.4	65.3	57.0
2500	56.1	68.0	71.3	71.3	70.5	69.5	68.7	69.7	68.9	67.6	66.9	68.2	68.5	69.1	62.8
3150	51.7	64.4	69.2	69.8	68.1	68.0	67.2	65.8	69.4	64.7	67.9	66.6	65.3	65.0	56.3
4000	49.7	63.6	73.1	72.4	70.7	69.0	68.2	66.8	68.0	66.5	67.0	68.1	65.3	66.5	57.3
5000	48.5	64.8	72.2	71.7	70.1	68.4	68.6	67.0	69.7	65.9	67.4	67.7	64.6	66.7	56.3
6300	44.1	62.4	69.9	69.9	68.2	67.2	66.7	66.1	71.6	63.1	64.1	65.5	62.3	62.1	53.0
8000	41.4	59.6	67.9	67.8	66.5	66.9	64.9	68.7	77.2	61.6	63.4	63.6	60.2	56.5	48.2
10000	36.7	55.4	63.5	63.8	62.9	64.2	61.4	67.1	77.0	59.8	60.6	59.7	56.4	53.2	41.7
OVERALL CALCULATED	69.0	76.9	83.3	83.0	83.2	83.0	80.9	82.4	85.1	82.2	83.5	82.6	82.4	80.6	75.2
PNDB	78.7	89.3	95.3	95.3	94.4	94.2	92.6	93.3	96.2	92.2	93.5	93.3	92.5	91.8	85.0

QEP FAN C SCALE MODEL

.79 M INLET

WITHOUT SPLITTERS

88% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	( )	PWL
50	78.9	76.9	75.6	77.0	77.7	78.6	80.9	81.5	83.0	84.3	85.0	85.7	88.6	94.2	97.8			136.6
63	74.2	75.0	77.1	76.2	78.4	77.9	80.4	81.9	84.1	84.6	84.9	87.0	89.8	94.5	99.0			137.4
80	73.7	74.8	76.7	78.8	78.2	78.7	80.7	82.3	83.7	85.2	85.8	87.3	89.4	94.0	97.4			136.8
100	73.8	76.2	75.7	79.2	79.9	78.8	81.0	81.6	83.1	83.5	84.2	85.8	88.7	91.3	92.6			134.6
125	76.5	79.4	84.0	82.5	82.0	79.3	80.5	84.1	87.3	85.0	87.1	84.9	87.2	88.9	88.9			134.8
160	82.0	85.1	89.9	87.3	80.9	82.0	83.0	88.7	93.1	89.6	90.3	87.7	91.0	91.4	92.6			139.4
200	73.9	78.3	78.2	77.3	77.6	77.1	80.2	82.0	84.4	89.9	88.1	90.8	93.8	95.7	94.6			138.0
250	79.0	79.3	81.1	82.8	83.0	82.0	84.1	85.6	87.3	88.9	91.1	94.1	95.8	96.4	94.7			140.1
315	82.8	82.4	83.0	86.0	87.7	85.8	87.0	89.9	88.4	89.0	90.4	93.8	94.9	95.5	93.6			140.1
400	80.2	83.1	82.0	84.0	85.0	83.8	84.0	89.8	86.1	88.9	87.2	89.0	91.8	90.7	88.6			136.6
500	77.9	81.9	82.6	80.8	82.5	81.9	81.8	83.9	84.9	80.4	87.0	89.7	91.6	91.3	88.7			136.4
630	78.1	82.6	85.3	83.5	86.2	80.3	86.2	89.2	89.6	88.9	89.3	90.0	92.0	91.4	88.0			138.8
800	78.1	81.2	82.1	81.2	83.0	82.1	83.1	83.9	86.4	86.6	88.3	90.1	90.1	89.4	86.9			136.4
1000	77.5	80.4	80.1	80.2	82.3	82.1	83.8	84.1	85.7	87.1	87.5	90.3	90.0	88.0	84.9			136.2
1250	77.3	79.2	79.1	80.3	81.8	81.1	83.1	82.7	85.4	86.6	87.0	88.8	88.8	87.5	83.7			135.4
1600	77.2	81.5	82.2	81.4	81.9	84.0	83.2	82.7	84.5	84.7	86.1	88.2	87.9	85.8	84.0			135.1
2000	76.3	79.5	82.1	80.3	81.1	83.4	82.3	82.0	83.4	83.8	85.3	86.0	87.1	86.7	84.0			134.3
2500	75.0	76.4	81.2	80.4	81.1	81.2	79.4	80.8	82.2	83.7	85.3	85.8	86.9	85.6	82.8			133.6
3150	74.6	79.6	84.5	82.5	83.4	83.3	81.8	81.3	82.6	83.6	84.4	86.4	86.1	85.8	82.1			134.4
4000	74.3	79.8	89.3	86.4	83.1	88.2	82.7	80.3	81.5	84.2	86.6	86.3	87.4	88.8	84.2			136.6
5000	72.9	76.8	82.9	79.8	80.7	79.9	79.0	80.7	82.1	81.3	81.7	83.7	83.4	84.5	82.4			132.7
6300	70.4	76.2	83.0	80.2	80.0	79.3	78.4	77.9	79.2	80.8	82.4	82.1	82.9	84.0	80.8			132.4
8000	69.7	73.6	82.6	78.9	80.3	77.2	78.4	77.2	77.5	79.1	79.7	81.5	81.1	86.2	81.1			132.2
10000	67.2	73.0	79.9	75.1	76.6	74.7	74.0	75.0	75.3	77.6	79.2	75.9	[illegible]	81.5	81.0			130.5
12500	67.4	71.6	77.4	72.7	73.1	73.3	73.4	73.9	73.5	75.1	75.5	75.2	77.4	81.1	80.5			129.6
16000	72.6	76.7	81.3	77.6	76.4	79.1	74.7	75.1	76.7	76.1	76.4	76.4	78.1	82.2	80.0			133.9
20000	70.4	75.3	80.4	76.1	74.9	78.2	74.4	73.2	75.5	75.9	74.2	75.0	71.9	80.7	79.8			135.4
OVERALL MEASURED	92.9	95.0	96.8	99.8	96.4	96.7	95.9	97.9	99.2	99.5	100.9	102.6	103.6	106.7	105.6			
OVERALL CALCULATED	91.1	93.8	97.3	95.9	96.0	96.6	96.3	97.6	99.6	99.5	101.0	102.4	103.9	105.2	105.7			150.6
PNDB	101.1	104.9	110.8	108.9	108.3	110.0	107.8	107.7	109.3	110.2	111.9	112.7	113.7	114.6	112.0			

QEP FAN C FULL SCALE
.79 M INLET
WITHOUT SPLITTERS
88% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG, F, 70 PERCENT REL, HUM, DAY)

50	63.7	69.6	71.4	76.4	78.2	77.8	80.4	81.4	82.5	82.5	82.5	83.0	84.3	84.8	82.5
63	66.2	72.7	79.6	79.7	80.2	78.3	79.9	83.6	86.7	84.0	85.4	82.1	82.8	82.2	78.6
80	71.4	78.3	85.4	84.4	89.1	81.0	82.3	80.2	92.4	88.4	90.5	84.8	86.5	84.6	82.0
100	63.2	68.4	73.6	74.3	75.8	76.0	79.9	81.4	83.7	84.7	86.3	87.8	89.2	88.8	83.9
125	60.1	72.3	76.4	79.0	81.1	80.9	83.3	85.0	86.6	87.8	89.2	91.0	91.1	89.4	83.8
160	70.9	75.2	78.3	83.0	85.7	84.0	86.3	86.2	87.6	87.8	88.4	90.7	90.1	88.3	82.5
200	68.9	75.8	77.2	80.0	83.0	82.5	83.8	84.2	89.3	84.6	85.2	85.0	86.1	83.3	77.3
250	66.4	74.5	77.7	77.6	80.5	80.6	80.3	82.8	84.1	84.1	85.0	86.5	86.7	83.8	77.2
315	66.4	75.1	80.3	80.2	86.1	86.9	85.4	88.9	90.7	87.6	87.2	86.7	87.0	83.9	76.3
400	66.1	73.5	77.0	77.9	80.8	80.7	82.1	83.2	85.5	85.2	86.2	86.7	89.0	81.7	74.9
500	69.3	72.6	74.9	76.8	80.1	80.7	82.4	83.3	84.7	85.7	89.3	86.9	84.9	80.1	72.7
630	64.9	71.2	73.0	76.8	79.5	79.6	82.1	81.9	84.4	85.1	84.7	85.4	83.5	79.5	71.3
800	64.5	73.4	76.8	77.9	79.6	82.5	82.2	81.9	83.8	83.2	83.8	84.6	82.5	77.7	71.3
1000	63.3	71.2	76.6	76.7	78.7	81.9	81.3	81.1	82.3	82.3	83.0	82.3	81.6	78.4	71.0
1250	61.7	67.9	75.6	76.7	78.7	79.6	78.3	79.1	81.1	82.1	82.9	82.1	81.3	77.1	69.4
1600	60.9	70.9	78.8	78.7	81.0	81.7	80.7	80.3	81.5	81.7	82.0	82.7	80.4	77.2	68.4
2000	69.3	70.9	83.5	82.7	80.7	86.7	81.7	79.4	80.5	82.7	84.2	82.6	81.6	80.0	70.2
2500	58.5	67.7	77.0	76.0	78.3	78.3	78.7	79.8	81.0	79.7	79.2	79.8	77.5	75.4	68.0
3150	55.4	67.0	77.0	76.4	77.5	77.8	77.4	77.0	78.2	79.2	81.0	78.2	76.9	74.7	65.9
4000	54.0	64.0	76.5	74.7	77.9	75.8	77.6	76.5	76.6	77.7	77.4	77.6	75.0	76.6	65.5
5000	51.6	63.7	74.2	71.7	74.7	73.9	74.8	74.9	75.0	76.7	77.3	75.5	74.2	72.2	65.4
6300	50.7	62.0	71.7	69.5	71.6	72.8	73.5	73.8	73.6	74.6	73.9	72.0	71.8	71.5	63.8
8000	54.5	66.7	75.7	74.9	75.4	79.4	75.8	76.2	77.6	76.3	75.5	73.6	72.5	72.2	61.9
10000	58.1	64.6	74.9	73.8	74.6	79.3	76.2	75.3	77.3	76.9	75.9	72.7	70.4	70.0	59.5
OVERALL CALCULATED	79.0	86.0	92.0	92.4	94.5	95.1	95.1	96.5	98.5	97.8	98.6	98.8	98.6	96.6	91.3
PNDB	85.5	94.8	103.7	103.6	104.4	106.9	105.8	105.6	107.0	107.0	107.7	107.0	106.1	104.1	98.1

QEP FAN C SCALE MODEL
.79 M INLET
WITHOUT SPLITTERS
58% FAN SPEED
100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG, F, 70 PERCENT REL, HUM, DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )	PNL
50	71.9	69.0	68.0	68.9	67.6	66.8	67.5	68.0	69.0	69.9	70.9	72.4	73.8	74.9	76.8		120.8
63	67.0	64.1	69.8	69.2	66.0	65.0	65.6	67.0	72.0	69.1	70.1	71.7	75.7	74.1	76.9		120.3
80	64.3	61.7	63.6	63.7	65.3	63.7	66.0	67.0	69.6	68.8	70.9	71.5	73.3	73.7	74.5		119.1
100	66.6	64.9	70.8	70.9	72.0	69.0	71.7	70.9	70.1	74.2	72.9	72.5	75.4	73.0	75.6		123.8
125	62.9	61.0	63.4	64.4	64.2	62.5	63.9	64.9	65.4	65.1	66.1	67.8	69.2	72.6	70.2		118.2
160	61.9	59.7	61.8	68.9	62.9	61.1	61.3	62.9	64.8	64.0	66.1	68.8	69.9	72.0	73.6		116.1
200	64.9	63.8	65.8	66.3	65.7	64.9	67.7	67.9	72.2	69.0	72.0	73.6	74.7	76.3	75.9		120.9
250	65.8	63.8	66.1	68.1	71.1	68.0	70.8	68.8	71.0	72.0	73.8	74.6	75.7	76.9	76.2		122.1
315	67.9	67.2	69.1	72.4	75.0	71.4	73.9	69.6	73.3	72.1	74.1	75.0	74.8	76.4	75.3		123.3
400	66.7	66.9	67.1	69.0	74.6	72.2	71.7	68.7	72.9	71.9	71.9	72.5	73.9	72.0	74.2		122.0
500	66.7	67.0	68.0	67.9	67.9	66.0	65.5	67.8	68.0	68.1	70.9	73.5	72.9	73.2	71.0		119.7
630	67.8	68.1	69.2	68.3	71.1	68.9	69.0	70.2	72.4	71.5	73.5	74.1	75.1	73.6	71.4		121.8
800	65.7	66.1	68.3	68.1	69.9	68.3	67.8	68.8	70.0	69.1	72.3	72.6	73.0	72.4	71.2		120.4
1000	64.1	65.3	67.4	69.3	69.4	68.3	68.0	69.0	69.2	69.5	72.2	73.9	72.9	71.5	69.4		120.5
1250	67.1	68.0	70.3	71.1	70.2	69.1	67.6	67.8	69.0	69.4	71.1	72.7	71.7	71.3	70.2		120.5
1600	68.2	69.2	72.4	72.3	71.1	69.2	68.7	69.2	69.2	69.2	70.9	71.8	71.9	71.3	71.3		120.9
2000	69.2	72.2	76.6	76.7	74.8	74.4	69.1	69.4	70.3	70.6	72.6	72.0	74.3	75.6	75.5		124.0
2500	70.9	80.3	87.4	86.2	84.0	81.4	75.7	70.9	78.1	77.8	78.4	79.7	83.1	84.4	85.1		132.8
3150	67.6	71.8	76.6	73.9	72.9	68.9	68.3	67.3	67.7	67.9	69.8	72.2	71.3	73.9	70.5		122.2
4000	66.2	71.7	77.5	76.6	78.7	71.8	68.3	67.3	66.6	69.8	70.6	72.1	73.5	76.6	71.7		123.7
5000	73.6	79.0	83.0	80.3	78.1	75.2	73.7	73.7	74.2	70.0	72.0	74.9	73.9	77.2	76.1		128.0
6300	66.3	74.6	78.9	77.7	75.5	71.7	69.4	67.2	68.5	68.6	70.9	73.2	73.5	75.7	69.8		125.1
8000	66.6	72.8	81.9	78.2	77.1	72.9	71.4	68.9	69.0	68.1	70.0	72.8	72.6	75.2	71.1		126.7
10000	63.2	73.5	79.8	76.9	75.7	70.6	68.9	69.1	66.4	66.6	67.7	71.2	71.3	71.7	67.6		125.7
12500	63.9	71.4	76.2	74.3	73.4	69.4	67.8	69.1	66.0	64.1	65.4	67.9	68.0	69.2	65.0		124.4
16000	66.3	71.5	77.3	73.4	72.4	73.3	68.0	66.2	69.1	66.2	68.2	67.8	69.1	68.2	66.1		127.1
20000	64.3	70.5	75.4	71.7	71.1	72.7	67.0	65.0	69.2	66.3	67.6	66.9	68.9	67.3	66.1		128.6
OVERALL MEASURED	87.8	86.8	90.8	89.2	87.8	85.9	84.4	84.9	86.1	89.9	86.9	87.5	88.0	89.2	89.3		
OVERALL CALCULATED	83.1	86.1	91.6	90.0	88.6	86.2	84.0	88.1	85.9	84.6	86.0	87.4	88.7	89.8	89.6		139.8
PNDB	97.2	99.9	105.8	104.9	102.9	100.4	97.1	96.9	98.7	97.9	99.4	100.9	102.7	104.0	103.5		

QEP FAN C FULL SCALE
.79 M INLET
WITHOUT SPLITTERS
58% FAN SPEED
200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	56.5	58.4	66.5	68.1	70.3	68.0	71.1	76.2	77.5	73.2	71.2	69.7	71.5	66.4	65.7
63	52.6	54.3	58.9	61.6	62.5	61.4	63.2	64.4	64.8	64.1	64.4	65.0	64.8	65.9	59.9
80	51.4	52.9	56.5	58.0	61.1	60.0	60.7	62.0	64.2	62.9	64.3	65.9	65.4	65.2	63.3
100	54.2	56.8	61.2	63.4	63.9	63.8	67.0	67.4	71.5	67.9	70.1	70.6	70.1	69.4	65.2
125	54.1	56.8	61.5	65.1	69.2	66.9	70.0	68.2	70.3	70.9	71.1	71.6	71.0	69.9	65.3
160	56.8	60.0	64.3	69.4	73.0	70.2	72.9	69.2	72.6	70.9	72.2	71.9	70.0	69.2	64.2
200	55.4	59.6	62.3	65.9	72.8	71.0	70.9	68.0	72.1	70.7	69.9	69.4	69.1	64.7	62.8
250	55.1	59.6	63.1	64.7	65.8	64.8	64.6	67.2	67.1	66.8	68.9	70.3	67.6	65.7	59.5
315	55.3	60.6	64.2	65.0	69.0	67.2	68.1	69.5	71.6	70.2	71.4	70.9	70.1	66.0	59.6
400	53.8	58.4	63.2	64.8	67.8	66.9	66.9	68.0	69.1	67.7	70.1	69.3	67.9	64.7	59.2
500	51.9	57.5	62.3	65.9	67.2	66.9	67.0	68.2	68.3	68.1	70.0	70.5	67.8	63.7	57.2
630	44.6	60.0	65.0	67.6	67.9	67.6	66.6	67.0	68.1	67.9	68.8	69.3	66.5	63.4	57.8
800	55.5	61.0	67.0	68.7	68.8	67.8	67.6	67.3	68.2	67.7	68.1	68.2	66.5	63.1	58.6
1000	56.2	63.9	71.1	73.1	72.2	72.9	68.1	68.5	69.2	69.1	70.2	68.3	68.9	67.3	62.5
1250	64.9	71.8	81.8	82.5	81.6	79.9	74.6	75.0	77.1	75.6	76.0	76.0	77.5	76.0	71.7
1600	53.9	63.1	70.9	70.2	70.1	67.3	67.5	66.4	66.7	66.3	67.3	68.4	65.6	65.3	56.9
2000	52.2	62.9	71.8	72.9	70.3	70.3	67.3	66.4	65.6	68.3	68.4	68.4	67.8	67.8	57.7
2500	59.4	69.9	77.1	76.4	75.6	73.6	72.6	72.8	73.1	68.4	69.5	71.0	68.0	69.2	61.7
3150	51.4	65.3	72.9	73.8	73.0	70.1	68.9	66.4	67.5	67.1	68.5	69.3	67.6	66.4	54.8
4000	51.0	63.3	75.8	74.4	74.7	71.5	70.6	68.2	68.2	66.7	67.6	69.0	66.5	65.7	55.4
5000	47.6	64.2	74.1	73.6	73.8	69.7	68.6	66.0	66.1	65.8	65.8	67.8	65.6	62.4	52.0
6300	47.3	61.8	70.6	71.1	71.8	68.9	67.9	65.4	66.1	63.6	63.8	64.7	62.3	59.5	48.4
8000	48.2	61.5	71.8	70.7	71.4	73.5	68.8	67.3	70.0	66.5	67.3	65.0	63.6	58.2	48.0
10000	43.9	59.8	69.9	69.4	70.9	73.8	68.8	69.0	71.0	67.4	67.3	64.6	63.4	56.6	45.8
OVERALL CALCULATED	69.6	77.2	85.9	86.4	86.4	84.9	83.1	83.1	84.8	82.9	83.5	83.6	83.0	81.2	76.3
PNDB	80.6	90.5	98.3	98.4	98.4	96.7	95.4	94.9	95.9	93.4	94.3	95.0	93.5	92.1	85.5

QEP FAN C SCALE MODEL

.79 M INLET

WITH 1 SPLITTER

90% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG. F, 70 PERCENT REL. HUM. DAY) , ANGLES FROM INLET IN DEGREES (AND RADIANS)

	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.		PNL
FREQ.	(0.35)	(0.52)	(0.70)	(0.87)	(1.05)	(1.22)	(1.40)	(1.57)	(1.75)	(1.92)	(2.09)	(2.27)	(2.44)	(2.62)	(2.79)	( )	( )
50	79.0	76.9	73.6	76.9	75.4	78.7	79.7	80.9	81.8	82.5	83.8	85.0	87.0	92.9	97.0		135.6
63	74.0	74.2	75.9	76.1	76.5	79.0	79.2	82.8	82.7	82.8	85.0	85.2	87.1	93.1	98.3		136.4
80	75.4	76.5	76.3	77.8	77.1	78.8	78.8	80.8	82.5	83.5	84.9	86.6	87.9	92.5	96.6		135.8
100	72.8	75.1	74.8	79.1	77.7	80.2	79.8	82.0	82.8	82.9	84.9	84.9	87.9	91.1	93.2		134.5
125	73.1	75.3	76.8	79.3	78.0	80.4	80.1	80.3	80.1	81.2	83.2	84.4	86.1	88.0	89.4		132.5
160	73.9	80.9	82.8	85.0	84.6	80.0	86.8	81.0	82.5	83.6	86.8	88.9	90.1	90.8	94.0		136.9
200	74.0	74.8	76.0	75.9	75.7	77.9	78.9	81.1	82.9	83.7	88.0	90.3	91.9	94.9	95.8		137.4
250	78.2	79.3	80.0	80.2	79.7	81.3	83.2	84.9	86.9	87.9	90.4	92.1	94.3	96.2	95.2		139.3
315	80.9	83.1	83.7	88.1	84.7	86.2	85.2	86.9	88.8	88.1	94.4	94.1	93.2	97.1	95.1		140.9
400	80.8	82.2	82.9	83.8	83.5	84.7	83.9	85.1	85.7	86.8	88.2	89.2	90.2	91.1	90.2		136.9
500	78.8	82.1	81.5	82.0	80.7	83.0	80.7	82.8	83.7	83.6	86.7	90.2	90.9	91.0	90.1		136.2
630	78.2	81.5	83.0	85.2	85.9	89.3	85.4	89.6	89.0	88.2	90.2	90.6	91.2	91.4	89.2		138.8
800	78.2	81.3	81.0	81.1	81.8	84.1	82.9	84.9	86.7	86.0	89.1	89.3	89.0	89.2	87.1		136.4
1000	77.3	80.3	79.8	81.3	82.7	83.0	82.3	84.3	86.0	89.9	89.4	89.6	89.2	88.3	85.2		138.3
1250	78.8	81.0	82.9	83.9	83.8	87.0	84.0	89.1	85.0	86.0	88.2	89.1	88.2	88.1	85.8		138.5
1600	70.8	78.4	80.9	80.1	80.9	82.5	82.1	83.3	83.9	84.2	86.5	87.5	80.5	86.0	83.2		134.5
2000	75.0	77.8	79.0	81.1	78.8	82.5	80.8	82.2	83.2	83.2	85.9	85.4	86.5	84.2	83.0		133.6
2500	74.7	76.1	79.8	78.9	79.5	81.2	78.1	80.9	81.9	82.0	86.2	85.1	86.2	85.1	83.0		133.2
3150	74.0	76.3	79.0	78.1	80.0	80.5	78.4	80.0	81.3	82.2	85.5	85.5	84.1	83.2	81.0		132.7
4000	72.0	75.1	78.0	80.9	78.6	82.0	80.1	81.1	80.9	81.7	85.8	85.2	85.1	83.7	83.7		133.4
5000	73.0	74.4	76.9	76.2	75.9	78.2	78.4	80.1	82.9	81.3	83.1	83.4	82.4	83.2	81.1		131.9
6300	70.3	72.4	76.0	76.2	74.7	78.4	77.3	78.3	79.3	80.1	84.3	81.5	83.4	81.1	81.3		131.5
8000	71.1	74.2	79.0	75.1	74.8	76.2	77.1	78.1	78.8	79.1	81.4	83.0	80.9	80.8	80.1		131.2
10000	69.1	72.1	73.7	72.7	71.9	73.8	74.9	75.7	76.8	77.8	80.2	79.0	79.9	78.7	78.8		129.9
12500	71.2	69.4	72.4	70.3	70.2	72.6	72.6	73.5	75.1	75.5	77.8	77.5	76.7	76.6	76.6		129.0
16000	72.9	71.3	74.8	70.9	70.9	74.2	71.2	74.9	74.9	73.2	75.3	75.1	75.2	74.2	73.9		130.1
20000	69.1	69.5	73.3	69.4	67.8	71.2	68.1	72.4	72.2	70.2	72.3	72.4	71.3	72.1	71.4		130.0
OVERALL MEASURED	93.0	93.9	93.9	95.1	94.6	96.9	96.1	96.7	97.9	98.7	100.9	101.9	103.2	104.9	105.8		
OVERALL CALCULATED	90.8	92.6	93.8	95.2	94.6	97.0	99.6	97.1	98.0	98.2	101.3	102.0	102.7	104.7	109.8		149.8
PROB	100.3	102.9	104.9	106.0	105.4	107.6	106.2	107.6	108.5	108.8	112.0	112.2	112.4	112.8	112.0		

QEP FAN C FULL SCALE

.79 M INLET

WITH 1 SPLITTER

90% FAN SPEED

200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (77 DEG. F, 70 PERCENT REL. HUM, DAY)

50	62.8	68.5	70.9	76.3	76.0	79.3	79.3	81.6	82.2	81.9	83.2	82.1	83.5	84.5	83.1
63	62.0	68.6	72.4	76.4	76.2	79.4	79.5	79.9	79.9	80.2	81.4	81.5	81.7	81.3	79.1
80	63.0	74.0	78.3	82.0	82.8	86.9	86.1	80.9	81.9	82.5	85.0	86.0	85.6	83.9	83.5
100	63.3	67.9	71.4	73.0	73.9	76.8	78.2	80.9	82.2	82.6	86.2	87.3	87.3	87.0	85.1
125	67.3	72.3	75.4	77.2	77.8	80.1	82.9	84.3	86.1	86.8	88.5	89.1	89.6	89.2	84.4
160	67.8	75.9	79.0	85.0	82.8	85.0	84.4	86.3	88.0	86.9	92.4	91.0	88.5	90.0	84.0
200	69.5	74.9	78.1	80.7	81.5	83.5	83.1	84.5	84.9	85.5	86.2	86.0	85.4	83.8	78.9
250	67.2	74.7	76.6	78.8	78.6	81.7	79.8	82.1	82.8	82.3	84.7	87.0	86.0	83.6	78.6
315	66.4	74.0	78.0	81.9	83.8	80.0	84.6	88.9	88.1	86.9	88.1	87.3	86.2	83.9	77.5
400	66.2	73.6	75.9	77.6	79.7	82.7	82.0	84.2	89.8	84.6	86.9	86.0	83.9	81.5	75.1
500	65.1	72.5	74.7	77.9	80.5	81.6	81.4	83.5	85.1	84.5	87.2	86.2	84.0	80.5	73.0
630	66.4	73.0	77.6	80.4	81.5	85.6	83.0	84.3	84.0	84.5	86.0	85.6	82.9	80.1	73.4
800	65.4	70.3	75.5	76.5	76.6	81.0	81.1	82.4	82.9	82.7	84.2	84.0	81.1	77.8	70.5
1000	62.0	68.9	73.5	77.5	74.4	80.9	79.2	81.3	82.2	81.7	83.2	81.8	81.0	75.9	70.0
1250	61.3	67.6	74.2	75.2	77.1	79.6	77.1	80.0	80.8	80.4	83.8	81.4	80.6	76.6	69.4
1600	60.3	67.7	73.3	76.4	77.6	78.9	77.3	79.8	80.2	80.6	83.1	81.7	78.4	74.5	67.3
2000	58.8	66.3	72.2	77.1	76.2	80.4	79.1	80.2	79.9	80.2	83.4	81.4	79.4	74.8	69.7
2500	58.5	65.3	71.0	72.3	73.5	76.6	77.3	79.2	81.8	79.7	80.6	79.6	76.5	74.2	66.6
3150	55.4	63.2	70.0	72.3	72.3	76.8	76.3	77.4	78.3	78.6	81.8	77.7	77.4	71.9	66.4
4000	55.5	64.6	72.9	71.2	72.4	74.8	76.3	77.4	78.0	77.7	79.0	79.2	74.8	71.3	64.4
5000	53.5	62.8	68.0	69.3	70.0	72.9	74.5	75.8	76.5	77.0	78.4	75.6	74.2	69.4	63.2
6300	54.6	59.8	66.7	67.1	68.7	72.1	72.7	73.8	75.2	75.1	76.3	74.3	71.0	67.0	59.9
8000	54.8	61.3	69.2	68.1	69.9	74.4	72.1	76.0	75.8	73.4	74.3	72.3	69.7	64.1	55.8
10000	48.9	58.8	67.8	67.0	67.5	72.3	69.9	74.4	74.0	71.2	72.1	70.1	65.8	61.4	51.1
OVERALL CALCULATED	78.0	84.7	88.5	91.8	92.3	95.5	94.5	96.0	96.8	96.5	99.0	98.5	97.4	96.9	92.3
PNDB	89.4	92.6	98.6	100.5	100.9	104.4	103.6	105.4	106.7	105.9	108.2	106.8	105.0	102.1	98.3

QEP FAN C SCALE MODEL

.79 M INLET

WITH 1 SPLITTER

58% FAN SPEED

100' ARC

MODEL SOUND PRESSURE LEVELS (59 DEG, F, 70 PERCENT REL. HUM, DAY) - ANGLES FROM INLET IN DEGREES (AND RADIANS)

FREQ.	20. (0.35)	30. (0.52)	40. (0.70)	50. (0.87)	60. (1.05)	70. (1.22)	80. (1.40)	90. (1.57)	100. (1.75)	110. (1.92)	120. (2.09)	130. (2.27)	140. (2.44)	150. (2.62)	160. (2.79)	( )( )	PWL
50	70.6	67.3	67.3	66.9	65.7	67.9	66.1	71.1	70.1	69.8	71.8	72.4	73.4	74.6	78.0		120.8
63	66.4	62.7	65.4	63.9	64.0	66.0	66.1	80.3	72.0	69.8	70.4	71.4	73.9	73.9	76.8		122.7
80	63.3	61.1	65.1	63.6	64.4	64.7	65.9	68.0	68.9	69.7	69.9	71.4	72.3	72.5	75.7		119.0
100	64.5	64.5	72.7	69.9	70.7	70.2	73.0	77.2	78.1	74.7	74.3	75.6	76.5	73.7	76.7		124.5
125	61.0	61.0	66.1	63.2	65.3	63.6	63.7	65.3	65.3	66.3	67.4	67.8	69.0	69.2	70.5		116.8
160	60.5	60.3	62.4	60.9	61.9	61.9	61.3	65.1	63.8	64.6	66.3	67.6	69.5	70.8	72.8		115.7
200	63.3	6?.3	66.7	69.0	63.6	66.3	66.0	70.1	70.2	68.8	72.2	72.4	74.0	74.1	75.9		128.4
250	62.4	62.8	65.8	64.8	67.9	67.4	67.1	69.2	71.1	71.2	73.6	73.5	75.7	75.9	76.2		121.4
315	65.3	67.5	69.8	69.7	73.8	73.3	71.1	72.0	74.0	71.0	74.4	74.7	75.6	75.1	73.8		123.1
400	66.9	66.9	67.8	69.2	70.8	69.5	71.8	70.2	71.2	71.9	70.6	71.8	72.8	72.0	73.3		121.0
500	64.5	65.3	65.3	65.7	64.8	66.1	64.1	66.1	67.0	68.7	69.3	70.5	71.7	71.9	70.8		118.3
630	64.8	66.8	67.8	67.2	66.9	67.3	67.9	69.3	71.2	72.0	73.7	72.9	73.8	73.0	71.3		120.9
800	65.8	66.7	67.7	67.0	67.1	67.5	67.4	68.4	69.4	70.0	72.6	72.5	71.7	71.9	71.3		120.0
1000	64.9	64.9	67.0	65.2	66.9	67.3	67.3	68.3	69.2	70.0	72.4	72.9	72.1	71.3	69.1		119.9
1250	64.9	65.6	69.0	67.1	67.0	67.6	66.3	67.2	68.1	70.1	70.5	71.7	71.1	70.1	69.4		119.3
1600	65.6	65.6	68.8	69.0	68.0	68.3	66.5	68.3	67.3	69.0	69.6	70.6	70.1	70.3	70.1		119.3
2000	66.8	67.8	71.8	72.4	69.1	71.6	66.6	67.2	68.1	68.3	69.7	69.9	70.9	71.0	71.4		120.5
2500	76.5	78.6	86.7	84.9	80.9	83.2	73.3	75.4	77.1	73.9	77.3	79.5	81.7	82.9	80.0		131.7
3150	64.7	68.1	74.1	71.2	68.1	69.4	65.5	66.5	66.4	67.2	68.4	69.7	69.2	71.1	69.4		120.0
4000	64.6	68.0	72.8	71.0	66.9	70.3	66.2	67.1	66.3	68.0	69.7	68.9	71.1	74.1	71.1		120.7
5000	68.8	74.8	78.1	76.1	75.1	72.3	71.6	70.3	70.5	69.8	70.7	74.6	71.8	76.3	74.1		124.8
6300	66.0	70.8	76.9	73.2	71.2	70.5	67.4	68.4	66.2	68.1	69.8	70.0	71.9	74.2	71.2		122.8
8000	65.7	75.1	77.9	75.1	72.1	71.4	71.7	69.6	69.5	69.3	70.7	74.0	72.9	76.1	73.4		125.2
10000	64.6	73.8	78.8	74.8	71.8	71.0	69.4	68.0	67.1	68.0	69.1	71.6	71.5	75.0	71.8		125.3
12500	63.2	70.4	76.2	72.7	69.5	69.7	68.0	66.9	65.5	65.5	65.9	69.3	68.5	70.4	69.4		124.0
16000	63.0	68.7	74.1	71.0	68.2	68.3	65.4	66.4	64.2	62.8	64.2	66.8	66.0	68.0	67.0		124.1
20000	60.0	65.0	70.3	65.5	64.1	63.4	60.7	63.3	62.3	60.1	61.5	61.9	63.1	63.1	61.2		122.7
OVERALL MEASURED	84.0	85.8	89.0	87.8	85.8	86.1	84.4	86.2	86.2	85.8	86.3	87.6	87.6	88.7	89.0		
OVERALL CALCULATED	81.2	84.2	89.8	87.7	85.3	86.2	82.8	85.6	85.0	84.1	85.6	86.8	87.8	88.6	88.1		137.5
PNDB	95.4	98.0	104.2	102.3	99.6	100.9	95.2	96.8	97.6	96.3	98.6	100.2	101.4	102.6	100.8		

QEP FAN C FULL SCALE

.79 M INLET

WITH 1 SPLITTER

58% FAN SPEED

200' SIDELINE

FULL SIZE SOUND PRESSURE LEVELS SCALED FROM MODEL DATA (59 DEG. F, 70 PERCENT REL. HUM. DAY)

50	54.3	57.9	68.3	67.1	69.8	69.2	72.4	76.7	77.5	73.7	72.6	72.8	72.1	67.1	66.6
63	50.7	54.3	61.7	60.4	63.5	62.6	63.1	64.8	64.6	65.3	65.7	64.9	64.6	62.5	60.2
80	50.8	53.5	57.9	58.0	60.1	60.9	60.6	64.5	63.2	63.5	64.5	64.7	65.0	63.2	62.3
100	52.6	60.6	62.2	62.0	61.8	65.1	65.3	69.5	69.5	67.7	70.4	69.4	70.3	67.2	65.2
125	51.6	55.7	61.2	61.8	66.0	66.3	66.4	68.6	70.4	70.0	71.7	70.5	71.0	68.9	65.3
160	54.2	60.3	65.0	66.6	71.8	72.1	70.3	71.4	73.2	70.6	72.5	71.6	70.8	67.9	62.7
200	55.6	59.6	63.0	66.0	68.0	68.2	70.8	69.5	70.4	70.7	68.6	68.6	67.9	64.7	62.0
250	53.0	57.9	60.4	62.5	62.8	64.8	63.3	65.4	66.2	67.4	67.3	67.3	66.8	64.5	59.3
315	53.1	59.2	62.8	64.0	64.8	66.0	66.6	68.8	70.3	70.7	71.6	69.6	68.8	65.5	59.6
400	53.8	59.0	62.6	63.6	65.0	66.1	66.5	67.7	68.9	68.6	70.4	69.2	66.6	64.2	59.3
500	52.7	57.1	61.8	61.8	64.7	65.9	66.3	67.5	68.3	68.6	70.2	69.5	66.9	63.4	56.9
630	52.4	57.7	63.8	63.6	64.8	66.2	65.4	66.4	67.2	66.6	68.2	68.2	65.8	62.1	56.9
800	52.8	57.5	63.4	65.5	65.7	66.8	65.5	67.4	66.3	67.5	67.3	67.1	64.7	62.1	57.3
1000	53.7	59.5	66.3	68.7	66.8	70.1	65.5	66.3	67.1	66.8	67.3	66.3	65.4	62.7	58.4
1250	63.1	70.1	81.2	81.2	78.5	81.7	72.2	74.5	76.0	72.4	74.9	75.8	76.1	74.4	66.6
1600	51.0	59.5	68.4	67.4	65.7	67.8	64.4	65.5	65.3	65.6	66.0	66.0	63.5	62.4	55.7
2000	50.6	59.2	67.1	67.3	64.5	68.8	65.2	66.3	65.3	66.5	67.3	65.2	65.3	65.3	57.1
2500	54.3	65.7	72.2	72.2	72.6	70.7	70.6	69.4	69.4	67.4	68.2	70.8	65.9	67.2	59.7
3150	51.1	61.6	70.9	69.3	68.8	69.0	66.4	67.6	65.2	66.0	67.3	66.2	65.9	64.9	56.3
4000	50.0	65.5	71.8	71.2	69.7	70.0	70.6	68.9	68.7	67.7	68.3	70.1	66.8	66.5	57.8
5000	49.0	64.5	73.1	71.4	69.9	70.2	69.0	67.9	68.0	67.1	67.3	68.2	65.9	65.7	56.2
6300	46.5	60.7	70.5	69.5	67.9	69.2	68.1	66.8	65.6	65.1	64.4	66.1	62.8	60.8	52.8
8000	45.7	58.7	68.5	68.2	67.3	68.5	66.3	67.4	65.1	63.0	63.2	64.0	60.4	57.9	48.9
10000	40.4	54.3	64.8	63.2	63.9	64.5	62.5	65.4	64.1	61.2	61.3	59.6	57.6	52.4	40.8
OVERALL CALCULATED	67.7	75.4	84.3	84.0	83.0	84.7	81.7	83.1	83.7	82.3	83.1	83.0	82.1	79.9	74.8
PROB	77.9	88.1	95.5	95.4	94.8	96.0	94.1	93.9	93.8	93.2	93.7	94.4	92.2	90.8	83.7

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