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Energy Efficient Engine

Acoustic Supporting Technology Report

by
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16. Abstract

The acoustic development of the Energy Efficient Engine combined testing and analysis using scale model rigs and an integrated Core/Low Spool demonstration engine. The scale model tests show that a cut-on blade/vane ratio fan with a large spacing (S/C = 2.3) is as quiet as a cut-off blade/vane ratio with a tighter spacing (S/C = 1.27). Scale model mixer tests show that separate flow nozzles are the noisiest, conic nozzles the quietest, with forced mixers in between. Based on projections of ICLS data the E^3 has FAR 36 margins of 3.7 EPNdB at approach, 4.5 EPNdB at full power takeoff, and 7.2 EPNdB at sideline conditions.

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FOREWORD

This report represents the results of an effort to develop higher thermodynamic and propulsive efficiencies in the Energy Efficient Engine without sacrificing community noise concerns. The work was performed by the General Electric Company for the National Aeronautics and Space Administration, Lewis Research Center, under Contract NAS3-20643. Mr. R. D. Hager is the NASA Project Manager, and Mr. A. F. Schexnayder is the General Electric Manager. This report was prepared by Mr. S. P. Lavin and Dr. P. Y. Ho of the General Electric Company, Evendale, Ohio.

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1.0 SUMMARY

Higher thermodynamic and propulsive efficiencies for commercial turbofan aircraft engines were developed and demonstrated in the Energy Efficient Engine Program (E^3), without sacrificing community noise concerns. This was accomplished by component acoustic development, testing, and analysis; design integration of recent acoustic technology advancements; and was finally demonstrated statically in an integrated component test (Integrated Core and Low Spool).

Component testing was concerned with two major studies. The first was an investigation into the effects of blade/vane ratio with respect to fan generated noise. The second was an investigation into the effects of forced mixer exhaust nozzle configuration. As a result of the fan blade/vane ratio study, it was demonstrated that a cut-on blade/vane ratio fan with large spacing (s/c = 2.3) is as quiet as a cut-off blade/vane ratio configuration with tighter spacing (s/c = 1.27). The conclusions of the mixer test investigations are that for subsonic velocities, separate flow nozzles are the noisiest, conic nozzles are the quietest, with the forced mixer nozzles in between.

Recent acoustic technology advancements which were incorporated into the E^3 design included the utilization of Kevlar and Astroquartz mat material as a bulk absorber acoustic suppression material, and the selection of turbine vane/blade ratios so that the blade passing frequency tones are cut-off.

Projecting the statically demonstrated Integrated Core and Low Spool levels to flight, an average growth margin of 3.7 EPNdB is observed relative to FAR 36 Stage 3 at approach, 4.5 EPNdB at full power takeoff, and 7.2 EPNdB at the sideline conditions.

2.0 PROGRAM DESCRIPTION

The overall objective of the Energy Efficient Engine (E^3) program was to develop, evaluate and demonstrate the technology base for achieving higher thermodynamic and propulsive efficiencies in future commercial turbofan engines. This overall objective was achieved through a program involving the development of components and their technologies, integration of components in a core and a core/low spool test system, and evaluation of the integrated system performance.

2.1 PROGRAM NOISE GOALS

The noise program goal was to ensure that the Flight Propulsion System (FPS) meets FAR Part 36 (as amended July 1978) with provisions for engine growth corresponding to future engine applications.

2.2 PLAN TO ASSURE MEETING NOISE GOALS

The plan to ensure meeting noise goals required active integration with component designers, development of advanced technologies, and demonstration of principles with component and system testing. The work structure to facilitate this plan was broken down into four task areas:

- System Acoustic Prediction,
- Vane Frame Testing,
- Mixer Testing, and
- Integrated Core/Low Spool (ICLS) Testing.

3.0 FAN SCALE MODEL TEST

A scaled model fan vane-frame test program was conducted in 1978. The primary objective of the test was to evaluate the impact on forward radiated fan noise of a non-cutoff (i.e., all tones are acoustically propagating) vane-frame design (V/B ratio = 1.09) and compare the results to a conventional cut-off design (V/B ratio = 1.95).

3.1 TEST FACILITIES

The test series was conducted in the fan noise anechoic chamber at the General Electric Corporate Research and Development Center in Schenectady, New York. The interior free space of the chamber is approximately 10.7 meters (35 feet) wide, 7.6 meters (25 feet) long, and 3.1 meters (10 feet) high (Reference Figure III.1.1). The air entering the chamber is drawn through the porous walls between 0.71 meter (28 inch) polyurethane foam wedges. The discharge air of the fan was ducted out of the building through an acoustically treated exhaust stack and a downstream discharge valve.

Acoustic measurements were made using an array of twelve 0.635 cm (0.25 in.) diameter microphones (B&K Type 4135) located on a 5.2 meter (17 feet) radius arc, centered one rotor diameter (approximately 0.5 meter) upstream of the rotor front face. The microphones were arranged on a grazing incidence at 10° intervals from 0° to 110° relative to the fan inlet centerline. Microphone signals were recorded on a Sangamo Sabre IV 28 track FM recorder.

A 2,500 horsepower motor-gear system was used to drive the fan. The model fan rig used for the test was the NASA 0.508 meter (20 inch) diameter transonic fan, designated as Rotor 11. The centerline of the fan was positioned 1.27 meters (4.2 feet) above the tip of the foam wedge on the floor. Detailed aerodynamic performance was reported by Kovich et al. (Reference 1). The original set of fan stators (48 vanes) was modified to simulate the ICLS engine (at that time) fan rotor - outlet guide vane (OGV) spacing (Reference Figure III.1.2). This fan has a maximum rated tip speed of 427 meter/sec (1,400 ft/sec) and a pressure ratio of 1.57. Fan speed and stage pressure

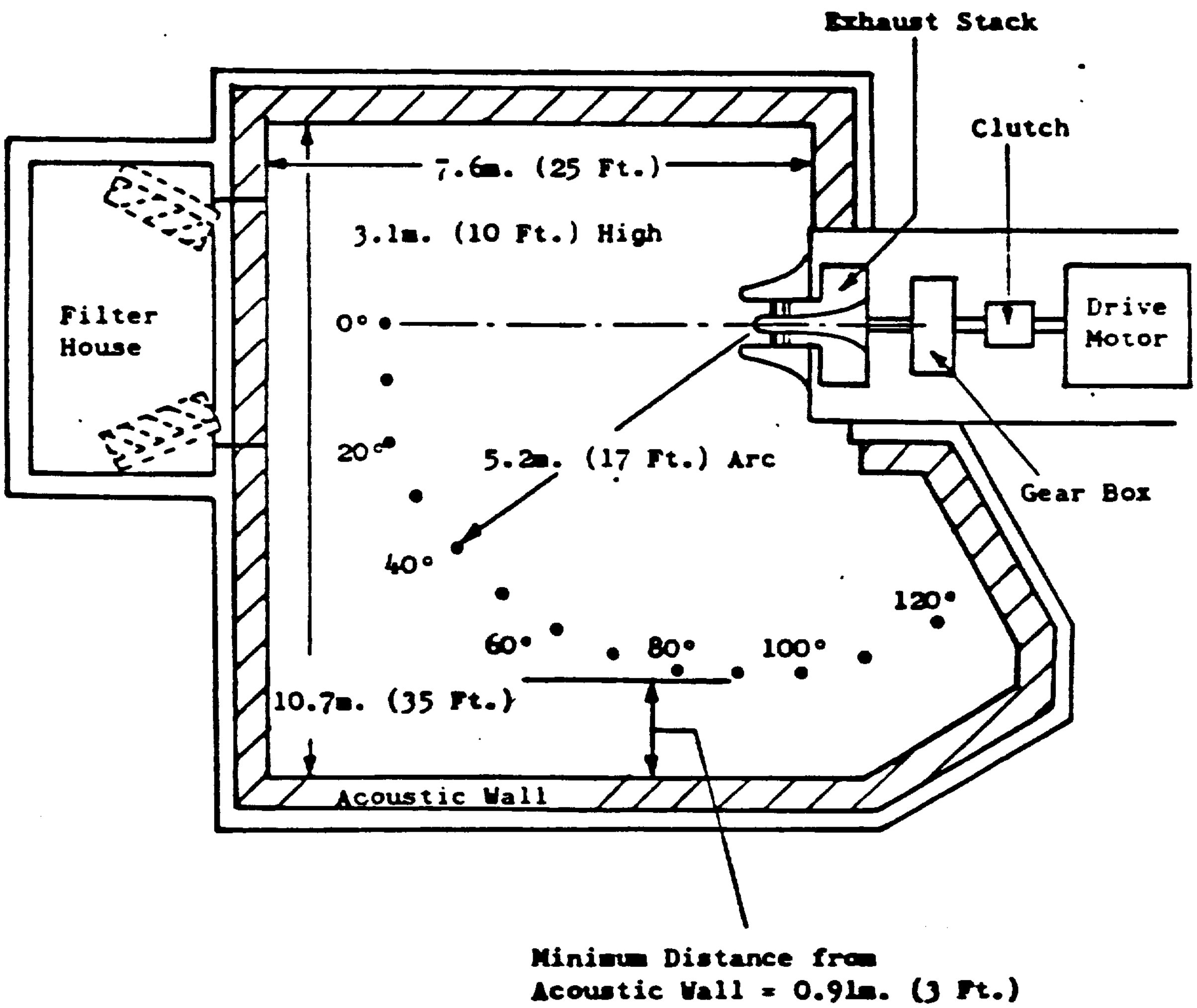

Figure III.1.1 Schematic of the General Electric CRD Aero/Acoustic Laboratory

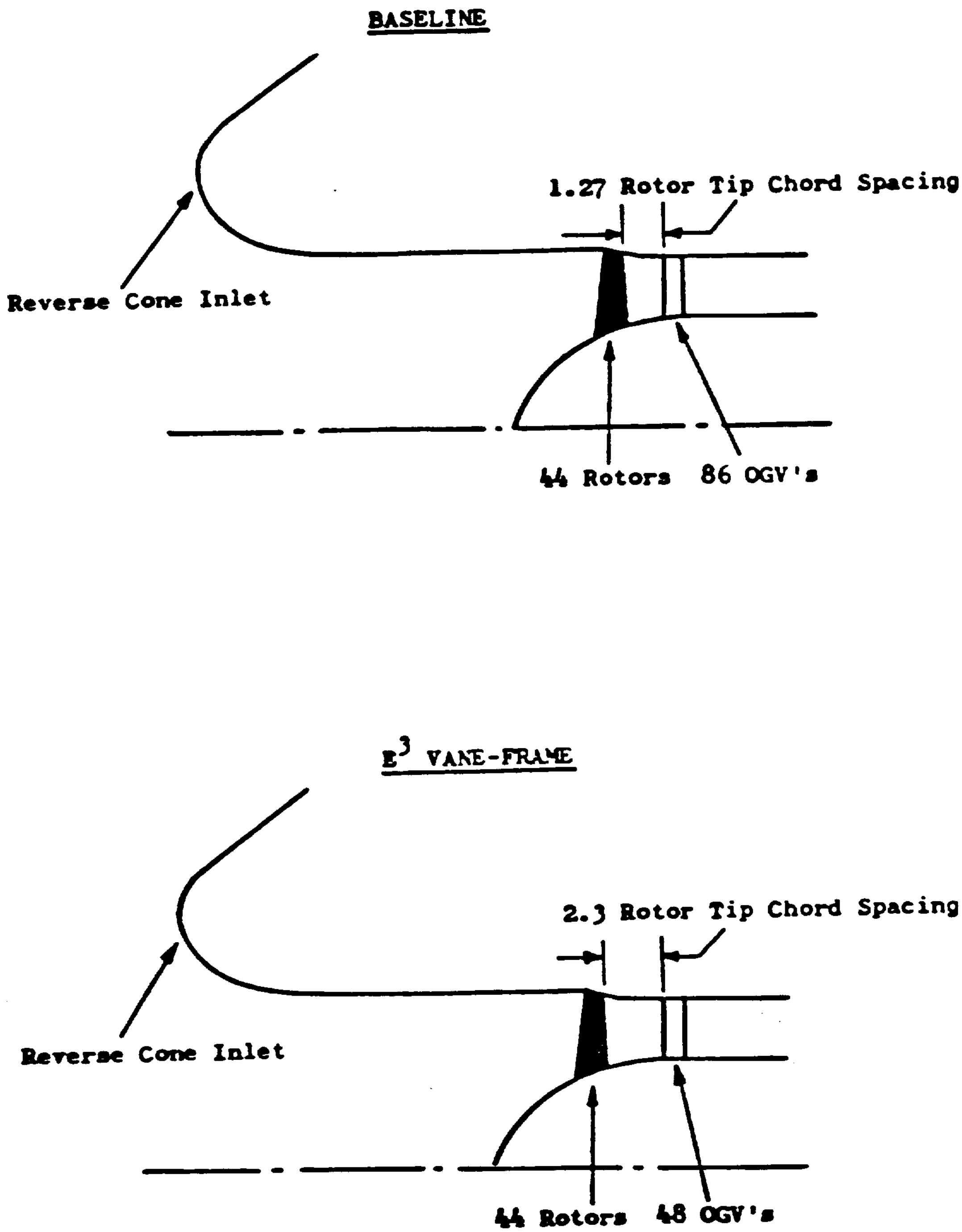

Figure III.1.2 Fan Rotor/OGV Configurations ratio can be actively varied, with the stage pressure ratio controlled by the setting of a discharge valve downstream. The pertinent fan style design parameters for Rotor 11 as modified for this test are shown in Table III.1.1.

3.2 TEST PROCEDURE

A total of six configurations were tested during the fan scale model program (Reference Table III.2.1).[1] During the test program, it was discovered that a feltmetal strip in front of the fan rotor, intended to be used as an intake suction surface decreasing the boundary layer thickness, actually acted as a triggering device for boundary layer turbulence as well as a suppressor for high frequencies.

Each configuration had a total of 14 fan operating points (Reference Table III.2.2). The corresponding fan pressure ratio associated with the different discharge valve (DV) settings can be seen from the fan performance map shown in Figure III.2.1. The specific speed points tested were selected so as to be consistent with previous data taken with the facility. The discharge valve setting of 1.27 represented the fan being operated at or near the designed operating line defined in Reference 2.

3.3 TEST RESULTS

Detailed comparisons and discussions of the validity of the test data measured with the feltmetal strip in the inlet are given in Reference 3. The following sections highlight the results reported in this reference.

3.3.1 VANE/BLADE RATIO EFFECTS

The primary objective of the scale model test was to evaluate the impact for forward radiated fan noise of a non-cutoff vane-frame design

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[1]Configuration numbers assigned to the different configurations are arbitrary and do not imply that a total of ten configurations were tested.

TABLE III.1.1

ROTOR 11 TEST FAN STAGE DESIGN CHARACTERISTICS

	E^3	Baseline
Rotor Inlet Tip Diameter	0.504m (19.84 in)	-
Pressure Ratio	1.574	-
Rotor Blade Number	44	-
Stator Vane Number	48	86
Vane/Blade Ratio	1.09	1.95
Inlet Guide Vanes	None	-
Rotor Inlet Hub/Tip Radius Ratio	0.50	-
Rotor-Stator Tip Spacing	2.3 Rotor Chords	1.27
Rotor Rotative Speed	16100 RPM	-
Rotor Tip Speed	424.9m/sec (1394 ft/sec)	-
Rotor Tip Inlet Relative Mach No.	1.394	-
Rotor Chord (Midspan)	4.62cm (1.817 in)	-
Stator Chord (Midspan)	4.05cm (1.596 in)	2.54cm (1.00 in)
Rotor Aspect Ratio	2.5	-
Stator Aspect Ratio	2.3	3.6
Rotor Tip Solidity	1.298	-
Stator Tip Solidity	1.270	1.426
Corrected Inlet Weight Flow	29.5 Kg/sec (65 lb/sec)	-
Adiabatic Efficiency	85.5% (80.9% Measured)	-

TABLE III.2.1

DESCRIPTION OF E^3 CONFIGURATIONS TESTED

CONFIGURATION NO.	TCS≠	INNER FLOWPATH FELTMETAL STRIP	TREATED INLET	INNERFLOW PATH SUCTION
3	No	Yes	No	No
4,9*	Yes	Yes	No	No
5	No	Yes	Yes	No
6	Yes	Yes	Yes	No
7,8**	Yes	No	No	No
10	Yes	Yes	No	Yes

NOTES:

* Configuration No. 9 is repeat of Configuration No. 4

** Configuration No. 8 is repeat of Configuration No. 7

≠ TCS is an inflow cleanup device, commonly referred to as Turbulence Control Screen

TABLE III.2.2

TEST MATRIX FOR EACH CONFIGURATION

	% FAN SPEED(1)						
DISCHARGE VALVE (DV) SETTING	54	60	69	74	80	86	100
0.0	X	X	X	X	X	X	X
1.27	X	X	X	X	X	X	X

(1) NOTE: Each Condition Repeated Except 60, 74, 80 and 100% Speed with 0.0 DV. 100% = 1,400 ft/sec Tip Speed

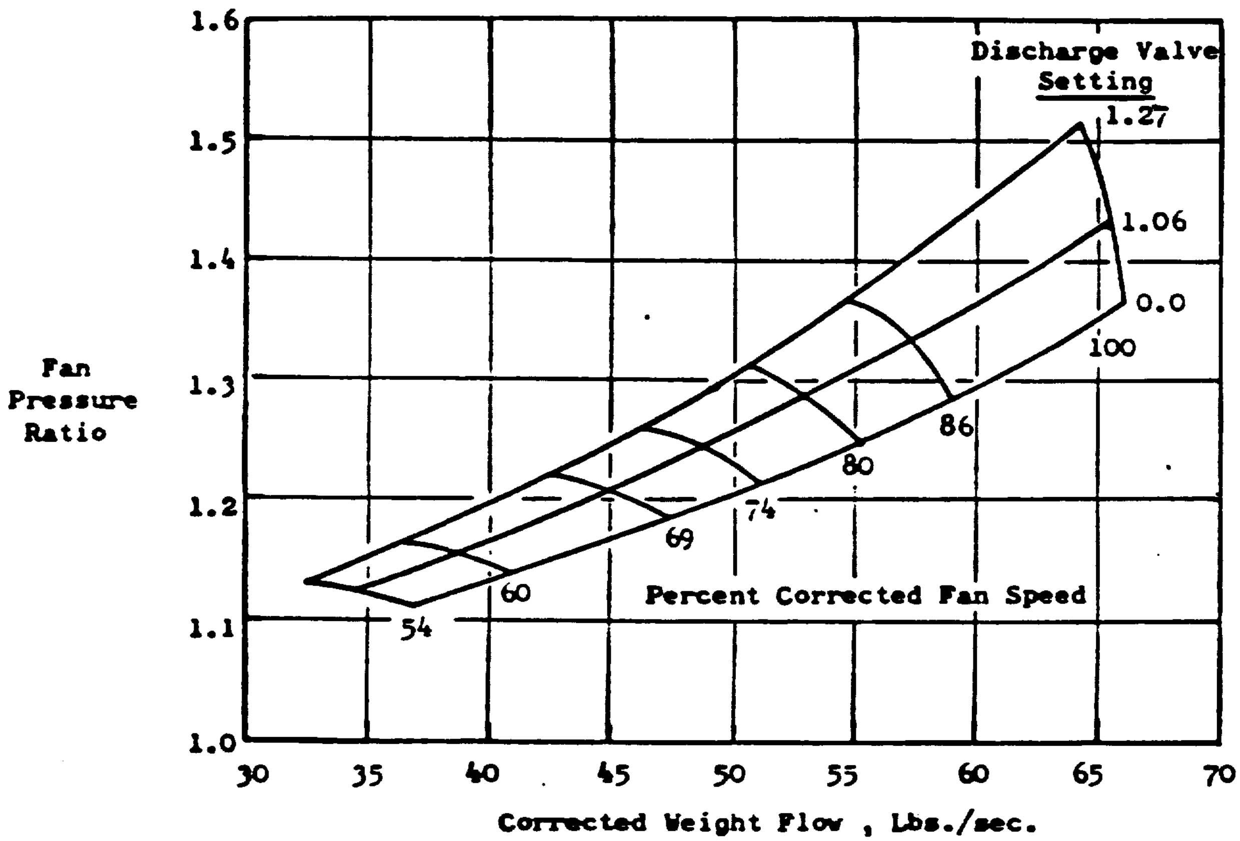


Figure III.2.1 Fan Performance from E^3 Scale Model Fan Test

(Vane/Blade ratio = 1.09), with and without a Turbulence Control Screen (TCS), when compared to a conventional cut-off design (V/B ratio = 1.95) run under the same conditions. The latter is defined as the Baseline configuration on Table III.1.1. It was the Rotor 11 base design reported in Reference 1. Comparisons of the blade passing frequency (BPF) one-third octave tone level directivity (Figures III.3.1 to III.3.3) shows that the scaled model E^3 vane frame configuration is slightly less than the baseline cut-off configuration which was previously tested by General Electric under a commercial engine program when a TCS was used. This is believed to be caused by larger vane/blade spacing for the E^3 configuration than the cut-off vane/blade ratio commercial engine configuration. Without a TCS, there is little or no difference between the configurations due to high rotor-turbulence interaction noise controlling the tone levels (Figures III.3.4 to III.3.9).

3.3.2 INFLOW TURBULENCE CONTROL SCREEN EFFECTS

The second objective of the scaled model test was to evaluate the impact on forward radiated fan noise of reducing the inflow turbulence to that of flight conditions. This effect, often referred to as flight clean-up, primarily affects only the tone levels and not broadband noise. Figures III.3.10 to III.3.12 show the BPF tone level directivites at three fan speeds for the hardwall inlet configuration, with and without a TCS, for the simulated E^3 vane-frame configuration. There appears to be a large change in clean-up effect between 60% and 74% speed. However, analysis of the spectra indicates that the 60% speed point has no discernable BPF tone on a one-third octave basis, either with or without a TCS. At 74% speed, the tone is much more pronounced for the case without TCS, and, consequently, the reduction is much greater when the TCS is in place (Figures III.3.13 to III.3.15).

3.3.3 INLET TREATMENT EVALUATION

The scale model tests were also used to evaluate inlet treatment effectiveness. The inlet treatment panels were 0.965 cm (0.38 inch) thick filled with DuPont Kevlar material to act as a bulk absorber. The treatment length was selected to give similar treatment length normalized by diameter (L/D) as the ICLS (L/D = 0.51).

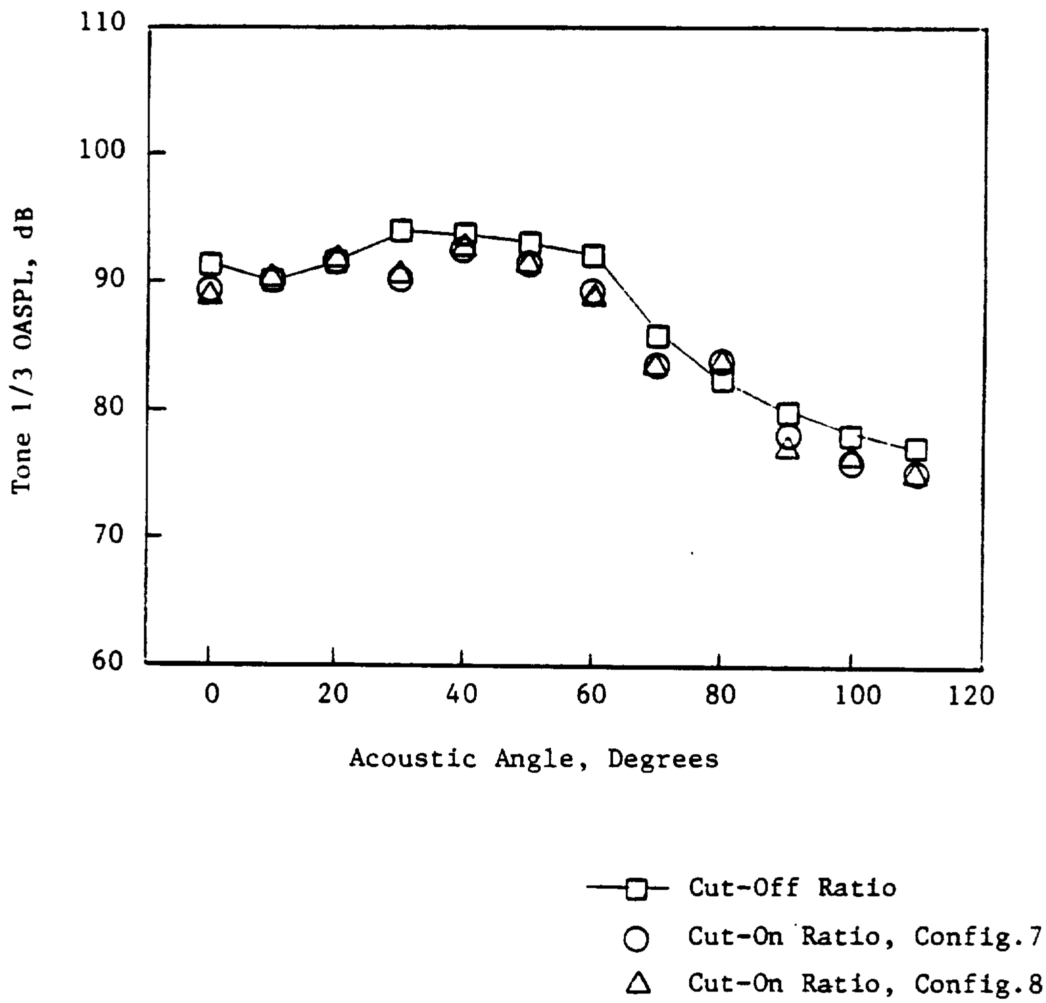


Figure III.3.1 Comparison of BPF Directivities of Cut-Off (V/B=1.95) Ratio and Cut-On Ratio (1.09) with TCS at 60% Fan Speed, DV=1.27

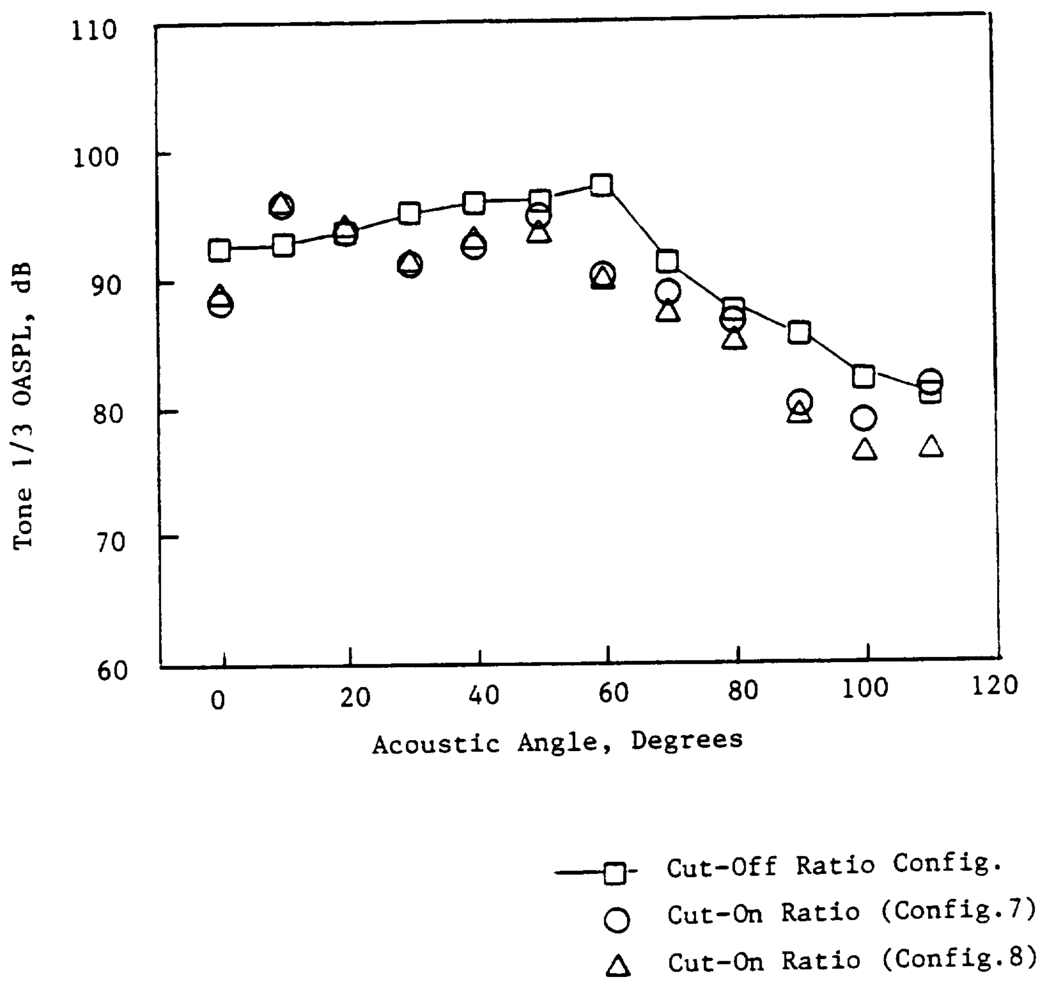


Figure III.3.2 Comparison of BPF Directivities of Cut-Off (V/B=1.95) Ratio and Cut-On (V/B=1.09) Ratio Configurations with TCS at 74% Fan Speed, DV=1.27

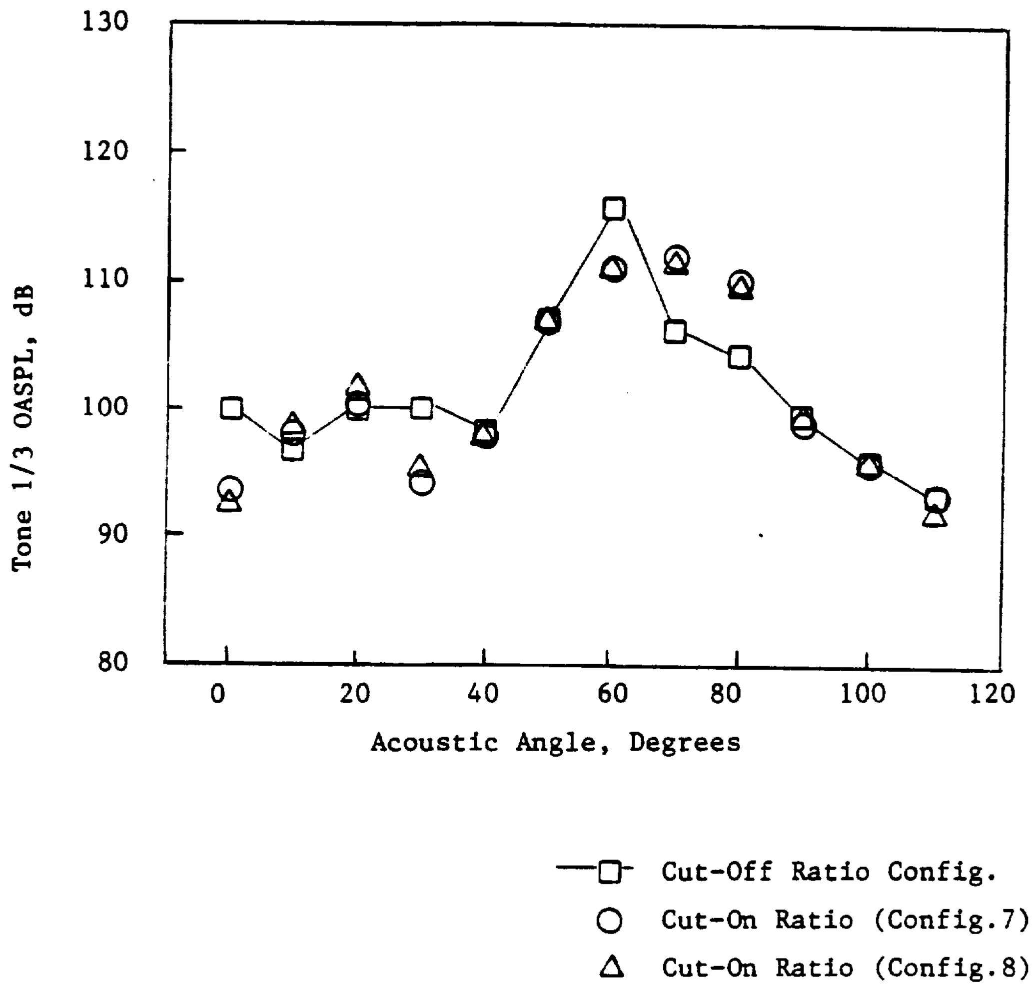


Figure III.3.3 Comparison of BPF Directivities of Cut-Off (V/B=1.95) Ratio and Cut-On (V/B=1.09) Ratio Configurations with TCS, at 88% Fan Speed, DV=1.27

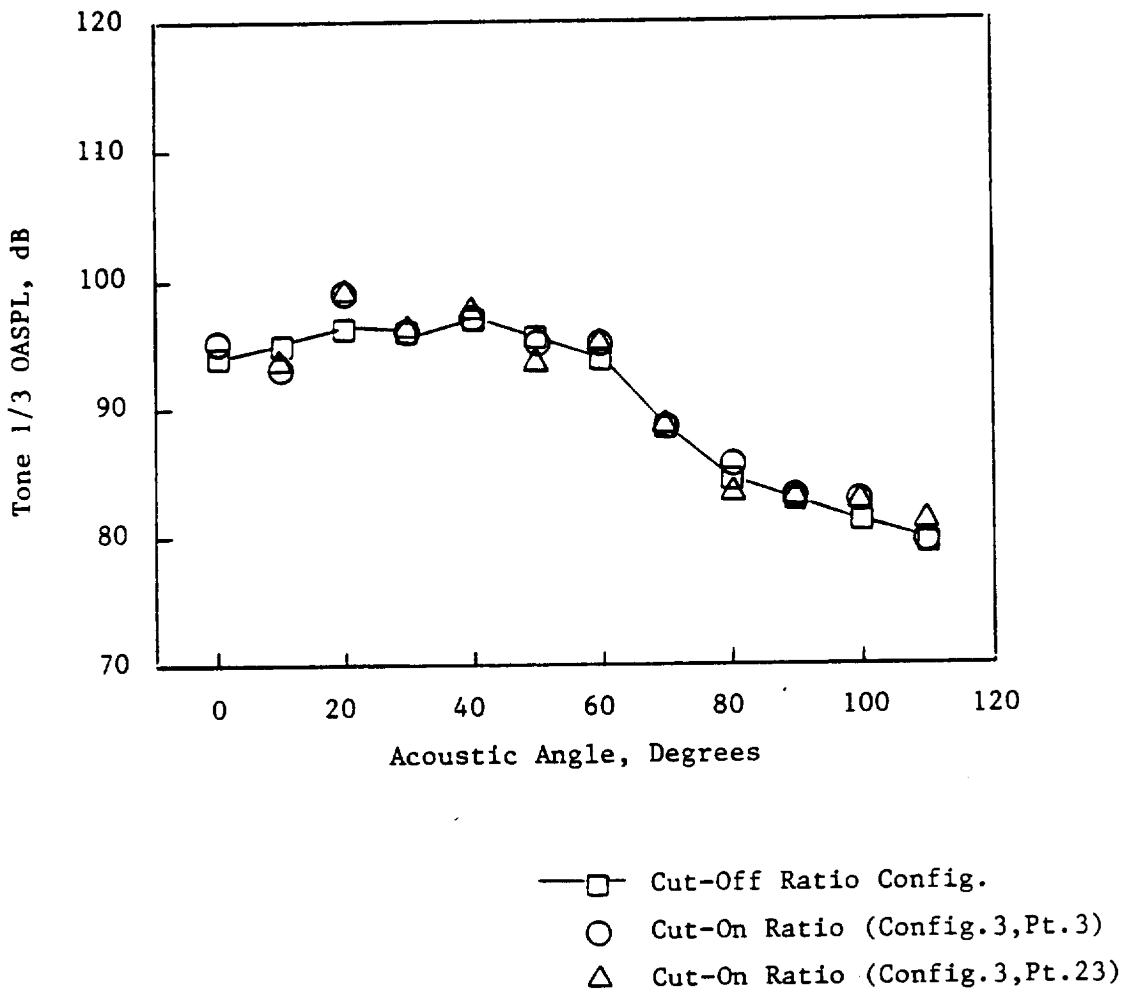


Figure III.3.4 Comparison of BPF Directivities of Cut-Off (V/B=1.95) Ratio and Cut-On (V/B=1.09) Ratio Configurations without a TCS at 60% Fan Speed, DV=1.27

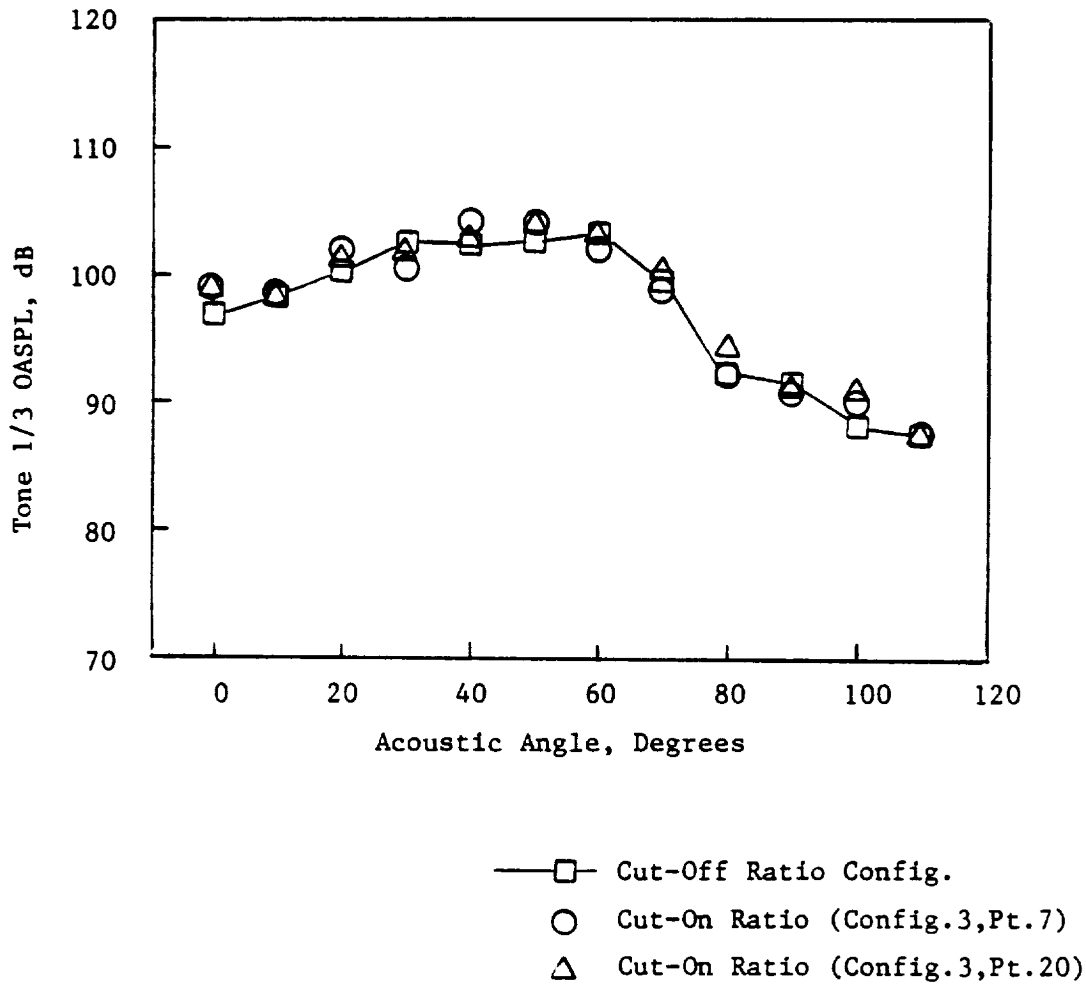


Figure III.3.5 Comparison of BPF Directivities of Cut-Off (V/B=1.95) Ratio and Cut-On (V/B=1.09) Ratio Configurations without a TCS, at 74% Fan Speed, DV=1.27

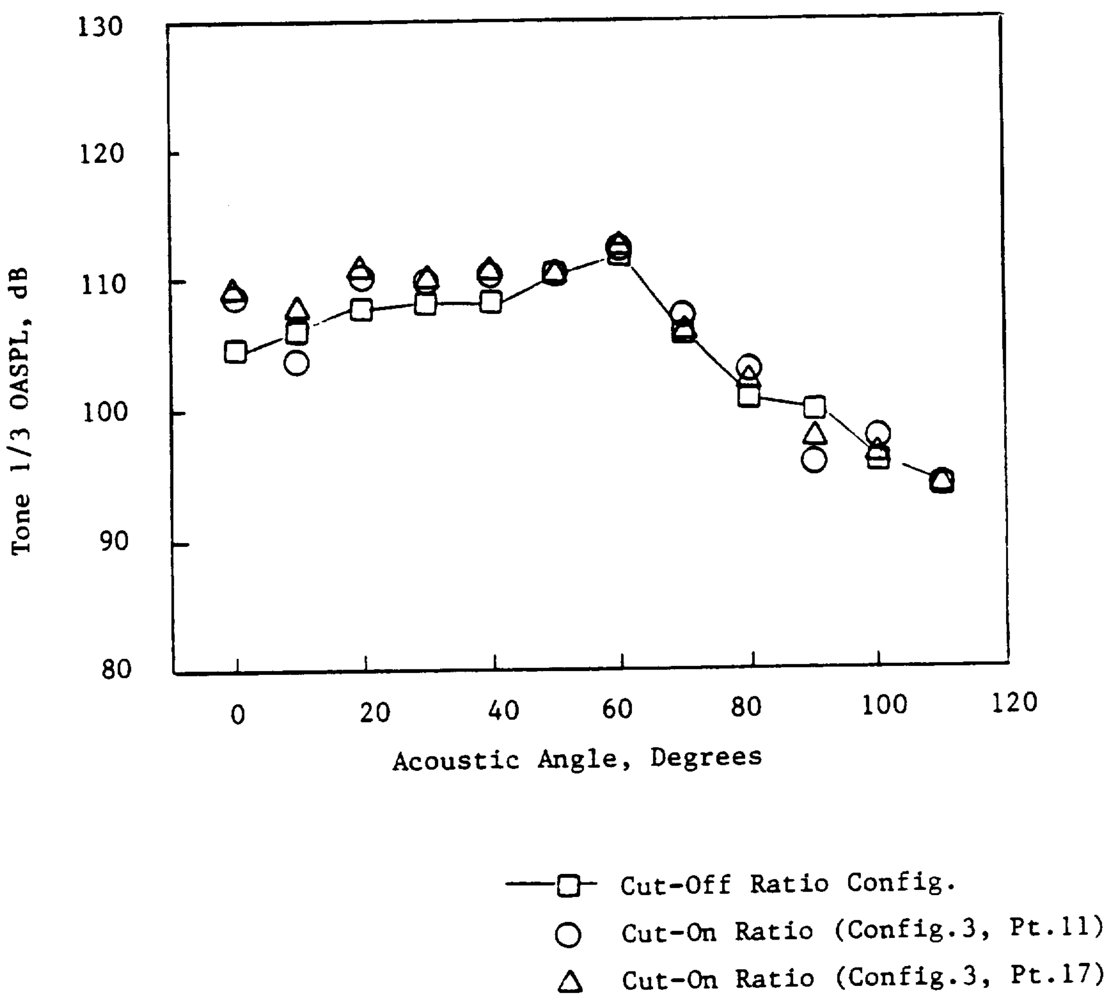


Figure III.3.6 Comparison of BPF Directivities of Cut-Off (V/B=1.95) Ratio and Cut-On (V/B=1.09) Ratio Configurations without a TCS, at 86% Fan Speed, DV=1.27

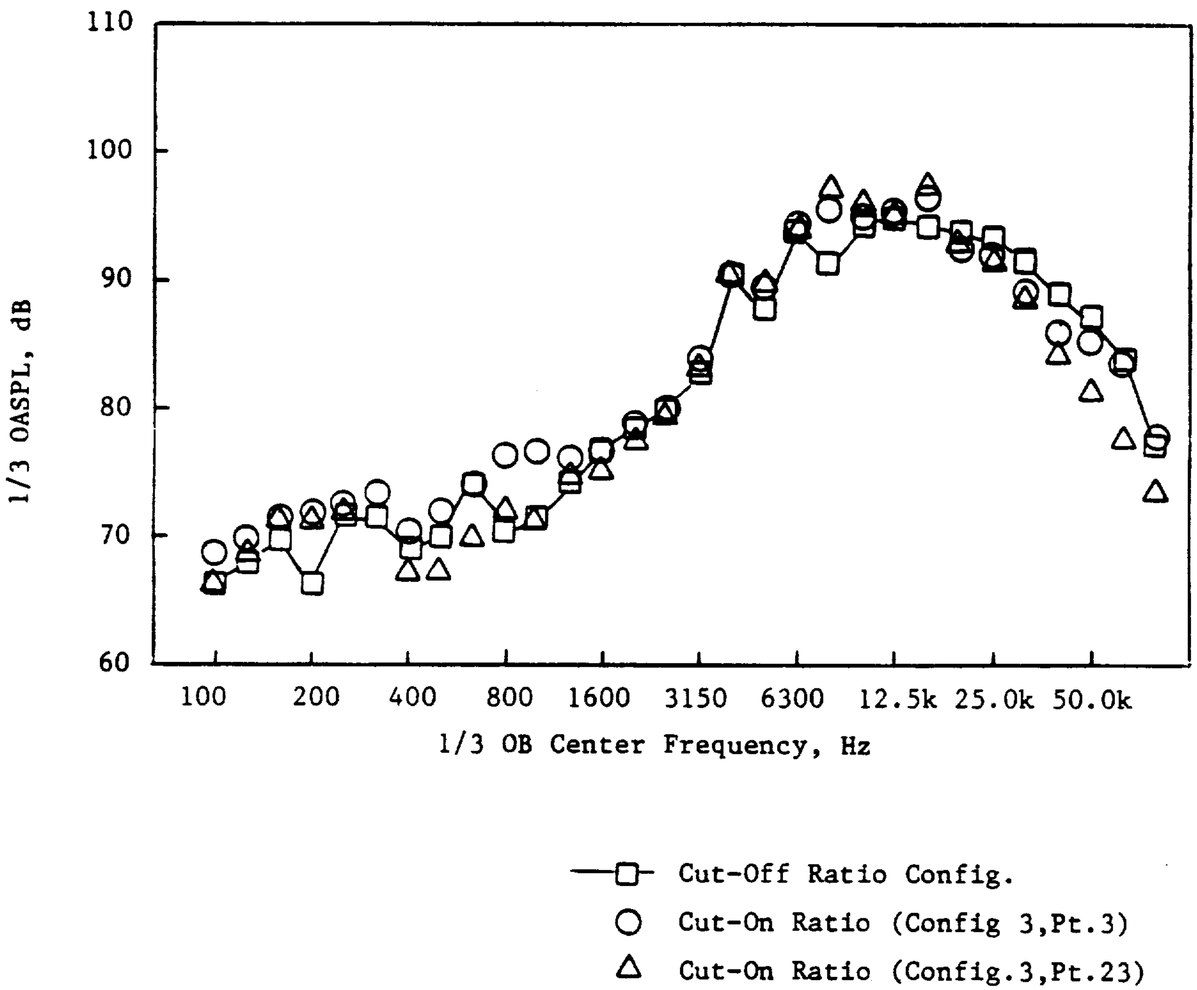


Figure III.3.7 60° Spectral Comparison of Cut-Off (V/B=1.95) Ratio and Cut-On (V/B=1.09) Ratio Configurations Without a TCS, at 60% Fan Speed, DV=1.27

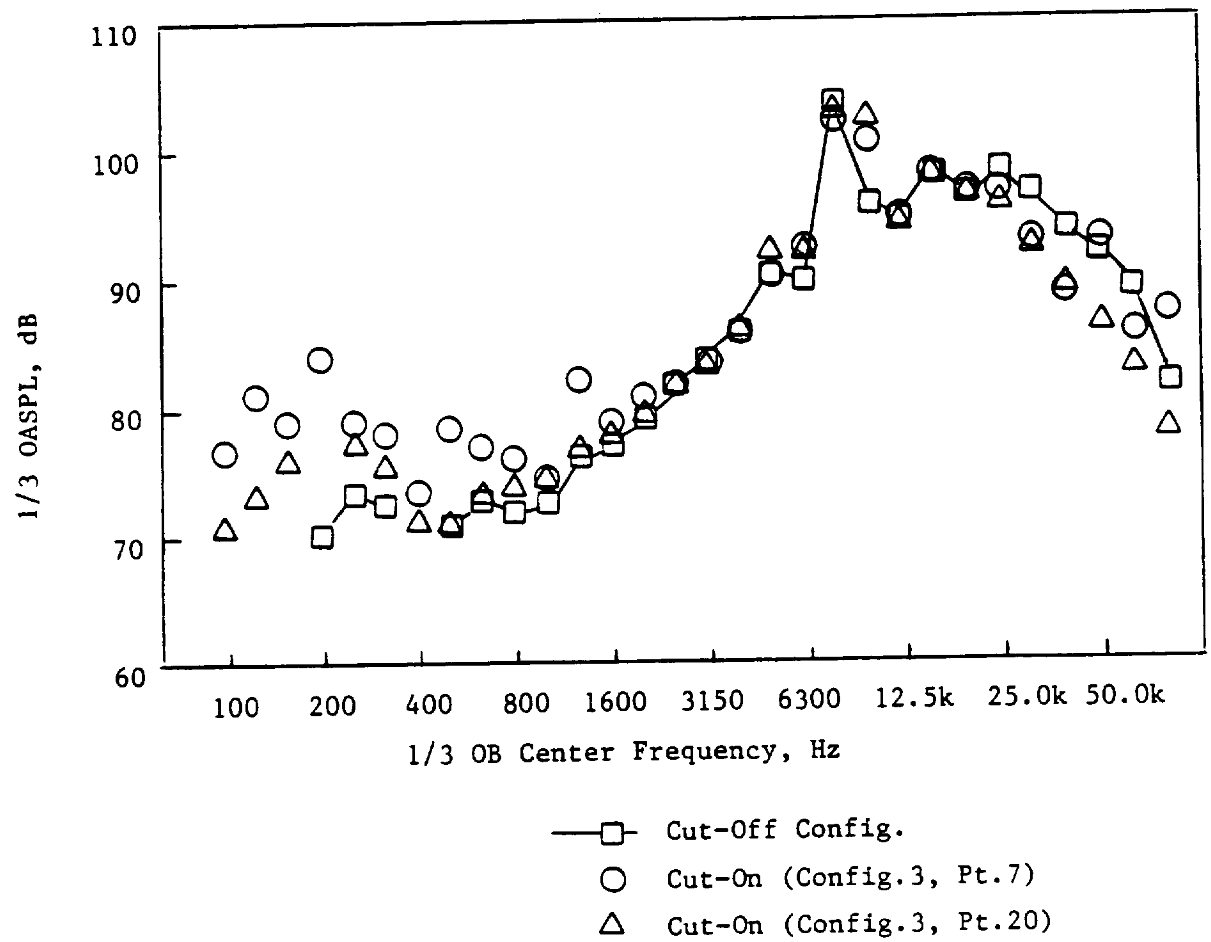


Figure III.3.8 60^{o} Spectral Comparison of Cut-Off (V/B=1.95) Ratio and Cut-On (V/B=1.09) Ratio Configurations without a TCS, at 74% Fan Speed, DV=1.27

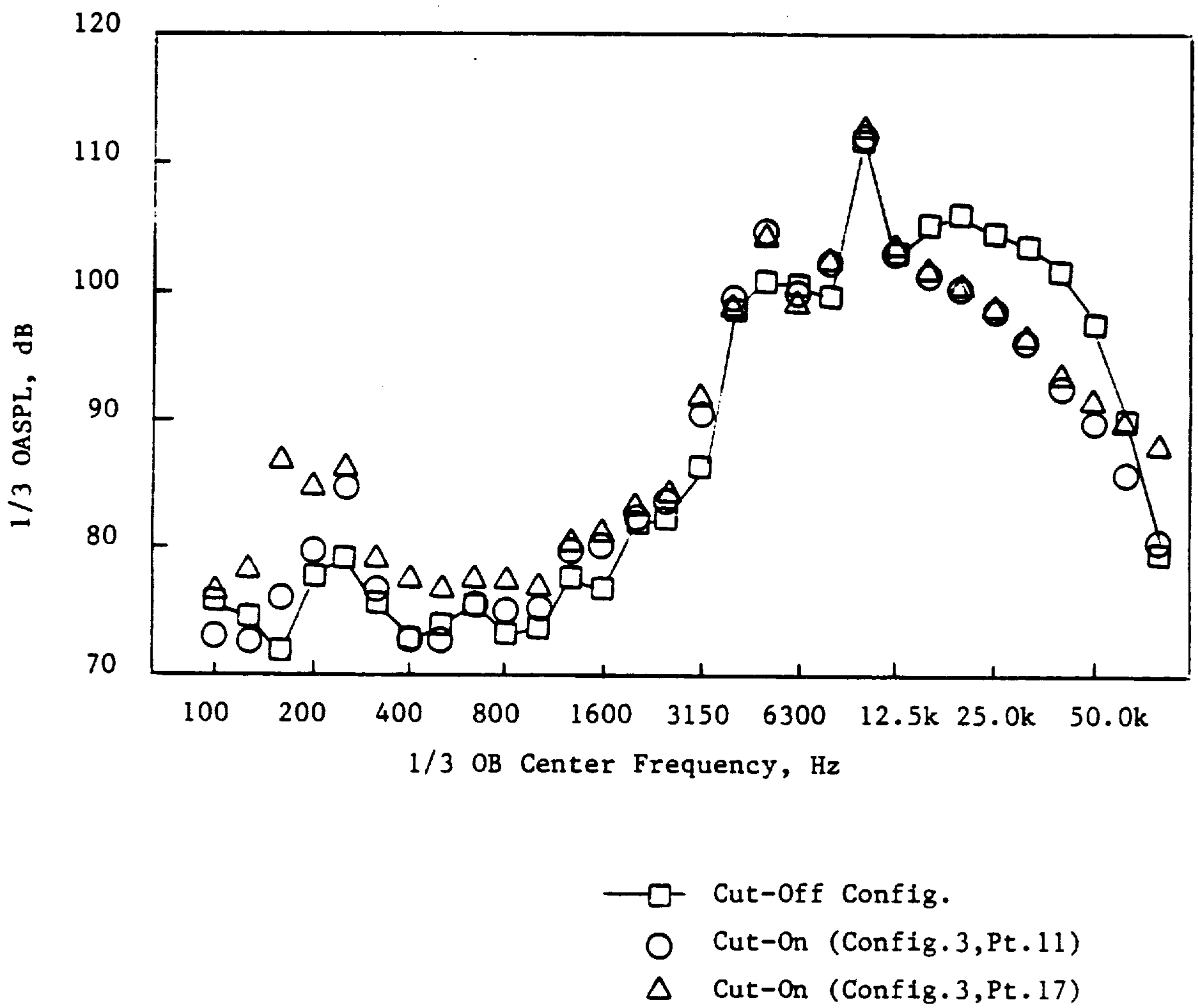


Figure III.3.9 60° Spectral Comparison of Cut-Off (V/B=1.95) Ratio and Cut-On (V/B=1.09) Ratio Configurations Without a TCS, at 86% Fan Speed, DV=1.27

- 60% N1K
- 6300 Hz BPF
- D.V. = 1.27
- Hardwall Inlet

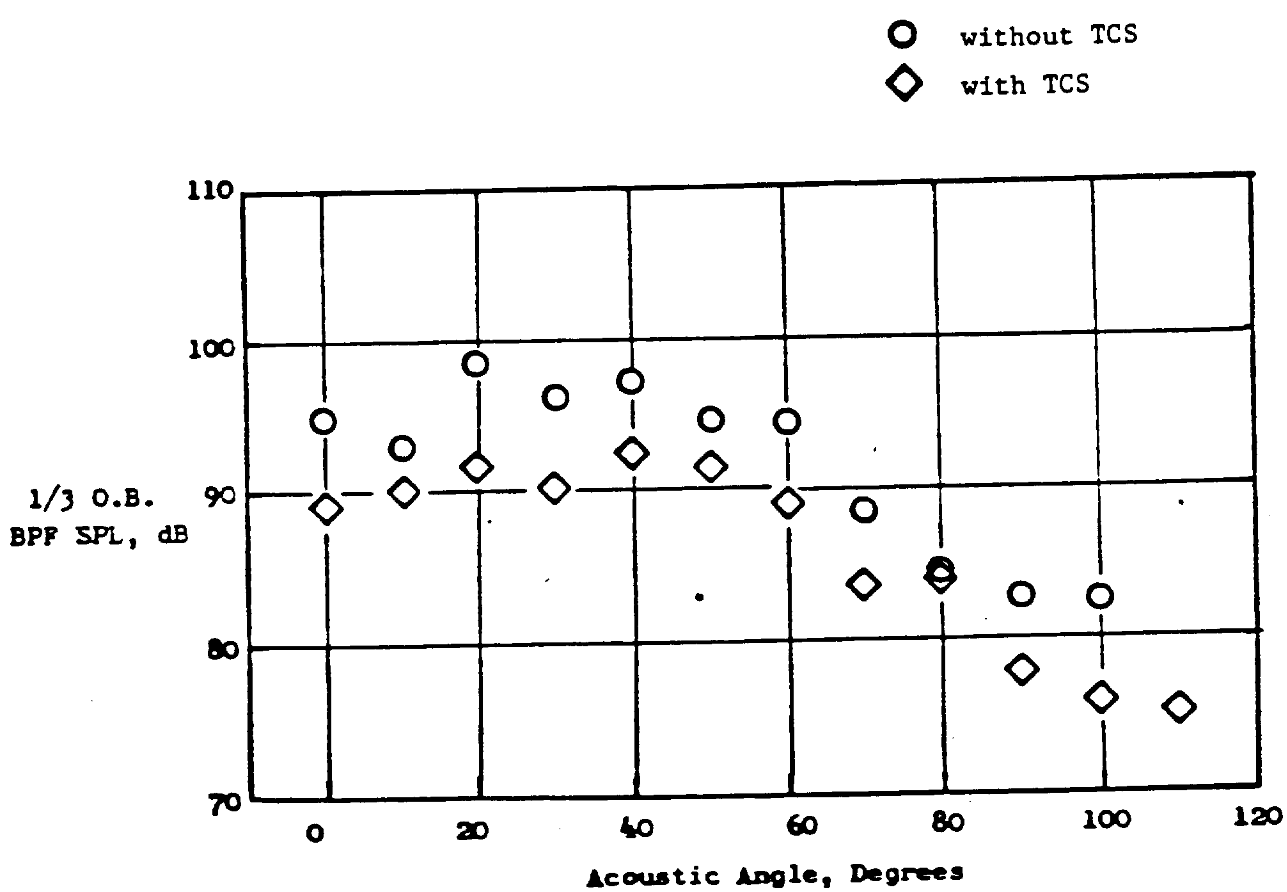


Figure III.3.10 Effect of TCS on Fan Fundamental Tone Directivity

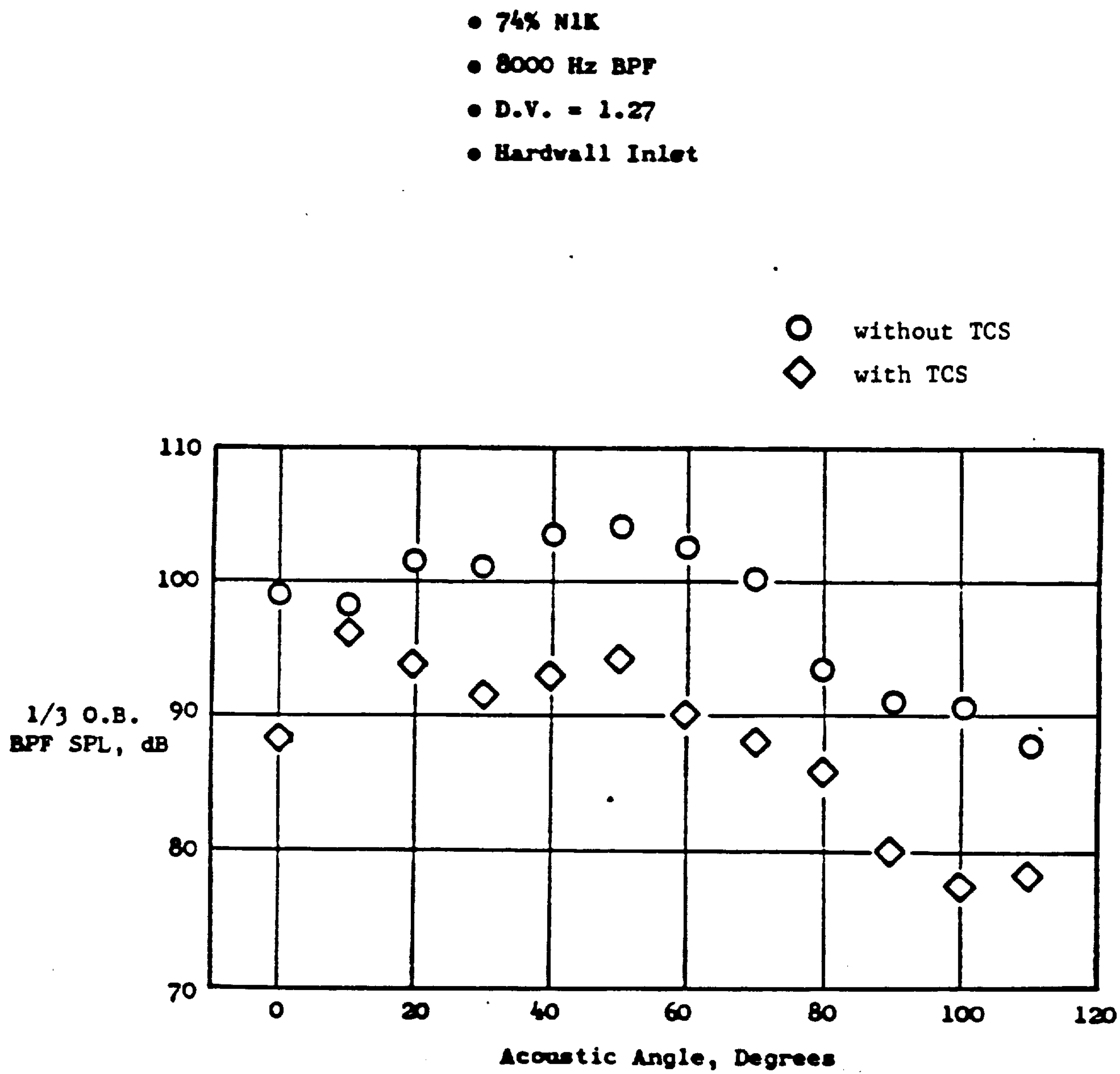


Figure III.3.11 Effect of TCS on Fan Fundamental Tone Directivity

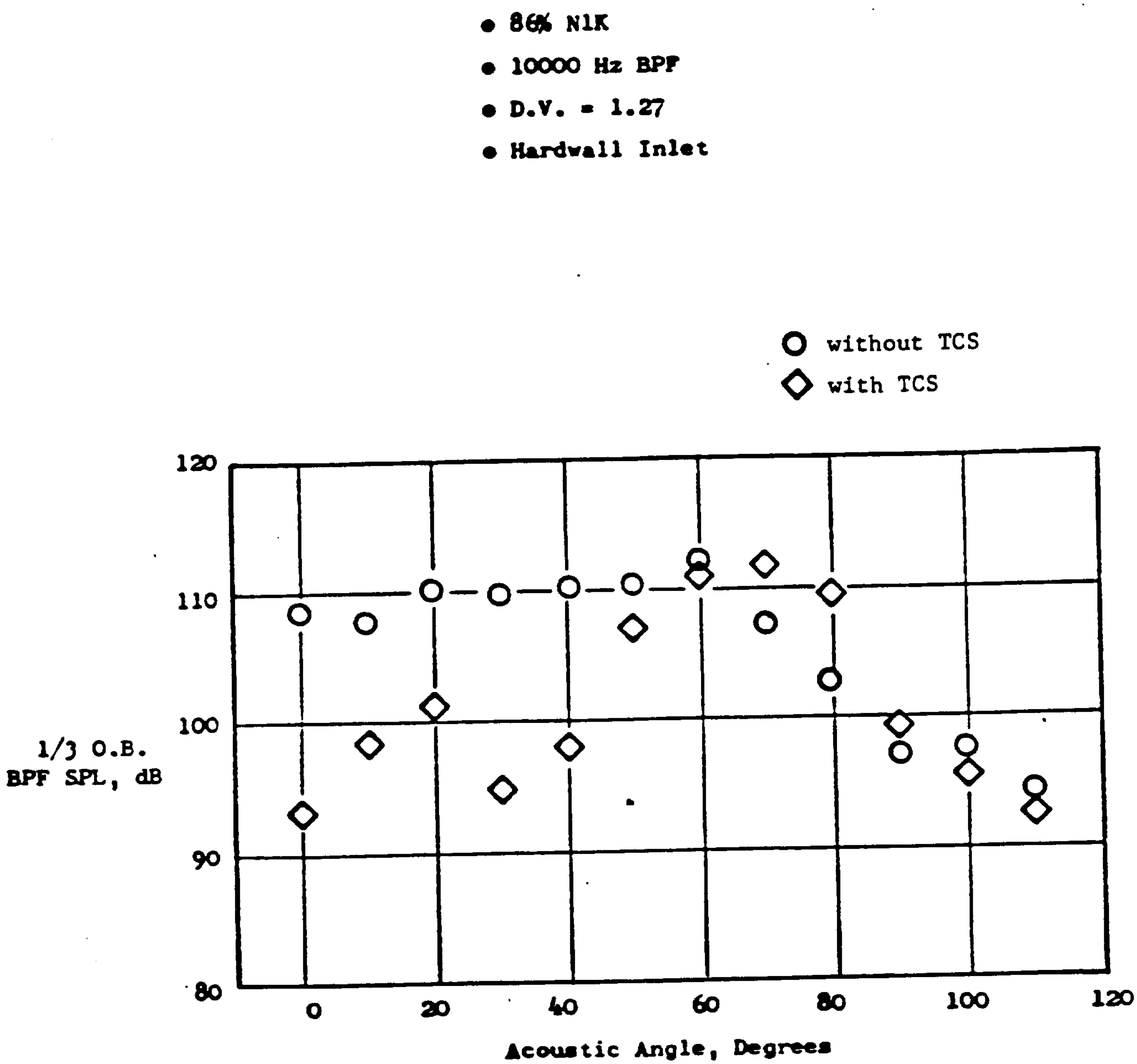


Figure III.3.12 Effect of TCS on Fan Fundamental Tone Directivity

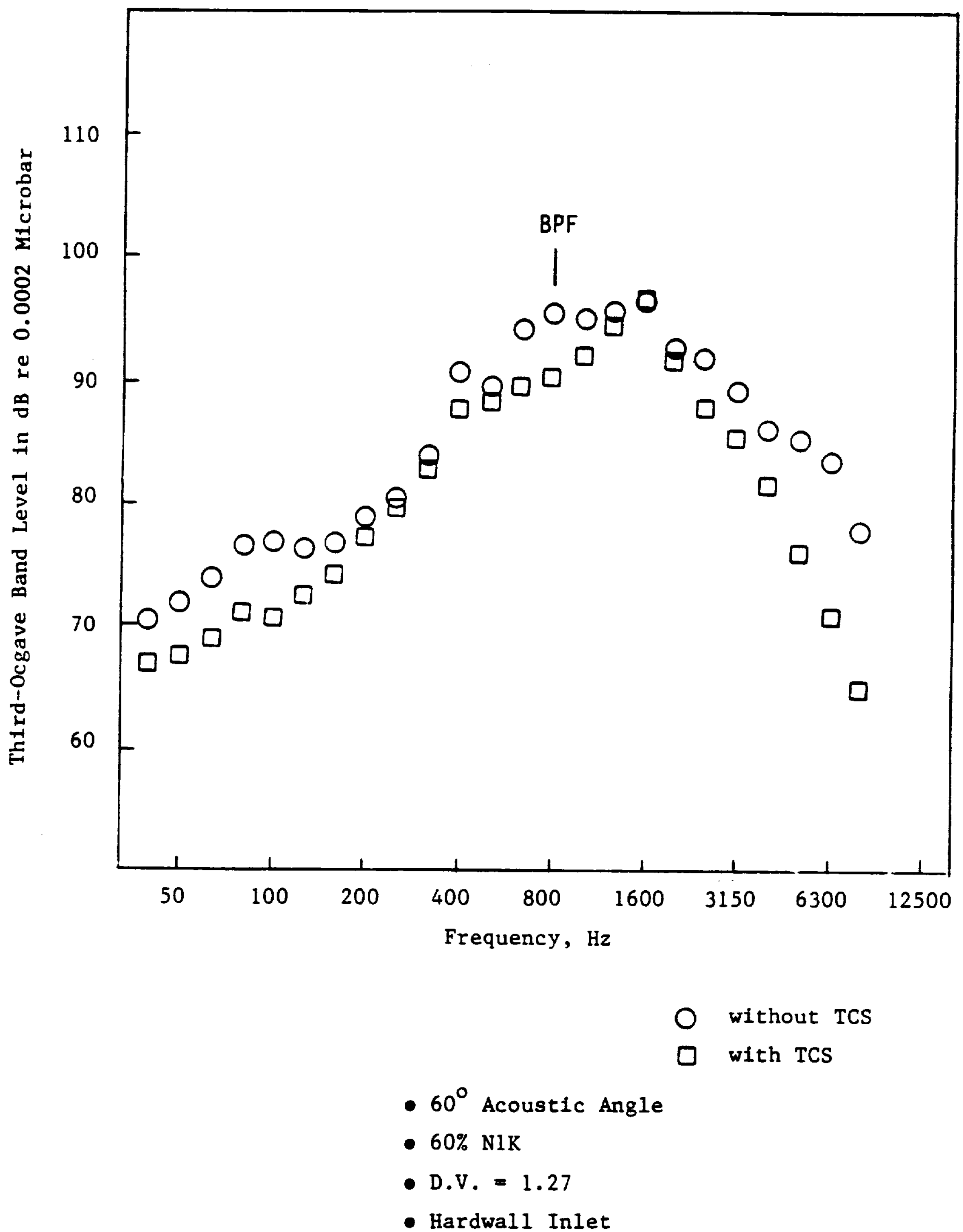
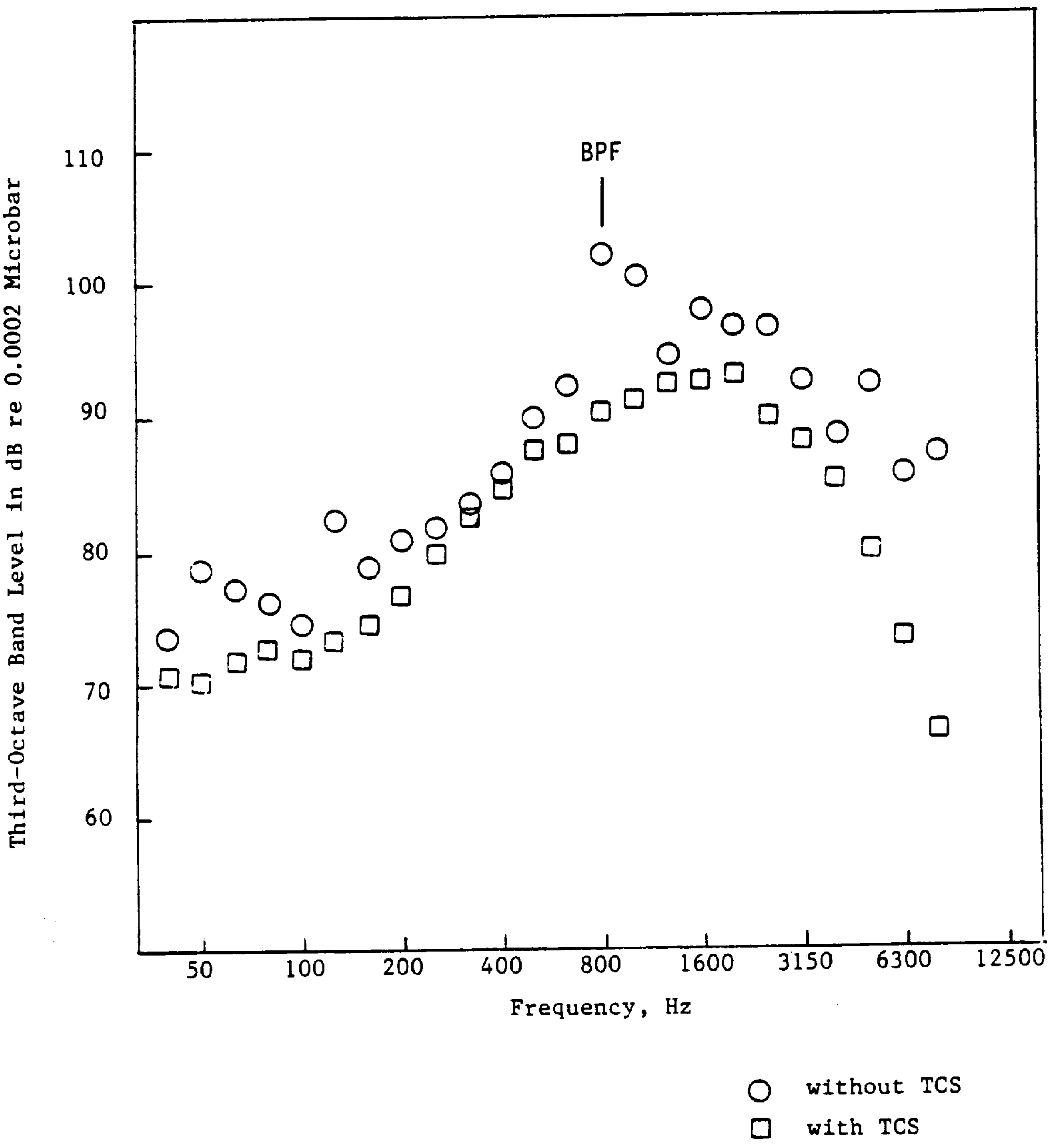
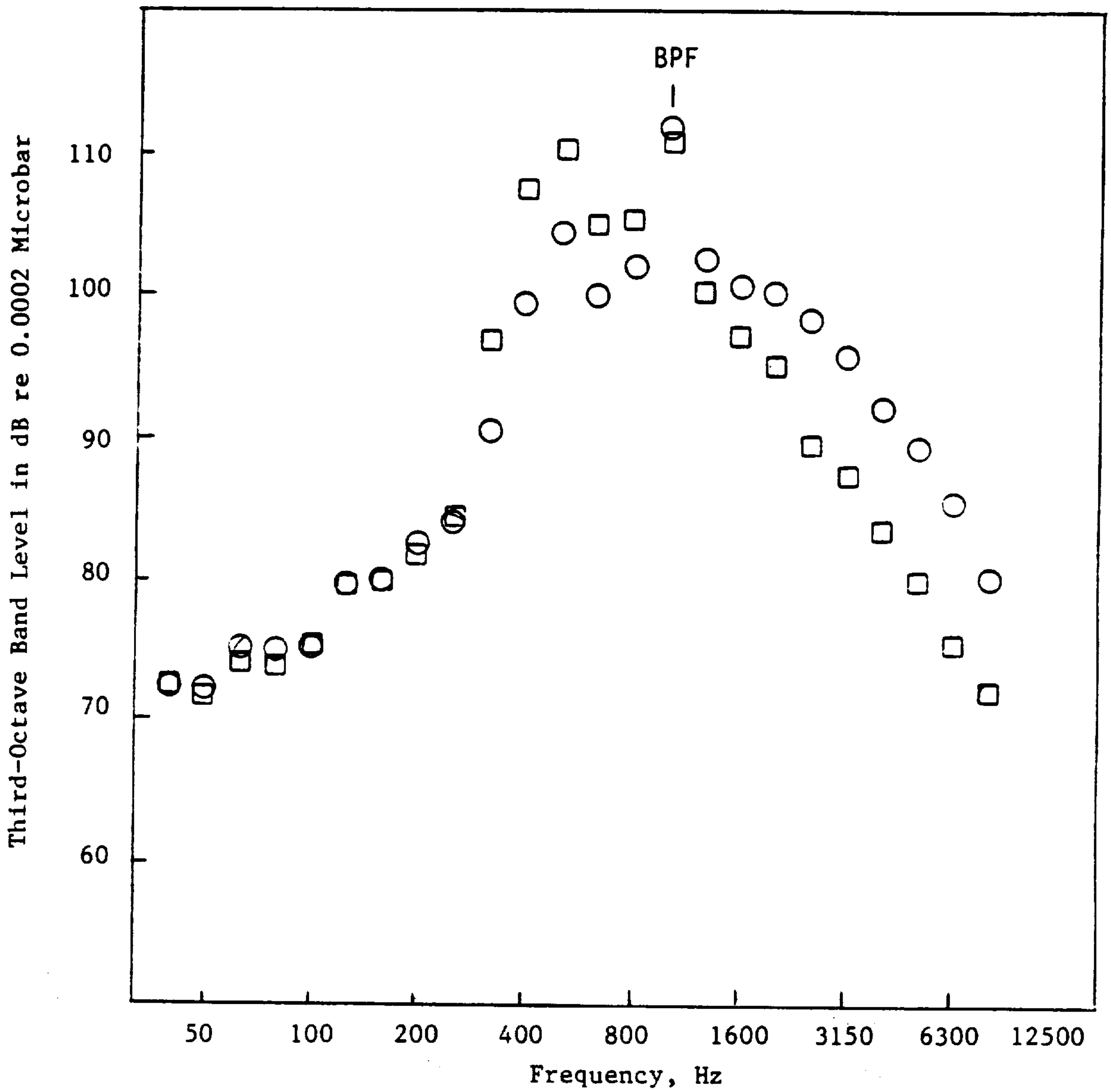


Figure III.3.13 Effect of TCS on Typical Fan Noise Spectrum



- 60^{o} Acoustic Angle
- 74% N1K
- D.V. = 1.27
- Hardwall Inlet

Figure III.3.14 Effect of TCS on Typical Fan Noise Spectrum



- 60° Acoustic Angle
- 86% N1K
- D.V. = 1.27
- Hardwall Inlet

Figure III.3.15 Effect of TCS on Typical Fan Noise Spectrum

Figures III.3.16 to III.3.18 show the PNL directivities obtained from the scale model test without TCS, treated and untreated, scaled up to E^3 ICLS size. This data indicates that forward of 40° the treatment benefit was small. Inspection of the spectra near the inlet axis indicates the treatment had little effect at any frequency, resulting in the small PNL reductions. The probable reason for this is that the treatment is ineffective at suppressing the low order modes which tend to peak in amplitude at these shallow angles.

Figures III.3.19 to III.3.21 show the treated and untreated PNL directivities obtained from the scale model (with a TCS) scaled up to ICLS size. The figures suggest that treatment evaluation without a TCS tends to be slightly more optimistic as compared to evaluation with a TCS.

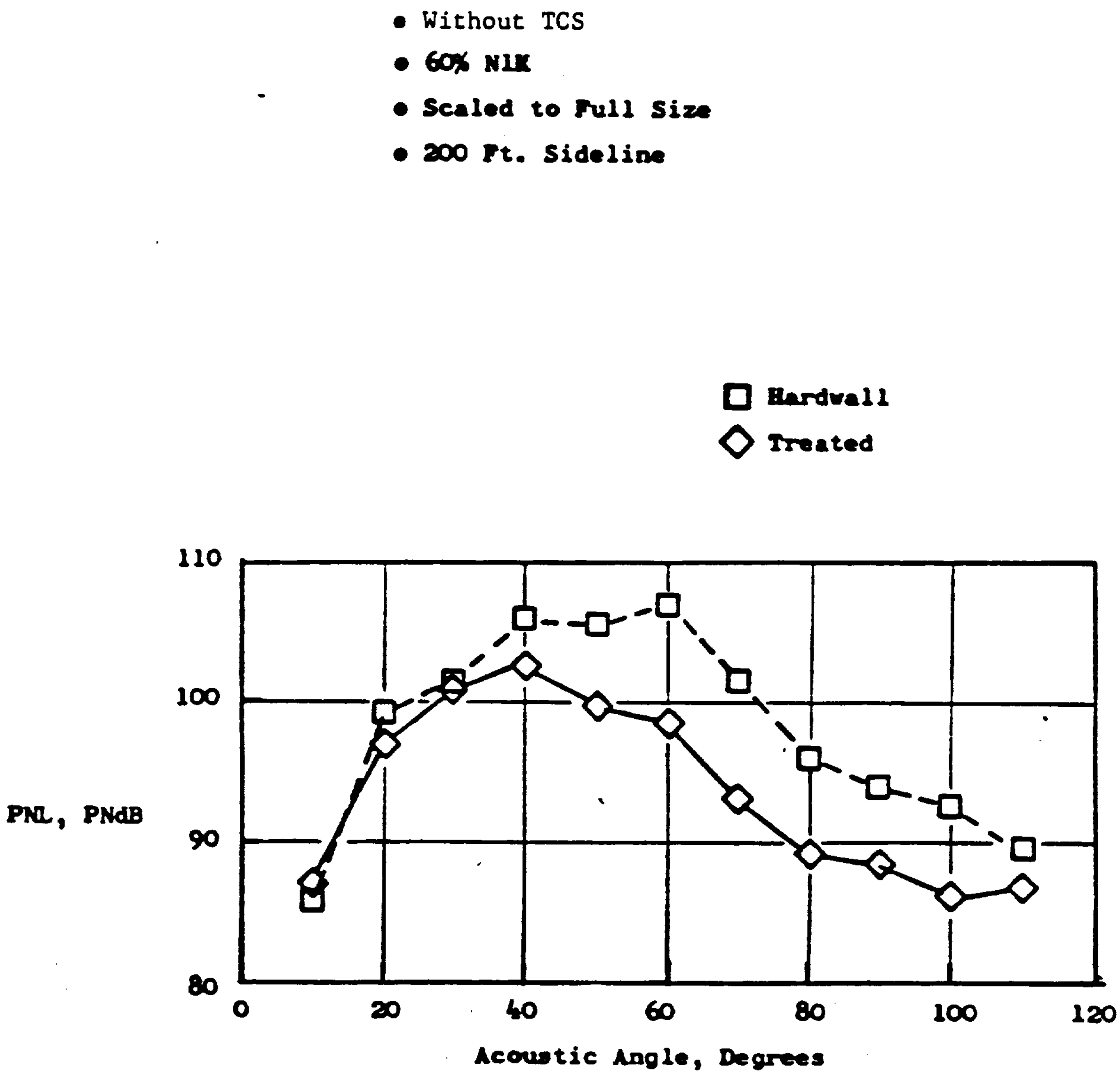


Figure III.3.16 Effect of Inlet Acoustic Treatment on Forward Radiated Fan Noise

• without TCS
• 74% N1K
• Scaled to Full Size
• 200 Ft. Sideline

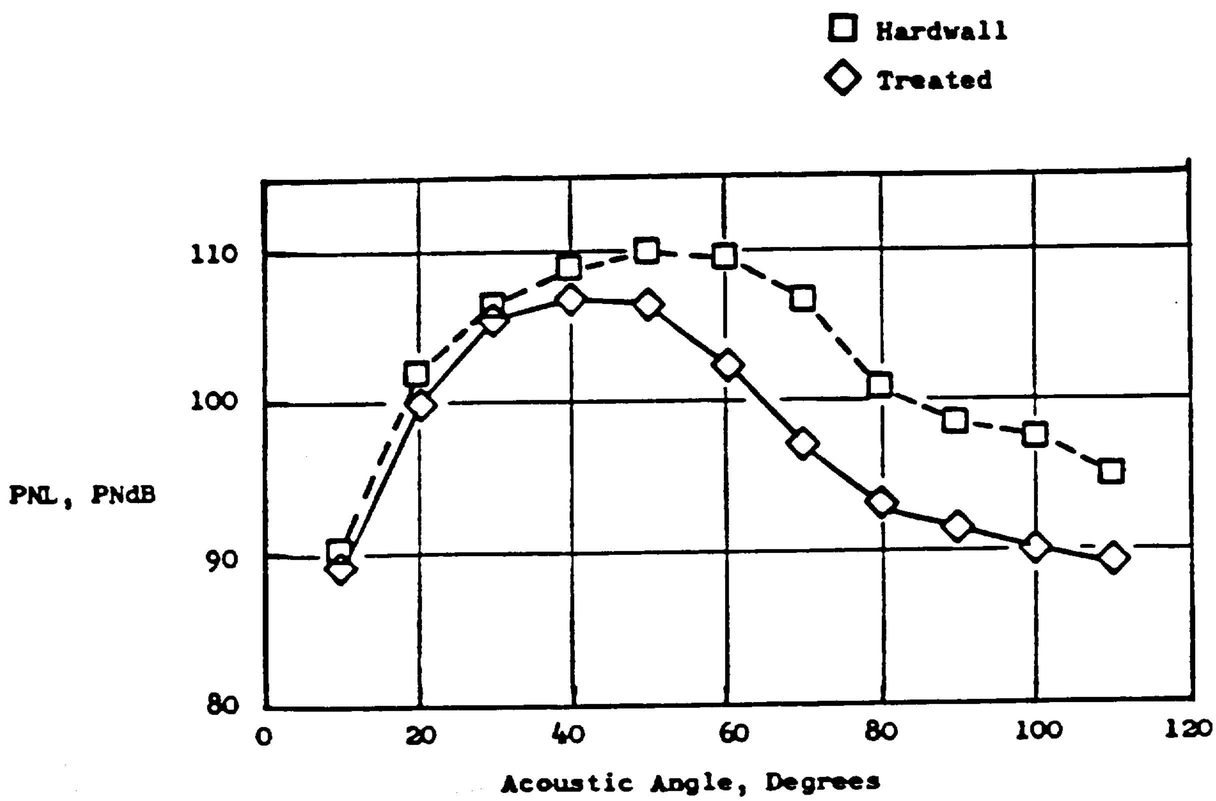


Figure III.3.17 Effect of Inlet Acoustic Treatment on Forward Radiated Fan Noise

- without TCS
- 86% N1K
- Scaled to Full Size
- 200 Ft. Sideline

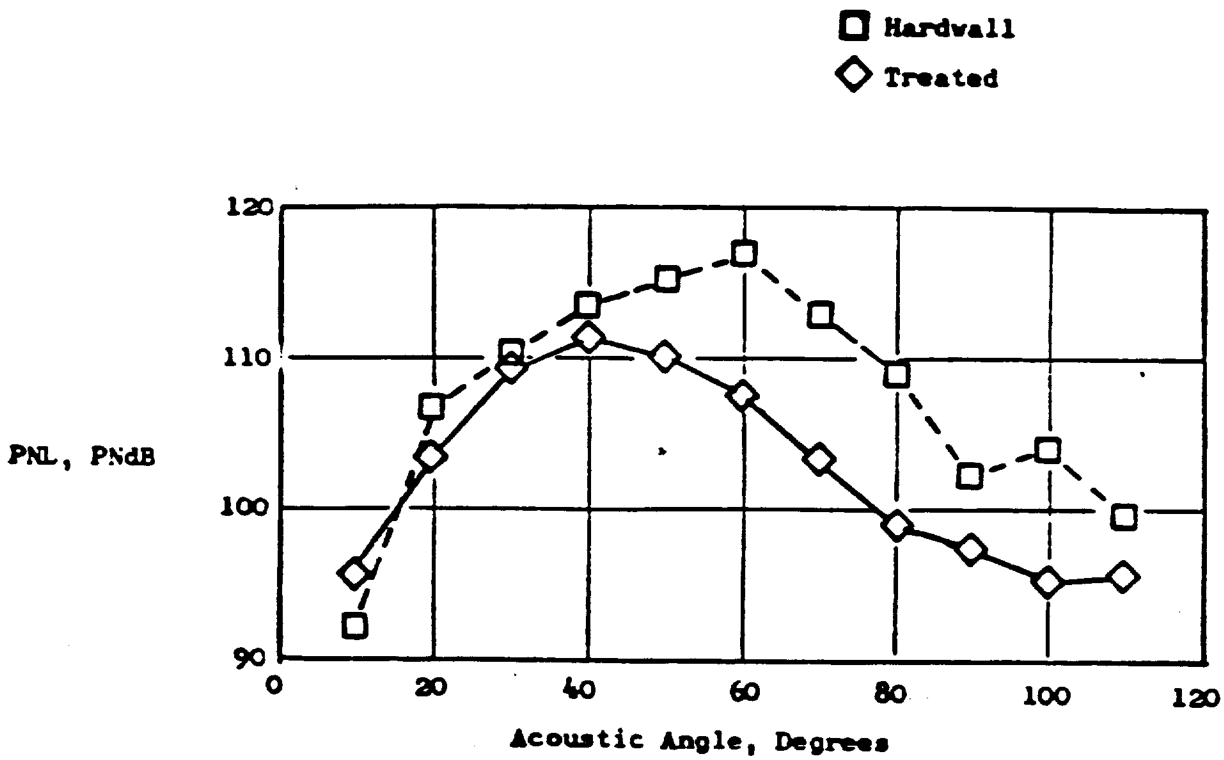


Figure III.3.18 Effect of Inlet Acoustic Treatment on Forward Radiated Fan Noise

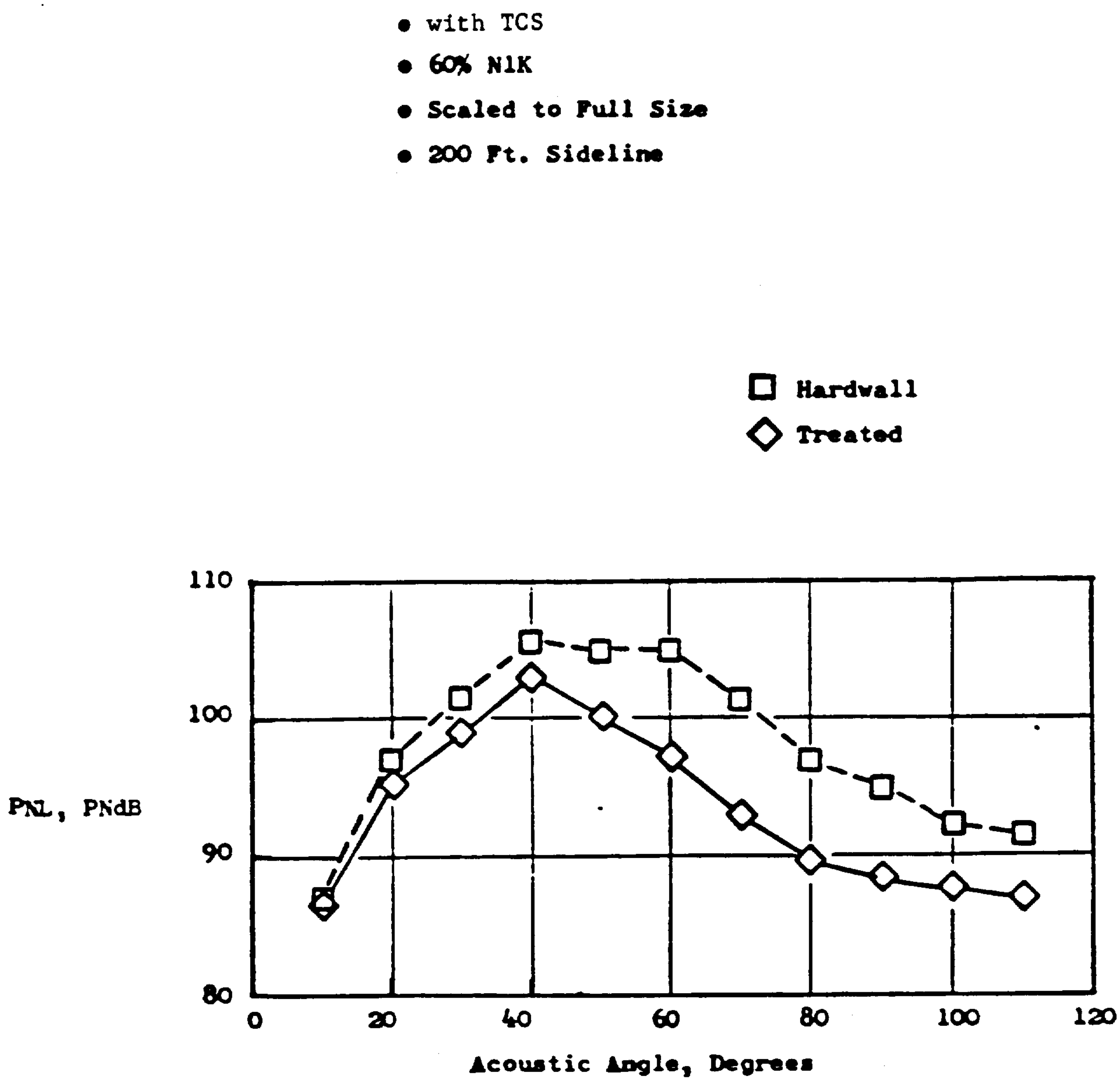


Figure III.3.19 Effect of Inlet Acoustic Treatment on Forward Radiated Fan Noise

• with TCS
• 74% N1K
• Scaled to Full Size
• 200 Ft. Sideline

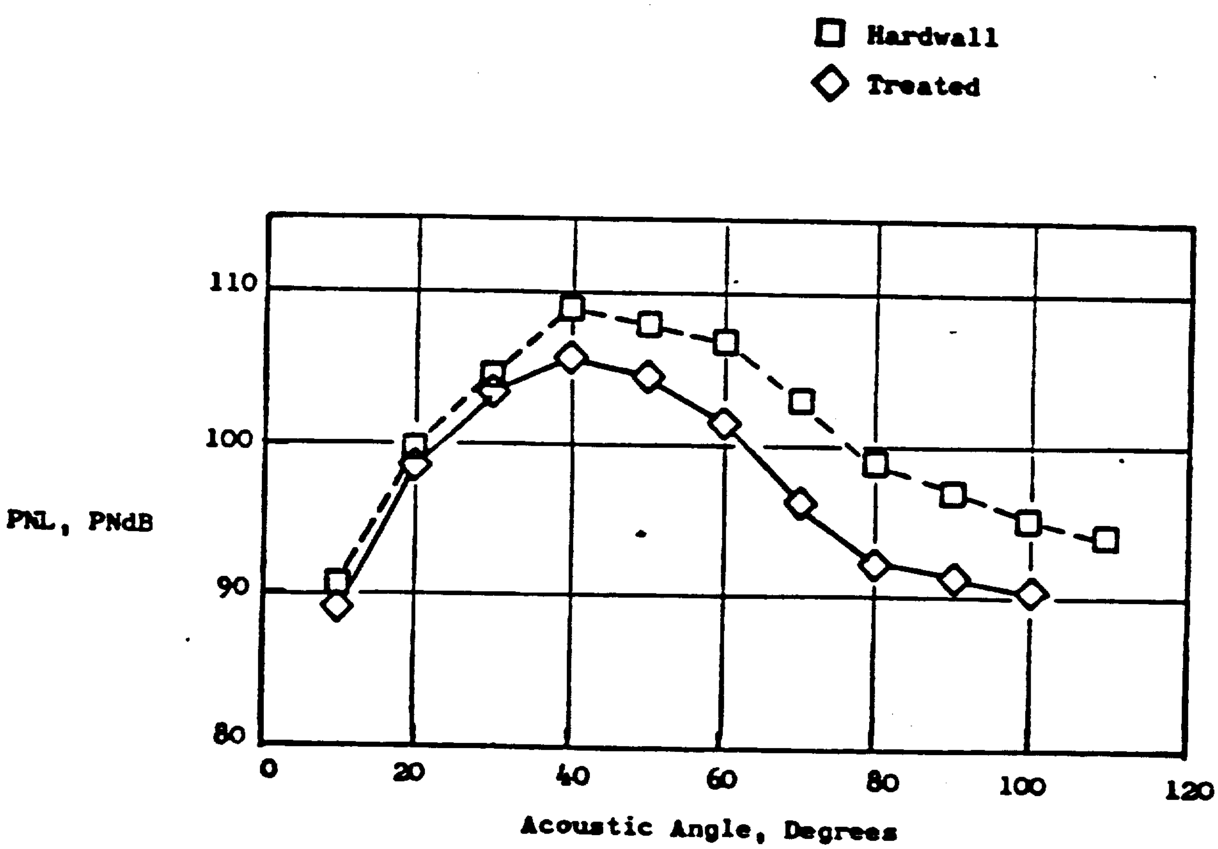


Figure III.3.20 Effect of Inlet Acoustic Treatment on Forward Radiated Fan Noise

- With TCS
- 86% N1K
- Scaled to Full Size
- 200 Ft. Sideline

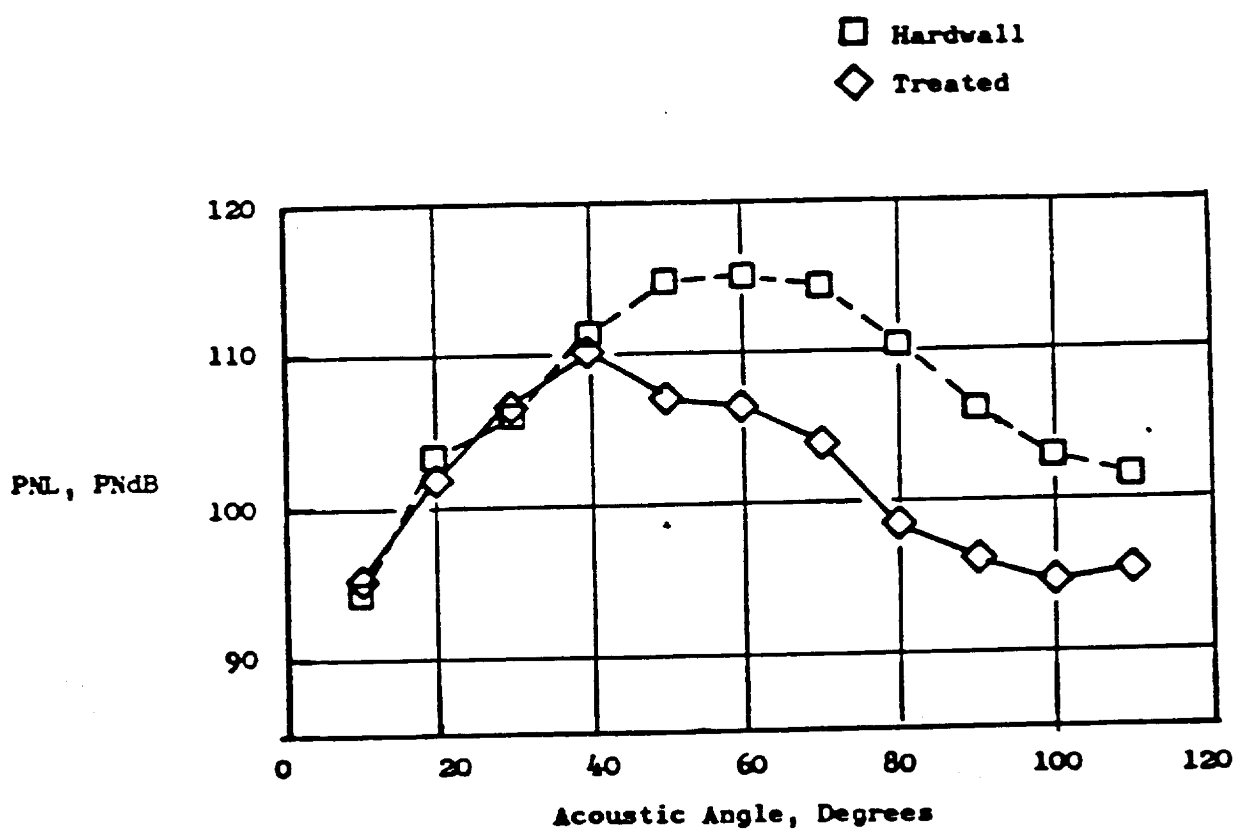


Figure III.3.21 Effect of Inlet Acoustic Treatment on Forward Radiated Fan Noise

4.0 MIXER TEST

In support of the forced mixed flow exhaust system design, acoustic and flow field survey measurements were made on several scale model exhaust systems. The primary objective of these tests was to provide experimental evaluation of the noise reduction potential of high bypass mixer nozzle exhaust systems relative to conventional separate flow nozzles.

4.1 TEST FACILITIES

All mixer acoustic testing was performed at the General Electric Jet Noise Anechoic Chamber located at Evendale, Ohio (shown schematically in Figure IV.1). The chamber is a cylindrical building 21.95 meters (72 ft) high and 13.1 meters (43 ft) in diameter. The chamber's inner surfaces are lined with anechoic wedges made of Owens Fiberglass "Intermediate Service Board." The installation is designed to meet a low frequency cut-off requirement of below 220 Hz and a 0.99 absorption coefficient above 220 Hz.

This facility was certified for acoustic measurements under Task 1 of the DOT/FAA High Velocity Jet Noise Source Location and Reduction Program (Reference 4).

4.1.1 ACOUSTIC INSTRUMENTATION

Acoustic measurements were made every 10° in a polar angle measured from the nozzle inlet centerline, from 40° to 160°. The microphones (Bruel & Kjaer 0.64 cm (0.25 in) diameter, Model 4135) were placed at various distances from the center of the nozzle exhaust plane along the chamber walls. All microphone data were corrected to a constant 12.2 meters (40 feet) arc distance and to a standard day of 25°C, 70% relative humidity using the methods developed by Shields and Bass, as discussed in Reference 5.

As previously described, all testing was conducted with B&K 4135 microphones. In order to obtain the best frequency response, the microphone grid caps were removed. The microphone signals were preamplified through a

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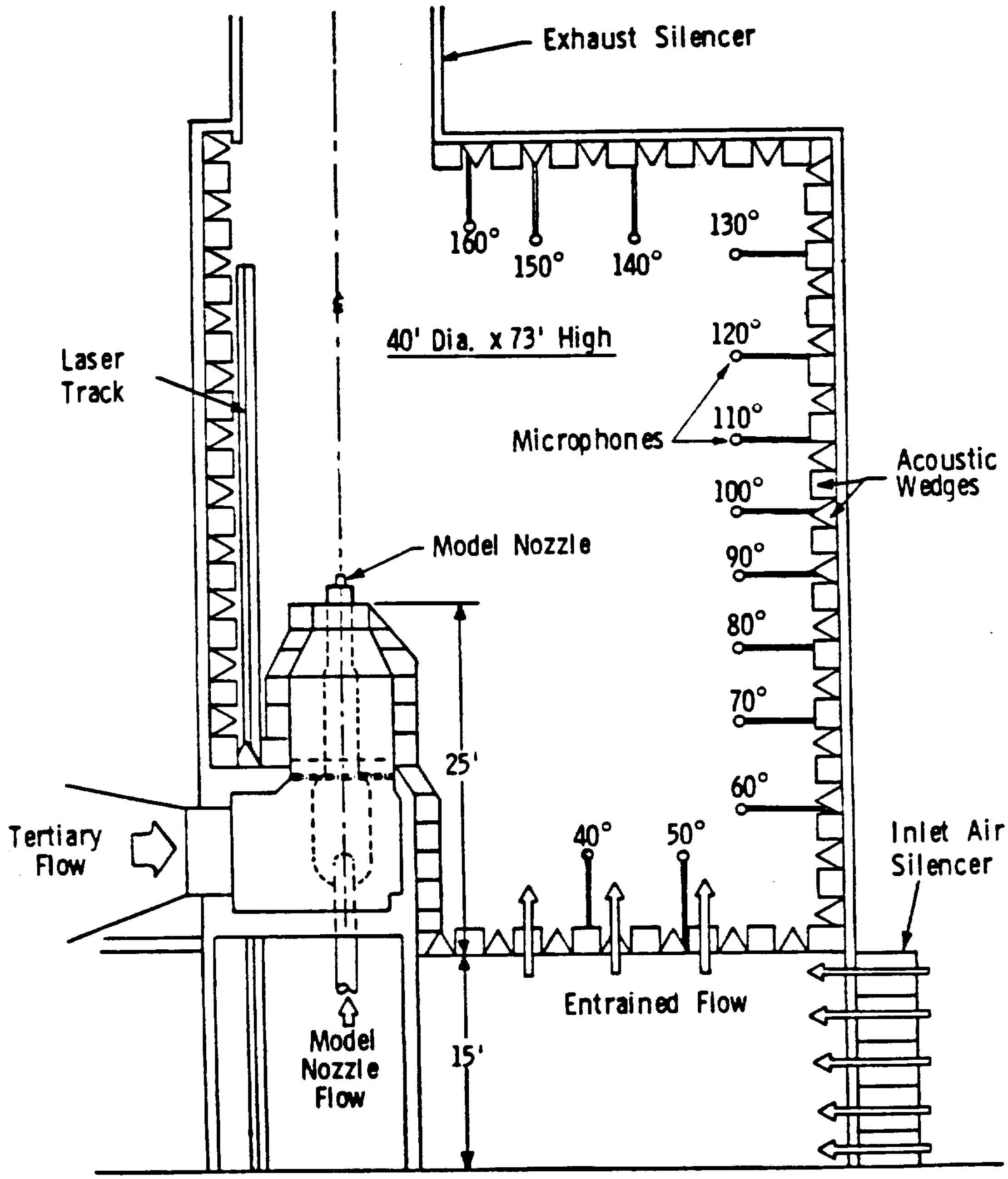
Figure IV.1

G.E. EVENDALE JET NOISE ANECHOIC CHAMBER



transistorized cathode follower, B&K type 2619, powered by a B&K type 2801 power supply to increase the signal strength over the inherent noise floor of the cabling. The signal was further amplified by a line driver, adding 10 dB gain to the signal, as well as adding an additional 3 dB at 40 KHz and 6 dB at 80 KHz "pre-emphasis," increasing the ability to measure low amplitude, high frequency data.

The tape recorder amplifiers had a variable gain from -10 dB to +60 dB in 10 dB steps and were used for normalizing incoming signals to the optimum dynamic range of the tape recorder. The prime system used for recording acoustic data is a Sangamo Sabre IV, 28 track FM recorder. The system was set up for Wideband Group I (intermediate band double extended) at 120 ips tape speed. The tape recorder was set up for ±40% carrier deviation with a recording level of 8 volts peak-to-peak.

All 1/3 octave analyses were performed on a General Radio 1921 1/3-octave analyzer. Integration time was set for 32 seconds to insure high statistical confidence of the low frequency content. The analyzer has 40 one-third octave filter bands ranging from 12.5 Hz to 100 KHz, and has a rated statistical accuracy (1σ) for the region of interest (i.e., 200 Hz to 100 KHz) of ± 1/4 dB in each band.

The digitized 1/3-octave levels are passed through an interface computer from the analyzer and stored on the General Electric Aircraft Engine Group's Honeywell 6000 computer for further processing. Post processing includes correction for microphone and amplifier system response (including de-emphasis) and correction for test day atmospheric conditions.

4.1.2 AERODYNAMIC DATA ACQUISITION

The flow parameters associated with the three flows in the anechoic chamber (core, fan, and tertiary) are measured using type k thermocouples for temperature and standard transducers for pressure. Flow rates were determined in two ways. One method used upstream pressure and measured change in pressure across an orifice. The other method used total pressure at the nozzles and effective area to calculate the flows.

A laser doppler velocimeter (LDV) was used for two nozzle configurations to measure the mean and RMS turbulent velocities in the plume of different jet streams. The description of the LDV system is given in Reference 6.

4.2 TEST PROCEDURE

Acoustic data were obtained for the seven configurations listed in Table IV.2.1 at several combinations of fan, core, and tertiary stream velocities, pressures and temperatures, corresponding to typical FPS engine operating line conditions between approach and takeoff thrust. The fan stream was maintained at ambient temperature, while the core stream was heated to between 717°K (1290°R) and 856°K (1540°R), depending on the power setting (Table IV.2.2). Simulated flight conditions were tested with the free jet operating at free stream Mach numbers of M_o = 0, 0.15, and 0.3.

The configurations tested were designed for a 12% scale model geometric simulation of the exhaust system flowpath, including the fan duct, turbine rear frame, core flow duct, mixer, centerbody, and exhaust nozzle. Reference 7 reports the results of aerodynamic performance characteristics measured on these same scale model configurations.

LDV measurements of nozzle axial mean velocity ($\bar{u}$) and axial component of turbulence velocity (u') were made on four nozzle configurations: 3C, 4S, confluent, and separate-flow. Mixer 3C was selected because it was found to be the noisiest of the mixers. Mixer 4S was selected because it had noise characteristics about the same as the other lobed mixers and had good aerodynamic performance as well. It also had the same lobe number as mixer 3C (18). The conical nozzle and separate flow configurations were selected as baselines for comparison with the mixer results.

A sketch of the nozzle exit plane measurement location grid used in surveying the exit profiles for the mixer nozzles is shown in Figure IV.2.1.

TABLE IV.2.1

ACOUSTIC NOZZLE CONFIGURATIONS

Configuration	Lobe	Scalloped	Cutback	Perimeter P/L	Penetration H_L/H_{MP}	Description
2S	12	Yes	No	7.9	0.39	Medium Penetration
4S	18	Yes	No	10.9	0.39	Medium Penetration
6	24	No	No	13.9	0.39	Medium Penetration
3C	18	No	Yes	10.9	0.39	Large Penetration, Cutback to Medium Penetration
Separate Flow	N/A	N/A	N/A	N/A	N/A	Conventional
Confluent Flow	N/A	N/A	N/A	N/A	N/A	Free Mixer
Conic Flow	N/A	N/A	N/A	N/A	N/A	Baseline

TABLE IV.2.2

E^3 MIXER ACOUSTIC TEST MATRIX

	Dual Flow Models						Conical Nozzle			Tertiary Flow Conditions		
	Fan Stream			Core Stream								
PT. No.	P_T(1) (PSIA)	T_T (°R)	V_j (ft/sec)	P_T(2) (PSIA)	T_T (°R)	V_j (ft/sec)	P_T(2) (PSIA)	T_T (°R)	V_j (ft/sec)	M_0= 0.00	M_0= 0.15	M_0= 0.30
1	19.01	Amb.	685	17.97	1290	930	17.72	700	650	X	X	
2	19.86	"	740	18.69	1335	1035	18.73	"	750	X	X	
3	20.72	"	785	19.45	1380	1135	19.39	"	800	X	X	X
4	22.63	"	875	21.22	1465	1330	20.13	"	850	X(3)	X	X(3)
5	22.63	"	875	20.11	1380	1200	20.97	"	900	X	X	X
6	22.63	"	875	22.82	1465	1450	21.86	"	950	X	X	X
7	21.71	"	835	21.22	1465	1330	22.90	"	1000	X	X	X
8	24.88	"	960	21.55	1415	1330	24.04	"	1050	X	X	X
9	24.72	"	955	24.91	1540	1615	25.32	"	1100	X	X	X
10	26.12	"	1000	22.93	1455	1450	26.77	"	1150	X	X	X
11	27.47	"	1040	24.90	1515	1600	27.06	750	1200	X	X	X
12	Amb.	Amb.	0	Amb.	Amb.	0	Amb.	Amb.	0	X	X	X

Notes: (1) P_T set such that ideal expanded velocity is achieved depending on temperature of air supply on day of test and ambient atmospheric pressure.

(2) Approximate values; P_T set such that specified T_T and ideal expanded velocity are achieved depending on ambient atmospheric pressure.

(3) Laser velocimeter data taken at these conditions on two models.

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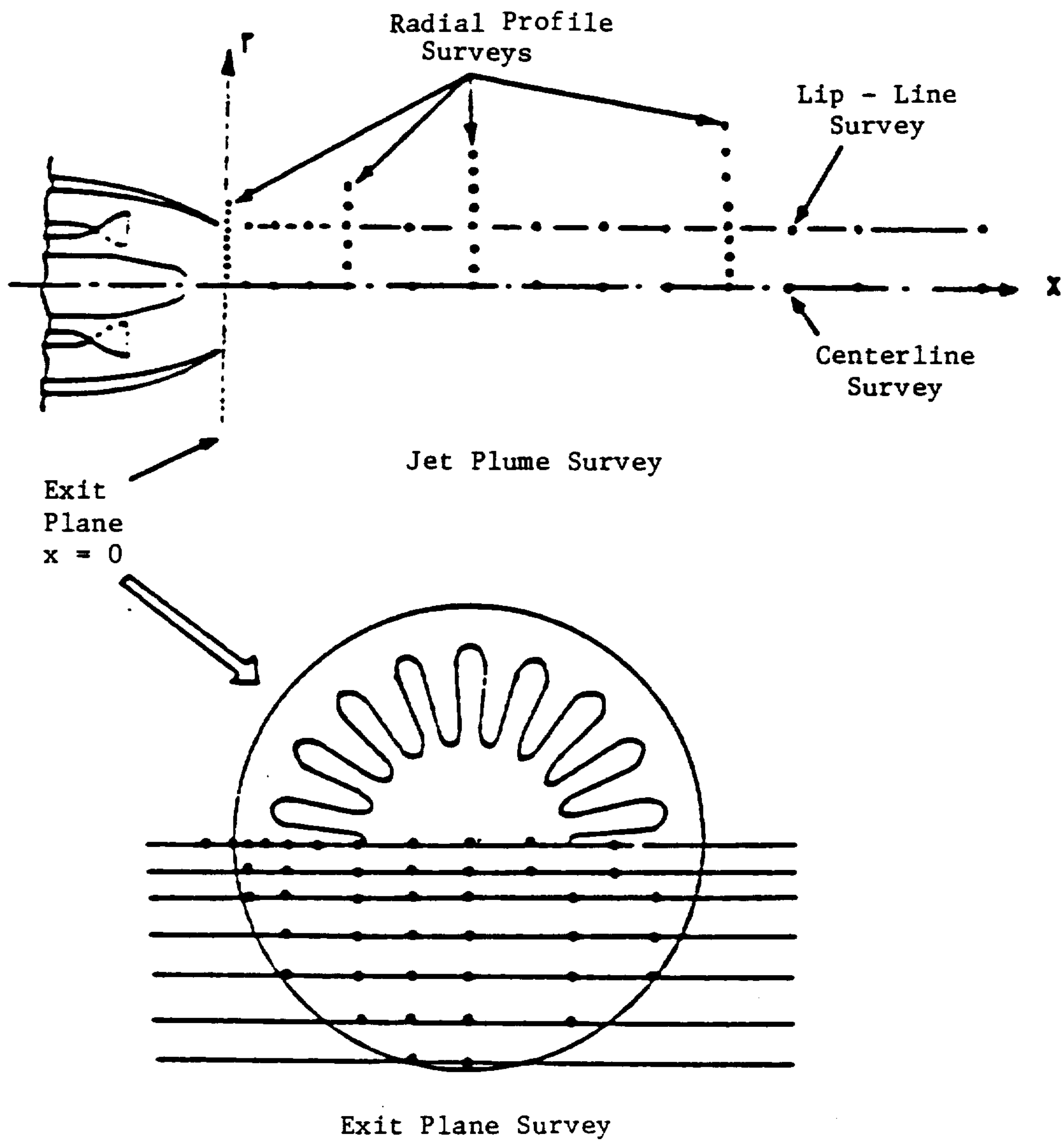

Figure IV.2.1 Typical Jet Plume and Nozzle Exit Plane LDV Survey Data Grid Point Matrix

4.3 TEST RESULTS

4.3.1 STATIC ACOUSTIC CHARACTERISTICS

The measured static (M_o = 0) acoustic data of all seven configurations are compared on a PNL basis in Figure IV.3.1, for a typical takeoff point as normalized for variations in size and test conditions:

$$PNL_n = PNL_m - 10 \log \left(\frac{F_n}{F_{ref}}\right)$$

where: PNL_n = Normalized Perceived Noise Level
PNL_m = Measured Percieved Noise Level
F_n = Measured Thrust
F_{ref} = Reference Thrust

The PNL characteristics are seen to be about the same for all configurations in the forward quadrant (i.e., 40° to 90°). In the aft quadrant, the conic nozzle is seen to be lowest in level, while the separate-flow nozzle is the highest, 3 to 4 PNdB higher than the conic nozzle.

All the mixer configurations fall between these two extremes. The confluent mixer is only slightly quieter than the separate-flow configuration, while all of the forced mixers are 2 to 3 PNdB quieter than the separate-flow configuration.

Comparisons of a typical forward quadrant 1/3-octave spectrum at takeoff conditions are shown in Figure IV.3.2. The spectral levels are virtually the same for all configurations, except for low frequencies. In the low frequency range (i.e., below 200 Hz of the full scale transformed data), the separate flow configuration has the highest levels (approximately 2 to 3 dB higher), while the lobe mixers are 1 to 2 dB lower than the conical nozzle.

Figure IV.3.1 Comparison of Measured PNL Directivity Characteristics under Static Conditions

- $V_o = 0$
- Full Size
- 1500 FT. SL

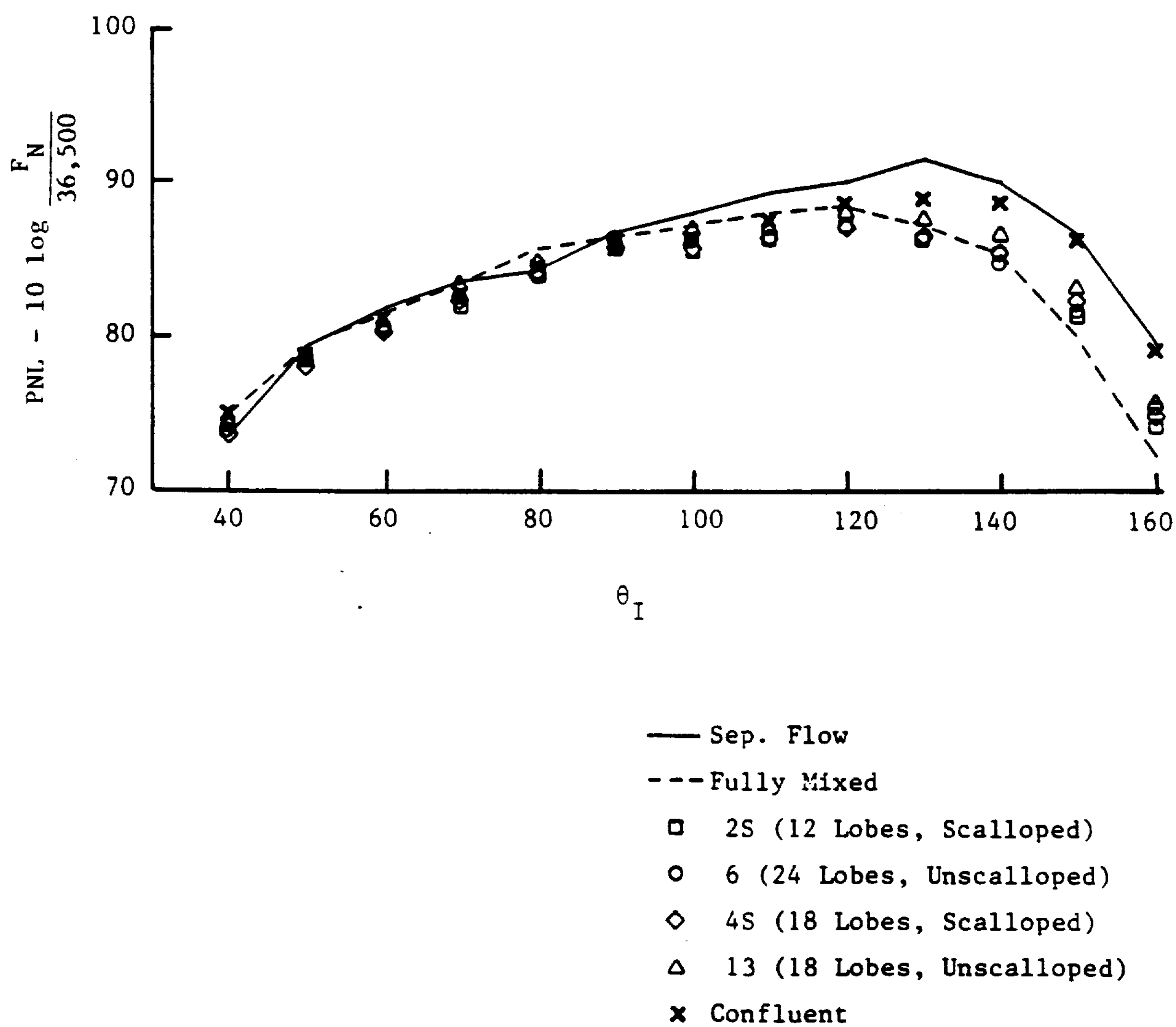

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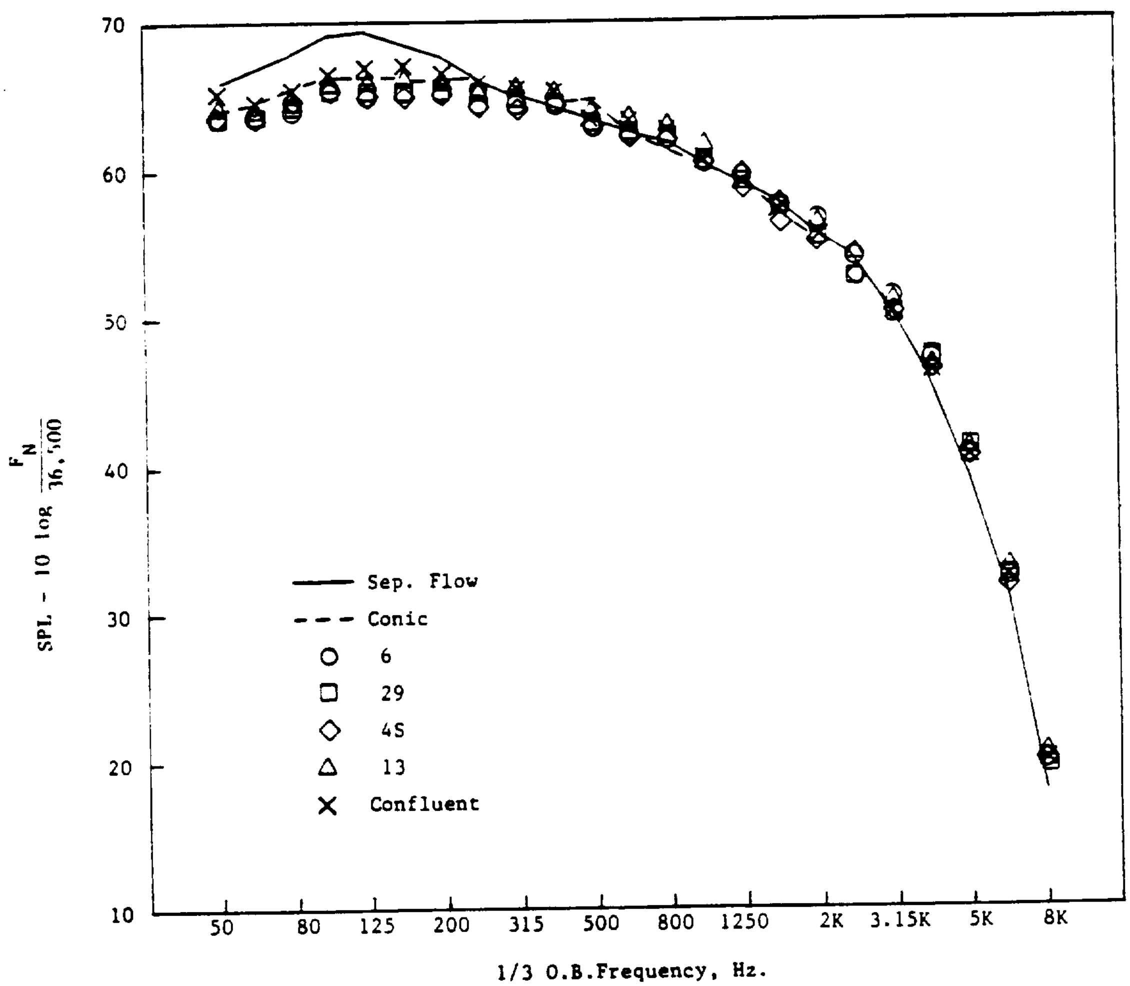
Figure IV.3.2 Comparison of Measured Forward-Arc Spectra Under Static Conditions

- 60°
- F_N = 36,500 lbs.
- 1500 Ft. Sideline
- Static



Similar trends for the low frequencies are observed for typical aft quadrant 1/3-octave spectral comparisons (Figure IV.3.3). Here, the separate flow configuration is 2 to 4 dB higher than the conic and 3 to 5 dB higher than the lobed configurations.

4.3.2 SIMULATED FLIGHT ACOUSTIC CHARACTERISTICS

The measured simulated flight acoustic data (M_o = .15, .3) of all seven configurations were compared on a normalized PNL basis (Figures IV.3.4 and IV.3.5). These comparisons consistently showed the separate-flow and configuration 3C to be the noisiest, the conic to be the quietest, with the other lobed mixers in between. Differences were more accentuated between configurations under simulated flight conditions than they were statically.

Corresponding typical flight spectra are shown in Figures IV.3.6 to IV.3.9. Again, much larger differences are observed between the various configurations than was observed in the static case. At 60°, the low frequency differences are similar to those observed for M_o = 0, but the high frequency portion of the spectrum changes considerably from one configuration to another. The conical and separate-flow configurations show the lowest levels while the 3C mixer levels are the highest. The confluent mixer has the lowest high frequency noise of all the mixers, while mixers 2S and 6 fall in between. The 120° spectra show similar trends with the 3C mixer again being the highest.

Another comparison which can be obtained with static and flight data is the derivation of flight effects. As discussed in K.W. Bushell's paper (see Reference 8), flight levels can be correlated to static levels according to the following relationship:

$$SPL_{static} - SPL_{flight} = 10 \text{ Log} \left[\left(\frac{V_j}{V_r} \right)^m * (1 - M_a \cos \Theta) \right]$$

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Figure IV.3.3 Comparison of Measured Aft Arc Spectra Under Static Conditions

- 120°
- F_N = 36,500 lbs.
- 1500 Ft. Sideline
- Static

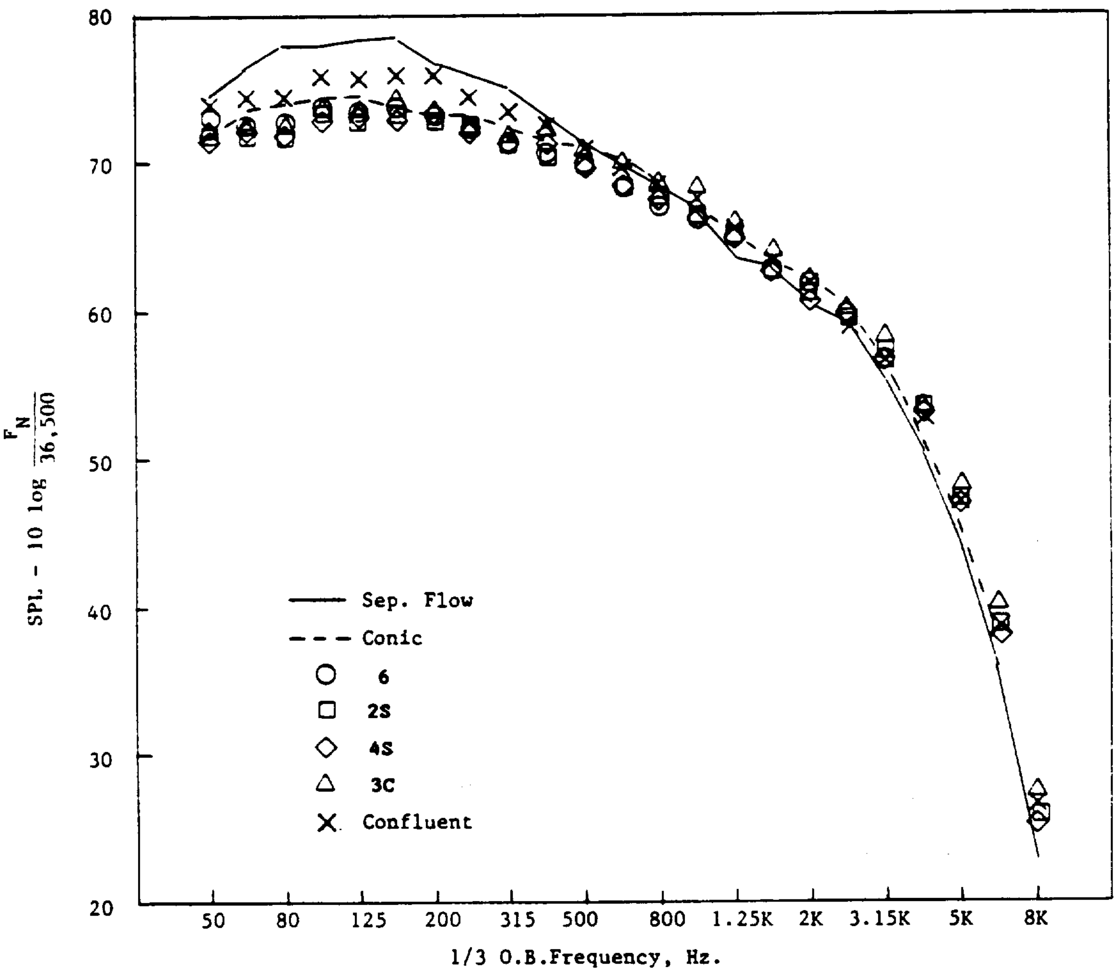

Figure IV.3.4 Comparison of Measured PNL Directivity Characteristics Under Simulated Flight Conditions

- $M_o = 0.15$
- Full Size
- 1500 Ft. Sideline

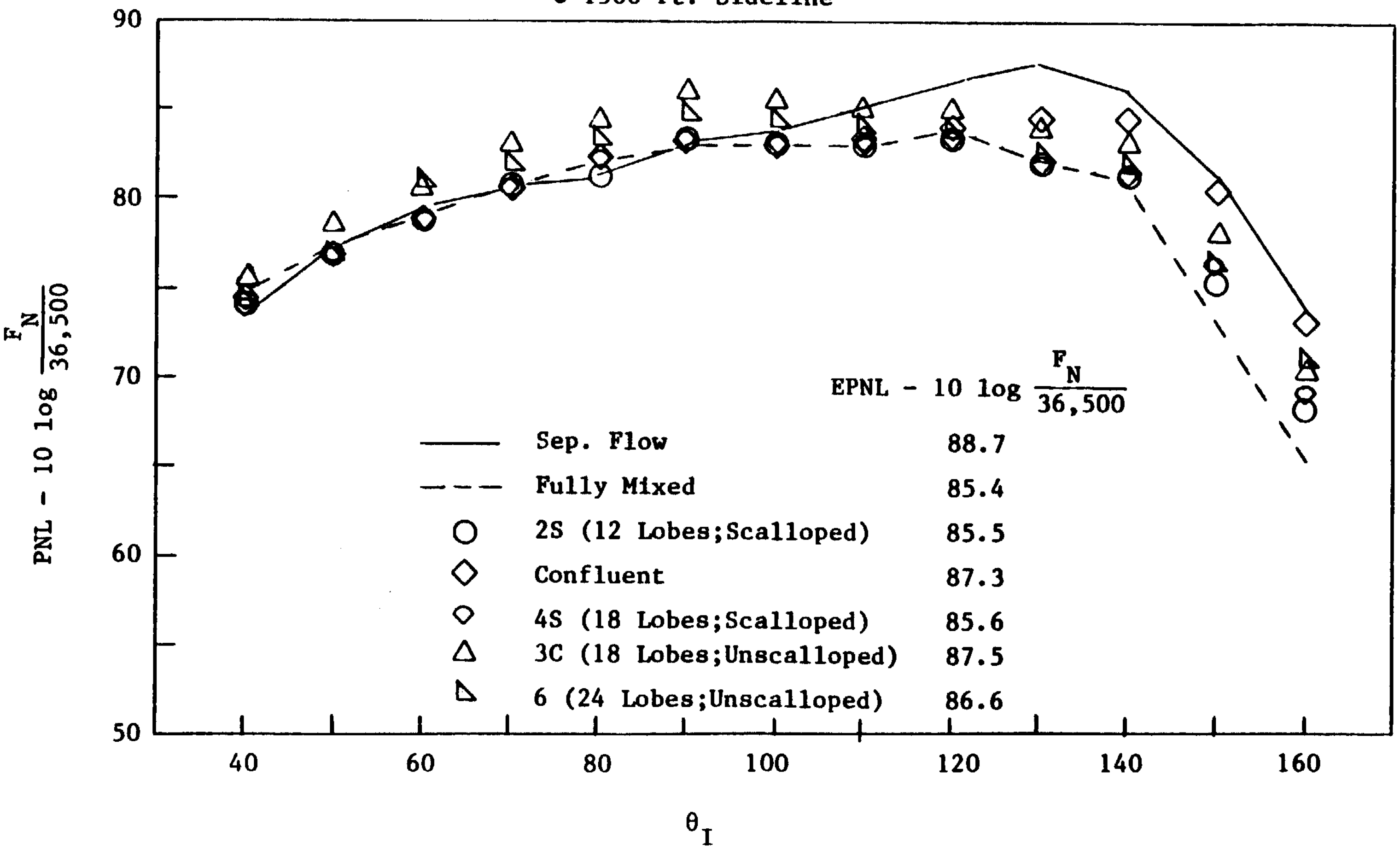

Figure IV.3.5 Comparison of Measured PNL Directivity Characteristics Under Simulated Flight Conditions

- $M_o = 0.3$
- Full Size
- 1500 Ft. Sideline

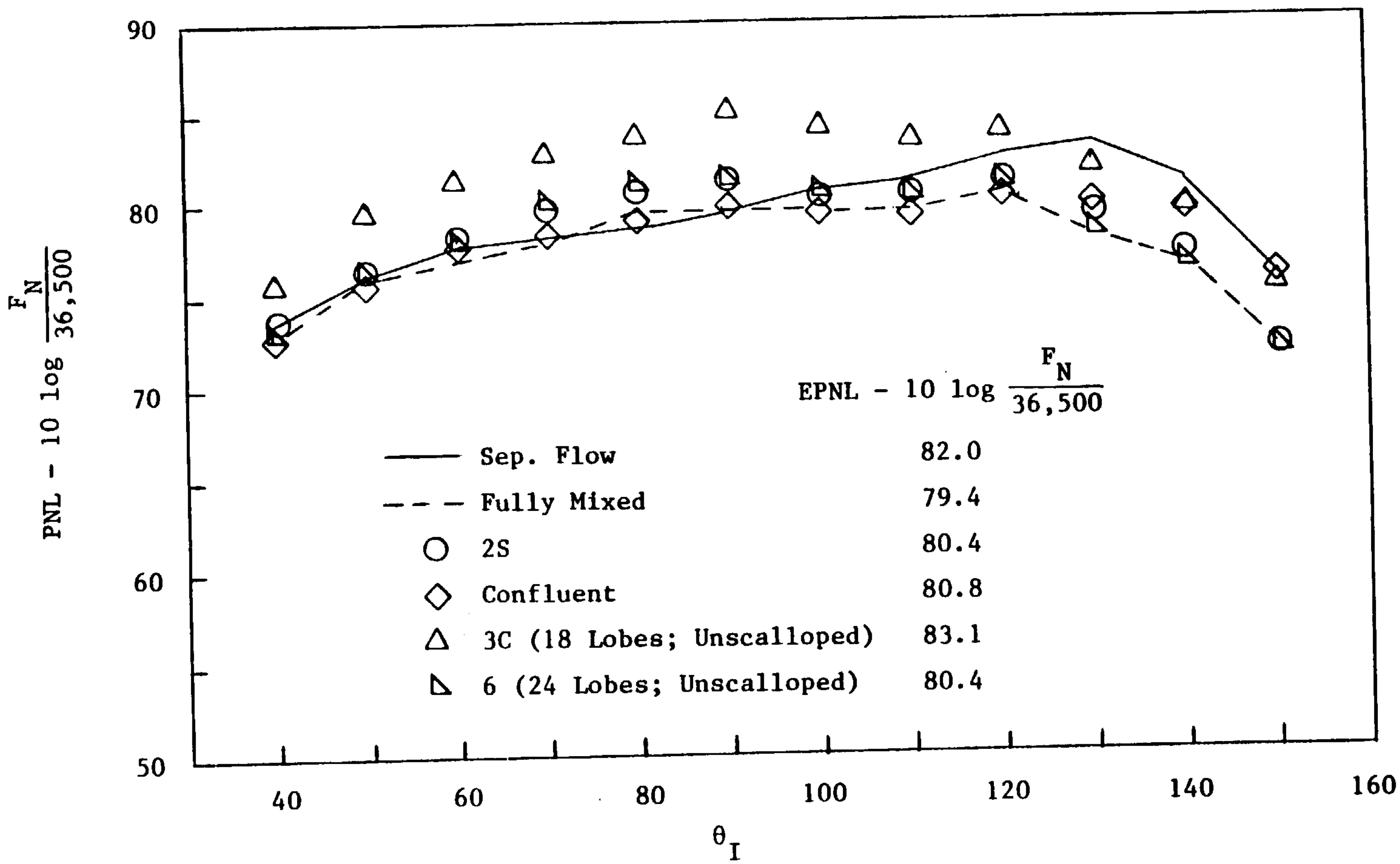

Figure IV.3.6 Comparison of Measured Forward-Arc Spectra Under Simulated Flight Conditions

- 60^{o}
- F_N = 36,500 lbs.
- 1500 Ft. Sideline
- M_o = 0.15

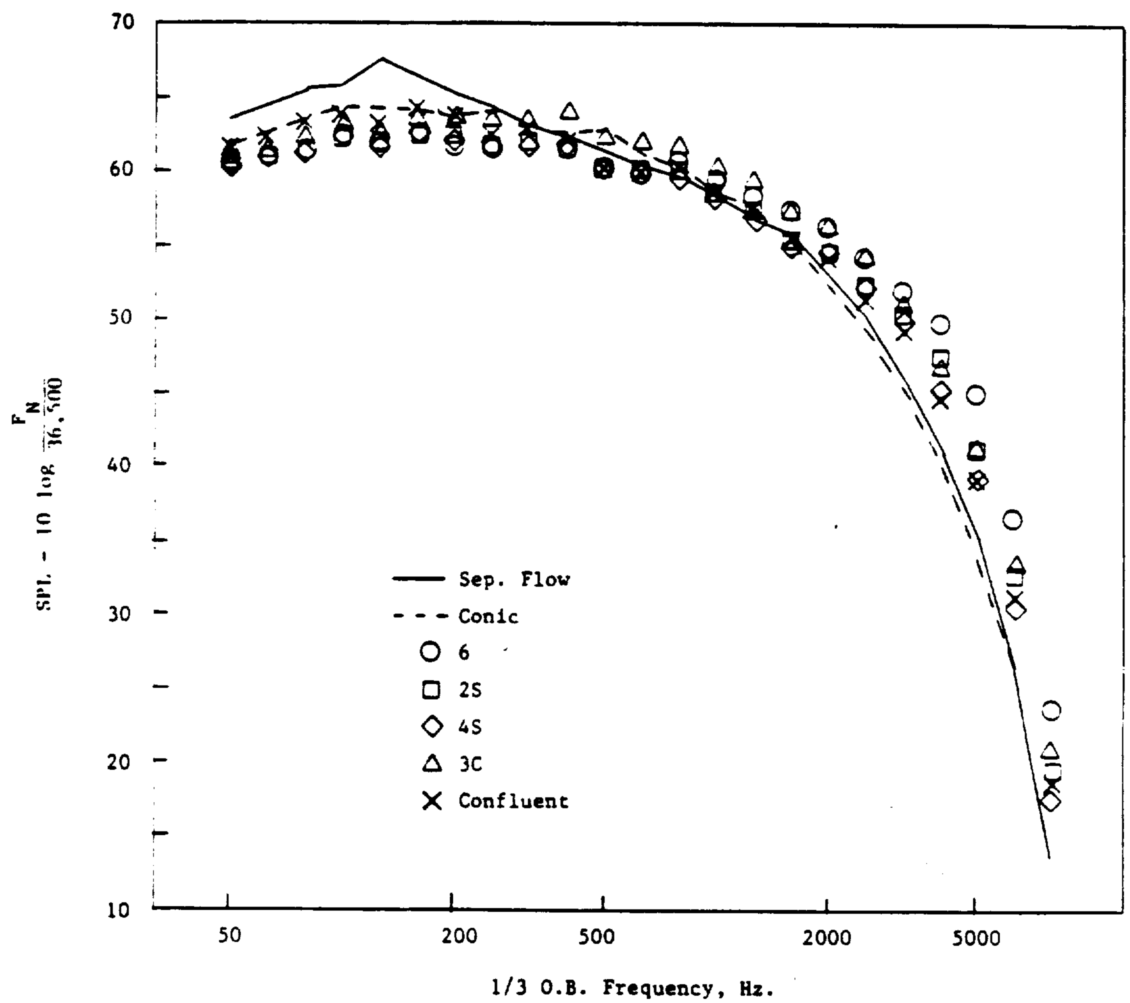

Figure IV.3.7 Comparison of Measured Aft-Arc Spectra Under Simulated Flight Conditions

- 120^{o}
- F_N = 36,500 lbs.
- 1500 Ft. Sideline
- M_o = 0.15

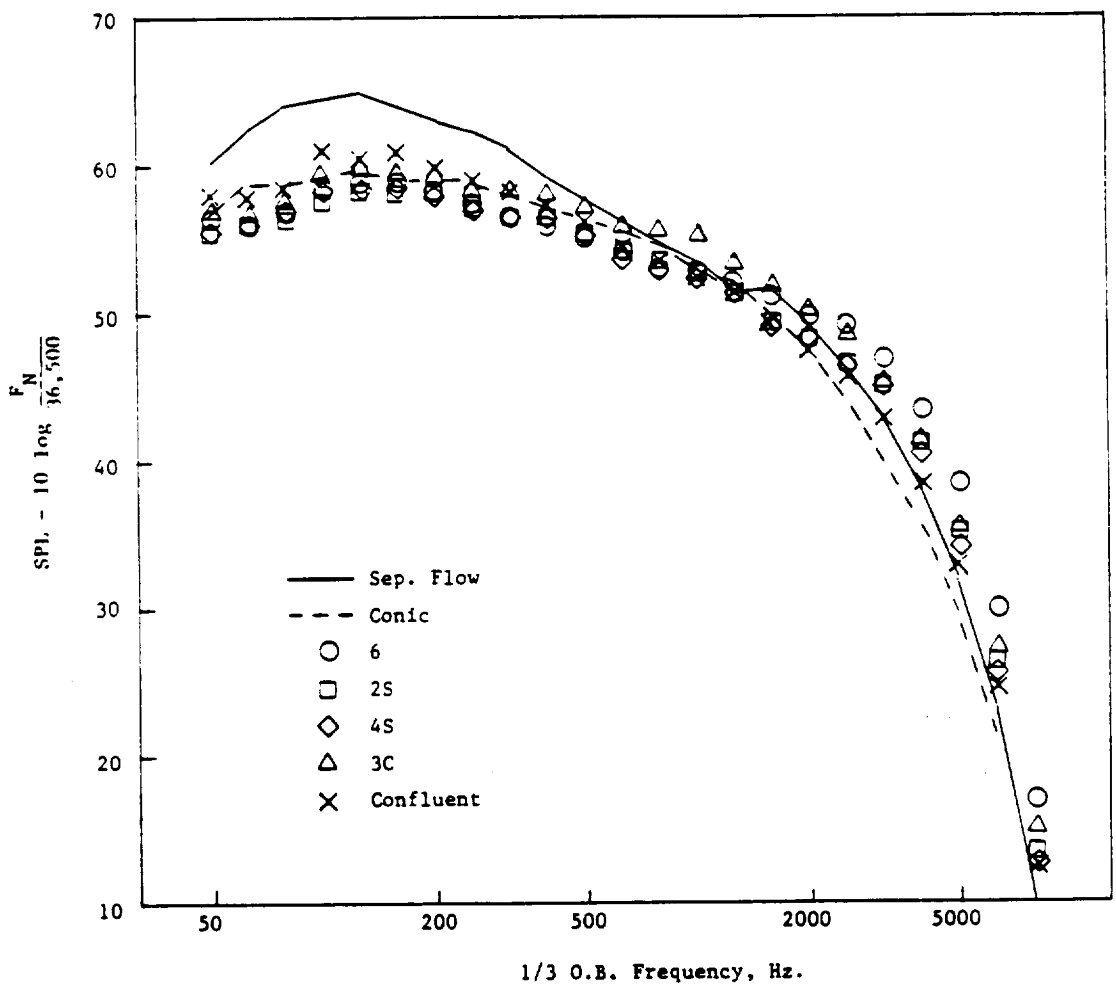

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Figure IV.3.8 Comparison of Measured Forward Arc Spectra Under Simulated Flight Conditions

- 60^{o}
- F_N = 36,500 lbs.
- 1500 Ft. Sideline
- M_o = 0.3

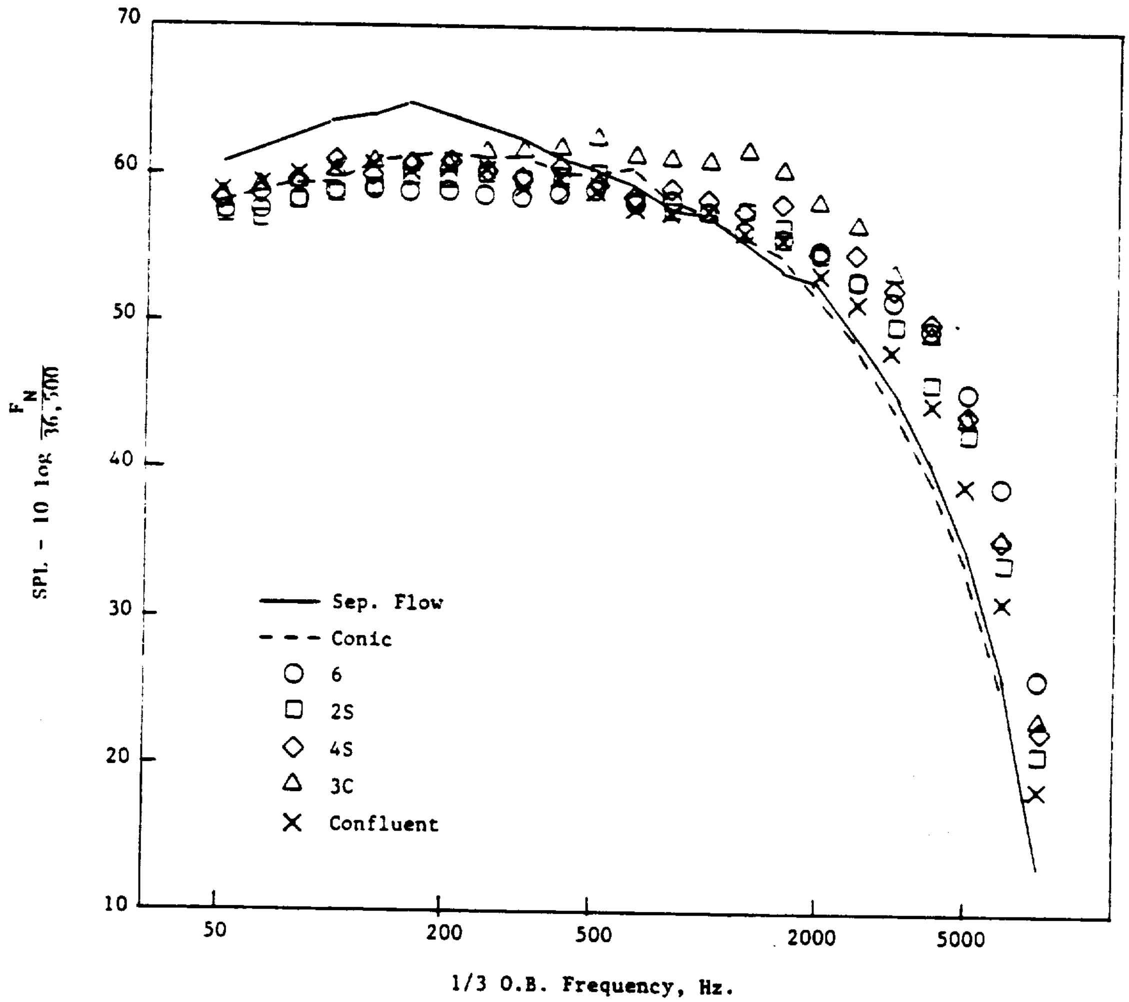

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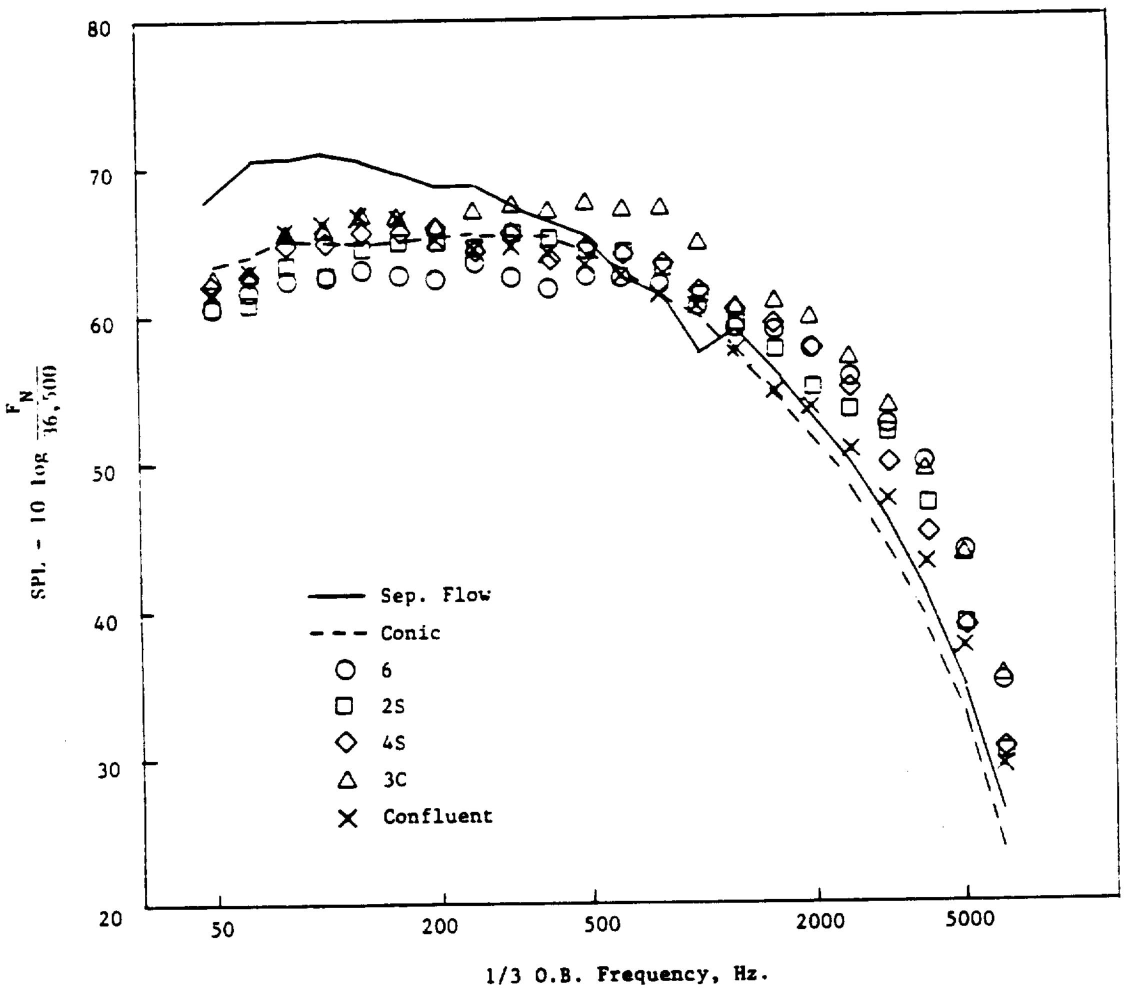
Figure IV.3.9 Comparison of Measured Aft Arc Spectra Under Simulated Flight Conditions

- 120^o
- F_N = 36,500 lbs.
- 1500 Ft. Sideline
- M_o = 0.3



where: SPL_{static} = Static Sound Pressure Level
SPL_{flight} = Flight Sound Pressure Level
V_j = Jet Mixed Velocity
V_r = Relative Velocity = $V_j - V_a$
V_a = Aircraft Velocity
M_a = Aircraft Mach No.
θ = Acoustic angle re Inlet
m = Experimentally derived correlation exponent

By comparing the Overall Sound Pressure Levels (OASPL) between static and flight, the correlation exponent can be derived from the scale model data. The values of the experimentally derived correlation exponent for the 2S and the conic mixer are compared to pretest prediction values in Figures IV.3.10 and IV.3.11. These plots suggested that early status predictions were overpredicting the flight noise at mid angles (40° to 110°) and underpredicting the flight noise at extreme aft angles (140° to 160°).

4.3.3 NOZZLE EXIT PLANE VELOCITY MEASUREMENTS

Because of the large gradients in exit plane velocity which occurred over relatively small circumferential and radial distances, it was not possible to develop a very useful velocity contour map with the limited number of measured data points. Instead, it was found to be more meaningful to plot measured velocities as a function of diameter normalized distance from the centerline, putting all of the data points on the same plot.

Figure IV.3.12 shows the exit plane mean axial velocity as normalized by the mass-averaged velocity V_m, for the 3C mixer, conical mixer and separate-flow nozzles. It can be seen that the data for the 3C mixer collapses fairly well as a curve except in the region of $.3 < r/D_{eg} < .4$, where a large spread in the data is observed. This range corresponds to the region between the lobe inner and outer diameters.

A similar exit plane axial velocity survey plot for the 4S mixer is shown in Figure IV.3.13. Again the greatest variance in axial velocities occurs in the region between the lobe inner and outer diameters.

Figure IV.3.10 "m" Factor Directivity Pattern

- Takeoff
- Full Scale
- 1500 Ft. Sideline

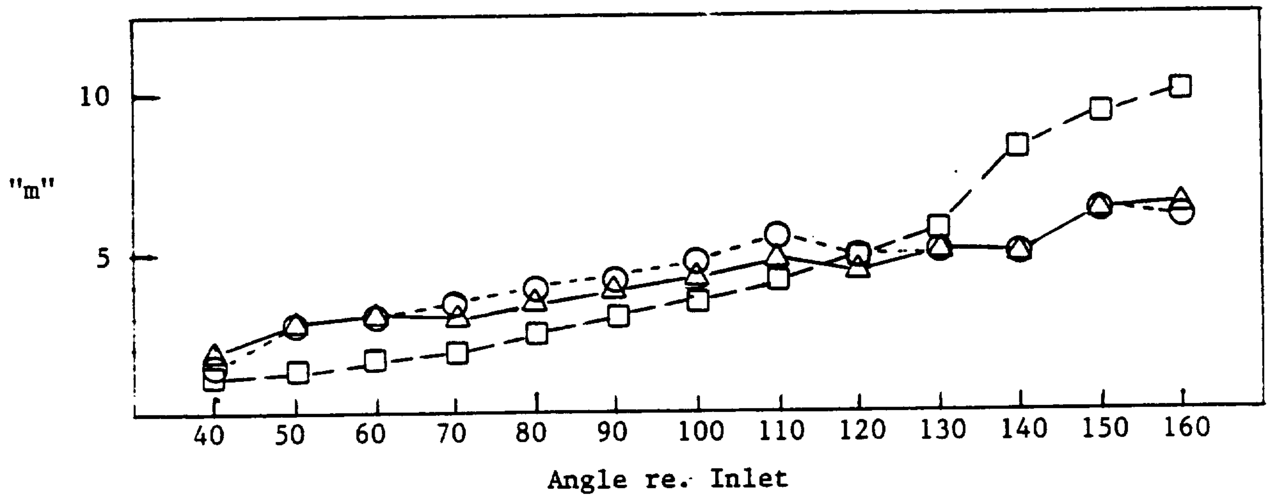
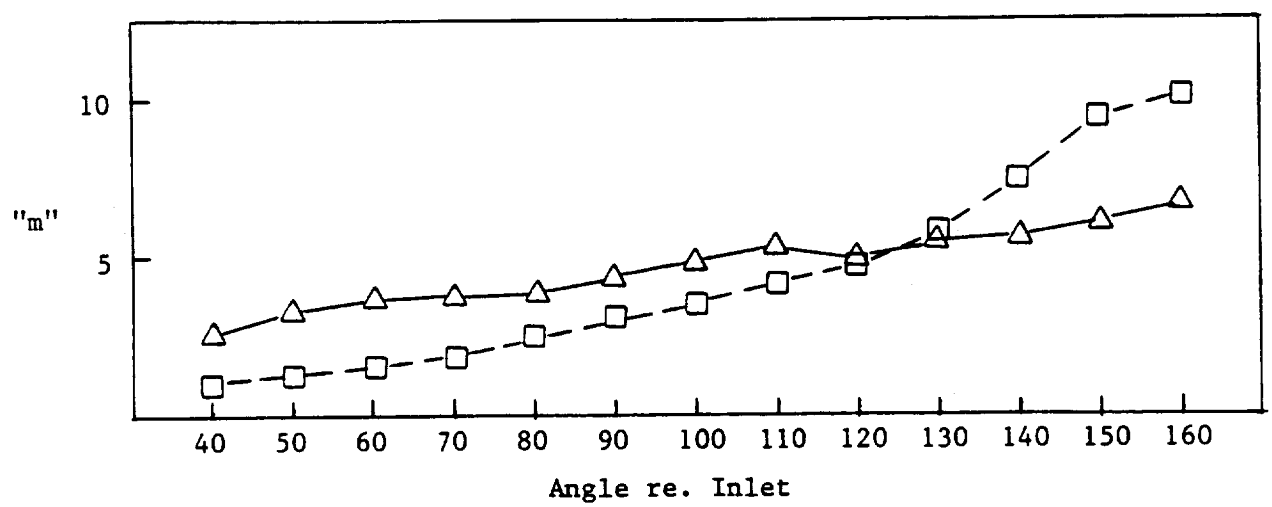


Figure IV.3.11 "m" Factor Directivity Pattern

- Approach
- Full Scale
- 1500 Ft. Sideline



---○- Conic

—△— 2S (12 Lobed, Scalloped)

– –□— Prediction (Based on SNECMA Conic Data)

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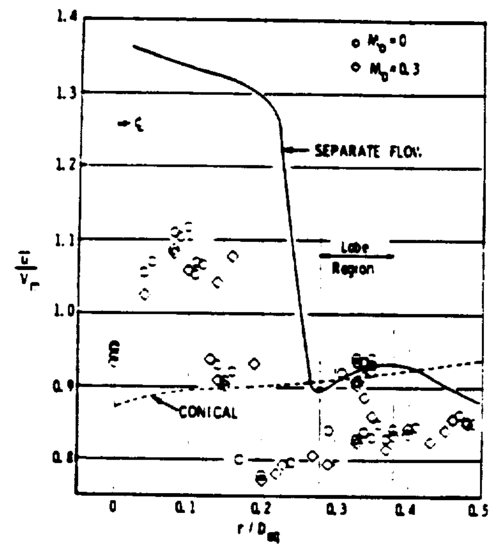

Figure IV.3.12 Mixer 3C Exit Plane Mean Axial Velocity Survey Profile

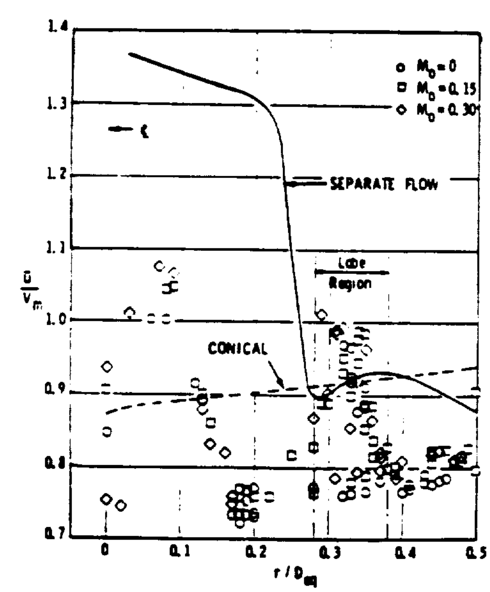

Figure IV.3.13 Mixer 4S Exit Plane Mean Axial Velocity Survey Profiles

Figure IV.3.14 shows the exit plane rms axial turbulence intensity as normalized by the mass-averaged velocity for the 3C mixer, conic mixer and separate-flow nozzles. Similar to the mean axial velocity plots, the greatest data scatter occurs in the lobe region. Figure IV.3.15 again supports the observation that the data has a high degree of scatter in the lobe region.

In comparing the mean axial velocity, Figures IV.3.12 and IV.3.13, along with the axial turbulence intensity, Figures IV.3.14 and IV.3.15, a paradox is observed. Both the mean axial velocity and the axial turbulence intensity levels for mixer 4S are higher than mixer 3C, but 3C has higher noise levels. It is apparent that the exit plane mean axial velocity and axial turbulence intensity levels are not good correlation parameters for determining the noise characteristics of these mixers.

4.3.4 JET PLUME SURVEY MEASUREMENTS

Axial distributions of axial mean velocity and axial turbulence intensity along the nozzle centerline are shown in Figures IV.3.16 and IV.3.17, respectively. These distributions are indicative of jet plume decay rate and turbulence generation in the jet plume and are related to the noise generation/emission processes of the jet plume itself. From Figures IV.3.16a, b, it can be seen that the mixer nozzle mean velocity decay characteristics are similar to that of the separate-flow configuration, both statically ($M_o = 0$) and in simulated flight ($M_o = 0.3$). Similar trends are also observed for centerline turbulence intensity development, Figures IV.3.17a, b. Axial distributions of u and u' along the nozzle lip line are compared in Figure IV.3.18 for $M_o = 0.3$. These comparisons show no real difference between mixers 3C and 4S either, except very close to the nozzle exit plane ($x/D_{eq} < 2.0$), where turbulence levels for the 3C mixer are seen to be about 10% higher.

Radial distributions of axial mean velocity and axial turbulence intensity at several axial locations along the jet plume were compared at M_o = 0.3 simulated flight conditions. Comparisons of $\bar{u}$ and u' vs. r/D_{eq} at x/D_{eq} = 2.0, 4.0, 8.0 and 12.0 are shown in Figures IV.3.19 to IV.3.24,

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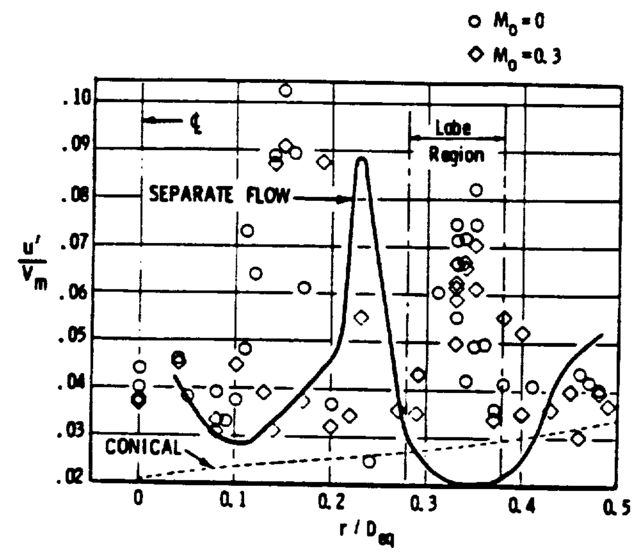

Figure IV.3.14 Mixer 3C Exit Plane Axial Turbulence Intensity Survey Profiles

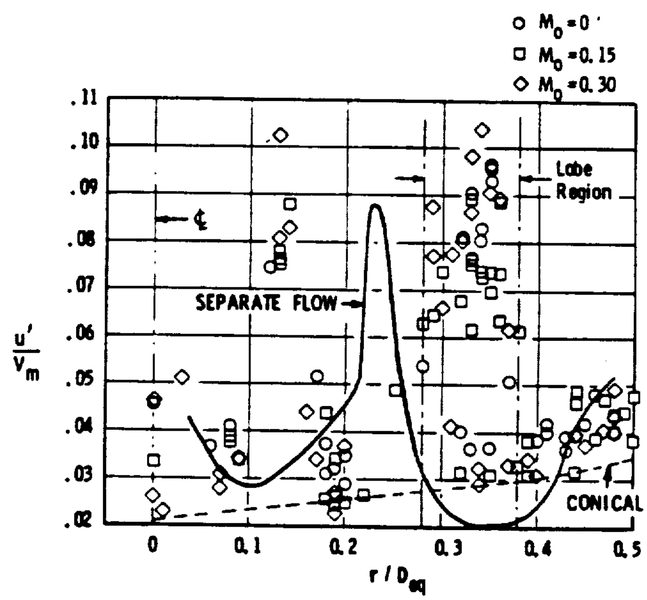

Figure IV.3.15 Mixer 4S Exit Plane Axial Turbulence Intensity Survey Profiles

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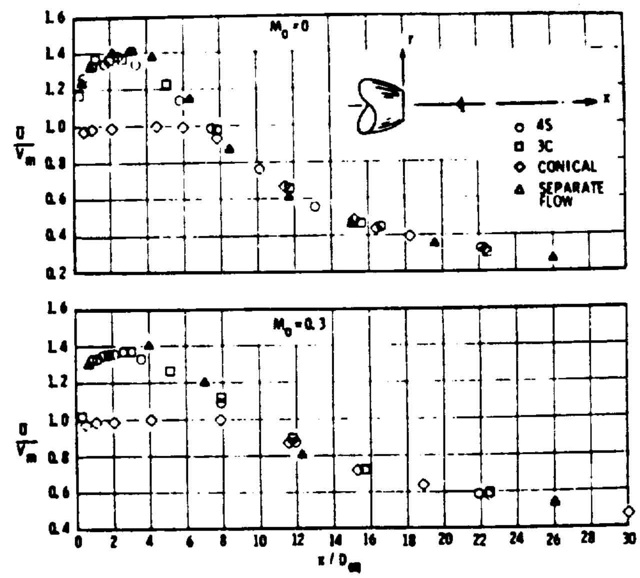

Figure IV.3.16 Comparison of Measured Jet Plume Centerline Mean Velocity Decay Characteristics

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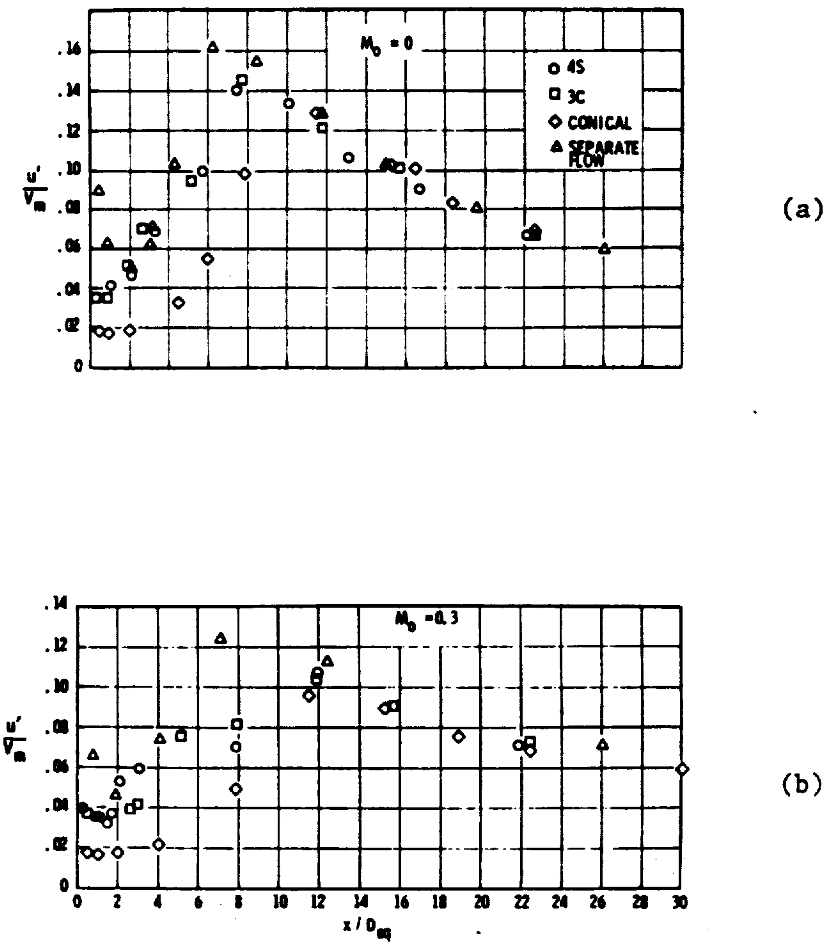

Figure IV.3.17 Comparison of Measured Jet Plume Centerline Axial Turbulence Intensity Distributions

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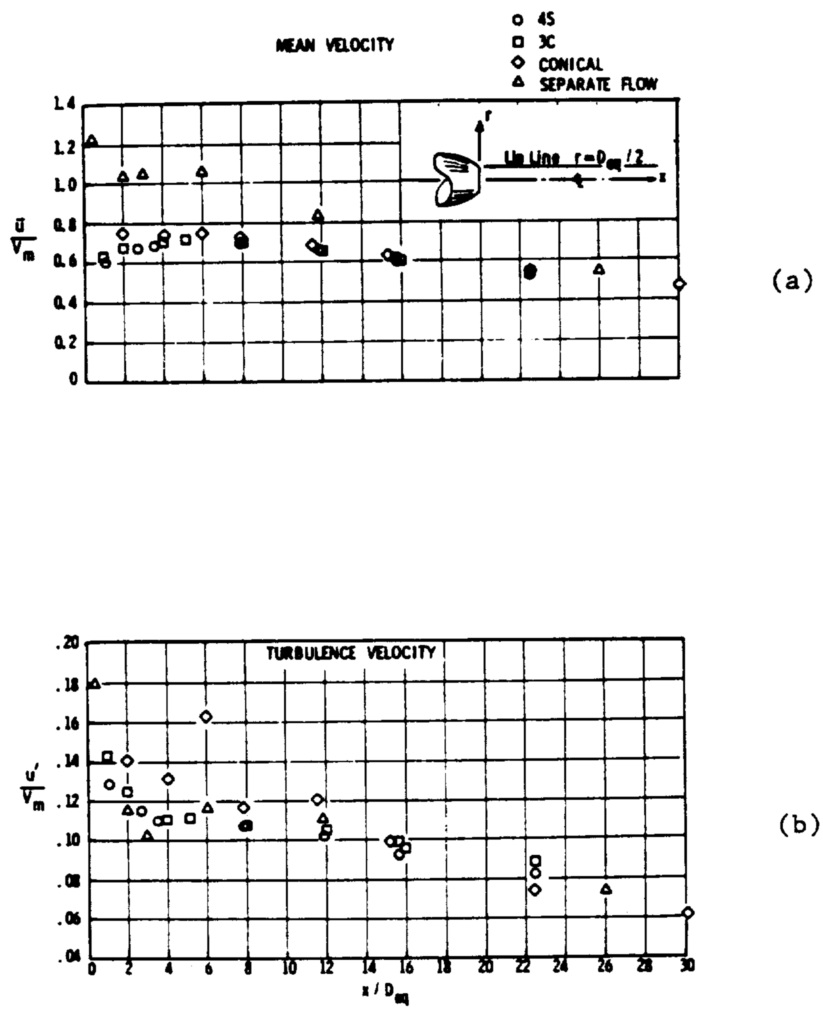

Figure IV.3.18 Comparison of Measured Jet Plume Lip-Line Axial Distributions of Mean Velocity and Turbulence Intensity

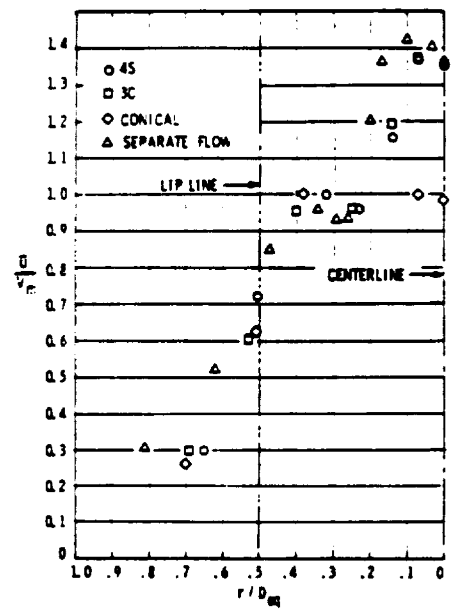

Figure IV.3.19 Comparison of Measured Mean Velocity Radial Profiles at $x/D_{eq} = 2.0$ and $M_o = 0.3$

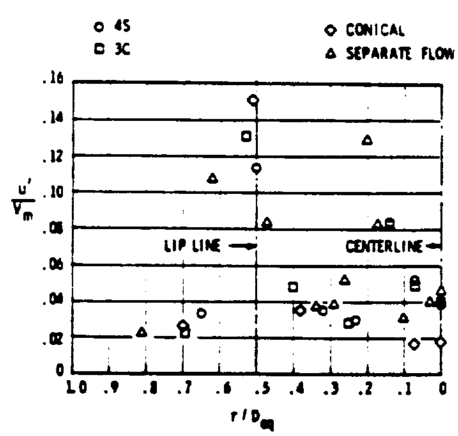

Figure IV.3.20 Comparison of Measured Turbulence Intensity Radial Profiles at $x/D_{eq} = 2.0$ and $M_o = 0.3$

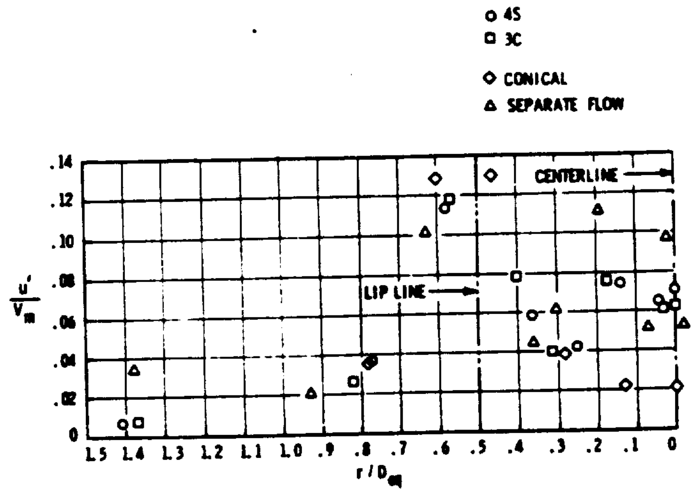

Figure IV.3.21 Comparison of Measured Turbulence Intensity Radial Profiles at $x/D_{eq} = 4.0$ and $M_o = 0.3$

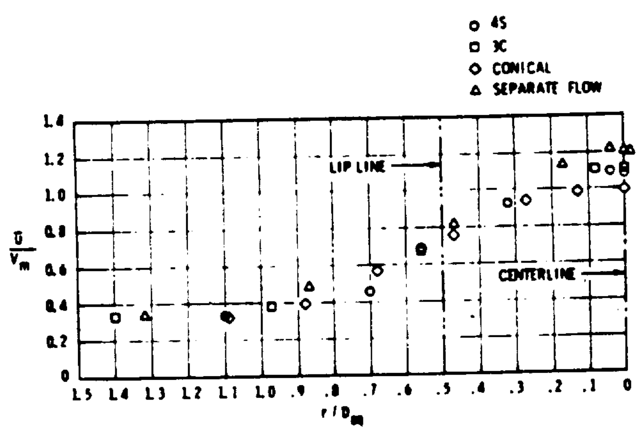

Figure IV.3.22 Comparison of Measured Mean Velocity Radial Profiles at $x/D_{eq} = 8.0$ and $M_o = 0.3$

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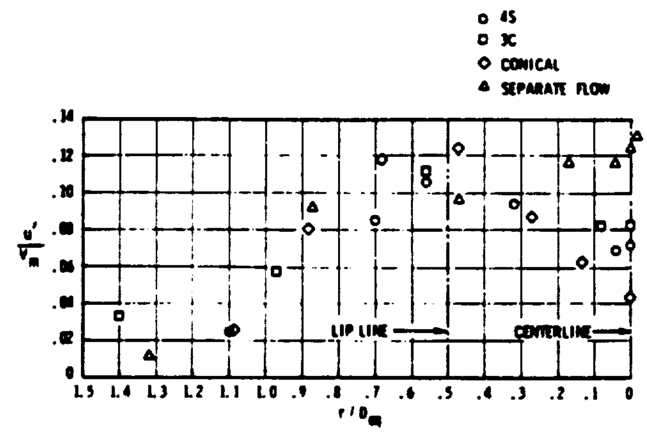


Figure IV.3.23 Comparison of Measured Turbulence Intensity Radial Profiles at $x/D_{eq} = 8.0$ and $M_o = 0.3$

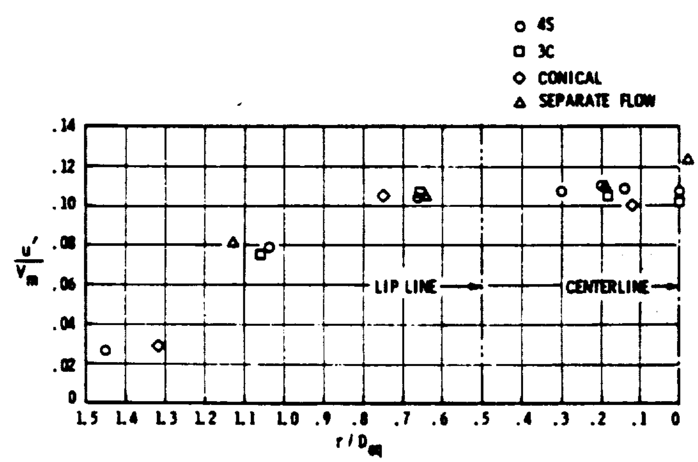


Figure IV.3.24 Comparison of Measured Turbulence Intensity Radial Profiles at $x/D_{eq} = 12.0$ and $M_o = 0.3$

respectively. These comparisons show similar plume development for all nozzles examined in the similarity region $x/D_{eq} > 8.0$. In the potential core zone $x/D_{eq} < 4.0$, only the conical nozzle profiles are appreciably different; and this is because the conical nozzle exit plane profile is nearly flat (Figure IV.3.12), whereas the mixers and separate-flow nozzle have an initial two-stream profile shape. Note that the large differences in mean velocity profile at the exit plane (Figures IV.3.12 and IV.3.13) between the mixers and the separate-flow nozzle rapidly diminish with axial distance, as the profiles are very similar at $x/D_{eq} = 2.0$ and 4.0. On the basis of available data, it can be concluded from these LDV measurement comparisons that the jet plume development is very similar for the two mixers tested, and no differences were observed which could explain the observed noise differences.

One final LDV measurement was made to further distinguish between the two mixers. Each mixer was run with equal fan stream and core stream conditions, $P_T/P_o = 1.44$ and $T_T/T_o = 1.56$. The purpose of this test was to assess the relative importance of turbulence and/or noise generated by the internal flow over and through the mixer lobes as opposed to the turbulence and/or noise generated by the mixing of the fan and core streams after exiting from the lobes. Exit plane LDV surveys were made for this condition, and the results are shown in Figure IV.3.25. The mean velocity profiles are seen to be nearly uniform and similar but about 5% lower in level than the conical nozzle. The turbulence levels are, however, significantly higher than those of the conical nozzle; and it appears that mixer 3C exhibits higher levels in the lobe region than does mixer 4S. Compared to the takeoff fan stream/core stream conditions of Figures IV.3.14 and IV.3.15, the 4S mixer turbulence levels are much lower while the 3C mixer levels are comparable to the levels shown in Figure IV.3.14.

Although the results in Figure IV.3.25 do not truly isolate the internal flow generated turbulence over the lobe surfaces, they suggest that the mixer 3C lobe design does introduce higher surface generated turbulence and therefore a higher internally generated noise level. Since the 3C mixer lobes were cut back relative to the original design intent, it is probable that

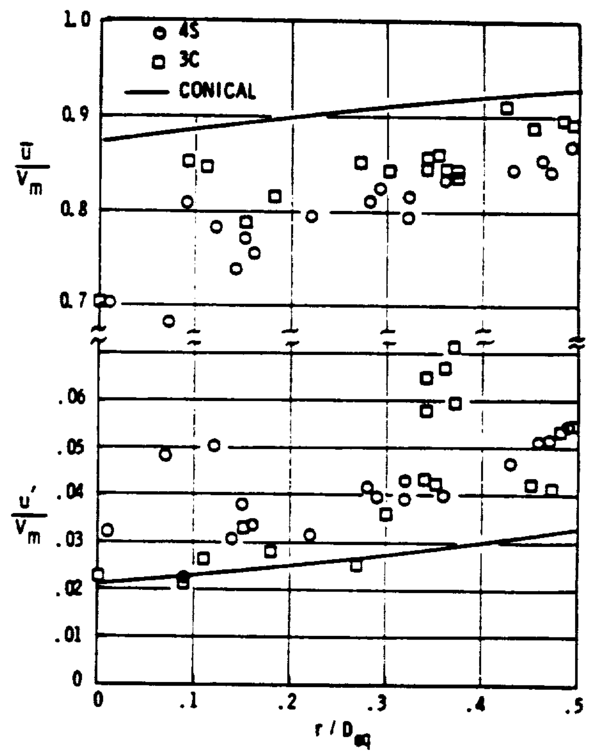


Figure IV.3.25 Exit Plane Survey of $\overline{u}$ and u' for Mixers 3C and 4S with Equal Core and Fan Stream Conditions cutting back of the lobes may have caused the additional turbulence generation. Comparisons of jet plume centerline and lip line distributions of $\bar{u}$ and u' for the two mixers (not shown herein) showed the mixers to be virtually identical and the same as the conical nozzle distributions for equal fan stream/core stream conditions.

4.3.5 AEROACOUSTIC MODEL PREDICTIONS

Attempts were made to predict the acoustic characteristics of each nozzle using the aeroacoustic prediction model developed by Mani, Gliebe, and Balsa (M.G.B.), (Reference 8) and the aerodynamic performance data measured with the laser doppler velocimeter. The M.G.B. aeroacoustic prediction model allows the specification of arbitrary temperature and total pressure profiles at the nozzle exit plane. The downstream jet plume flow characteristics are then computed from the inital exit profiles. From these flow characteristics, the mixing noise spectrum and farfield directivity are estimated.

As a baseline, the acoustic levels for the conical nozzle were predicted using M.G.B., and comparisons with measured data were made (Reference Figure IV.3.26 and IV.3.27). There is reasonably good agreement of the predicted and measured spectral levels and directivities, except under flight conditions, where the levels tend to be slightly overpredicted.

The mixer nozzles were similarily evaluated with comparisons of predictions and measured data (Reference Figures IV.3.28 and IV.3.29 for a typical example). Again, the static levels were predicted reasonably well, but the flight levels were overpredicted. Inspection of the power level spectra shows significantly different spectral shapes between the measurement and prediction. The largest differences in spectral shape occur at high frequency (approximately 5 KHz, to 40 KHz, unscaled). These differences are probably due to internally generated mixing noise, which the M.G.B. prediction is incapable of modeling due to lack of internal aerodynamic performance information. This performance information could not be obtained with an LDV system due to the fact that the outside nozzle shrouds the inside mixing process.

Figure IV.3.26 Conic Nozzle Model OASPL Directivity

• V_m = 945 fps

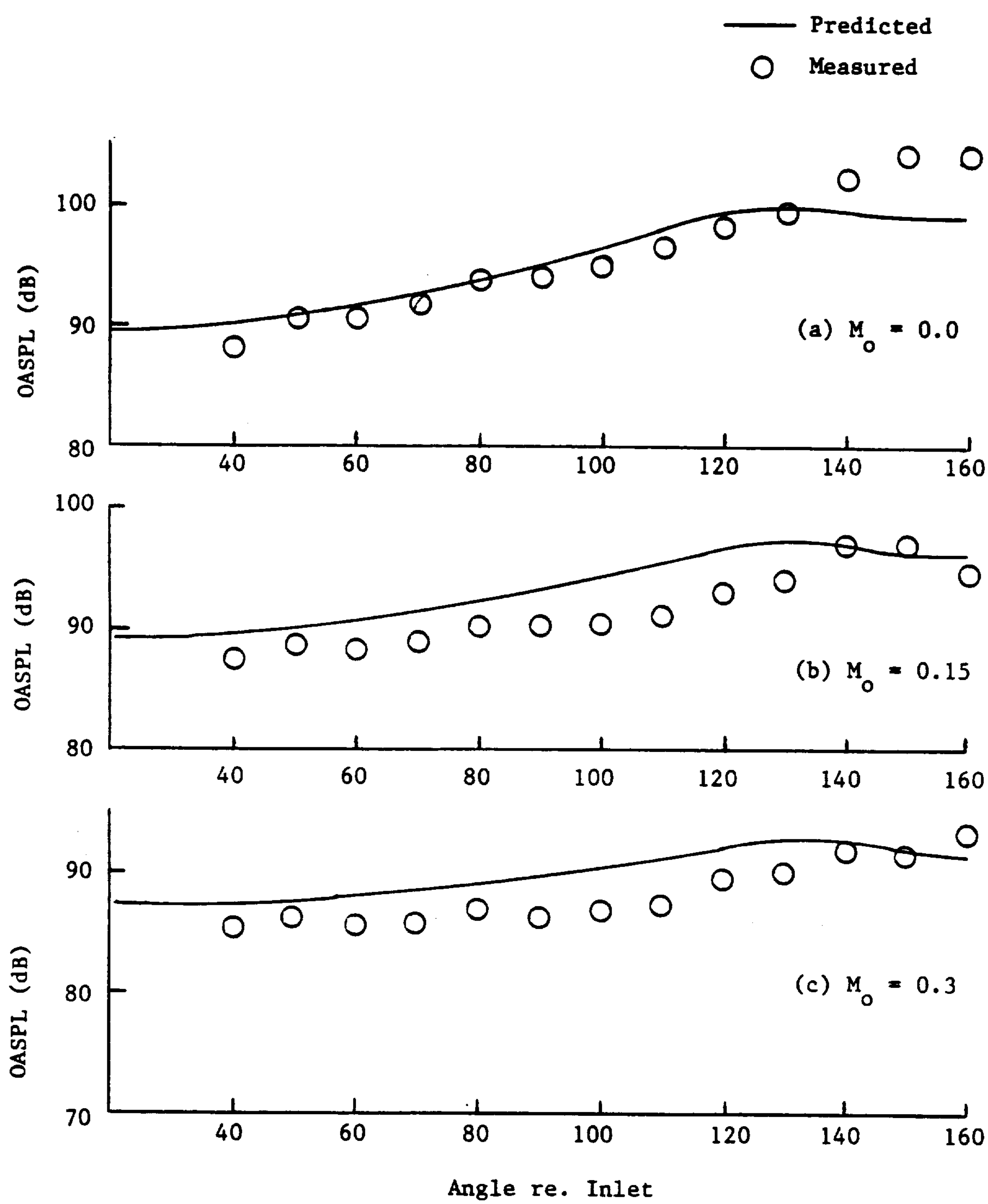


Figure IV.3.27.a Conical Nozzle Model Power Levels

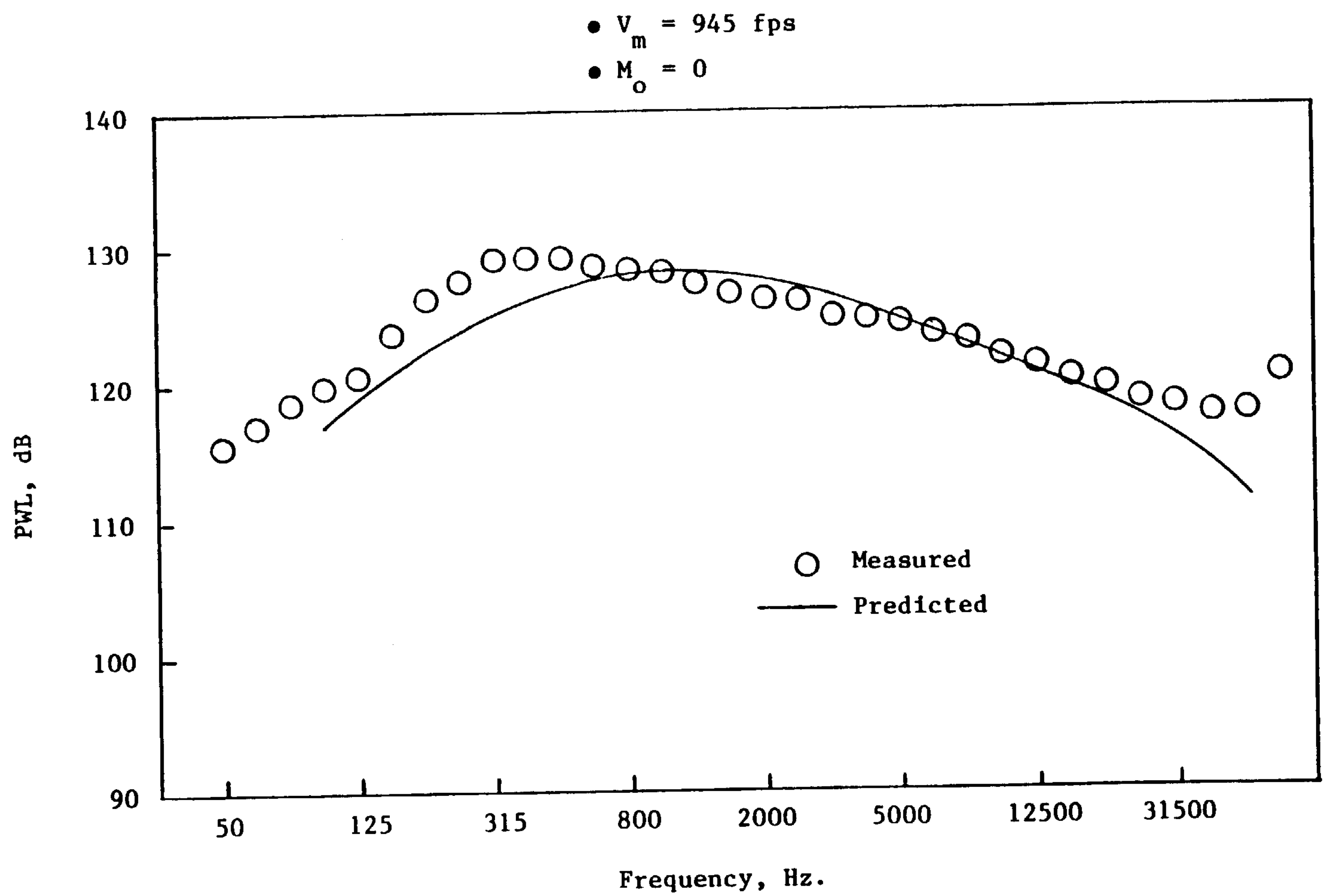


Figure IV.3.27.b Conical Nozzle Model Power Levels

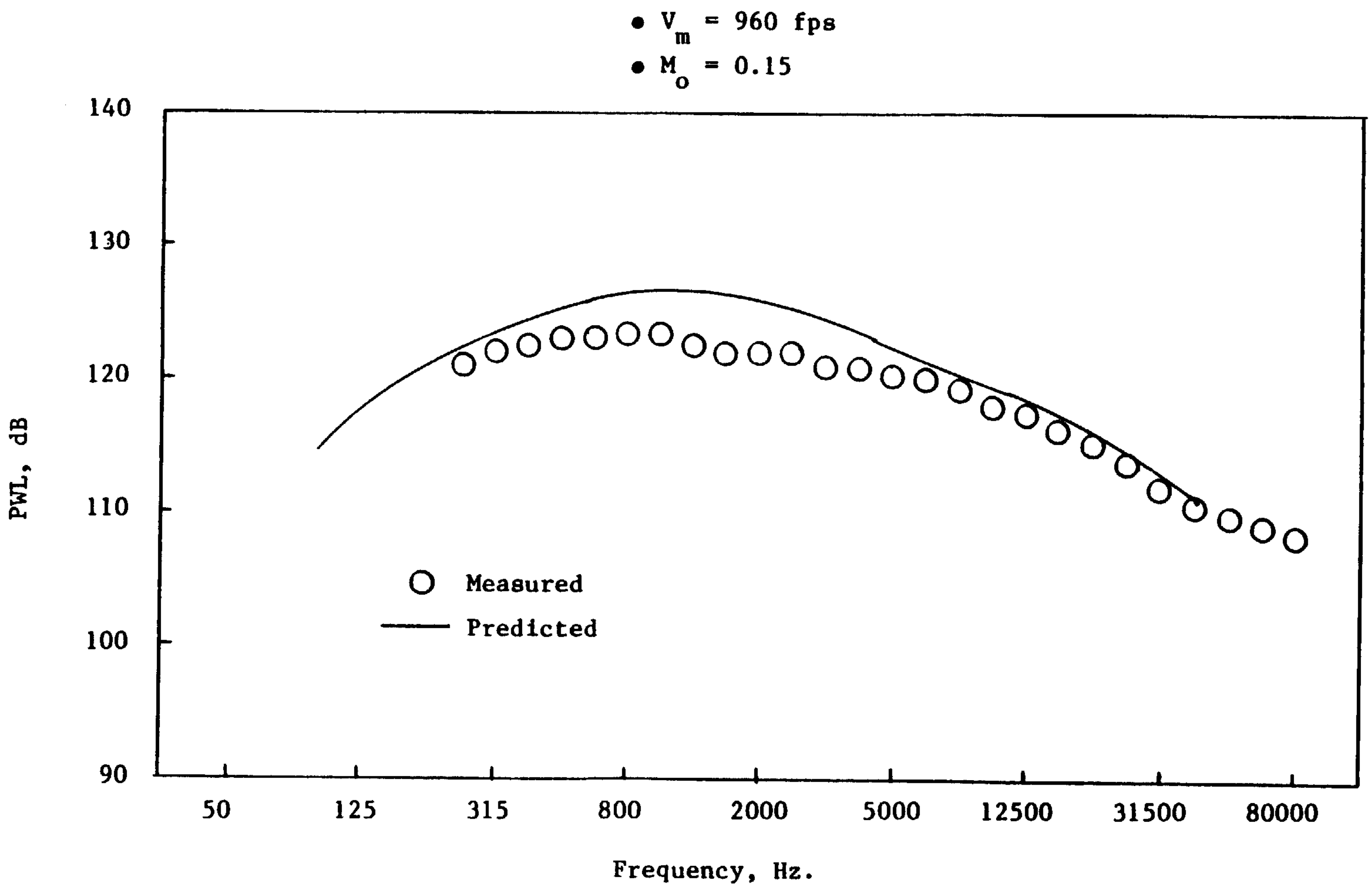
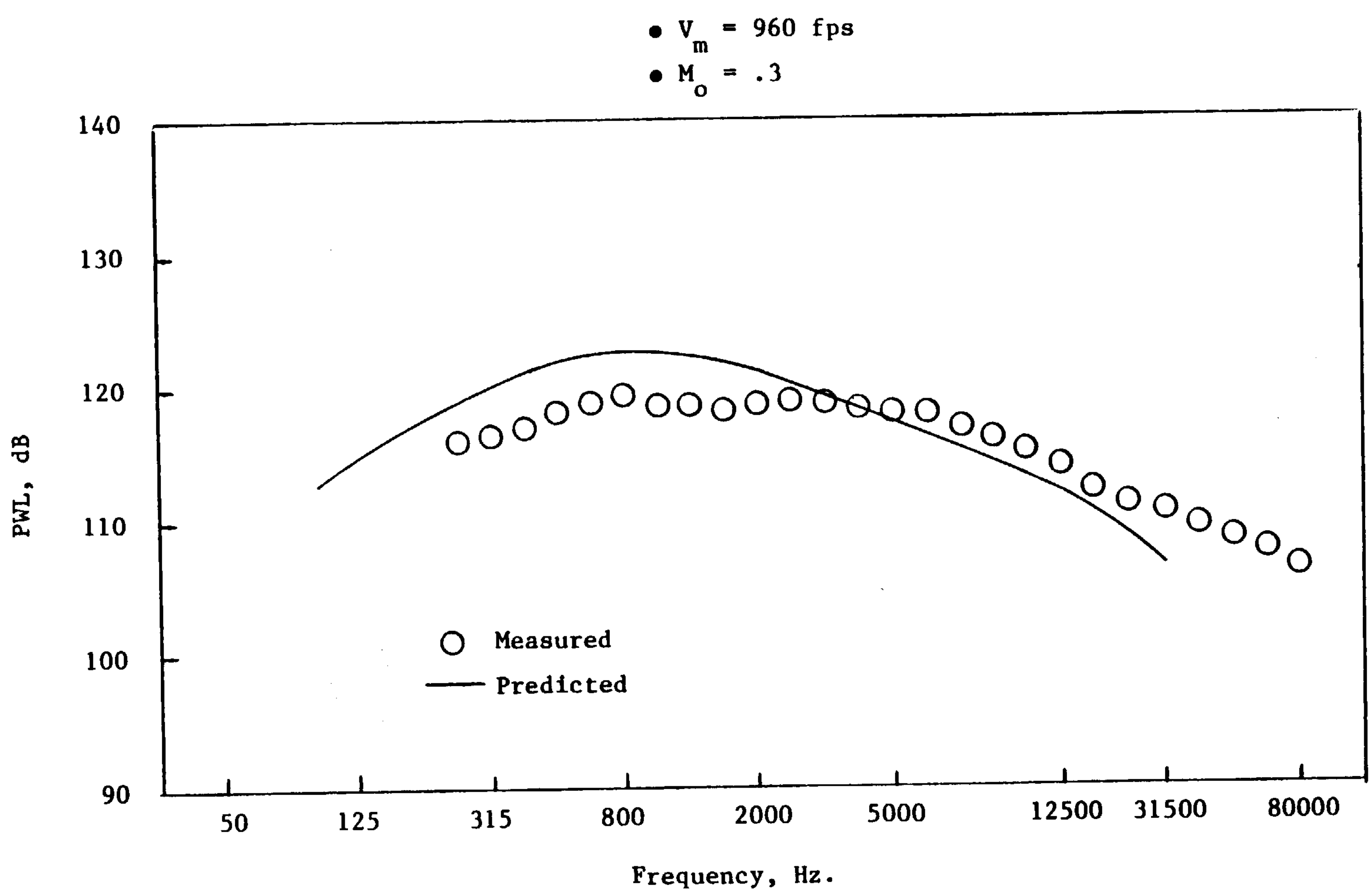


Figure IV.3.27.c Conical Nozzle Model Power Levels



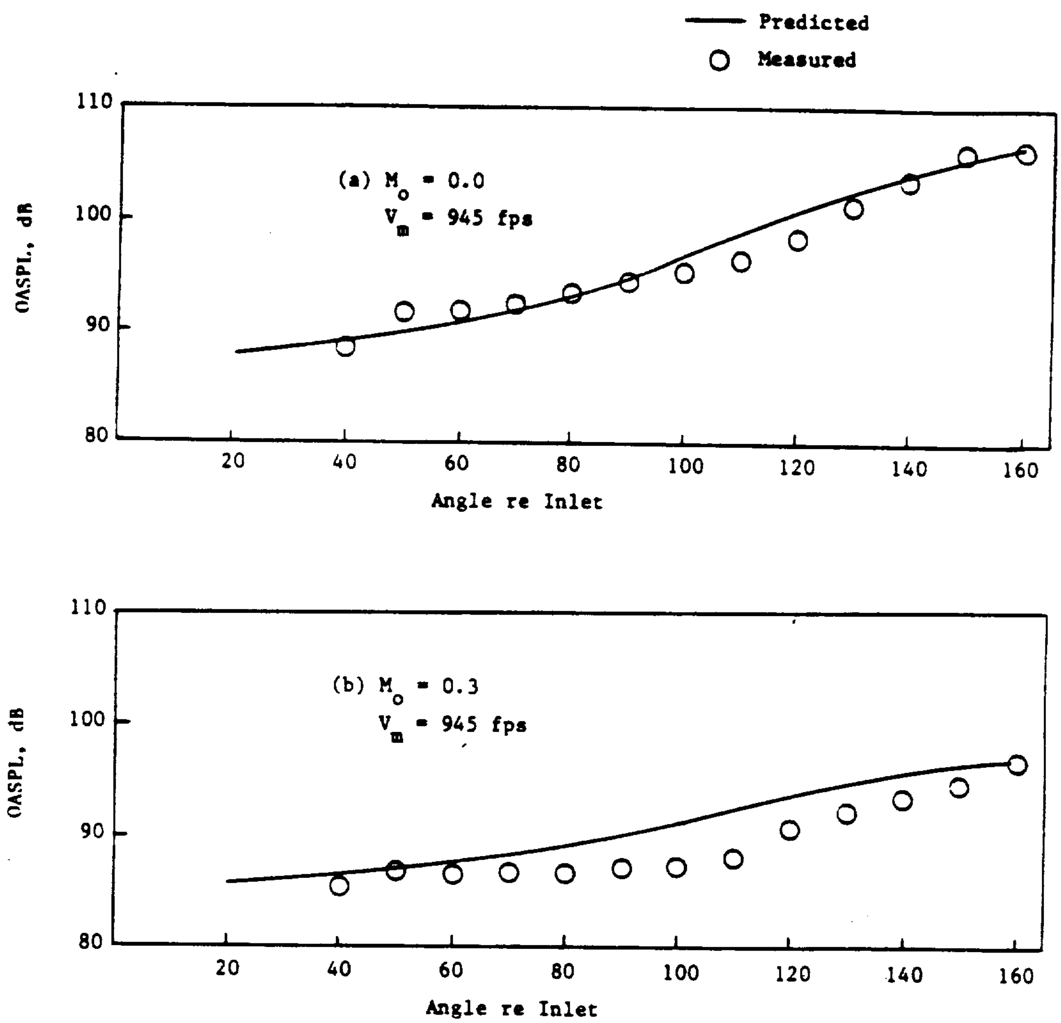


Figure IV.3.28 P4 Mixer Model OASPL Directivity

Figure IV.3.29.a P4 Mixer Model Power Levels

- V_m = 945 fps
- M_o = 0.0

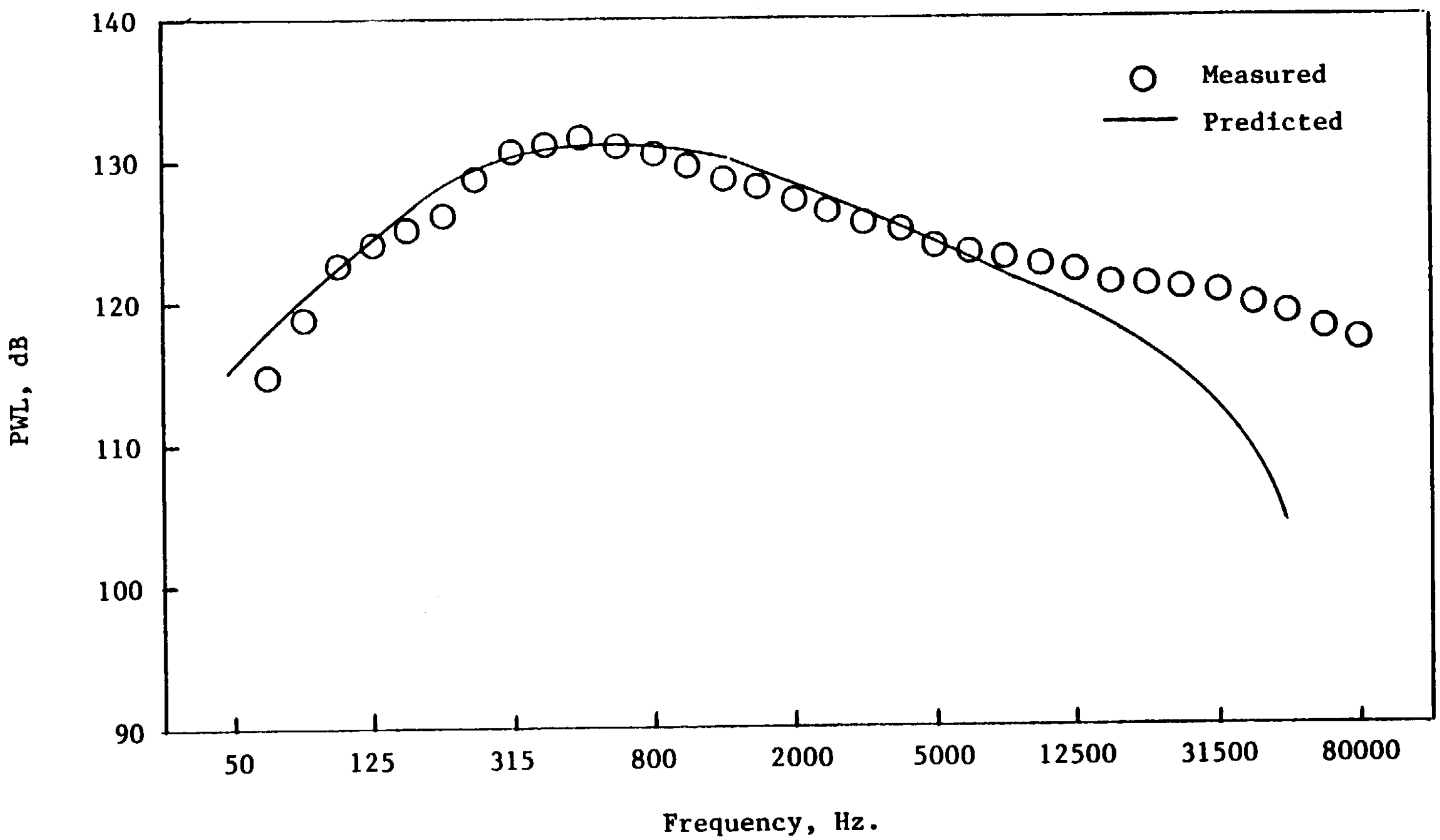


Figure IV.3.29.b P4 Mixer Model Power Levels

- V_m = 945 fps
- M_o = 0.15

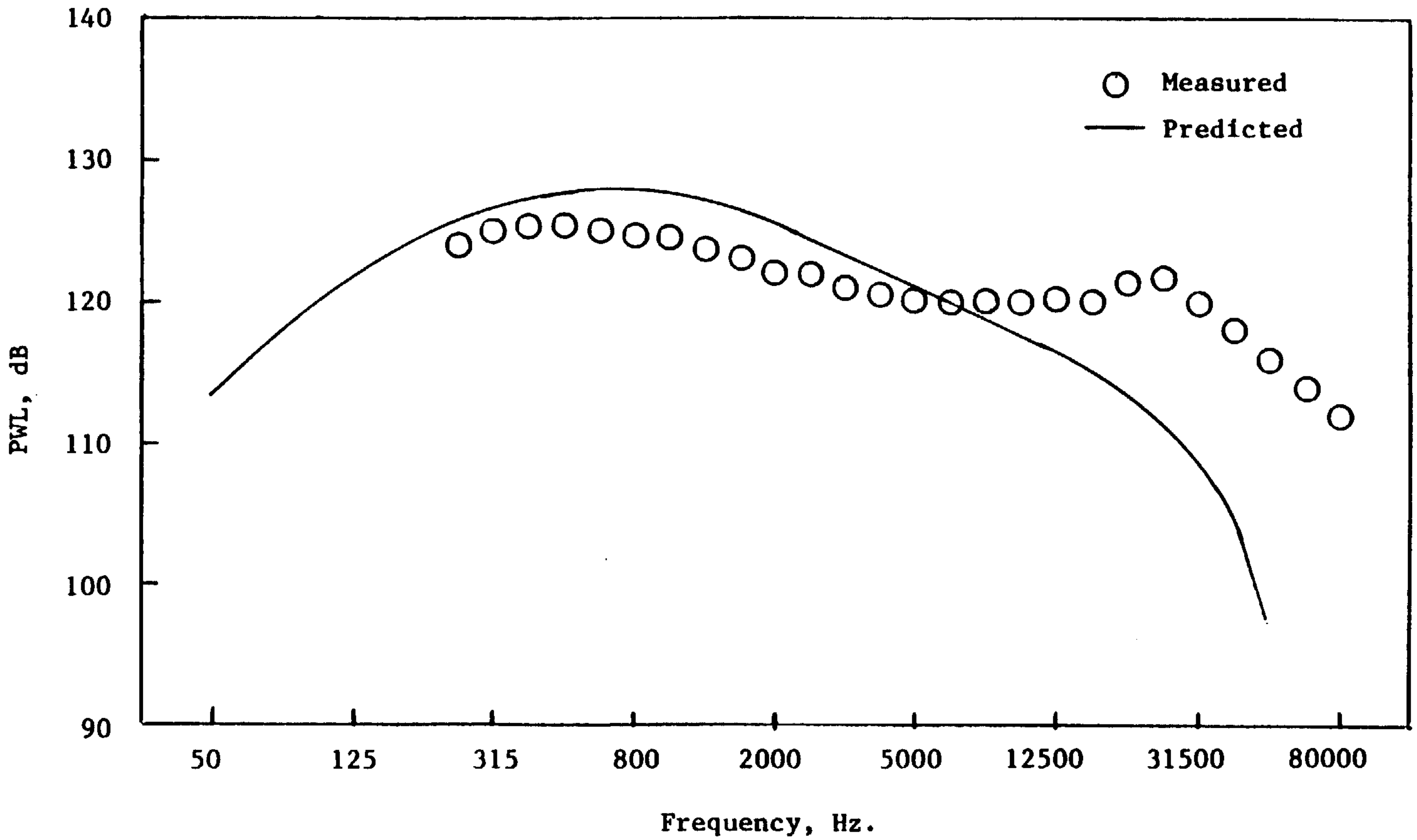
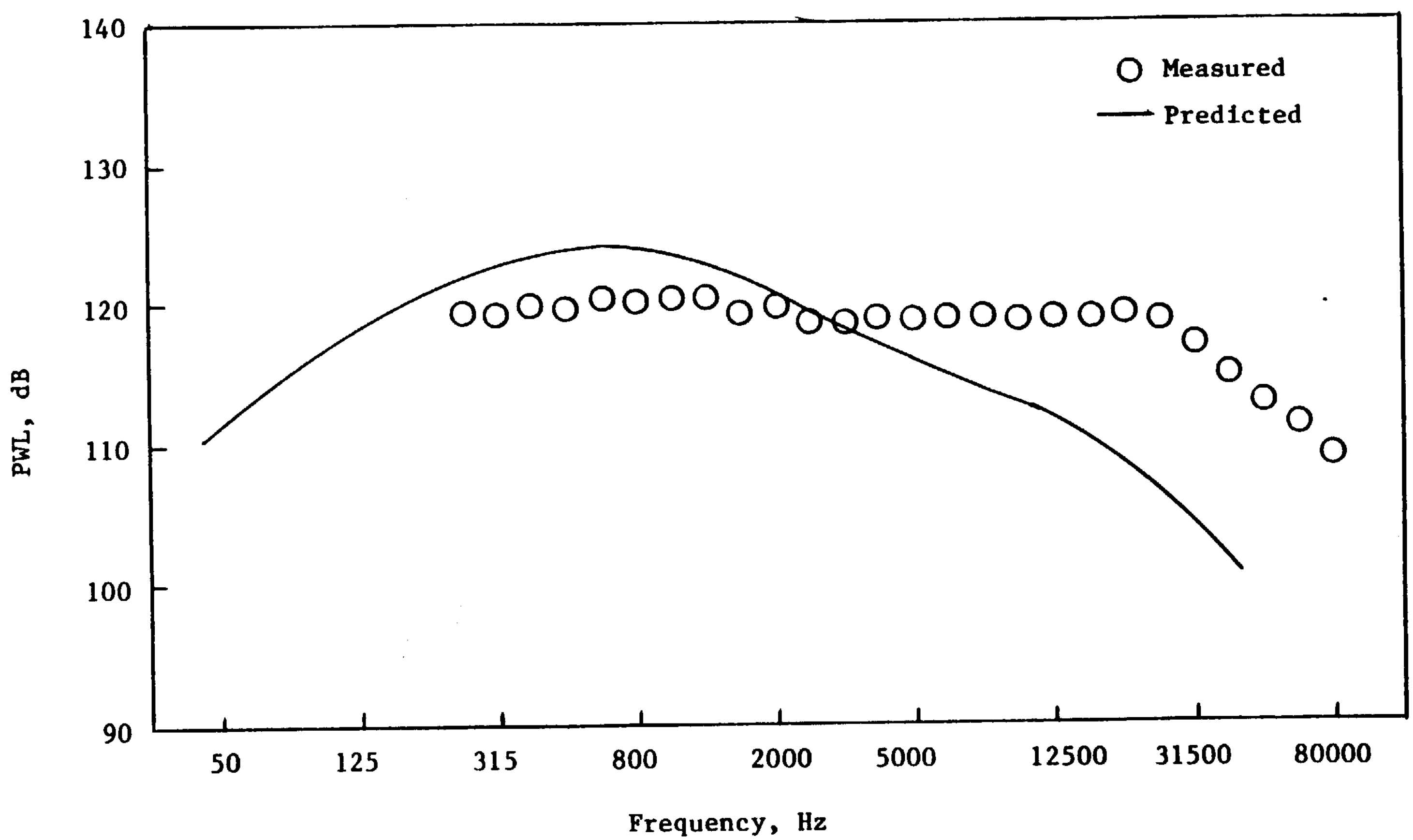


Figure IV.3.29.c P4 Mixer Model Power Levels

- V_m = 945 fps
- M_o = 0.3



5.0 ICLS TEST

The full scale demonstration of technology developed under the Energy Efficient Engine (E^3) program was accomplished during the Integrated Core/Low Spool (ICLS) Test series. The important acoustic technology features which were demonstrated during this program are highlighted in Figure V.1.

5.1 TEST PLAN

A total of four different nacelle suppression configurations were initially planned to be tested on the ICLS. But, due to an acoustic panel face sheet deformation (see Photograph V.1.1 and Reference 10), one configuration was changed, and another configuration was added using a readily available hardwall performance bellmouth inlet as opposed to previously planned aero-acoustic inlet, for a total of five different nacelle test configurations (Reference Table V.1.1).

The hardwall nacelle configurations, unless otherwise noted, were achieved using Scotch Brand aluminum tape #425 (5 mil thick, with pressure sensitive adhesive), run axially along the panel, with approximately 25% tape overlap (Reference Photograph V.1.2). The one-half treated inlet configuration (#2) was accomplished by taping the leading 0.48 meters (19 inches) of the inlet. The hardwall exhaust configuration (#4) had a treated turbine plug and a treated fan frame region between the rotor and the stator.

Three acoustic fan speed operating lines were tested for the first four acoustic test configurations. Each operating line consisted of at least seven stabilized speed points (eight on configurations 1 and 2, Reference Table V.1.2), selected to be within 50 RPM of the FPS operating speeds.

The last acoustic test configuration was tested for only one operating line, but it was held longer on point (2 minutes as opposed to 1 minute) so that multiple acoustic samples could be taken to improve the statistical accuracy of the results.

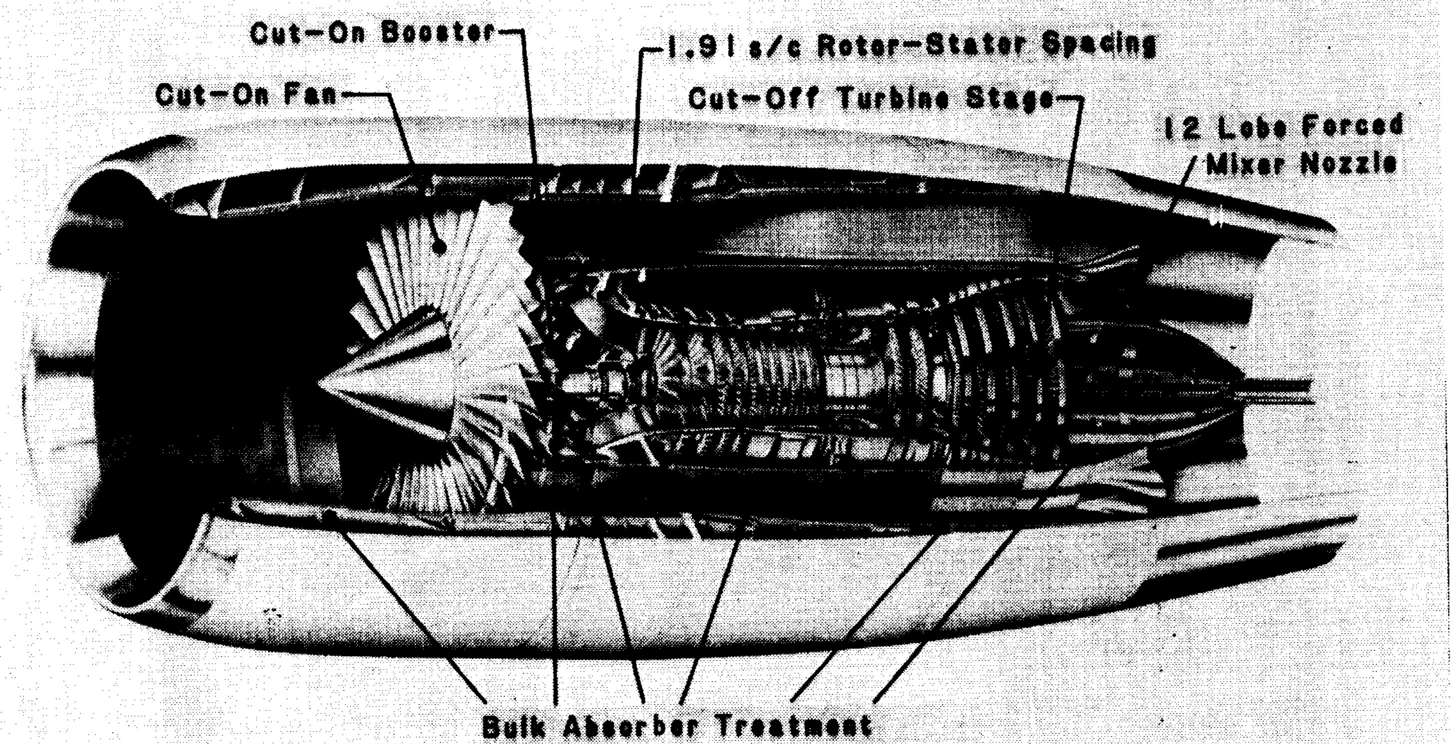


Figure V.1 E^3 Acoustic Features

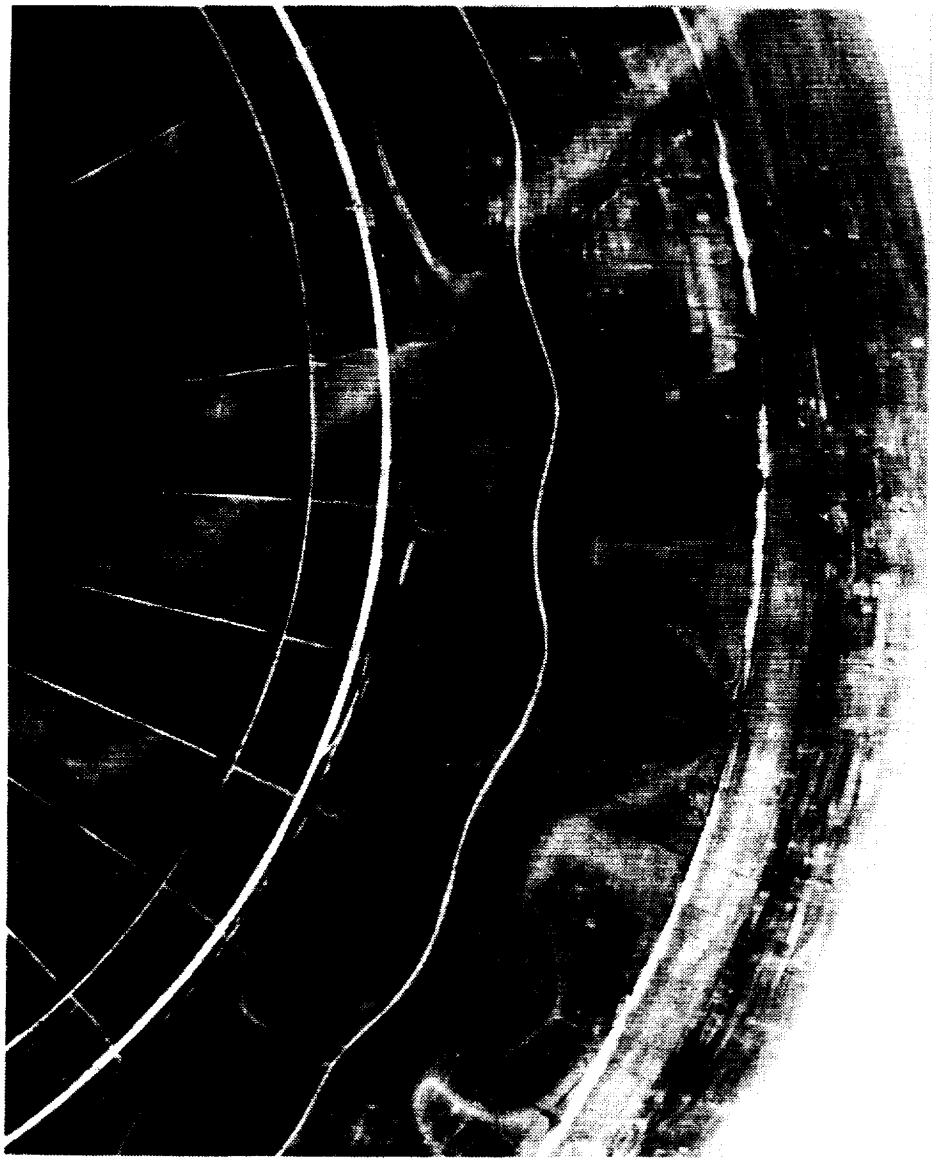


Figure V.1.1 Acoustic Panel Face Sheet (Deformed)

TABLE V.1.1

TEST CONFIGURATIONS

CONFIG.	INLET	EXHAUST	DAY TESTED
1	Aero Acoustic, Treated	Treated	6/07/83
2	Aero Acoustic, 1/2 Treated	Treated	6/08/83
3	Aero Acoustic, Hardwall	Treated	6/09/83
4	Bellmouth, Hardwall	Hardwall	6/14/83
5	Bellmouth, Hardwall	Treated	6/15/83

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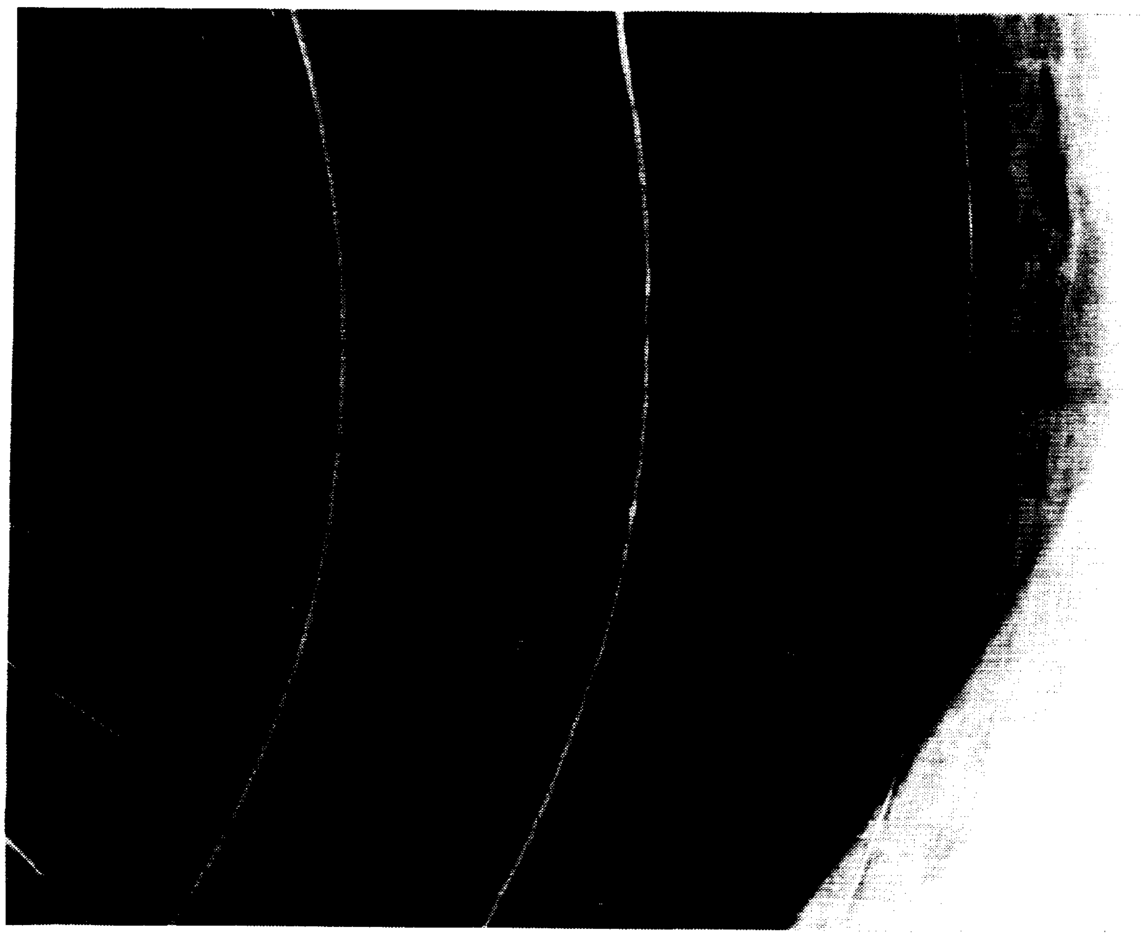


Figure V.1.2 Hardwall Taping Procedure

TABLE V.1.2

ACOUSTIC TESTING - FAN SPEED OPERATING LINE

PT. NO.	CORRECTED FAN SPEED
1	1820
2	2030
3	2180
4	2320
5	2500
6	2800
7	3100
(8)*	3270

*This point was not reached on Configurations 3, 4, and 5 due to restrictions on exhaust gas temperature.

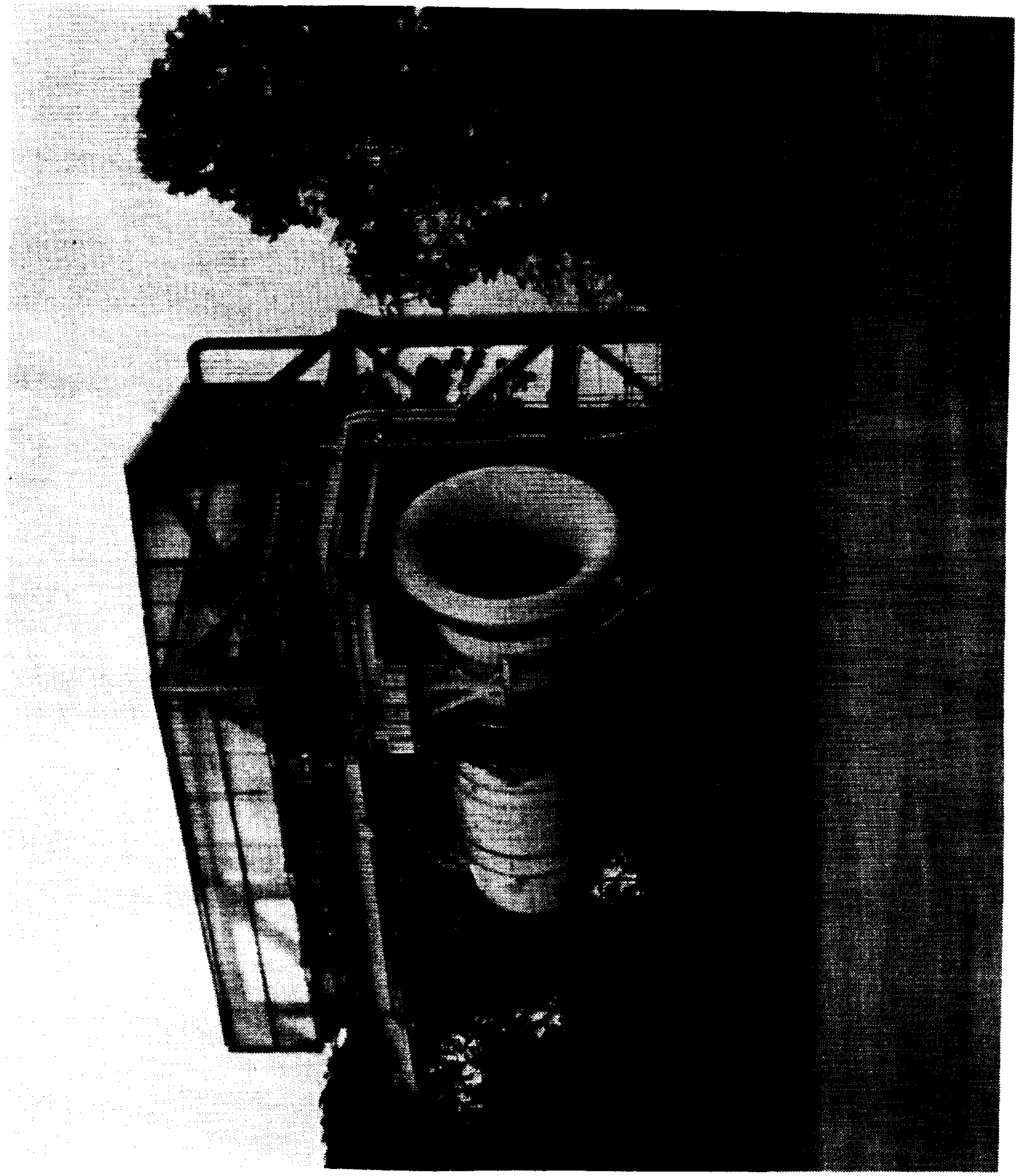


Figure V.1.3 Peebles Site IV-D Test Stand

All testing was performed at the General Electric Aircraft Engine Group, Peebles, Ohio, Site IVD test site. This acoustic arena consists of a 0.15 meter (6 inch) thick concrete test pad and a 3.96 meter (13 ft.) high engine centerline test stand (Photograph V.1.3).

5.2 INSTRUMENTATION

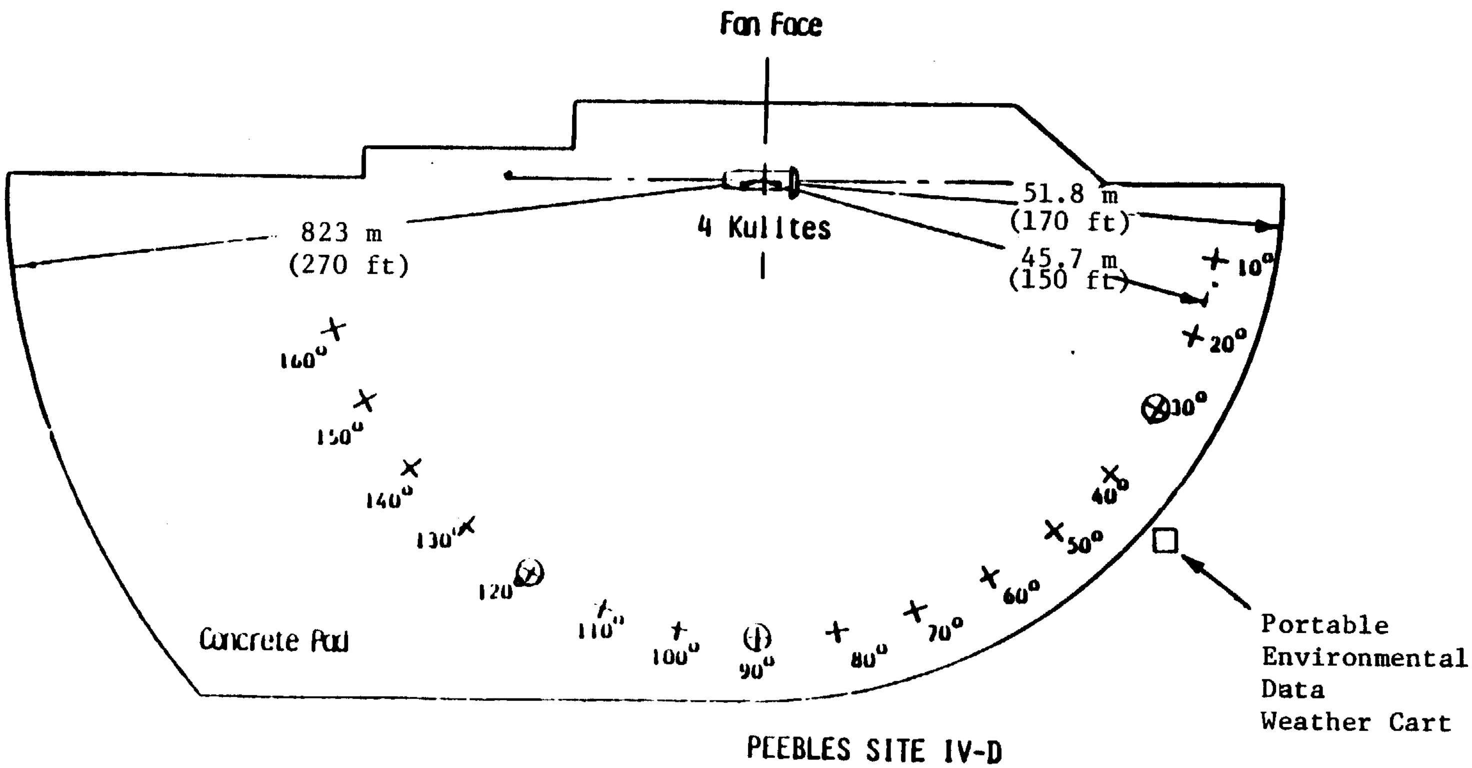
Nineteen 45.7 meter (150 ft.) arc microphones and four in-duct dynamic pressure transducers were recorded on a 28 track FM tape recorder, along with fan speed, core speed, time code and a reference oscillator. Sixteen of the 45.7 meter arc microphones were positioned every 10° in a polar angle measured from the inlet centerline, from 10° to 160° (Bruel & Kjaer 1.27 cm dia., Model 4134) pointing towards the ground, 0.64 cm (1/4-inch) above the center of a metal plate which was glued to the concrete test pad (Figure V.2.1). The other three microphones (also Bruel & Kjaer Type 4134) were pointing upwards 3.96 meters (13 ft.) above the concrete surface at 30°, 90°, and 120° (Photographs V.2.2 and V.2.3). The dynamic pressure transducers were located at the positions defined in Table V.2.1.

The nineteen microphone signals were preamplified through transistorized cathode followers (Bruel & Kjaer Type 2619), powered by Bruel & Kjaer Type 2801 power supplies. The preamplified signals are then fed through approximately 230 meters (750 ft.) of coaxial cable into the tape recording room of the Site IV control building. Here, the signals are fed into variable gain amplifiers with gains settings ranging from -10 dB to +60 dB in 10 dB steps for normalizing incoming signals into the optimized dynamic range of the tape recorder. The tape recorder used was a Honeywell 9600, 28 track FM recorder. The recorder was set up for Wideband Group I at 30 ips tape speed.

The four dynamic pressure transducers are of the piezo-resistive bridge type excited by a 10vdc power supply. As low signal strengths were expected, 20 dB of gain was provided before the signals were fed through approximately 250 meters (820 ft.) of coaxial cabling into the tape recording room. As with the microphone signals, the induct transducers were fed through a second set of variable gain amplifiers and were recorded on the Honeywell 9600 tape recorder.

Figure V.2.1 E^3 Test Setup

- No TCS
- With Vortex Destroyer
- Engine Centerline 3.96 m (13 ft)



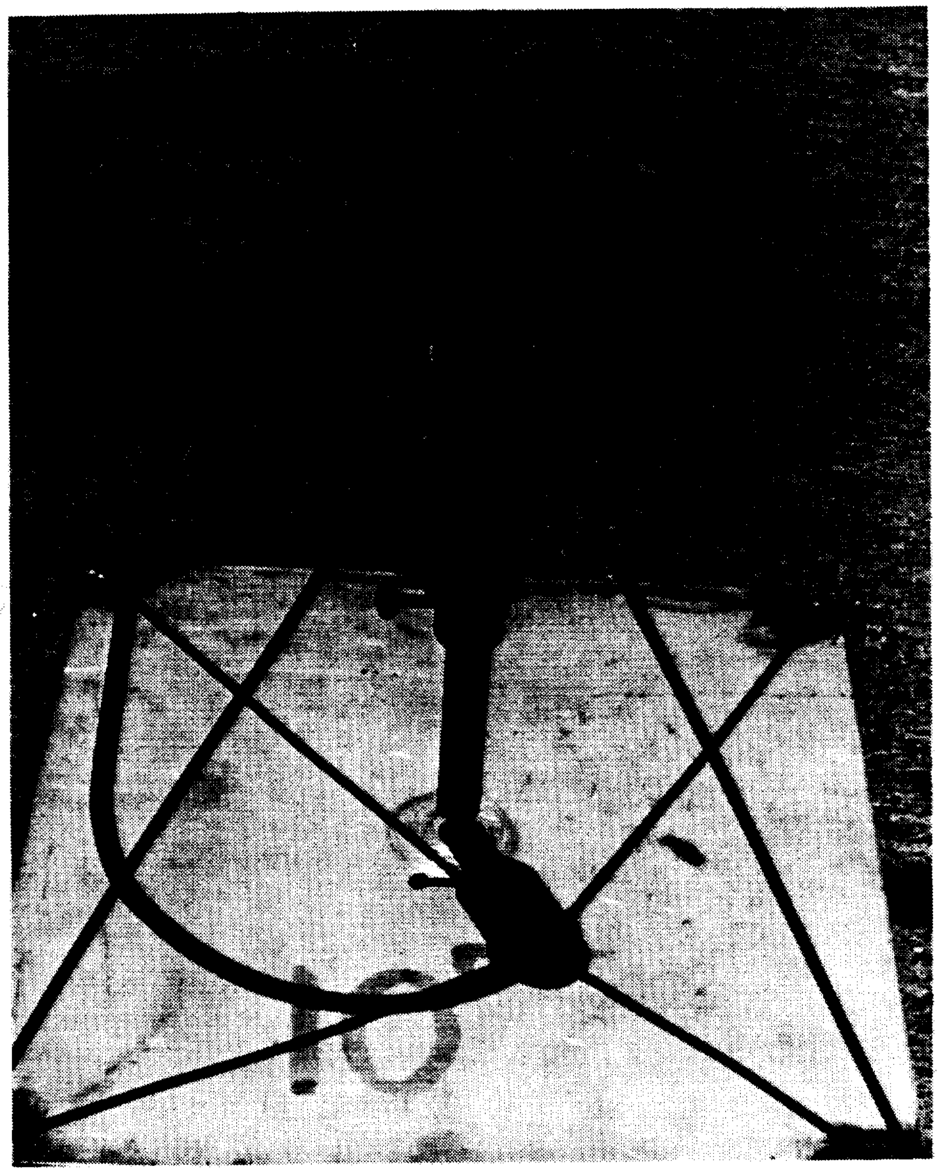


Figure V.2.2 Ground Plane Microphone Installation

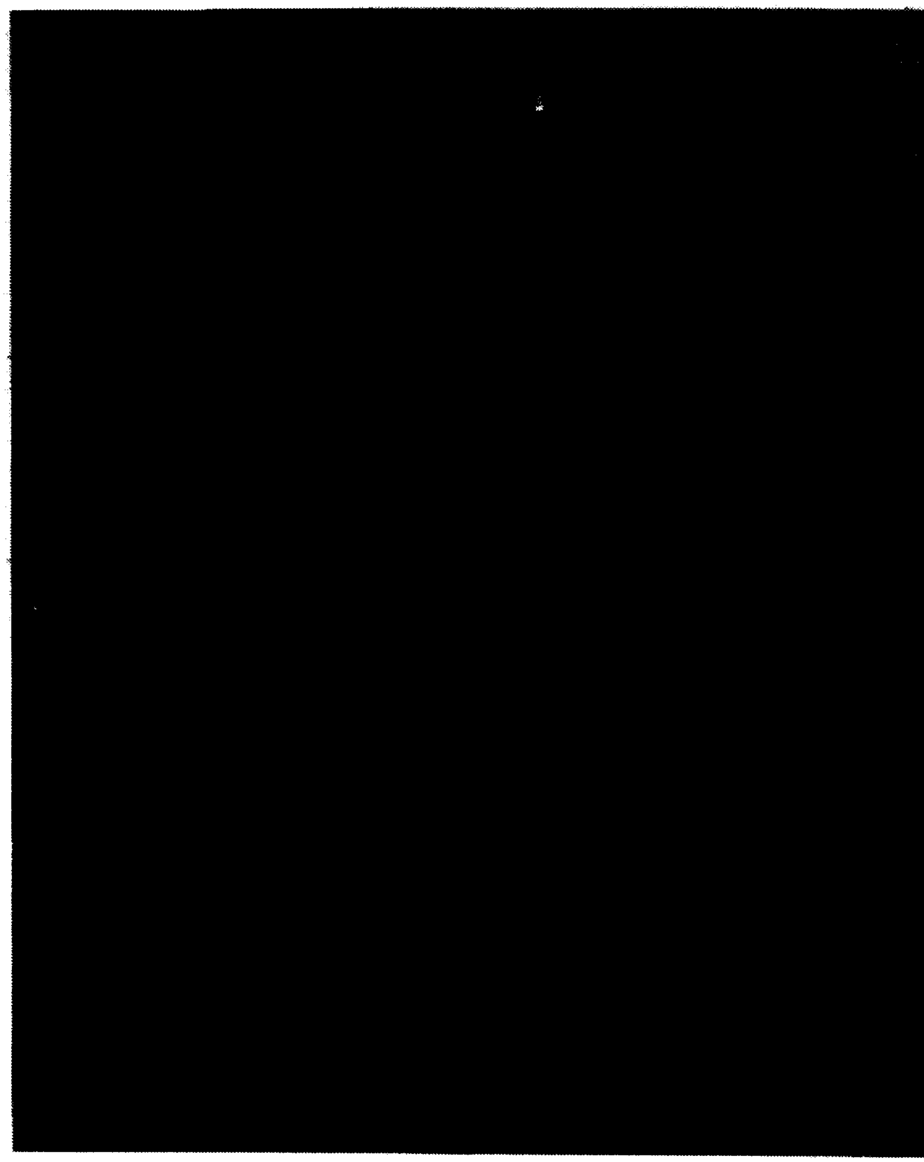


Figure V.2.3 Centerline Microphone Installation

TABLE V.2.1

DYNAMIC PRESSURE TRANSDUCERS

Approximate Station No.	Approximate Circumferential Position (°ALF)	Transducer Type	Description
114	30	Kulite XCS-190-15	10-32 bolt
151.8	30	Endevco 8507-15	Panel Bolt Probe
204.8	84	Kulite XCS-190-15	10-32 bolt
286.7	84	Kulite XCS-190-15	10-32 bolt

All 1/3 octave analysis were performed on a General Radio 1921 1/3 octave analyzer. Integration time was set for 32 seconds. The digitized 1/3 octave levels are passed through an interface computer from the analyzer and stored on the General Electric Aircraft Engine Group's Honeywell 6000 computer for further processing. Post processing included correction for microphone and amplifier system response and corrections to standard day [25°C (77°F), 70% RH] atmosphere conditions using the SAE ARP 866A recommended procedure (Reference 11).

All narrowband, enhanced waveform, and probability density analyses processing were performed at the General Electric Aircraft Engine Business Group's Acoustic Data Analysis Center (ADAC). This center is equipped with a DEC PDP11-34A based digital signal processing system (Photograph V.2.4).

Wind speed and direction, along with temperature and relative humidity were measured at the engine site using the General Electric Portable Environmental Data System (PEDS). Wind speed and direction were measured at 0.3 meters (1 ft.) and at 3.96 meters (13 ft.). Temperature and relative humidity were measured at 3.96 meters (13 ft.).

Acoustic shadowing of the ground plane microphones were monitored on-line during testing and verified with post-test data reduction to ensure that all data acquired was not contaminated by shadowing effects. Shadowing was considered to be present when the difference between the high and low microphones in the one-third octave bands between 5kHz and 8kHz was beyond the range of 3 $\pm$ 1.5 dB.

5.3 ICLS DATA

5.3.1 FARFIELD ONE-THIRD OCTAVE DATA

The ground plane data were averaged by taking all of the runs and repeats, normalizing the RPM differences using a correction determined from a second order localized curve fit for the data, then arithmatically averaging the corrected data to find an estimate of the mean of the distribution. Six

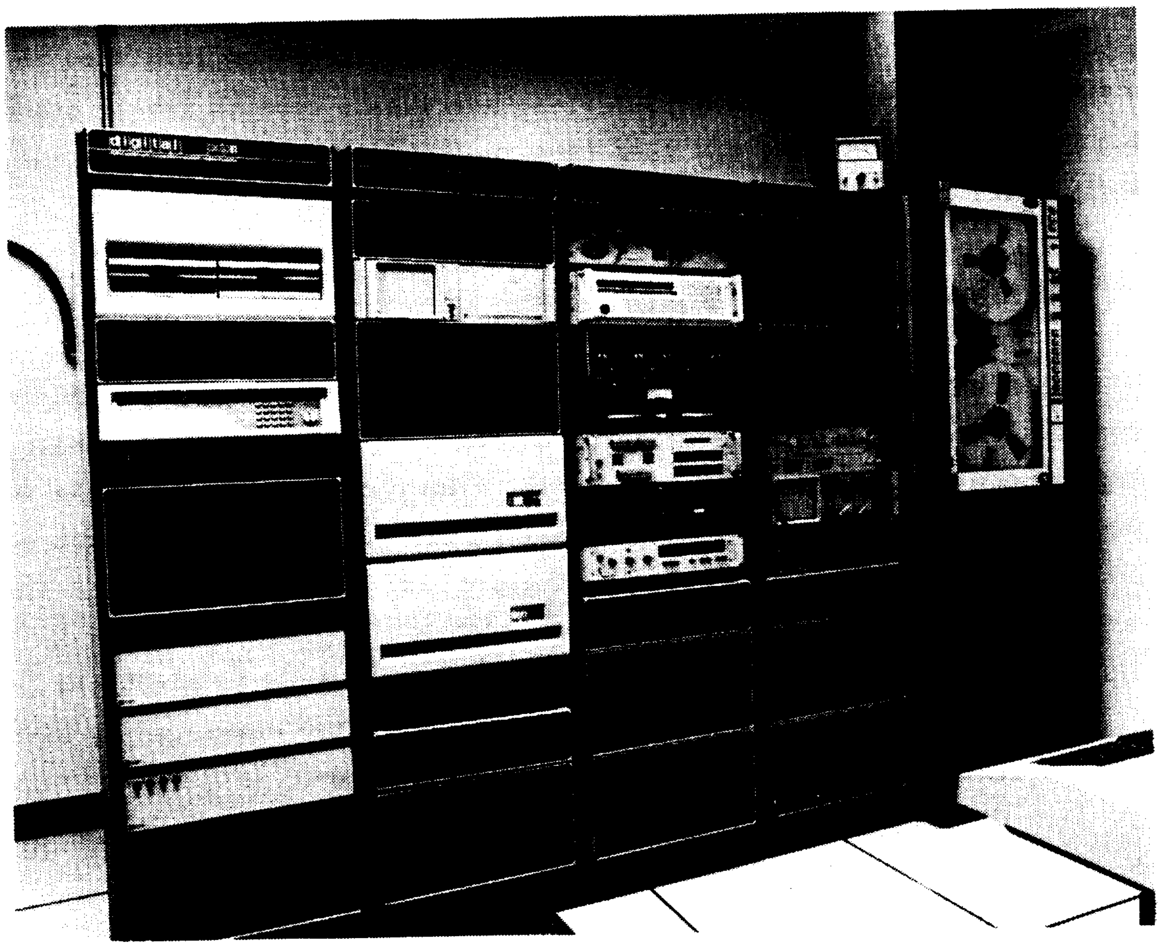


Figure V.2.4   Acoustic Data Analysis Center dB was subtracted from these ground plane averages to simulate free field conditions. A typical tabulation of the statistical standard deviation for the data is given in Table V.3.1 for a sample size of 3.

5.3.2 FARFIELD NARROWBAND DATA

All narrowbands were digitally processed on the ADAC system with a 1024 line analysis, valid 0 to 10 KHz, with a Hanning window, giving an effective bandwidth of 18.75 Hz. A total of 100 ensemble averages were taken, yielding an estimate of the normalized random error of the narrowband levels to be 0.4 dB. The 45.7 m (150 ft.) arc ground plane narrowband spectra levels are displayed for configuration 1, one pass through the fan speed operating line, in Appendix 9.2.1.a to 9.2.8.p.

5.3.3 FARFIELD ENHANCED WAVEFORM DATA

Enhanced Waveform Analysis is a digital processing technique designed to improve the signal to noise ratio of a sinusoidal signal, in the presence of high random (Gaussian) background noise. The procedure requires the averaging of the digitized time domain signal before it is Fourier transformed, and it is accomplished using the following process (Reference Figure V.3.3.1):

- The analog time domain signal from a microphone is digitized, with the digitization for each ensemble commencing concurrently with a once-per-rev signal from the low speed rotor.

- Each ensemble element is arithmetically averaged with all of the other ensembles corresponding elements, yielding a mean time domain ensemble.

- The mean time domain ensemble is Fourier transformed, squared, and logarithmically converted.

Table V.3.1

16019EQ/NRB/RPMAVG 11/14/83 8.935 PAGE 2

STANDARD DEVIATIONS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C1AE103G/P 1 1820A0

INPUT - C1AE103G/P 1 X02510 C1AE103G/P 1 X02600
C1AE103G/P 1 X02370

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	0.03	0.66	0.95	1.39	1.13	1.25	1.09	0.95	0.90	1.30	1.46	0.95	0.43	0.38	0.25	0.38	0.57
63	0.18	0.63	0.80	1.42	1.09	1.01	0.50	0.88	1.38	0.90	1.09	0.80	0.43	0.14	0.01	0.29	0.49
80	0.18	0.14	0.52	0.58	0.63	0.66	0.58	0.38	0.66	0.75	0.52	0.50	0.43	0.52	0.66	0.63	0.52
100	0.35	0.38	0.87	0.38	0.80	1.01	0.52	0.58	0.66	0.76	0.43	0.38	0.38	0.25	0.43	0.50	0.43
125	0.35	0.50	0.58	0.25	0.38	0.29	0.25	0.29	0.14	0.52	0.38	0.14	0.14	0.29	0.29	0.29	0.20
160	0.18	0.38	0.58	1.01	0.80	1.64	1.04	1.39	1.75	0.52	0.25	0.90	0.25	0.14	0.29	0.25	0.47
200	0.05	0.38	0.58	2.18	1.32	2.70	1.89	2.32	3.28	1.38	0.52	1.56	0.13	0.14	1.01	0.63	0.98
250	0.02	0.38	0.52	0.25	0.14	0.14	0.25	0.25	0.15	0.25	0.01	0.25	0.15	0.14	0.29	0.14	0.07
315	0.18	0.38	0.29	0.86	0.52	0.29	0.52	0.25	0.25	0.14	0.15	0.29	0.25	0.29	0.29	0.38	0.24
400	0.01	0.50	0.38	0.25	0.50	0.25	0.00	0.15	0.29	0.00	0.14	0.15	0.14	0.00	0.25	1.09	0.04
500	0.18	0.38	0.29	0.43	0.58	0.38	0.50	0.38	0.58	0.29	0.14	0.52	0.25	0.38	0.29	0.14	0.18
630	0.36	0.66	0.63	0.00	0.44	0.14	0.15	0.38	0.29	0.14	0.01	0.14	0.25	0.14	0.29	0.14	0.05
800	0.17	0.75	0.25	0.14	0.38	0.43	0.43	0.25	0.38	0.01	0.15	0.15	0.15	0.38	0.00	0.25	0.25
1000	0.17	0.72	0.50	0.52	0.52	0.57	0.50	1.04	0.38	0.38	0.52	1.09	0.63	1.28	0.63	1.13	0.33
1250	0.19	0.38	0.14	0.38	0.28	0.14	0.39	0.38	0.29	0.14	0.14	0.14	0.14	0.63	0.14	0.24	0.35
1600	1.94	1.29	0.72	1.14	0.56	1.57	1.13	0.87	0.81	1.28	0.77	0.44	0.63	0.77	0.50	0.14	0.63
2000	0.52	1.17	0.16	0.24	0.28	0.88	0.62	0.76	0.53	0.54	0.52	1.04	0.64	0.39	0.29	0.23	0.37
2500	0.17	0.27	0.81	1.86	0.91	1.44	0.16	0.81	1.29	0.31	0.15	0.53	0.27	0.41	0.40	0.75	0.48
3150	0.69	0.89	0.87	0.28	0.12	0.54	0.46	0.81	0.62	0.75	0.49	0.41	0.44	0.60	0.15	0.26	0.49
4000	0.50	0.19	0.30	0.19	0.30	0.33	0.15	0.40	0.68	0.30	0.33	0.35	0.51	0.58	0.30	0.47	0.32
5000	0.14	0.16	0.91	0.20	0.16	0.06	0.09	0.58	0.61	0.23	0.19	0.56	0.19	0.38	0.22	0.46	0.28
6300	0.12	0.34	0.68	0.55	0.08	0.18	0.17	0.88	0.66	0.43	0.36	0.08	0.23	0.65	0.17	0.29	0.42
8000	0.10	0.39	0.46	0.25	0.27	0.19	0.45	0.95	0.63	0.50	0.39	0.46	0.41	0.77	0.47	0.53	0.25
10000	0.41	0.44	0.57	0.95	0.06	0.74	0.64	1.24	1.07	0.33	0.79	0.19	0.54	0.44	0.28	1.58	0.27
OASPL	0.87	0.76	0.54	0.17	0.13	0.27	0.33	0.65	0.45	0.18	0.12	0.14	0.07	0.27	0.11	0.29	0.28
PNL	1.03	0.67	0.55	0.12	0.24	0.61	0.38	0.58	0.55	0.28	0.24	0.09	0.07	0.32	0.05	0.44	
PNLT	1.41	0.98	0.77	0.33	0.25	0.51	0.55	0.71	0.35	0.58	0.06	0.38	0.26	0.42	0.19	0.59	
DBA	0.94	0.82	0.55	0.13	0.10	0.51	0.44	0.75	0.35	0.32	0.04	0.06	0.00	0.27	0.14	0.33	

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C1AE103G/P 1 1820A0	06-07-83	PEEBLES 4D	150. FT ARC	1820.	9663.	SAE77	28.74	FULL SPHERE

GP MICS/FULLY TREATED/6DB FREEFIELD CORR./#21102

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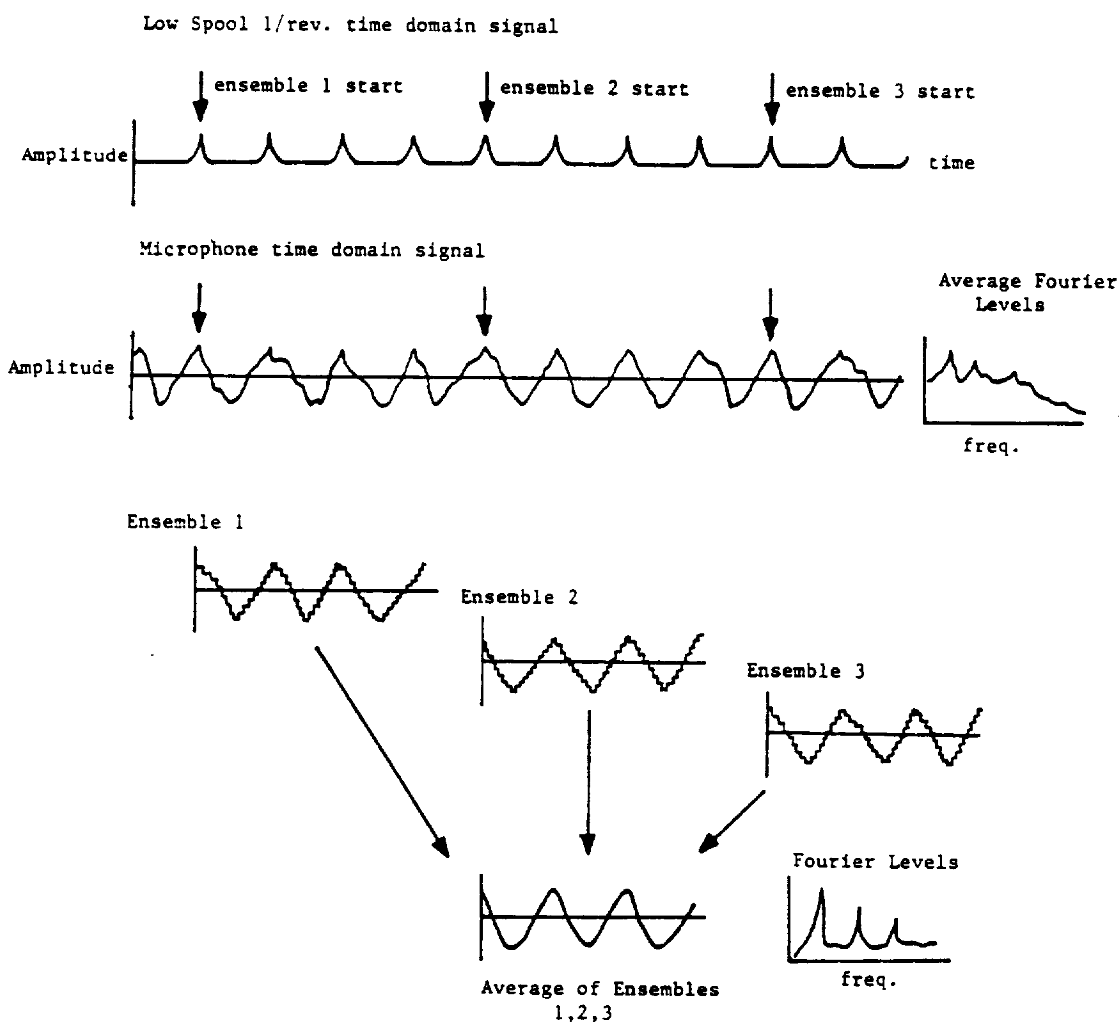
Figure V.3.3.1 Example of Enhanced Waveform Technique



This analysis procedure can be used where turbomachinery noise is measured in the presence of high random inflow distortion, the contribution of interaction effects between, for instance, a rotor and a stator can be identified.

5.3.4 PROBABILITY DENSITY ANALYSIS

Probability Density Analysis is the study of the amplitude distribution of a signal (see Reference 12). This is accomplished by digitizing the time domain signal from a microphone, computing a mean and standard deviation of the digitized amplitudes for each ensemble, then sorting the amplitude levels into mean and standard deviation normalized accumulators so that a probability density distribution can be determined.

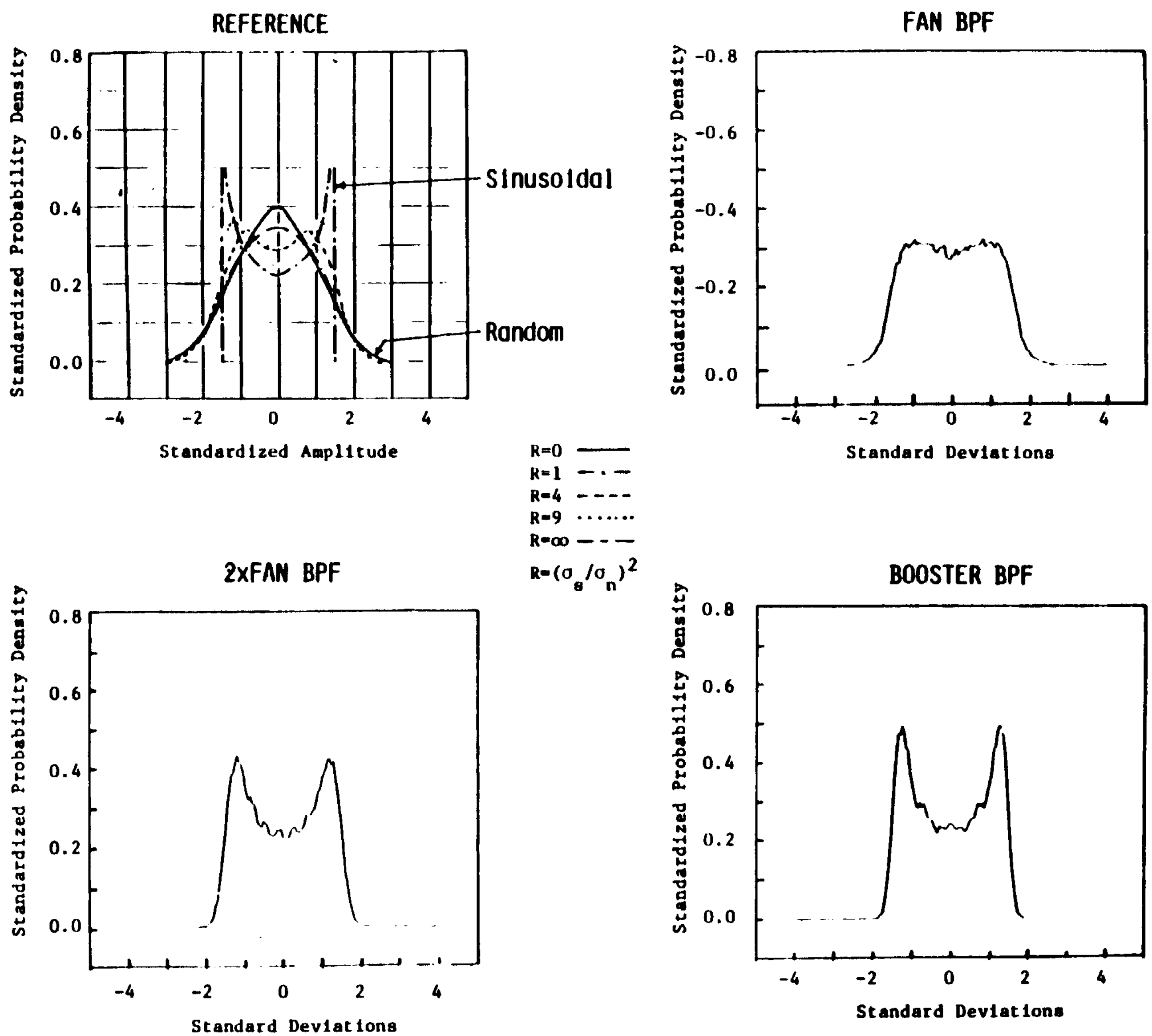
This procedure has the application that it can determine the random and sinusoidal content (i.e., signal-to-noise ratio) of a blade passing frequency tone or harmonic, by first isolating the tone with a tracking band pass filter, then determine the probability density distribution for the band passed time domain signal. If one makes the same assumption as in Section 5.3.3 that rotor/stator interactions are sinusoidal in nature, and rotor/turbulence interactions are random in amplitude as for the enhanced waveform, then the relative contribution to the tone levels for these two mechanisms can be identified.

Typical results of this procedure as used for the ICLS are given in Figure V.3.4.

5.3.5 IN-DUCT DYNAMIC PRESSURE TRANSDUCER NARROWBANDS

The in-duct dynamic pressure transducer narrowbands for Configuration 1 are in Appendix 9.3. All narrowbands are digitally processed with a 1024 line analysis, valid 0 to 10 KHz with a Hanning window, giving an effective bandwidth of 18.75 Hz. A total of 100 ensemble averages were taken, yielding an estimate of the normalized random error of the narrowband levels to be 0.4 dB.

Figure V.3.4 Probability Density Analysis of 70° 45.7 m Microphones for Config. 1



5.4 TREATMENT EVALUATION

The acoustic suppressive treatments used on the ICLS engine are all of the fibrous bulk absorber type with characteristics summarized in Figures V.1 and V.4.

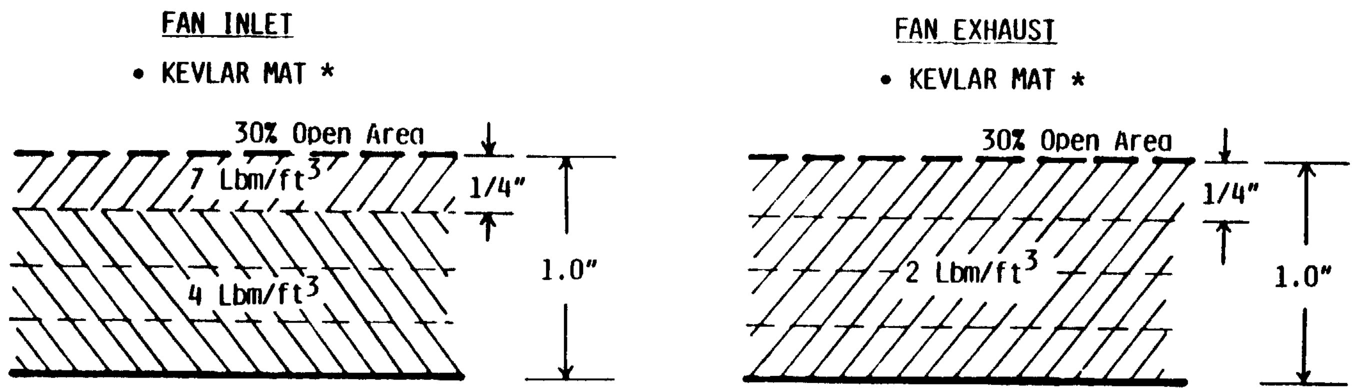
Two different techniques were used to select the optimized treatment designs. The approach adopted for designing the inlet treatment was developed by Dr. E. J. Rice at NASA-Lewis (Reference 13). This method allows determination of the optimum impedance values and the corresponding suppressions from the knowledge of the cutoff ratio, the flow Mach number, the shear layer thickness ratio, the lined length ratio, and the duct diameter to wavelength ratio. The design approach adopted for the fan exhaust was purely empirical. It was based on the optimum impedance curves derived from a series of laboratory tests carried out in a curved duct representing a segment of a fan exhaust duct.

5.4.1 PORTABLE IMPEDANCE MEASUREMENT SYSTEM EVALUATION (PLUNKER)

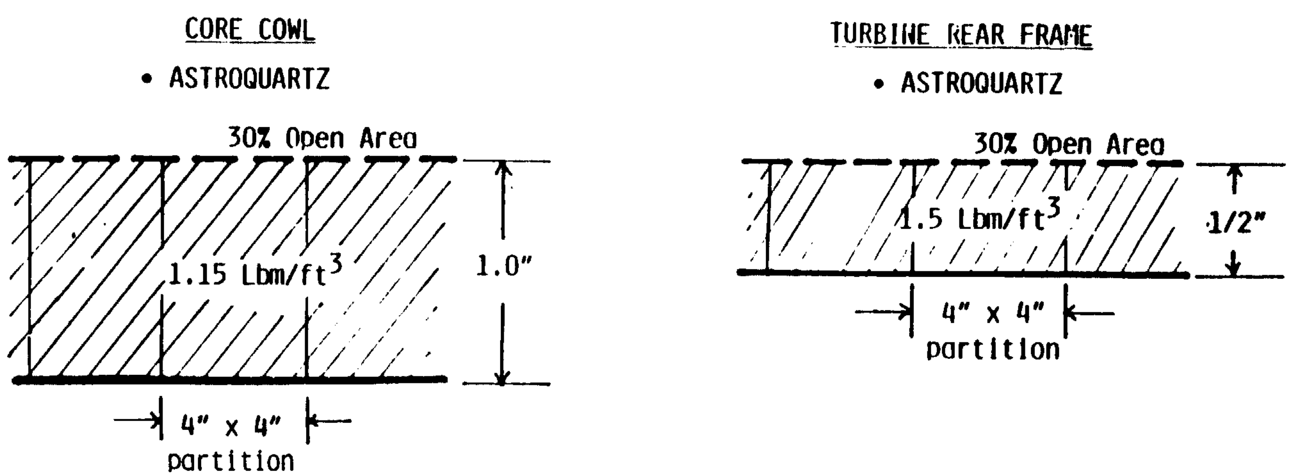
Prior to any testing of the engine, and prior to acoustical testing of the engine, the acoustic impedance properties of the engine treatment panels was quality insured to be to design intent using General Electric's non-destructive, portable impedance measurement system (Plunker). The Plunker is a short tube, driven by a speaker, with two dynamic transducers to evaluate the direct and reflected pressure waves, thereby determining the real and imaginary parts of the acoustical impedance characteristics of a treatment sample placed normal to the tube (Reference Figure V.4.1.1).

The results of these tests confirmed that the acoustical impedance properties were as intended, and they did not degrade with approximately 43 hours of engine running time. Figure V.4.1.2 shows a typical example of the normal impedance characteristics of the fan exhaust duct evaluated at six different locations prior to engine testing.

Figure V.4 E^3 ICLS Acoustic Treatment



*Note: All Kevlar Mat is coated with ZEPEL to repel water.



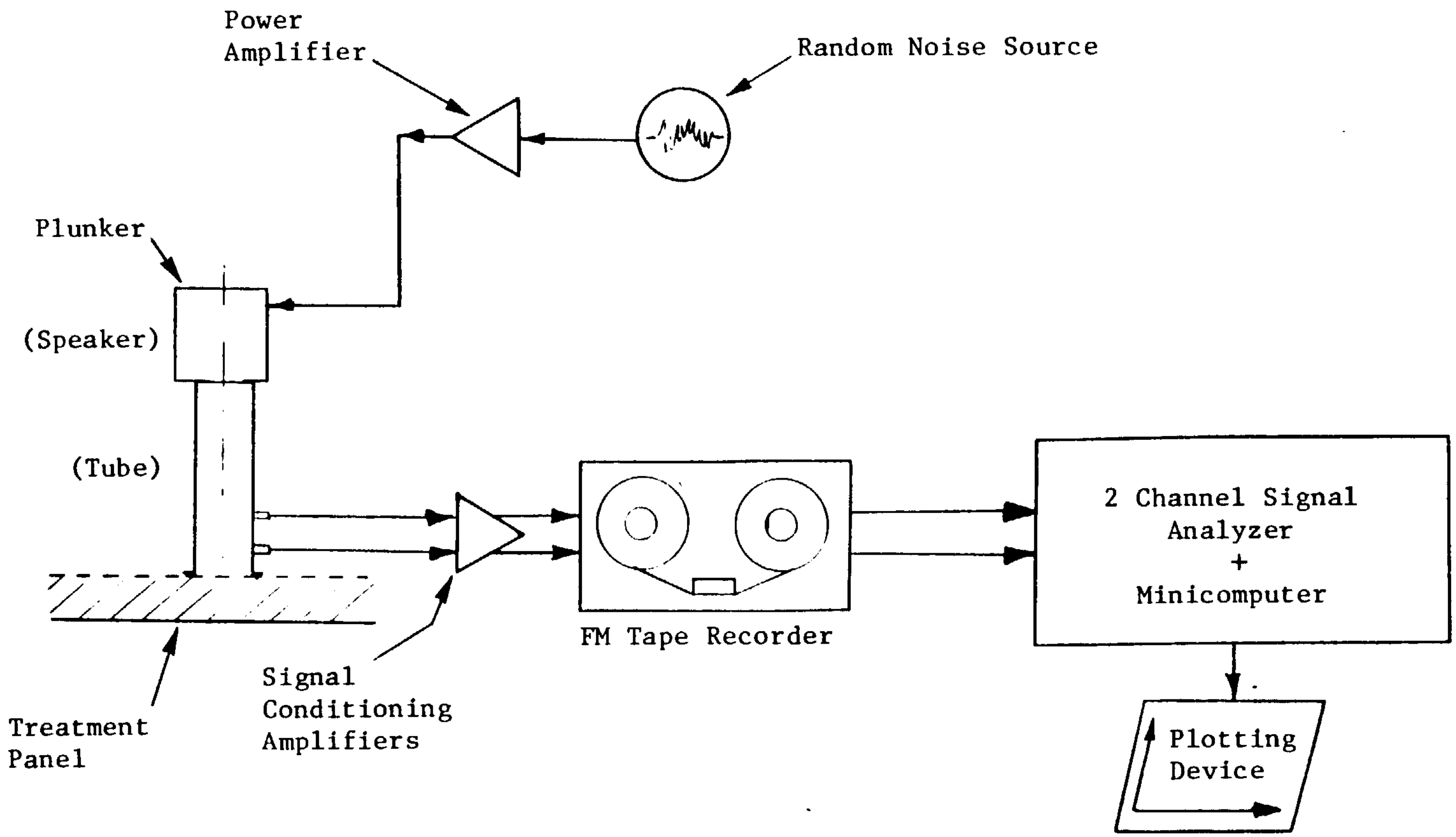
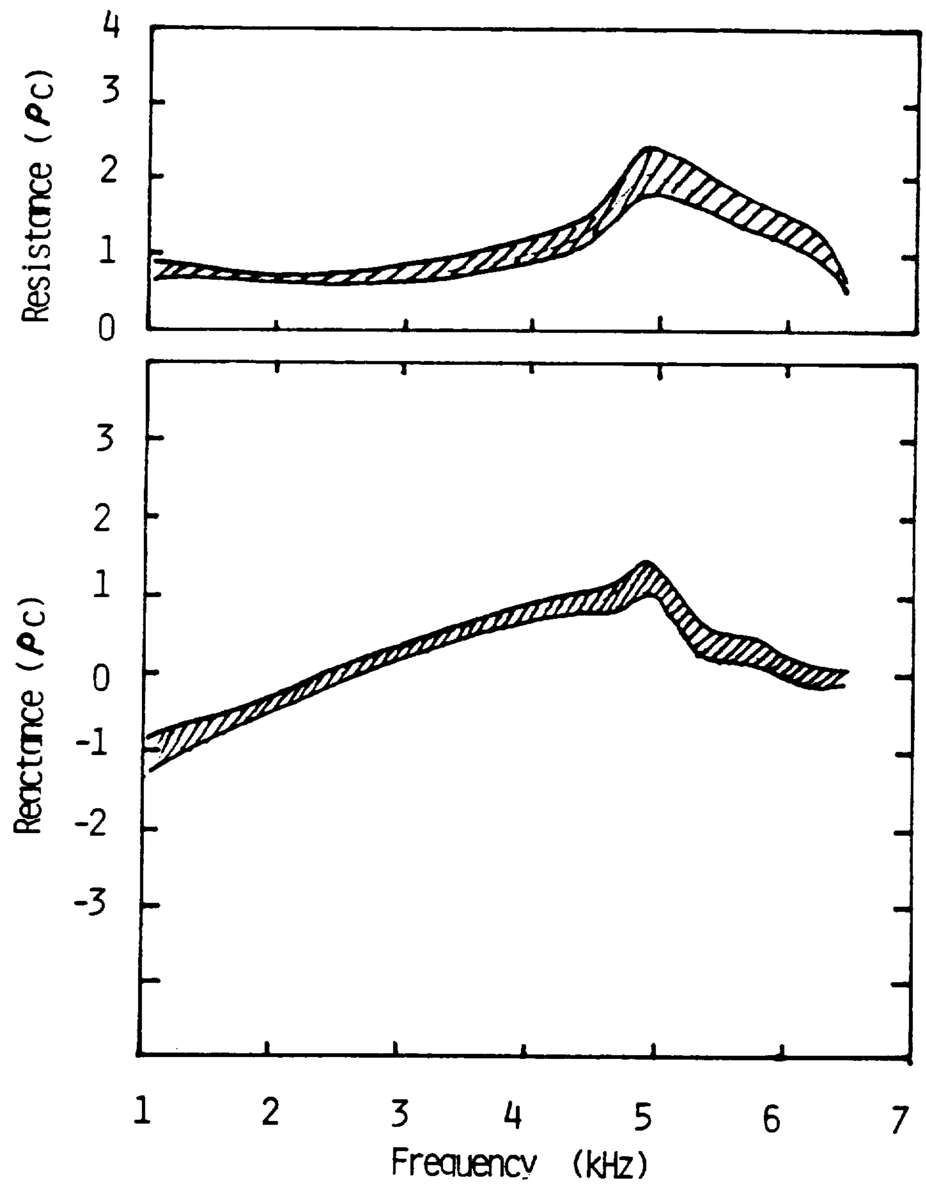


Figure V.4.1.1 Plunker System Used for Quality Assurance of ICLS Engine Treatment Panels

Figure V.4.1.2 E^3 Fan Exhaust Duct. Plunker Measurements on the 2 lb/cu.ft. Kevlar-filled treatment panels on the inner and outer surfaces of the duct.

(The shaded area shows the data scatter of 6 different measurements.)



5.4.2 FARFIELD TREATMENT EVALUATION

The benefits of acoustic treatment on farfield levels was obtained by comparing the averaged 45.7 meter arc data projected to 1,000 ft. level fly-over of the different test configurations. Specifically, each treatment section effectively was appraised using the following comparisons:

Inlet	:	Configuration 3 - Configuration 1
Half-Treated Inlet	:	Configuration 3 - Configuration 2
Exhaust	:	Configuration 4 - Configuration 1

Descriptions of the test configurations are reported in Table V.1.1, and the results of these comparisons are shown in Table V.4.2.1

5.4.3 IN-DUCT TREATMENT EVALUATION

The differences between upstream and downstream dynamic pressure measurements as made for the fully treated (Configuration 1) case, corrected by the differences determined by the hardwall (Configuration 4) case, gives an independent measure of the treatment effectivity. The results are summarized in Figure V.4.3.

5.5 FLIGHT PROPULSION SYSTEM PROJECTION

The ICLS engine levels were projected to the conditions of the flight propulsion systems using the procedures discussed in the following sections. Assuming the Flight Propulsion System (FPS) has the same treatment effectiveness as that of ICLS, the resultant levels for the four study aircraft are given in Table V.5.

5.5.1 STATIC DATABASE CONSTRUCTION

To accurately project the ICLS engine static noise levels to FPS flight conditions, the composite system levels needed to be segregated into its separate primary components: fan noise, turbine noise, booster noise, jet noise, and combustor noise. This was accomplished using the procedures schematized in Figure V.5.1.1.

TABLE V.4.2.1

TREATMENT EFFECTIVITY

Static Data Projected to a Level Flyover

ΔEPNL

- Inlet Evaluated (Configuration 3-1)
- Half Inlet Evaluated (Configuration 3-2)
- Exhaust Evaluated (Combination of Configurations (1 and 4) - 1; i.e., ~ Treated Inlet

		APPROACH Alt. 400 Ft. V_{ac} 226 Ft./Sec.				TAKEOFF Alt. 1,000 Ft. V_{ac} 255 Ft./Sec.	
N1K	(RPM)	1820	2030	2180	2320	2800	3100
Inlet	(ΔEPNdB)	2.9	5.6	5.0	3.9	4.6	2.2
Half Inlet	(ΔEPNdB)	2.6	4.3	3.4	3.1	4.3	1.0
Exhaust	(ΔEPNdB)	2.0	2.5	2.7	2.9	1.9	1.2

Figure V.4.3 E^3 Fan Exhaust Suppression Predicted vs. Measured

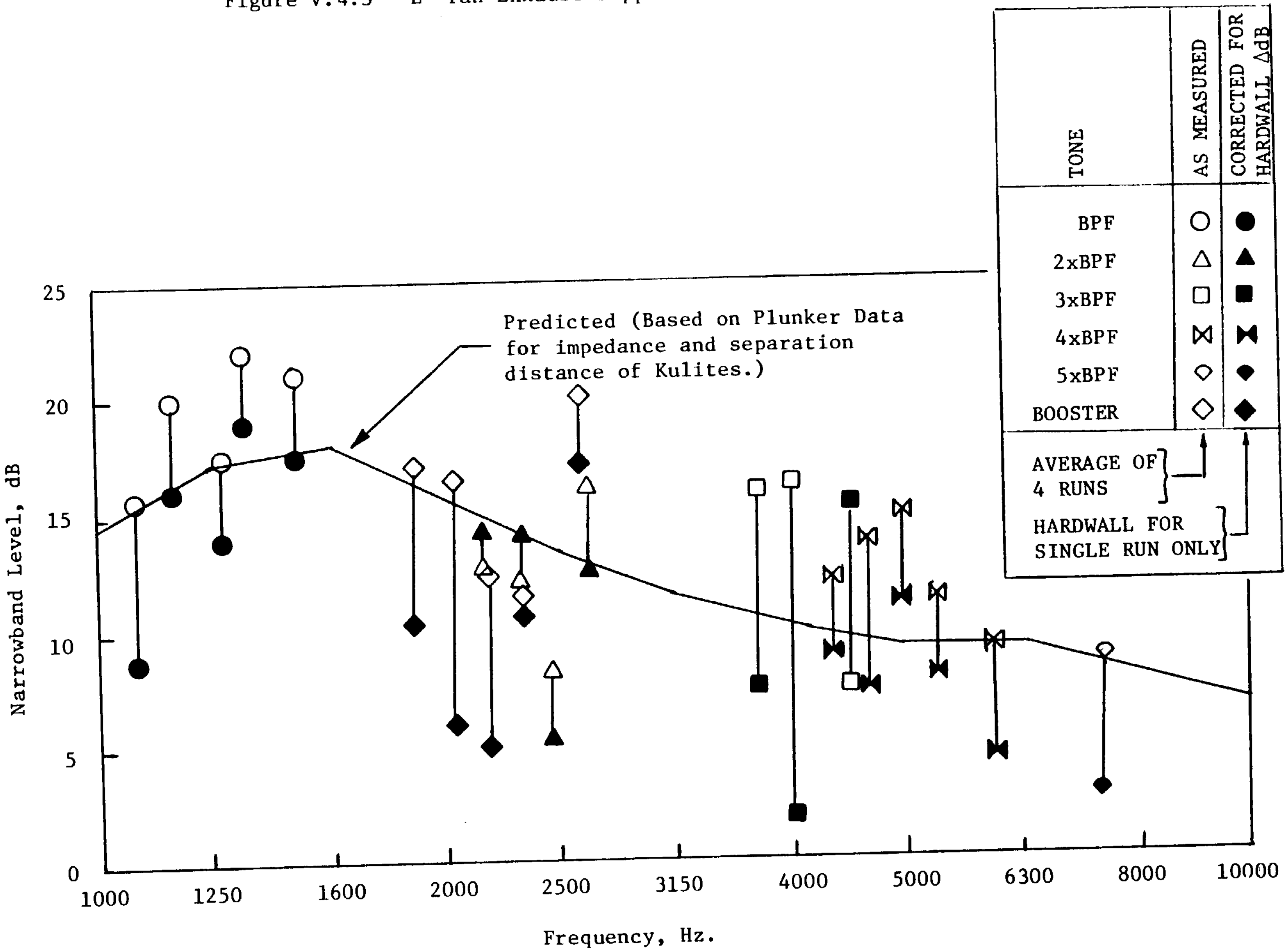
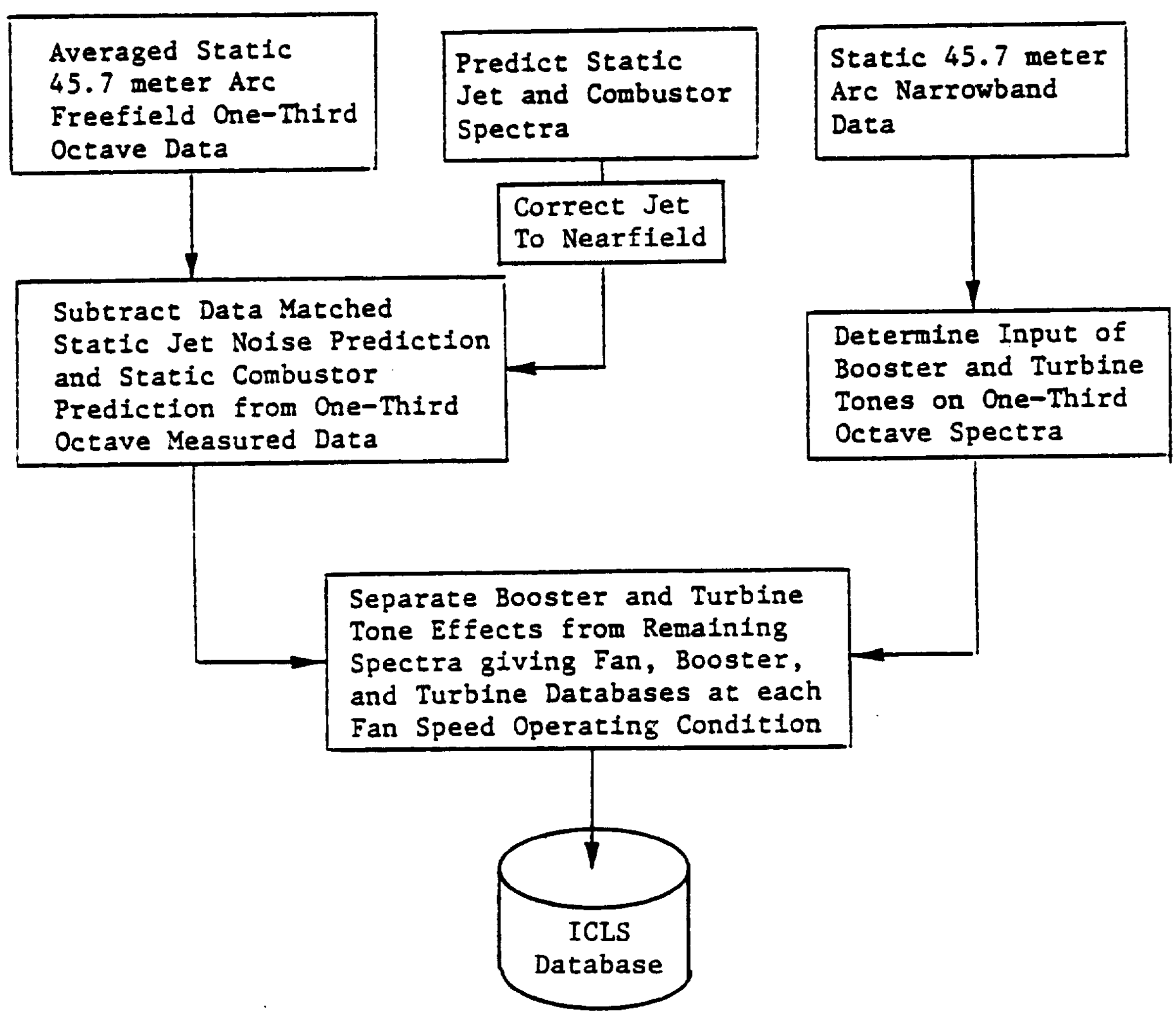


TABLE V.5

EPNL FLIGHT NOISE ESTIMATES FOR E^3 AIRCRAFT

	Boeing Twinjet SLS F_n = 37,710 lb. TOGW = 243,660 lb.	Douglas Trijet SLS F_n = 41,230 lb. TOGW = 497,000 lb.	Lockheed Trijet SLS F_n = 40,757 lb. TOGW = 452,857 lb.	Lockheed Quadjet SLS F_n = 37,767 lb. TOGW = 626,841 lb.
Takeoff				
Level	90.9	96.5	94.8	99.1
Margin re: FAR36 (1978)	2.9	4.4	5.6	5.1
Sideline				
Level	91.6	94.4	92.8	93.6
Margin re: FAR36 (1978)	6.6	6.5	7.7	8.1
Approach	100.2	100.5	99.9	99.7
Margin re: FAR36 (1978)	1.7	3.8	4.1	5.3
Airframer Supplied Aircraft Noise	93.2	92.3	95.9	96.0

Figure V.5.1.1 Database Construction Flowchart



First, the static jet and combustor levels are predicted using the procedures discussed in SAE ARP 876B (Reference 14) and the engine performance cycle as determined at the time of testing. These predicted levels are logarithmically subtracted from the averaged freefield 45.7 meter arc one-third octave data (as tabulated in Appendix 9.1).

Next, the booster and turbine tones are identified in the narrowband spectra based on blade counts (Reference Figure V.5.1.2) and physical fan speeds. The one-third octave contribution of these tones are determined, and their effect is removed from the averaged 45.7 meter arc one-third octave data with the combustor and jet noise components removed.

The net result of this analysis is the generation of three separate component databases:

- Fan noise database
- Booster tone database
- Turbine tone database

The FPS fan noise database was obtained by scaling the previously determined static fan noise database, correcting for cycle differences in fan total weight flow and fan tip speed between the ICLS and FPS engines. The scaling procedures used were based on General Electric's commercial engine experience.

The FPS booster and turbine databases are the unscaled component databases as determined in the previous paragraphs, selected to have a slightly higher tip speed than the FPS target tip speed. This selection tends to slightly overpredict the levels, for a more conservative estimate of the margins expected relative to the FAR 36 Stage III rule.

5.5.2 FAN NOISE FLIGHT CLEANUP DETERMINATION

As the ICLS engine was tested statically without a turbulence control structure, strong inlet turbulence distortions generated abnormally high fan tone levels as compared to what is expected in flight. Based on General

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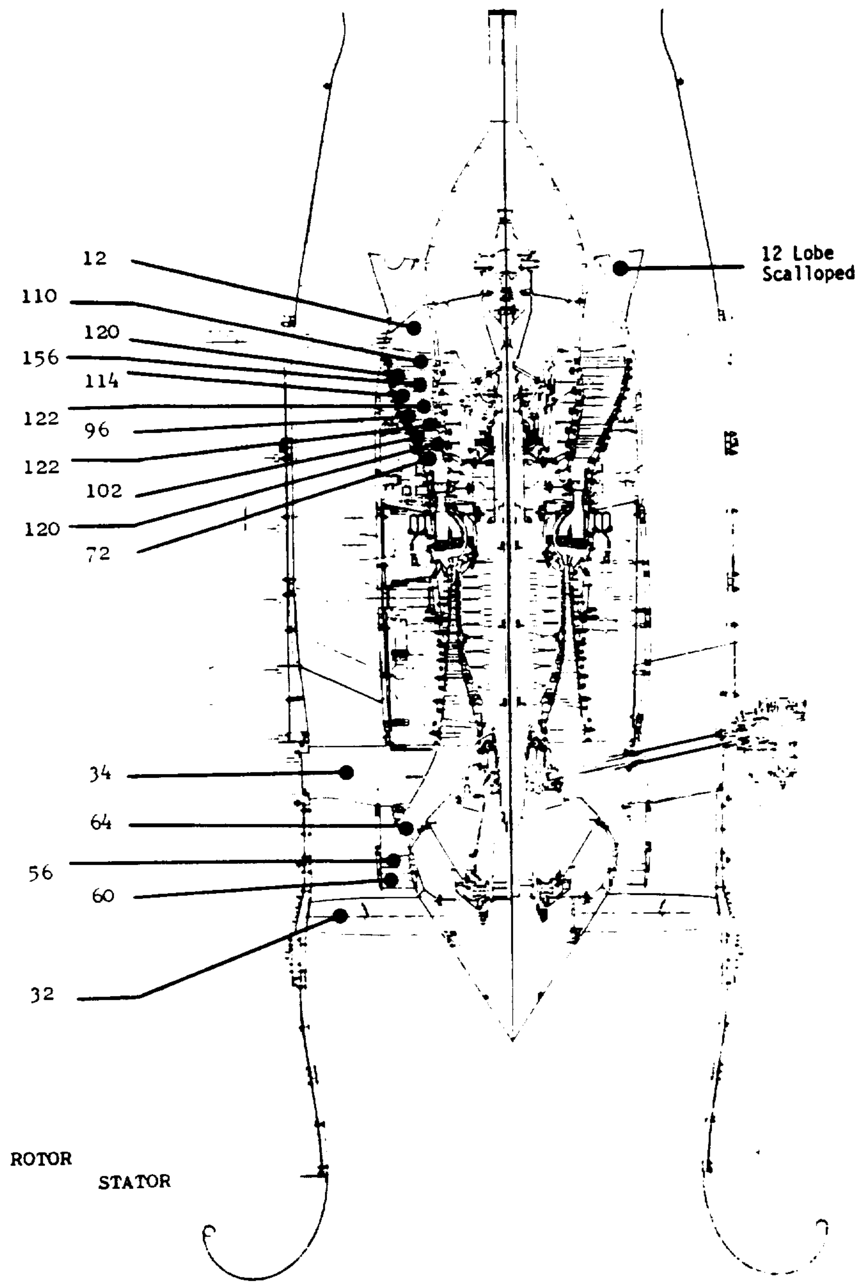


Figure V.5.1.2 E^3 ICLS Blade Counts

Electric's commercial turbofan experience, it has been found that modern signal processing techniques, such as those discussed in Sections 5.3.3 and 5.3.4, accurately identify the relative contribution of the turbulence distortions, so that their effect can be isolated from the data. These contributions can be summarized in a table of corrections, based on the assumption that flight turbulence levels are significantly reduced, or "cleaned up" (Reference Table V.5.1).

These corrections have been determined for each individual speed tested, then they were averaged over two speed regimes to improve the statistical significance of the estimate. Two speed regimes were selected as the directivity characteristics of fan noise source change due to the extremity of operating conditions.

5.5.3 FPS FLIGHT PROJECTION PROCEDURE

The flight FPS jet and combustor noise components were predicted using the methods discussed in Reference 14 and the projected FPS performance cycle. The predicted jet and combustor, along with the FPS fan, booster, and turbine components were projected individually to flight using corrections for spherical divergence, air attenuation, Doppler shifting, and dynamic amplitude effects. The flight projected components are then summed and an Effective Perceived Noise Level (EPNL) is calculated.

5.5.4 COMPARISON TO PRETEST PREDICTION

Predicted fully treated and measured noise levels are shown as a function of angle from the engine in Figure V.5.4.1 to V.5.4.8. Data is presented for three test configurations over a range of fan speeds. In Figures V.5.4.9 to V.5.4.14, the frequency distributions are shown for 60° and 120° angles for selected fan speeds.

The measured ICLS test data show that the overall engine's acoustic performance was, in general, as expected. However, there are three minor areas where the pretest predictions did not match the data as well as the:

TABLE V.5.1

FAN NOISE FLIGHT "CLEANUP" CORRECTIONS

	Approach		Takeoff	
Angle	BPF	2BPF	BPF	2BPF
10°	5.6	5.4	4.8	5.8
20°	5.8	4.3	5.5	3.8
30°	4.7	3.4	5.5	5.3
40°	4.6	4.1	5.3	6.4
50°	4.9	2.0	5.3	3.5
60°	5.1	2.9	5.1	3.0
70°	2.9	1.6	4.4	2.1
80°	3.2	1.3	3.9	2.1
90°	1.6	1.5	2.6	1.1
100°	1.6	1.1	2.3	1.4
110°	1.8	1.4	1.8	.9
120°	2.1	1.5	2.1	.7
130°	2.4	1.0	1.7	.7
140°	2.2	1.8	1.7	.4
150°	2.0	1.6	2.6	.6
160°	2.8	1.6	3.5	.8

Figure V.5.4.1

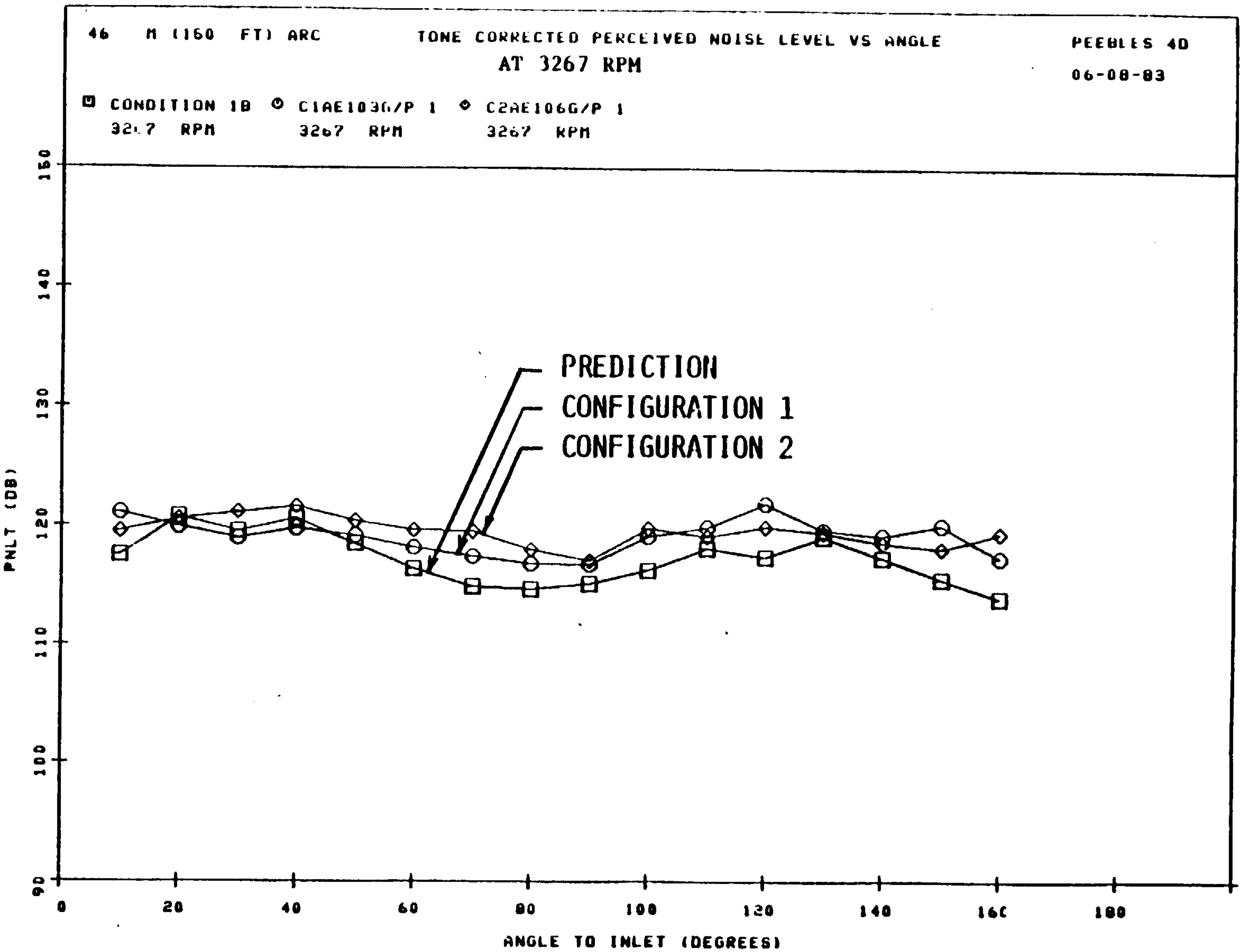
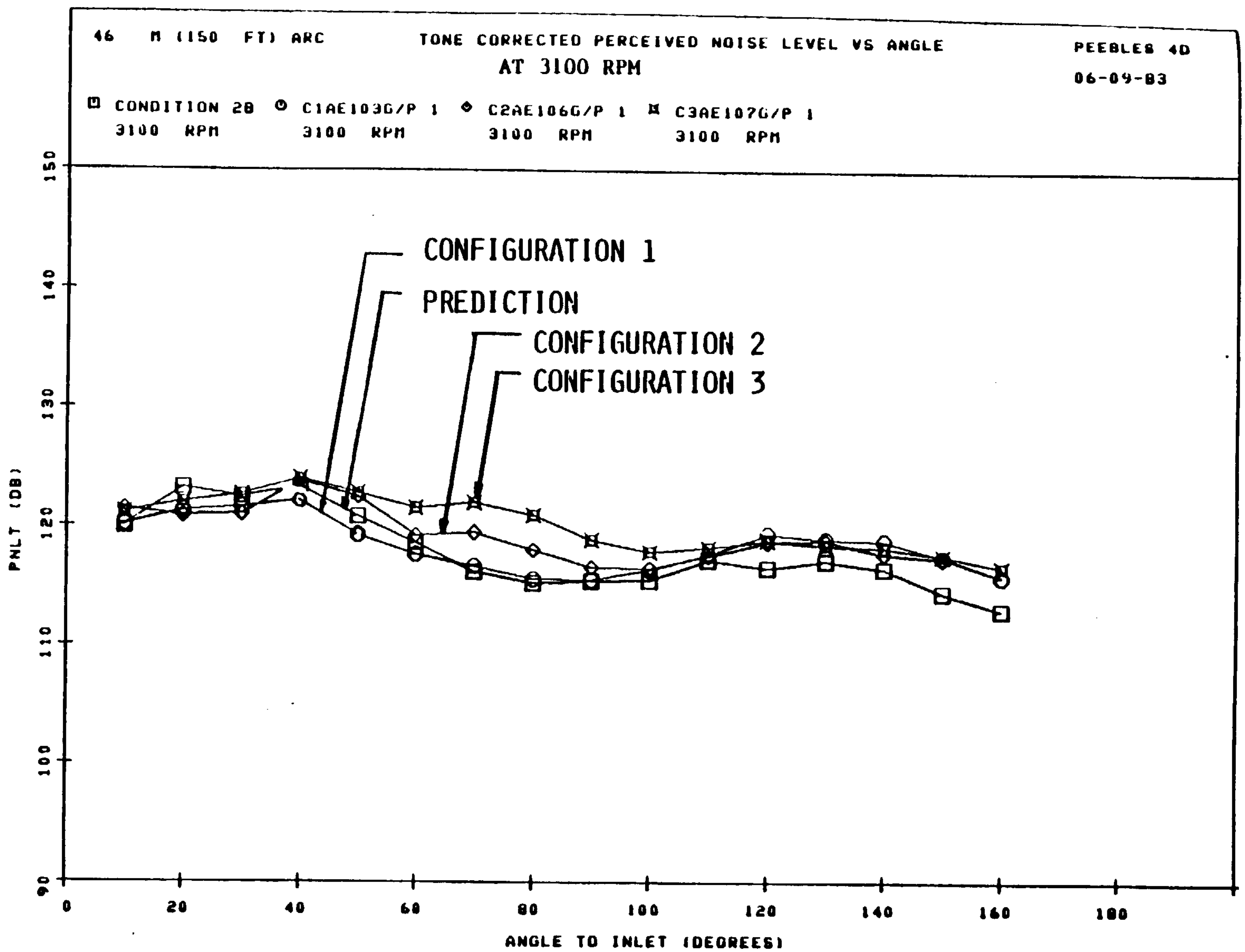

46 M (160 FT) ARC
TONE CORRECTED PERCEIVED NOISE LEVEL VS ANGLE
AT 3267 RPM
PEEBLES 4D
06-08-83
CONDITION 1B 3267 RPM
C1AE103G/P 1 3267 RPM
C2AE106G/P 1 3267 RPM
PREDICTION
CONFIGURATION 1
CONFIGURATION 2
PNLT (DB)
90
100
110
120
130
140
150
0
20
40
60
80
100
120
140
160
180
ANGLE TO INLET (DEGREES)

Figure V.5.4.2



46 M (150 FT) ARC
TONE CORRECTED PERCEIVED NOISE LEVEL VS ANGLE
AT 3100 RPM
PEEBLES 4D
06-09-83
CONDITION 28 3100 RPM
C1AE103G/P 1 3100 RPM
C2AE106G/P 1 3100 RPM
C3AE107G/P 1 3100 RPM
CONFIGURATION 1
PREDICTION
CONFIGURATION 2
CONFIGURATION 3
PNLT (DB)
90
100
110
120
130
140
150
0
20
40
60
80
100
120
140
160
180
ANGLE TO INLET (DEGREES)

Figure V.5.4.3

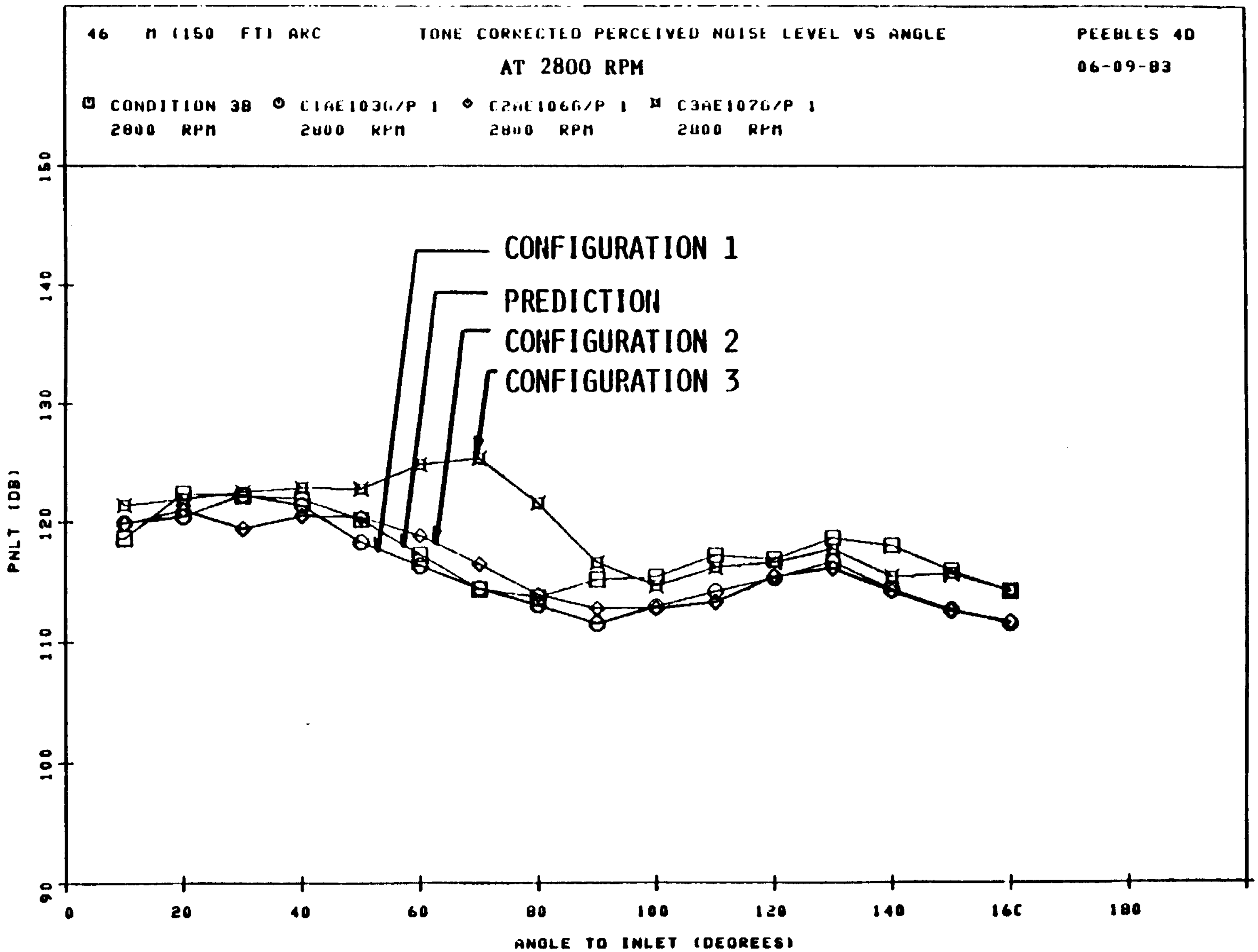

46 M (150 FT) ARC
TONE CORRECTED PERCEIVED NOISE LEVEL VS ANGLE
AT 2800 RPM
PEEBLES 4D
06-09-83
CONDITION 38 2800 RPM
C1AE1036/P 1 2800 RPM
C2AE1066/P 1 2800 RPM
C3AE1076/P 1 2800 RPM
CONFIGURATION 1
PREDICTION
CONFIGURATION 2
CONFIGURATION 3
PNLT (DB)
90
100
110
120
130
140
150
0
20
40
60
80
100
120
140
160
180
ANGLE TO INLET (DEGREES)

Figure V.5.4.4

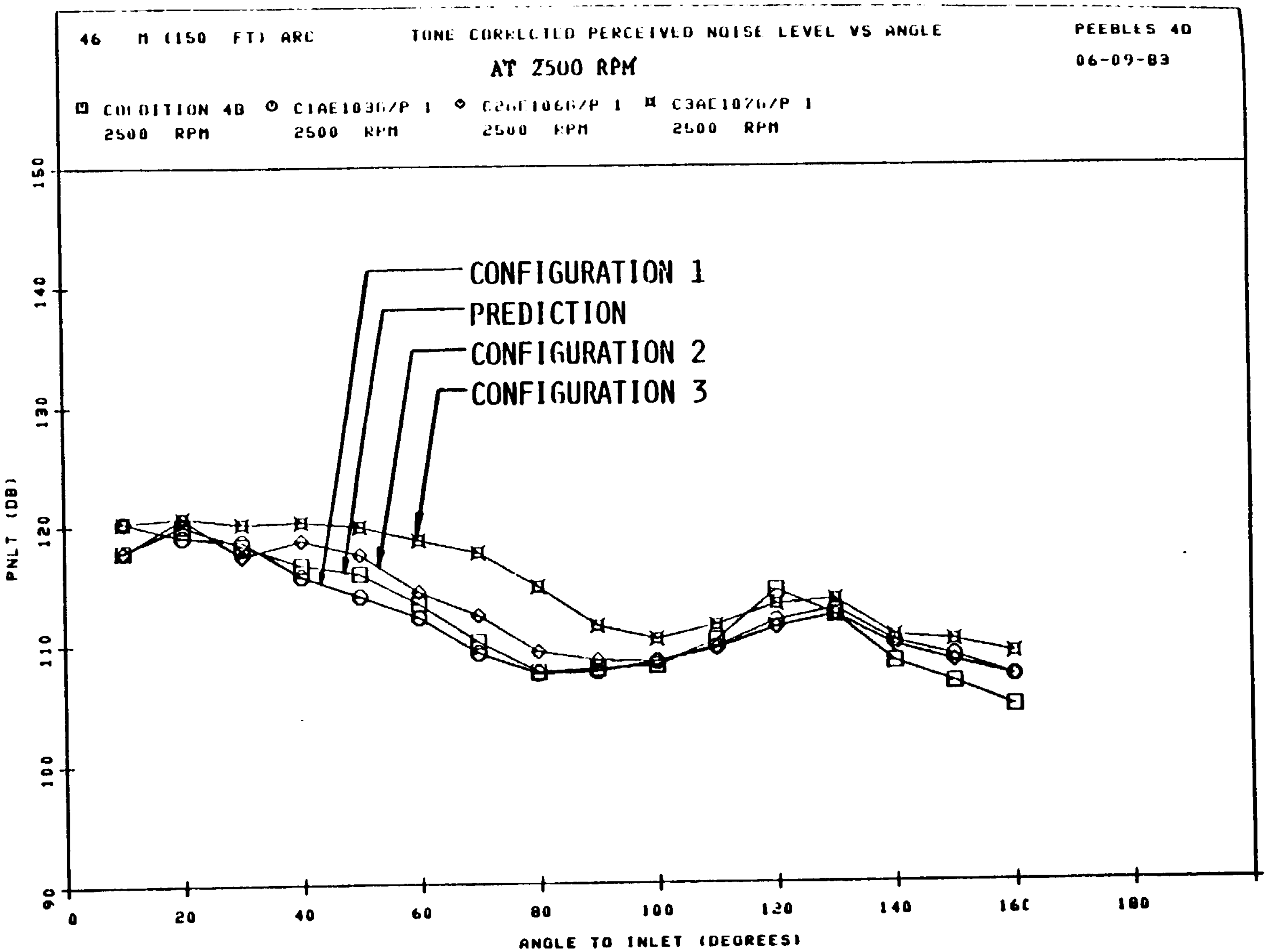

46 M (150 FT) ARC
TONE CORRECTED PERCEIVED NOISE LEVEL VS ANGLE
AT 2500 RPM
PEEBLES 4D
06-09-83
CONDITION 4B
2500 RPM
C1AE1036/P 1
2500 RPM
C2AE1066/P 1
2500 RPM
C3AE1076/P 1
2500 RPM
CONFIGURATION 1
PREDICTION
CONFIGURATION 2
CONFIGURATION 3
PNLT (DB)
90
100
110
120
130
140
150
0
20
40
60
80
100
120
140
160
180
ANGLE TO INLET (DEGREES)

Figure V.5.4.5

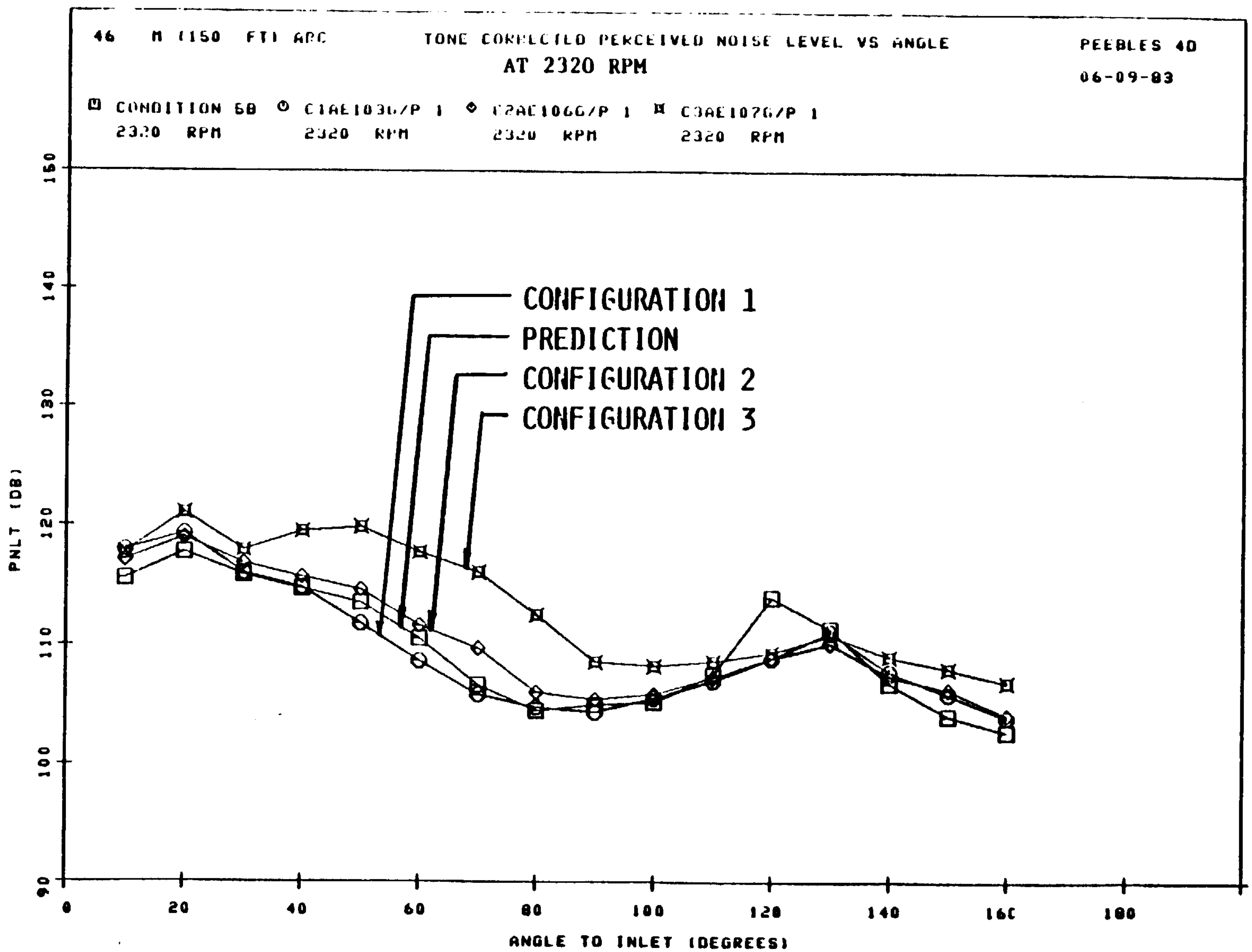


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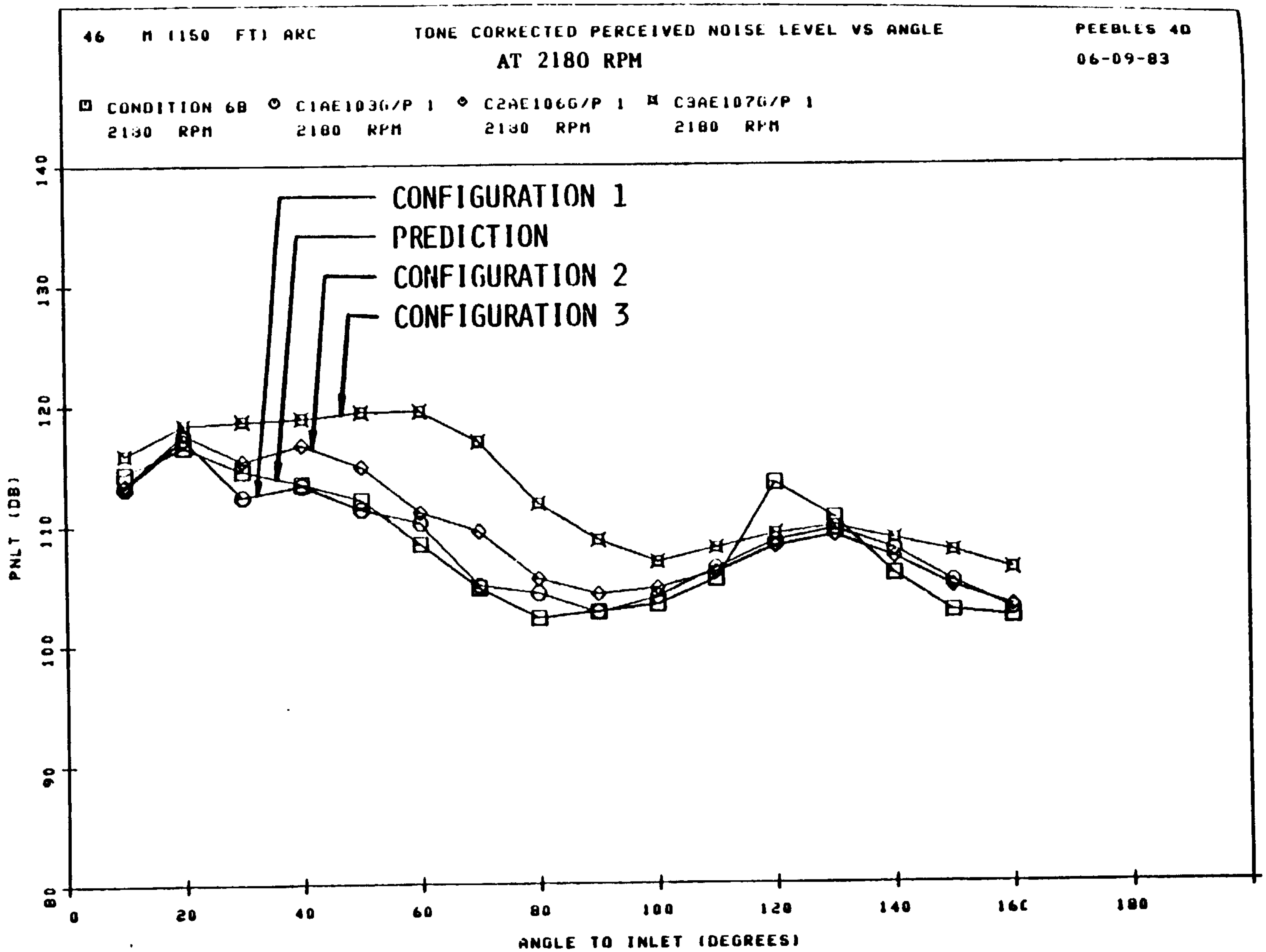
Figure V.5.4.6



46 M (150 FT) ARC
TONE CORRECTED PERCEIVED NOISE LEVEL VS ANGLE
AT 2180 RPM
PEEBLES 4D
06-09-83
CONDITION 6B 2180 RPM
C1AE103G/P 1 2180 RPM
C2AE106G/P 1 2180 RPM
C3AE107G/P 1 2180 RPM
CONFIGURATION 1
PREDICTION
CONFIGURATION 2
CONFIGURATION 3
PNLT (DB)
80
90
100
110
120
130
140
0
20
40
60
80
100
120
140
160
180
ANGLE TO INLET (DEGREES)

Figure V.5.4.7

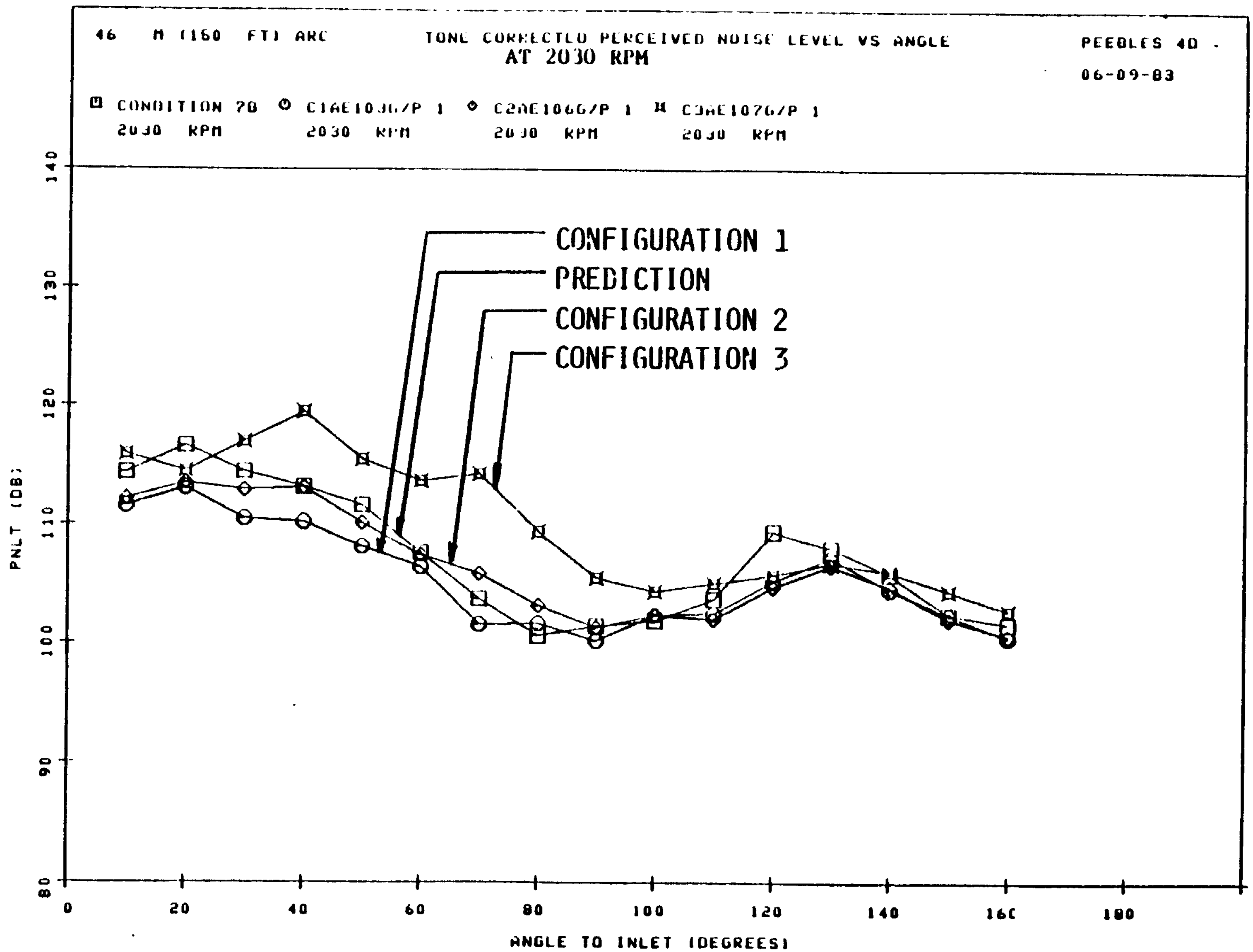


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Figure V.5.4.8

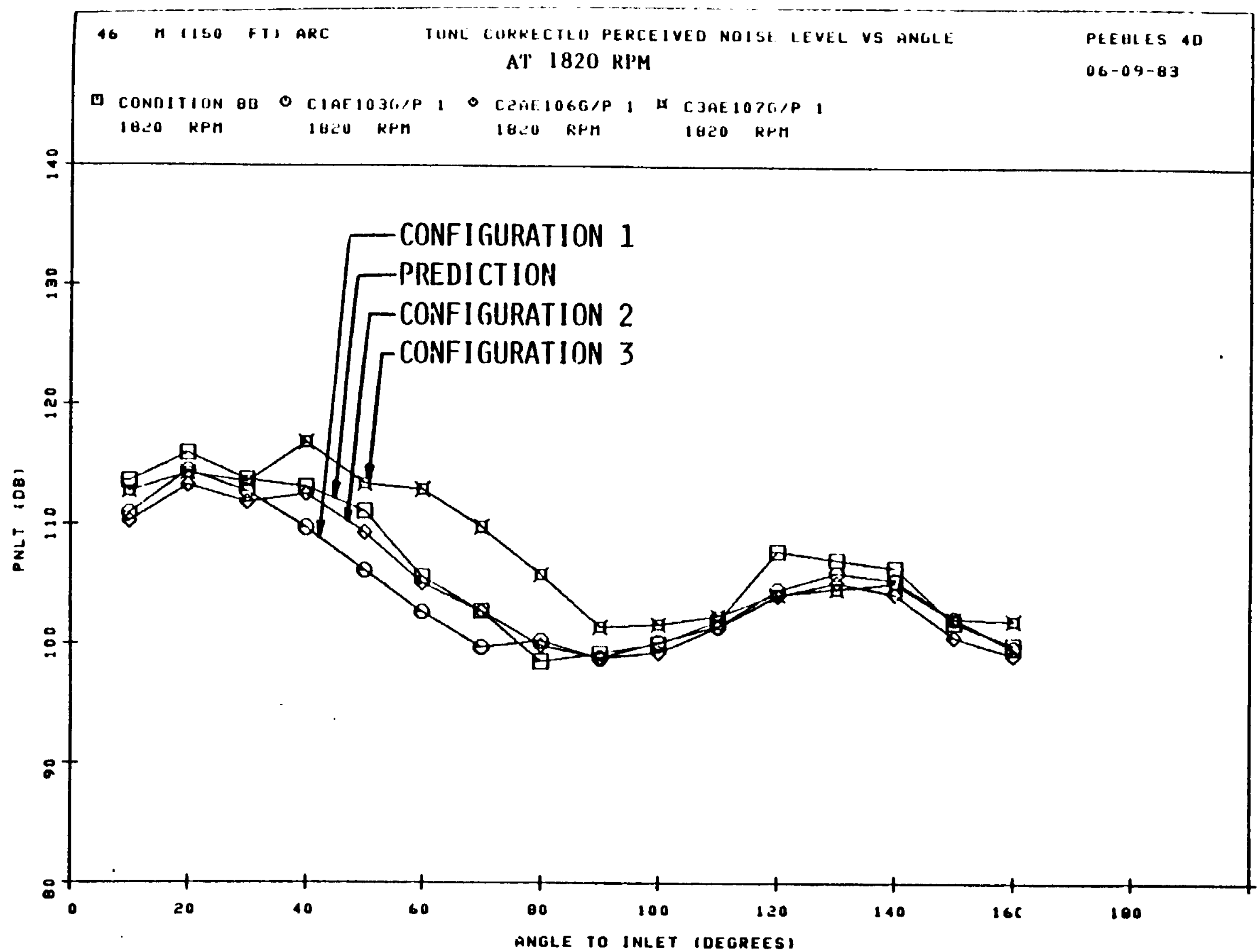

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Figure V.5.4.9

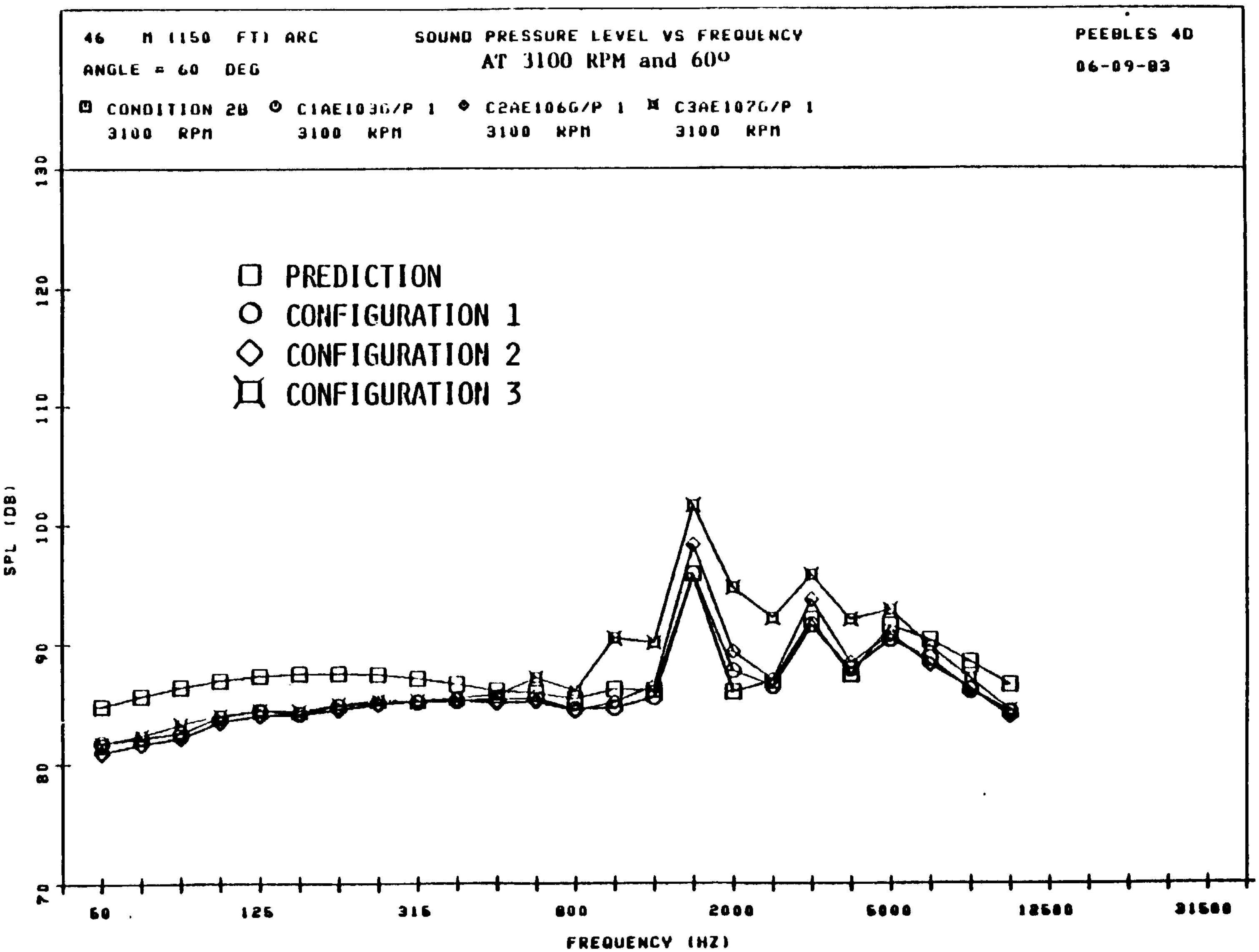
46 M (150 FT) ARC
ANGLE = 60 DEG
SOUND PRESSURE LEVEL VS FREQUENCY
AT 3100 RPM and 60°
PEEBLES 4D
06-09-83
CONDITION 2B 3100 RPM
C1AE103G/P 1 3100 RPM
C2AE106G/P 1 3100 RPM
C3AE107G/P 1 3100 RPM
PREDICTION
CONFIGURATION 1
CONFIGURATION 2
CONFIGURATION 3
SPL (DB)
130
120
110
100
90
80
70
50
125
315
800
2000
5000
12500
31500
FREQUENCY (HZ)

Figure V.5.4.10

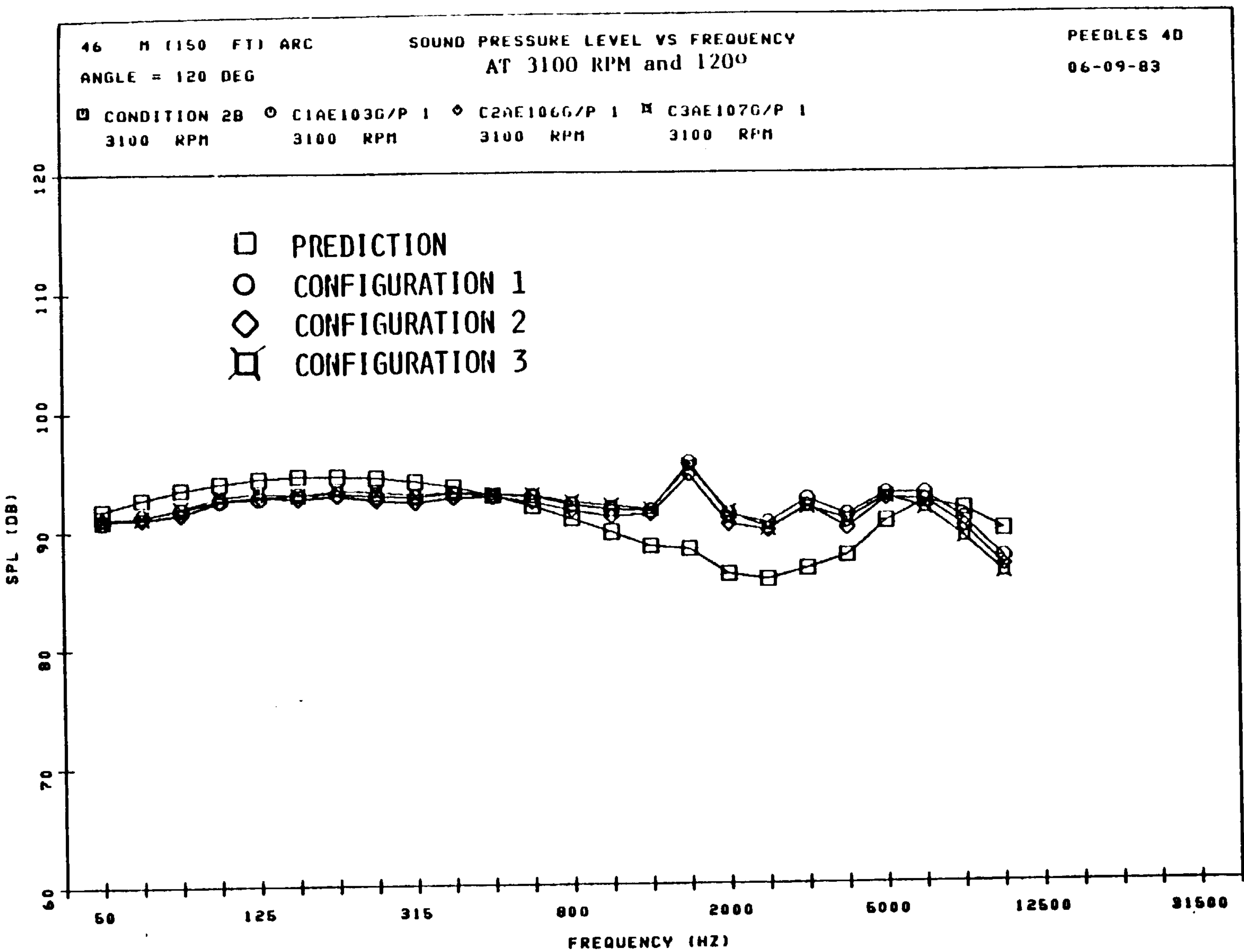

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Figure V.5.4.11

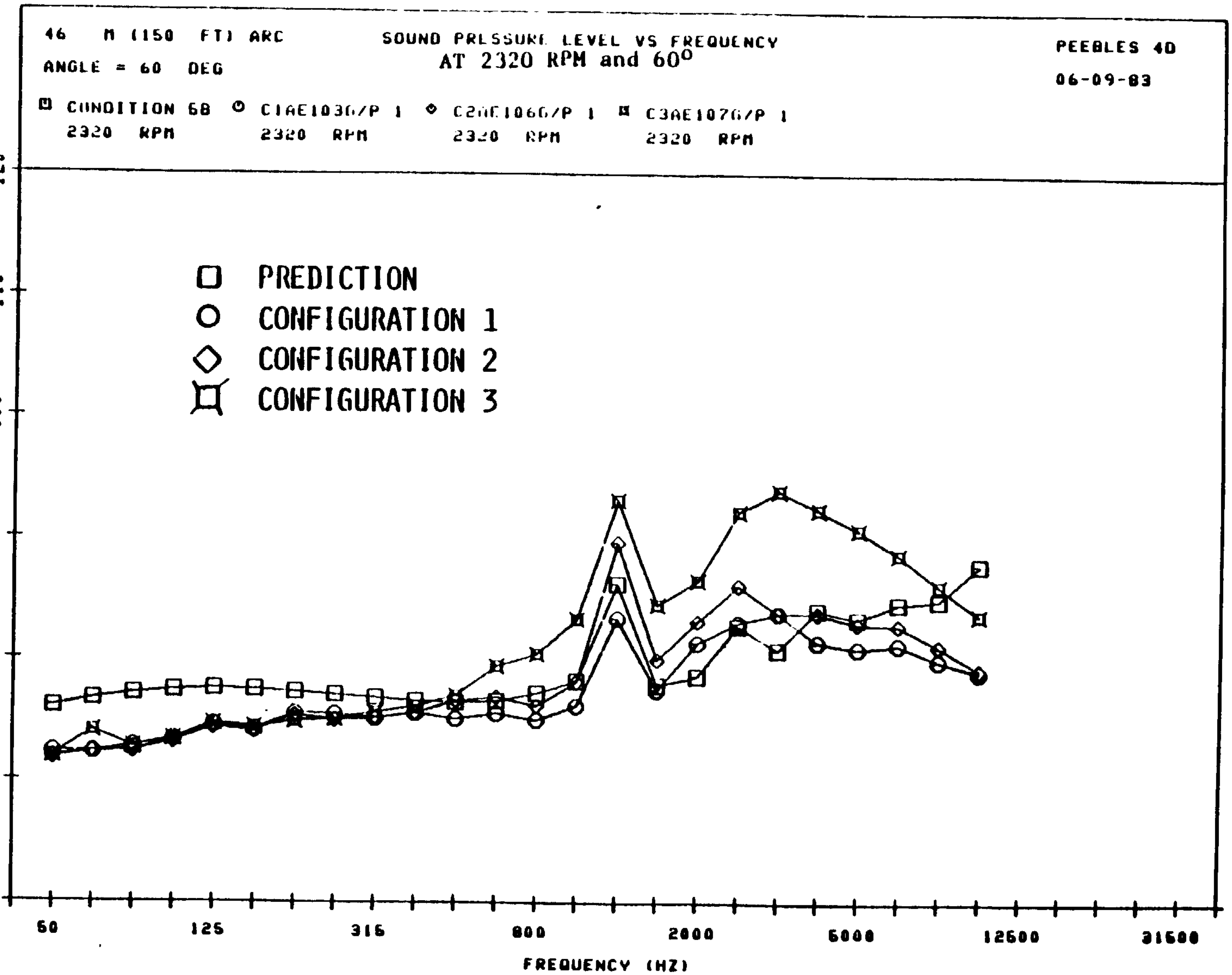

Figure V.5.4.12

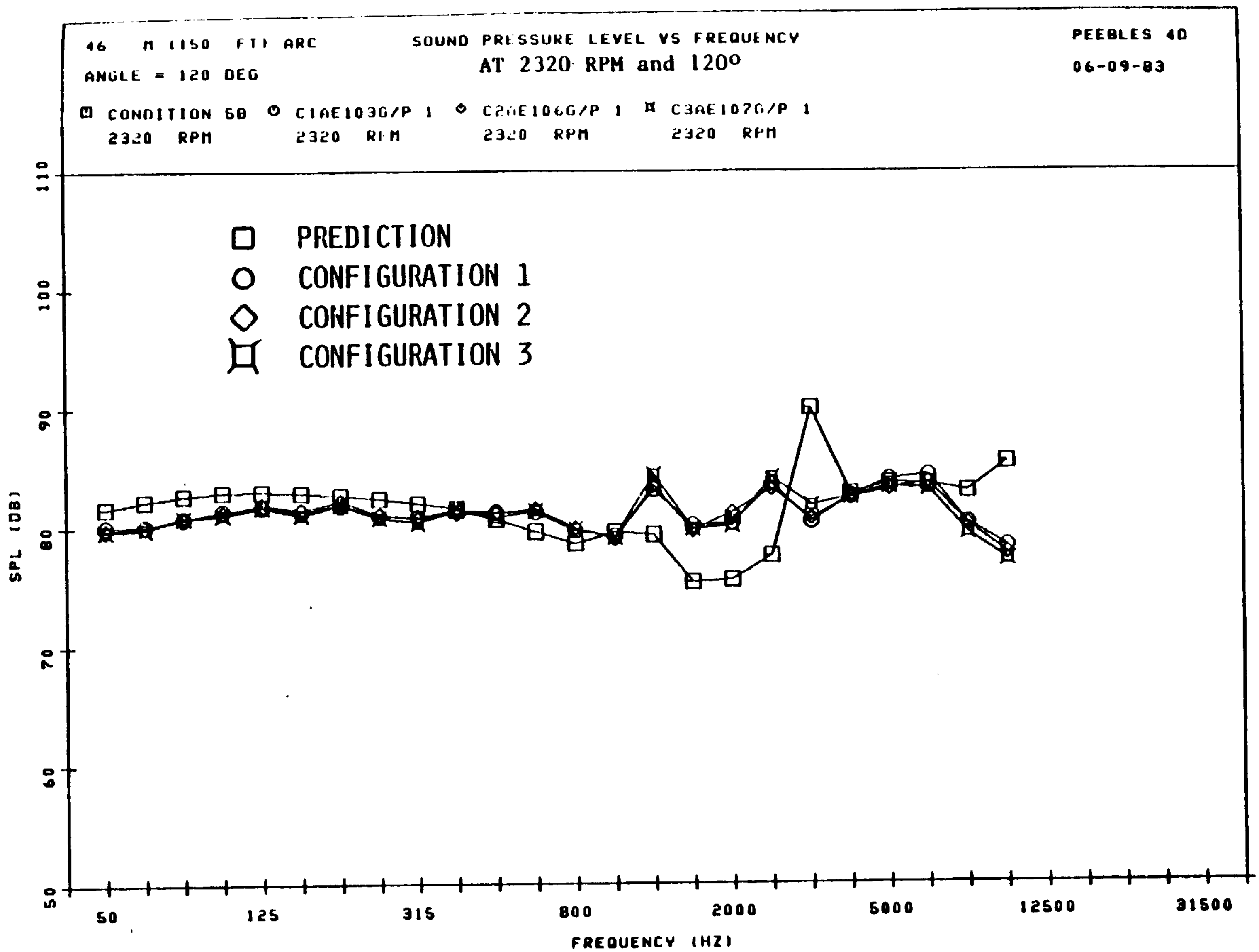

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Figure V.5.4.13

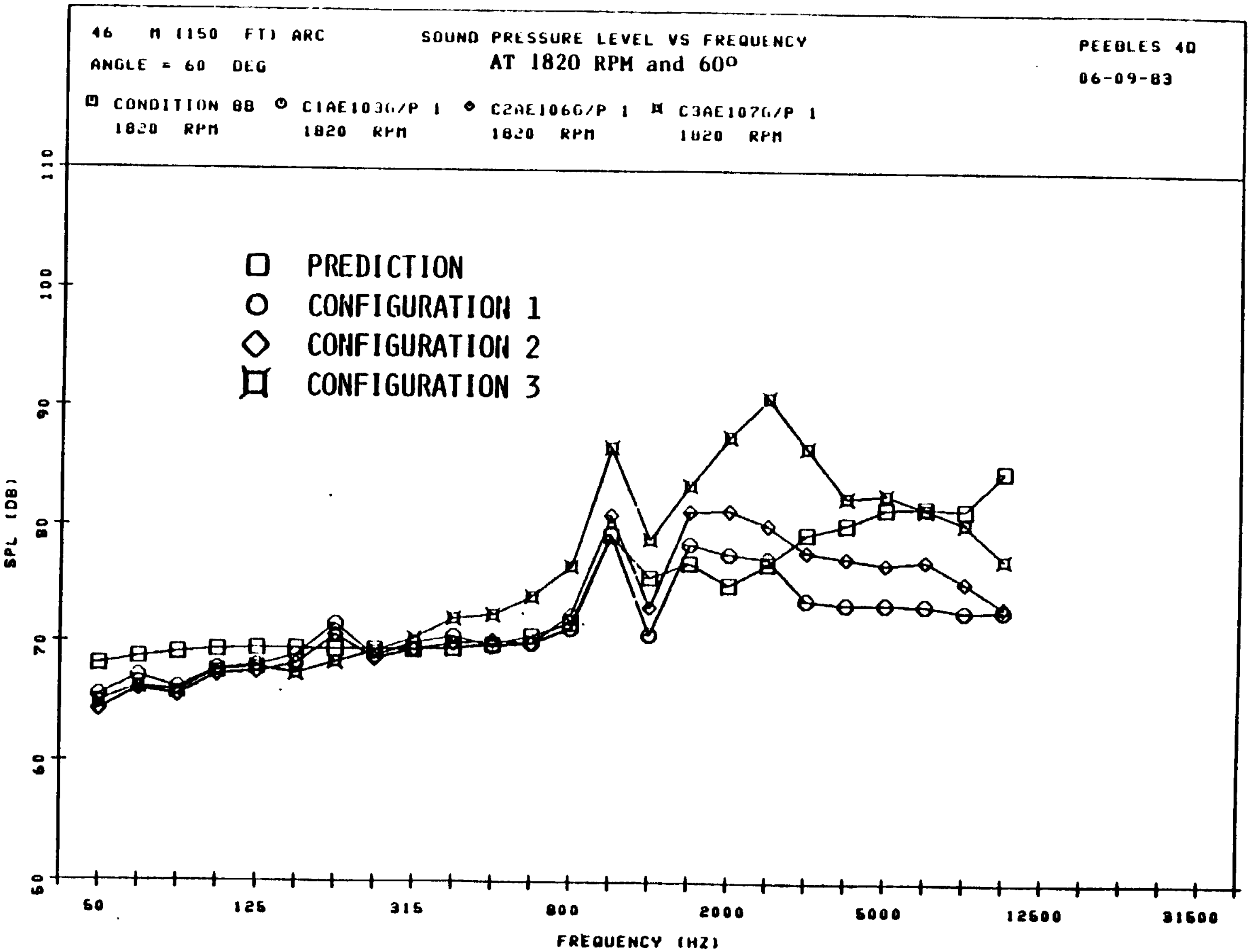
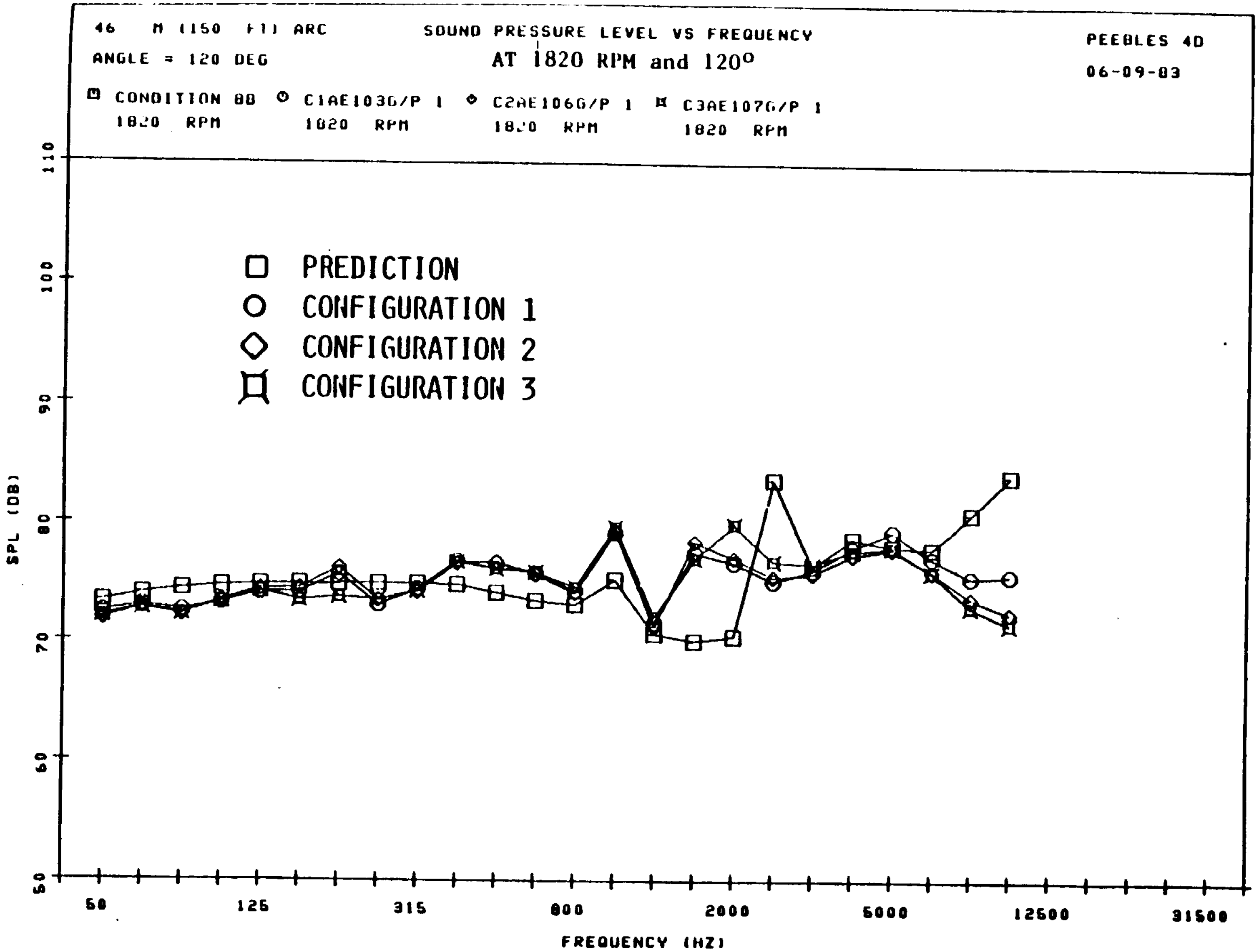


Figure V.5.4.14



- High speed aft measured levels are underpredicted - All measurements were made on a polar arc centered on the fan face. As jet noise is a distributed source, with an apparent source location located several diameters downstream from the fan face, the measurements were made in the nearfield of the source. The jet noise prediction methodology used (SAE ARP 876B) does not have a source location procedure to account for this.

- Low speed forward quadrant and 120° levels are overpredicted - This is probably due to an overprediction of the fan rotor-turbulence interaction noise effects on the higher harmonics.

- Aft angles, all speeds show overpredicted turbine levels - The turbine tones appear to be broadened spectrally and lower in amplitude than expected, probably due to turbulence in the jet mixer.

6.0 COMPARISON AND DISCUSSIONS

6.1 CUT-ON FAN NOISE CHARACTERISTICS

It was demonstrated during the fan scale model test (Section 2.3.1) and confirmed by comparisons to scaled CF6-50 data (Figures VI.1.1 to VI.1.3) that cut-on fan blade passing frequency levels with wide rotor-stator spacing are similar to cut-off fan blade passing frequency levels with tighter spacing.

6.2 EXHAUST MIXER NOZZLE NOISE CHARACTERISTICS

The exhaust nozzle scale model test demonstrated that forced mixer exhaust nozzles are quieter than separate flow nozzles and similar to conic flow nozzles for the same thrust. (Reference Photograph VI.2 for example of ICLS mixer.)

6.3 KEVLAR BULK ABSORBER CHARACTERISTICS

Both the fan scale model test and the ICLS test verified the suitable applicability of Kevlar as a bulk absorber material for acoustic treatment panels.

6.4 FAN NOISE SCALING TECHNIQUES

Comparison of the Rotor 11 scale model data scaled up to ICLS conditions and the ICLS full scale data verified the fan modeling techniques used.

Rotor 11 data was scaled up to the full size ICLS conditions by first selecting tip speeds equal to those tested on the ICLS. Then after shifting the blade passing frequency tone to the correct frequency band, the amplitudes of the scale model data were adjusted using the following relationship:

$$L_{FS} = L_{SM} + 10 \log \left(\frac{W_{FS}}{W_{SM}} \right) + 50 \log_{10} \left(\frac{V_{FS}}{V_{SM}} \right)$$

Figure VI.1.1 Comparison of 1/3 Octave BPF Directivity for E^3 ICLS and CF6-50 LNN at Equal Tip Speeds

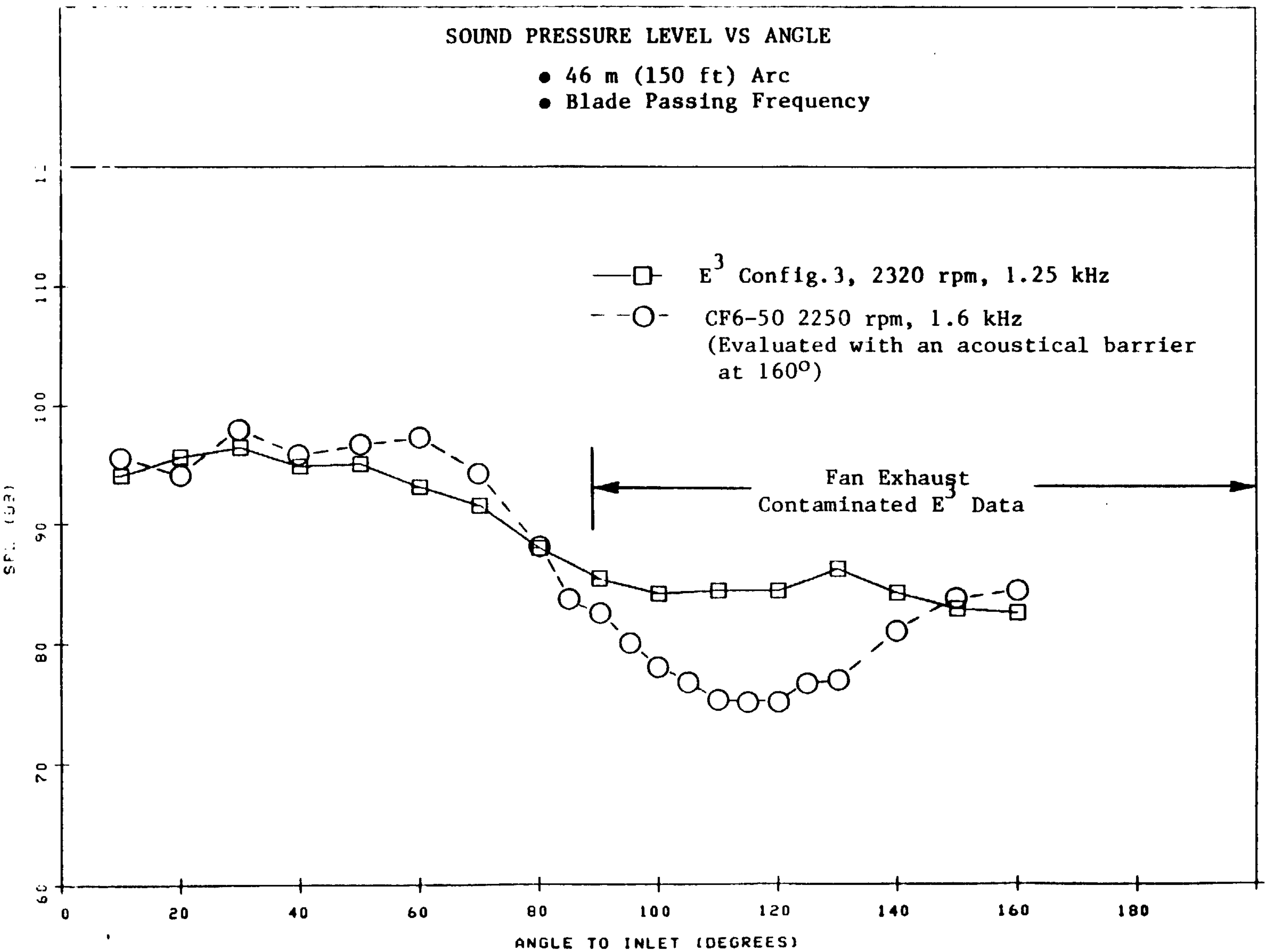


Figure VI.1.2 Comparison of 1/3 Octave BPF Directivity for E^3 ICLS and CF6-50 LNN at Equal Tip Speeds

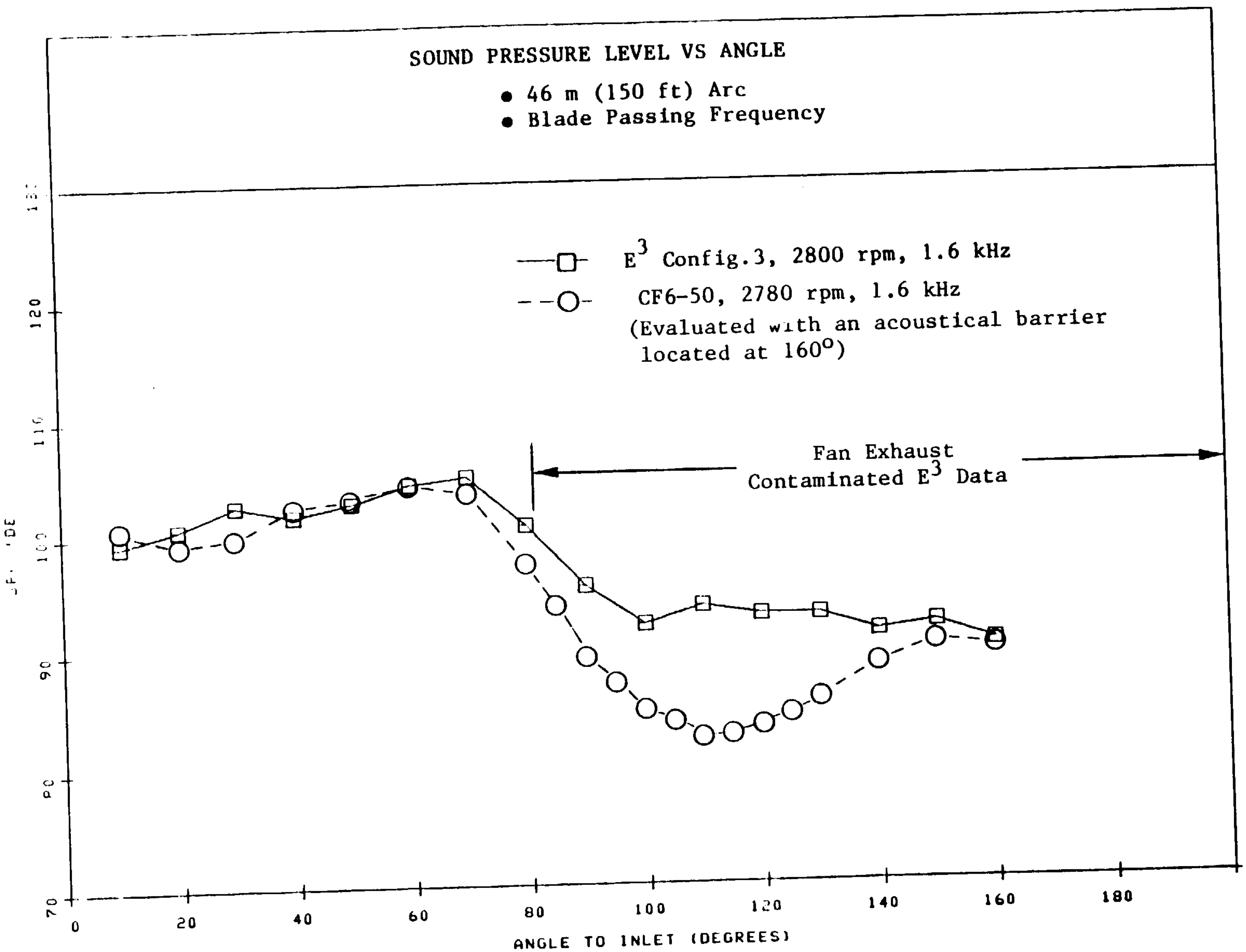


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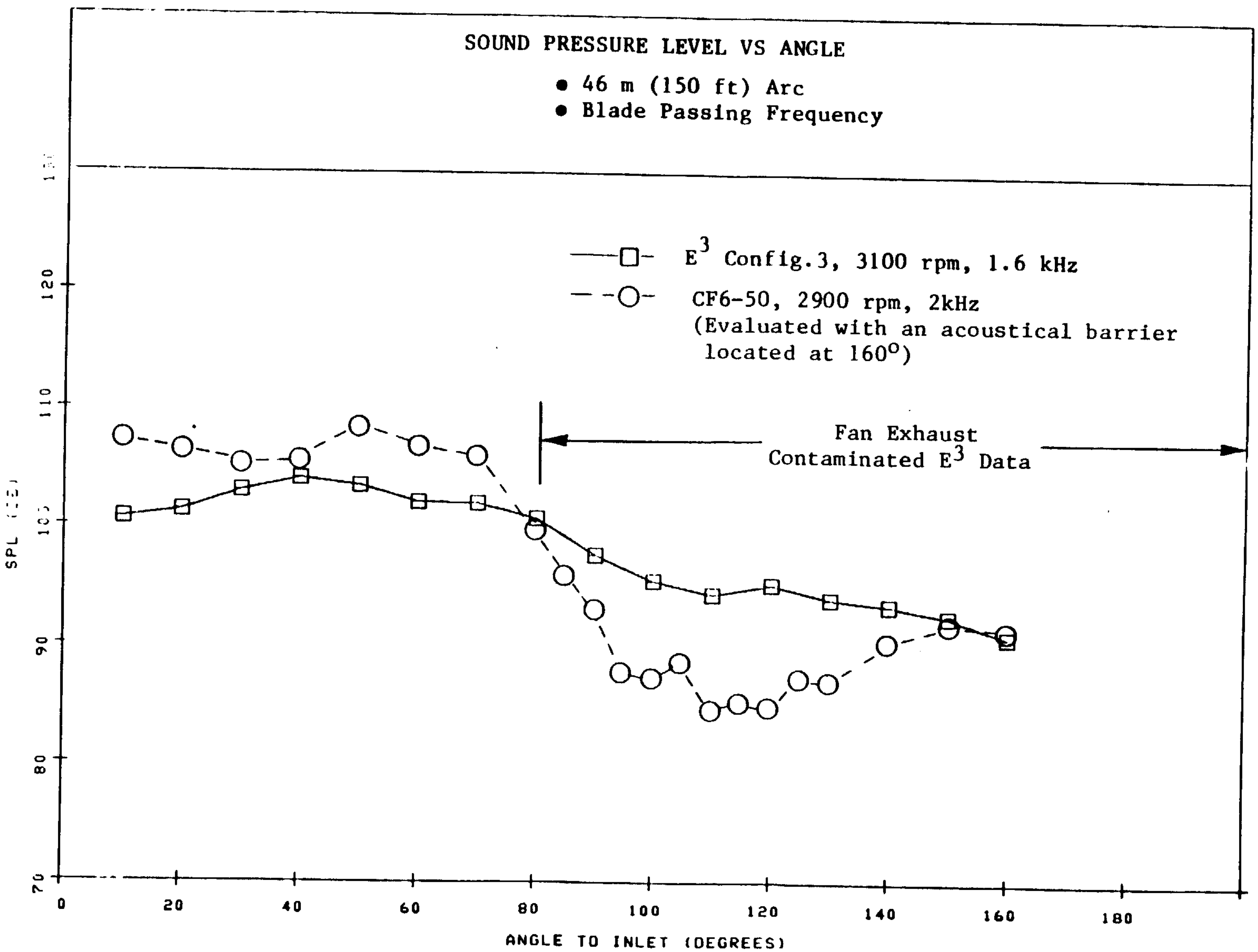
Figure VI.1.3 Comparison of 1/3 Octave BPF Directivity for E^3 ICLS and CF6-50 LNN at Equal Tip Speeds



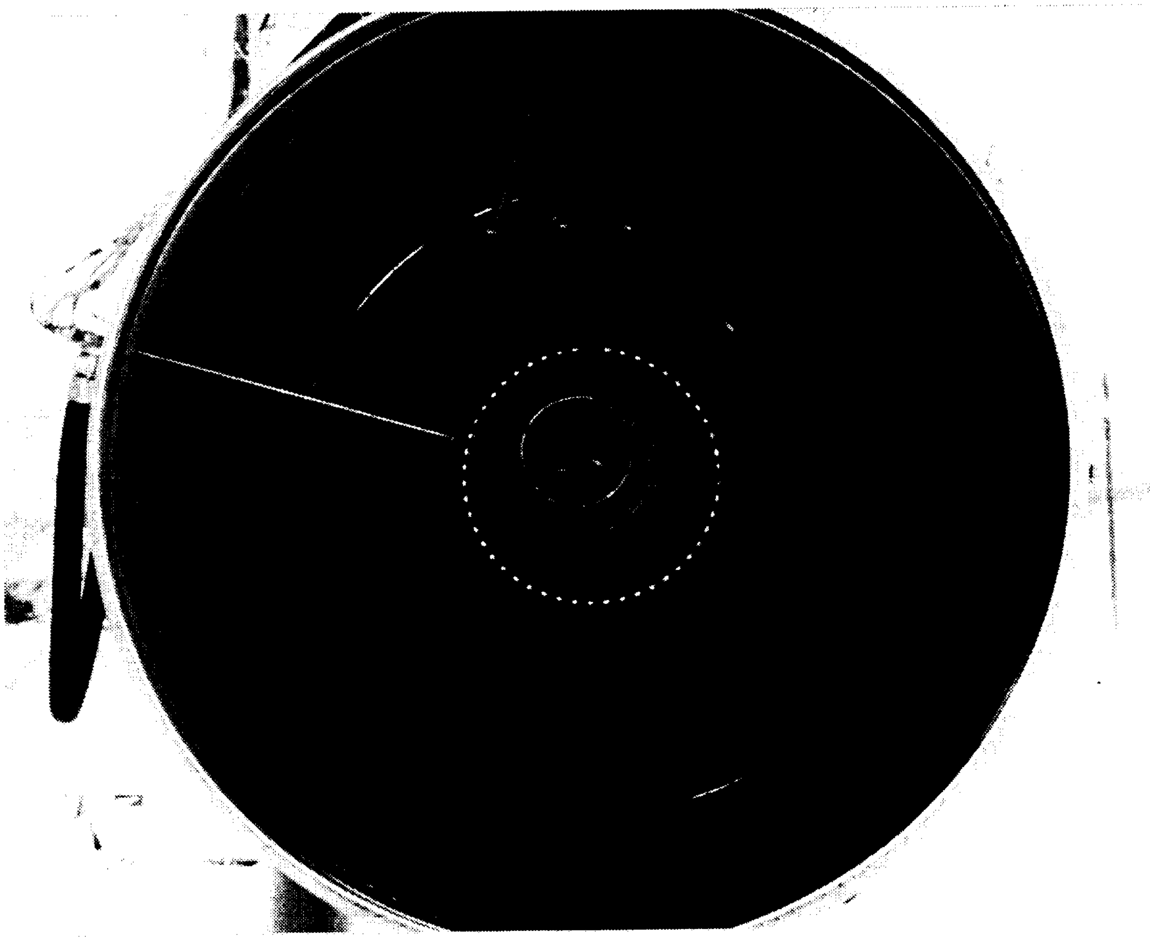


Figure VI.2 ICLS Exhaust Mixer Nozzle

Where: L_{FS} = Full scale tone level
L_{SM} = Scale model tone level
W_{FS} = Full scale weight flow
W_{SM} = Scale model weight flow
V_{FS} = Full scale tip speed
V_{SM} = Scale model tip speed

No adjustments were made to the data to reflect hardware design differences, e.g., vane-blade ratio and spacing (for BPF and harmonics), blade metal angles (for broadband noise), blade details (radial mode distribution) and booster effects (combination tones).

Figures VI.4.1 to VI.4.3 show the comparisons of the hardwall inlet configurations at 30°, 60°, and 90° at 45.7 meter arc freefield conditions for 3,100, 2,800, and 2,320 RPM corrected fan speeds. The scaled model data is generally in good agreement with the ICLS data, except, as expected, at 90° where exhaust radiated noise contaminates the ICLS data. As there are higher induced inflow turbulence levels at the ICLS outdoor test stand structures than the scale model anechoic chamber structures, higher fan tones were expected at the cutback (2,800 RPM) and approach (2,320 RPM) speeds. In addition, at low speed, the booster and booster plus fan combination tones become significant and contribute to the corresponding one-third octave bands.

Figures VI.4.4 to VI.4.6 show the similar comparisons using the treated inlet configurations. Again, the scaled model and the full scaled data are in reasonably good agreement.

It should be noted that there is a potential problem with the scaling techniques used. By shifting the scale model several one-third octave frequency bands so that the blade passing frequencies of the model and full scale coincide, the assumption is made that the size and magnitude of the ingested turbulence is also scalable. The scale model data is typically between 16 KHz to 40 KHz. If the turbulence effects are not scalable, then it would be expected that its effect at these frequencies would be rapidly diminishing with harmonic number, and the scale model will have a higher fall off rate. This effect is evidenced in the data.

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- 150' Arc
- 77°F, 70% RH
- Peebles, Site 4-D

$-\!\square\!-$ E^3 ICLS, 3100 rpm
△ R11 S/M, 12880 rpm

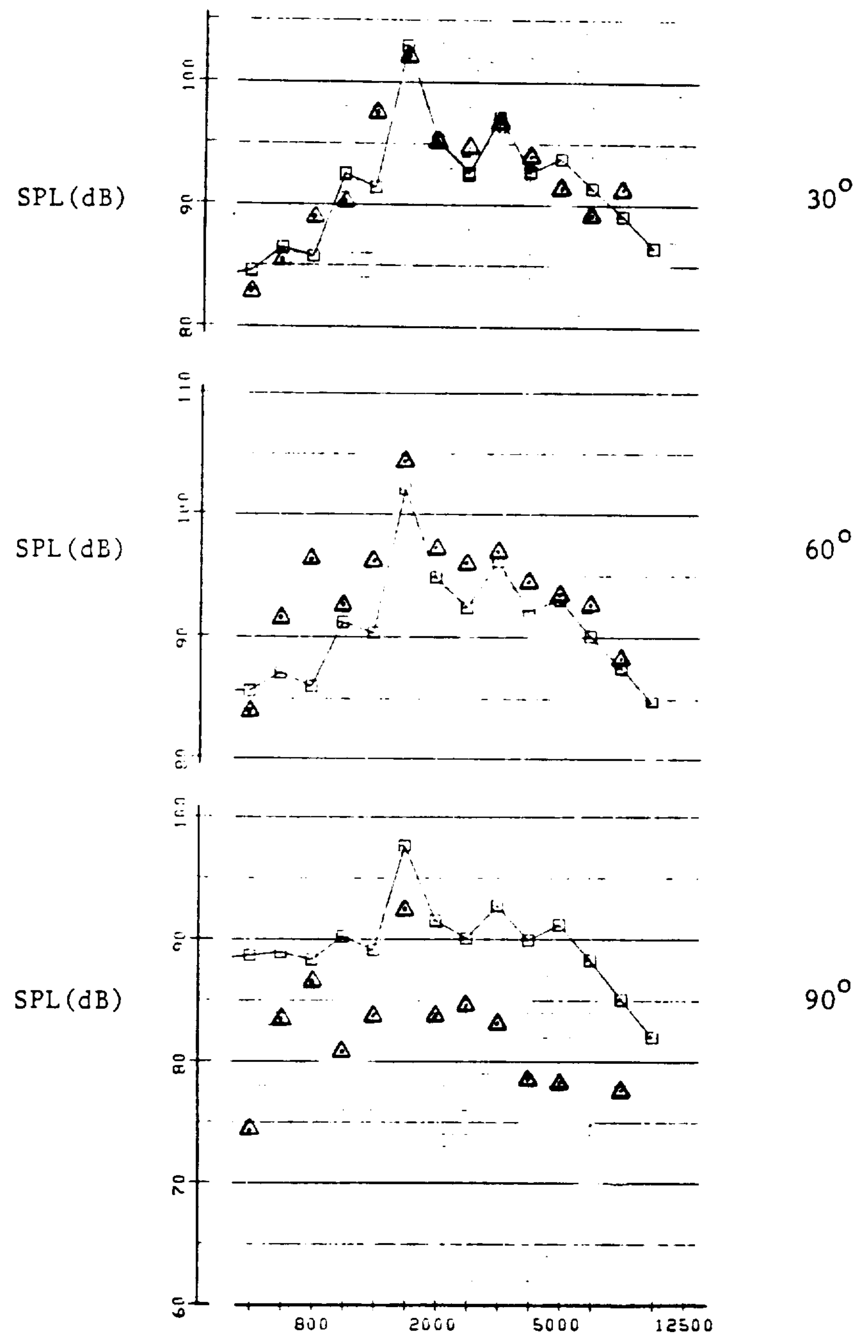

Figure VI.4.1 Comparison of Full Scale E^3 ICLS Test Results with R11 Scaled Model Fan Rig Data (Hardwall Inlet)

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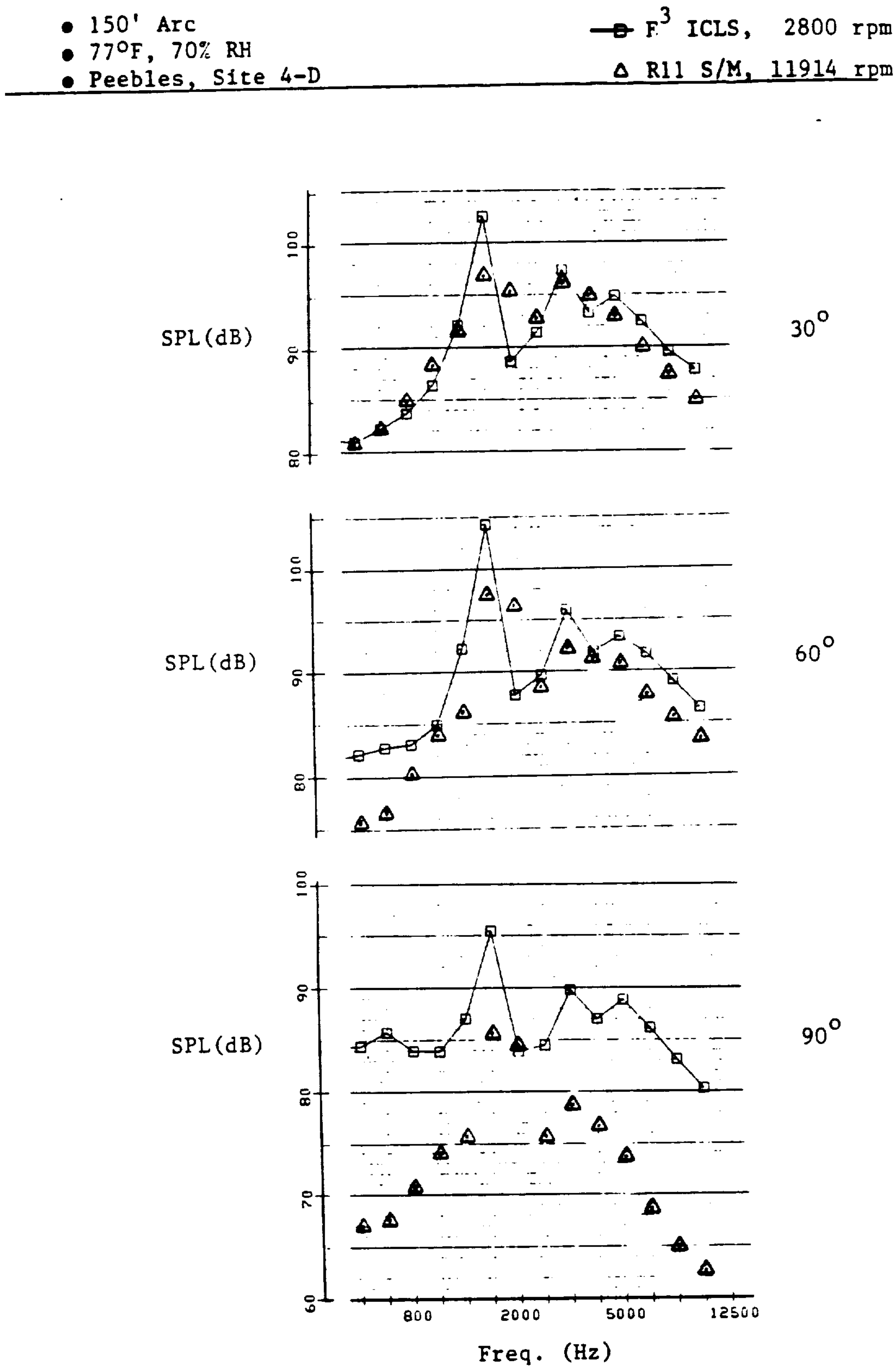

Figure VI.4.2 **Comparison of Full Scale E^3 ICLS Test Results with R11 Scaled Model Fan Rig Data (Hardwall Inlet)**

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- 150' Arc
- 77°F, 70% RH
- Peebles, Site 4-D

E^3 ICLS, 2320 rpm
R11 S/M, 9660 rpm

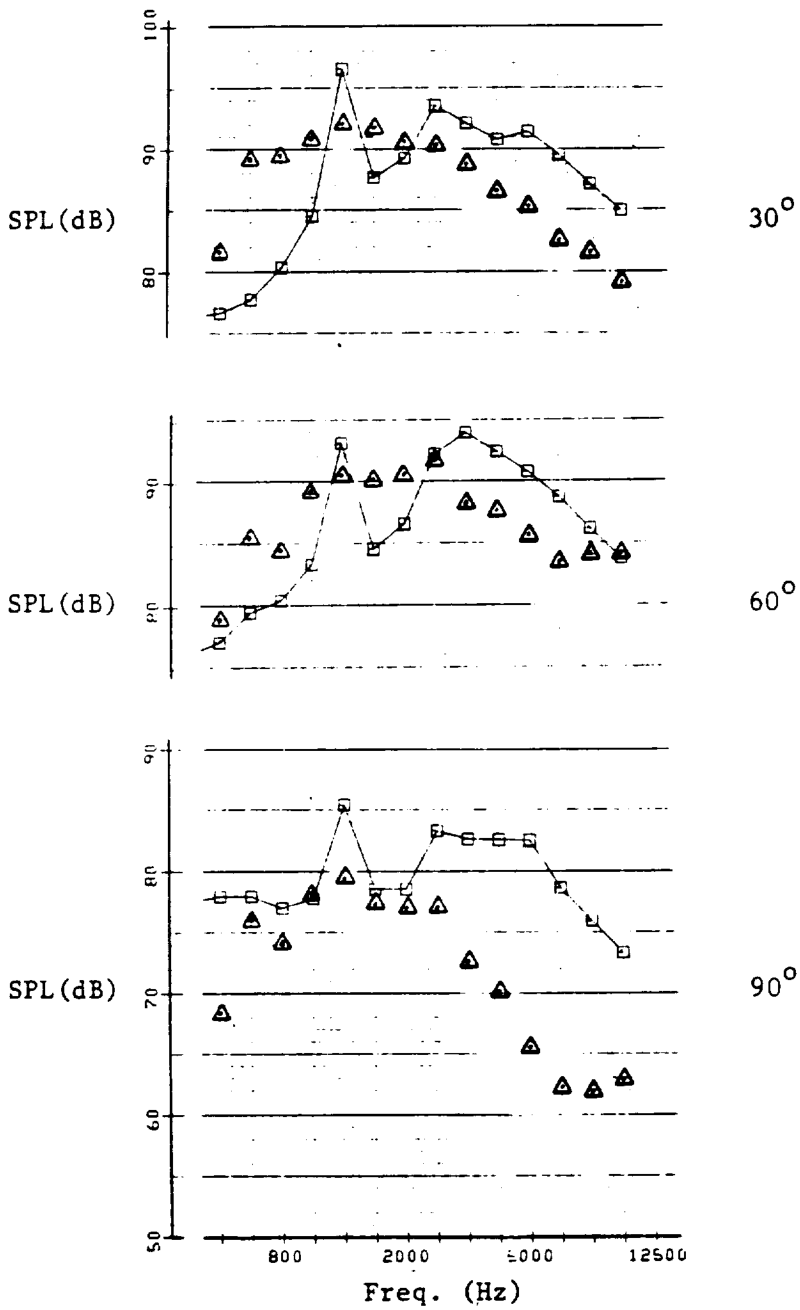

Figure VI.4.3 **Comparison of Full Scale E^3 ICLS Test Results with R11 Scaled Model Fan Rig Data (Hardwall Inlet)**

• 150' Arc
• 77°F, 70% RH
• Peebles, Site 4-D

—□— E^3 ICLS, 3100 rpm
△ R11 S/M, 12880 rpm

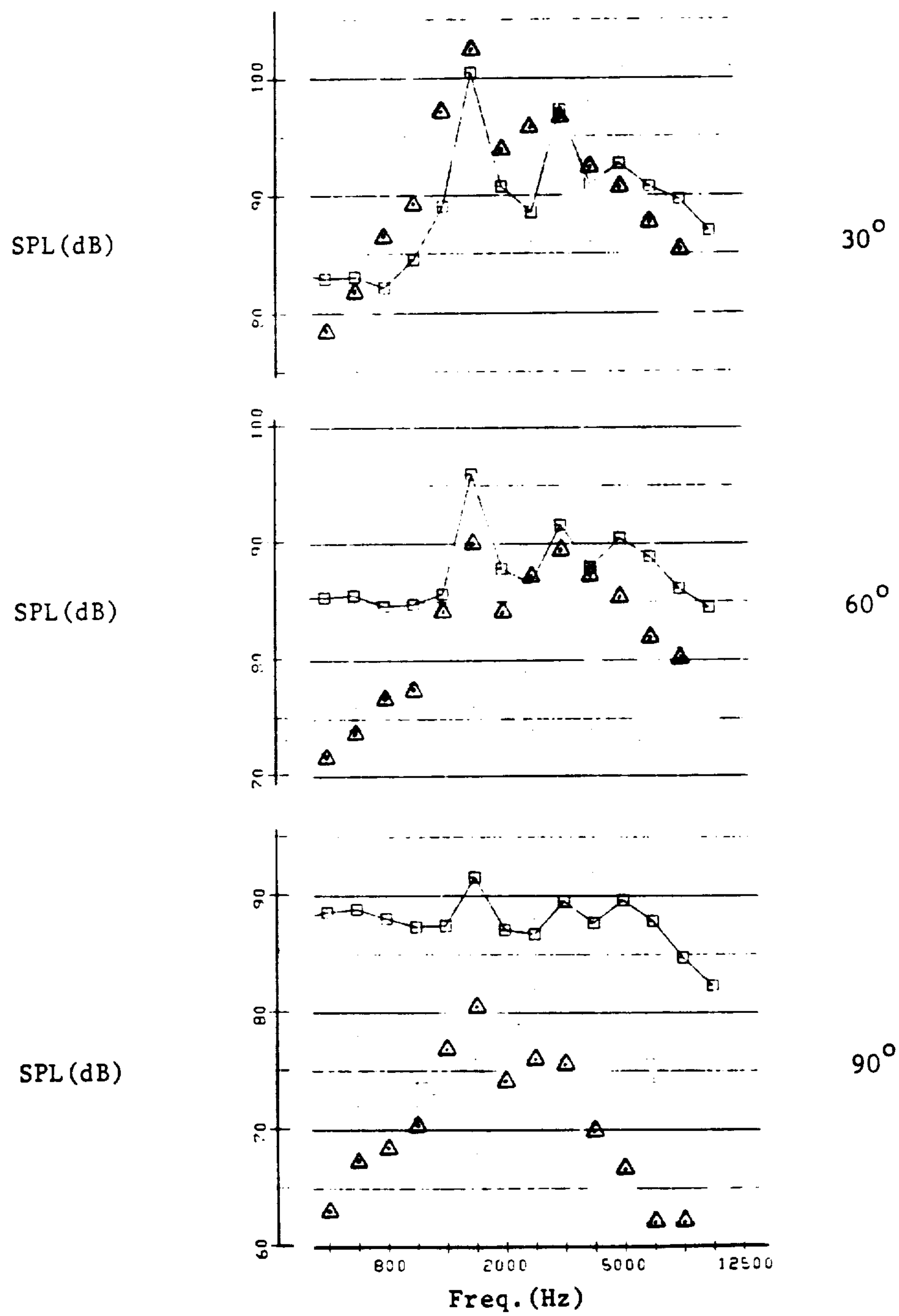

Figure VI.4.4 Comparison of Full Scale E^3 ICLS Test Results with R11 Scaled Model Fan Rig Data (Treated Inlet)

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- 150' Arc
- 77°F, 70% RH
- Peebles, Site 4-D

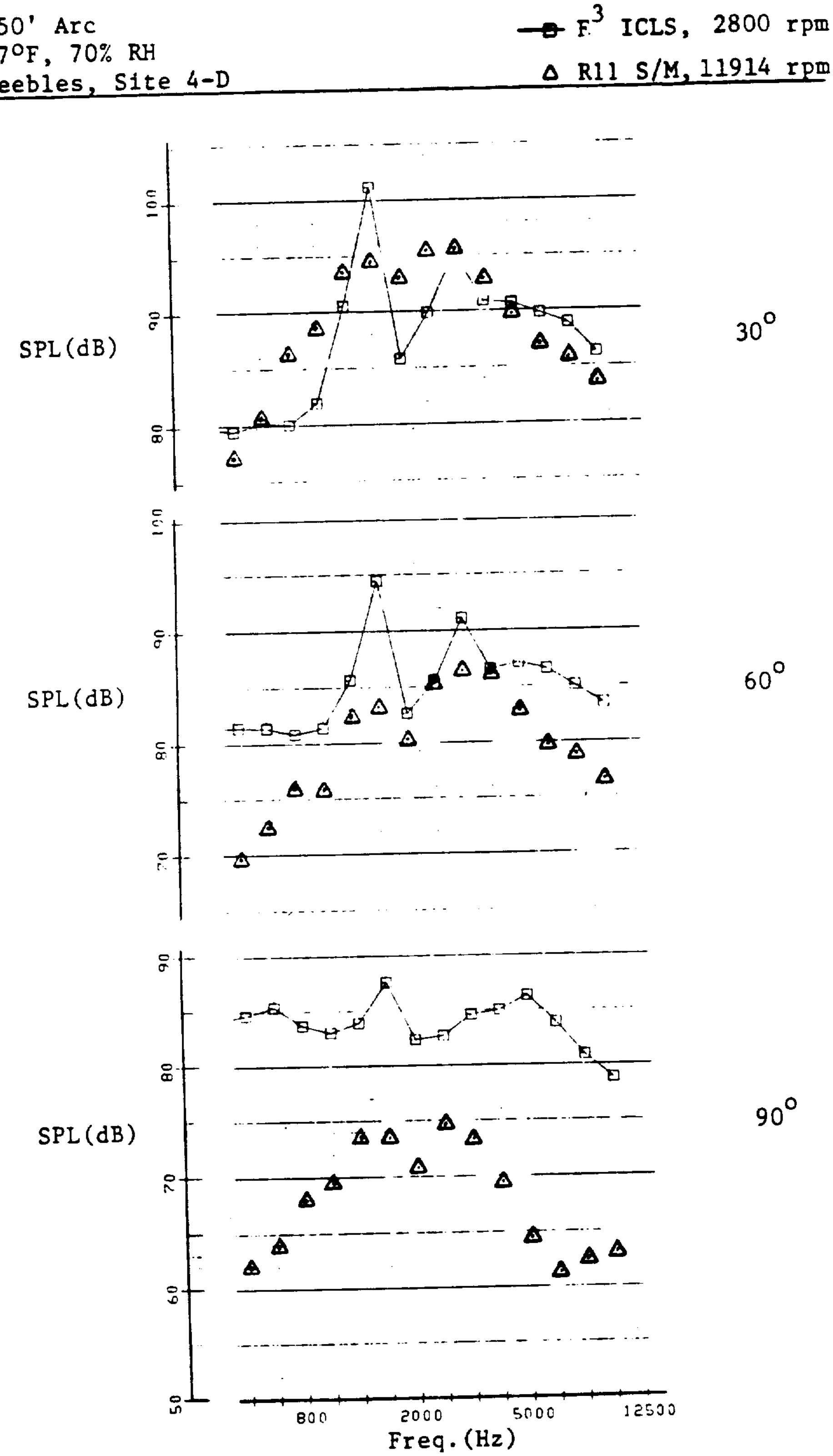

Figure VI.4.5 Comparison of Full Scale E^3 ICLS Test Results with R11 Scaled Model Fan Rig Data (Treated Inlet)

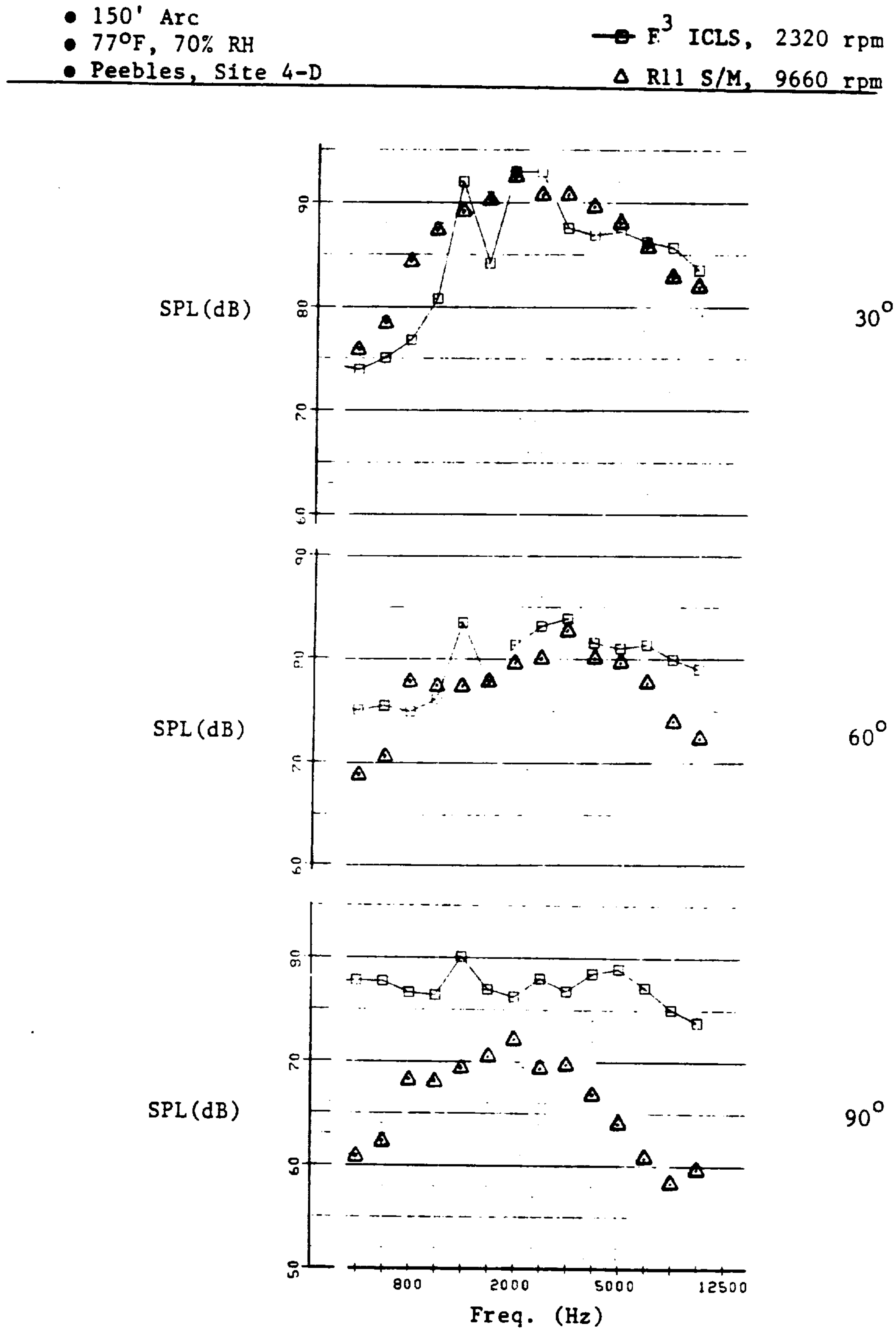

Figure VI.4.6 Comparison of Full Scale E^3 ICLS Test Results with R11 Scaled Model Fan Rig Data (Treated Inlet)

6.5 JET EXHAUST MIXER SCALING TECHNIQUES

Comparison of the scaled mixer nozzle model data presented in Section 4 of this report to the full scale ICLS data verified the jet scaling techniques, and it substantiated the use of scale model tests for exhaust nozzle acoustic design purposes.

The mixer nozzle model data was scaled to the ICLS conditions using the data points which had similar bypass ratios and mean mixed velocities. The one-third octave frequency bands are shifted to lower frequencies based on maintaining equivalence of Strouhal numbers. The relationship relating the scale model and full scale frequencies is:

$$f_{fs} = f_{sm}\left(\frac{d_{sm}}{d_{fs}}\right)$$

Where: f_{fs} = Full scale frequency, Hz
f_{sm} = Scale model frequency, Hz
d_{sm} = Scale model diameter, m
d_{fs} = Full scale diameter, m

No adjustments were made to reflect differences in jet apparent source location and the directivity and spherical divergence corrections associated with such.

Figures VI.5.1 and VI.5.2 show typical directivity comparisons of the overall sound pressure level of the scaled model mixer levels and the full scale ICLS data. These comparisons show good agreement between the scaled model and the full scale data at these high power points (low power points were not compared due to contamination of the OASPL's because of turbomachinery related noise).

Figures VI.5.3 to VI.5.8 show selected spectral comparisons corresponding to the high power OASPL directivities discussed above. The spectral shapes observed are also in good agreement, with the small differences at low

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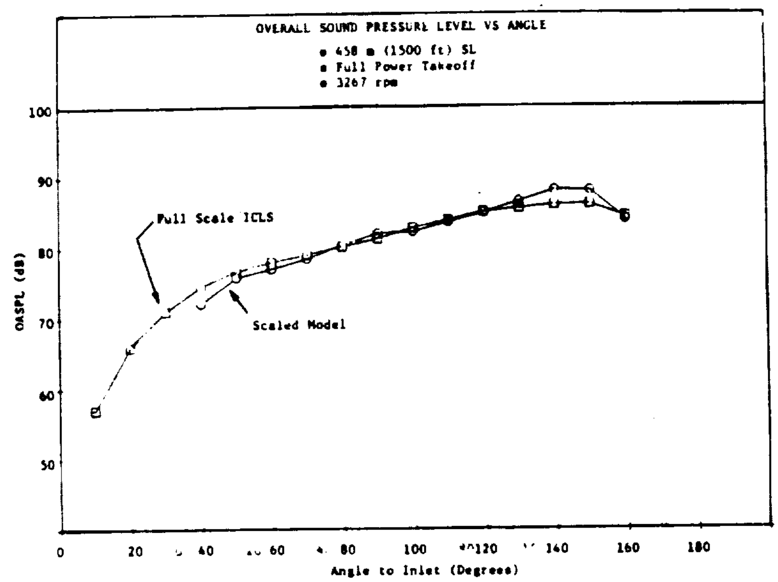

Figure VI.5.1 OASPL Directivity Comparison of Scaled Model Data and Full Scale ICLS Data at Takeoff Power

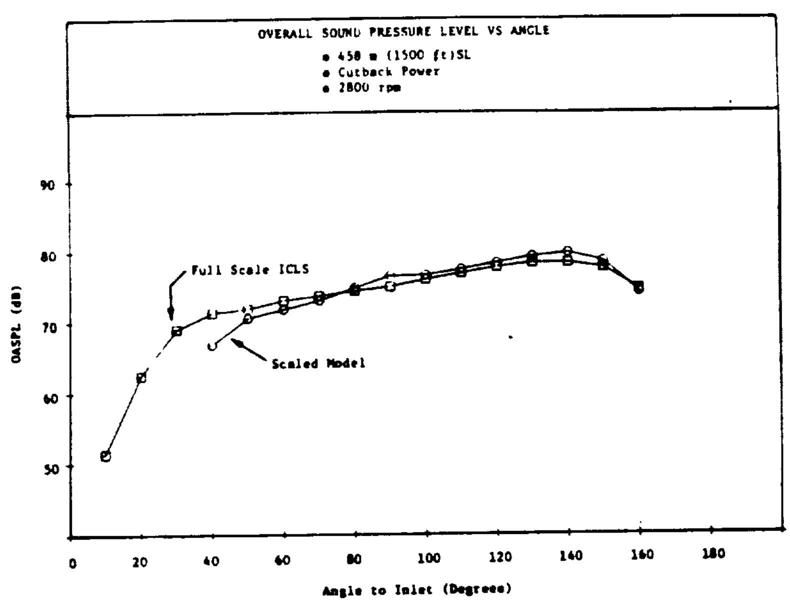

Figure VI.5.2 OASPL Directivity Comparison of Scaled Model Data and Full Scale ICLS Data at Cutback Power

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Figure VI.5.3

60° Spectral Comparison of Scaled Model Data to Full Scale ICLS Data at Takeoff Power Power

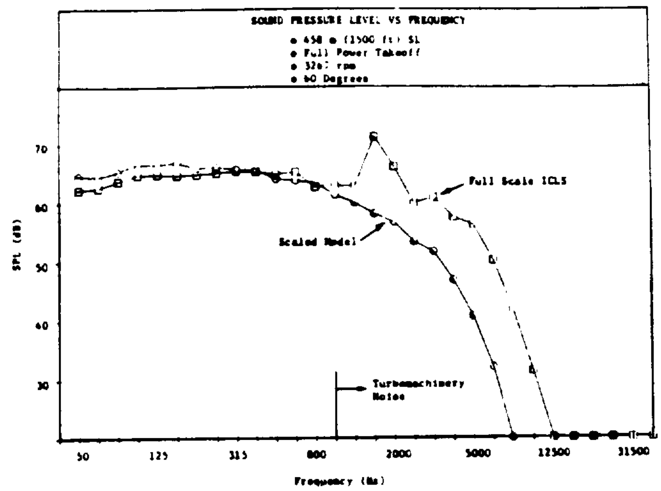


Figure VI.5.4

90° Spectral Comparison of Scaled Model Data to Full Scale ICLS Data at Takeoff Power

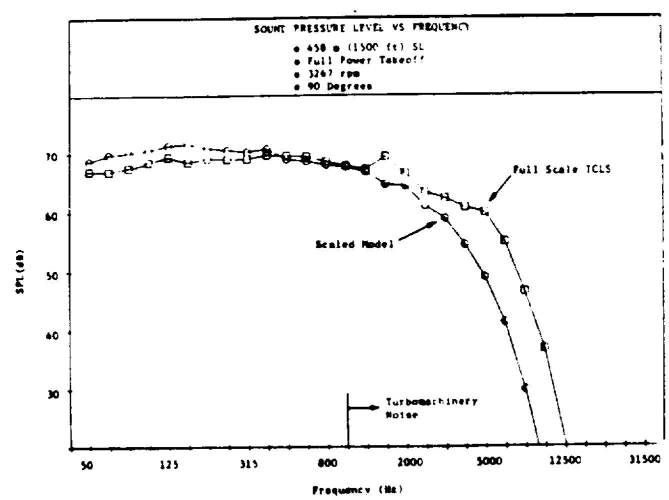


Figure VI.5.5

120° Spectral Comparison of Scaled Model Data to Full Scale ICLS Data at Takeoff Power

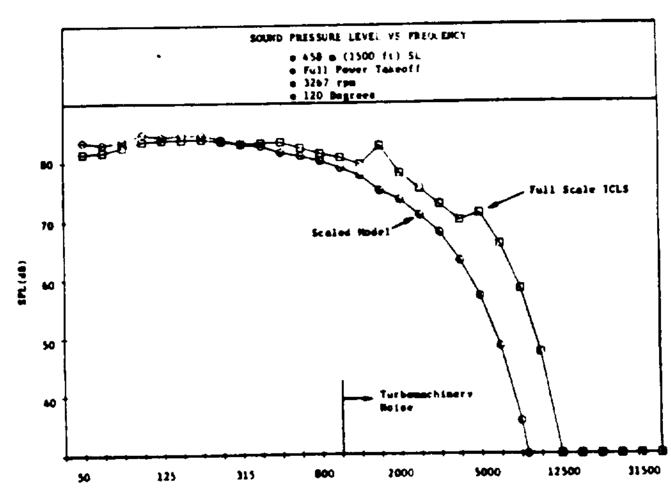


Figure VI.5.6

60° Spectral Comparison of Scaled Model Data to Full Scale ICLS Data at Cutback Power

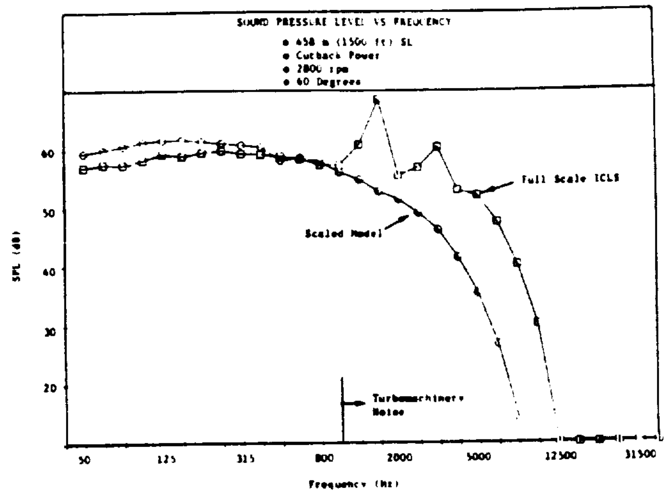


Figure VI.5.7

90° Spectral Comparison of Scaled Model Data to Full Scale ICLS Data at Cutback Power

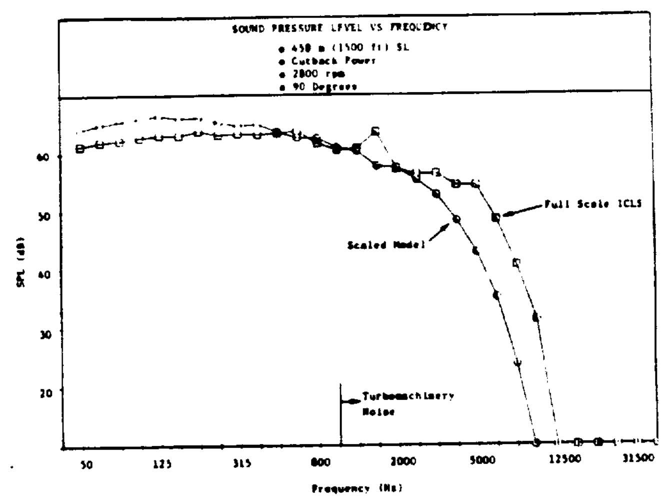
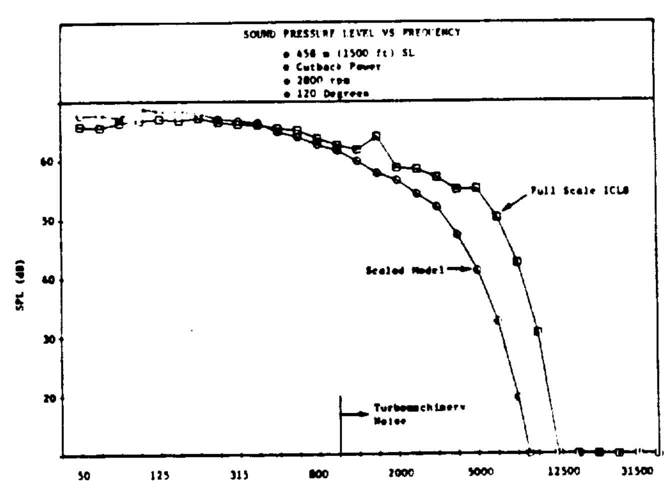


Figure VI.5.8

120° Spectral Comparison of Scaled Model Data to Full Scale ICLS Data at Cutback Power



frequency attributable to mixer cycle differences, measurement arc differences (the ICLS measurement arc was centered on the fan face, the scale model measurement arc was centered at exhaust nozzle exit plane, approximately 4.8 meters different), and apparent source location differences between the two measurement schemes used (apparent source locations are different between the two tests due to differences in the relationship of distributed source effects and microphone locations). Large differences are expected at frequencies above 1,000 Hz since ICLS full size engine included other turbomachinery component noise contributions, while the nozzle scaled model data was for jet noise alone.

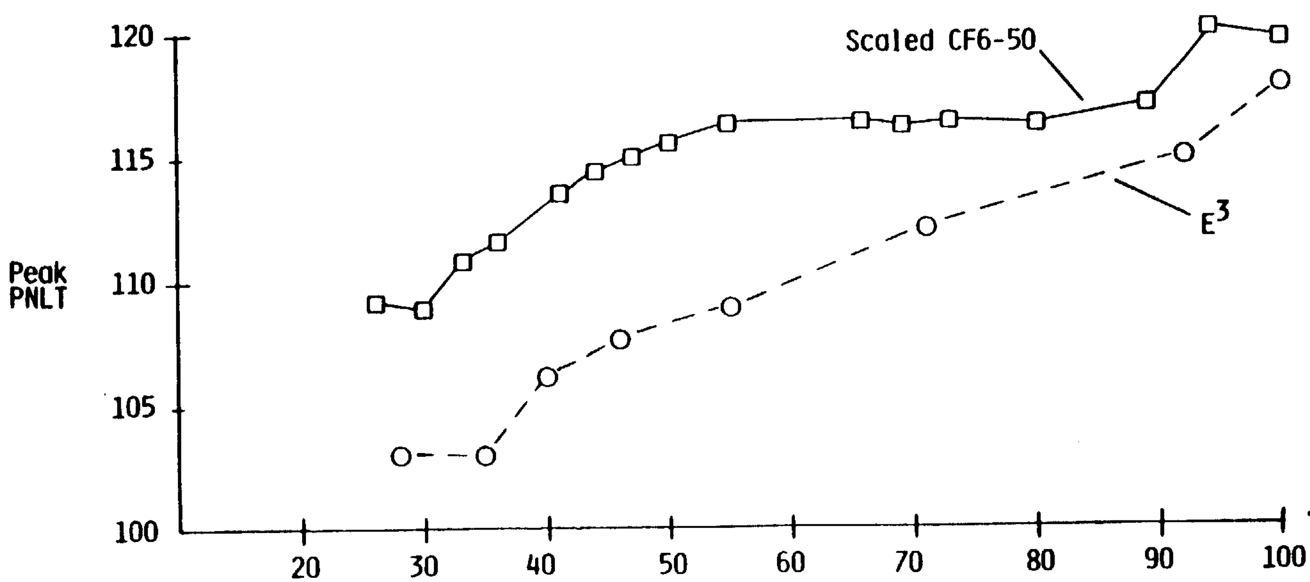
6.6 COMPARISON OF ICLS TO THE CF6-50 AND REFERENCE ENGINE

The overall demonstration of the acoustic technology developed under this program can best be seen by comparison of the ICLS to the CF6-50 reference engine. One of the more dramatic comparisons is the PNLT vs thrust correlation shown in Figure VI.6.1. This figure shows the substantial reduction of noise generated by newer technology E^3 engine when compared to the older technology CF6-50. The reduction of lower powers are due to improvements in fan rotor/IGV spacing, turbine vane/blade ratio selection and treatment selection. Reductions at higher powers are primarily due to the improved exhaust mixer nozzle as opposed to the separate flow nozzle used on the older technology engine.

These differences in design technology are further evidenced by comparison of the margins relative to FAR36 Stage 3 rule (Reference Table VI.6). For example, the margins of the newer technology E^3 powered Douglas Trijet are significantly better than the older technology CF6-50 powered DC-10 Trijet (values quoted are taken from Reference 15).

Figure VI.6.1 Comparison of E^3 ICLS Peak PNLT to Thrust Corrected CF6-50 Levels

- Fully Treated
- 200 Ft. Sideline



$$\text{Scale Adjustment} = \Delta\,\text{dB} = 10 \log \left(\frac{Fn_{CF6\text{-}50_{100\%}}}{Fn_{E^3_{100\%}}} \right)$$

TABLE VI.6

MARGIN RE FAR36 (STAGE 3)

	E^3 Projected Douglas Trijet TOGW = 497,000 lb.	CF6-50C2 DC-10-30 TOGW = 555,000 lb.
Takeoff	4.4 (Full Power)	3.5 (Cutback)
Sideline	6.5	3.3
Approach	3.8	-1.1

Note: "-" denotes exceeding FAR36 limits.

7.0 CONCLUSIONS

It is projected that advanced aircraft powered by engines using the design concepts developed under this contract will meet noise regulation goals with a minimum average growth margin of 3.7 EPNdB (Table VII).

Several notable acoustic technological contributions were made during this contract:

- Demonstration of cut-on fan noise characteristics and acceptability
- Demonstration of jet exhaust mixer nozzle noise characteristics
- Demonstration of Kevlar bulk absorber suppression panels
- Verification of fan model noise scaling procedures
- Verification of mixer nozzle model noise scaling procedures

These characteristics and procedures are elaborated in the Appendix.

TABLE VII

SUMMARY

PROJECTED AIRCRAFT NOISE LEVELS MEET ACOUSTIC PROGRAM GOALS WITH AVERAGE GROWTH MARGIN RELATIVE TO FAR36 (STAGE 3)

Approach	:	3.7 EPNdB
Full Power Takeoff	:	4.5 EPNdB
Sideline	:	7.2 EPNdB

8.0 REFERENCES

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2. Bekofske, K. L., Sheer, R. E., and Wang, J. C. F., "Fan Inlet Disturbances and Their Effect on Static Acoustic Data," ASME Paper No. 77-GT-63, March 1977.

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14. SAE ARP 876B, "Gas Turbine Jet Exhaust Noise Prediction," June 1981.

15. DOT Advisory Circular 36-1C, "Certificated and International Airplane Noise Levels," June 6, 1983.

9.0 APPENDIX

9.1 AVERAGE SOUND PRESSURE LEVELS

Appendix 9.1.1

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C1AE103G/P 1 1820A0

INPUT - C1AE103G/P 1 X02510 C1AE103G/P 1 X02600
C1AE103G/P 1 X02370

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120	130.	140.	150.	160.	PWL
50	65.1	66.1	65.4	66.9	64.6	65.5	66.4	67.8	68.6	69.4	70.9	72.4	74.4	76.1	77.6	79.1	125.7
63	72.6	72.9	71.9	74.4	66.2	67.1	68.5	69.4	69.0	70.3	71.6	73.0	74.6	76.0	77.3	78.0	126.5
80	67.7	66.2	65.0	65.0	65.1	66.1	66.8	67.7	68.4	69.7	71.1	72.5	74.2	75.5	76.6	76.3	125.1
100	67.9	66.7	65.7	66.1	67.3	67.7	67.1	68.4	70.0	71.2	71.7	73.3	74.7	76.6	77.5	75.6	125.9
125	67.8	68.0	67.3	67.1	67.8	68.0	68.1	69.4	70.0	70.9	72.1	74.1	75.6	76.6	77.0	75.2	126.2
160	68.9	68.6	67.9	69.4	69.1	68.9	69.3	70.8	71.0	70.7	72.0	74.1	75.4	76.5	75.6	74.8	126.3
200	68.9	69.0	69.7	70.9	70.7	71.6	71.1	73.8	72.8	71.8	73.0	75.6	76.6	76.0	75.3	73.4	127.3
250	69.1	69.4	69.4	69.5	69.1	68.9	68.5	68.8	69.7	70.5	71.8	73.0	74.7	75.4	73.7	72.0	125.4
315	71.9	71.8	71.5	71.4	70.7	70.0	69.7	70.1	70.7	71.6	73.1	74.4	75.1	75.9	74.2	72.6	126.5
400	70.9	71.4	70.3	71.0	71.6	70.6	70.2	71.1	71.8	73.9	75.3	76.8	76.1	77.2	75.3	73.6	127.8
500	69.6	69.7	69.2	69.9	70.6	69.8	73.1	71.5	73.3	75.0	75.5	76.6	76.7	77.1	74.5	71.5	128.0
630	72.2	71.5	70.9	71.0	70.3	70.0	70.3	70.3	71.7	73.7	74.7	75.8	75.4	75.1	72.9	69.9	127.0
800	78.0	77.5	74.5	74.5	72.4	71.3	69.9	70.5	70.9	72.4	73.5	74.3	75.6	75.1	72.0	69.7	127.5
1000	86.2	87.5	82.7	83.7	80.4	79.5	75.4	74.3	73.5	75.2	75.5	79.3	78.6	79.0	76.9	74.4	133.8
1250	81.4	80.3	77.8	75.0	73.0	70.9	68.7	69.6	68.7	70.3	71.1	71.6	74.0	73.9	70.4	67.7	127.5
1600	91.3	95.5	94.1	85.8	84.6	78.7	78.6	76.6	74.3	75.7	76.3	77.6	81.3	79.1	76.4	73.7	139.6
2000	87.8	89.1	90.0	88.2	81.9	77.8	75.3	74.3	72.0	73.1	75.0	76.7	79.3	78.3	74.6	71.5	136.5
2500	82.4	82.4	81.6	82.3	82.1	77.4	74.6	74.3	73.0	73.6	73.5	75.2	78.3	79.0	74.2	73.3	132.6
3150	83.4	85.2	82.0	81.9	78.1	73.9	71.2	73.2	72.4	73.4	76.2	76.1	79.1	78.2	73.9	70.9	132.6
4000	84.0	87.0	81.7	81.0	77.4	73.5	70.8	73.5	72.4	73.5	75.4	78.0	78.7	78.5	73.9	70.6	133.1
5000	83.6	83.8	81.7	81.3	77.4	73.6	70.2	73.9	72.3	74.4	75.6	79.5	81.3	79.8	75.4	71.3	133.3
6300	84.1	85.4	85.7	82.6	78.0	73.5	69.1	74.3	71.9	73.5	75.1	77.2	80.5	80.0	75.0	71.6	134.4
8000	81.9	82.0	80.1	79.6	76.7	72.9	67.9	75.3	70.8	72.5	72.6	75.5	79.5	80.2	74.5	69.7	132.8
10000	79.3	79.1	77.1	77.0	76.1	73.0	66.5	77.0	71.3	73.0	71.1	75.8	79.6	80.7	75.0	68.8	133.0
OASPL	96.1	98.5	97.1	93.7	90.7	87.2	85.4	86.6	85.4	86.6	87.7	89.7	91.5	91.5	89.1	87.5	145.7
PNL	108.5	110.9	109.4	106.9	103.7	100.0	97.7	98.8	97.6	98.9	100.5	102.6	104.5	104.0	100.4	97.9	
PNLT	110.7	114.5	112.8	109.9	106.3	102.8	99.8	100.4	98.9	100.2	101.6	104.7	106.1	105.5	102.3	99.8	
DBA	96.7	99.2	97.9	94.3	91.1	87.1	84.9	85.6	84.0	85.4	86.5	88.5	90.7	90.2	86.4	83.5	

APNLW= 108.6 IPNLW= 117.3 LAPNLW= 96.4 LIPNLW= 98.7 TPNLW= 116.1

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C1AE103G/P 1 1820A0	06-07-83	PEEBLES 4D	150. FT ARC	1820.	9663	SAE77	28.74	FULL SPHERE

GP MICS/FULLY TREATED/6DB FREEFIELD CORR./#21102

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Appendix 9.1.2

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C1AE103G/P 1 2030A0

INPUT - C1AE103G/P 1 X02500 C1AE103G/P 1 X02380
C1AE103G/P 1 X02520

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	66.8	67.3	66.5	68.1	67.5	68.1	68.8	70.4	70.8	72.2	73.6	75.4	77.4	79.6	81.9	83.8	129.2
63	72.7	72.9	71.8	74.9	69.6	69.8	70.3	71.0	71.6	72.8	74.1	75.3	77.5	79.4	81.6	82.6	129.4
80	69.1	68.1	67.3	67.3	68.0	69.2	69.7	70.5	71.4	72.5	73.9	75.6	77.6	79.3	81.0	80.8	128.6
100	69.6	68.5	67.9	68.5	69.2	69.6	70.2	71.5	72.5	73.1	74.4	76.4	78.3	79.9	81.4	79.4	129.1
125	69.7	69.3	69.3	70.2	69.9	70.4	71.3	71.9	72.8	73.7	75.3	76.9	76.6	79.7	81.2	78.8	129.3
160	70.4	70.1	69.5	70.4	70.0	70.2	70.9	71.3	72.5	73.6	74.7	76.6	77.9	79.5	79.1	78.5	128.7
200	71.8	71.4	71.0	72.2	71.8	72.9	71.6	73.2	73.3	75.1	75.3	76.4	79.1	78.8	78.6	77.5	129.2
250	70.1	70.8	71.1	71.2	71.0	71.2	71.5	71.7	72.7	73.6	74.7	76.0	77.3	77.8	77.1	75.0	128.1
315	73.0	73.0	72.8	73.2	72.5	71.7	72.0	72.2	72.6	74.2	75.2	76.4	77.5	78.2	77.3	75.0	128.7
400	71.7	72.2	72.3	73.0	71.8	72.3	71.9	72.9	73.7	76.2	76.9	78.2	78.7	78.3	78.7	75.2	129.6
500	71.0	70.8	72.0	72.0	71.6	72.0	72.5	73.4	75.0	76.6	77.5	77.9	78.6	78.1	75.8	73.2	129.5
630	73.5	72.2	73.1	73.1	71.8	71.7	71.8	73.1	74.3	76.0	77.2	77.3	77.9	76.8	75.0	72.4	129.1
800	77.6	77.2	76.3	75.2	72.8	72.0	71.5	72.9	72.9	74.4	76.1	75.6	77.0	76.0	73.6	71.5	128.8
1000	87.8	89.0	86.0	84.6	81.4	79.4	77.3	77.0	74.8	76.3	77.4	80.1	80.0	78.6	77.0	75.8	135.2
1250	85.5	84.8	82.7	80.5	77.6	75.6	73.7	73.6	72.6	73.8	75.5	76.1	77.4	76.2	73.7	72.2	131.9
1600	83.2	83.5	81.5	79.0	76.2	74.5	73.1	73.4	74.1	74.3	74.8	75.7	78.1	75.4	73.0	71.0	131.1
2000	90.2	92.0	88.7	87.5	83.4	82.1	78.3	76.0	74.9	75.9	77.0	79.0	82.[illegible]	79.0	76.9	73.4	137.6
2500	84.6	85.0	83.0	82.6	79.8	77.0	73.5	74.0	72.4	74.4	75.4	77.7	79.7	77.8	74.5	71.7	133.1
3150	84.1	84.7	85.5	85.4	85.0	83.2	76.6	76.2	74.2	75.6	76.1	78.1	81.4	78.5	74.8	72.7	135.7
4000	86.1	86.1	84.6	85.0	79.4	75.7	73.1	74.8	75.7	78.5	77.5	79.4	81.1	78.4	74.7	72.5	135.0
5000	85.5	86.2	85.3	85.6	81.5	77.1	73.3	75.1	74.5	76.6	78.2	79.8	81.9	78.8	74.3	71.4	135.6
6300	85.6	85.9	83.6	84.1	80.9	77.4	73.0	74.9	73.3	75.1	77.0	78.7	82.1	80.1	74.9	72.2	135.3
8000	84.1	84.1	83.2	82.4	79.7	75.6	71.4	75.8	71.9	73.4	74.3	77.1	80.7	79.0	72.4	69.6	134.5
10000	82.3	82.4	81.7	80.7	79.5	75.9	70.7	76.1	71.5	73.9	72.6	76.5	80.2	78.2	70.9	67.7	134.4
OASPL	96.6	97.3	95.3	94.8	91.9	89.8	86.9	87.7	87.1	88.7	89.6	91.2	93.3	92.4	91.6	90.7	146.4
PNL	109.5	110.4	108.3	108.0	106.2	104.3	100.0	100.5	99.9	101.9	102.2	103.9	106.1	104.1	101.3	99.2	
PNLT	111.6	113.1	110.5	110.2	108.3	106.6	101.7	101.7	100.3	102.5	102.6	105.4	[illegible]	104.7	102.5	100.6	
DBA	97.0	97.8	95.8	95.2	92.2	89.9	86.2	86.6	85.6	87.3	88.2	89.8	92.1	89.9	86.8	84.5	

APNLW= 109.4 IPNLW= 117.4 LAPNLW= 97.8 LIPNLW= 101.0 TPNLW= 116.1

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C1AE103G/P 1 2030A0	06-07-83	PEEBLES 4D	150 FT ARC	2030.	12157.	SAE77	28.72	FULL SPHERE

GP MICS/FULLY TREATED/6DB FREEFIELD CORR /#21102

Appendix 9.1.3

16214ES/FSDR/RPMAVG

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C1AE103G/P 1 2180A0

INPUT - C1AE103G/P 1 X02530 C1AE103G/P 1 X02490
C1AE103G/P 1 X02390

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90	100.	110.	120.	130.	140.	150.	160.	PWL
50	68.5	68.8	67.8	69.6	69.5	70.4	71.2	72.5	73.3	74.3	75.6	77.6	80.3	82.6	85.0	87.0	132.0
63	73.6	73.5	72.1	75.1	71.0	71.0	72.2	72.8	73.2	75.1	76.1	78.2	80.9	82.4	84.5	85.7	132.0
80	72.0	70.6	69.7	69.9	71.1	71.6	71.8	72.9	74.0	75.1	76.3	78.6	80.9	82.7	84.3	84.2	131.7
100	71.3	69.5	69.5	70.5	71.6	72.5	72.9	73.3	74.3	75.7	77.2	79.3	81.4	83.1	84.2	82.7	131.9
125	71.4	70.9	71.4	72.4	72.1	72.7	73.4	74.5	74.9	76.2	77.8	79.7	81.5	82.9	84.1	82.1	132.1
160	71.9	72.0	72.0	72.4	72.0	72.7	73.2	73.9	74.6	76.1	77.2	79.3	81.0	82.4	82.5	81.3	131.5
200	72.8	72.4	73.7	73.7	74.2	74.6	73.9	75.7	75.7	77.5	77.6	79.6	81.9	81.9	81.9	80.1	131.9
250	71.3	72.4	72.5	73.1	73.1	73.3	73.5	74.1	75.0	75.8	77.0	78.8	80.1	80.9	80.5	78.0	130.7
315	73.7	74.0	73.8	74.2	73.6	73.4	74.0	74.4	75.0	76.6	77.5	79.0	80.3	80.4	80.3	77.6	130.9
400	72.8	74.4	73.3	73.9	74.0	74.1	74.3	74.7	75.8	77.8	78.8	79.7	81.1	80.5	79.8	77.1	131.5
500	72.5	72.4	72.3	73.6	73.2	73.4	74.4	75.3	76.2	78.3	78.8	79.7	80.4	79.5	78.2	75.0	131.1
630	74.7	74.0	73.4	74.8	73.5	73.5	74.0	75.5	75.9	78.6	78.6	79.6	79.8	79.0	77.2	74.4	131.0
800	78.3	77.7	75.8	76.4	74.3	73.6	73.5	74.0	74.6	76.1	77.0	77.7	79.0	77.5	75.9	73.3	130.2
1000	84.8	84.5	81.9	81.2	79.5	77.2	75.2	74.7	75.0	76.8	77.6	79.1	78.9	77.9	76.3	73.7	132.8
1250	91.4	90.9	88.4	88.1	86.4	82.8	79.8	78.0	77.9	78.0	80.6	83.4	82.9	83.1	79.8	77.8	138.3
1600	83.6	83.7	81.9	79.9	77.8	75.9	74.2	74.3	74.8	76.5	76.3	77.3	79.1	76.7	75.0	74.4	132.1
2000	90.1	93.7	91.2	87.6	86.3	80.8	80.1	78.7	77.1	77.6	78.2	80.9	80.3	78.7	76.5	74.2	138.8
2500	90.0	95.9	89.1	86.7	83.2	80.4	77.6	77.1	75.7	77.3	79.3	84.3	83.0	81.9	78.8	76.4	139.3
3150	85.8	87.2	88.4	90.4	88.1	87.9	81.2	80.3	76.8	77.9	78.7	79.9	82.2	78.4	76.8	74.5	139.1
4000	85.3	85.2	84.2	84.0	81.7	78.6	75.7	76.5	77.1	79.7	81.6	82.1	65.5	81.2	77.2	74.7	136.4
5000	86.7	86.8	85.6	85.9	82.4	78.2	75.2	76.0	76.5	78.5	80.4	81.6	81.5	77.8	75.2	72.8	136.3
6300	85.3	85.2	83.8	84.5	82.1	78.3	75.2	76.1	75.2	77.1	80.0	81.6	83.9	80.8	76.2	73.5	136.3
8000	84.4	84.7	84.2	83.8	81.7	77.6	74.4	76.0	73.5	75.1	76.8	78.3	79.7	77.4	73.4	70.5	135.4
10000	83.2	83.1	82.7	82.2	80.7	77.4	73.5	76.8	72.9	74.2	74.5	76.8	77.5	75.5	70.3	68.0	134.9
OASPL	97.9	100.2	97.3	96.7	94.6	92.3	89.5	89.6	89.2	90.8	92.0	93.9	95.1	94.5	94.3	93.6	148.6
PNL	110.9	114.1	110.3	111.0	108.8	107.5	103.3	103.2	101.8	103.7	105.2	107.0	108.5	106.1	103.8	101.7	
PNLT	113.3	117.4	112.5	113.5	111.4	110.3	105.1	104.4	102.8	104.0	106.4	108.8	109.8	108.0	105.2	103.0	
DBA	98.5	101.0	98.0	97.2	95.0	92.6	83.9	89.6	87.8	89.3	90.7	92.7	93.5	91.5	89.0	86.7	

APNLW= 111.7 IPNLW= 119.9 LAPNLW= 101.6 LIPNLW= 104.5 TPNLW= 118.8

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C1AF103G/P 1 2180A0	06-07-83	PEEBLES 4D	150 FT ARC	2180	14163.	SAE77	28.74	FULL SPHERE

GP MICS/FULLY TREATED/COB FREEFIELD CORR./#21102

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Appendix 9.1.4

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C1AE103G/P 1 2320A0

INPUT - C1AF103G/P 1 X02540 C1AE103G/P 1 X02480
C1AE103G/P 1 X02400

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	69.1	69.5	69.5	71.1	71.7	72.3	73.1	74.1	74.9	76.4	77.9	80.1	82.4	84.7	87.7	89.9	134.4
63	73.5	73.5	73.0	76.1	73.3	72.3	73.5	74.1	75.3	77.2	77.9	80.2	82.9	85.0	87.3	88.6	134.3
80	72.4	71.6	71.6	71.6	72.4	72.8	73.5	74.7	75.7	77.1	78.7	80.9	82.8	84.8	86.7	87.0	133.9
100	72.3	71.3	72.0	72.4	72.6	73.4	74.4	75.2	76.3	77.6	79.0	8 5	83.5	85.3	86.8	85.5	134.1
125	72.4	72.7	74.0	74.5	73.7	74.6	75.4	75.9	76.7	78.1	79.7	81.8	83.5	85.0	86.5	84.5	134.2
160	73.0	73.8	74.0	74.1	73.7	74.2	74.9	76.0	76.5	78.0	79.4	81.4	83.3	84.7	84.7	83.8	133.6
200	73.6	74.0	75.7	74.6	75.9	75.5	75.6	77.2	77.7	78.8	79.8	81.9	83.8	84.5	84.5	82.7	134.0
250	72.8	74.2	75.0	74.7	75.0	75.4	75.4	75.8	77.0	78.0	79.0	81.0	82.6	83.2	83.2	80.8	132.9
315	74.9	75.2	76.0	75.6	75.3	75.1	75.7	76.0	77.0	78.2	79.5	80.9	82.3	82.8	82.2	79.3	132.8
400	74.2	75.1	74.5	75.7	75.3	75.5	75.8	76.3	77.6	79.6	80.4	81.5	82.5	82.3	81.8	78.9	133.1
500	74.1	73.6	73.9	75.1	74.8	75.1	76.4	76.6	77.8	79.5	80.2	81.3	82.3	81.7	80.7	77.4	132.8
630	75.9	75.1	75.0	76.0	75.1	75.5	76.8	77.0	77.8	80.0	80.6	81.3	81.9	80.7	79.7	76.6	132.9
800	78.8	78.7	76.8	77.0	75.3	75.0	75.0	75.7	76.6	78.4	78.7	79.8	80.8	79.8	78.3	75.6	132.0
1000	83.1	83.4	80.8	79.6	77.7	76.2	75.2	75.6	76.4	78.1	78.4	79.3	79.8	79.1	77.9	74.5	132.7
1250	90.9	94.8	92.0	90.1	87.2	83.5	81.9	81.2	80.1	80.8	81.4	83.2	85.3	81.8	80.4	79.0	140.3
1600	85.1	85.5	84.2	82.1	80.2	77.5	76.2	76.4	76.9	78.6	79.2	80.2	80.2	79.1	77.3	77.4	134.2
2000	90.1	97.0	92.9	88.6	83.0	81.4	78.2	76.8	76.2	78.0	78.6	80.4	81.1	78.7	76.9	74.7	140.2
2500	96.2	97.1	93.0	91.0	86.6	83.1	80.8	78.4	78.0	79.4	80.2	85.7	84.7	81.8	79.0	76.2	141.8
3150	86.6	87.9	87.5	89.5	86.9	83.9	79.7	77.7	76.8	77.3	78.4	80.5	83.4	78.9	76.2	74.0	138.1
4000	87.5	88.1	86.8	87.2	85.2	81.5	78.4	78.2	78.5	80.7	81.4	82.7	81.3	79.9	77.2	75.2	138.0
5000	89.4	89.7	87.2	87.2	84.5	81.0	77.9	77.8	78.9	81.2	82.9	84.1	83.9	80.2	77.9	75.7	138.6
6300	87.4	87.7	86.2	87.2	84.8	81.3	78.3	77.2	77.2	79.1	81.8	84.4	86.1	81.3	77.8	74.9	138.7
8000	86.3	86.8	85.7	85.6	83.4	80.0	76.7	76.9	75.1	76.9	78.7	80.4	82.3	79.9	75.5	72.8	137.3
10000	84.8	84.7	83.5	83.4	81.9	79.1	75.6	77.0	73.9	76.1	76.6	78.5	80.1	77.6	72.5	70.0	136.4
OASPL	100.2	102.5	99.5	98.3	95.4	92.7	90.9	90.7	90.9	92.5	93.6	95.3	96.9	96.2	96.5	96.1	150.3
PNL	114.6	115.8	112.9	111.8	109.1	106.5	103.8	103.1	103.3	105.1	106.3	107.9	109.1	106.9	105.1	103.0	
PNLT	118.0	119.4	116.1	114.9	111.9	108.7	105.9	104.9	104.4	105.7	107.1	109.0	111.2	107.9	106.0	104.0	
DBA	101.0	103.4	100.2	98.8	95.7	92.6	90.1	89.4	89.3	90.9	91.9	93.7	95.0	92.2	90.2	88.1	

APNLW= 112.3 IPNLW= 121.4 LAPNLW= 102.8 LIPNLW= 106.7 TPNLW= 120.2

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C1AE103G/P 1 2320A0	06-07-83	PEEBLES 4D	150. FT ARC	2320	16223.	SAE77	28.74	FULL SPHERE

GP MICS/FULLY TREATED/6DB FREEFIELD CORR./#21102

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Appendix 9.1.5

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C1AE103G/P 1 2500A0

INPUT - C1AE103G/P 1 X02550 C1AE103G/P 1 X02470
C1AE103G/P 1 X02410

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	70.8	71.5	71.6	73.4	73.7	74.4	75.0	76.1	77.6	78.8	80.8	82.8	85.3	87.7	90.9	93.1	137.4
63	74.7	74.9	74.0	76.0	75.5	75.7	76.2	76.9	77.7	80.0	80.9	82.6	85.4	87.6	90.1	91.9	137.1
80	74.6	73.6	73.5	73.8	74.2	75.1	76.2	77.1	77.9	79.8	81.7	83.2	85.7	87.8	89.7	90.2	136.8
100	74.5	73.3	74.6	75.1	75.1	75.7	76.7	77.6	78.4	80.3	81.7	83.9	85.3	88.1	90.0	88.6	136.8
125	74.8	75.8	76.2	76.5	75.7	76.6	77.6	78.4	79.3	80.8	82.5	84.3	86.3	87.8	89.7	88.0	137.0
160	75.3	76.1	75.6	76.4	75.8	76.5	77.4	78.1	79.2	80.6	82.1	84.1	85.9	87.9	88.2	87.2	136.5
200	75.8	77.2	76.9	77.4	77.3	77.2	78.1	80.0	80.2	81.2	82.6	84.7	86.4	87.3	87.7	85.7	136.7
250	74.9	76.8	76.7	77.0	77.2	77.6	77.7	78.3	79.2	81.0	82.2	83.9	85.5	86.2	86.5	83.7	135.8
315	76.4	77.0	77.2	77.5	77.8	77.5	78.5	78.7	79.6	81.2	82.2	84.5	85.2	85.7	85.2	82.4	135.6
400	75.8	77.4	76.7	77.7	77.6	77.6	78.2	79.1	80.4	82.0	83.1	84.1	85.0	85.0	84.6	81.7	135.7
500	75.3	75.9	76.1	77.1	76.8	77.3	78.4	78.9	80.3	82.1	82.7	84.0	84.8	84.4	83.6	80.4	135.4
630	77.5	77.2	77.5	78.0	77.4	77.5	78.4	79.4	81.1	83.7	83.0	83.7	84.5	83.4	82.6	79.4	135.5
800	80.0	80.1	78.3	79.4	77.6	77.1	77.4	78.2	79.0	81.1	82.1	82.5	83.3	82.5	81.2	78.3	134.5
1000	82.8	82.9	81.3	80.5	78.9	77.6	77.3	77.5	78.7	80.1	81.3	82.1	82.2	81.7	80.2	77.1	134.4
1250	93.0	92.1	95.5	91.4	90.7	87.9	84.9	83.3	83.0	83.3	83.2	85.0	85.9	84.9	82.7	80.4	142.2
1600	87.7	88.0	88.8	86.6	85.1	82.6	80.6	79.1	79.8	81.3	80.9	82.3	82.7	81.7	80.2	77.6	137.6
2000	87.1	88.2	84.5	84.4	81.9	79.5	77.9	77.3	78.0	79.7	80.5	82.0	81.6	80.2	78.0	75.4	135.9
2500	99.1	97.8	96.0	92.4	89.3	88.7	85.2	82.9	82.9	82.0	82.7	84.9	86.8	83.3	81.7	79.9	144.0
3150	90.2	90.4	90.2	89.0	86.5	83.6	80.8	79.3	79.3	79.8	81.4	83.4	85.1	81.0	78.9	76.3	139.4
4000	89.1	90.3	92.0	89.8	88.9	86.7	83.2	81.1	81.7	82.8	84.2	85.7	87.6	82.1	79.7	77.4	141.3
5000	90.0	91.3	88.5	89.1	87.2	84.6	82.2	80.9	82.4	84.3	86.4	88.3	86.0	82.1	80.1	78.2	141.1
6300	89.1	89.1	88.3	88.6	86.8	83.9	81.6	79.0	79.7	81.5	84.3	86.1	86.3	82.3	79.1	76.6	140.4
8000	87.7	87.9	87.7	87.6	85.7	82.8	80.5	77.9	76.9	78.5	91.5	83.2	85.3	82.5	78.0	75.6	139.6
10000	86.2	86.4	85.9	85.8	85.0	81.9	79.4	77.1	75.8	76.3	78.5	80.6	81.6	78.9	74.2	71.5	138.5
OASPL	102.2	101.8	101.5	99.5	97.8	95.9	93.9	93.0	93.7	95.1	96.3	97.9	99.1	98.9	99.6	99.2	152.3
PNL	116.8	116.3	115.2	113.2	111.2	109.7	107.4	105.9	106.3	107.6	109.2	110.9	111.7	109.0	107.8	105.8	
PNLT	120.3	119.1	116.7	115.8	114.1	112.3	109.3	107.6	107.8	108.5	109.7	111.9	112.9	110.0	108.9	107.2	
DBA	103.0	102.5	102.2	99.9	98.1	96.0	93.3	91.8	92.3	93.4	94.6	96.2	96.9	94.5	92.8	90.4	

APNLW= 114.7 IPNLW= 123.6 LAPNLW= 105.1 LIPNLW= 109.4 TPNLW= 122.4

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C1AE103G/P 1 2500A0	06-07-83	PEEBLES 4D	150 FT ARC	2500	19263.	SAE77	28.74	FULL SPHERE

GP MICS/FULLY TREATED/6DB FREEFIELD CORR /#21102

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C1AE103G/P 1 2800A0

INPUT - C1AE103G/P 1 X02560 C1AE103G/P 1 X02420
C1AE103G/P 1 X02460

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	74.3	74.9	74.9	76.6	77.6	78.4	79.2	80.3	81.5	82.9	84.8	87.2	89.4	92.9	96.5	100.0	143.0
63	77.4	77.3	76.6	78.1	78.5	78.9	79.9	81.1	82.1	83.4	84.9	87.0	89.6	92.6	95.8	98.0	142.2
80	78.5	77.6	77.1	77.7	77.8	78.9	80.2	81.4	82.5	83.7	85.6	87.8	90.2	93.0	95.4	96.1	141.8
100	79.5	78.3	79.0	79.1	79.2	79.7	81.3	82.0	83.0	84.3	86.2	88.4	90.6	93.5	93.5	94.5	142.0
125	79.7	79.6	79.4	80.1	79.9	80.9	81.4	82.5	83.5	85.1	86.8	88.7	90.9	93.2	95.5	93.5	141.9
160	78.6	80.1	79.6	80.6	79.9	80.5	81.4	82.4	83.5	84.8	86.5	88.6	90.9	93.0	94.1	92.6	141.5
200	79.5	80.7	81.3	81.8	80.5	81.3	82.2	83.5	84.3	85.5	87.0	89.0	91.2	92.8	93.3	91.7	141.5
250	78.0	80.2	80.7	81.1	81.1	81.7	82.2	82.7	83.8	85.1	86.7	88.5	90.6	91.7	92.2	89.6	140.7
315	78.6	80.0	80.1	81.0	81.3	81.4	82.4	83.0	84.1	85.2	86.6	88.2	90.1	91.3	91.0	88.3	140.4
400	77.8	79.9	79.8	81.1	81.2	81.5	82.2	83.1	84.2	85.7	87.3	88.5	90.1	90.5	90.0	86.7	140.2
500	78.2	79.3	79.5	80.9	80.7	81.5	82.6	83.2	84.7	86.1	86.9	88.1	89.0	39.7	88.6	85.7	139.8
630	79.1	79.5	80.1	81.1	81.0	81.4	82.3	83.6	85.4	86.2	87.1	88.1	89.0	88.9	87.7	84.4	139.7
800	80.9	81.5	80.1	81.3	80.7	80.9	81.8	82.6	83.7	85.3	86.1	87.3	88.2	87.5	86.0	82.9	138.8
1000	83.7	83.4	81.9	82.2	81.6	81.4	81.3	82.4	83.1	84.6	85.6	86.7	87.0	86.6	85.0	81.8	138.4
1250	88.8	90.3	90.5	88.7	86.8	85.6	84.4	34.1	83.9	84.9	85.8	86.6	87.0	86.6	85.4	81.4	140.7
1600	96.3	100.4	101.2	98.2	94.9	94.4	92.7	91.4	87.6	88.4	88.9	89.9	89.4	09.7	87.3	85.1	148.3
2000	86.6	87.3	85.8	85.2	84.3	82.6	81.9	81.6	82.4	83.8	84.4	85.8	85.2	84.4	85.7	79.4	138.7
2500	90.4	91.6	89.9	89.6	87.7	85.5	83.4	82.8	82.7	84.5	84.7	87.1	87.3	84.2	84.2	79.7	141.0
3150	97.4	94.7	95.2	96.2	94.5	91.1	89.2	85.9	84.6	87.1	86.1	87.8	87.8	85.5	84.3	81.0	145.5
4000	90.3	91.2	90.8	90.9	89.2	86.5	85.2	83.6	85.0	86.1	87.5	88.5	91.7	85.4	82.6	81.0	143.0
5000	90.5	91.4	90.6	91.0	89.6	87.1	86.0	84.5	86.3	87.5	89.7	90.1	90.2	85.6	83.0	80.8	143.6
6300	90.7	91.3	89.8	91.0	89.3	86.6	85.3	83.2	83.8	85.3	87.8	89.3	89.1	85.1	82.1	79.5	143.1
8000	88.7	89.3	88.9	89.7	88.1	85.0	84.0	81.5	80.9	82.5	85.5	87.4	88.4	84.8	80.6	78.5	142.1
10000	86.8	86.9	86.3	86.9	86.0	83.5	82.3	79.0	78.8	80.2	82.1	84.0	84.4	81.7	78.0	75.4	140.3
OASPL	102.5	103.8	103.9	102.9	100.9	99.3	98.2	97.6	97.7	99.0	100.3	101.8	103.2	103.9	105.1	105.2	156.1
PNL	117.1	116.6	116.7	116.8	115.3	113.0	111.4	110.3	110.1	111.6	113.0	114.2	115.6	113.0	112.2	109.7	
PNLT	120.0	120.5	122.3	121.5	118.4	116.4	114.5	113.1	111.6	113.0	114.3	115.4	116.7	114.4	112.6	111.3	
DBA	103.2	104.4	104.6	103.5	101.3	99.5	97.9	96.7	96.1	97.5	98.5	99.8	100.5	98.7	97.5	94.6	

APNLW= 118.1 IPNLW= 126.2 LAPNLW= 108.7 LIPNLW= 107.8 TPNLW= 125.0

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C1AE103G/P 1 2800A0	06-07-83	PEEBLES 4D	150. FT ARC	2800.	25193.	SAE77	28.72	FULL SPHERE

GP MICS/FULLY TREATED/GDB FREEFIELD CORR /#21102

ORIGINAL PAGE IS OF POOR QUALITY

Appendix 9.1.7

16214ES/FSDR/RPMAVG

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C1AE103G/P 1 3100A0

INPUT - C1AE103G/P 1 X02430 C1AE103G/P 1 X02450
C1AE103G/P 1 X02590

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	78.0	78.7	78.6	80.5	81.0	81.8	82.9	83.9	85.1	86.3	88.3	90.9	93.6	97.1	101.9	105.9	148.1
63	81.8	80.8	80.9	81.9	81.6	82.2	83.4	84.5	85.2	87.4	89.0	91.3	94.3	97.4	100.6	103.9	147.2
80	83.1	81.8	81.2	81.9	82.0	82.6	83.6	85.0	86.2	87.4	89.6	91.9	94.9	97.6	100.7	101.8	146.7
100	83.8	82.6	82.5	83.2	83.3	83.9	84.7	85.7	86.7	88.3	90.3	92.6	95.4	98.2	101.0	99.7	146.7
125	82.8	83.4	82.8	83.8	83.7	84.5	85.2	86.2	87.3	88.9	90.8	92.8	95.5	97.9	100.7	98.7	146.6
160	82.4	84.0	83.4	84.3	83.7	84.2	85.2	86.0	87.1	88.8	90.8	93.1	95.6	98.1	99.4	97.8	146.3
200	81.8	84.2	84.7	84.9	85.1	84.9	85.8	87.2	88.2	89.3	91.2	93.2	95.8	97.5	98.6	96.7	146.0
250	81.9	83.7	84.4	84.7	84.5	85.2	85.9	86.5	87.9	89.3	91.0	92.9	95.7	97.0	97.3	94.8	145.4
315	82.1	83.1	84.3	85.1	85.2	85.2	86.1	86.8	87.9	89.4	91.0	92.9	95.1	96.0	96.2	93.1	145.0
400	81.3	83.1	83.5	84.8	85.1	85.4	86.3	86.9	88.1	89.8	91.3	93.2	94.6	95.7	94.9	91.9	144.7
500	81.4	82.4	82.9	84.5	84.9	85.4	86.4	87.2	88.6	90.2	91.2	93.0	94.2	94.6	93.7	90.4	144.3
630	82.0	83.4	83.1	84.5	84.7	85.6	86.4	87.6	88.9	90.2	91.1	92.9	93.8	93.6	92.5	89.6	144.0
800	83.6	83.6	82.1	84.1	83.9	84.6	85.7	86.8	88.1	89.7	90.6	92.1	92.8	92.5	90.9	87.9	143.2
1000	85.7	85.9	84.5	84.4	84.7	84.8	85.4	86.2	87.3	89.3	90.3	91.7	91.6	91.6	89.9	88.7	142.8
1250	89.6	90.5	89.0	86.9	86.2	85.7	86.2	86.3	87.5	88.8	89.5	91.6	91.7	90.8	89.1	85.9	143.1
1600	98.3	101.4	100.5	99.9	97.0	96.0	94.2	92.4	91.6	92.1	92.7	95.7	95.2	94.8	92.9	89.7	150.2
2000	90.6	91.8	90.8	91.0	88.5	87.9	87.3	86.7	87.1	88.7	89.5	91.3	90.7	89.8	88.2	84.9	143.7
2500	89.3	89.1	88.5	89.2	87.3	86.6	86.4	86.1	86.8	88.7	89.7	90.6	89.4	88.5	86.1	83.7	142.8
3150	96.3	95.9	97.3	97.7	94.2	91.6	90.9	89.7	89.5	90.4	91.7	92.5	90.9	89.6	87.0	85.5	147.5
4000	91.1	91.2	91.0	91.5	89.5	88.0	87.5	87.0	87.7	88.8	89.8	91.2	89.5	87.9	85.1	83.4	144.2
5000	93.7	93.8	92.7	94.3	92.1	90.4	89.3	88.8	89.6	90.9	91.8	93.0	91.0	88.3	85.9	84.0	146.4
6300	91.6	91.3	90.7	92.2	90.4	88.9	87.7	86.6	87.8	89.9	92.2	93.0	92.3	89.5	85.7	83.5	145.9
8000	89.2	89.2	89.7	90.3	88.3	86.2	85.5	84.2	84.7	86.5	89.7	90.8	89.9	87.9	83.6	81.3	144.1
10000	87.4	86.8	87.0	87.7	86.2	84.5	83.7	81.7	82.4	84.3	85.8	87.6	87.6	86.7	80.8	78.1	142.4
OASPL	103.6	104.8	104.5	104.6	102.4	101.5	101.0	100.8	101.6	103.0	104.4	106.2	107.3	108.6	110.2	110.8	159.5
PNL	117.4	117.8	118.1	118.5	116.2	114.6	114.2	113.7	114.1	115.4	116.7	118.1	117.8	117.4	116.3	114.4	
PNLT	120.2	121.3	121.6	122.2	119.4	117.7	116.7	115.7	115.6	116.5	117.8	119.5	119.1	118.9	117.7	115.8	
DBA	104.0	105.4	105.0	105.1	102.5	101.2	100.4	99.6	100.1	101.4	102.5	104.1	103.8	103.3	101.9	99.4	

APNLW= 121.2 IPNLW= 127.7 LAPNLW= 113.5 LIPNLW= 108.7 TPNLW= 126.6

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C1AE103G/P 1 3100A0	06-07-83	PEEBLES 4D	150. FT ARC	3100.	32327.	SAE77	28.72	FULL SPHERE

GP MICS/FULLY TREATED/6DB FREEFIELD CORR./#21102

Appendix 9.1.8

16214ES/FSDR/RPMAVG

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT ARC

IDENTIFICATION

AVERAGE - C1AF103G/P 1 3267A0

INPUT - C1AF103G/P 1 X02440 C1AE103G/P 1 X02570

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	80.6	81.2	81.0	82.2	83.1	83.6	84.4	85.8	87.1	89.0	91.3	92.9	95.5	98.9	105.0	110.1	151.5
63	84.1	84.3	83.2	84.0	83.7	84.0	84.7	86.4	87.0	89.1	91.3	93.1	96.3	99.7	104.0	107.7	150.2
80	85.4	83.6	83.0	83.5	83.9	85.2	86.0	86.5	87.7	89.7	91.9	94.1	96.5	99.9	103.0	104.8	149.1
100	86.3	85.4	85.4	85.9	85.7	86.3	86.9	88.2	88.8	90.6	92.6	95.1	97.7	100.9	103.8	102.9	149.4
125	84.3	85.6	85.3	85.8	85.5	86.4	87.6	88.4	89.7	90.8	92.7	95.4	97.5	100.9	103.5	101.8	149.2
160	84.4	86.0	86.1	86.8	85.9	86.4	87.2	88.5	88.9	91.0	93.0	95.5	97.9	100.3	101.9	100.4	148.6
200	83.7	86.3	87.2	86.9	86.8	86.6	87.9	89.4	89.6	91.6	93.6	95.7	97.7	100.4	101.2	99.5	148.5
250	83.9	86.1	87.0	87.4	87.5	87.0	87.8	88.8	89.6	91.5	93.3	95.5	98.1	99.3	100.1	97.8	147.9
315	84.2	85.9	86.5	87.6	87.7	87.6	88.6	80.9	89.8	92.0	93.5	95.2	97.5	99.2	98.5	96.1	147.5
400	83.4	85.0	85.5	87.6	88.1	87.7	88.6	88.6	90.7	92.4	93.7	95.6	97.4	98.1	97.5	94.9	147.2
500	83.1	84.3	85.7	87.3	87.7	87.5	89.0	89.3	90.8	92.1	93.8	96.0	97.0	97.4	96.5	93.6	147.0
630	82.6	84.1	85.0	86.9	87.8	88.3	88.3	89.8	91.0	91.9	93.6	95.4	96.6	96.5	95.6	91.8	146.6
800	84.8	84.9	84.0	85.7	87.0	86.2	87.9	89.1	90.6	91.8	92.9	95.0	95.1	95.7	93.9	90.7	145.8
1000	85.7	87.6	87.9	86.0	86.4	87.1	87.8	88.4	90.4	91.6	92.8	94.8	94.8	93.9	92.7	88.2	145.4
1250	88.8	90.3	90.5	88.5	87.9	87.7	87.4	88.5	90.4	91.1	92.4	[illegible]	94.2	93.3	91.7	88.3	145.3
1600	97.0	97.7	98.5	97.6	97.5	97.2	94.8	94.2	93.4	96.9	96.6	98.5	95.1	93.6	95.3	91.1	150.7
2000	94.4	94.7	94.6	94.9	94.2	93.2	91.3	91.4	91.6	92.6	93.9	95.1	93.2	92.3	92.5	89.4	147.7
2500	89.2	88.9	88.9	89.9	89.6	88.6	88.4	88.5	89.7	91.1	91.7	94.0	91.7	90.9	88.8	87.0	145.0
3150	98.4	96.6	93.8	95.0	93.6	91.6	91.6	90.9	90.5	91.1	92.0	93.4	91.7	90.3	88.8	86.4	147.3
4000	94.0	93.6	92.2	93.4	93.5	91.0	90.8	90.7	91.3	91.6	92.5	93.5	91.4	89.8	88.6	85.9	146.9
5000	92.6	93.3	93.5	93.8	93.4	91.3	90.7	90.1	91.8	93.1	94.1	96.2	92.7	90.1	88.5	86.3	147.9
6300	90.7	90.5	91.0	92.3	90.5	89.2	88.7	88.0	90.2	92.0	91.0	95.0	93.5	91.2	88.8	86.2	147.1
8000	88.4	88.8	89.3	90.3	88.9	86.8	85.7	84.9	86.7	88.8	92.3	93.1	91.6	89.6	86.3	84.6	145.6
10000	86.5	85.7	86.3	86.9	86.7	84.9	84.1	82.7	84.3	86.3	88.3	90.8	89.5	88.1	85.4	83.5	143.9
OASPL	104.3	104.3	104.1	104.4	104.0	103.2	102.7	103.0	103.8	105.5	106.9	108.8	109.4	111.0	113.0	114.3	161.8
PNL	118.9	118.2	117.1	117.9	117.1	116.0	115.7	115.5	116.3	117.6	118.9	120.7	119.5	119.1	119.0	117.0	
PNLT	121.1	120.0	119.0	119.9	119.3	118.2	117.5	116.9	116.9	119.3	120.0	122.0	119.8	119.3	120.1	117.5	
DBA	104.7	104.5	104.2	104.4	103.9	102.9	101.9	101.8	102.5	104.1	105.1	106.8	105.7	105.3	104.7	101.8	

APNLW= 123.0 IPNLW= 127.6 LAPNLW= 116.1 LIPNLW= 110.7 TPNLW= 126.7

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C1AE103G/P 1 3267A0	06-07-83	PEEBLES 4D	150. FT ARC	3267.	35330.	SAE77	28.72	FULL SPHERE

GP MICS/FULLY TREATED/60B FREEFIELD CORR /#21102

ORIGINAL PAGE IS OF POOR QUALITY

Appendix 9.1.9

16214ES/FSDR/RPMAVG　　　　11/14/83　　9.019　　PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE　150.0 FT. ARC

IDENTIFICATION

AVERAGE - C2AE106G/P 1　1820A0

INPUT - C2AE106G/P 1　X02810　　C2AE106G/P 1　X02900
C2AE106G/P 1　X02660

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	64.9	64.7	64.0	66.2	63.9	64.3	65.4	67.1	67.9	68.6	69.8	71.8	73.3	75.0	77.1	79.3	125.0
63	70.7	69.0	68.7	74.2	64.8	66.0	67.1	68.2	68.2	69.4	70.8	72.8	73.5	74.9	76.0	77.8	125.6
80	67.3	65.5	64.3	63.7	64.8	65.5	65.9	67.0	67.6	69.0	70.4	72.2	73.4	74.7	76.3	76.1	124.5
100	67.6	66.0	65.1	65.7	67.0	67.2	66.7	68.1	69.4	70.7	71.3	73.4	74.4	76.1	77.0	74.5	125.5
125	67.5	67.2	66.5	67.0	67.5	67.4	67.6	68.7	69.7	70.3	72.0	74.3	75.1	75.9	76.7	74.2	125.8
160	68.3	67.6	67.4	68.7	68.7	68.1	68.5	69.3	69.7	70.1	71.3	74.4	75.1	75.7	74.6	74.1	125.6
200	67.8	68.0	69.2	70.6	70.1	70.6	70.5	71.6	71.3	71.5	72.0	76.1	76.7	75.5	74.4	72.9	126.8
250	68.6	69.0	69.0	69.4	69.3	68.6	68.3	68.6	69.6	70.5	71.7	73.4	74.0	74.3	72.7	71.0	125.0
315	70.7	70.5	70.4	71.1	70.6	69.4	69.6	69.4	70.0	71.5	72.7	74.1	74.3	74.8	73.6	71.6	125.9
400	70.8	71.1	70.5	71.0	71.1	69.9	70.3	70.5	71.4	73.8	75.2	76.5	75.8	76.1	75.1	72.8	127.4
500	70.2	70.2	69.9	70.5	70.6	70.2	73.1	71.3	73.9	74.9	75.2	76.7	75.9	76.0	74.0	70.6	127.8
630	72.7	72.5	71.8	71.5	71.1	70.0	70.5	70.0	71.8	73.8	74.7	75.6	74.5	74.1	71.9	69.5	126.8
800	78.7	78.1	76.0	76.2	74.4	72.5	71.1	69.8	70.6	72.7	73.4	74.1	74.6	73.5	71.2	69.2	127.8
1000	88.0	88.0	85.4	85.4	84.1	81.0	78.2	76.2	74.6	74.6	75.9	79.4	78.1	78.8	75.8	73.7	135.2
1250	81.8	80.1	78.2	76.6	75.1	73.1	71.1	69.1	68.8	69.9	71.2	71.2	72.9	71.7	69.3	67.2	127.9
1600	89.1	93.8	92.7	90.4	86.8	81.4	79.6	75.2	75.7	75.4	76.1	78.5	81.3	80.5	74.7	73.8	139.4
2000	87.2	88.9	89.8	91.0	85.8	81.4	77.7	74.3	73.1	73.2	75.3	77.1	79.6	77.7	73.4	71.9	137.7
2500	82.3	83.4	82.8	86.3	85.1	80.2	78.1	74.3	72.5	72.8	73.8	75.5	77.5	77.3	73.7	72.9	134.5
3150	82.9	85.8	83.2	83.4	82.3	78.0	74.9	72.2	72.2	72.9	76.2	75.8	78.2	76.2	72.4	70.6	133.5
4000	83.9	87.6	82.8	82.6	80.8	77.4	74.1	71.9	72.2	72.7	75.5	77.4	77.5	75.8	71.7	70.6	133.8
5000	83.4	83.8	82.3	82.5	80.5	76.9	74.2	71.3	71.2	73.0	74.9	77.9	80.0	77.7	73.1	70.2	133.4
6300	83.9	84.5	87.6	82.5	80.8	77.2	74.7	71.1	70.0	71.5	74.4	76.0	78.8	77.2	72.4	70.9	134.7
8000	81.4	82.3	80.0	79.9	78.1	75.3	73.3	70.1	67.2	69.1	71.9	73.7	77.6	77.1	71.1	67.4	132.1
10000	79.1	79.0	77.2	77.1	75.6	73.3	70.7	69.8	65.3	67.0	69.0	72.5	77.9	77.0	70.2	64.5	131.0
OASPL	95.5	97.8	96.8	96.3	93.5	89.6	87.4	85.2	85.1	85.9	87.4	89.4	90.7	90.2	88.0	87.0	146.0
PNL	107.5	110.1	109.0	109.0	106.3	102.4	100.4	97.7	97.2	98.1	100.3	101.9	103.5	102.2	98.8	97.3	
PNLT	110.1	113.3	111.9	112.6	109.4	105.1	102.8	99.9	98.8	99.4	101.5	104.1	105.2	104.3	100.6	99.1	
DBA	96.1	98.5	97.6	97.1	94.1	89.9	87.4	84.4	84.0	84.7	86.4	88.2	89.9	88.8	84.8	83.0	

APNLW= 107.3　IPNLW= 118.0　LAPNLW= 96.0　LIPNLW= 100.5　TPNLW= 116.5

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	AR'TH AVG FNK	IALPHA	PAMB	PWL AREA
C2AE106G/P 1　1820A0	06-08-83	PEEBLES 4D	150. FT ARC	1820.	9474.	SAE77	28.85	FULL SPHERE

GP MICS/HALF INLET TRID/6DB FREEFIELD CORR./#09995

Appendix 9.1.10

16214ES/FSDR/RPMAVG

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C2AE106G/P 1 2030A0

INPUT - C2AE106G/P 1 X02820 C2AE106G/P 1 X02670
C2AE106G/P 1 X02800

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130	140.	150.	160.	PWL
50	66.5	66.4	66.0	67.6	67.0	67.8	68.6	70.4	70.7	72.2	73.4	75.7	77.0	79.2	81.5	83.9	129.0
63	71.4	70.5	69.8	74.9	68.1	68.0	69.9	70.8	70.9	73.3	74.3	75.7	77.1	78.8	80.4	82.6	129.0
80	69.8	67.9	66.9	67.0	68.3	68.9	69.3	70.3	71.6	72.8	74.1	76.3	77.6	79.0	80.7	80.7	128.6
100	69.9	68.2	68.0	68.6	69.8	69.8	70.2	71.8	72.2	73.3	74.6	76.7	78.1	79.9	81.3	78.8	129.0
125	70.6	69.1	68.6	70.3	70.5	70.1	71.0	72.1	72.8	73.7	75.3	77.2	78.5	79.9	80.9	78.4	129.3
160	70.1	69.3	69.7	70.6	70.4	70.4	70.7	71.9	72.6	73.6	74.8	76.6	78.1	79.3	79.1	78.1	128.7
200	71.6	70.4	72.2	72.1	72.1	73.8	71.8	73.9	73.3	75.2	75.3	76.9	79.8	79.0	78.3	77.5	129.5
250	70.4	70.5	70.8	71.4	71.2	71.0	71.3	71.8	72.5	73.7	74.4	75.9	77.0	77.8	77.4	75.0	128.0
315	72.7	72.1	71.8	72.3	72.3	71.5	71.8	71.9	72.9	74.1	75.1	76.5	77.2	77.5	76.9	74.5	128.4
400	72.9	72.7	72.5	73.9	72.8	72.7	72.2	73.0	74.1	76.0	76.9	78.3	78.4	77.8	79.0	75.5	129.7
500	72.2	71.6	71.4	72.3	72.0	71.7	72.8	73.3	75.5	76.7	77.3	77.7	78.0	77.6	75.9	73.3	129.4
630	74.6	73.4	72.9	73.6	72.9	71.8	72.4	72.9	75.2	76.5	77.3	77.1	77.0	76.4	75.0	72.5	129.2
800	78.6	77.5	75.6	75.7	74.0	73.1	72.0	72.7	72.7	74.9	75.4	75.9	76.7	75.5	73.9	71.5	128.9
1000	88.4	89.1	87.8	87.4	83.9	82.7	80.0	78.0	76.7	76.9	77.0	79.4	78.1	78.6	75.9	75.5	136.5
1250	86.5	86.4	84.8	83.6	80.9	79.4	77.1	75.2	73.9	74.3	75.0	76.6	76.8	76.4	74.3	72.7	133.7
1600	83.2	83.6	82.3	80.5	78.4	76.7	75.1	74.1	73.9	74.0	74.6	75.3	77.9	75.5	73.5	71.6	131.7
2000	89.0	92.8	91.7	89.9	85.8	84.6	79.6	78.0	78.1	76.5	75.8	79.8	81.9	78.7	76.5	74.1	139.1
2500	85.8	87.0	85.5	85.9	83.0	80.1	77.7	74.8	73.4	74.2	74.9	78.1	79.0	77.4	74.6	72.6	135.0
3150	84.7	85.1	87.7	89.7	86.3	83.0	82.6	79.2	75.0	74.9	76.7	78.1	81.0	78.6	75.6	73.5	137.6
4000	88.2	86.6	84.6	83.7	82.2	78.9	76.9	74.0	75.2	78.0	76.7	79.1	80.3	77.9	74.4	72.6	135.3
5000	86.3	85.8	88.0	87.1	86.4	82.6	78.2	74.2	73.9	75.9	77.3	79.3	81.0	77.8	74.1	71.7	137.2
6300	85.7	85.0	85.3	84.1	83.3	80.5	78.7	74.7	72.5	74.4	77.0	78.6	81.7	80.4	75.3	72.5	136.0
8000	84.3	83.8	82.9	82.7	80.7	77.6	75.9	72.3	69.8	71.8	73.7	75.8	78.8	78.2	72.7	69.9	134.3
10000	82.9	82.3	81.4	80.8	79.6	76.8	74.9	71.9	68.0	70.1	71.6	74.3	78.5	77.7	71.6	66.8	133.9
OASPL	97.0	97.8	97.2	96.7	94.2	91.9	89.8	88.0	87.5	88.6	89.4	91.2	92.7	92.1	91.4	90.6	147.3
PNL	110.2	111.0	110.3	110.5	108.0	105.4	104.1	101.7	99.9	101.6	101.7	103.8	105.5	104.0	101.6	99.6	
PNLT	112.2	113.5	112.9	113.1	110.2	107.5	105.9	103.3	101.4	102.5	102.1	104.8	106.7	104.9	102.1	100.7	
DBA	97.4	98.4	97.8	97.3	94.7	92.2	89.7	87.3	86.4	87.2	87.7	89.7	91.3	89.6	86.8	84.7	

APNLW= 108.9 IPNLW= 119.5 LAPNLW= 97.5 LIPNLW= 102.6 TPNLW= 118.0

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C2AE106G/P 1 2030A0	05-08-83	PEEBLES 4D	150. FT ARC	2030.	12093.	SAE77	28.88	FULL SPHERE

GP MICS/HALF INLET TRTD/6DB FREEFIELD CORR./#09995

ORIGINAL PAGE IS OF POOR QUALITY

Appendix 9.1.11

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT ARC

IDENTIFICATION

AVERAGE - C2AE106G/P 1 2180A0

INPUT - C2AE106G/P 1 X02680 C2AE106G/P 1 X02790
C2AE106G/P 1 X02830

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	67.5	67.7	67.4	69.1	69.0	69.6	71.0	72.5	73.1	74.4	76.0	78.1	79.6	81.8	84.7	87.1	131.8
63	72.1	71.8	70.6	74.4	71.3	71.6	72.3	72.6	73.0	74.7	75.9	77.9	79.8	81.8	83.3	85.8	131.5
80	71.5	69.9	69.2	69.5	71.3	71.0	71.1	72.9	73.6	74.9	76.2	78.8	80.3	82.1	83.6	83.7	131.3
100	71.0	69.1	69.6	70.7	71.4	71.8	72.5	73.4	74.4	75.4	77.0	79.3	80.9	82.6	84.2	82.1	131.7
125	70.8	70.8	71.2	72.6	71.9	72.1	73.1	74.3	74.9	75.9	77.9	79.5	81.1	82.1	83.6	81.4	131.7
160	71.0	71.6	71.7	72.5	71.9	72.3	72.7	74.2	74.6	76.0	77.3	79.3	80.6	81.8	82.0	80.8	131.2
200	72.4	71.9	73.5	73.3	74.4	74.4	73.5	75.9	76.2	77.1	77.4	80.0	81.4	81.4	81.4	80.0	131.7
250	71.0	71.9	72.5	73.0	73.3	73.2	73.6	74.0	74.9	75.8	77.0	78.6	79.4	80.1	80.1	77.7	130.4
315	73.2	73.2	73.2	74.0	73.8	73.4	74.0	74.2	75.0	76.1	77.0	78.8	79.3	79.6	79.5	77.2	130.5
400	73.6	74.1	73.4	74.2	75.0	73.8	74.1	74.5	75.7	77.7	78.6	79.8	80.3	79.5	79.8	77.1	131.2
500	73.2	72.6	72.7	73.8	73.6	73.3	74.4	75.0	76.5	78.1	78.5	79.3	79.5	78.8	77.9	74.9	130.8
630	75.2	74.5	73.7	75.6	74.1	73.3	74.5	74.8	76.2	78.7	79.4	79.6	78.9	78.5	77.2	74.4	131.1
800	78.3	77.8	76.1	76.9	74.9	73.8	73.6	73.7	74.9	76.3	77.3	77.9	78.0	77.1	75.9	73.1	130.3
1000	84.8	85.7	83.3	82.2	81.4	79.0	77.5	75.6	75.7	77.0	77.6	79.0	78.0	77.2	75.9	73.6	133.6
1250	91.2	92.8	90.5	88.1	88.5	85.0	83.3	80.2	79.8	80.8	81.3	84.0	83.3	81.2	79.4	78.2	139.6
1600	83.5	84.1	83.0	81.1	80.2	78.0	76.4	74.6	74.9	76.9	76.0	77.0	78.4	76.1	74.5	74.5	132.7
2000	91.7	96.8	94.8	89.4	91.0	81.3	81.0	78.6	76.6	78.0	78.0	80.9	79.9	78.0	76.6	74.6	141.5
2500	90.3	96.7	89.6	90.6	89.1	84.5	81.1	77.8	76.7	77.8	79.8	82.8	83.6	82.1	77.7	75.8	140.8
3150	86.5	88.3	91.7	95.6	91.1	89.0	87.0	81.8	79.3	78.5	79.0	80.1	81.8	79.1	77.1	75.6	142.2
4000	85.1	86.1	84.9	86.2	84.7	82.4	79.9	76.9	77.6	79.0	79.9	81.3	83.6	80.7	77.1	74.8	137.0
5000	86.5	88.3	87.3	86.3	84.5	81.5	79.2	75.7	76.3	78.0	79.7	80.5	80.9	77.6	74.7	73.0	137.2
6300	85.0	85.3	85.1	85.1	83.6	81.1	79.1	75.0	74.8	76.4	79.5	81.1	83.4	80.0	75.4	73.2	136.8
8000	83.9	84.8	84.8	84.6	82.8	79.9	77.5	73.5	72.3	73.4	76.0	77.7	79.3	76.8	72.4	70.8	135.8
10000	82.8	83.5	82.5	82.3	80.6	77.8	76.0	71.7	70.2	71.7	73.5	75.5	77.3	75.6	70.3	68.4	134.6
OASPL	98.2	101.7	99.4	99.3	97.6	94.0	92.4	89.8	89.6	90.8	91.9	93.6	94.5	93.9	93.8	93.4	149.8
PNL	111.1	115.0	112.5	114.3	111.5	108.9	107.3	103.8	102.7	103.4	104.5	106.3	107.5	105.7	103.3	101.8	
PNLT	113.5	117.7	115.4	116.7	114.9	111.1	109.6	105.5	104.2	104.7	106.0	108.3	109.2	107.2	104.7	103.2	
DBA	98.9	102.7	100.3	100.1	98.3	94.5	92.6	89.1	88.4	89.6	90.5	92.3	93.0	91.0	88.6	86.8	

APNLW= 111.0 IPNLW= 122.6 LAPNLW= 101.4 LIPNLW= 105.8 TPNLW= 121.3

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C2AE106G/P 1 2180A0	06 08 83	PEEBLES 4D	150. FT ARC	2180.	14124.	SAE77	28.89	FULL SPHERE

GP MICS/HALF INLET TRID/6DB FREEFIELD CORR /#09995

P1108-88

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE   150.0 FT. ARC

IDENTIFICATION

AVERAGE - C2AE106G/P 1   2320A0

INPUT - C2AE106G/P 1   X02690   C2AE106G/P 1   X02780
C2AE106G/P 1   X02840

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	68.8	69.1	68.6	70.5	71.3	71.8	72.3	74.0	74.8	76.0	77.6	79.8	81.8	84.1	87.1	90.2	134.1
63	72.2	72.5	71.5	74.5	72.7	72.3	73.2	74.3	75.2	76.6	77.8	80.1	82.0	84.4	86.0	88.5	133.8
80	71.8	71.1	70.9	71.5	72.4	72.4	73.1	74.9	75.6	76.9	78.5	80.7	82.4	84.3	86.5	86.7	133.6
100	72.2	70.5	71.4	72.2	72.9	73.1	74.0	75.3	76.0	77.4	78.8	81.2	82.9	84.8	86.4	84.5	133.7
125	72.1	72.3	73.4	74.4	73.7	74.3	75.1	76.2	76.7	78.1	79.4	82.0	83.0	84.2	86.1	84.5	133.9
160	72.3	73.1	73.5	73.9	73.7	74.0	75.0	75.9	76.7	78.0	79.2	81.4	82.8	84.2	84.6	83.5	133.4
200	73.3	73.5	74.9	74.4	75.7	75.2	75.5	77.1	77.5	78.8	79.4	82.2	83.1	83.5	84.0	82.3	133.6
250	72.9	74.3	74.5	74.8	75.1	75.0	75.5	75.9	77.0	77.7	79.0	81.0	82.1	82.5	82.5	80.5	132.7
315	74.7	75.1	74.9	75.7	75.6	75.1	75.6	75.9	77.0	78.1	79.1	80.7	81.6	81.9	81.6	79.6	132.5
400	74.7	75.7	74.8	75.8	76.0	75.5	75.7	76.6	77.7	79.5	80.6	81.2	82.1	81.6	81.2	79.1	133.0
500	74.3	74.5	74.4	75.6	75.1	76.5	76.1	76.7	77.8	79.5	80.0	81.2	81.4	81.2	80.1	76.9	132.7
630	76.0	75.8	75.4	76.4	75.9	76.9	77.2	77.4	77.8	79.5	80.3	81.5	81.3	80.6	79.4	76.4	132.9
800	79.3	79.0	77.2	77.5	76.6	76.2	75.0	75.6	76.6	78.2	78.7	79.9	80.1	79.1	78.3	75.7	132.0
1000	83.6	83.5	81.9	80.8	79.6	78.1	76.9	76.1	76.4	77.7	78.1	79.1	79.0	78.5	77.0	74.3	133.0
1250	92.6	93.8	93.3	91.8	90.0	89.7	80.4	82.9	82.1	81.9	82.1	83.5	85.0	82.3	81.3	78.4	142.0
1600	85.1	86.1	84.4	83.2	82.1	79.9	78.9	76.7	76.5	78.1	78.5	79.7	79.4	78.2	76.5	77.0	134.6
2000	92.7	99.2	91.5	87.0	83.7	83.1	79.6	77.0	76.4	78.4	78.6	81.2	80.4	79.5	76.7	75.7	141.1
2500	95.1	96.5	93.8	92.0	89.8	86.2	83.5	80.4	78.9	79.4	80.4	83.2	83.6	80.8	78.8	76.9	142.1
3150	86.8	89.2	87.7	89.9	90.5	83.9	81.3	78.7	77.1	77.2	78.7	80.8	82.4	78.6	76.8	75.1	139.1
4000	87.0	88.6	86.9	88.3	89.3	83.9	81.9	79.7	79.1	79.9	80.9	82.5	83.1	79.7	77.1	76.0	139.1
5000	88.7	89.2	88.0	88.0	86.2	83.0	81.9	78.5	78.8	80.9	82.7	83.2	82.7	79.6	77.5	75.3	138.9
6300	87.2	87.8	87.5	87.1	85.7	82.8	81.5	77.2	76.7	78.3	81.2	83.7	84.7	80.3	76.9	75.1	138.7
8000	85.6	86.6	85.5	85.5	83.9	81.1	79.5	75.8	74.4	75.3	77.8	80.2	80.9	78.3	74.7	72.9	137.1
10000	83.6	84.5	83.5	83.5	82.3	79.2	77.8	74.1	72.3	73.2	75.2	77.8	79.3	76.0	72.0	70.0	135.9
OASPL	100.3	103.0	99.8	98.8	97.6	95.0	93.6	91.2	91.1	92.3	93.4	95.2	96.0	95.6	96.1	96.0	150.7
PNL	114.1	116.0	113.4	112.4	111.6	108.0	106.2	103.9	103.6	104.6	106.0	107.6	108.3	106.2	104.8	103.3	
PNLT	117.1	119.0	116.8	115.7	114.6	111.6	109.7	106.1	105.4	106.0	107.3	108.9	110.2	107.5	106.3	104.2	
DBA	101.0	103.9	100.5	99.4	98.2	95.3	93.6	90.2	89.7	90.7	91.8	93.5	94.0	91.7	90.1	88.2	

APNLW= 111.5   IPNLW= 122.3   LAPNLW= 102.7   LIPNLW= 108.3   TPNLW= 120.9

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C2AE106G/P 1 2320A0	06-08-83	PEEBLES 4D	150. FT ARC	2320	16044.	SAE77	28.89	FULL SPHERE

GP MICS/HALF INLET TRTD/6DB FREEFIELD CORR./*09995

ORIGINAL PAGE IS
OF POOR QUALITY

Appendix 9.1.13

16214ES/FSDR/RPMAVG

11/14/83 9.019 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C2AE106G/P 1 2500A0

INPUT - C2AE106G/P 1 X02770 C2AE106G/P 1 X02700
C2AE106G/P 1 X02850

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	70.4	70.9	70.8	72.5	73.5	74.0	75.1	76.4	77.3	78.8	80.6	82.8	84.6	87.2	90.4	93.2	137.2
63	73.1	73.4	72.5	75.6	74.6	75.1	76.1	77.1	78.0	79.5	80.8	82.8	84.9	87.2	89.5	91.8	136.8
80	73.8	73.0	72.8	73.6	74.2	74.6	75.7	77.2	78.3	79.3	81.4	83.4	85.1	87.3	89.5	89.9	136.5
100	74.5	72.8	73.9	74.9	74.9	75.1	76.4	77.8	78.4	80.0	81.6	84.0	85.6	87.6	89.5	88.1	136.5
125	74.3	74.6	75.6	76.2	75.4	76.0	77.2	78.2	79.3	80.5	82.2	84.3	85.8	87.4	89.2	87.3	136.6
160	74.3	75.4	75.3	76.0	75.9	76.4	77.0	78.4	79.2	80.5	81.9	84.1	85.4	87.0	87.8	87.0	136.2
200	75.3	76.6	76.8	76.8	76.8	76.8	77.8	79.5	80.1	81.2	82.3	81.9	86.0	86.7	87.2	85.8	136.4
250	74.8	76.2	76.9	77.1	77.3	77.3	77.6	78.3	79.6	80.3	82.2	83.8	85.0	86.0	85.9	84.0	135.6
315	76.3	76.8	76.9	77.3	77.6	77.3	78.2	78.5	79.6	80.7	82.0	83.2	84.7	85.1	84.7	82.6	135.2
400	76.4	77.2	77.2	78.1	77.8	77.2	78.3	79.0	80.5	82.1	83.2	81.0	84.4	84.5	84.4	82.1	135.6
500	76.3	76.1	76.7	77.3	77.6	77.3	78.2	78.6	80.3	81.9	82.5	83.5	84.2	83.9	83.3	80.4	135.1
630	77.6	77.3	77.7	78.1	77.9	77.7	78.7	79.0	81.0	82.9	82.9	83.1	83.8	83.0	82.4	79.2	135.2
800	79.8	80.1	78.7	79.5	77.9	77.2	77.3	77.9	79.7	80.7	81.6	82.4	82.7	82.2	81.0	78.4	134.4
1000	82.8	82.9	82.0	81.6	80.4	78.6	78.3	78.1	79.1	80.3	80.7	81.9	81.6	81.3	80.1	76.8	134.6
1250	92.4	94.0	94.6	95.9	94.2	90.4	89.4	86.0	84.4	84.1	84.0	85.0	84.9	85.3	83.2	81.2	144.2
1600	87.4	89.0	89.0	89.3	87.7	84.8	83.5	80.8	80.3	81.0	81.4	82.1	82.0	81.7	79.9	78.3	138.8
2000	86.4	88.3	85.1	85.9	83.7	80.9	79.3	77.9	78.2	79.4	80.3	81.5	80.7	79.4	77.8	76.0	136.3
2500	96.2	99.6	94.5	95.4	92.4	90.8	87.5	84.9	82.5	82.2	83.6	85.3	86.5	82.3	80.9	80.0	144.9
3150	89.6	91.7	90.9	90.9	88.6	86.0	83.3	80.4	79.6	79.5	81.3	83.5	84.5	80.2	78.0	76.9	140.5
4000	89.2	90.8	91.4	92.7	93.5	90.1	87.3	83.9	83.4	82.1	83.1	85.4	86.8	81.6	79.6	78.6	143.1
5000	89.7	90.7	88.7	89.3	88.6	86.4	84.7	81.8	82.4	83.9	85.0	86.8	85.3	81.4	79.4	77.8	141.1
6300	89.2	89.3	88.1	88.6	87.2	84.9	82.9	79.3	79.6	80.9	83.4	85.2	85.2	81.2	78.5	76.4	140.2
8000	87.2	87.9	87.0	87.5	86.2	83.7	81.5	77.7	76.8	77.6	80.7	82.7	84.1	81.8	77.3	75.2	139.3
10000	85.6	86.2	85.3	85.7	84.5	82.0	79.2	75.2	74.5	75.4	77.6	79.6	80.6	77.2	73.9	72.0	138.0
OASPL	100.8	102.9	100.9	101.8	100.3	97.7	96.0	94.0	94.0	94.8	96.0	97.6	98.4	98.4	99.1	99.1	152.9
PNL	115.1	117.4	114.5	115.2	114.2	111.5	109.6	107.1	107.0	107.3	108.5	110.2	111.0	108.4	107.3	106.0	
PNLT	117.8	120.6	117.5	118.7	117.5	114.4	112.4	109.3	108.6	108.4	109.5	111.2	112.3	109.6	108.3	107.2	
DBA	101.5	103.8	101.5	102.4	100.9	98.1	96.1	93.3	92.8	93.2	94.2	95.8	96.1	94.0	92.5	90.6	

APNLW= 114.0 TPNLW= 124.3 LAPNLW= 104.9 LTPNLW= 110.6 TPNLW= 123.0

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C2AE106G/P 1 2500A0	06-09-83	PEEBLES 4D	150. FT ARC	2500.	18993.	SAE77	28.90	FULL SPHERE

GP MICS/HALF INLET TRTD/6DD FREEFIELD CORR /#09995

Appendix 9.1.14

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C2AE1060/P 1 2800AO

INPUT - C2AE1060/P 1 X02860 C2AE1060/P 1 X02710
C2AE1060/P 1 X02760

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100	110.	120.	130.	140.	150.	160.	PWL
50	73.5	74.0	74.2	76.6	77.5	77.9	78.7	80.3	81.3	82.8	84.4	86.7	88.8	91.9	95.8	99.9	142.5
63	76.3	75.9	75.3	78.4	78.1	78.2	79.5	80.7	81.8	83.2	84.6	86.8	87.4	91.7	94.7	98.3	141.8
80	77.9	76.4	76.6	77.6	78.1	78.6	79.8	81.4	82.4	83.5	85.3	87.6	89.8	92.2	94.7	95.7	141.3
100	78.5	77.4	78.2	78.8	78.9	79.8	80.9	82.3	82.8	83.9	85.7	88.4	90.0	92.4	95.2	93.8	141.4
125	79.2	78.8	78.7	79.6	80.1	80.6	81.2	82.5	83.4	84.7	86.3	88.6	90.3	92.4	94.8	93.0	141.4
160	78.2	79.1	79.0	80.1	79.8	80.3	81.3	82.4	83.1	84.5	86.0	88.5	90.2	91.8	93.4	91.7	140.8
200	79.6	80.5	80.5	81.4	80.7	81.5	82.0	83.6	84.1	85.7	86.6	88.9	90.7	91.6	92.5	91.3	141.0
250	78.3	79.7	80.5	81.0	80.9	81.2	81.8	82.5	83.6	84.8	86.2	88.2	89.8	90.9	91.3	89.2	140.2
315	78.9	79.8	80.2	81.0	81.3	81.2	82.1	82.6	83.6	85.0	86.1	87.9	89.3	90.1	90.2	87.8	139.8
400	78.8	80.1	79.8	81.2	81.5	81.5	82.1	82.8	84.0	85.5	86.7	88.3	89.2	89.8	89.5	87.1	139.8
500	79.1	79.2	79.8	80.8	81.1	81.4	82.4	82.9	84.3	85.6	86.2	87.8	88.8	88.8	88.0	85.2	139.3
630	79.4	80.1	80.1	81.0	81.1	82.1	82.6	83.1	85.4	86.2	86.9	87.7	88.2	88.2	87.2	84.2	139.4
800	81.2	82.0	80.6	82.1	81.0	81.2	81.8	82.5	83.3	84.9	85.9	86.8	87.0	86.8	85.7	82.4	138.4
1000	83.2	83.4	83.2	83.4	82.3	81.7	81.8	82.0	83.0	84.7	85.0	86.3	86.0	85.9	84.6	81.8	138.2
1250	89.0	89.3	89.3	89.4	89.2	87.4	85.8	84.3	84.3	84.8	85.1	86.8	86.3	86.0	84.2	81.7	140.9
1600	97.6	99.6	97.9	98.6	99.0	97.3	94.6	91.8	89.9	89.1	88.3	91.1	90.1	89.9	87.2	86.0	148.9
2000	86.6	87.0	85.9	86.3	85.1	83.2	82.6	81.7	82.1	83.0	83.6	85.3	84.5	83.5	81.8	78.7	138.4
2500	91.0	91.2	89.4	89.9	87.9	86.2	84.5	82.7	82.7	83.7	84.0	86.5	86.2	83.9	82.1	79.0	140.8
3150	96.2	96.8	95.3	96.1	94.0	92.4	90.8	87.7	86.4	85.8	85.9	87.8	87.0	85.4	82.7	81.6	145.9
4000	90.4	91.2	90.8	92.2	90.4	88.4	87.1	85.0	84.7	85.2	86.2	87.9	90.1	84.4	82.1	80.6	143.1
5000	91.0	91.5	90.8	92.1	90.5	88.6	88.2	85.7	85.7	87.2	88.1	89.6	89.8	84.7	82.6	80.8	143.8
6300	90.9	90.7	89.9	91.0	89.4	87.5	86.9	84.3	83.4	84.5	86.9	88.3	87.5	84.1	81.3	79.1	142.9
8000	88.4	88.9	87.8	89.3	87.6	85.3	85.2	81.9	80.6	82.1	84.4	86.6	87.1	83.6	79.7	78.2	141.6
10000	86.7	86.5	85.3	86.4	85.0	83.3	82.4	78.9	78.1	78.9	80.5	82.7	83.4	80.6	77.2	75.5	139.6
OASPL	102.6	103.6	102.4	103.2	102.5	100.9	99.6	98.0	97.9	98.7	99.7	101.6	102.5	103.0	104.3	105.0	156.0
PNL	116.6	117.2	116.1	116.9	115.5	114.0	113.0	111.0	110.6	111.1	112.0	113.7	114.6	112.4	111.2	109.7	
PNLT	119.9	121.0	119.5	120.5	120.4	118.9	116.5	113.9	112.8	112.8	113.3	115.4	116.1	114.2	112.6	111.7	
DBA	103.3	104.3	103.0	103.8	103.0	101.4	99.6	97.3	96.7	97.2	97.7	99.6	99.6	98.1	96.7	94.5	

APNLW= 117.3 IPNLW= 126.1 LAPNLW= 108.1 LIPNLW= 108.0 TPNLW= 124.8

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C2AE1060/P 1 2800AO	06-08-83	PEEBLES 4D	150. FT ARC	2800.	24803.	SAE77	28.88	FULL SPHERE

GP MICS/HALF INLET TRTD/GDB FREEFIELD CORR./#09995

ORIGINAL PAGE IS OF POOR QUALITY

Appendix 9.1.15

16214ES/FSDR/RPMAVG 11/14/83 9.019 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C2AE106G/P 1 3100A0

INPUT - C2AE106G/P 1 X02880 C2AE106G/P 1 X02720
C2AE106G/P 1 X02750

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90	100.	110.	120.	130.	140.	150.	160.	PWL
50	77.2	77.5	77.9	79.6	80.8	80.9	82.2	83.3	84.6	86.2	88.1	90.6	93.0	96.3	101.0	105.8	147.7
63	79.7	79.0	80.2	82.2	81.4	81.5	82.8	83.9	85.1	86.5	88.4	90.9	93.7	96.7	99.6	103.9	146.7
80	82.1	80.5	80.3	80.9	81.8	82.1	83.4	84.6	85.7	87.1	89.1	91.5	94.0	97.0	99.9	101.3	146.1
100	83.4	81.5	81.9	83.0	83.4	83.5	84.5	85.3	86.4	87.9	89.9	92.4	94.9	97.6	100.0	98.9	146.1
125	82.5	82.3	82.5	83.6	83.6	83.8	84.8	86.1	86.7	88.6	90.2	92.9	95.0	97.3	99.9	97.8	146.0
160	82.0	82.8	82.7	84.0	83.6	84.1	84.7	85.9	87.0	88.4	90.2	92.6	94.9	97.2	98.7	96.8	145.6
200	82.0	83.5	84.6	85.1	85.5	84.5	85.2	87.0	88.0	88.9	90.5	91.1	95.3	96.8	97.9	96.1	145.6
250	81.8	83.2	84.2	84.8	84.7	85.0	85.5	86.2	87.5	88.7	90.5	92.7	94.7	95.9	96.6	94.3	144.8
315	82.2	82.8	84.0	85.0	85.1	85.2	85.9	86.6	87.5	89.1	90.5	92.4	94.2	95.5	95.2	92.9	144.4
400	81.5	83.0	83.2	85.0	85.2	85.4	85.9	87.2	88.0	89.5	91.1	92.7	94.2	94.7	94.5	91.2	144.3
500	82.1	82.2	83.0	85.0	85.1	85.2	86.5	86.7	88.2	89.8	90.7	92.7	93.7	94.2	93.2	94.2	144.2
630	81.6	82.9	83.0	84.9	85.1	85.2	86.1	87.1	88.6	90.1	90.6	92.2	93.1	92.9	92.2	96.0	144.0
800	82.3	82.9	82.2	84.4	84.5	84.5	85.4	86.4	87.6	88.9	90.0	91.6	92.0	91.8	90.8	90.2	142.8
1000	85.2	85.0	84.0	85.5	86.4	85.1	85.9	86.3	87.2	88.6	89.6	91.2	90.7	90.9	89.2	97.9	143.4
1250	88.9	88.6	88.2	87.8	87.5	86.6	86.8	86.8	87.5	88.5	89.0	91.3	90.4	90.3	88.4	92.2	143.0
1600	98.9	100.7	100.7	103.5	102.1	99.3	99.4	96.8	94.7	93.7	94.5	94.4	95.7	93.7	92.7	90.1	152.6
2000	90.6	91.5	91.4	93.2	91.7	89.9	89.5	88.4	87.9	88.3	88.9	90.3	90.3	89.1	87.3	84.8	144.3
2500	87.9	88.5	87.8	89.2	88.4	87.0	86.0	86.0	86.9	87.5	88.1	89.8	88.8	87.6	85.8	83.2	142.3
3150	98.0	96.0	96.3	97.9	95.9	93.9	93.4	91.7	89.8	89.6	90.4	91.9	90.1	88.9	86.8	84.6	147.9
4000	90.4	90.6	90.2	91.2	90.0	88.7	88.2	87.6	87.8	88.1	88.8	90.2	88.8	86.7	84.7	83.1	143.9
5000	92.7	93.2	92.8	94.1	92.2	91.0	90.0	89.4	89.8	90.1	90.6	92.3	90.0	86.8	85.2	83.5	146.1
6300	91.1	90.2	90.0	92.0	90.2	88.6	88.3	87.0	87.8	88.8	91.0	92.2	91.1	87.9	85.2	83.3	145.2
8000	88.3	88.3	88.2	89.8	87.9	86.8	85.9	84.4	84.5	85.5	88.4	90.0	88.5	86.1	82.7	81.6	143.4
10000	86.4	86.1	85.8	86.8	85.8	84.4	83.7	81.4	81.7	82.6	84.4	86.6	86.3	83.6	80.8	80.7	141.5
OASPL	103.9	104.2	104.2	106.3	104.9	103.0	103.0	102.0	101.9	102.6	103.9	105.6	106.7	107.8	109.4	110.9	159.6
PNL	118.1	117.3	117.4	119.2	118.0	116.1	116.2	114.9	114.3	114.8	115.9	117.5	117.2	116.5	115.8	115.5	
PNLT	121.1	120.8	121.0	123.6	122.2	119.8	119.9	118.0	116.7	116.6	117.7	118.7	119.0	117.8	117.4	117.7	
DBA	104.4	104.8	104.8	106.9	105.5	103.3	103.1	101.5	100.8	101.1	102.1	103.4	103.3	102.4	101.4	102.6	

APNLW= 120.4 IPNLW= 128.2 LAPNLW= 112.8 LIPNLW= 108.9 TPNLW= 126.8

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C2AE106G/P 1 3100A0	06-08-83	PEEBLES 4D	150. FT ARC	3100.	31546.	SAE77	28.86	FULL SPHERE

GP MICS/HALF INLET TRTD/60B FREEFIELD CORR./#09995

P1185-88

ORIGINAL PAGE IS OF POOR QUALITY

Appendix 9.1.16

16214ES/FSDR/RPMAVG 11/14/83 9.019 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C2AE106G/P 1 3267A0

INPUT - C2AE106G/P 1 X02730 C2AF106G/P 1 X02890
C2AE106G/P 1 X02870

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	79.2	79.5	79.8	81.5	83.0	83.2	83.9	85.8	87.1	88.5	90.2	92.6	95.4	98.8	104.3	109.2	150.8
63	82.0	81.4	82.0	83.9	83.1	83.2	84.7	86.2	87.1	88.9	90.9	92.8	95.6	98.9	102.0	107.3	149.4
80	84.0	82.3	82.5	83.5	83.9	84.5	85.1	86.8	87.7	89.3	91.7	94.1	96.4	99.6	102.9	105.0	149.1
100	85.1	83.7	83.3	84.6	84.9	85.8	86.4	87.5	88.2	89.8	92.3	94.8	96.7	100.2	103.1	102.2	148.7
125	84.5	84.5	84.2	85.3	85.5	85.9	86.8	88.2	89.1	90.3	92.7	95.0	97.3	99.9	102.7	100.8	148.6
160	84.2	85.4	85.0	86.4	85.6	85.8	86.4	87.9	88.8	90.7	92.5	95.1	97.4	99.9	101.5	100.1	148.2
200	83.2	85.7	86.4	86.8	86.7	86.4	87.8	89.0	89.7	91.6	93.1	95.6	97.4	99.5	100.7	98.6	148.0
250	83.5	85.3	85.9	86.7	86.7	86.9	87.9	88.5	89.3	91.2	93.1	95.6	97.2	99.3	99.6	96.3	147.5
315	83.8	85.3	86.4	87.4	87.4	87.0	87.9	88.3	89.3	91.2	92.7	91.9	97.1	98.4	98.3	94.9	147.0
400	83.5	85.1	84.8	87.1	87.7	87.3	88.1	89.3	89.8	91.7	93.2	95.8	96.8	97.8	97.2	93.8	146.9
500	82.0	83.8	85.2	86.8	87.3	87.5	88.6	89.3	90.7	91.7	93.0	95.3	96.0	96.7	96.1	90.9	146.3
630	83.2	84.1	85.1	86.8	87.0	87.3	88.3	89.6	90.5	91.7	93.0	95.0	95.6	95.8	95.0	89.0	146.0
800	84.3	84.5	83.7	85.7	85.6	87.1	87.8	88.8	89.8	91.3	92.7	94.4	94.8	94.4	93.5	88.9	145.2
1000	86.5	86.9	86.3	87.2	86.8	86.6	87.4	88.6	89.5	91.2	92.2	94.5	93.8	93.4	92.4	84.4	144.9
1250	89.0	90.1	89.8	88.6	88.5	87.1	88.1	98.3	89.6	90.7	91.6	93.7	93.6	92.6	91.5	85.0	144.8
1600	99.6	100.4	102.0	100.2	100.2	99.1	99.0	97.1	94.4	99.0	96.6	96.3	96.0	93.6	92.7	91.2	152.4
2000	96.4	96.7	99.1	98.0	97.2	96.3	96.2	94.4	92.6	95.2	93.8	94.2	94.3	92.3	91.5	89.4	149.8
2500	89.1	88.8	88.9	91.5	89.2	89.1	88.7	88.8	88.8	89.6	91.3	92.0	90.9	90.5	88.5	85.2	144.5
3150	93.9	96.3	93.8	97.3	95.0	92.0	91.9	91.0	91.0	90.6	91.6	92.7	91.6	89.9	87.8	85.6	147.4
4000	92.5	93.5	92.5	94.8	94.0	91.4	91.5	90.3	91.0	90.6	91.1	92.4	90.8	89.3	87.6	85.4	146.7
5000	93.2	93.4	92.9	94.4	93.2	91.5	91.5	90.2	91.0	91.6	92.7	94.6	91.7	88.7	87.3	85.0	147.3
6300	90.2	90.4	90.6	92.5	90.5	89.4	89.5	88.1	88.9	90.3	92.6	93.7	92.8	89.7	87.2	85.0	146.4
8000	88.1	88.9	88.9	89.6	88.8	86.4	87.0	85.3	86.0	87.2	90.0	91.6	90.2	87.9	84.6	82.9	144.5
10000	85.8	85.8	85.7	86.5	86.0	84.7	84.6	82.2	82.9	84.0	86.4	89.0	87.8	85.6	83.0	81.1	142.4
OASPL	104.3	105.1	105.8	105.9	105.2	104.1	104.3	103.7	103.6	105.5	106.3	108.0	109.0	110.4	112.2	113.7	161.6
PNL	117.1	118.2	118.5	119.3	118.0	117.0	117.1	116.2	116.0	117.9	117.9	119.6	119.1	118.5	117.9	115.9	
PNLT	119.4	120.6	121.0	121.6	120.5	119.4	119.4	118.1	117.1	119.9	119.2	120.1	119.5	118.7	118.2	117.1	
DBA	104.7	105.6	106.4	106.3	105.5	104.2	104.3	103.0	102.4	104.5	104.5	105.7	105.4	104.6	103.9	100.6	

APNLW= 122.3 IPNLW= 128.8 LAPNLW= 115.5 LIPNLW= 110.4 TPNLW= 127.6

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C2AF106G/P 1 3267A0	06-08-83	PEEBLES 4D	150. FT ARC	3267.	34530.	SAE77	28.90	FULL SPHERE

GP MICS/HALF INLET TRTD/6DB FREEFIELD CORR./#09995

ORIGINAL PAGE IS OF POOR QUALITY

Appendix 9.1.17

16214ES/FSDR/RPMAVG 11/14/83 9.045 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT ARC

IDENTIFICATION

AVERAGE - C3AE107G/P 1 1820A0

INPUT - C3AE107G/P 1 X03110 C3AE107G/P 1 X03180
C3AE107G/P 1 X02900

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	64.7	65.1	65.0	67.5	64.5	64.9	66.0	67.0	67.7	69.1	70.7	72.0	73.7	75.7	77.8	79.5	125.5
63	71.1	70.8	70.0	77.5	67.1	66.2	67.9	68.6	68.3	70.1	71.3	72.7	73.6	75.4	76.4	78.5	126.4
80	67.2	66.0	65.1	65.0	65.1	65.8	66.9	67.3	68.2	69.5	70.9	72.2	73.7	75.7	76.7	76.9	125.0
100	67.8	66.7	66.3	66.3	67.0	67.5	67.4	68.7	69.4	70.4	72.3	73.3	75.0	76.6	77.4	75.6	125.9
125	67.5	67.0	66.7	67.4	67.3	67.8	68.5	69.7	70.3	71.1	72.9	74.2	75.5	76.4	77.1	75.2	126.2
160	69.3	68.2	67.7	68.3	68.1	67.3	68.7	69.3	70.0	71.2	72.5	73.4	75.3	76.0	75.5	74.6	125.8
200	68.9	68.3	69.9	69.2	68.7	68.3	69.6	71.4	70.7	73.3	74.0	73.6	75.7	75.6	74.6	74.7	126.5
250	68.8	68.8	69.4	70.1	69.3	69.3	69.8	69.9	71.0	71.4	72.7	73.5	74.6	74.9	73.4	72.5	125.8
315	71.3	71.7	71.9	72.9	71.4	70.3	70.5	70.7	71.2	72.1	73.4	74.2	74.6	75.1	73.9	72.1	126.6
400	72.3	72.7	72.7	73.1	72.3	72.0	71.6	71.4	72.7	74.0	75.8	76.7	75.8	76.4	75.7	73.1	128.1
500	72.9	72.4	72.7	74.2	73.2	72.4	73.9	71.9	73.9	74.9	75.5	76.1	76.1	76.1	73.8	71.7	128.4
630	75.8	75.0	74.6	75.6	75.0	74.0	73.3	71.9	72.7	74.0	75.2	75.8	75.2	74.4	72.6	70.9	128.4
800	80.8	81.0	79.4	79.9	78.6	76.6	75.0	72.8	72.7	73.2	74.3	74.5	75.0	73.8	72.3	70.9	130.2
1000	90.3	91.6	89.6	91.5	89.6	86.7	83.9	81.2	77.7	76.6	77.7	79.6	79.2	82.2	78.9	78.5	139.7
1250	83.1	82.7	81.8	81.1	80.1	79.0	76.9	73.6	71.8	71.5	72.6	72.1	73.4	72.5	71.0	69.5	131.3
1600	90.8	90.8	92.1	91.6	83.3	83.5	82.8	80.4	76.0	76.5	76.6	77.0	79.2	78.4	74.3	75.4	139.1
2000	90.5	90.0	90.1	93.2	87.6	87.7	83.6	80.7	77.3	76.4	76.8	80.0	79.6	77.4	75.2	74.3	140.0
2500	86.4	87.4	89.4	93.9	90.0	90.9	87.2	82.4	77.0	77.7	76.1	76.8	78.7	77.6	75.4	75.7	141.2
3150	85.3	87.7	86.7	89.1	86.5	86.7	83.2	78.7	74.9	75.3	76.6	76.6	78.5	76.0	73.6	72.7	137.9
4000	85.7	88.9	85.0	85.7	84.5	82.5	81.0	76.2	73.3	74.2	75.3	77.7	77.1	75.5	72.8	71.0	136.2
5000	84.6	86.2	84.4	85.0	84.4	82.8	81.3	76.1	73.5	73.7	75.8	78.0	79.0	77.0	73.4	70.7	135.9
6300	85.1	86.4	88.1	85.9	84.2	81.6	79.8	74.2	71.1	71.7	74.7	75.9	77.2	76.1	72.2	71.3	136.5
8000	82.5	83.6	82.4	83.3	82.5	80.4	79.3	73.3	68.7	69.1	72.1	73.0	74.9	75.8	70.7	69.0	134.5
10000	79.2	79.9	79.1	79.8	79.6	77.3	75.7	70.0	65.8	67.0	68.8	71.5	72.9	74.7	67.1	65.3	132.2
OASPL	97.7	98.6	98.3	100.0	96.6	95.9	93.7	89.6	86.8	87.3	88.3	89.5	90.3	90.3	88.7	88.3	148.6
PNL	110.0	111.0	110.6	113.2	110.0	109.9	107.2	103.2	99.7	100.3	101.0	102.2	103.0	102.1	99.8	99.2	
PNLT	112.7	114.3	113.6	116.9	113.4	112.9	109.9	105.9	101.5	101.7	102.4	104.3	104.7	105.1	102.2	102.0	
DBA	98.3	99.2	99.0	100.8	97.2	96.7	93.8	89.9	86.3	86.5	87.3	88.7	89.4	88.8	85.9	85.2	

APNLW= 107.3 IPNLW= 121.3 LAPNLW= 97.3 LIPNLW= 104.8 TPNLW= 119.6

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C3AE107G/P 1 1820A0	06-09-83	PEEBLES 4D	150. FT ARC	1820.	9700.	SAE77	28.91	FULL SPHERE

GP MICS/HARDWALL INLET/6DB FREEFIELD CORR./#09811

ORIGINAL PAGE IS
OF POOR QUALITY

Appendix 9.1.18

16214ES/FSDR/RPMAVG   11/14/83   9.045   PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE   150.0 FT. ARC

IDENTIFICATION

AVERAGE - C3AE107G/P 1   2030A0

INPUT - C3AE107G/P 1   X03100   C3AE107G/P 1   X02990
C3AE107G/P 1   X03120

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110	120	130	140	150.	160.	PWL
50	66.5	67.3	66.7	68.8	67.7	68.4	69.5	70.6	71.2	72.3	73.9	75.9	77.5	79.6	82.0	84.2	129.4
63	71.9	72.7	70.9	76.2	70.3	70.9	72.2	71.1	71.4	73.3	74.7	75.9	77.6	79.4	80.7	82.5	129.5
80	70.0	68.7	68.0	67.7	68.8	69.7	70.0	71.0	71.7	73.7	74.6	76.1	78.0	79.9	81.2	81.4	129.1
100	70.0	68.6	68.6	69.0	70.5	70.5	70.8	72.7	72.8	73.7	75.6	77.1	78.9	80.7	81.7	79.9	129.7
125	69.5	69.0	69.3	70.2	70.4	70.4	71.6	72.7	73.2	74.5	76.1	77.6	79.1	80.3	81.0	79.2	129.7
160	69.8	69.6	69.9	70.6	70.0	70.2	71.4	72.2	72.9	74.3	75.5	76.6	78.5	79.9	79.4	78.6	129.1
200	70.8	70.6	71.1	71.2	71.4	71.8	71.6	73.3	73.4	75.3	76.0	76.7	78.9	79.2	78.8	77.9	129.3
250	69.8	70.4	71.1	71.0	71.3	71.1	71.9	72.4	73.4	74.0	75.5	76.4	77.4	78.0	77.3	75.5	128.4
315	72.4	72.7	73.1	72.8	72.9	72.4	73.0	72.7	73.4	74.3	75.8	76.7	77.5	77.8	76.7	74.8	128.8
400	73.7	74.1	73.8	74.7	73.8	73.5	73.2	73.2	71.3	75.7	77.3	77.9	79.1	78.2	77.2	75.3	129.9
500	74.2	74.0	74.3	74.9	74.7	73.7	73.9	74.0	74.9	76.4	77.7	77.7	78.5	77.5	76.0	73.4	129.9
630	76.7	76.1	75.5	77.1	76.0	74.8	74.6	74.3	74.9	76.4	78.2	77.7	78.3	77.2	75.8	73.0	130.4
800	79.9	80.5	78.9	79.4	78.3	76.1	75.3	74.4	73.4	75.1	76.6	76.7	77.2	75.5	74.7	72.4	130.8
1000	89.4	90.9	89.9	91.0	88.6	87.4	85.2	82.8	79.5	79.2	79.2	80.2	79.2	79.6	79.2	77.4	139.6
1250	87.7	88.8	88.2	88.3	86.6	85.1	83.2	80.3	77.5	77.1	77.3	78.1	77.7	78.2	76.9	75.2	137.6
1600	85.2	84.7	84.7	83.2	82.7	81.3	80.3	76.4	75.0	75.4	76.0	76.0	78.2	75.6	74.0	72.8	134.2
2000	95.3	92.4	94.6	91.5	88.6	88.5	87.5	84.0	79.2	79.6	78.5	80.1	81.7	79.8	77.4	76.6	141.8
2500	87.0	87.7	88.1	89.7	88.1	86.0	85.2	80.8	77.1	76.1	77.0	78.7	79.5	77.6	75.9	74.2	138.6
3150	89.5	90.9	94.5	98.1	93.7	91.2	92.4	86.9	82.3	80.1	80.7	81.4	[illegible]	81.0	79.1	77.1	145.1
4000	86.7	88.0	86.8	88.6	87.1	85.0	83.3	78.9	76.9	79.0	77.6	79.3	80.2	77.3	74.9	73.2	138.3
5000	86.6	88.4	88.0	89.5	89.2	86.5	83.8	78.9	76.2	76.2	77.9	[illegible]	80.1	76.9	74.5	73.0	139.3
6300	86.6	87.2	86.6	88.7	87.0	85.5	84.7	79.4	75.4	74.8	77.4	78.3	[illegible]	79.0	75.3	73.5	138.8
8000	83.7	84.9	84.1	86.1	84.4	82.3	80.9	75.7	71.2	71.5	73.8	75.2	77.1	76.4	72.6	71.0	136.5
10000	82.0	83.1	82.6	83.3	82.1	80.6	78.5	72.9	68.7	69.5	71.0	73.6	74.4	74.8	70.1	67.6	135.1
OASPL	99.4	99.3	100.2	101.6	98.8	97.0	96.5	92.4	89.6	89.8	90.6	91.6	92.7	92.4	91.9	91.4	150.6
PNL	112.8	112.4	114.2	116.5	113.4	111.4	111.5	107.1	103.8	103.1	103.9	104.9	[illegible]	104.9	103.2	101.6	
PNLT	115.9	114.5	116.9	119.5	115.4	113.6	114.3	109.5	105.5	104.4	105.1	105.9	[illegible]	106.0	104.4	102.8	
DBA	100.1	99.9	101.1	102.4	99.5	97.7	97.2	92.8	89.2	89.0	89.4	90.5	[illegible]	89.9	88.1	86.4	

APNLW= 110.1   IPNLW= 124.6   LAPNLW= 98.5   LIPNLW= 105.7   TPNLW= 123.2

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C3AE107G/P 1 2030A0	06-09-83	PEEBLES 4D	150. FT ARC	2030	12341.	SAE77	28.91	FULL SPHERE

GP MICS/HARDWALL INLET/6DB FREEFIELD CORR /#09011

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P1106-08

Appendix 9.1.19

16214ES/FSDR/RPMAVG

11/14/83 9.045 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C3AE107G/P 1 2180AO

INPUT - C3AE107G/P 1 X03090 C3AE107G/P 1 X03000
C3AE107G/P 1 X03130

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	68.3	68.4	68.7	70.3	69.9	70.7	71.8	73.0	73.7	74.9	76.2	78.1	80.2	82.6	84.8	87.1	132.1
63	71.8	72.3	71.9	77.1	72.7	72.9	73.8	73.7	73.8	75.6	76.7	78.0	80.4	82.8	83.7	86.2	132.2
80	71.3	70.9	71.0	69.8	71.4	72.0	72.0	73.5	74.5	75.7	77.2	78.9	80.9	82.8	84.3	84.3	131.9
100	71.4	70.1	71.0	70.7	71.6	72.2	72.9	74.4	74.9	76.2	77.8	79.7	81.3	83.3	84.4	83.1	132.2
125	71.6	70.9	71.9	72.4	72.2	73.4	74.0	75.0	75.1	76.7	78.1	79.9	81.7	8?.9	84.0	82.4	132.2
160	71.7	71.8	72.5	72.5	72.3	72.7	73.6	74.8	75.0	76.5	77.8	79.4	81.1	82.6	82.4	81.6	131.7
200	73.2	73.1	73.8	73.1	73.4	73.5	74.4	75.9	75.7	77.5	78.3	79.4	81.4	82.0	81.8	80.8	131.9
250	71.7	72.8	73.6	73.4	73.4	73.5	74.1	74.7	75.5	76.1	77.5	78.7	80.3	81.2	80.7	78.7	131.0
315	74.4	74.2	74.9	74.7	74.4	74.1	75.1	74.4	75.2	76.4	77.7	76.6	79.9	80.5	79.7	77.8	131.0
400	75.3	75.7	75.5	75.6	75.5	75.3	75.0	75.0	75.9	77.9	79.3	79.5	81.0	80.5	79.5	77.6	131.8
500	75.7	75.0	75.5	76.2	75.7	75.4	75.3	75.2	76.0	78.3	78.8	79.4	80.0	79.8	78.3	75.7	131.5
630	78.4	77.1	76.9	77.4	77.0	76.3	75.8	76.0	76.0	78.7	79.9	79.5	79.6	79.1	77.6	75.0	131.9
800	82.5	80.8	79.6	79.7	78.9	77.6	76.7	75.6	75.2	76.7	78.1	77.7	79.1	77.8	76.5	74.3	132.0
1000	86.7	86.4	85.8	85.5	85.3	84.5	83.0	79.5	78.0	77.8	78.8	78.8	79.9	78.3	77.3	75.5	136.3
1250	94.4	93.5	93.7	93.0	93.5	92.7	91.4	86.6	85.0	82.2	84.0	84.2	83.7	84.0	81.8	81.1	143.8
1600	85.2	85.7	85.8	84.2	83.6	82.8	81.8	78.0	76.3	77.5	78.0	77.9	79.1	78.0	75.8	75.7	135.4
2000	90.0	98.4	98.3	90.7	92.8	89.9	86.0	81.7	78.6	78.4	79.0	80.1	81.0	80.1	77.4	76.2	144.0
2500	91.1	95.2	92.5	94.2	91.8	91.3	89.8	85.6	82.9	80.9	81.1	85.0	83.1	82.0	79.6	77.7	143.4
3150	91.4	93.2	94.6	96.9	97.4	96.9	93.5	88.9	84.7	82.7	82.9	83.3	84.6	82.3	82.7	80.6	146.9
4000	88.0	89.6	89.1	90.3	91.1	89.1	88.4	84.3	81.0	80.6	81.3	81.9	85.0	81.2	78.3	76.2	141.6
5000	88.7	89.8	89.3	89.3	89.2	87.7	86.6	82.2	78.8	78.7	80.6	81.3	81.4	78.7	76.2	74.5	140.4
6300	87.7	87.7	87.9	88.6	88.4	87.2	85.9	80.7	76.6	76.8	79.6	81.1	82.8	80.1	76.4	74.4	140.0
8000	85.8	86.0	85.8	86.3	86.0	83.9	83.1	78.0	73.4	73.4	76.1	77.3	78.9	78.4	73.9	72.5	137.9
10000	83.6	83.7	83.8	83.6	84.7	81.6	80.5	75.2	70.8	71.0	72.7	75.5	75.9	78.4	71.2	69.3	136.6
OASPL	100.1	102.7	102.5	101.8	101.9	100.9	98.8	94.7	92.3	91.9	93.1	94.1	95.1	95.0	94.6	94.3	152.9
PNL	113.1	115.8	115.6	116.2	116.5	115.6	113.3	109.3	106.2	105.5	106.3	107.4	108.4	106.9	106.0	104.4	
PNLT	115.9	118.4	118.7	119.0	119.5	119.5	117.0	111.9	109.9	107.0	108.1	109.3	110.0	108.9	107.8	106.3	
DBA	100.7	103.7	103.4	102.6	102.8	101.7	99.5	95.0	92.2	91.1	92.1	93.1	93.8	92.3	90.5	88.9	

APNLW= 112.4 IPNLW= 126.1 LAPNLW= 102.5 LIPNLW= 109.7 TPNLW= 124.8

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C3AE107G/P 1 2180AO	06-09-83	PEEBLES 4D	150. FT ARC	2180.	14398.	SAE77	28.92	FULL SPHERE

GP MICS/HARDWALL INLET/GDR FREEFIELD CORR./#09811

ORIGINAL PAGE IS
OF POOR QUALITY

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT ARC

IDENTIFICATION

AVERAGE - C3AE107G/P 1 2320A0

INPUT - C3AE107G/P 1 X03080 C3AE107G/P 1 X03010
C3AE107G/P 1 X03140

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100	110.	120.	130.	140.	150.	160.	PWL
50	68.8	69.3	69.5	71.3	71.5	71.9	73.1	74.2	75.1	76.7	78.1	79.8	82.1	84.8	87.6	90.2	134.5
63	72.9	73.4	71.9	75.9	73.3	74.0	74.9	75.1	75.4	77.3	78.6	79.9	82.3	84.8	86.4	89.0	134.2
80	72.1	71.3	71.3	71.7	72.5	72.7	73.8	75.2	75.7	76.9	79.0	80.9	82.7	84.9	86.7	87.2	134.0
100	72.3	70.9	71.8	72.4	73.0	73.3	74.4	75.6	76.0	77.7	79.4	81.0	83.1	85.5	87.0	85.5	134.1
125	72.4	72.5	73.7	74.4	73.6	74.6	75.4	76.4	77.0	78.1	80.0	81.7	83.5	85.0	86.5	84.7	134.2
160	72.6	73.6	73.9	73.9	73.6	74.3	75.4	76.1	76.7	78.0	79.8	81.1	83.3	85.0	85.1	84.0	133.8
200	73.8	74.0	74.8	74.4	74.6	74.8	76.2	77.5	76.9	79.1	80.2	81.9	83.9	84.4	84.2	82.9	133.9
250	72.6	74.0	74.7	74.7	75.0	75.0	75.4	76.3	77.0	78.0	79.5	80.8	82.3	83.2	82.9	81.2	132.9
315	75.0	75.4	75.5	75.6	76.0	75.6	76.3	76.4	76.6	78.0	79.6	80.4	82.4	82.7	82.1	79.9	132.8
400	75.8	76.6	76.3	76.6	76.7	76.0	76.7	76.7	77.5	79.3	80.8	81.5	82.7	82.2	81.4	79.1	133.3
500	76.7	76.4	76.6	77.1	76.9	77.0	76.8	76.9	78.0	79.6	80.3	80.8	82.0	81.6	80.7	78.0	133.1
630	78.9	78.5	77.7	78.5	79.0	79.4	78.7	78.0	77.9	79.9	80.9	81.4	81.8	80.9	79.9	77.1	133.7
800	81.9	81.8	80.3	80.6	79.9	80.4	78.5	76.9	77.0	78.6	79.1	79.9	80.7	79.9	78.8	75.9	133.5
1000	85.1	85.1	84.5	84.2	83.5	83.3	81.3	79.0	77.8	78.7	78.9	79.2	79.8	79.3	77.8	75.9	135.4
1250	94.1	95.7	96.5	94.9	95.1	93.1	91.5	87.9	85.4	84.1	84.4	84.4	86.2	84.2	82.8	82.5	145.2
1600	86.9	87.8	87.7	86.4	86.0	84.6	83.8	80.6	78.5	78.9	79.4	79.9	80.1	79.3	77.9	77.0	137.4
2000	89.4	98.2	89.3	90.0	89.8	86.6	85.4	81.1	78.6	79.4	79.6	80.1	80.3	79.6	78.5	75.9	141.4
2500	91.9	99.0	93.6	96.6	94.1	92.2	91.2	87.1	83.3	82.1	82.1	84.1	84.3	82.6	81.5	79.1	145.5
3150	91.8	95.0	92.1	94.4	95.9	93.9	91.7	88.0	82.7	82.8	81.4	81.8	83.5	81.2	79.9	78.8	145.1
4000	91.8	92.7	90.8	92.9	94.4	92.4	90.4	86.7	87.6	87.3	82.0	82.5	83.9	80.7	79.2	77.5	144.0
5000	91.6	92.1	91.5	92.3	92.9	90.7	89.7	86.5	82.6	82.2	83.5	83.4	83.5	80.8	78.7	76.9	143.5
6300	89.2	90.4	89.6	91.2	89.9	88.7	87.5	83.0	78.6	78.8	81.0	83.2	84.[illegible]	80.6	77.7	75.7	141.8
8000	87.3	88.1	87.1	88.7	87.6	86.1	84.8	80.8	75.9	75.3	78.0	79.5	81.0	79.4	76.0	74.2	139.9
10000	85.1	85.7	84.9	85.8	85.5	83.7	82.0	78.0	73.3	73.4	74.7	77.3	77.7	76.6	72.6	71.0	138.2
OASPL	101.5	104.5	101.7	102.7	102.6	100.8	99.3	96.0	93.1	93.4	94.2	95.2	96.6	96.5	96.7	96.6	153.7
PNL	115.0	118.0	114.4	116.3	116.4	114.7	113.1	109.9	106.2	106.5	106.9	107.8	10[illegible].8	107.4	106.4	104.9	
PNLT	117.7	121.1	117.9	119.6	119.9	117.7	116.1	112.6	108.6	108.2	108.6	10[illegible].4	110.9	1[illegible]3.0	108.1	106.9	
DBA	102.2	105.5	102.4	103.5	103.4	101.5	99.9	96.2	92.7	92.5	92.9	93.7	94.7	92.9	91.5	89.9	

APNLW= 112.5 IPNLW= 125.6 LAPNLW= 103.8 LIPNLW= 111.4 TPNLW= 124.2

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C3AE107G/P 1 2320A0	06-09-83	PEEBLES 4D	150. FT ARC	2320.	16477.	SAE77	28.92	FULL SPHERE

GP MICS/HARDWALL INLET/6DB FREEFIELD CORR./#09811

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT ARC

IDENTIFICATION

AVERAGE - C3AE107G/P 1 2500A0

INPUT - C3AE107G/P 1 X03020 C3AE107G/P 1 X03150
C3AE107G/P 1 X03070

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90	100	110.	120.	130.	140.	150.	160.	PWL
50	70.3	71.1	71.2	73.4	73.9	74.0	75.2	76.6	77.7	79.1	80.8	83.0	84.9	87.8	91.0	93.5	137.6
63	73.7	74.4	74.1	77.6	75.5	75.5	76.7	77.5	78.0	79.2	81.0	[illegible]	85.4	[illegible]	89.8	92.6	137.2
80	74.2	73.2	73.6	73.7	74.3	74.9	76.2	77.5	78.4	79.8	81.7	83.6	85.6	88.1	90.1	90.8	137.0
100	74.0	73.1	74.4	74.9	75.2	75.5	76.9	77.9	78.7	80.5	82.0	84.2	86.1	88.5	90.1	88.8	137.1
125	74.3	74.8	75.9	76.3	75.8	76.7	77.7	78.5	79.4	80.7	82.5	84.4	85.9	88.2	89.6	88.2	137.0
160	74.1	75.3	75.4	76.0	75.9	76.4	77.4	78.5	79.2	80.6	82.3	84.3	85.9	87.7	88.3	87.2	136.5
200	75.1	76.3	76.9	77.2	77.4	76.9	78.0	79.8	79.7	82.2	82.8	84.7	86.4	87.4	87.5	86.2	136.7
250	74.6	76.2	77.0	77.3	77.3	77.4	78.1	78.6	79.4	80.7	82.4	84.0	85.4	[illegible]	86.3	84.2	135.9
315	76.2	77.2	77.5	77.6	78.1	77.6	78.3	78.9	79.5	80.8	82.1	83.7	84.9	85.8	85.1	82.8	135.5
400	77.3	78.0	78.3	78.8	78.9	78.1	78.5	79.0	80.3	82.0	83.6	84.2	85.2	85.1	84.7	81.9	135.9
500	77.9	78.0	78.4	78.8	79.1	78.2	79.0	79.3	80.3	81.9	82.9	83.8	84.6	84.6	83.3	80.5	135.6
630	80.8	80.6	79.9	80.7	81.5	80.8	80.3	80.3	81.1	83.1	81.4	83.6	84.4	83.7	82.7	79.9	136.2
800	82.3	82.4	81.5	81.9	82.3	82.1	81.5	79.8	79.9	80.8	82.4	82.7	83.4	82.6	81.6	79.1	135.9
1000	84.9	84.9	84.6	84.9	84.2	83.8	82.8	81.2	80.3	80.7	81.8	82.2	82.3	81.9	80.6	78.0	136.8
1250	97.9	96.4	98.4	96.8	97.1	96.8	95.5	93.1	88.8	87.5	89.2	89.9	88.0	85.4	85.5	85.0	148.0
1600	92.2	91.6	93.3	91.7	92.1	91.2	90.2	87.6	84.4	83.6	84.5	85.0	84.3	82.9	81.9	80.1	143.0
2000	87.4	88.7	87.7	87.7	86.7	85.8	84.8	81.8	79.8	80.2	80.7	82.1	81.7	80.6	79.0	76.5	138.5
2500	98.0	99.1	96.9	95.2	95.1	94.5	92.9	90.2	86.3	83.9	84.6	85.7	86.1	83.5	82.6	81.4	146.7
3150	92.5	93.2	92.8	93.1	92.4	90.3	89.2	86.1	82.9	81.3	82.2	84.1	85.1	81.7	80.0	77.9	143.3
4000	92.6	95.0	94.9	96.9	96.0	94.3	93.2	89.6	86.3	84.4	84.8	86.2	88.6	83.4	82.4	80.1	146.8
5000	92.1	92.8	91.9	92.8	92.9	91.9	91.2	87.5	85.2	85.3	85.6	87.9	85.4	81.9	80.1	78.2	144.5
6300	90.9	90.6	90.6	91.0	90.7	89.5	88.4	85.3	81.9	81.4	83.6	85.3	[illegible]	81.7	79.0	77.1	142.8
8000	88.2	88.7	88.7	89.3	88.4	87.0	86.1	82.5	78.5	78.0	80.8	[illegible]	84.3	82.3	78.3	76.3	141.2
10000	86.2	86.7	86.9	86.6	86.7	85.0	83.6	79.3	75.9	75.7	77.4	79.6	79.8	77.9	74.1	72.4	139.6
OASPL	103.6	104.0	103.9	103.6	103.3	102.4	101.3	98.7	96.1	95.9	97.1	98.5	99.1	99.1	99.7	99.8	155.3
PNL	117.2	118.0	117.0	117.4	116.9	115.6	114.7	111.9	109.3	108.6	109.5	111.1	112.0	109.5	108.7	107.0	
PNLT	120.3	120.7	120.1	120.3	119.9	118.7	117.7	114.8	111.5	110.3	111.5	113.2	113.6	110.5	110.1	109.0	
DBA	104.4	104.8	104.6	101.2	104.0	103.0	101.8	99.0	95.7	94.9	95.9	97.1	97.1	94.8	93.8	92.0	

APNLW= 115.2 IPNLW= 127.1 LAPNLW= 106.7 LIPNLW= 113.6 TPNLW= 125.8

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C3AE107G/P 1 2500A0	06-09-83	PEEBLES 4D	150 FT ARC	2500.	19209.	SAE77	28.91	FULL SPHERE

GP MICS/HARDWALL INLET/6DB FREEFIELD CORR./#09811

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C3AE107G/P 1 2800A0

INPUT - C3AE107G/P 1 X03160 C3AE107G/P 1 X03050
C3AE107G/P 1 X03030

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	74.2	74.9	75.6	77.5	77.8	78.0	79.1	80.5	81.5	83.3	85.2	87.3	89.0	92.6	96.5	99.9	142.9
63	76.8	77.0	76.5	79.4	78.5	78.5	80.1	81.6	82.0	81.3	85.6	87.0	89.9	92.6	95.1	98.6	142.3
80	78.2	77.1	77.4	77.7	78.3	79.2	80.3	81.8	82.7	84.0	86.1	88.1	90.6	93.3	95.7	96.4	142.2
100	79.3	77.9	78.6	79.3	79.9	79.9	81.0	82.2	83.0	84.7	86.4	88.5	90.8	93.5	95.8	94.6	142.1
125	79.4	79.0	79.8	80.1	80.2	80.8	81.9	82.7	83.9	85.2	86.9	89.1	91.2	93.7	95.3	93.9	142.2
160	78.6	79.8	79.7	80.3	80.3	80.7	81.8	82.9	83.3	85.0	87.0	88.8	90.8	93.4	94.2	93.0	141.7
200	78.9	80.3	80.8	81.3	80.7	81.4	82.3	84.0	84.0	85.7	87.4	89.1	91.4	92.6	93.4	91.8	141.6
250	78.0	80.0	81.0	81.2	81.1	81.3	82.3	83.3	84.0	85.4	87.1	88.6	90.4	91.8	91.9	89.7	140.8
315	79.2	80.2	80.6	81.5	81.9	81.6	82.7	83.3	83.9	85.2	87.1	88.1	89.9	91.2	90.9	88.4	140.4
400	79.6	81.0	81.3	81.8	82.2	81.7	83.1	83.0	84.4	85.8	87.7	88.9	89.6	90.5	89.8	87.2	140.4
500	80.4	80.6	80.9	82.0	82.2	82.2	83.0	83.7	84.4	85.8	87.1	88.4	89.6	89.5	88.8	85.6	140.0
630	82.3	82.5	82.2	82.6	82.6	82.8	83.4	84.0	85.7	86.1	87.6	88.1	89.1	89.1	87.8	84.7	140.1
800	82.5	84.1	83.7	83.8	83.4	83.1	83.1	83.4	84.0	85.4	86.4	87.1	87.8	87.7	86.6	83.2	139.3
1000	85.8	86.2	86.4	86.2	85.6	85.0	84.5	83.9	83.9	85.1	86.2	86.9	86.8	86.9	85.1	82.0	139.7
1250	90.9	91.0	92.2	91.7	92.8	92.2	92.8	89.8	87.0	85.9	86.5	87.9	87.4	86.7	85.5	83.4	144.1
1600	99.4	100.7	102.6	101.7	102.7	104.3	104.9	100.7	95.5	92.1	93.6	92.8	92.8	91.2	91.9	90.2	154.4
2000	88.2	89.2	88.6	89.0	88.9	87.8	87.5	85.5	83.9	84.2	85.0	86.0	85.5	85.0	83.3	80.6	141.0
2500	91.7	92.4	91.4	92.3	91.3	89.6	88.2	86.5	84.5	84.9	85.4	87.3	86.6	84.7	83.1	80.5	142.9
3150	97.9	97.5	97.4	98.1	97.7	95.9	96.0	93.4	89.8	88.1	88.3	89.7	86.8	86.9	85.7	83.3	148.8
4000	92.4	93.9	93.2	94.9	93.9	91.9	91.0	89.0	87.0	86.6	87.5	88.9	91.4	85.6	83.3	81.8	145.7
5000	93.6	95.1	94.9	95.7	95.3	93.4	93.0	90.6	88.9	88.2	90.0	91.6	90.2	85.6	84.1	82.3	147.1
6300	92.2	92.5	92.5	93.6	93.3	91.7	91.1	88.5	86.2	85.3	87.9	89.3	88.6	85.2	82.5	80.4	145.5
8000	89.0	90.2	89.6	91.6	90.8	89.0	88.6	85.3	83.1	82.3	85.1	86.9	87.6	84.6	80.8	78.9	143.7
10000	86.9	87.6	87.8	88.2	88.9	86.4	85.9	82.7	80.3	79.3	81.2	83.6	83.4	81.7	77.3	76.0	141.7
OASPL	104.3	105.1	105.7	105.8	106.1	106.3	106.6	103.3	100.3	99.8	101.2	102.3	103.4	104.1	105.2	105.5	158.8
PNL	118.1	118.4	118.5	119.1	118.8	119.0	119.3	116.4	113.3	112.3	113.6	114.[illegible]	115.6	113.6	113.2	111.5	
PNLT	121.4	121.9	122.5	122.9	122.8	124.9	125.4	121.6	116.6	114.7	116.2	116.6	117.7	115.4	115.7	114.3	
DBA	105.0	105.7	106.5	106.5	106.8	107.0	107.4	103.8	100.1	98.6	99.9	100.6	100.9	99.2	98.4	96.3	

APNLW= 118.6 IPNLW= 129.3 LAPNLW= 108.9 LIPNLW= 110.7 TPNLW= 128.0

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C3AE107G/P 1 2800A0	06-09-83	PEEBLES 4D	150. FT ARC	2800.	25362.	SAE77	28.91	FULL SPHERE

GP MICS/HARDWALL INLET/GDB FREEFIELD CORR./#C9811

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16214ES/FSDR/RPMAVG

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R H. DAY, SAE 150 0 FT. ARC

IDENTIFICATION

AVERAGE - C3AE107G/P 1 3100A0

INPUT - C3AE107G/P 1 X03040 C3AE107G/P 1 X03060
C3AE107G/P 1 X03170

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	77.9	78.6	78.7	80.1	80.8	81.7	83 0	84.1	85.1	86.8	88 6	90.8	93.5	97.3	101.9	106.2	148.3
63	80.6	80.3	80.0	81.3	82.0	82.2	83.8	85.0	85.7	87.2	89.0	91.0	94.3	97.8	100.6	104.8	147.5
80	82.9	81.6	81.4	81.8	82.3	83.2	84 0	85.4	86 6	87.9	89 8	92 0	94 7	97.9	100.9	102.2	147.0
100	83.7	82.5	82.6	83.2	83.6	84.0	85 3	85.9	87.1	88.4	90.6	92.9	95.3	98.4	101.0	100.4	147.0
125	82.8	82.9	83.2	83.9	83.9	84.5	85.4	86.7	87.6	88 9	91.1	93.2	95.6	98.3	100.8	99.3	146.9
160	82.3	83.7	83.3	84.4	83.9	84 2	85.5	86.5	87.2	88.8	91.1	93.1	95.7	98.2	99.6	98.3	146.4
200	81.6	84 0	84.8	85.0	85.0	84 9	86.1	87 2	87.6	89 2	91.3	93.3	95.6	97.8	98.7	97.6	146.2
250	81.7	83.7	84.8	85.2	84.9	85.3	85.9	86.9	87.9	89.2	91.2	93 2	95.1	97.1	97.4	95.3	145.5
315	82.3	83.1	84.6	85.1	85.6	85.2	86.4	86.8	88.0	89.2	91.2	92 9	95.0	96.4	96.0	93.8	145.1
400	81.7	83.8	84.1	85.2	85.5	85.6	86.5	87.4	88.5	89.9	91.7	93.3	94.8	95.6	95.1	92.3	144.9
500	82.9	83.5	84.5	85.7	85 5	85.7	86.9	87.4	88.7	90.1	91.3	93.0	94.3	94.6	94.0	91.1	144.5
630	84.0	85.0	86.5	86.8	85.9	87.1	87.9	88.2	88.9	90 3	91.2	93.0	93.8	93 9	93.0	89.9	144.5
800	86.3	87.4	85.7	86.3	85.9	86.0	86 7	87.5	88.3	89 4	90 5	92.4	93.1	92 9	91.5	88.4	143.7
1000	90.1	89.2	92.6	90.3	91.7	91.2	91.7	91.9	90.2	89.6	90.6	92.1	91.9	92.2	90.2	88.1	145.4
1250	91.2	91.3	91.4	90.5	91.6	90.3	90.8	89.7	89.2	89 6	90.1	91.7	91.5	91 3	89.7	86.6	144.8
1600	100.7	101.3	103.0	104.1	103.5	102.1	102.0	100.7	97.7	95 5	91.4	95.2	94.1	93.6	92.6	90.9	154.3
2000	93.9	94.7	95.3	95.8	95.5	94 8	94 2	93.3	91.6	90.5	90 5	91.4	90.6	90.3	88.6	86.2	147.5
2500	92.2	93.2	92.6	93.1	92.8	92.4	92.1	90.7	90.1	89.4	89.7	90.3	89.6	88.8	86.9	84.5	145.6
3150	96.9	98.4	97.2	98.5	97.4	96.1	96.5	93.5	92.7	91.8	92.0	91.9	90.9	89.9	87.9	85.4	149.5
4000	93.0	93.2	92.8	93.8	93.7	92.1	92.1	90.4	89.9	89.4	89.8	91.0	89.3	87.8	85.9	84.2	146.2
5000	93.9	94.3	93.8	95.0	94.4	93.1	92.8	91 2	91.2	90.9	91.3	92.9	90.5	87.7	86.4	84.2	147.4
6300	91.4	91.2	91.4	92.7	91.6	90.1	90 1	88.3	88 3	89 5	91.2	92.0	91.5	88.5	85.7	83.9	146.0
8000	88.4	88.9	89.1	90.4	89.2	87.5	87.2	85.7	85.1	85.6	89.0	89.7	88.3	87.1	83.5	81.4	143.9
10000	86.0	86.0	86.5	87.0	86.8	84.7	84.5	82.3	82.1	82.6	84.5	86.5	85.8	84.7	81.1	79.0	141.8
OASPL	105.1	105.8	106.4	107.3	106.8	105.7	105.8	104.7	103.6	103.6	104.6	106.1	107.2	108.8	110.3	111.3	160.9
PNL	118.4	119.4	119.3	120.2	119.8	118.7	118.8	117.8	116.4	116 2	116.9	117 8	117 6	117.4	116.5	114.9	
PNLT	121.1	122.2	122.6	123.9	123.1	121.9	122.0	120 8	118.8	118.0	118.3	119.0	119.6	118 3	117.6	116.4	
DBA	105.7	106.4	107.0	107.9	107.4	106 2	106.2	104 8	103.2	102 4	102.8	103.9	103 6	103.2	102.2	99.9	

APNLW= 121.1 IPNLW= 130.0 LAPNLW= 113.6 LIPNLW= 111.6 TPNLW= 128.5

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C3AE107G/P 1 3100A0	06-09-83	PEEBLES 4D	150. FT ARC	3100.	32563.	SAE77	28.92	FULL SPHERE

GP MICS/HARDWALL INLET/GDB FREEFIELD CORR./#09811

P1100-08

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Appendix 9.1.24

16214ES/FSDR/RPMAVG   11/14/83   9.060   PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE   150.0 FT. ARC

IDENTIFICATION

AVERAGE - C4AE109G/P 1   1820AO

INPUT - C4AE109G/P 1   X03360   C4AE109G/P 1   X03440
C4AE109G/P 1   X03230

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	65.7	64.9	64.7	67.8	64.1	65.1	66.1	67.2	67.7	68.7	70.4	72.0	74.1	75.5	77.1	79.6	125.4
63	69.8	68.6	68.4	76.7	67.0	67.4	68.2	68.0	67.9	70.4	71.2	72.1	70.5	75.5	76.9	82.0	127.5
80	68.2	66.7	65.2	64.4	65.3	66.0	66.1	67.1	68.3	69.8	70.7	72.2	73.9	75.6	76.3	76.3	124.9
100	68.0	66.8	66.7	66.5	66.9	66.6	66.6	68.0	70.3	72.4	72.9	73.1	74.3	76.4	76.9	75.5	125.9
125	69.3	68.4	68.3	67.8	67.5	67.6	68.3	68.9	69.7	70.8	72.3	73.4	74.8	76.3	76.5	78.1	126.1
160	70.3	69.1	68.9	68.9	67.8	67.3	67.5	69.1	69.0	70.4	71.5	73.0	74.6	75.8	75.0	74.4	125.4
200	70.1	69.8	71.1	69.9	69.0	69.0	68.2	71.1	69.6	71.3	72.7	73.6	75.3	75.2	74.0	73.6	125.9
250	70.7	69.9	71.1	70.9	70.1	69.4	69.0	68.9	69.9	70.9	72.1	72.9	73.9	74.9	72.9	72.2	125.5
315	72.3	72.0	72.8	72.8	71.8	70.7	69.9	69.8	70.3	71.5	72.8	73.6	74.3	75.1	73.1	71.9	126.3
400	73.6	73.3	73.8	74.1	72.9	71.9	70.8	71.3	72.2	73.4	75.5	76.0	75.6	76.6	74.2	72.7	127.9
500	74.2	73.3	73.9	74.6	74.5	73.6	72.8	71.7	74.1	74.9	75.3	76.2	75.7	76.2	73.1	71.1	128.5
630	75.5	75.1	75.1	75.6	74.4	72.5	72.2	71.2	73.0	74.4	75.4	76.1	75.8	75.0	72.6	70.5	128.3
800	80.6	79.3	78.0	78.9	77.7	75.8	73.4	72.9	73.3	74.8	76.1	76.6	77.5	77.1	73.4	71.8	130.4
1000	90.8	88.5	88.0	90.7	88.4	86.5	81.3	84.0	80.8	82.6	84.1	86.7	84.2	89.6	83.9	82.3	140.4
1250	82.8	81.9	81.0	81.1	80.2	79.5	75.1	73.9	74.1	75.7	77.1	79.0	81.1	78.0	74.3	72.0	132.7
1600	93.5	90.2	86.9	91.7	87.7	82.6	78.9	78.2	78.3	81.7	80.9	87.4	84.5	81.4	78.1	75.9	139.7
2000	90.9	89.9	90.4	93.0	88.3	84.6	80.9	77.3	77.2	79.9	81.0	85.7	85.9	82.6	78.2	76.2	140.3
2500	85.3	86.6	93.5	93.6	95.1	89.4	86.1	79.8	77.3	79.0	80.0	81.8	81.3	79.1	76.7	75.1	142.6
3150	84.1	85.7	88.6	89.3	90.0	86.4	82.1	76.9	77.1	78.9	82.0	81.5	83.1	80.1	76.8	74.9	139.2
4000	85.1	86.7	84.2	84.7	83.3	80.8	77.3	74.4	75.8	78.0	79.9	81.1	81.2	79.1	75.5	73.4	135.9
5000	84.6	85.6	84.7	86.0	83.7	82.6	78.2	75.9	78.3	80.9	82.5	84.5	87.4	83.6	79.8	76.6	138.2
6300	88.7	86.5	86.4	85.9	82.7	80.0	76.5	73.5	75.4	77.9	81.4	83.3	83.8	82.0	77.2	74.8	137.6
8000	82.2	83.3	82.6	84.0	82.6	79.2	75.6	71.2	71.7	74.3	77.6	79.7	80.7	80.6	75.2	72.8	135.6
10000	78.9	79.7	79.3	80.4	78.0	76.2	72.9	68.8	68.5	71.1	73.2	75.8	75.9	76.8	71.6	68.3	132.6
OASPL	98.6	97.4	98.3	99.8	98.7	94.8	91.1	88.9	88.4	90.5	92.0	94.6	94.5	94.1	90.6	89.9	149.4
PNL	110.6	109.8	112.4	113.1	112.9	108.7	105.5	101.5	101.2	103.4	105.2	107.1	108.4	106.3	102.8	100.7	
PNLT	113.6	112.4	115.2	116.6	116.1	111.7	107.8	105.1	103.5	105.9	107.7	110.0	110.0	110.3	106.1	104.2	
DBA	99.2	98.1	99.2	100.6	99.6	95.5	91.7	88.9	88.3	90.5	92.0	94.8	91.5	93.8	89.4	87.4	

APNLW= 113.0   IPNLW= 122.2   LAPNLW= 101.8   LIPNLW= 104.1   TPNLW= 121.1

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C4AE109G/P 1 1820AO	06-14-83	PEEBLES 40	150 FT ARC	1820.	9785.	SAE77	28.90	FULL SPHERE

GP MICS/PERFORMANCE INLET-HWI/6DB FREEFIELD CORR./#21092

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Appendix 9.1.25

16214ES/FSDR/RPMAVG 11/14/83 9.060 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C4AE109G/P 1 2030A0

INPUT - C4AE109G/P 1 X03350 C4AE109G/P 1 X03240
C4AE109G/P 1 X03370

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	67.7	67.3	67.1	69.1	67.4	68.3	69.6	70.8	71.4	72.6	74.2	75.9	77.7	80.0	82.0	84.4	129.6
63	71.8	71.2	70.0	76.8	70.2	71.4	71.3	71.2	71.5	73.4	74.6	75.9	80.4	80.3	81.2	84.2	130.3
80	71.0	69.6	68.1	67.7	69.3	69.8	69.6	70.9	72.3	73.1	74.6	76.5	78.2	79.9	81.0	81.2	129.1
100	70.2	68.8	69.1	69.4	69.9	69.9	70.2	71.7	72.2	74.1	75.1	76.7	78.6	80.7	81.3	80.1	129.5
125	70.9	70.3	71.0	71.1	70.4	70.6	71.4	72.1	72.9	74.2	75.9	77.3	78.8	80.1	80.7	80.6	129.7
160	71.6	71.0	71.6	71.4	69.9	71.1	70.7	72.2	72.4	74.1	75.2	76.6	78.4	80.0	79.4	78.4	129.1
200	72.3	72.9	73.7	72.7	71.7	72.1	71.6	73.1	73.4	74.9	75.9	76.7	78.8	79.1	78.3	77.7	129.3
250	71.6	71.5	73.2	73.1	72.2	71.7	71.4	72.4	73.1	74.0	75.1	76.1	77.4	78.0	76.8	75.7	128.5
315	74.8	73.9	74.9	74.6	74.1	73.0	72.6	72.6	72.9	74.5	75.6	76.1	77.5	77.8	76.8	74.7	129.0
400	75.1	75.0	75.8	75.3	74.5	73.0	72.9	73.3	74.3	75.8	77.2	78.4	78.7	78.2	77.3	74.5	130.0
500	75.4	75.2	76.1	76.3	75.8	74.1	74.1	74.1	75.3	77.1	77.6	77.7	78.4	78.0	75.7	74.1	130.3
630	77.4	76.5	77.7	77.6	76.2	74.6	74.6	74.2	75.8	77.6	78.4	78.1	78.7	77.9	75.6	73.1	130.9
800	80.9	80.5	79.9	79.4	78.7	76.8	75.2	74.7	75.1	77.1	78.4	78.7	79.3	77.2	75.2	73.2	131.8
1000	87.8	90.0	89.8	89.4	89.3	87.5	84.4	81.8	81.6	82.3	84.8	86.2	84.7	85.7	81.7	80.4	140.3
1250	87.3	88.6	88.4	88.5	88.0	86.5	83.2	80.6	80.6	81.8	83.5	85.2	85.4	84.9	80.9	79.2	139.4
1600	85.0	86.0	84.4	84.7	82.9	81.8	78.9	76.7	78.1	80.5	81.5	83.0	85.0	80.7	77.4	75.2	136.3
2000	93.9	96.6	93.5	94.4	90.0	88.4	85.0	81.2	80.8	85.1	83.8	87.9	89.3	84.2	80.5	78.3	143.4
2500	89.4	87.9	88.9	91.1	89.0	86.3	82.3	78.8	79.0	80.8	82.5	87.3	85.6	81.8	79.2	76.5	140.2
3150	88.8	92.7	95.3	96.1	96.5	94.5	88.8	83.4	81.3	82.2	84.0	85.9	86.6	82.6	80.1	78.8	145.5
4000	87.5	87.7	87.1	87.6	85.8	84.7	81.5	77.4	78.6	81.6	82.2	84.5	85.0	81.4	78.4	75.9	138.8
5000	87.4	88.5	88.8	90.6	87.4	84.7	81.1	77.9	80.3	82.4	84.1	85.9	85.9	81.3	78.6	76.7	140.3
6300	86.7	87.0	87.4	88.7	86.8	86.1	81.5	77.1	78.3	81.2	84.5	86.4	87.9	84.7	81.1	78.4	140.5
8000	84.2	84.9	85.1	86.1	82.7	81.3	78.0	73.7	74.4	77.2	80.3	82.8	83.6	81.8	77.3	74.8	137.6
10000	82.4	82.9	83.1	83.4	81.0	79.4	75.7	71.5	71.9	74.3	76.1	79.8	79.8	78.5	74.3	71.4	135.8
OASPL	99.0	100.7	100.4	101.3	100.0	98.2	94.0	90.8	90.9	93.0	94.4	96.6	97.2	95.1	93.1	92.5	151.6
PNL	112.3	114.0	114.8	115.7	114.9	113.2	108.8	104.9	104.3	106.0	107.6	109.8	110.3	107.5	105.0	103.4	
PNLT	114.5	117.2	117.3	117.9	117.9	116.2	111.1	106.7	105.6	107.5	108.8	111.2	111.7	109.0	106.2	104.8	
DBA	99.7	101.5	101.2	102.1	100.8	98.9	94.6	90.8	90.8	93.0	94.3	96.7	97.2	94.2	90.9	88.9	

APNLW= 114.7 IPNLW= 124.8 LAPNLW= 102.8 LIPNLW= 106.1 TPNLW= 123.7

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C4AE109G/P 1 2030A0	06-14-83	PEEBLES 4D	150. FT ARC	2030.	12435.	SAE77	28.86	FULL SPHERE

GP MICS/PERFORMANCE INLET-HWL/6DB FREEFIELD CORR./#21092

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Appendix 9.1.26

16214ES/FSDR/RPMAVG 11/14/83 9.060 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C4AE109G/P 1 2180A0

INPUT - C4AE109G/P 1 X03250 C4AE109G/P 1 X03340
C4AE109G/P 1 X03380

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	67.9	67.9	67.8	70.0	69.3	70.2	71.3	72.5	73.5	74.9	76.5	78.3	79.9	82.5	84.9	87.3	132.1
63	71.4	70.8	69.9	77.2	71.3	72.1	72.4	73.5	74.6	76.0	76.6	78.0	82.1	82.8	83.9	86.8	132.5
80	71.2	70.3	69.7	69.9	71.2	70.8	71.4	72.9	74.2	75.2	76.9	78.8	80.5	82.9	83.8	84.3	131.6
100	70.7	69.5	70.5	70.9	71.2	71.3	72.1	73.3	74.2	76.1	77.5	79.5	81.0	83.1	84.0	82.8	131.8
125	71.3	71.2	72.3	72.3	71.6	72.2	73.0	74.1	75.0	76.3	77.9	79.7	81.2	82.7	83.6	82.4	131.9
160	72.0	72.4	73.2	72.7	71.3	72.5	72.6	74.0	74.6	76.1	77.7	79.3	80.7	82.3	82.1	81.4	131.4
200	74.0	74.4	75.7	73.5	73.8	73.3	73.8	75.6	75.4	76.9	78.2	79.8	81.1	82.0	81.1	80.5	131.8
250	72.7	73.2	74.6	74.6	73.9	73.4	73.2	74.1	75.0	75.9	77.5	78.5	79.8	80.8	80.0	78.1	130.8
315	75.7	75.2	76.2	76.2	75.7	74.6	74.2	74.6	75.4	76.4	77.7	78.5	79.7	80.4	79.4	77.3	131.0
400	76.1	76.4	76.2	76.5	76.3	74.6	74.8	75.2	76.5	78.2	79.6	79.9	80.2	80.3	79.1	76.4	131.8
500	76.3	76.0	76.4	77.5	76.8	75.4	75.0	75.5	76.3	78.0	79.6	79.7	80.1	79.5	77.9	75.6	131.7
630	78.1	77.8	77.5	78.8	77.6	76.3	76.0	76.2	76.7	79.0	80.6	80.3	80.2	79.5	77.6	74.8	132.5
800	81.5	80.6	79.6	80.3	79.6	78.2	76.8	76.5	76.9	78.0	79.9	80.1	80.7	79.1	76.8	74.7	133.0
1000	85.3	85.6	85.3	85.2	85.7	85.2	81.9	80.3	80.0	81.3	82.7	85.9	83.6	83.9	80.3	78.7	137.7
1250	91.7	93.9	94.0	93.5	94.8	94.3	90.5	88.2	88.3	87.0	88.0	94.6	91.4	94.5	89.0	88.6	146.3
1600	85.0	85.5	85.1	85.2	84.7	83.4	80.7	78.6	80.3	82.3	83.3	84.9	85.8	82.2	79.0	77.7	137.6
2000	94.7	95.4	97.8	91.4	90.4	85.6	82.5	80.5	81.2	83.6	84.3	88.7	87.6	83.3	80.0	78.4	143.5
2500	92.2	93.2	93.3	93.9	93.9	91.4	87.3	83.7	84.5	84.6	85.6	90.8	92.0	84.8	81.7	79.8	144.5
3150	91.9	97.1	97.2	100.7	99.6	95.3	89.9	85.8	84.7	84.9	86.4	87.6	87.9	84.4	82.3	80.7	148.4
4000	87.2	88.9	91.9	92.2	91.6	90.2	87.2	82.7	82.8	84.9	87.0	90.1	89.1	86.7	83.2	80.6	143.5
5000	87.7	88.9	89.3	90.2	89.2	88.5	86.0	81.7	82.8	84.5	85.8	87.5	86.7	83.0	80.7	78.5	141.8
6300	85.8	86.9	88.0	90.0	88.6	87.0	82.7	80.2	81.4	84.2	86.8	89.8	90.7	86.8	83.2	80.5	142.5
8000	83.6	84.8	85.7	87.6	85.1	83.5	80.2	75.6	76.8	80.3	83.6	85.5	85.5	83.7	79.4	77.1	139.5
10000	81.8	82.8	83.4	84.7	83.2	81.3	77.7	71.7	73.5	76.1	78.8	82.2	81.8	80.7	76.4	73.6	137.4
OASPL	100.3	102.2	103.1	103.7	103.1	100.5	96.7	93.8	94.2	95.1	96.7	100.1	99.6	98.7	96.1	95.6	154.2
PNL	113.3	116.4	116.8	118.8	117.8	114.7	110.7	107.4	107.4	108.4	110.2	113.0	113.3	110.6	107.7	105.9	
PNLT	115.5	119.1	119.8	121.5	121.0	118.9	113.7	110.3	110.1	110.1	111.8	116.7	115.6	115.0	110.8	109.3	
DBA	101.1	103.1	104.1	104.6	104.0	101.3	97.3	94.1	94.3	95.1	96.6	100.4	99.7	98.1	94.1	92.7	

APNLW= 117.9 IPNLW= 127.3 LAPNLW= 108.5 LIPNLW= 110.3 TPNLW= 126.5

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C4AE109G/P 1 2180A0	06-14-83	PEEBLES 4D	150. FT ARC	2180.	14445.	SAE77	28.86	FULL SPHERE

GP MICS/PERFORMANCE INLET-HWL/6DB FREEFIELD CORR./#21092

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OF POOR QUALITY

Appendix 9.1.27

16214ES/FSDR/RPMAVG 11/14/83 9.060 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C4AE109G/P 1 2320A0

INPUT - C4AE109G/P 1 X03330 C4AE109G/P 1 X03390
C4AE109G/P 1 X03260

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	69.7	69.6	69.2	71.2	71.1	71.9	72.7	74.1	75.1	76.5	78.6	80.4	82.4	85.0	87.3	90.0	134.5
63	73.7	73.9	71.1	77.1	72.6	72.9	74.0	74.9	76.0	77.5	78.6	80.0	83.5	84.9	86.2	88.7	134.3
80	71.6	71.1	71.0	71.3	72.1	72.5	73.5	75.0	76.2	77.2	79.4	80.7	82.8	85.1	86.5	87.2	134.0
100	72.1	70.9	72.2	72.4	72.5	73.0	74.1	75.2	76.1	77.9	79.5	81.2	83.0	85.3	86.4	85.4	134.0
125	72.6	72.8	74.3	74.4	73.5	74.4	75.0	75.8	77.1	78.4	80.2	81.7	83.4	85.0	85.9	84.7	134.1
160	73.7	74.1	74.6	74.5	73.6	74.6	74.8	75.9	76.7	78.3	79.9	81.0	83.0	84.8	84.7	84.0	133.7
200	75.5	75.8	76.2	75.4	75.5	75.2	75.0	77.7	77.4	79.5	80.2	81.7	83.7	84.1	83.7	82.6	133.9
250	74.6	75.2	76.3	76.4	75.7	75.8	75.4	75.8	77.3	78.3	79.7	80.9	82.5	83.3	82.6	80.8	133.1
315	77.3	76.7	77.4	77.3	76.9	76.0	76.1	76.6	77.2	78.3	79.9	80.5	82.1	82.5	81.5	79.5	133.0
400	77.2	77.9	78.0	78.2	77.6	76.4	76.4	76.8	77.8	79.8	81.2	81.5	82.4	82.4	81.0	78.9	133.6
500	77.9	77.6	77.8	78.5	77.8	77.1	76.3	76.9	78.2	80.0	81.0	81.3	82.1	81.7	80.1	77.7	133.4
630	79.6	79.4	79.5	80.5	79.7	78.4	77.9	78.0	78.8	81.1	81.6	81.7	82.0	81.4	79.8	77.0	134.2
800	82.0	81.5	81.0	81.6	80.8	79.6	78.2	77.8	78.2	79.8	81.0	81.5	82.3	80.8	78.7	76.6	134.4
1000	85.0	84.8	84.1	84.5	84.1	83.4	80.8	79.3	79.8	81.6	82.7	83.7	84.2	81.5	79.2	77.1	136.7
1250	92.8	93.7	93.4	96.1	97.2	95.6	93.2	89.3	89.0	90.7	92.1	92.7	99.0	92.6	88.5	87.9	140.2
1600	86.5	87.5	86.7	87.1	86.5	85.4	83.0	80.8	81.8	83.5	84.8	86.2	87.3	83.9	81.3	79.2	139.2
2000	92.8	97.7	91.2	91.4	88.7	85.3	82.6	80.5	82.0	83.5	84.7	87.6	86.2	82.8	79.8	78.1	142.2
2500	99.5	98.8	94.2	95.3	93.2	92.3	88.9	85.6	84.7	86.3	87.2	91.4	90.5	86.1	82.8	81.5	146.0
3150	92.1	94.9	93.8	98.4	95.9	96.1	90.0	85.0	83.4	85.0	86.4	87.7	87.7	83.8	81.1	80.2	146.6
4000	90.6	92.5	93.0	96.0	94.3	94.2	89.3	84.3	83.2	85.8	86.4	88.0	87.8	94.0	81.3	80.2	145.4
5000	90.9	91.7	91.2	92.1	92.2	91.5	88.1	83.8	84.5	86.2	86.5	87.5	87.9	83.9	81.6	80.2	143.8
6300	88.6	89.7	89.8	91.1	89.0	88.4	85.2	81.9	82.8	85.4	87.7	90.2	91.8	86.7	83.1	81.4	143.6
8000	86.1	87.1	87.9	88.8	86.7	86.0	82.8	77.9	78.5	81.7	83.7	85.9	86.9	85.4	81.1	79.2	141.0
10000	83.3	84.5	85.2	85.3	84.0	83.1	80.5	74.3	75.1	78.3	79.7	82.6	82.8	81.7	77.6	75.0	138.6
OASPL	102.9	104.0	101.8	104.0	102.8	102.1	98.4	95.0	95.0	96.9	98.2	99.8	102.2	98.8	97.4	97.3	155.0
PNL	117.4	117.7	115.3	118.1	116.3	116.0	111.6	108.0	107.7	109.7	110.7	113.2	113.8	110.4	107.9	106.7	
PNLT	120.5	120.3	117.9	121.6	120.3	119.7	115.4	111.1	110.4	112.4	113.5	115.8	118.2	113.7	110.7	109.9	
DBA	103.8	105.0	102.5	104.8	103.5	102.8	99.0	95.1	95.0	96.8	98.0	99.8	102.3	97.4	94.2	92.9	

APNLW= 117.9 IPNLW= 126.5 LAPNLW= 110.4 LIPNLW= 111.5 TPNLW= 125.6

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C4AE109G/P 1 2320A0	06-14-83	PEEBLES 4D	150. FT ARC	2320.	16713.	SAE77	28.89	FULL SPHERE

GP MICS/PERFORMANCE INLET-HWI/6DB FREEFIELD CORR./#21092

Appendix 9.1.28

16214ES/FSDR/RPMAVG 11/14/83 9.060 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C4AE109G/P 1 2500A0

INPUT - C4AE109G/P 1 X03400 C4AE109G/P 1 X03320
C4AE109G/P 1 X03270

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	70.6	70.4	71.0	73.6	73.6	74.4	75.4	76.5	77.8	79.3	81.0	82.6	84.9	87.9	90.6	93.9	137.6
63	72.6	72.5	72.6	78.3	74.6	75.0	76.0	77.4	78.5	80.0	81.4	82.6	85.7	87.6	89.3	92.1	137.0
80	73.5	73.0	73.2	73.6	74.3	75.2	76.0	77.8	78.6	80.2	81.6	83.2	85.4	87.9	89.7	90.5	136.8
100	74.3	73.0	74.4	74.9	74.9	75.5	76.5	77.8	78.8	80.5	82.0	84.0	85.6	88.3	89.6	88.6	136.8
125	74.6	75.0	76.3	76.4	75.7	76.5	77.4	78.4	79.4	80.8	82.7	84.3	85.8	87.9	89.2	87.8	136.8
160	75.8	75.9	76.5	76.5	75.7	76.7	77.0	78.5	79.3	81.0	82.4	84.0	85.5	87.7	87.9	86.9	136.4
200	77.0	77.4	77.4	77.8	77.4	77.4	77.9	79.4	80.4	82.0	83.0	84.4	85.9	87.6	87.0	85.8	136.6
250	76.2	77.0	78.3	77.9	77.8	77.7	77.9	78.9	79.8	81.2	82.5	83.6	85.3	86.3	85.7	83.9	135.8
315	78.3	78.0	78.7	79.0	78.8	78.0	78.2	78.8	79.7	80.9	82.3	83.4	84.5	85.5	84.7	82.4	135.5
400	79.0	79.5	79.6	80.0	79.0	78.1	78.8	79.2	80.5	82.6	83.5	83.7	85.2	85.3	83.9	81.6	136.0
500	79.3	78.9	79.2	79.9	79.7	78.7	78.6	79.1	80.6	82.1	82.9	81.8	84.5	84.5	83.2	80.6	135.7
630	81.2	80.8	80.1	81.6	81.7	80.9	80.1	79.9	81.0	83.1	83.5	83.9	81.4	83.8	82.6	79.4	136.3
800	82.9	82.8	81.8	82.3	82.4	80.9	80.0	80.0	80.5	82.2	83.1	83.9	81.3	83.1	81.5	79.0	136.3
1000	85.2	84.8	84.3	84.7	84.6	83.7	81.8	81.0	81.6	82.8	82.9	85.2	84.8	92.9	81.0	78.9	137.6
1250	96.7	95.8	96.1	98.9	99.2	99.0	95.1	92.9	90.0	89.9	95.1	98.8	99.5	92.2	90.0	88.6	150.5
1600	91.7	92.0	92.1	93.8	94.3	93.9	90.5	88.0	86.6	87.0	90.5	93.4	93.9	89.9	86.8	84.3	145.8
2000	88.2	88.4	87.5	87.8	86.8	85.6	83.6	81.9	83.0	84.9	86.4	88.1	85.9	83.8	81.0	78.9	140.2
2500	97.6	100.1	94.7	95.8	93.9	93.4	90.9	87.2	87.8	88.6	88.8	92.7	91.2	86.6	84.0	82.4	146.9
3150	91.6	94.4	92.4	93.4	91.6	90.0	87.7	85.1	86.1	87.4	89.1	91.6	90.4	86.2	83.4	81.3	144.5
4000	93.9	96.8	95.0	95.9	96.1	95.2	91.7	87.6	87.1	89.3	89.5	92.9	93.0	88.2	85.2	83.3	147.6
5000	91.3	92.3	92.2	93.2	92.8	92.5	90.1	85.8	86.7	88.4	89.5	91.9	90.3	85.8	83.7	81.9	145.5
6300	89.2	90.2	91.0	91.4	90.1	89.3	87.1	83.6	85.1	88.1	90.2	92.1	90.7	86.7	83.3	81.6	144.6
8000	87.0	88.5	88.5	89.9	87.8	86.6	84.5	80.5	81.6	84.9	88.0	90.8	91.2	88.7	83.9	81.4	143.6
10000	84.7	86.2	86.0	86.9	85.8	84.4	82.0	76.9	78.3	81.5	83.4	86.9	86.4	84.2	79.9	77.2	141.0
OASPL	103.1	104.6	102.8	104.3	103.9	103.4	100.3	97.8	97.4	98.8	101.0	103.8	103.9	101.0	100.2	100.2	156.6
PNL	116.9	118.7	116.3	117.3	116.9	116.2	113.5	110.5	110.6	112.4	113.6	116.3	116.3	113.0	110.7	109.1	
PNLT	119.6	121.6	118.9	120.5	120.2	119.6	116.5	113.3	112.6	114.1	116.2	119.5	119.7	114.9	112.8	111.4	
DBA	103.9	105.5	103.5	104.9	104.5	104.0	100.8	98.0	97.3	98.7	100.9	103.9	103.9	99.1	96.5	94.6	

APNLW= 120.6 IPNLW= 126.8 LAPNLW= 112.2 LIPNLW= 113.9 TPNLW= 126.3

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C4AE109G/P 1 2500A0	06-14-83	PEEBLES 4D	150 FT ARC	2500.	19471.	SAE77	28.89	FULL SPHERE

GP MICS/PERFORMANCE INLET-HWL/6DB FREEFIELD CORR /#21092

ORIGINAL PAGE IS OF POOR QUALITY

Appendix 9.1.29

16214ES/FSDR/RPMAVG   11/14/83   9.060   PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT ARC

IDENTIFICATION

AVERAGE - C4AE109G/P 1   2800A0

INPUT - C4AE109G/P 1   X03410   C4AE109G/P 1   X03300
C4AE109G/P 1   X03200

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	74.3	74.2	74.8	76.9	77.4	78.6	79.4	80.7	82.1	83.5	85.2	86.8	89.4	92.9	95.9	100.2	142.9
63	76.6	78.0	77.9	81.4	78.7	79.4	80.3	81.3	81.9	84.0	85.5	87.0	89.7	92.6	94.5	97.9	142.0
80	77.9	76.5	77.0	77.4	78.0	78.8	80.0	81.5	82.6	84.1	86.0	87.8	90.2	93.0	94.9	96.6	141.9
100	79.1	77.6	79.0	79.1	79.3	79.8	80.7	82.1	83.1	84.9	86.5	89.3	90.5	93.5	95.2	94.7	141.9
125	79.4	78.6	79.4	79.9	79.7	80.6	81.1	82.8	83.6	85.1	86.8	88.8	90.9	92.9	94.8	93.6	141.8
160	78.8	79.4	79.7	80.2	79.6	80.5	80.9	82.3	83.4	84.9	86.4	88.5	90.5	92.8	93.4	93.0	141.3
200	79.4	80.0	80.9	80.9	81.0	81.1	81.7	83.3	84.0	85.7	87.0	88.8	90.9	92.4	92.6	91.6	141.2
250	79.0	79.9	80.9	81.2	81.1	81.3	81.7	82.9	84.8	85.0	86.9	88.3	90.0	91.7	91.2	89.6	140.5
315	80.0	80.4	81.6	82.0	81.6	81.7	81.9	82.6	83.8	85.2	86.8	88.0	90.0	90.8	90.1	87.9	140.2
400	80.5	81.2	81.5	82.7	81.9	81.8	81.8	82.8	84.0	85.4	87.5	88.4	89.4	90.4	89.2	86.7	140.1
500	81.8	81.4	81.5	82.3	82.3	82.0	82.5	82.9	84.3	85.9	86.8	88.1	89.1	89.5	87.9	85.4	139.7
630	83.3	82.8	82.1	83.3	82.9	83.3	82.2	83.5	85.2	86.3	87.4	87.5	88.9	88.5	86.8	84.2	139.8
800	83.7	83.9	83.2	83.7	83.4	82.7	82.2	82.8	83.7	85.4	86.6	87.4	87.8	87.4	85.7	83.1	139.2
1000	85.5	86.1	85.4	85.6	85.4	84.3	83.2	83.3	84.0	85.4	86.3	87.3	87.3	86.6	84.7	82.3	139.6
1250	90.0	90.6	90.9	91.9	92.5	91.2	88.9	86.7	86.4	87.4	89.2	90.7	90.0	87.3	85.1	83.1	143.8
1600	100.8	101.2	101.3	102.1	103.6	102.3	99.7	96.6	93.6	94.1	94.7	97.1	98.9	92.7	90.7	90.6	153.4
2000	87.8	88.7	88.9	89.9	89.1	87.7	86.1	85.0	85.4	86.9	88.2	89.5	88.4	86.4	83.6	81.9	142.0
2500	91.0	91.2	90.6	91.9	90.0	89.0	87.1	85.9	87.1	89.6	89.8	91.3	89.1	86.8	83.9	82.7	143.7
3150	94.9	96.3	97.1	97.9	96.6	95.2	93.1	89.9	89.4	92.1	93.2	93.2	93.2	89.3	86.4	85.3	148.5
4000	91.4	93.3	93.8	94.5	93.2	91.8	89.3	87.9	88.7	91.4	93.6	94.4	93.6	89.5	86.5	85.3	147.0
5000	92.4	94.9	95.6	95.8	94.8	93.5	91.3	87.9	89.4	91.1	93.2	94.9	93.5	89.7	87.8	85.6	148.0
6300	90.5	91.0	91.3	93.6	91.7	90.9	88.5	85.3	85.9	88.5	90.8	92.6	90.8	87.3	84.4	82.9	145.6
8000	87.1	88.3	88.4	91.5	89.0	87.1	85.2	82.2	82.5	85.5	88.9	90.5	90.7	87.5	83.2	81.3	143.9
10000	84.6	85.7	86.1	87.7	86.6	84.6	82.7	78.5	80.0	82.5	84.9	87.4	86.5	81.7	80.7	78.7	141.6
OASPL	103.9	104.8	105.1	106.0	106.1	104.9	102.7	100.5	100.0	101.6	103.1	104.6	105.2	104.4	104.6	105.6	158.6
PNL	116.8	117.6	118.1	119.0	118.9	117.7	115.7	113.6	113.0	115.1	116.7	117.9	117.8	115.3	113.4	112.3	
PNLT	120.8	121.4	121.9	122.7	124.1	123.0	119.8	117.2	115.6	117.4	118.7	120.2	121.0	117.2	115.5	115.0	
DBA	104.6	105.5	105.8	106.6	106.9	105.6	103.2	100.5	99.6	101.3	102.7	104.1	104.2	100.6	98.5	97.2	

APNLW= 122.0   IPNLW= 128.6   LAPNLW= 109.6   LIPNLW= 110.0   TPNLW= 127.9

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C4AE109G/P 1 2800A0	06-14-83	PEEBLES 4D	150 FT ARC	2800	25639.	SAE77	28.89	FULL SPHERE

GP MICS/PERFORMANCE INLET-HWL/GDB FREEFIELD CORR./#21092

ORIGINAL PAGE IS
OF POOR QUALITY

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C4AE109G/P 1 3100AO

INPUT - C4AE109G/P 1 X03420 C4AE109G/P 1 X03430
C4AE109G/P 1 X03310 C4AE109G/P 1 X03290

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120	130.	140.	150.	160.	PWL
50	77.7	77.9	78.8	80.5	81.0	81.9	82.7	84.0	85.3	86.9	88.9	90.9	93.5	97.4	101.4	106.3	148.2
63	80.1	80.1	80.2	81.8	81.9	82.3	83.4	84.4	85.6	87.4	89.2	91.1	94.1	97.5	99.6	104.0	147.0
80	82.5	81.1	81.2	81.4	81.6	82.7	83.7	85.0	86.0	87.9	89.8	92.2	94.6	97.6	99.8	102.1	146.6
100	83.7	82.0	82.4	83.0	83.1	83.8	84.4	85.5	86.7	88.5	90.3	92.5	95.1	98.6	100.2	100.0	146.6
125	82.7	82.5	83.2	83.4	83.2	84.3	84.9	86.2	87.1	88.8	90.9	92.7	95.5	98.2	99.9	98.6	146.4
160	82.5	83.4	83.7	84.1	83.4	83.9	84.7	86.0	86.9	88.6	90.8	92.8	93.2	97.9	98.6	98.1	146.0
200	82.3	83.7	84.8	84.4	84.4	84.4	85.3	86.9	87.8	89.6	91.3	93.1	95.6	97.5	97.8	97.0	145.9
250	82.0	83.2	84.6	84.6	84.2	84.9	85.6	86.4	87.5	89.0	91.0	92.8	94.9	96.9	96.6	94.8	145.1
315	82.3	82.9	84.3	85.8	85.4	85.0	85.8	87.3	87.7	89.1	90.9	92.6	94.8	96.4	95.2	93.3	144.8
400	82.2	83.8	84.6	85.3	85.7	85.5	85.6	87.2	88.0	89.6	91.2	93.0	94.3	95.4	94.4	92.1	144.5
500	83.3	84.5	85.9	86.7	86.3	86.2	86.2	86.9	88.1	89.6	91.0	92.5	93.6	94.6	93.3	90.8	144.2
630	84.4	87.7	88.5	89.0	88.4	88.7	88.1	87.4	89.8	90.3	91.3	92.6	93.4	93.5	92.1	89.7	144.6
800	84.9	87.0	85.8	86.9	88.0	88.2	87.1	86.9	87.9	89.5	90.4	91.7	92.3	92.6	90.9	88.5	143.6
1000	87.8	89.1	89.3	89.3	89.7	89.1	88.9	88.2	87.9	89.3	90.5	91.6	91.5	91.6	89.6	87.2	143.9
1250	90.6	91.3	91.6	91.1	90.1	89.4	88.3	87.6	88.5	89.2	90.4	92.0	91.2	91.3	88.7	86.4	144.3
1600	100.8	103.3	100.8	102.6	103.4	103.9	102.4	99.7	96.5	97.1	100.0	100.2	97.8	95.5	93.9	92.2	154.9
2000	93.8	95.0	94.2	95.8	95.9	96.1	94.5	92.2	90.7	91.3	92.9	94.5	94.2	93.0	90.1	87.6	148.3
2500	90.9	90.6	90.4	92.4	91.7	91.5	90.6	88.9	88.7	89.9	91.0	92.0	89.9	89.4	86.9	85.4	145.1
3150	97.1	96.8	97.5	98.0	96.6	95.8	94.0	92.1	92.5	94.0	94.4	95.7	94.1	91.0	88.9	88.0	149.6
4000	91.8	91.7	91.6	93.3	91.7	91.3	90.8	89.6	90.3	91.7	93.3	94.2	92.0	90.1	87.5	86.1	146.7
5000	92.6	93.2	92.1	94.5	92.7	92.0	90.8	89.8	91.3	93.6	95.5	97.3	92.7	91.0	88.8	87.6	148.4
6300	89.7	89.3	89.0	92.0	89.0	89.0	87.8	87.0	88.4	91.0	93.7	96.0	94.7	92.1	89.0	87.0	147.0
8000	86.3	87.2	86.6	89.3	86.0	85.4	84.3	83.3	84.5	87.5	91.0	92.7	90.6	90.2	86.2	84.7	144.5
10000	83.7	84.4	83.4	86.0	83.4	82.7	81.6	79.7	81.3	84.5	86.8	89.7	87.8	87.6	83.9	81.8	142.2
OASPL	104.8	106.1	105.0	106.5	106.3	106.5	105.2	103.6	103.0	104.4	106.3	107.7	107.8	108.9	109.6	111.1	161.0
PNL	118.1	119.0	118.5	119.6	119.2	119.4	118.2	116.6	116.0	117.6	119.1	120.5	119.4	118.4	117.0	116.0	
PNLT	121.0	122.4	121.2	122.6	122.7	123.1	121.9	119.9	118.3	119.8	121.8	122.8	121.1	119.6	118.4	117.7	
DBA	105.4	106.8	105.6	107.1	106.9	107.1	105.7	103.6	102.3	103.7	105.6	106.8	105.3	104.2	102.4	100.6	

APNLW= 123.7 IPNLW= 129.5 LAPNLW= 113.4 LIPNLW= 111.2 TPNLW= 128.6

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C4AE109G/P 1 3100AO	06-14-83	PEEBLES 4D	150 FT ARC	3100.	32334.	SAE77	28.89	FULL SPHERE

GP MICS/PERFORMANCE INLET-HWL/6DB FREEFIELD CORR./#21092

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Appendix 9.1.31

16214ES/FSDR/RPMAVG

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C5AE110G/P 1 1820A0

INPUT - C5AE110G/P 1 X03490 C5AE110G/P 1 X05490

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	68.8	68.5	68.2	69.9	68.3	68.7	69.6	69.4	69.4	70.7	71.7	72.9	75.5	76.2	78.3	80.4	126.8
63	71.5	70.5	70.3	76.4	69.8	70.9	70.2	70.6	69.5	71.9	72.1	72.8	81.6	76.5	78.1	84.2	129.4
80	70.5	69.9	69.5	69.4	69.8	70.9	70.5	71.4	70.1	72.4	72.3	74.2	75.1	76.3	77.4	77.6	126.9
100	71.4	70.9	70.5	71.2	71.5	72.0	72.9	73.0	71.2	74.7	74.0	75.3	76.4	77.1	78.2	77.3	128.2
125	73.7	73.0	72.9	74.0	73.5	73.7	74.5	74.4	72.7	73.0	72.6	75.9	76.9	77.3	78.3	80.3	129.0
160	76.0	75.4	75.0	75.5	75.1	74.4	75.2	74.0	73.1	72.4	72.7	74.7	76.5	77.4	77.2	77.7	129.0
200	77.1	76.7	77.0	77.1	76.5	76.1	76.3	75.7	74.2	73.5	74.8	75.4	78.1	78.1	77.8	78.4	130.3
250	76.1	76.1	76.4	76.9	76.3	75.2	74.6	74.3	74.5	71.5	73.0	74.6	76.3	77.0	77.0	76.3	129.3
315	75.3	74.9	75.6	76.4	75.8	75.9	74.1	73.7	73.1	71.7	73.6	74.6	75.7	76.1	76.2	75.3	128.8
400	75.0	75.0	75.5	76.5	76.3	75.9	74.8	74.1	74.0	74.1	75.9	76.9	76.4	76.4	75.6	75.9	129.6
500	74.6	74.6	74.9	75.8	76.6	75.9	74.1	73.3	75.0	75.4	75.5	77.0	76.5	76.4	74.2	72.3	129.5
630	76.3	75.6	75.7	76.6	75.5	73.3	73.0	71.9	72.5	74.2	74.9	76.2	75.3	74.2	72.5	70.4	128.5
800	81.2	79.9	78.5	79.2	78.5	76.0	74.3	72.2	71.9	72.9	74.1	74.7	75.3	73.3	72.0	70.7	129.8
1000	92.4	88.6	87.8	90.8	87.8	84.9	81.1	78.8	75.5	75.8	77.9	80.3	79.6	80.0	80.1	76.8	138.4
1250	83.5	82.4	81.4	80.9	80.4	78.6	75.5	72.2	70.0	71.5	72.0	72.9	73.1	70.9	70.3	68.7	131.0
1600	95.3	88.4	89.5	93.1	89.2	82.1	81.3	77.7	75.4	78.2	75.0	80.2	81.6	80.7	76.6	76.7	139.9
2000	91.9	90.0	90.9	92.2	88.2	84.6	80.7	76.9	74.1	77.2	74.9	79.2	80.1	77.6	75.4	74.3	139.4
2500	86.1	87.6	95.4	93.9	94.0	90.4	85.9	80.4	77.1	75.4	76.9	79.4	80.0	80.4	77.1	77.6	142.8
3150	85.0	86.1	89.2	90.1	88.8	85.8	81.1	76.4	74.1	74.0	76.5	77.6	78.7	76.1	73.8	72.9	138.4
4000	86.6	87.7	85.3	85.8	85.1	81.7	78.7	74.5	72.3	73.9	75.5	78.4	77.0	74.3	71.7	70.4	135.9
5000	86.1	85.8	86.0	86.7	84.7	83.7	78.9	74.0	72.8	74.2	76.1	80.1	80.1	76.5	73.3	70.9	136.5
6300	89.8	88.1	88.5	86.7	84.0	80.8	78.2	74.0	71.4	73.3	75.3	78.1	77.6	75.5	71.6	71.2	137.2
8000	84.2	85.9	84.2	85.0	84.2	80.8	78.4	74.4	70.3	72.1	73.7	76.1	76.1	75.6	71.7	70.5	135.9
10000	81.7	82.8	81.4	81.6	80.0	78.0	77.0	74.5	70.1	70.9	71.9	76.0	74.0	73.7	67.9	66.4	134.0
OASPL	100.1	97.9	99.7	100.3	98.5	95.2	92.0	88.8	87.0	87.8	88.4	90.8	91.6	90.7	89.8	90.5	149.2
PNL	112.3	110.8	114.1	113.8	112.9	109.8	106.3	102.2	99.8	99.8	101.1	103.6	103.9	103.2	100.9	100.7	
PNLT	115.7	113.3	116.7	117.4	115.7	112.5	108.4	104.4	101.3	101.1	102.7	105.8	105.7	105.8	103.9	103.1	
DBA	100.7	98.3	100.5	101.0	99.3	95.7	92.0	87.9	85.6	86.6	87.2	90.0	90.2	89.0	86.7	85.7	

APNLW= 108.2 IPNLW= 123.3 LAPNLW= 97.1 LIPNLW= 104.6 TPNLW= 121.5

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C5AE110G/P 1 1820A0	06-14-83	PEEBLES 4D	150. FT ARC	1820.	9667.	SAE77	28.87	FULL SPHERE

GP MICS/HWL PERFORMANCE INLET,TRTD EXH/6DB FRFLD CORR/#63462

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE   150.0 FT. ARC

IDENTIFICATION

AVERAGE - C5AE110G/P 1   2030A0

INPUT - C5AE110G/P 1   X03500   C5AE110G/P 1   X05500

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	67.6	67.4	66.9	68.8	67.4	68.6	69.4	70.4	70.5	71.7	73.6	75.4	78.0	79.5	82.2	84.4	129.5
63	71.7	71.3	69.6	76.3	69.8	71.0	70.5	70.5	71.1	72.9	74.4	75.2	82.3	79.7	81.3	85.3	130.8
80	70.8	69.2	67.5	68.0	69.6	69.4	69.2	70.4	71.9	72.5	74.1	76.2	77.9	79.7	81.2	81.2	129.0
100	69.9	68.3	68.6	69.4	69.7	69.3	70.3	71.2	72.0	73.7	74.6	76.5	78.7	80.4	81.7	79.8	129.3
125	70.5	70.0	71.0	71.3	70.6	70.3	72.3	72.7	73.2	74.3	75.2	77.1	78.7	80.0	81.0	81.2	129.7
160	71.3	70.8	71.5	72.0	70.3	70.6	70.5	72.0	72.1	73.6	75.0	76.8	78.7	79.6	79.5	78.7	129.1
200	72.5	72.1	72.9	72.5	72.2	71.8	72.2	72.7	73.4	74.8	75.3	76.5	78.6	78.9	78.7	78.3	129.2
250	71.7	72.0	73.1	73.1	72.6	71.8	72.2	71.7	72.9	73.7	75.0	76.1	77.7	78.0	77.6	75.6	128.6
315	74.9	74.2	74.7	75.3	74.4	73.0	73.0	72.5	73.3	74.2	75.5	76.3	77.3	77.5	77.1	74.9	129.0
400	75.1	74.9	75.5	75.9	75.1	73.5	73.9	73.9	74.3	75.9	77.0	78.3	78.9	78.3	77.5	74.8	130.2
500	75.8	75.4	75.0	76.9	75.9	74.0	74.3	73.9	75.1	76.6	77.7	77.7	78.5	77.9	76.0	73.7	130.3
630	77.4	77.0	76.7	77.9	76.8	75.2	74.5	73.9	74.8	76.6	77.8	77.4	77.7	77.1	75.2	72.5	130.4
800	81.2	80.4	79.0	80.0	78.9	76.6	74.9	74.1	73.9	75.1	76.4	76.1	76.8	75.4	74.2	71.8	130.8
1000	87.6	89.4	88.6	89.6	91.3	88.7	84.7	82.9	78.2	79.4	77.9	78.7	79.7	79.3	76.9	75.9	139.6
1250	87.0	87.5	86.6	87.2	88.3	86.2	82.3	80.0	76.4	77.1	76.4	77.1	77.9	77.0	75.5	73.8	137.3
1600	85.5	86.8	84.3	85.1	84.1	82.3	78.8	75.6	75.0	75.5	75.8	76.5	78.6	75.0	73.6	72.2	134.8
2000	94.7	97.6	93.1	94.2	91.1	88.3	84.5	79.8	77.9	77.4	77.1	80.3	83.2	79.6	77.1	76.6	142.8
2500	89.4	88.1	89.2	90.2	89.0	86.0	80.8	77.0	74.8	74.7	76.0	78.5	79.5	77.8	75.2	73.1	138.7
3150	90.8	93.6	96.8	94.7	95.7	92.6	85.7	81.4	78.0	77.4	78.4	79.1	81.6	78.7	77.1	77.0	144.6
4000	88.6	88.9	87.5	88.5	87.1	85.2	81.9	76.9	75.9	77.9	77.3	79.7	80.7	77.1	74.6	72.5	138.3
5000	88.4	90.2	89.0	91.6	89.2	85.9	81.4	76.0	75.3	76.4	78.0	79.9	80.7	76.2	74.1	72.4	139.9
6300	88.2	88.8	88.2	89.5	88.4	86.9	82.2	76.7	74.4	75.4	77.5	79.4	81.4	78.8	74.6	73.9	139.6
8000	86.5	87.2	86.2	87.6	85.2	83.0	80.7	75.1	72.7	74.6	75.0	77.8	78.6	76.9	73.2	72.7	137.8
10000	85.1	86.0	84.7	85.4	83.9	81.1	79.2	74.8	71.7	73.7	73.7	77.2	76.1	74.6	69.8	68.2	137.0
OASPL	99.9	101.6	100.8	101.1	100.4	97.8	93.4	90.2	88.4	89.4	90.1	91.5	93.3	92.1	91.7	91.9	150.9
PNL	113.2	115.0	115.7	115.1	115.0	112.3	107.4	103.7	101.6	102.2	102.8	104.3	106.0	103.9	102.2	101.5	
PNLT	115.6	118.3	118.5	117.3	117.5	114.8	109.4	105.7	102.6	103.3	103.2	105.3	107.3	104.9	103.2	102.9	
DBA	100.5	102.4	101.6	101.7	101.1	98.4	93.7	90.0	87.6	88.3	88.7	90.3	91.8	89.4	87.2	86.0	

APNLW= 109.4   IPNLW= 124.9   LAPNLW= 98.1   LIPNLW= 105.6   TPNLW= 123.4

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C5AE110G/P 1 2030A0	06-14-83	PEEBLES 4D	150. FT ARC	2030.	12207.	SAE77	28.87	FULL SPHERE

GP MICS/HWL PERFORMANCE INLET,TRTD EXH/6DB FRFLD CORR/#63462

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OF POOR QUALITY

Appendix 9.1.33

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C5AE110G/P 1 2180A0

INPUT - C5AE110G/P 1 X03510 C5AE110G/P 1 X05510

ANGLE MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	68.1	67.8	67.8	69.7	69.2	70.2	71.3	72.1	72.9	74.6	76.2	77.7	80.3	82.2	85.1	87.4	132.1
63	70.7	70.4	69.7	75.7	70.8	71.4	71.1	72.3	73.1	75.2	76.3	77.7	83.1	82.5	84.0	87.2	132.5
80	71.4	70.2	70.1	69.8	70.8	70.7	71.4	72.4	73.8	75.0	76.5	78.4	80.5	82.4	84.4	84.4	131.6
100	70.8	69.5	70.5	71.2	71.3	71.6	72.5	73.3	74.2	75.6	77.5	79.0	81.1	82.9	84.3	83.0	131.8
125	71.8	71.3	72.6	72.9	72.0	72.4	73.9	74.4	74.8	76.3	77.5	79.6	81.3	82.7	83.9	83.2	132.1
160	71.9	73.0	72.9	73.2	72.2	72.4	72.5	73.9	74.5	75.9	77.3	78.9	81.0	82.1	82.6	81.3	131.4
200	73.7	74.0	74.6	73.9	73.4	73.4	74.1	75.4	75.1	76.8	77.6	78.8	81.4	81.9	81.7	80.6	131.6
250	73.1	73.8	74.3	75.1	74.1	73.7	73.4	74.4	75.2	76.1	77.2	78.4	80.0	80.6	80.0	78.1	130.8
315	76.3	75.3	76.0	76.7	75.7	74.4	74.7	74.3	75.2	76.4	77.7	78.4	79.9	80.0	79.7	77.2	131.1
400	76.6	76.9	76.7	77.2	76.2	74.8	75.1	75.3	76.3	78.0	79.1	79.6	80.9	79.9	79.4	76.4	131.8
500	77.0	76.6	76.7	78.3	77.1	75.5	75.6	75.4	76.5	78.1	78.8	79.9	80.2	79.4	78.1	75.5	131.8
630	78.5	78.2	77.4	80.2	77.8	76.2	75.6	76.2	76.0	78.6	78.8	79.8	79.6	79.2	77.7	74.7	132.1
800	82.1	81.1	79.9	80.5	79.9	78.0	76.6	75.6	75.4	76.5	78.0	78.3	79.2	77.6	76.5	73.9	132.3
1000	86.1	86.4	85.5	85.2	87.2	86.2	82.6	79.4	78.1	78.4	78.0	78.6	79.0	78.1	76.3	74.9	136.7
1250	92.2	94.5	93.5	92.6	95.7	95.0	91.0	87.3	85.5	84.1	82.5	83.3	83.7	83.9	80.7	81.5	144.6
1600	86.1	86.2	85.5	85.8	85.5	83.7	80.5	77.0	75.9	77.7	77.3	78.3	79.3	77.4	75.5	75.6	135.9
2000	94.6	96.0	97.9	92.5	92.0	85.5	82.2	78.6	77.5	77.7	79.2	80.1	80.5	79.4	77.5	75.4	143.6
2500	92.3	94.0	93.6	95.3	95.9	91.4	86.2	81.3	78.7	78.5	79.6	83.8	83.0	81.3	79.0	77.3	144.1
3150	93.5	99.3	97.1	101.5	99.7	95.9	89.2	85.2	81.4	80.2	80.8	81.9	83.4	81.5	82.7	80.8	148.7
4000	88.5	90.2	92.6	92.9	91.9	90.8	86.9	81.0	79.3	80.5	81.2	82.3	85.7	81.4	78.4	76.3	142.6
5000	89.3	90.8	90.5	90.8	90.5	89.3	86.4	80.0	78.1	79.0	80.7	81.5	82.1	78.2	76.4	74.8	141.3
6300	88.6	89.4	89.9	90.8	89.2	87.6	83.7	77.9	76.0	77.8	80.2	81.4	84.0	80.3	76.6	75.3	140.8
8000	87.0	88.2	88.0	88.9	87.2	85.1	82.3	76.8	74.0	75.2	77.2	79.1	80.0	77.8	74.6	73.8	139.3
10000	85.8	86.9	86.2	86.2	85.9	83.7	80.6	75.8	72.5	74.2	74.7	77.8	77.9	76.1	71.5	70.0	138.4
OASPL	101.1	104.1	103.4	104.4	103.9	101.1	96.8	92.9	91.4	91.8	92.5	93.9	95.3	94.6	94.6	94.5	153.8
PNL	114.6	118.3	117.1	119.5	118.4	115.3	110.4	106.7	104.3	104.6	105.4	106.9	108.7	106.4	106.0	104.5	
PNLT	116.7	121.0	119.9	122.0	122.4	119.7	114.3	109.7	107.2	106.6	107.0	108.5	110.3	108.4	107.6	106.6	
DBA	101.9	105.0	104.3	105.4	104.8	101.8	97.2	92.9	90.9	90.9	91.4	92.8	93.9	91.9	90.3	88.9	

APNLW= 112.1   IPNLW= 127.8   LAPNLW= 102.3   LIPNLW= 110.3   TPNLW= 126.5

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C5AE110G/P 1 2180A0	06-14-83	PEEBLES 4D	150. FT ARC	2180.	14244.	SAE77	28.87	FULL SPHERE

GP MICS/HWL PERFORMANCE INLET,TRTD EXH/6DB FRFLD CORR/#63462

Appendix 9.1.34

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C5AE110G/P 1 2320A0

INPUT - C5AE110G/P 1 X03520   C5AE110G/P 1 X05520

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	70.7	70.3	70.2	72.5	72.2	72.7	73.6	74.5	75.4	76.8	78.7	80.4	82.7	84.9	88.0	90.2	134.8
63	72.1	71.8	71.5	76.4	72.9	73.2	73.2	74.8	75.3	77.0	78.5	80.2	84.6	84.9	86.7	89.0	134.5
80	73.1	72.2	72.1	72.7	73.2	73.8	74.3	75.3	76.3	77.5	79.1	80.8	82.9	84.7	87.0	87.1	134.1
100	73.2	72.0	73.1	74.1	74.0	74.5	75.0	75.9	76.3	78.2	79.1	81.5	83.4	85.7	86.8	85.6	134.3
125	74.1	74.2	75.3	75.7	75.1	75.5	76.5	77.0	77.4	78.4	79.8	82.0	83.7	85.1	86.6	85.4	134.5
160	75.4	75.7	75.9	75.8	75.7	75.7	76.3	76.7	76.8	78.2	79.6	81.4	83.5	85.0	85.3	84.3	134.1
200	76.8	77.1	77.0	77.0	77.1	76.5	77.3	78.0	78.0	78.9	80.1	81.9	84.5	84.5	84.4	83.6	134.5
250	76.0	76.3	77.0	77.8	76.7	77.0	76.7	77.1	78.1	78.4	79.9	81.0	82.6	83.8	83.6	81.5	133.7
315	77.2	77.0	77.4	78.0	77.6	76.8	76.7	76.7	77.4	78.0	79.8	80.6	82.4	82.7	82.1	80.3	133.3
400	78.0	77.6	77.6	78.5	78.0	77.3	77.0	77.0	78.1	79.8	81.2	81.1	82.3	82.4	82.0	79.3	133.7
500	78.1	77.7	77.8	79.0	78.3	77.1	76.7	77.0	78.3	79.5	80.7	81.1	82.5	81.7	80.8	78.0	133.5
630	79.5	79.2	79.0	80.2	80.1	78.5	78.4	77.4	78.1	80.5	81.5	81.2	81.9	80.9	79.4	76.9	134.0
800	82.4	81.8	80.4	81.2	80.9	79.2	77.4	76.6	77.1	78.9	79.5	80.0	80.8	79.7	78.6	76.2	133.6
1000	85.3	84.4	83.8	84.4	85.2	83.4	80.0	77.9	77.6	78.5	79.4	79.5	80.3	79.1	77.8	75.3	135.5
1250	91.9	93.5	92.3	96.0	98.7	96.0	91.5	88.8	86.7	84.5	86.3	85.6	85.4	85.2	83.7	82.8	146.3
1600	86.5	87.5	86.2	87.0	87.3	85.7	82.2	78.8	77.7	79.2	79.7	80.5	80.2	79.3	78.5	76.6	137.4
2000	93.6	98.6	93.1	94.9	91.5	85.3	82.7	79.1	78.2	78.8	79.5	80.8	81.5	79.6	77.8	75.5	143.0
2500	101.5	98.9	95.2	96.8	94.9	93.5	88.3	83.7	81.7	80.3	81.6	84.4	84.8	82.0	80.5	78.3	146.2
3150	93.3	96.5	93.4	95.7	96.7	95.4	90.6	83.1	80.7	80.8	80.3	82.0	83.9	83.4	78.9	80.7	145.8
4000	91.3	93.4	92.3	94.7	94.3	93.1	88.8	82.6	80.8	81.6	82.0	83.0	84.6	81.7	78.7	78.9	144.3
5000	92.3	93.5	91.7	93.5	94.9	92.7	89.0	83.0	81.5	83.4	83.3	83.8	84.3	80.9	78.8	77.2	144.4
6300	90.5	92.5	91.3	91.9	90.9	89.1	85.6	79.8	78.2	79.7	82.3	84.4	85.6	81.4	78.4	77.0	142.5
8000	89.2	90.5	89.6	90.4	89.3	87.2	84.0	78.2	75.9	77.4	79.5	81.3	82.5	80.5	77.2	76.3	141.3
10000	87.4	88.6	87.8	87.4	87.7	85.2	83.0	76.9	74.5	75.9	77.3	80.1	80.7	78.4	73.5	71.8	140.2
OASPL	104.3	105.0	102.2	104.1	104.2	102.2	98.2	94.1	93.0	93.5	94.6	95.7	97.0	96.7	96.9	96.8	154.8
PNL	119.0	118.4	115.7	117.3	117.5	115.9	112.0	106.8	105.3	106.4	107.1	108.2	109.4	108.3	106.1	105.8	
PNLT	122.5	120.9	118.1	120.8	121.7	119.7	115.5	110.3	108.3	108.3	109.3	110.1	111.1	110.3	108.0	108.1	
DBA	105.3	105.8	102.8	104.8	104.9	102.9	98.6	94.0	92.3	92.4	93.4	94.3	95.1	93.4	91.5	90.3	

APNLW= 113.1   TPNLW= 126.5   LAPNLW= 104.2   LIPNLW= 111.7   TPNLW= 125.1

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C5AE110G/P 1 2320A0	06-14-83	PEEBLES 4D	150. FT ARC	2320.	16355.	SAE77	28.87	FULL SPHERE

GP MICS/HWL PERFORMANCE INLET, TRTD EXH/6DB FRFLD CORR/#63462

Appendix 9.1.35

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C5AE110G/P 1 2500A0

INPUT - C5AE110G/P 1 X03530 C5AE110G/P 1 X05530

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100	110.	120	130.	140.	150.	160.	PWL
50	71.1	70.7	70.9	73.3	73.3	74.0	75.0	76.2	77.1	78.9	81.0	82.6	85.2	87.5	90.8	93.5	137.4
63	73.1	72.3	71.9	75.9	74.3	74.8	75.7	76.4	77.1	79.2	80.7	81.9	86.5	87.2	89.9	92.0	137.0
80	74.3	73.1	73.4	74.0	74.8	74.9	76.0	77.4	78.1	79.4	81.3	83.0	85.7	87.7	89.9	90.4	136.8
100	74.3	73.3	74.7	75.5	75.2	75.8	76.4	77.5	78.6	79.9	81.7	83.5	86.1	88.2	89.9	88.8	136.8
125	75.4	75.5	76.4	76.4	76.3	76.8	77.6	78.3	78.9	80.6	82.2	84.2	86.2	87.8	89.6	88.1	136.9
160	75.7	76.1	76.5	76.9	76.5	76.9	77.1	78.1	79.1	80.4	82.0	83.7	86.0	87.5	88.3	87.1	136.5
200	77.6	77.9	77.4	77.6	77.2	77.6	77.6	79.2	80.2	81.9	82.5	84.1	86.2	87.3	87.6	85.7	136.6
250	76.0	77.0	77.9	78.2	77.9	77.5	77.9	78.3	79.7	80.7	82.0	83.3	85.4	86.3	86.3	84.2	135.8
315	78.3	77.9	79.2	79.6	78.6	77.7	78.1	78.5	79.1	80.4	82.1	83.2	85.0	85.3	85.3	82.9	135.5
400	79.0	79.6	79.9	80.3	79.2	78.6	78.7	78.9	80.1	81.4	83.0	83.7	85.2	85.2	84.4	81.8	135.9
500	79.4	79.2	79.4	80.3	80.0	79.2	78.9	79.0	80.1	81.8	82.3	83.8	84.7	84.3	83.4	80.6	135.6
630	81.5	80.8	80.1	81.7	81.2	80.2	79.9	79.2	80.6	82.5	83.3	83.2	84.5	83.4	82.4	79.7	136.0
800	83.1	82.4	81.5	82.2	82.0	80.7	79.8	78.8	79.4	80.9	81.5	82.4	83.5	82.2	81.5	78.5	135.5
1000	85.4	84.7	84.4	84.5	84.5	83.5	81.2	79.4	79.3	80.7	81.2	81.7	82.2	81.5	80.2	77.6	136.3
1250	99.5	94.8	100.1	99.8	97.6	97.8	94.2	89.5	88.8	87.3	88.2	86.0	87.7	85.4	85.9	83.5	148.5
1600	92.8	90.5	93.7	93.1	92.2	91.7	88.7	84.3	83.3	83.1	83.1	82.8	83.8	82.5	81.7	79.5	142.8
2000	88.6	90.1	87.8	88.0	87.4	85.9	82.7	79.7	79.0	79.9	80.6	81.6	82.1	80.1	78.4	76.1	138.5
2500	99.3	102.8	94.1	94.5	94.9	95.2	92.1	86.3	84.4	82.1	83.3	84.9	87.2	83.0	81.6	80.0	147.1
3150	92.9	95.7	92.5	93.2	92.6	90.9	87.7	82.6	80.8	80.7	82.0	83.4	85.3	81.2	79.4	77.0	143.4
4000	94.1	99.4	97.2	96.7	98.0	95.0	93.8	85.8	84.1	83.7	84.6	86.6	88.1	82.7	81.3	79.7	147.8
5000	93.0	94.1	93.2	93.9	94.2	93.4	90.7	84.8	83.7	85.1	86.0	88.2	85.9	82.2	80.6	79.3	145.2
6300	90.8	92.5	92.3	92.6	91.5	90.3	88.4	82.2	80.6	81.9	84.5	86.1	86.3	81.8	79.5	78.1	143.6
8000	89.5	91.2	90.7	91.0	90.5	88.1	86.4	80.6	78.0	79.5	82.2	83.9	85.8	83.1	79.4	78.2	142.6
10000	88.5	89.7	89.0	88.9	88.5	86.5	84.0	78.7	76.2	77.7	79.1	81.6	81.7	79.4	74.9	73.2	141.3
OASPL	104.8	106.5	104.7	104.7	104.2	103.2	100.7	95.8	95.2	95.6	96.8	97.9	99.3	98.9	99.7	99.5	155.8
PNL	118.3	120.7	117.9	117.8	118.2	116.3	114.6	109.0	107.9	108.3	109.4	111.0	112.1	109.2	108.3	106.7	
PNLT	121.8	124.0	121.6	121.5	121.2	119.7	117.7	111.5	110.4	110.1	111.4	112.2	113.6	110.3	109.9	108.3	
DBA	105.6	107.4	105.3	105.2	104.8	103.8	101.2	95.7	94.6	94.5	95.5	96.4	97.3	94.6	93.6	91.5	

APNLW= 115.1 IPNLW= 127.8 LAPNLW= 106.0 LIPNLW= 114.8 TPNLW= 126.4

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C5AE110G/P 1 2500A0	06-14-83	PEEBLES 4D	150. FT ARC	2500.	19213.	SAE77	28.87	FULL SPHERE

GP MICS/HWL PERFORMANCE INLET,TRTD EXH/GDB FRFLD CORR/#63462

ORIGINAL PAGE IS OF POOR QUALITY

Appendix 9.1.36

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AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C5AE110G/P 1 2800A0

INPUT - C5AE110G/P 1 X03540 C5AE110G/P 1 X05540

ANGLES MEASURED FROM INLET, DEGREES

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	74.8	74.4	75.0	77.4	77.8	78.0	78.9	80.1	81.7	83.2	85.0	86.8	89.4	92.4	96.4	99.7	142.8
63	76.4	76.0	76.0	79.0	78.3	78.4	79.6	80.7	81.9	83.4	84.9	86.9	90.3	92.4	95.1	97.6	141.9
80	78.1	76.7	77.1	77.7	78.5	79.1	79.9	81.3	82.5	83.6	85.6	87.9	89.9	92.6	95.4	96.4	141.8
100	79.1	78.0	79.2	79.1	79.9	79.8	81.0	82.1	82.7	84.3	86.2	88.4	90.8	92.8	95.3	94.4	141.8
125	79.9	79.0	79.7	80.5	80.4	80.3	81.3	82.4	83.7	84.8	86.7	88.9	90.8	93.0	95.0	93.3	141.8
160	78.8	79.6	80.0	80.7	80.5	80.7	81.2	82.4	83.4	84.9	86.4	88.3	90.7	92.4	93.6	92.3	141.2
200	79.8	80.2	81.4	81.4	81.6	81.3	81.8	83.4	84.3	85.6	86.9	89.0	90.9	92.3	92.7	91.5	141.2
250	78.6	80.3	81.4	81.5	81.3	81.5	82.0	82.6	83.9	84.9	86.8	88.4	90.4	91.4	91.9	89.5	140.6
315	80.1	80.4	81.6	82.2	82.1	81.4	82.4	82.7	83.8	85.0	86.5	88.0	89.9	90.5	90.5	87.8	140.1
400	80.5	81.2	81.5	82.7	82.7	81.8	81.9	83.0	84.3	85.5	87.1	88.5	89.7	89.9	89.5	86.5	140.1
500	82.0	81.3	81.7	82.8	82.7	82.2	82.5	83.0	84.5	85.9	86.8	88.2	89.4	89.1	88.7	85.4	139.9
630	83.2	82.7	82.0	83.3	82.9	83.2	82.6	83.4	85.4	86.6	87.8	88.0	88.9	88.3	87.3	84.2	140.0
800	83.8	83.6	82.5	83.5	83.2	82.6	82.1	82.7	83.6	85.1	86.1	87.2	87.8	87.2	86.2	83.1	139.0
1000	85.9	85.7	85.3	85.3	85.5	84.4	82.9	82.5	83.7	84.9	85.6	86.6	86.8	86.4	85.2	81.8	139.2
1250	89.8	91.1	91.3	91.3	93.0	92.1	89.4	85.9	85.2	85.4	86.2	86.9	87.0	86.2	85.4	82.3	143.1
1600	99.2	101.9	101.4	100.9	104.4	103.1	99.7	95.2	92.3	92.1	92.3	91.2	92.6	89.9	88.9	88.0	152.9
2000	87.9	88.5	88.4	88.8	88.9	87.0	85.3	82.8	82.8	84.1	84.5	85.6	85.4	84.5	82.6	80.2	140.3
2500	91.1	91.2	91.8	91.6	90.2	88.6	86.7	83.6	83.0	83.8	84.7	86.9	86.6	84.2	82.9	80.0	142.1
3150	97.4	96.4	99.1	97.4	97.2	95.8	93.8	89.5	86.7	85.9	87.3	88.4	87.3	85.5	83.7	82.0	148.0
4000	92.6	94.6	95.6	95.3	94.1	92.9	90.6	86.1	85.4	85.7	87.3	89.0	92.1	85.6	83.1	81.7	146.0
5000	93.3	95.2	95.9	96.0	95.1	94.6	92.1	87.9	87.1	87.9	89.7	90.2	90.6	85.5	84.2	82.1	147.1
6300	92.3	93.2	92.9	94.2	92.6	92.1	90.1	85.3	83.7	85.2	88.2	89.8	88.4	84.8	82.3	80.5	145.4
8000	89.8	91.0	91.1	92.1	90.7	89.4	87.7	82.8	81.0	82.4	85.6	87.3	88.4	84.8	81.3	80.0	143.9
10000	88.0	89.1	88.9	88.8	89.1	87.3	85.7	80.1	78.8	80.1	82.3	84.5	84.6	81.6	77.6	75.5	142.2
OASPL	104.1	105.5	105.9	105.5	106.8	105.7	103.0	99.6	98.7	99.5	100.8	102.0	103.3	103.5	104.8	105.1	158.1
PNL	117.9	118.2	119.4	118.8	119.6	118.5	116.1	112.6	111.3	111.8	113.3	114.3	115.9	112.9	112.0	110.5	
PNLT	121.4	122.2	123.3	122.4	125.1	124.1	121.1	116.2	114.0	114.2	115.6	115.9	118.0	114.4	113.6	112.8	
DBA	104.7	106.1	106.6	106.2	107.6	106.4	103.5	99.4	97.8	98.2	99.4	100.1	100.9	98.5	97.5	95.4	

APNLW= 118.4   IPNLW= 129.3   LAPNLW= 108.5   LIPNLW= 110.1   TPNLW= 127.9

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C5AE110G/P 1 2800A0	06-14-83	PEEBLES 4D	150. FT ARC	2800.	25246.	SAE77	28.87	FULL SPHERE

GP MICS/HWL PERFORMANCE INLET,TRTD EXH/6DB FRFLD CORR/#63462

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Appendix 9.1.37

16214ES/FSDR/RPMAVG

11/14/83 9.065 PAGE 1

AVERAGE SOUND PRESSURE LEVELS

77.0 DEG. F., 70 PERCENT R.H. DAY, SAE 150.0 FT. ARC

IDENTIFICATION

AVERAGE - C5AE110G/P 1 3100A0

INPUT - C5AE110G/P 1 X03550 C5AE110G/P 1 X05550

ANGLES MEASURED FROM INLET, DEGREFS

FREQ	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.	160.	PWL
50	77.8	77.7	78.6	80.4	81.0	81.9	82.4	83.5	84.9	86.6	88.5	90.7	93.1	96.7	101.9	106.4	148.2
63	80.1	79.1	79.1	81.2	81.9	82.3	83.0	84.3	85.4	86.8	88.5	90.7	94.1	96.8	100.3	103.5	146.7
80	82.5	81.2	81.4	81.8	81.6	82.1	83.6	84.9	86.0	87.3	89.5	91.8	94.5	97.5	100.5	102.1	146.7
100	83.8	82.1	82.9	83.5	83.4	83.8	84.5	85.3	86.6	88.1	90.1	92.5	95.1	98.2	100.8	99.6	146.6
125	83.0	82.8	83.6	84.2	83.8	84.0	85.0	86.0	87.2	88.8	90.8	92.9	95.2	98.0	100.4	98.4	146.5
160	82.8	83.6	83.6	84.6	83.5	84.1	84.8	86.0	87.1	88.8	90.5	92.6	95.0	97.9	99.3	97.7	146.0
200	82.3	84.1	85.1	85.0	85.1	84.8	85.3	87.0	87.6	89.6	91.0	92.9	95.5	97.4	98.3	97.0	145.9
250	82.4	83.9	85.0	85.3	85.3	85.5	85.8	86.6	87.8	89.1	90.9	92.9	94.9	96.7	97.0	94.9	145.2
315	82.7	83.4	84.3	86.0	86.2	85.6	86.1	87.2	88.3	89.4	91.0	92.5	94.4	95.9	95.7	93.1	144.8
400	82.9	84.3	84.8	85.9	86.3	85.9	86.2	87.5	88.2	89.8	91.4	92.8	94.6	95.1	94.9	91.6	144.7
500	83.7	84.2	86.4	86.9	86.8	86.2	86.8	87.3	88.6	90.1	90.9	92.7	93.9	94.3	93.5	90.5	144.3
630	84.7	87.2	88.3	89.1	88.2	88.4	88.9	87.9	89.1	90.4	91.0	92.8	93.5	93.4	92.8	89.5	144.6
800	85.8	85.4	85.6	86.6	87.9	87.5	86.5	87.2	88.0	89.5	90.4	91.9	92.4	92.4	91.2	87.9	143.6
1000	87.5	87.8	90.0	88.1	88.2	88.6	87.4	88.1	88.5	89.5	90.4	91.6	91.9	91.7	90.2	87.3	143.8
1250	90.8	91.2	91.0	90.4	91.2	90.6	88.8	87.7	88.1	89.1	89.7	91.3	91.4	90.5	89.0	86.3	144.2
1600	101.0	105.2	100.2	103.2	109.7	107.2	104.5	98.7	96.9	97.3	93.1	94.1	95.0	92.7	93.2	92.1	156.9
2000	93.8	95.7	93.6	95.5	99.0	97.7	95.6	91.1	90.0	90.2	89.6	91.1	90.7	89.9	88.3	85.8	148.3
2500	91.9	92.2	90.9	91.9	92.5	91.5	90.4	87.9	87.5	87.7	88.9	90.1	89.4	88.1	86.8	83.7	144.5
3150	98.2	100.0	99.0	98.2	98.5	96.8	94.8	91.3	89.5	90.9	91.0	91.7	90.7	89.0	87.6	85.2	149.5
4000	93.2	93.5	92.9	93.9	93.6	92.3	91.4	88.8	88.4	88.8	89.8	91.0	89.2	87.6	85.7	83.7	145.9
5000	94.0	94.6	94.0	95.2	94.9	93.7	92.0	90.1	90.0	90.8	91.9	93.9	91.0	87.9	86.8	84.6	147.5
6300	92.4	91.7	91.9	93.3	92.1	91.5	90.1	87.9	87.9	89.9	92.2	92.8	92.7	89.4	86.0	84.3	146.6
8000	89.4	90.6	90.2	90.9	90.3	88.5	87.4	84.6	84.6	86.5	89.9	91.0	89.3	87.5	83.8	82.1	144.7
10000	87.3	88.4	88.0	88.0	88.3	86.6	85.4	81.9	82.2	83.8	85.9	87.9	87.5	85.5	81.4	79.0	143.0
OASPL	105.5	107.9	105.8	106.8	111.0	108.9	106.7	103.1	102.7	103.7	104.3	105.9	107.0	108.3	110.0	110.9	161.5
PNL	119.1	120.7	119.7	119.9	123.4	121.6	119.7	116.2	115.4	116.3	116.5	118.1	117.6	116.9	116.5	115.0	
PNLT	122.0	124.6	122.3	123.3	128.2	125.9	123.8	119.3	118.0	118.8	117.6	119.0	118.9	117.5	118.0	117.0	
DBA	106.1	108.7	106.0	107.4	111.8	109.6	107.3	102.9	101.9	102.7	102.5	103.8	103.7	102.8	102.0	99.8	

APNLW= 121.1 IPNLW= 131.2 LAPNLW= 113.2 LIPNLW= 111.3 TPNLW= 129.6

IDENTIFICATION	TEST DATE	LOCATION	ACOUSTIC RANGE	REFERENCE RPM	ARITH AVG FNK	IALPHA	PAMB	PWL AREA
C5AE110G/P 1 3100A0	06-14-83	PEEBLES 4D	150. FT ARC	3100.	32355.	SAE77	28.87	FULL SPHERE

GP MICS/HWL PERFORMANCE INLET,TRTD EXH/6DB FRFLD CORR/#63462

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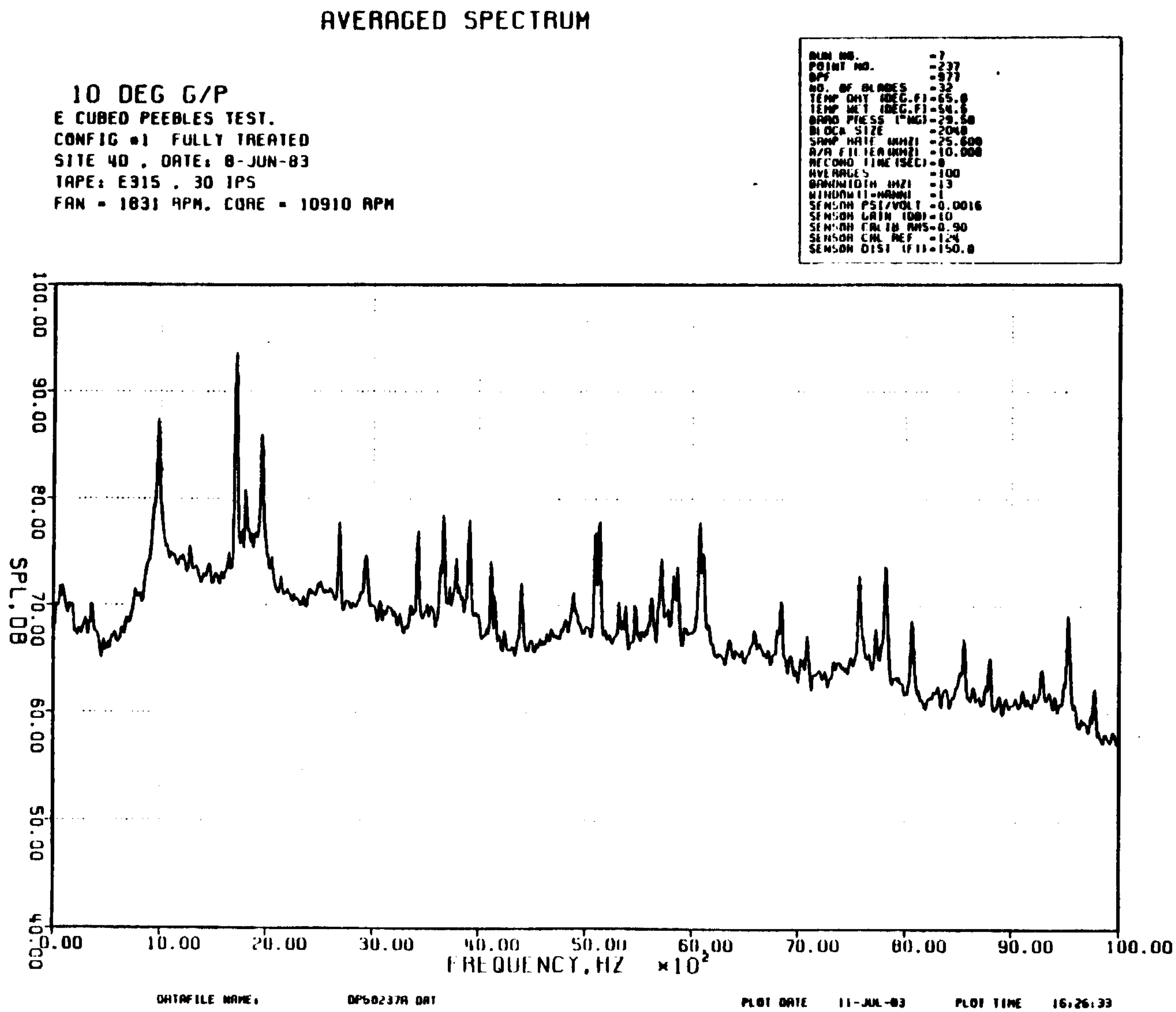
9.2 NARROWBANDS

C3

Appendix 9.2.1.a



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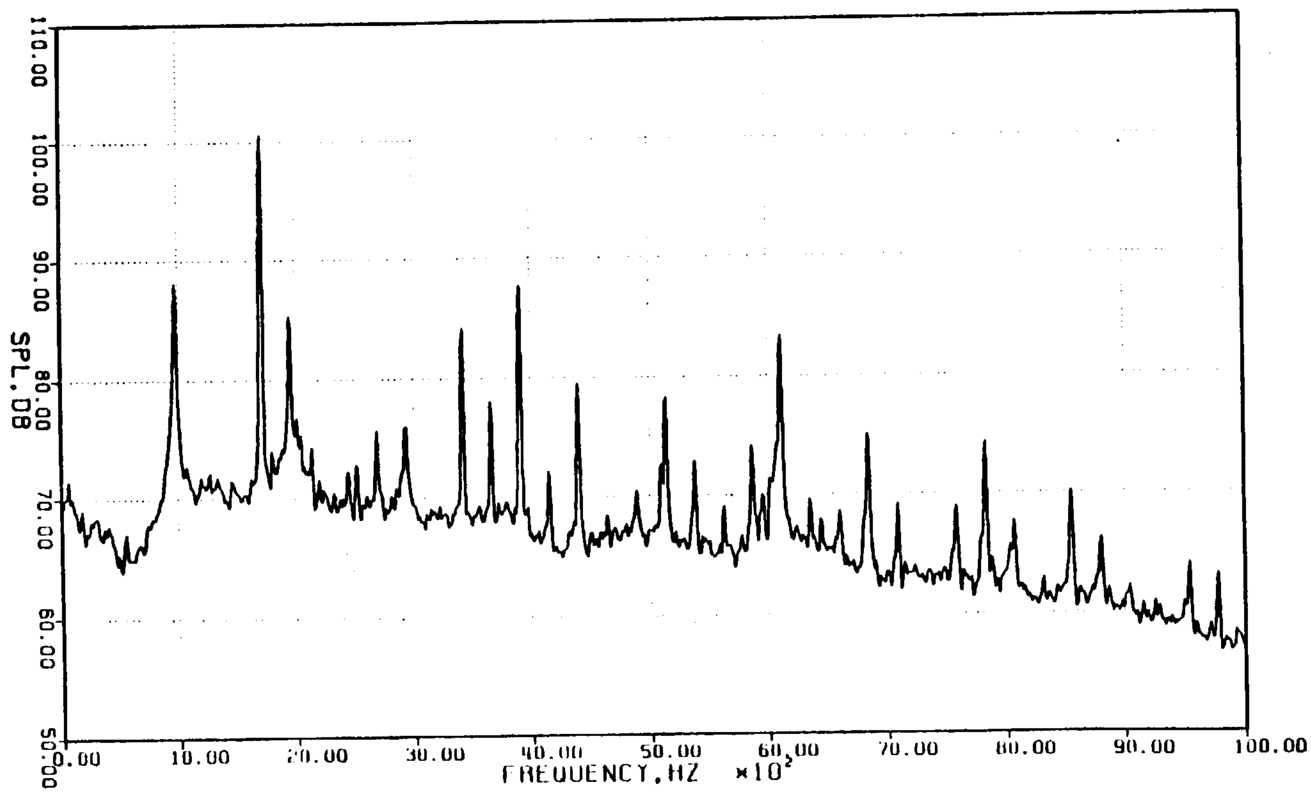
Appendix 9.2.1.b

AVERAGED SPECTRUM

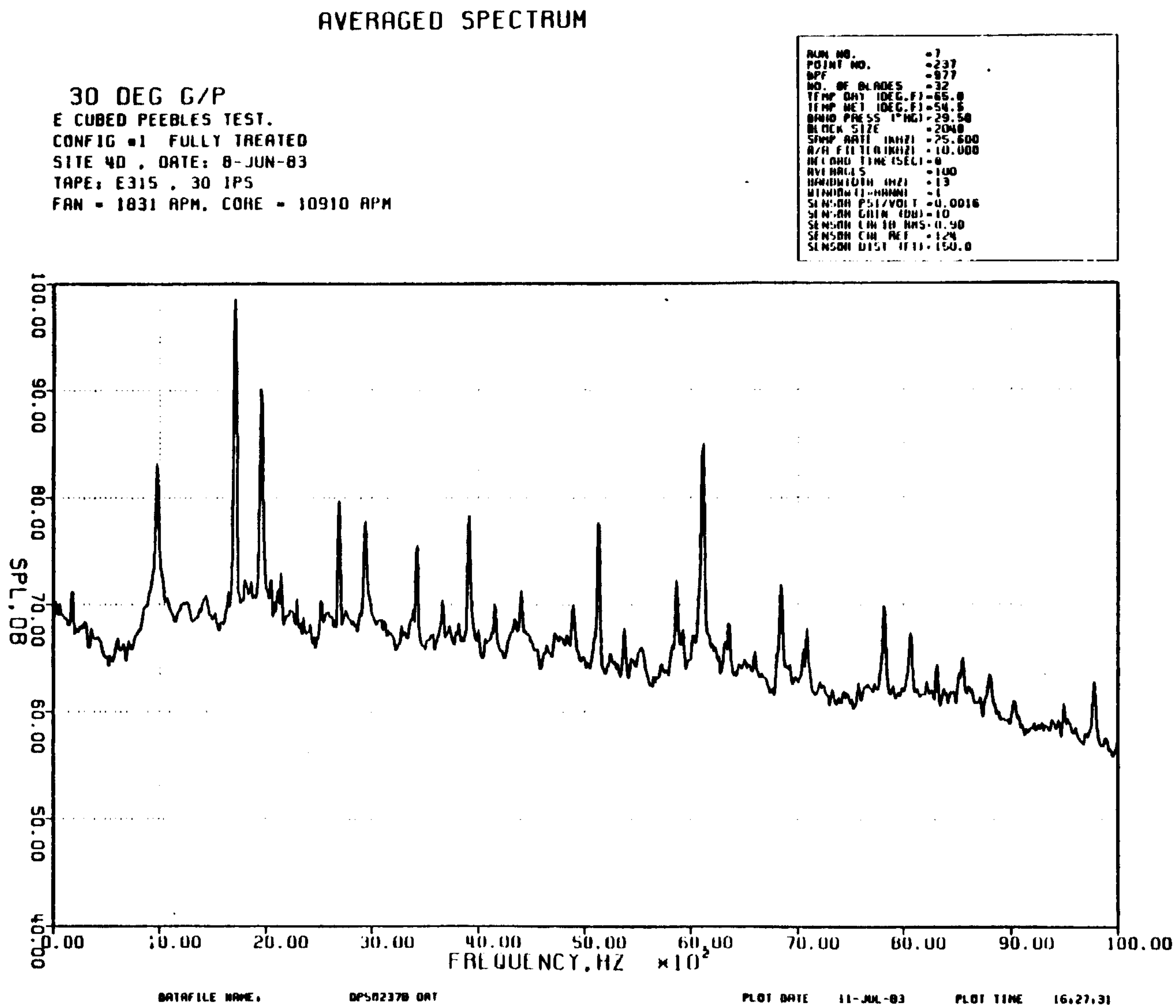
20 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 1831 RPM, CORE = 10910 RPM

RUN NO.	=7
POINT NO.	=237
BPF	=977
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.8
TEMP WET (DEG.F)	=54.5
BARO PRESS (" HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CAL 1B RMS	=0.88
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OPS0237A DAT PLOT DATE 11-JUL-83 PLOT TIME 16:26:47

Appendix 9.2.1.c



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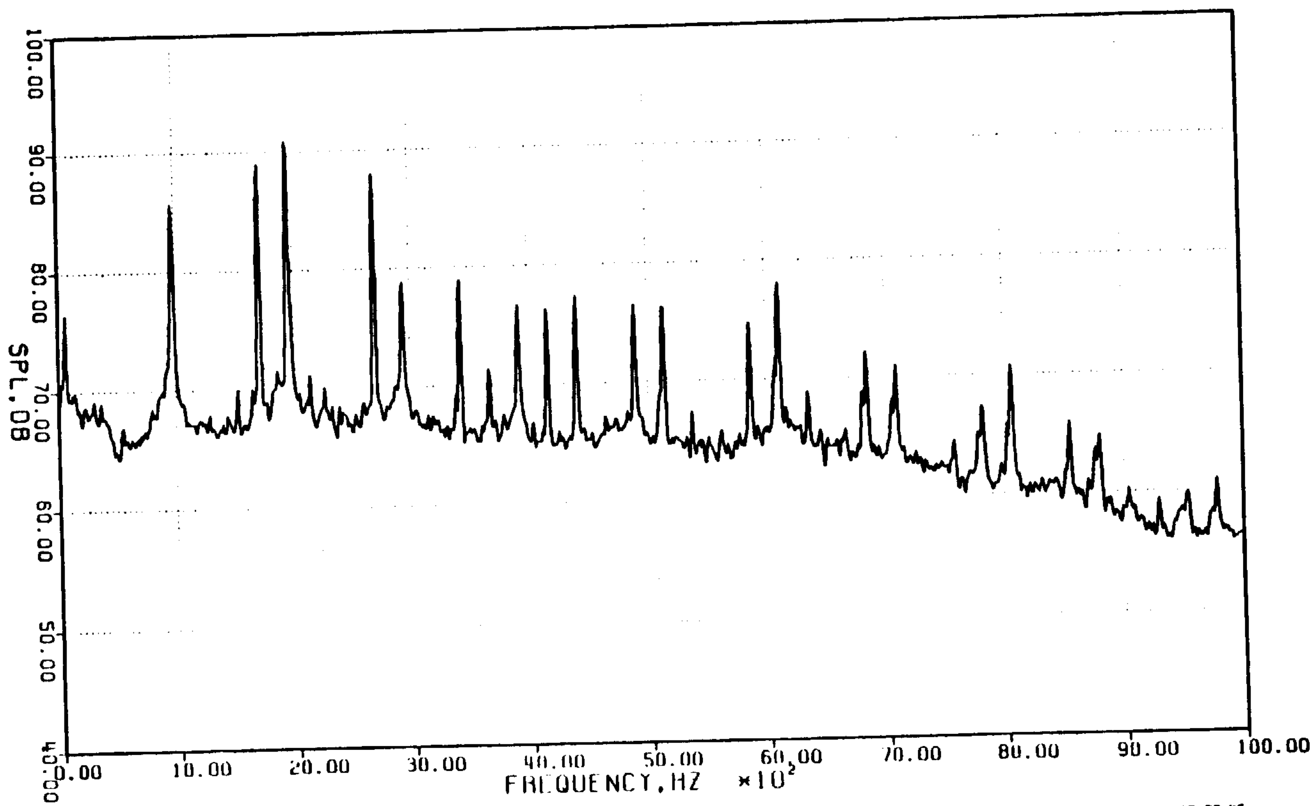
Appendix 9.2.1.d

AVERAGED SPECTRUM

40 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 1831 RPM. CORE = 10910 RPM

RUN NO. =7
POINT NO. =237
BPF =977
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER(KHZ) =10.000
RECORD TIME(SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0005
SENSOR GAIN (DB)=20
SENSOR CALIB RMS=0.93
SENSOR CAL REF =124
SENSOR DIST (FT)=150.0



DATAFILE NAME: DPS0237B DAT PLOT DATE 11-JUL-83 PLOT TIME 16:27:45

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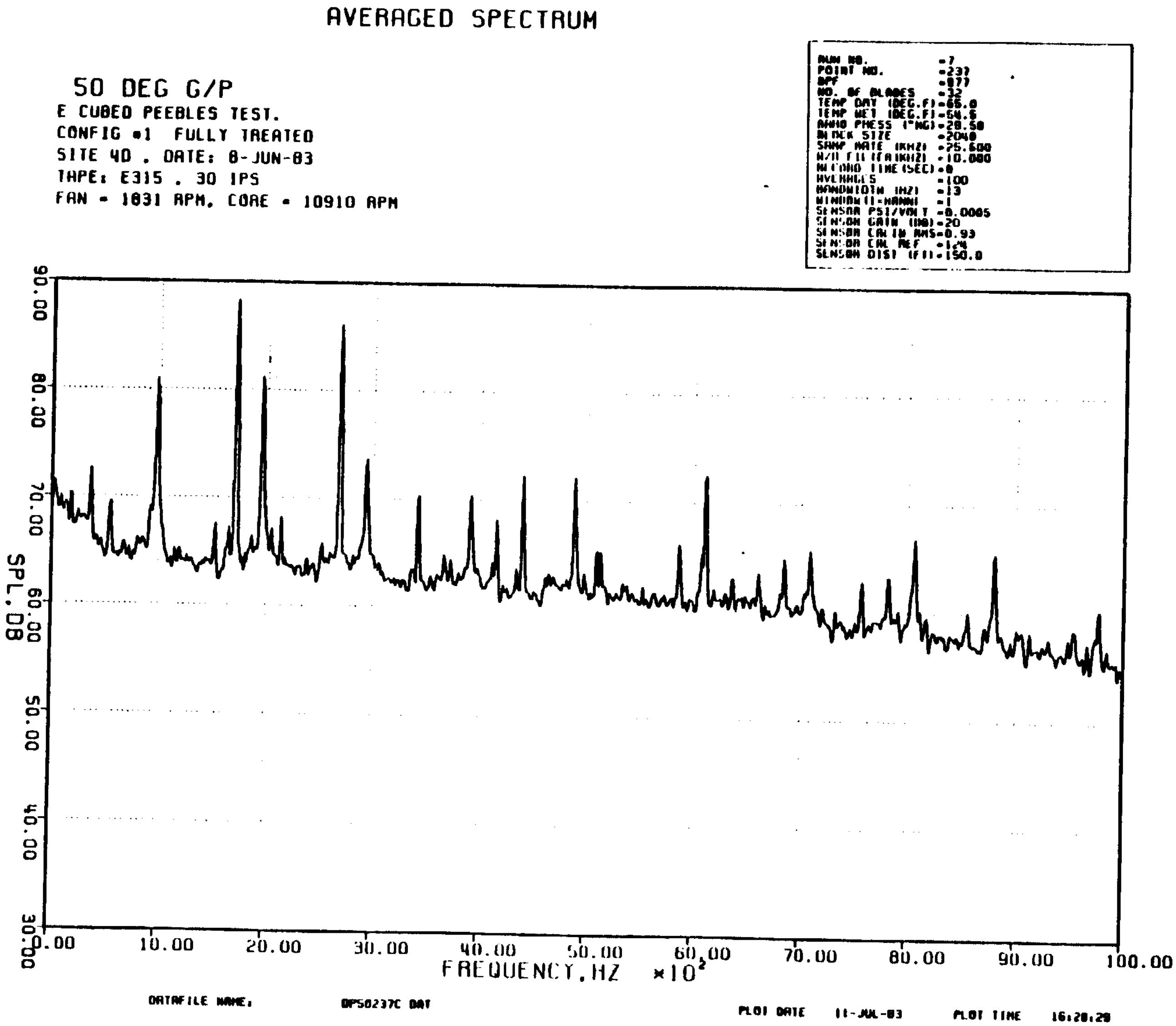
Appendix 9.2.1.e

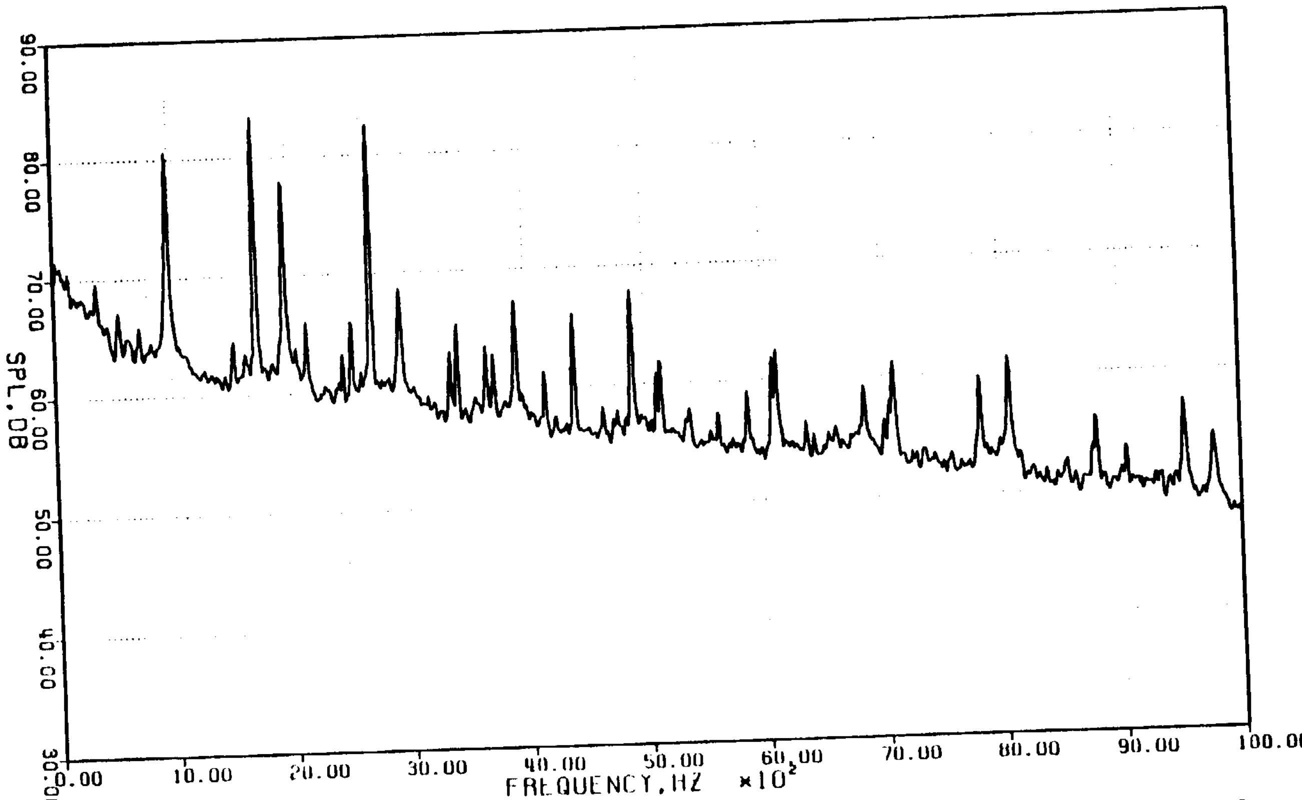


Appendix 9.2.1.f

AVERAGED SPECTRUM

60 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 1831 RPM. CORE = 10910 RPM

RUN NO. =7
POINT NO. =237
BPF =977
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER(KHZ) =10.000
RECORD TIME(SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0005
SENSOR GAIN (DB)=20
SENSOR CAL(B RMS=0.91
SENSOR CAL REF =124
SENSOR DIST (FT)=160.0



DATAFILE NAME: DP50237C DAT

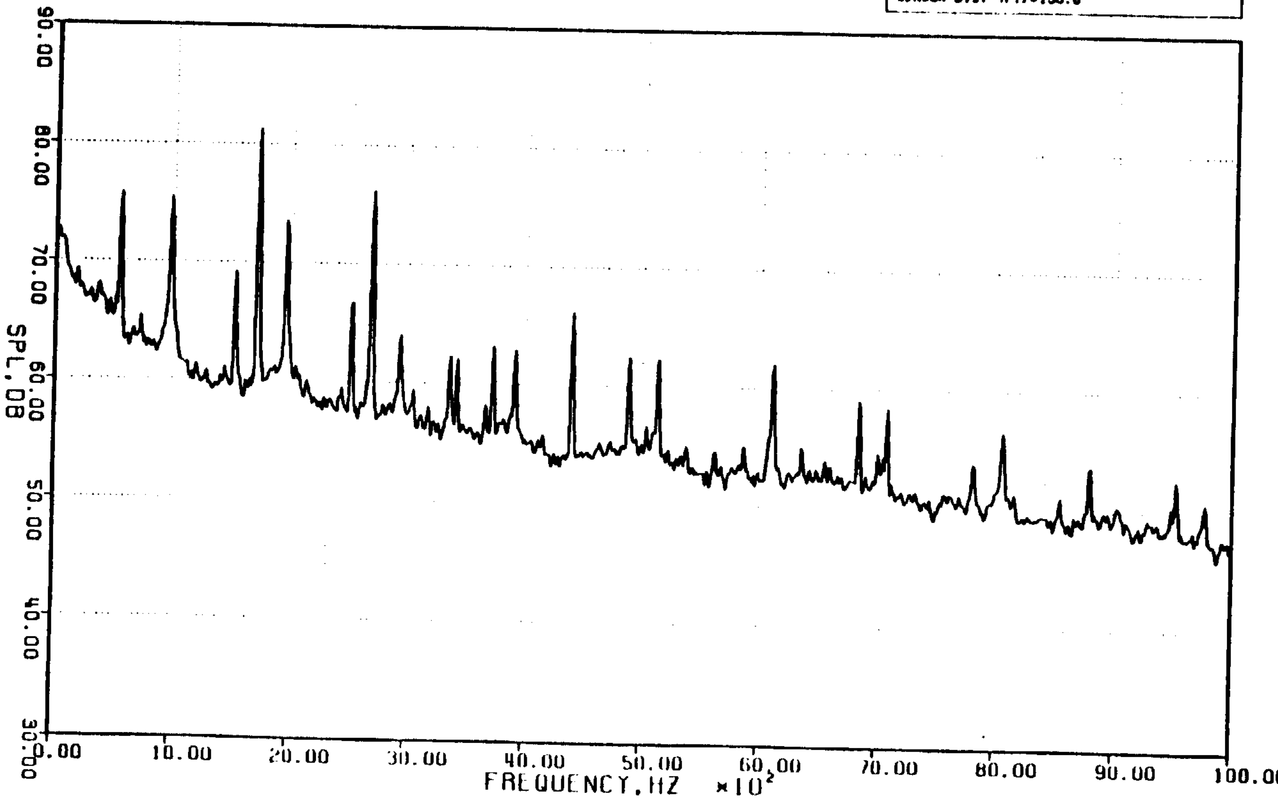
PLOT DATE 11-JUL-83 PLOT TIME 16:28:43

Appendix 9.2.1.g

AVERAGED SPECTRUM

70 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 1831 RPM. CORE = 10910 RPM

RUN NO. =7
POINT NO. =237
BPF =877
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.58
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER (KHZ) =10.000
RECORD TIME (SEC) =0
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1=HANN) =1
SENSOR PSI/VOLT =0.0006
SENSOR GAIN (DB) =20
SENSOR CALIB RMS =0.92
SENSOR CAL (DB) =124
SENSOR DIST (FT) =160.0



DATAFILE NAME: DPS02370 DAT

PLOT DATE 11-JUL-83 PLOT TIME 16:28:27

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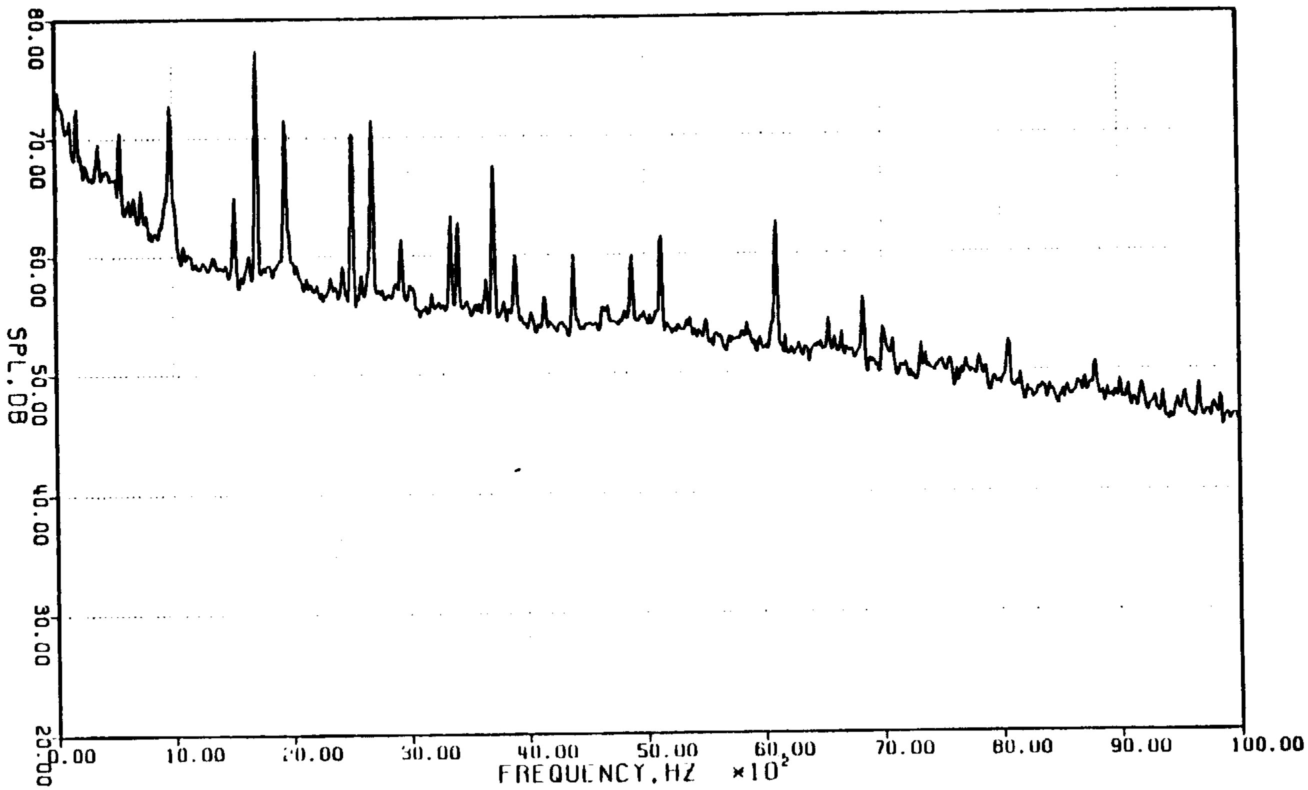
Appendix 9.2.1.h

AVERAGED SPECTRUM

80 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 1831 RPM. CORE = 10910 RPM

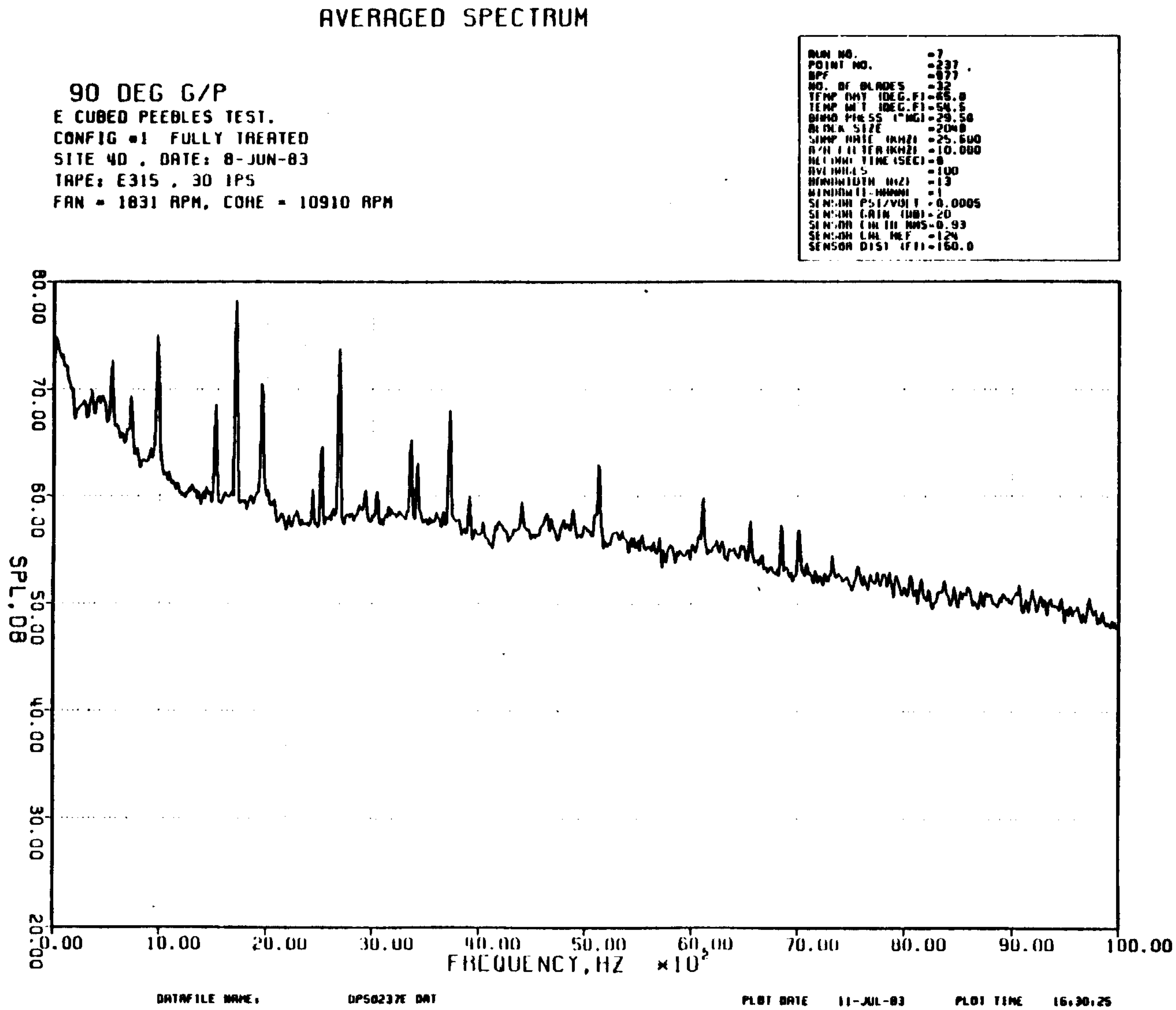
RUN NO. =7
POINT NO. =237
BPF =977
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=64.5
BARO PRESS ("HG)=29.60
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER(KHZ) =10.000
RECORD TIME(SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0005
SENSOR GAIN (DB)=20
SENSOR CALIB RMS=0.91
SENSOR CAL REF =124
SENSOR DIST (FT)=150.0



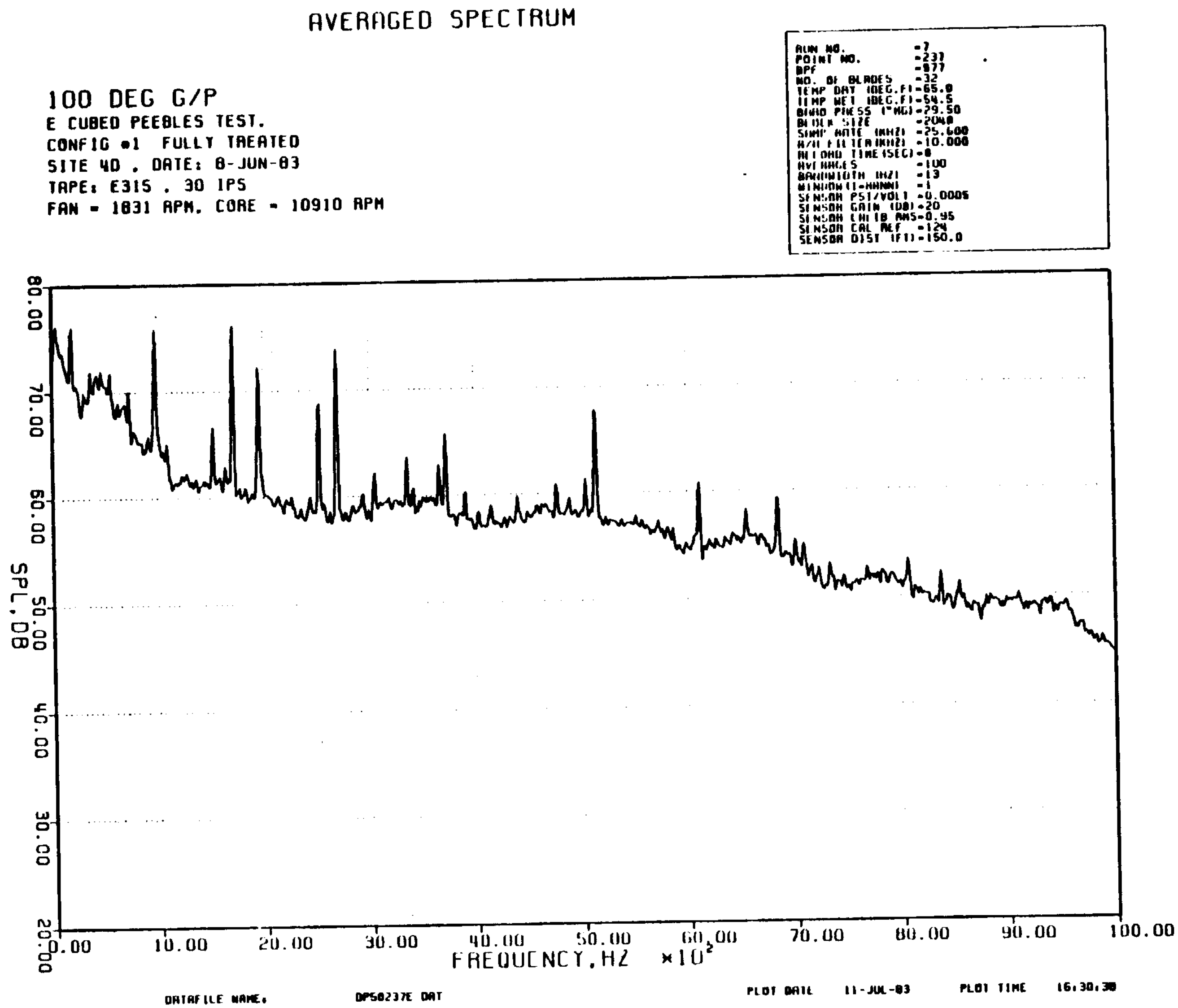
DATAFILE NAME: DP502370 DAT

PLOT DATE 11-JUL-83 PLOT TIME 16:28:40

Appendix 9.2.1.i



Appendix 9.2.1.j



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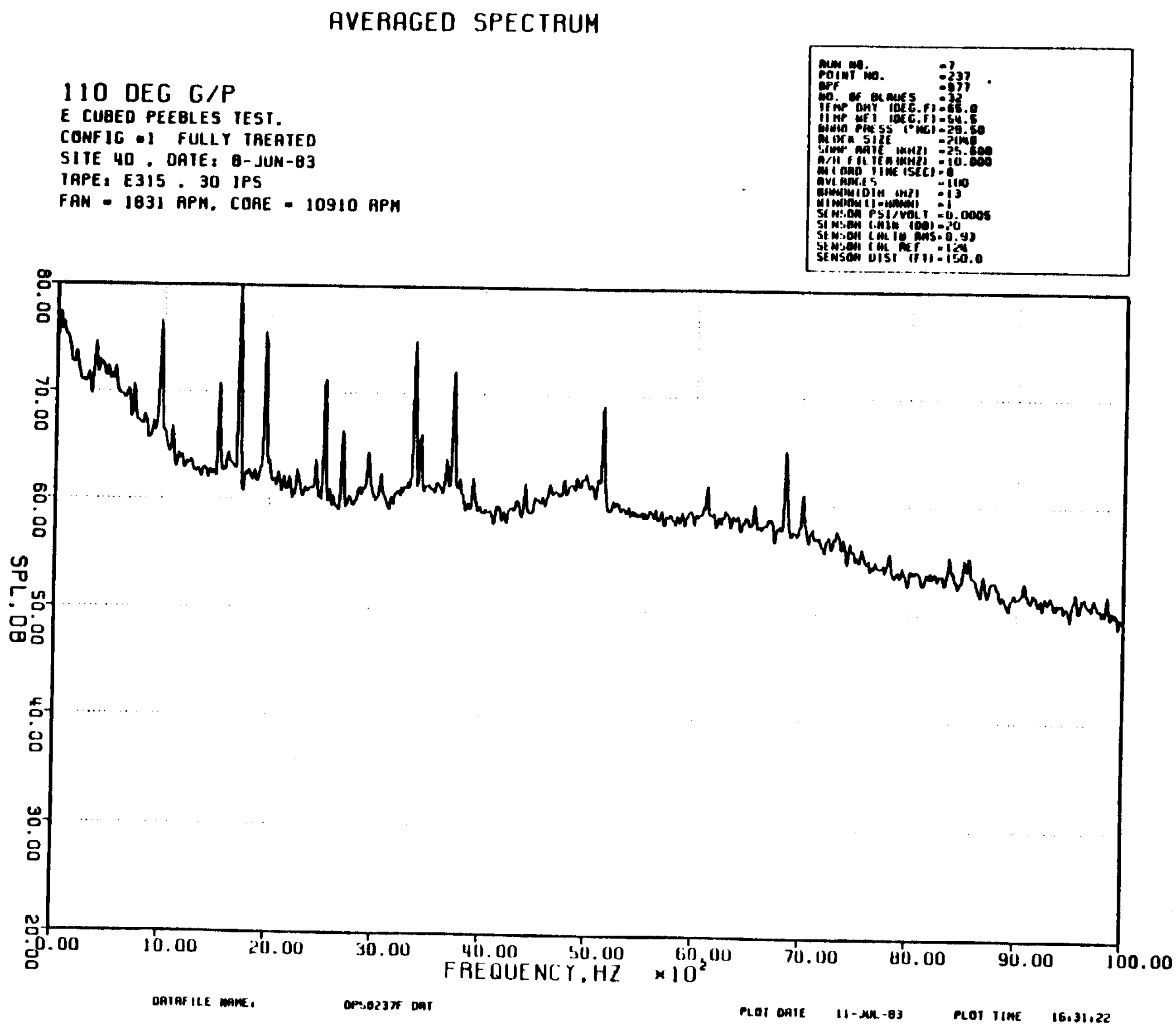
Appendix 9.2.1.k



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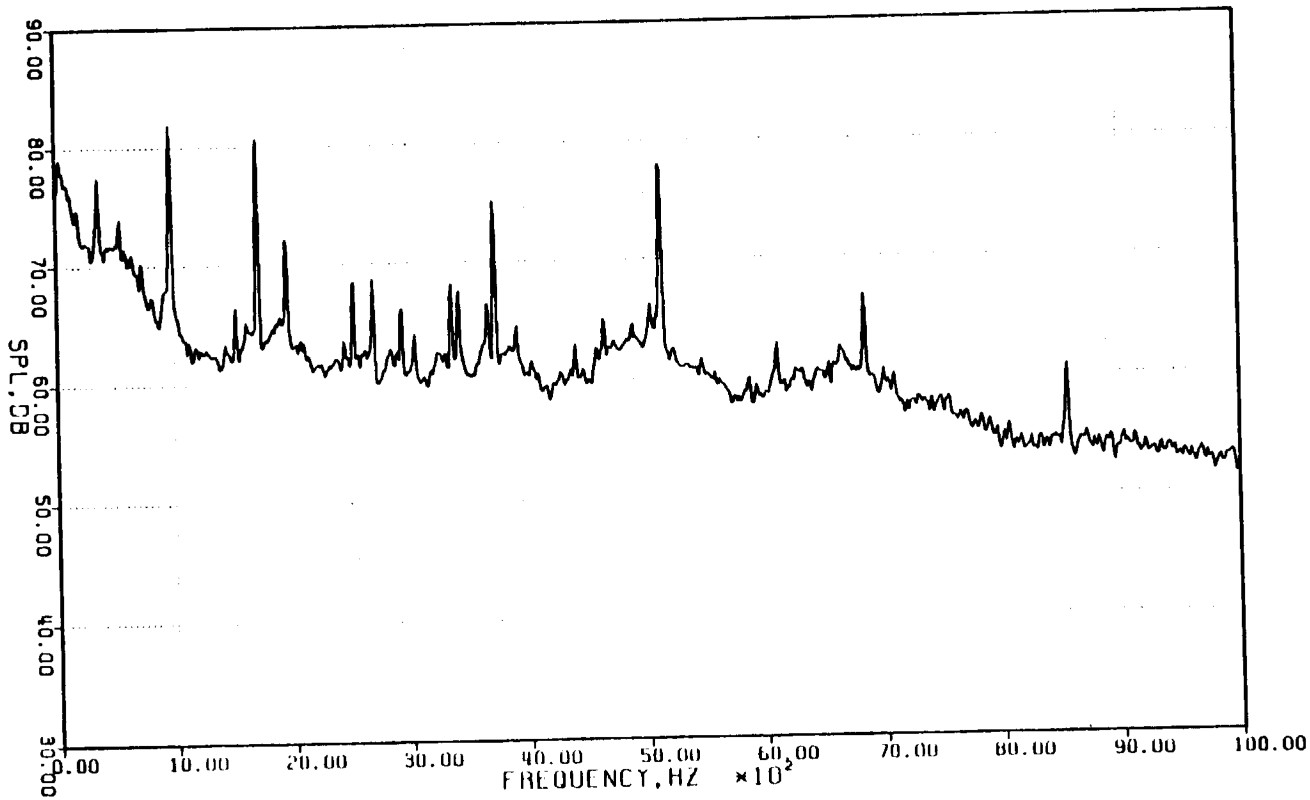
Appendix 9.2.1.1

AVERAGED SPECTRUM

120 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 1831 RPM, CORE = 10910 RPM

RUN NO. =7
POINT NO. =237
BPF =977
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER (KHZ) =10.000
RECORD TIME (SEC) =0
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1=HANN) =1
SENSOR PSI/VOLT =0.0005
SENSOR GAIN (DB) =20
SENSOR CALIB RMS =0.92
SENSOR CAL REF =124
SENSOR DIST (FT) =150.0



DATAFILE NAME: DP50237F DAT

PLOT DATE 11-JUL-83 PLOT TIME 16:31:36

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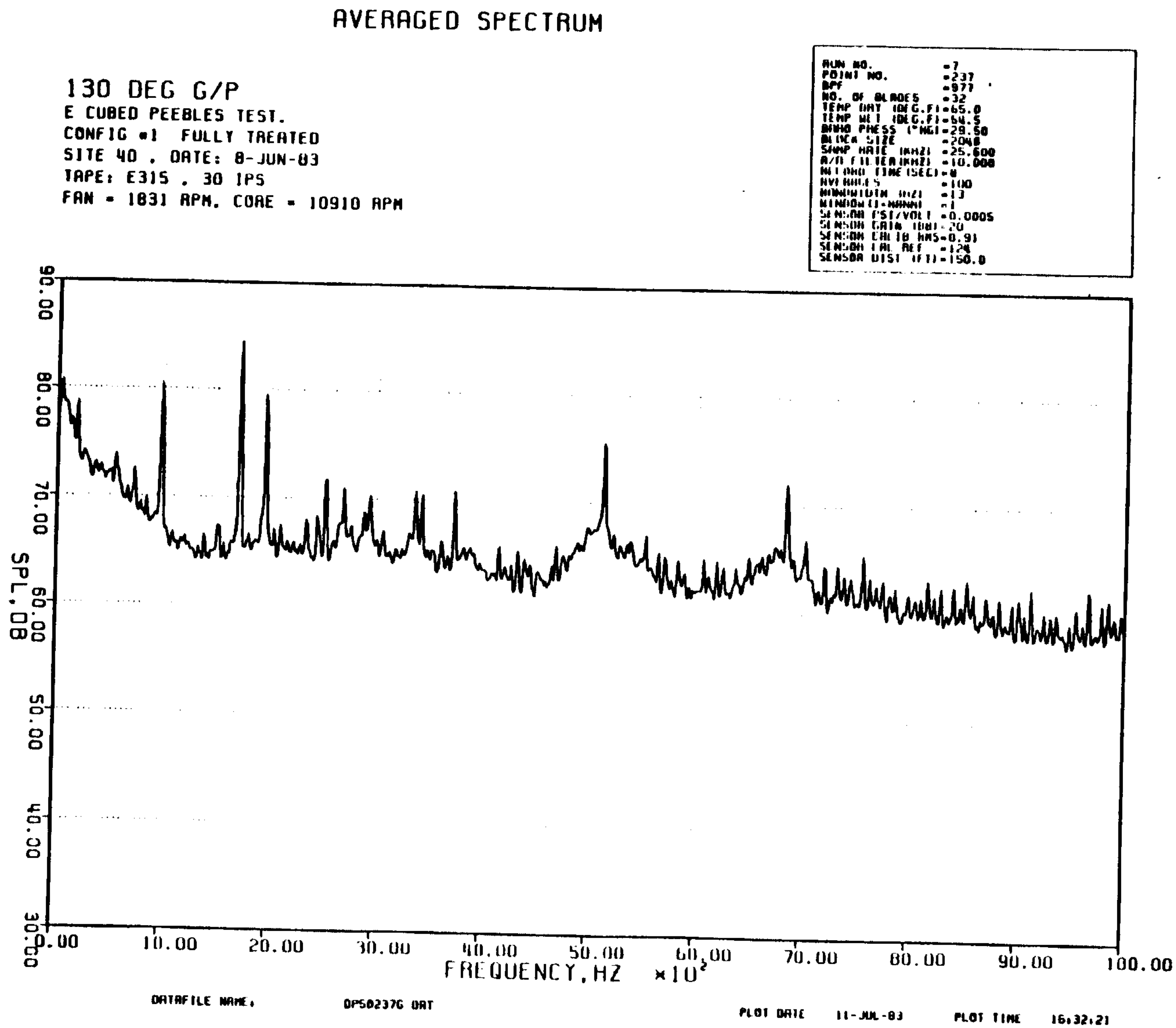
Appendix 9.2.1.m



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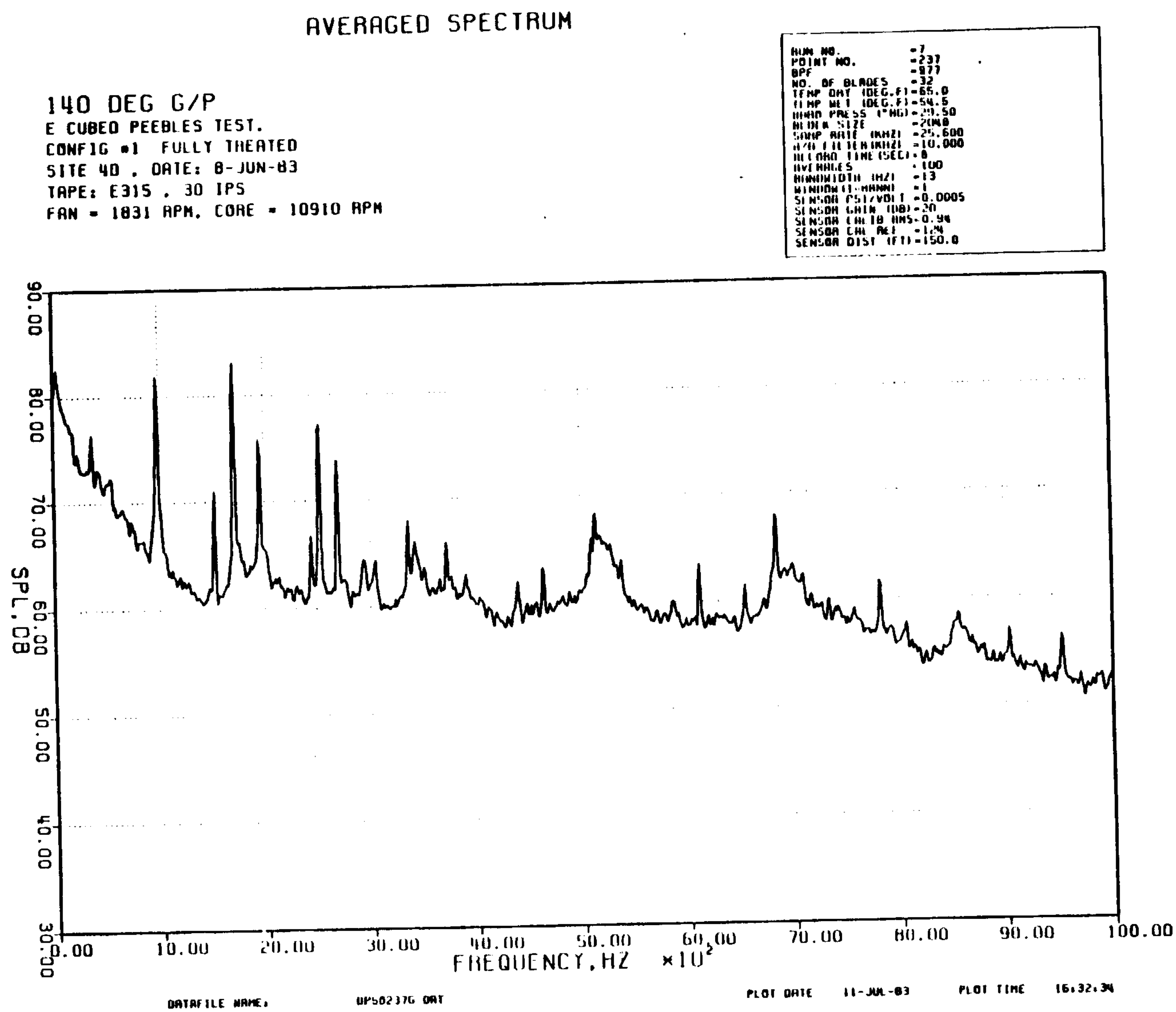
Appendix 9.2.1.n



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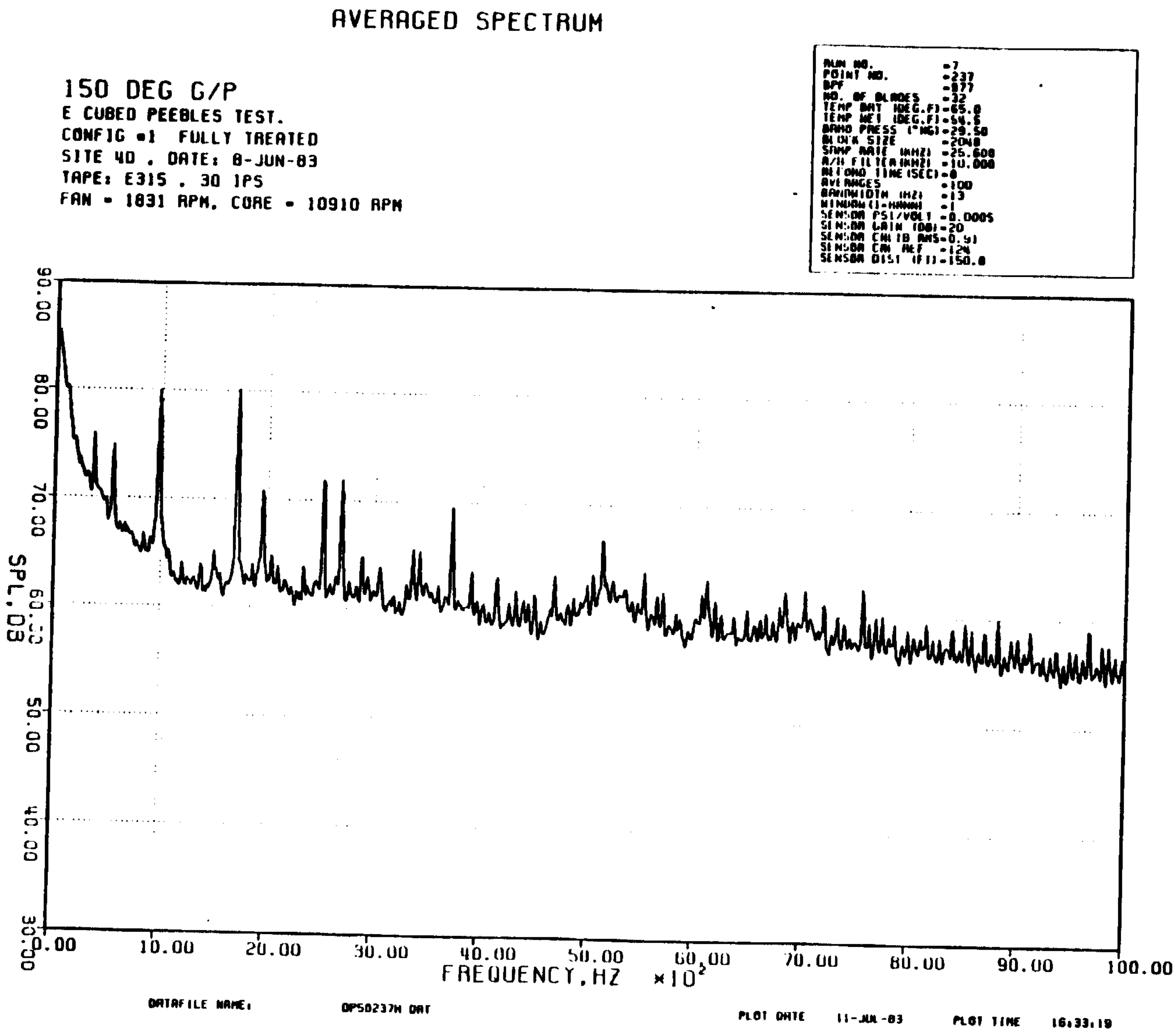
Appendix 9.2.1.o



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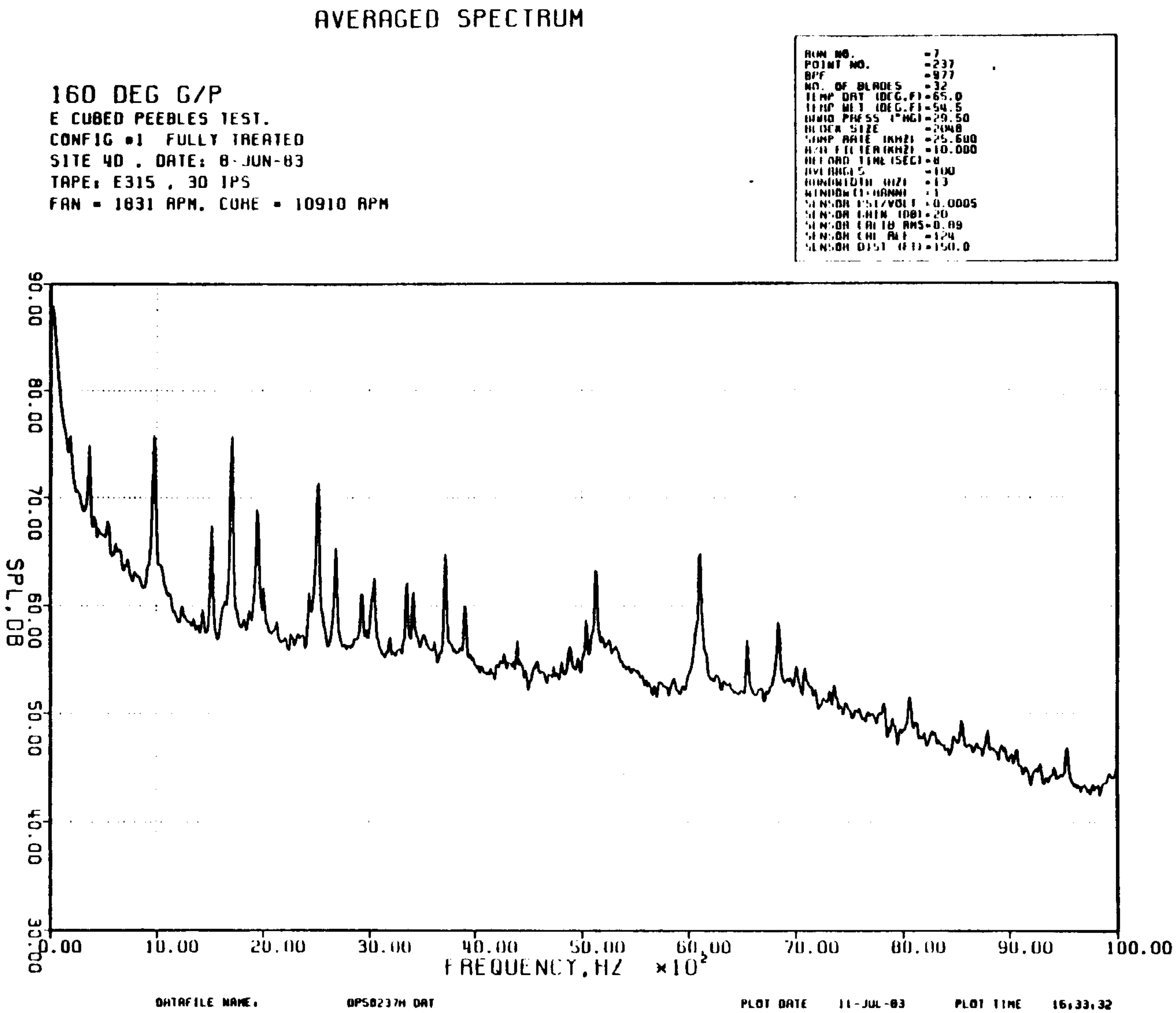
Appendix 9.2.1.p



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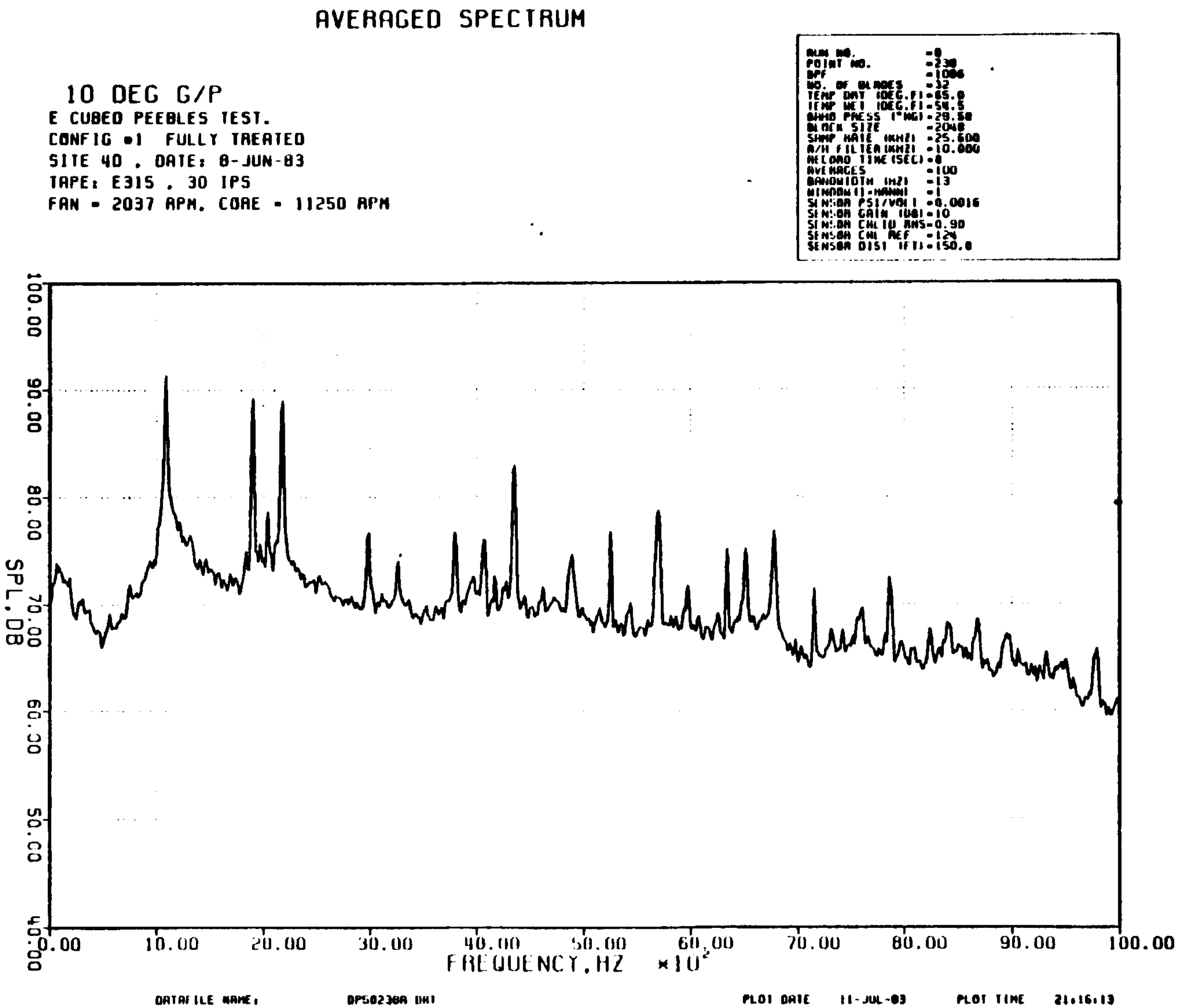
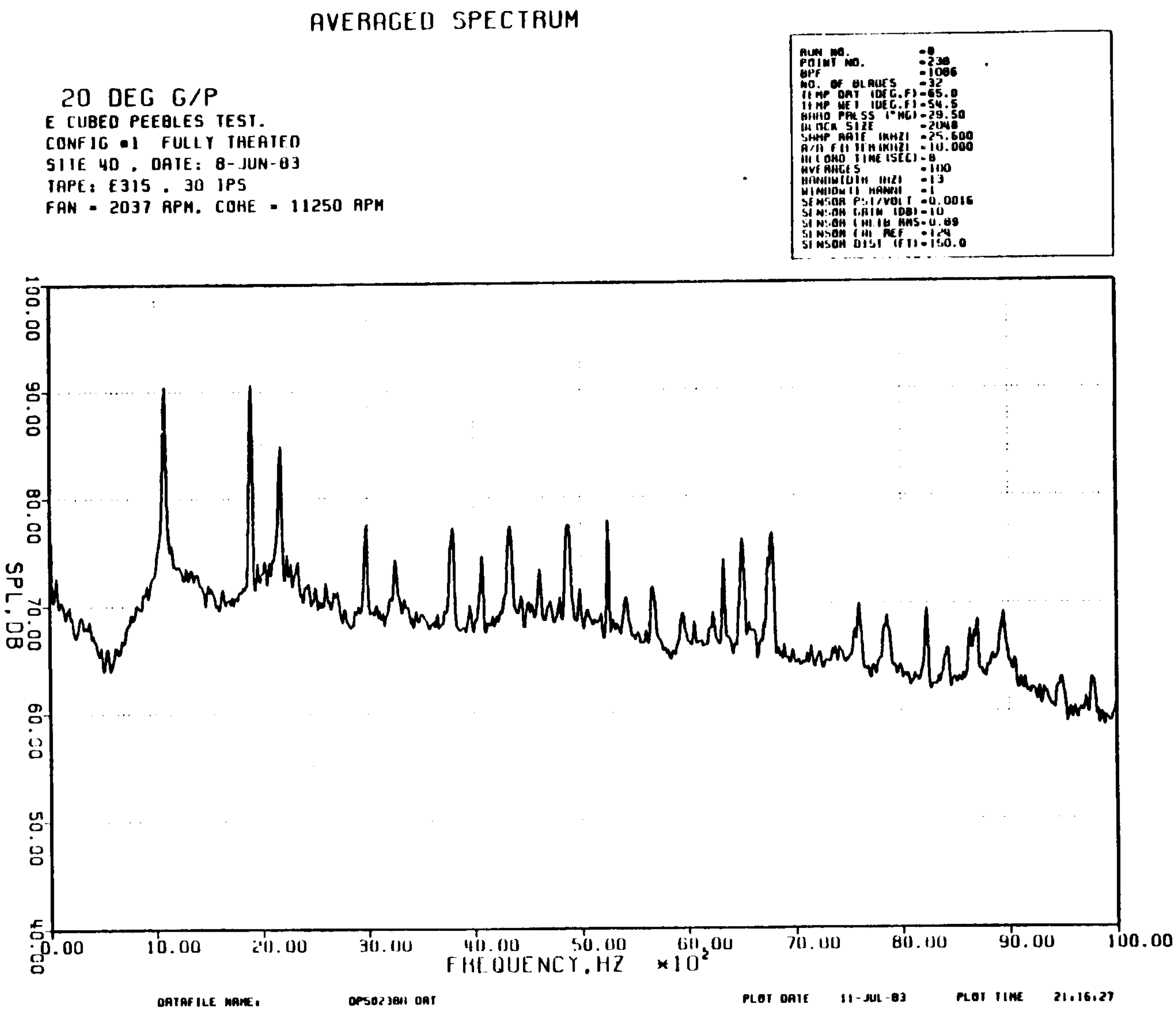
Appendix 9.2.2.a



Appendix 9.2.2.b



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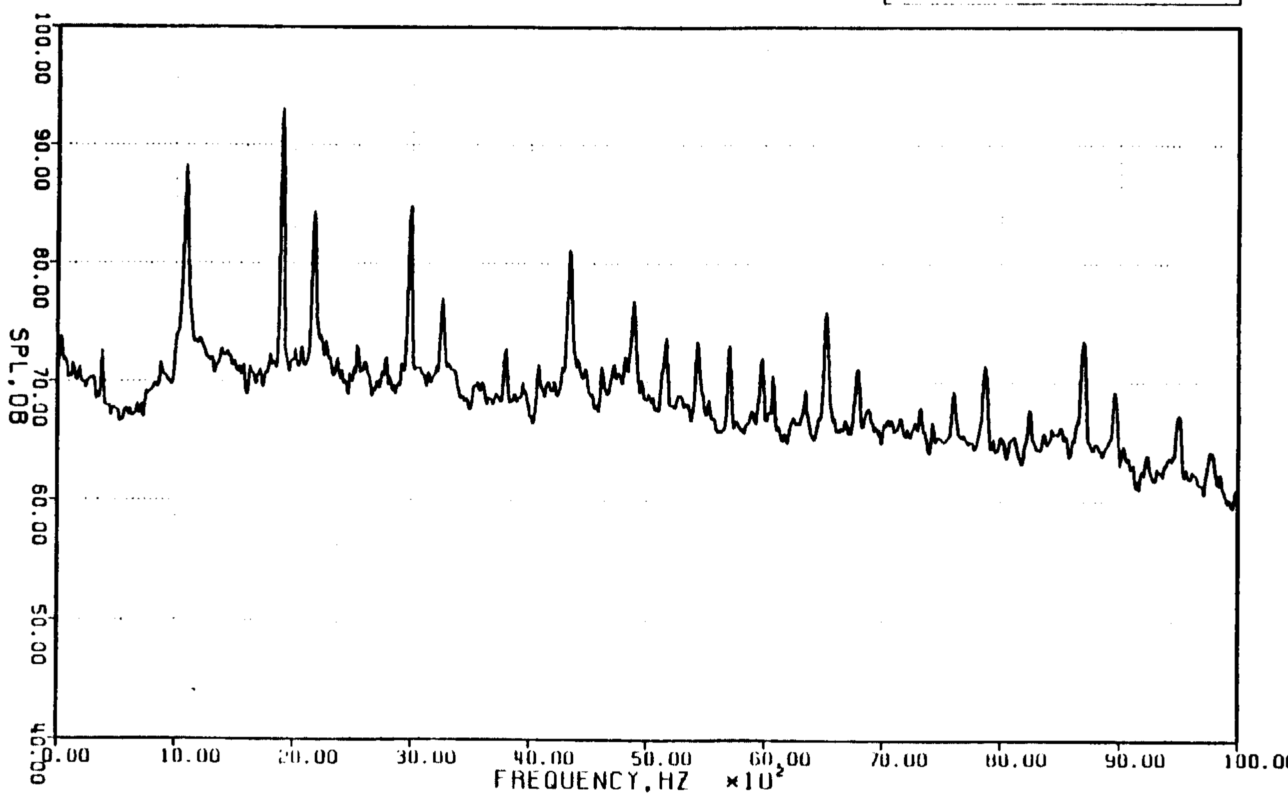
Appendix 9.2.2.c

AVERAGED SPECTRUM

30 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2037 RPM. CORE = 11250 RPM

RUN NO.	=8
POINT NO.	=230
BPF	=1086
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS (" HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RELOAD TIME (SEC)	=0
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1-HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.90
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DPS0230B DAT PLOT DATE 11-JUL-83 PLOT TIME 21:17:11

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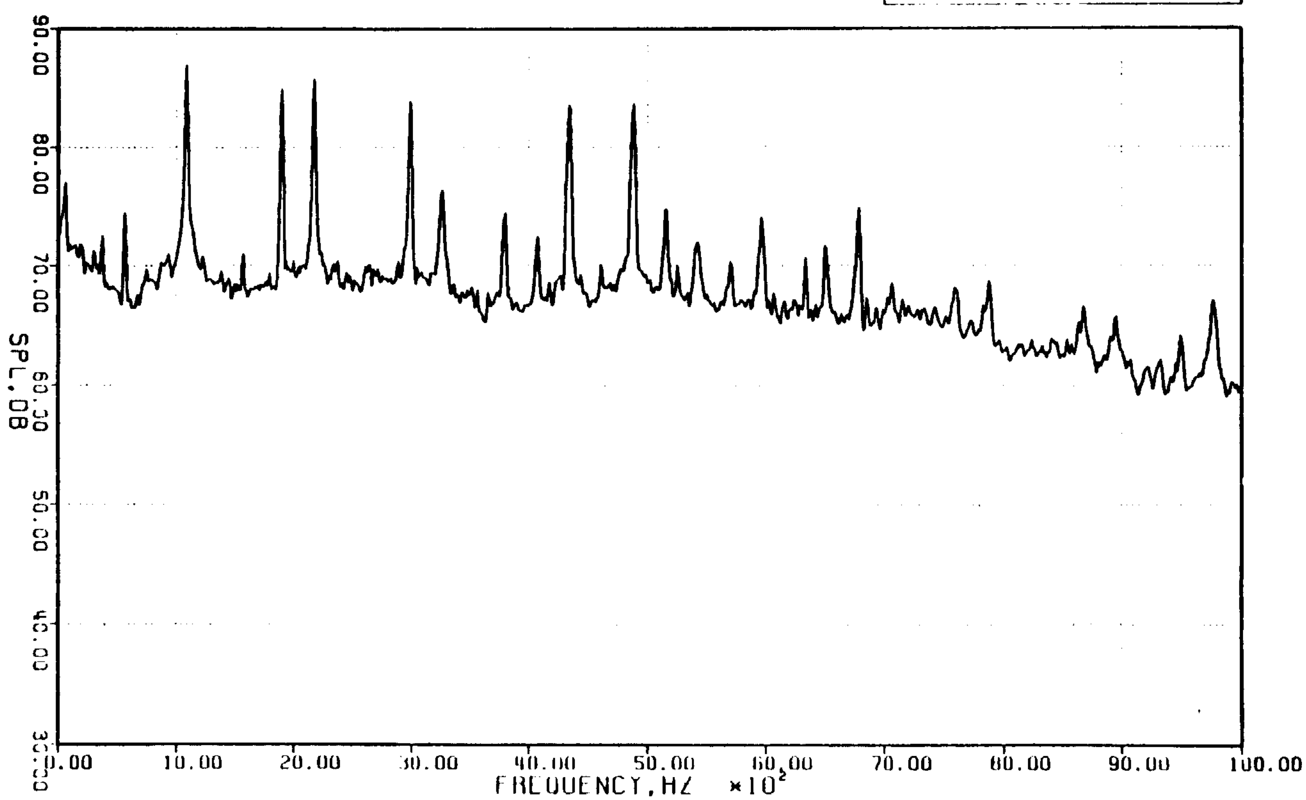
Appendix 9.2.2.d

AVERAGED SPECTRUM

40 DEG G/P
E CUBED FEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2037 RPM, CORE = 11250 RPM

RUN NO. =8
POINT NO. =238
BPF =1086
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.6
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER(KHZ) =10.000
RECORD TIME(SEC)=0
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1-HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB)=10
SENSOR CALIB RMS=0.93
SENSOR CAL REF =124
SENSOR DIST (FT)=150.0



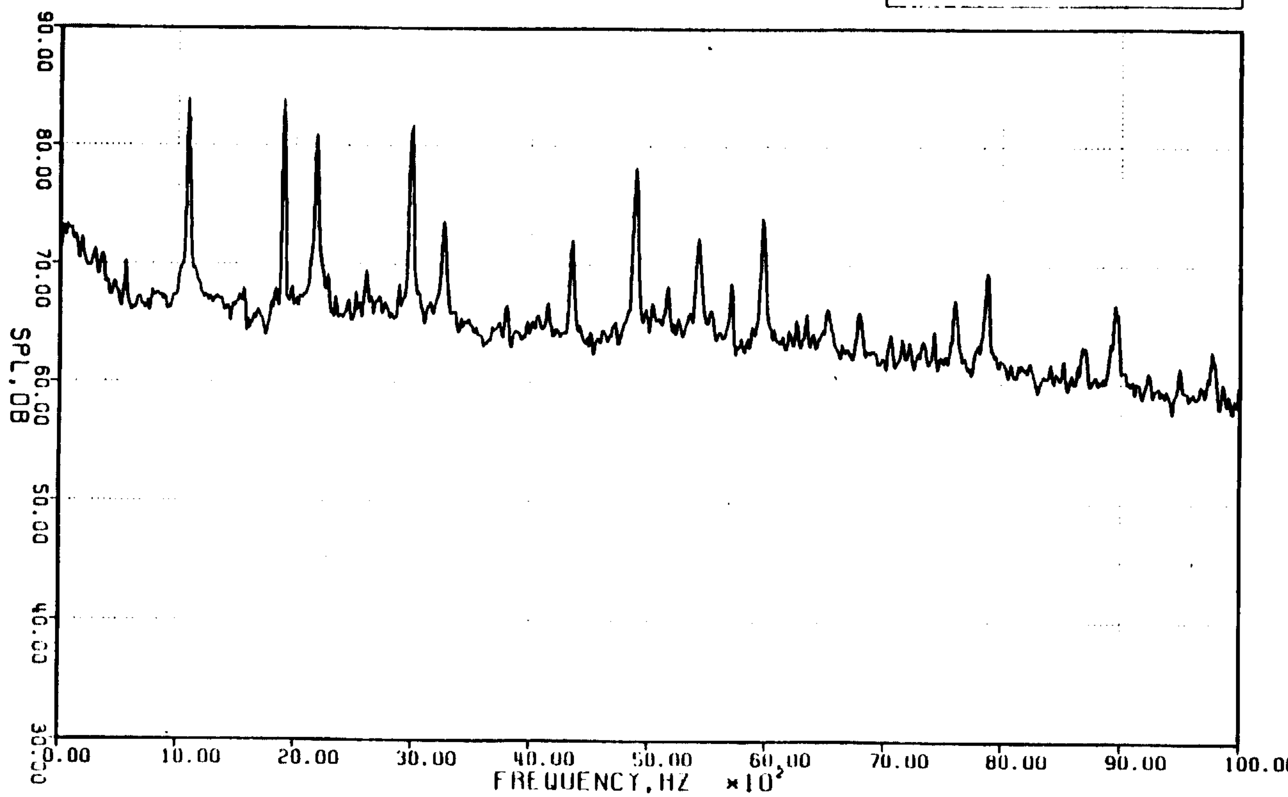
DATAFILE NAME: DP502388 DAT PLOT DATE 11-JUL-83 PLOT TIME 21:17:25

Appendix 9.2.2.e

AVERAGED SPECTRUM

50 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2037 RPM, CORE = 11250 RPM

RUN NO.	=8
POINT NO.	=238
BPF	=1088
NO. OF BLADES	=32
TEMP DAT (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
RELOAD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0005
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=0.93
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.8



DATAFILE NAME: OPS8238C DAT PLOT DATE 11-JUL-83 PLOT TIME 21:10:10

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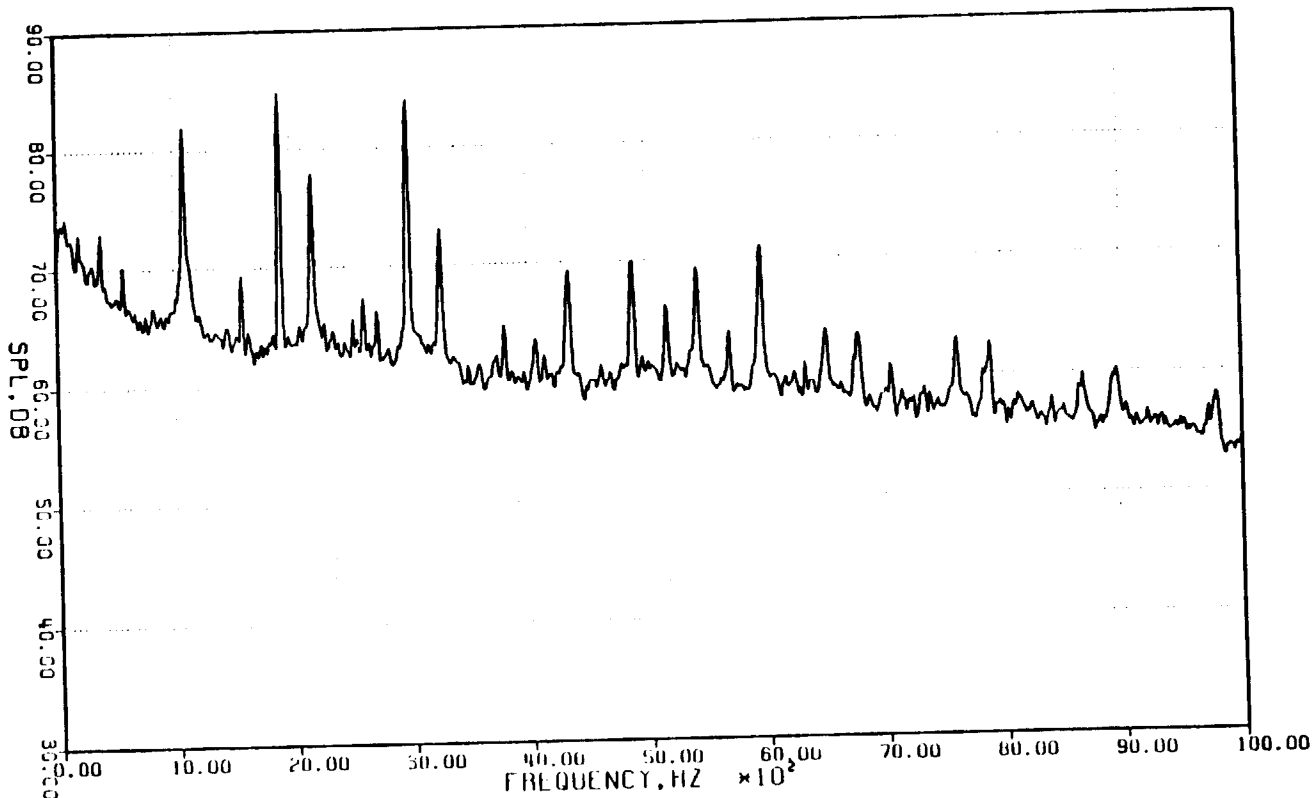
Appendix 9.2.2.f

AVERAGED SPECTRUM

60 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 , DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2037 RPM. CORE = 11250 RPM

RUN NO. =8
POINT NO. =238
BPF =1066
NO. OF BLADES =32
TEMP DRY (DEG.F) =66.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
H/L FILTER(KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1-HANN) =1
SENSOR PSI/VOLT =0.0005
SENSOR GAIN (DB) =20
SENSOR CAL IB RMS =0.91
SENSOR CAL REF =124
SENSOR DIST (FT) =150.0



DATAFILE NAME: OP50238C DAT

PLOT DATE 11-JUL-83 PLOT TIME 21:18:23

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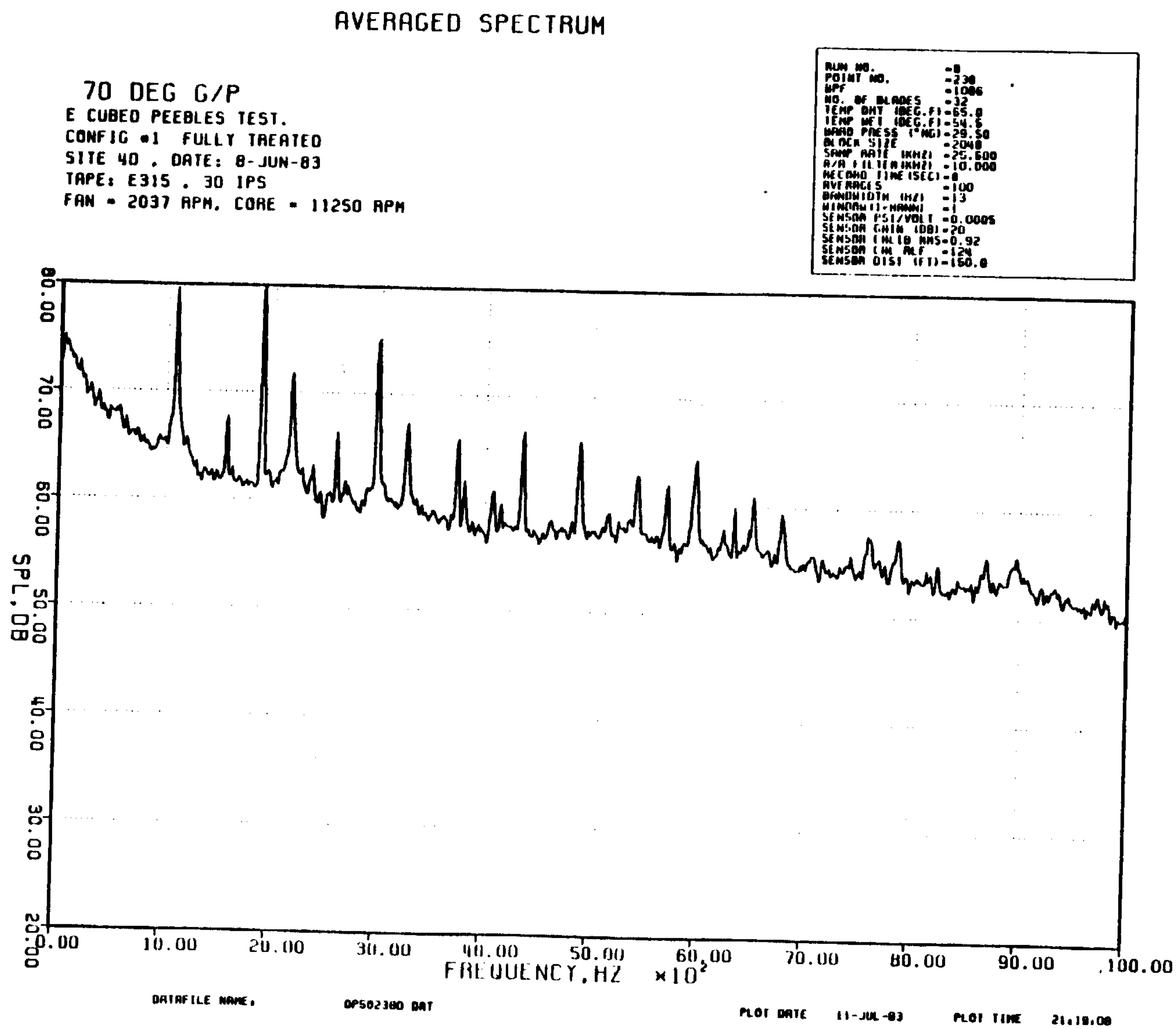
Appendix 9.2.2.g



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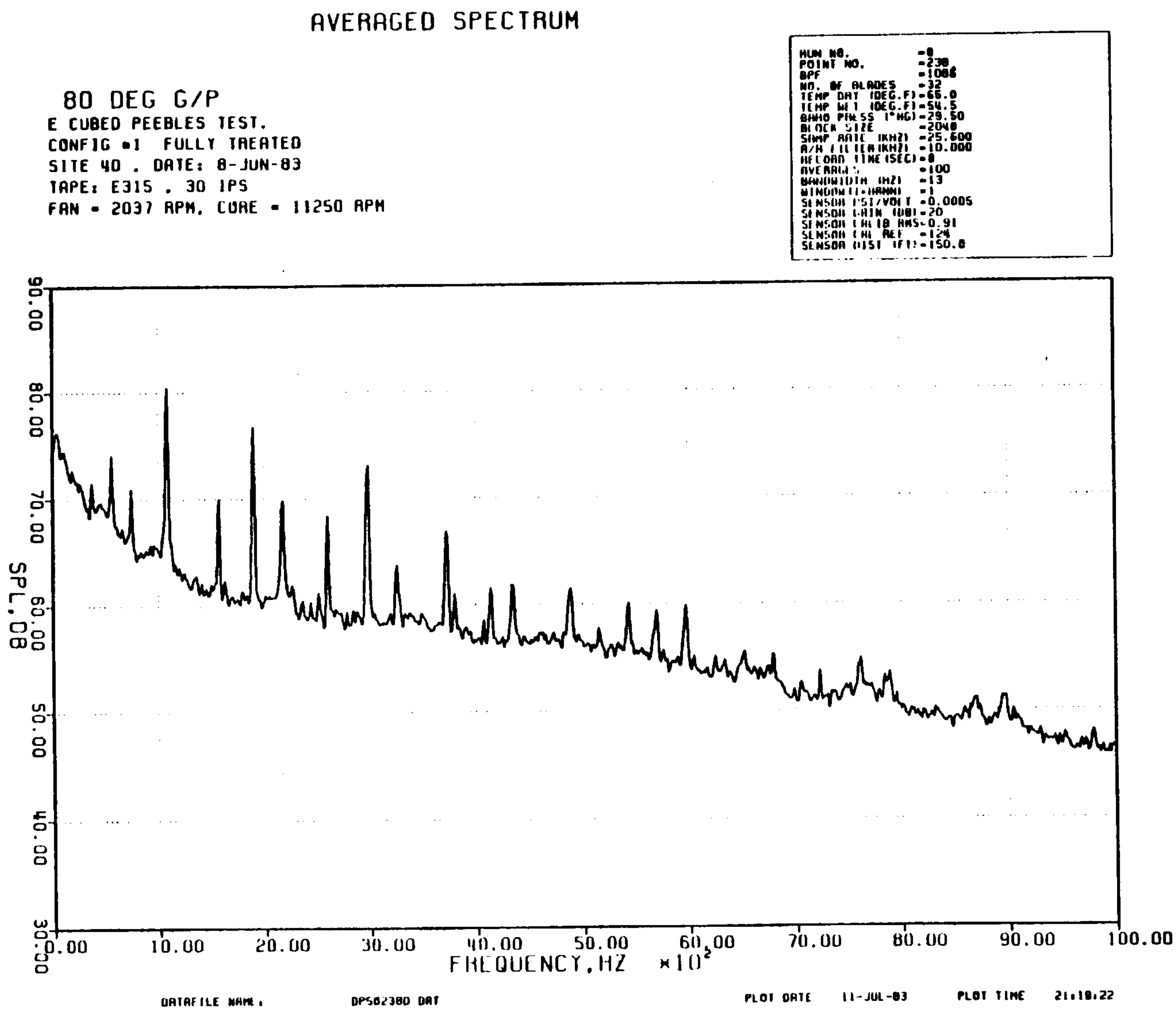
Appendix 9.2.2.h



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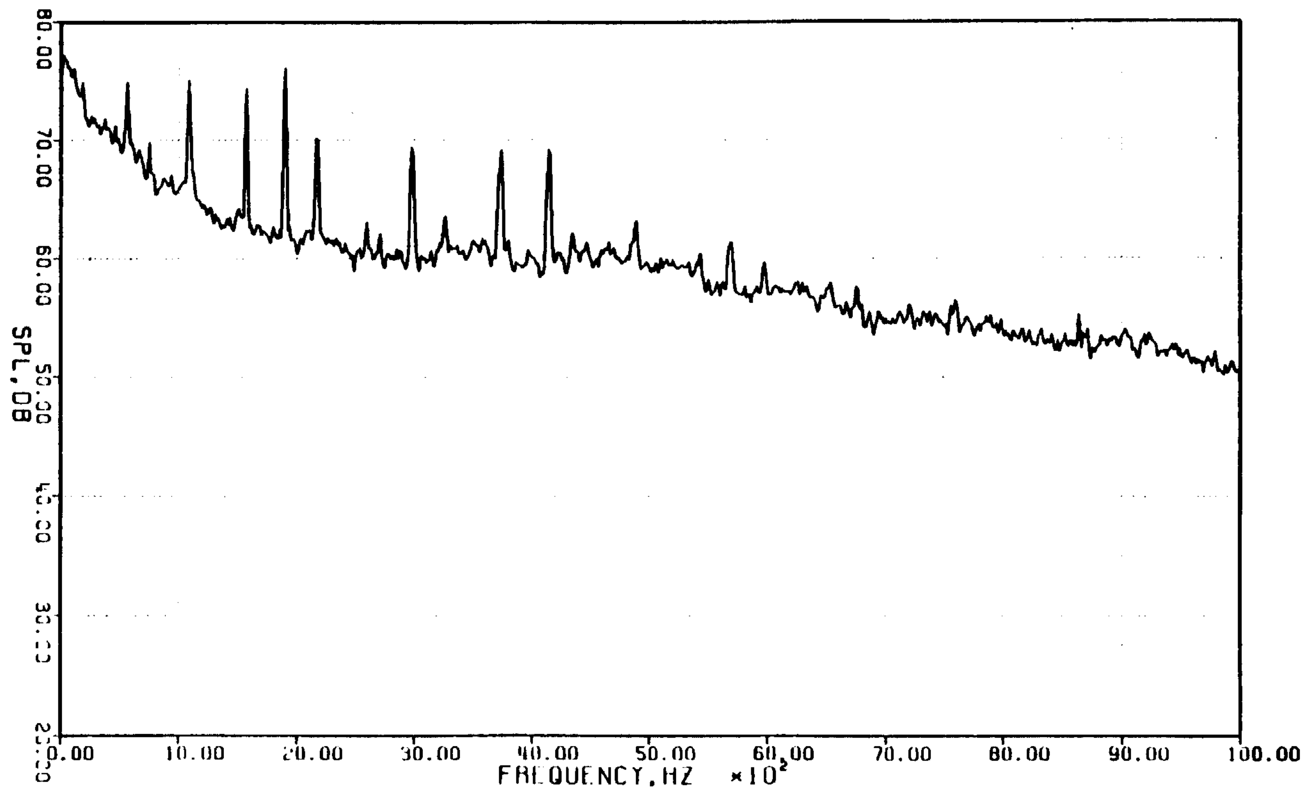
Appendix 9.2.2.i

AVERAGED SPECTRUM

90 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2037 RPM, CORE = 11250 RPM

RUN NO.	=0
POINT NO.	=230
BPF	=1086
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
REC'D TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0005
SENSOR GAIN (DB)	=20
SENSOR CAL(B RMS	=0.93
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OPS0230E DAT   PLOT DATE 11-JUL-83   PLOT TIME 21:20:06

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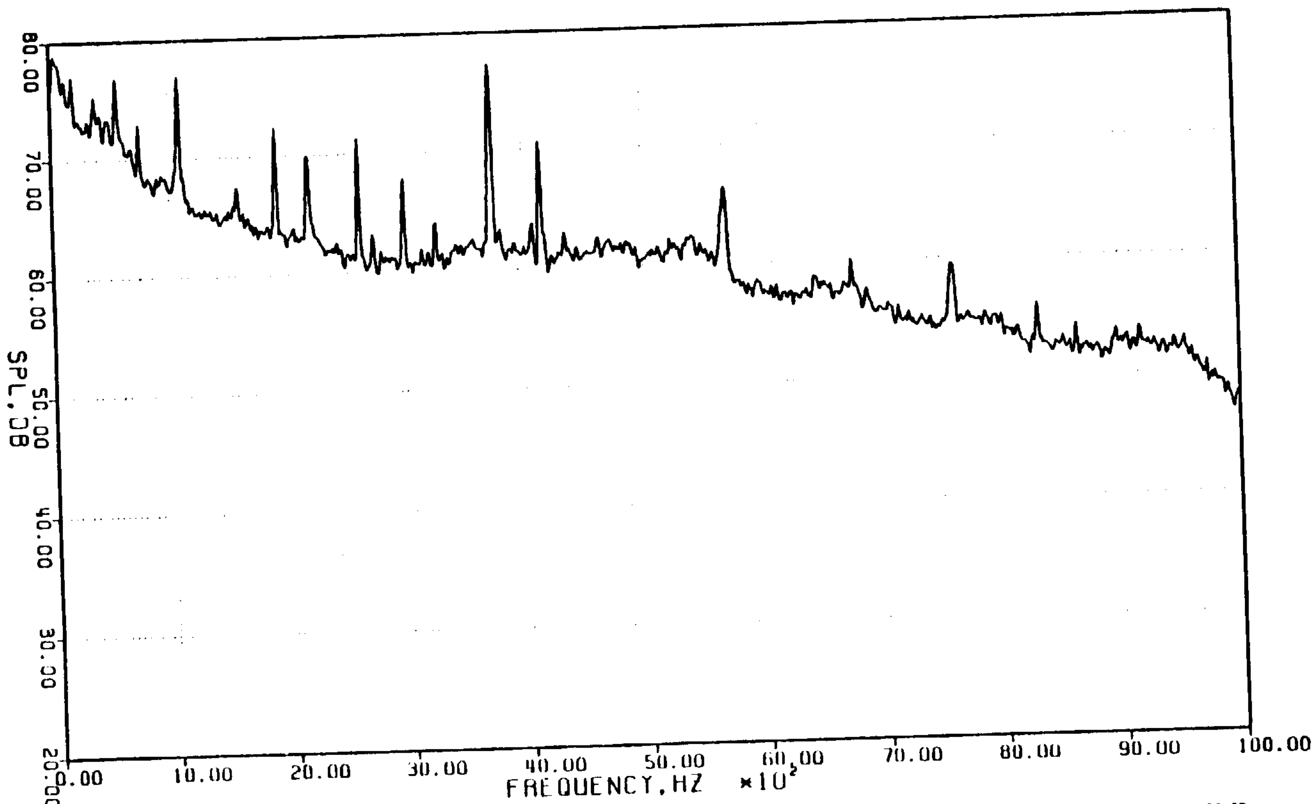
Appendix 9.2.2.j

AVERAGED SPECTRUM

100 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2037 RPM, CORE = 11250 RPM

RUN NO.	=8
POINT NO.	=238
BPF	=1086
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0005
SENSOR GAIN (DB)	=20
SENSOR CAL (A RMS	=0.95
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DPS0238E DAT

PLOT DATE 11-JUL-83 PLOT TIME 21:20:20

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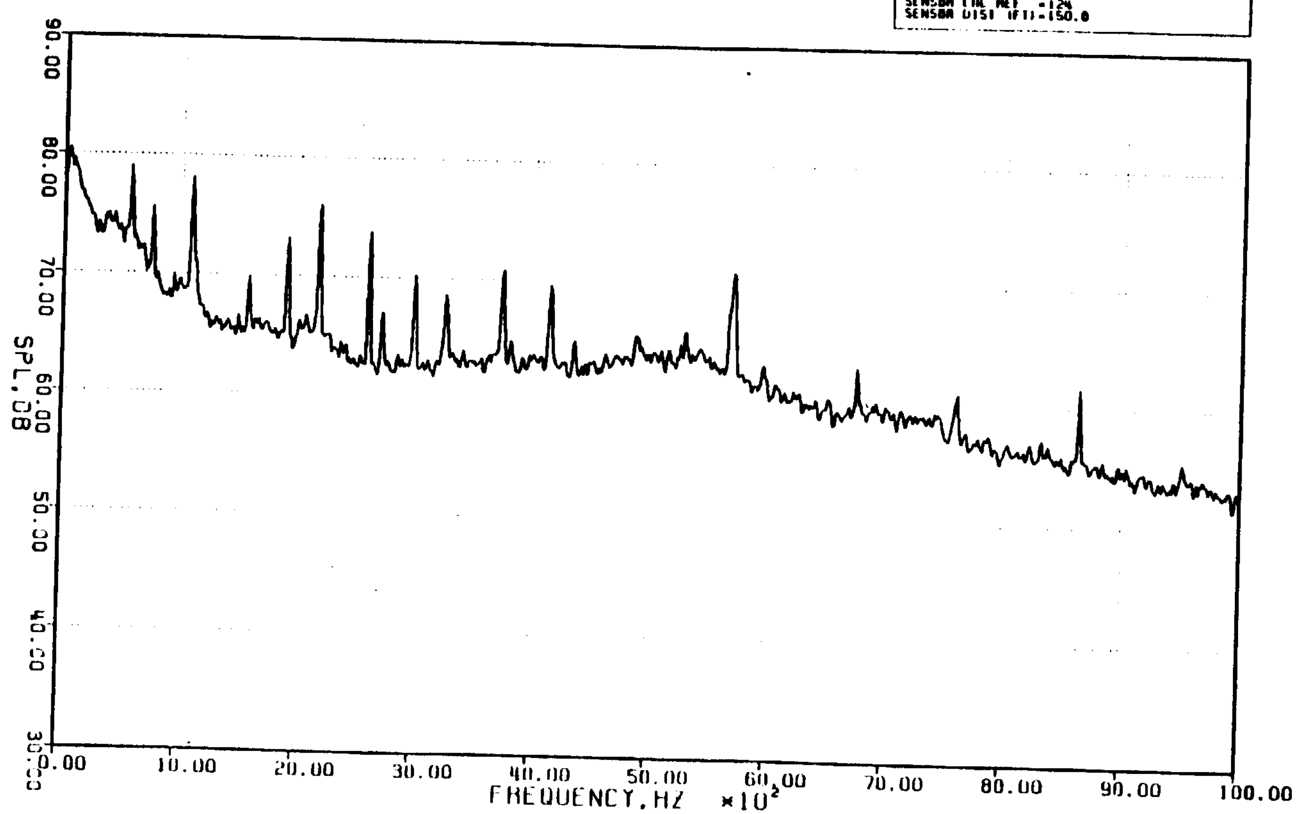
Appendix 9.2.2.k

AVERAGED SPECTRUM

110 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2037 RPM. CORE = 11250 RPM

RUN NO.	=8
POINT NO.	=230
BPF	=1086
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.6
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0006
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=0.93
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DPS0230F DAT

PLOT DATE 11-JUL-83 PLOT TIME 21:21:05

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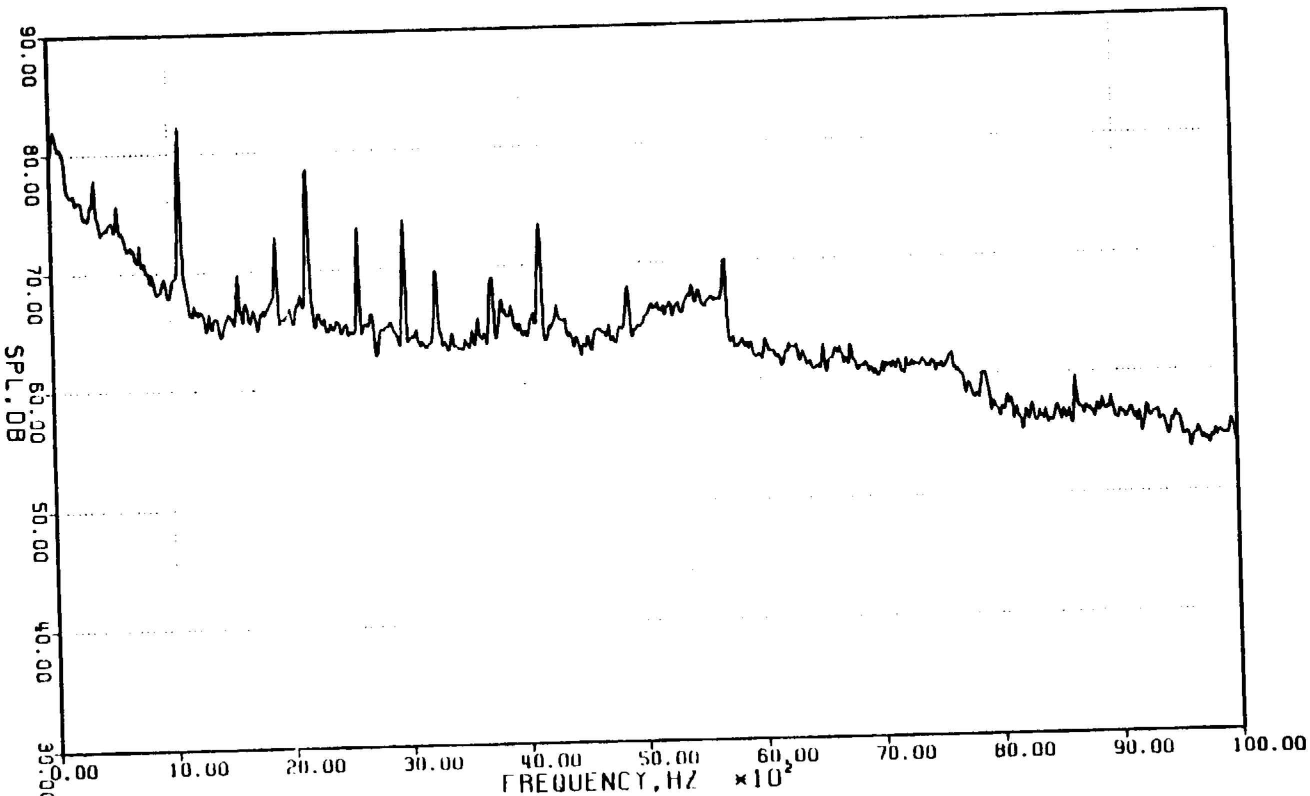
Appendix 9.2.2.1

AVERAGED SPECTRUM

120 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2037 RPM, CORE = 11250 RPM

RUN NO. =8
POINT NO. =238
BPF =1086
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
AMBIENT PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1-HANN) =1
SENSOR PSI/VOLT =0.0005
SENSOR GAIN (DB) =20
SENSOR CAL IB RMS =0.92
SENSOR CAL REF =124
SENSOR DIST (FT) =150.0



DATAFILE NAME: OP50238F DAT

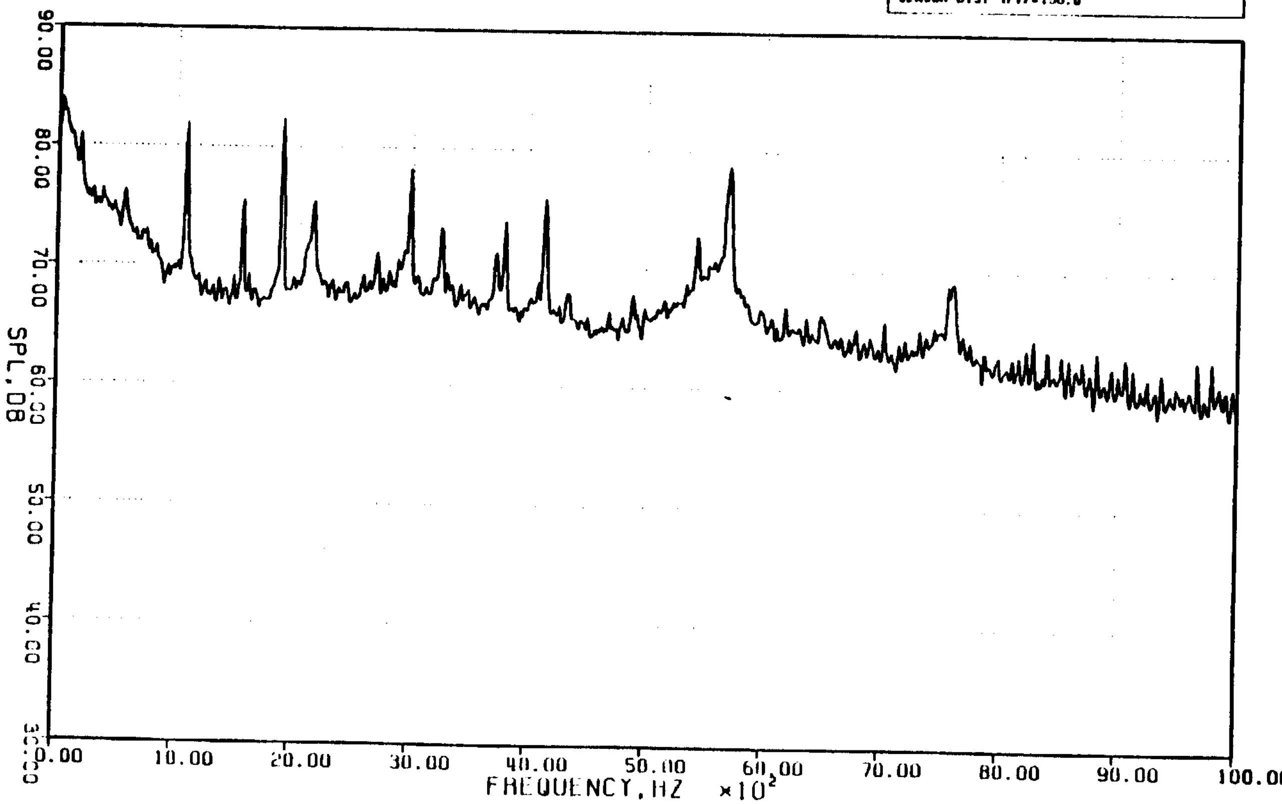
PLOT DATE 11-JUL-83 PLOT TIME 21:21:18

Appendix 9.2.2.m

AVERAGED SPECTRUM

130 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2037 RPM. CORE = 11250 RPM

RUN NO. =8
POINT NO. =238
BPF =1086
NO. OF BLADES =32
TEMP DRY (DEG.F)=66.0
TEMP WET (DEG.F)=64.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER(KHZ) =10.000
RECORD TIME(SEC)=0
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1-HANN) =1
SENSOR PSI/VOLT =0.0005
SENSOR GAIN (DB)=20
SENSOR CALIB RMS=0.91
SENSOR CAL REF =124
SENSOR DIST (FT)=150.0



DATAFILE NAME: DPS0238G DAT

PLOT DATE 11-JUL-83 PLOT TIME 21:22:03

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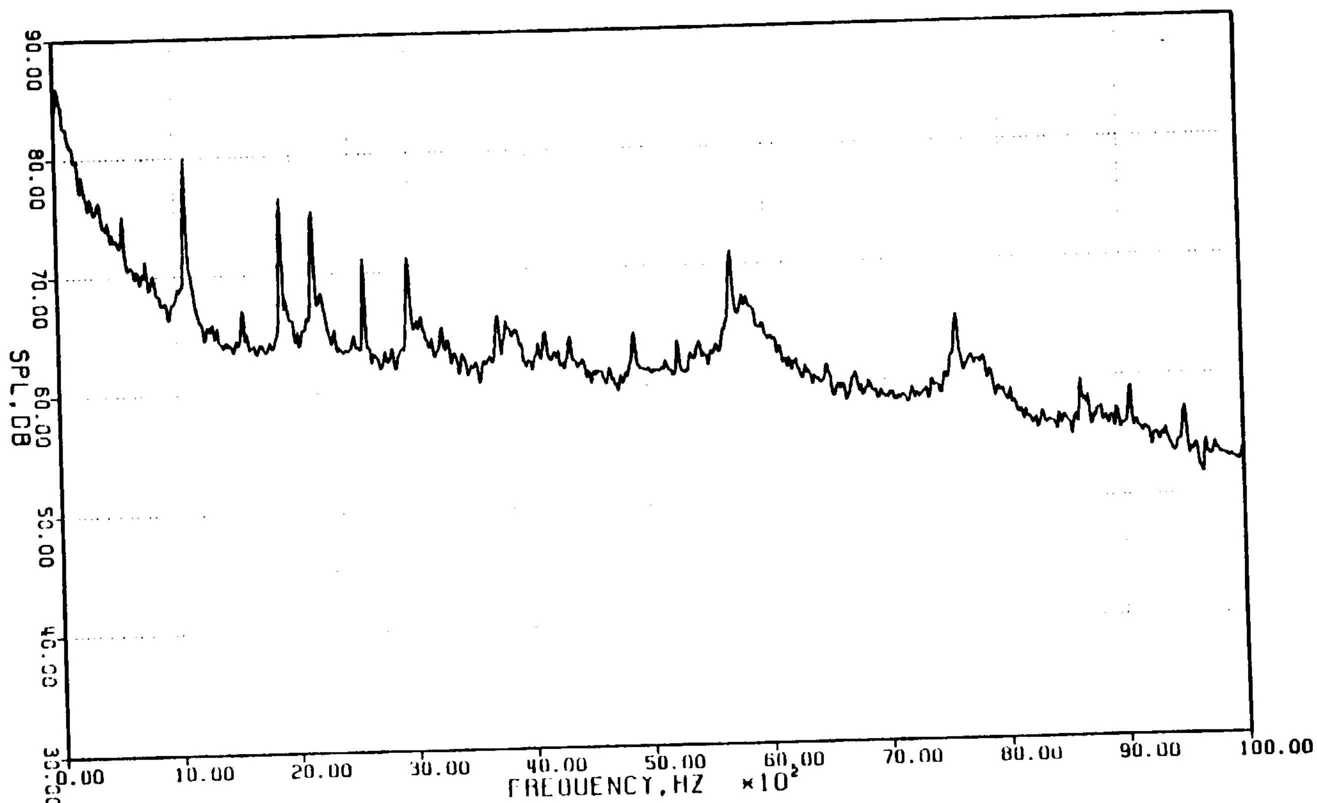
AVERAGED SPECTRUM

140 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2037 RPM, CORE = 11250 RPM

RUN NO.	=8
POINT NO.	=230
BPF	=1086
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS (“HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0015
SENSOR GAIN (DB)	=10
SENSOR CAL(B RMS	=0.[illegible]
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DPS0230G DAT

PLOT DATE 11-JUL-83 PLOT TIME 21:22:17

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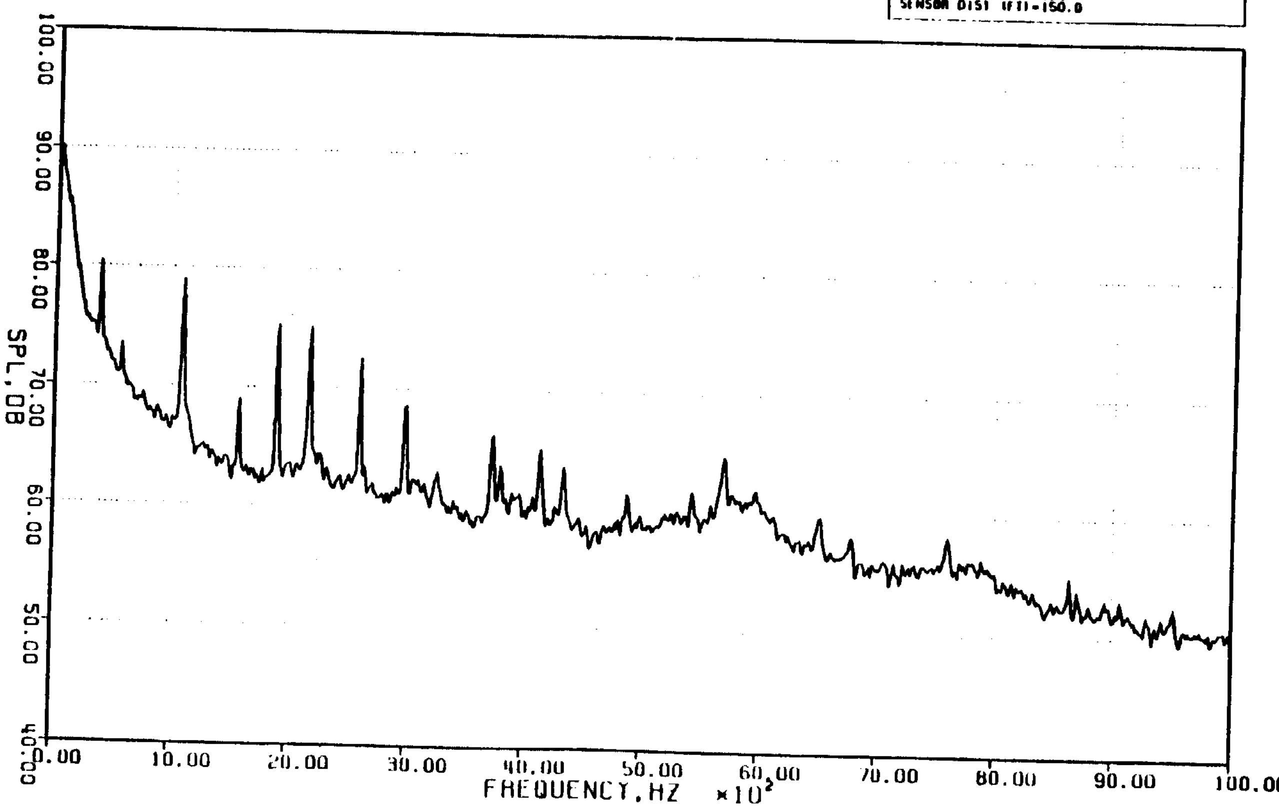
Appendix 9.2.2.o

AVERAGED SPECTRUM

150 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2037 RPM, CORE = 11250 RPM

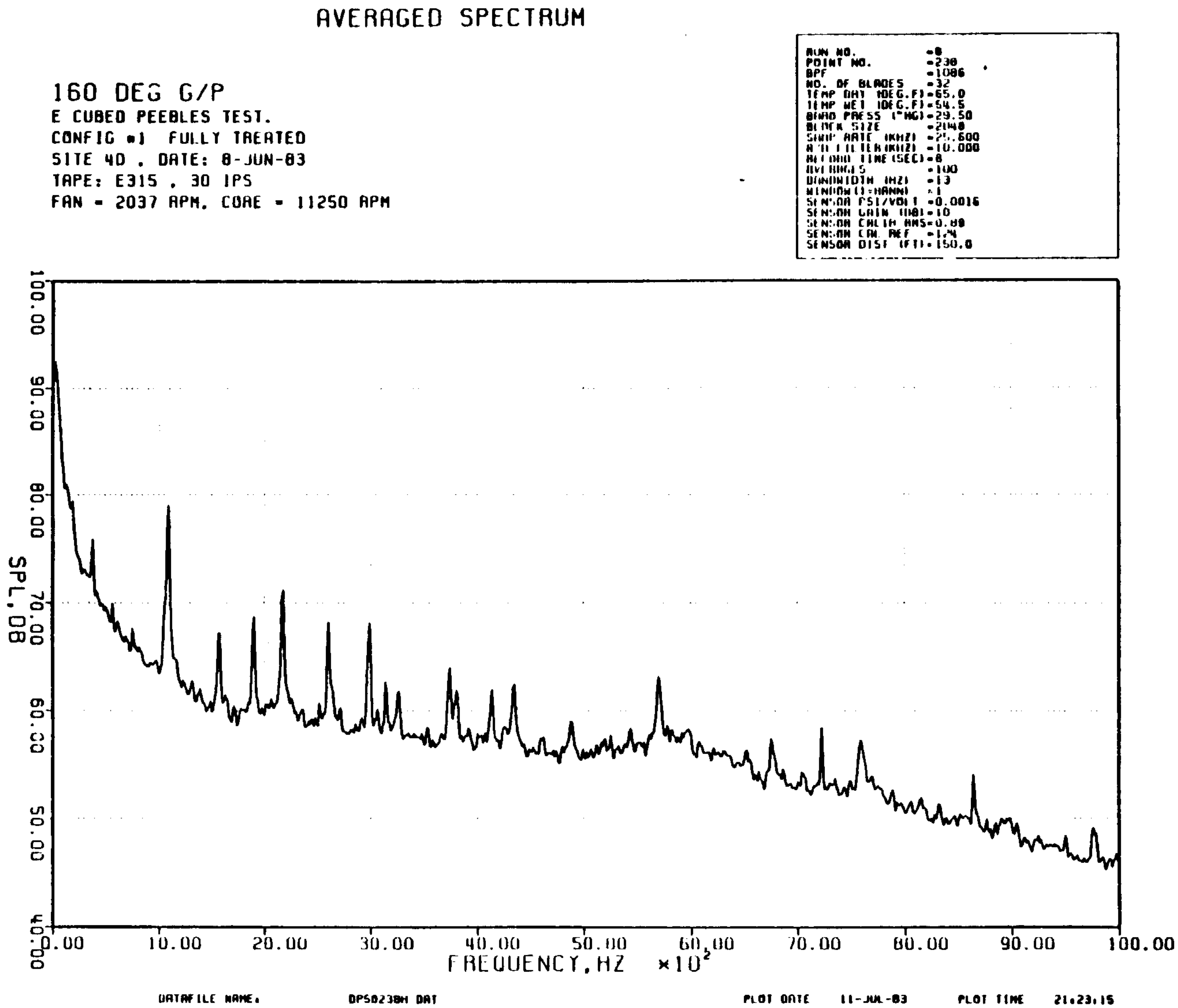
RUN NO. =8
POINT NO. =238
BPF =1086
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER(KHZ) =10.000
RECORD TIME(SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB)=10
SENSOR CALIB RMS=0.91
SENSOR CAL REF =124
SENSOR DIST (FT)=150.0



DATAFILE NAME, OP50238H DAT

PLOT DATE 11-JUL-83 PLOT TIME 21:23:01

Appendix 9.2.2.p



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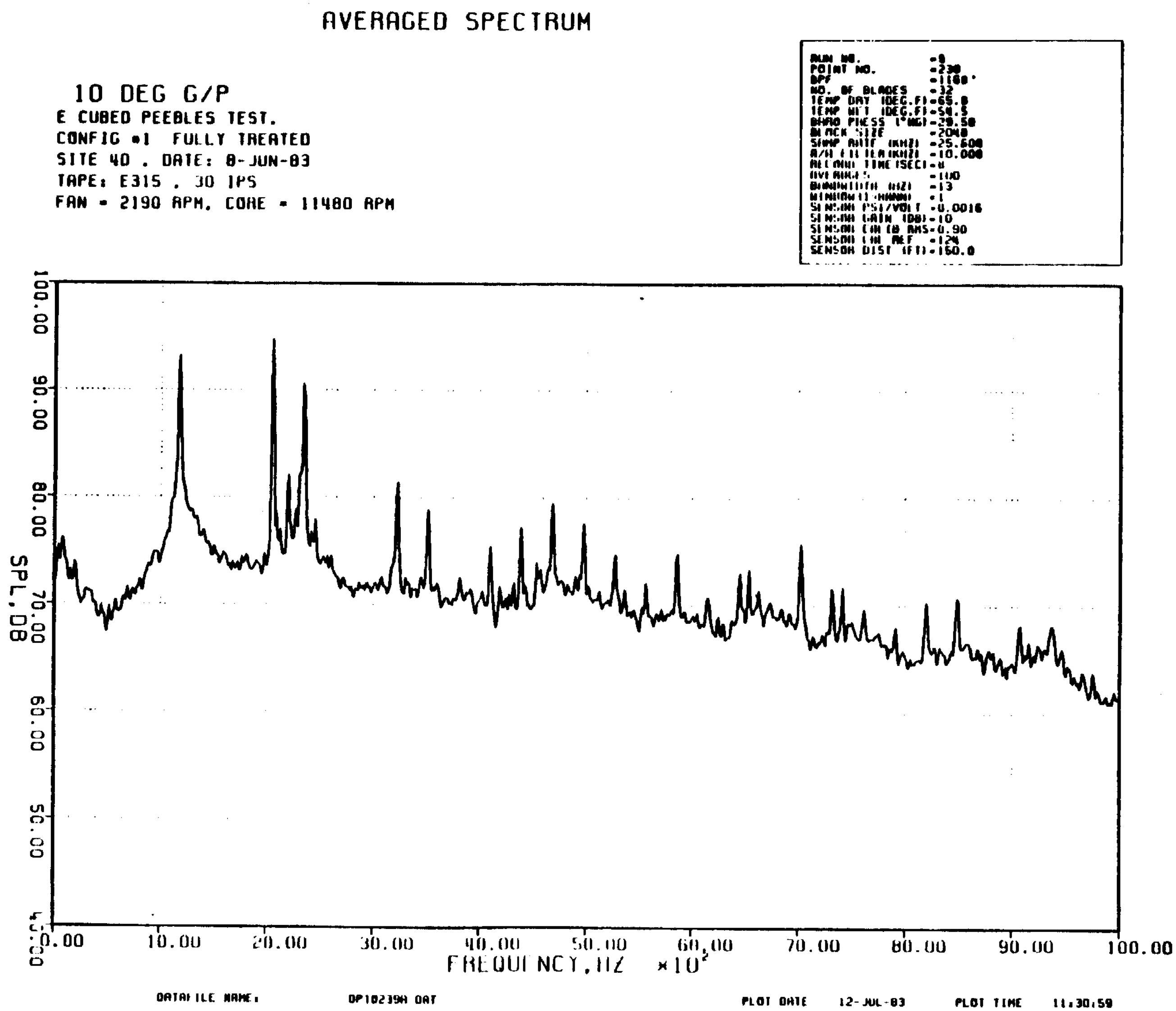
Appendix 9.2.3.a

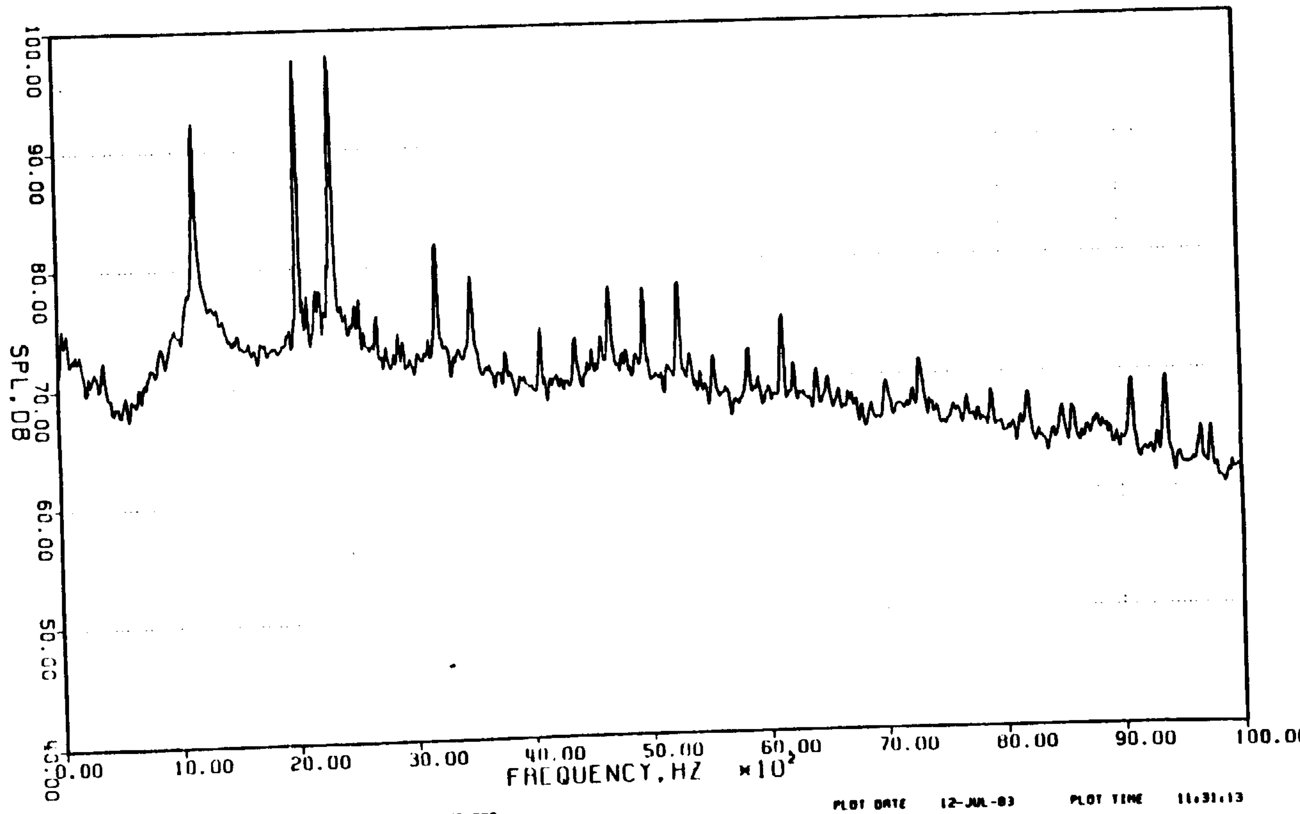


Appendix 9.2.3.b

AVERAGED SPECTRUM

20 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2190 RPM. CORE = 11480 RPM

RUN NO. =9
POINT NO. =239
BPF =1168
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1-HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB) =10
SENSOR CALIB RMS =0.83
SENSOR CAL REF =124
SENSOR DIST (FT) =150.0



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DATAFILE NAME: DP10239A DAT

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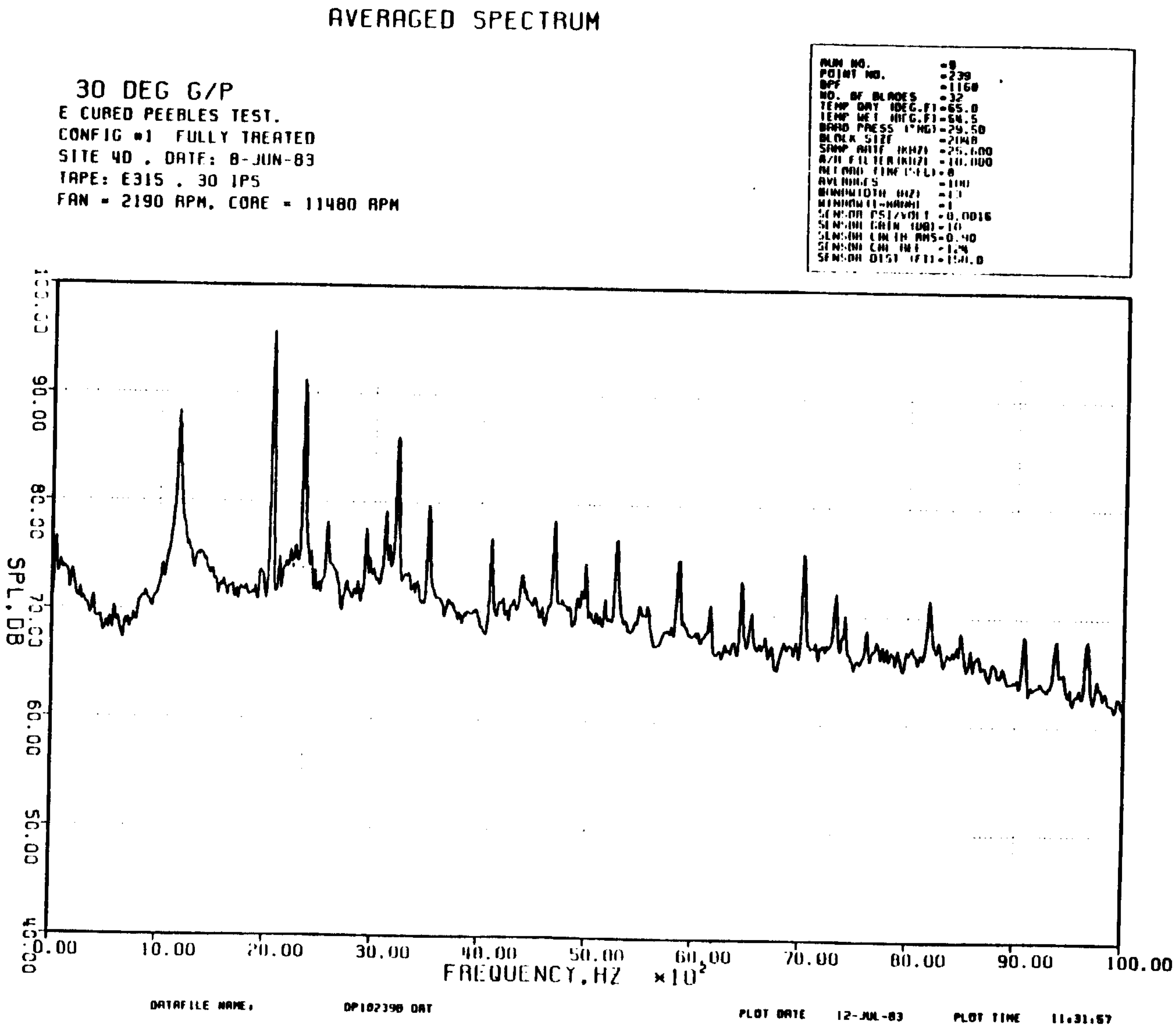
Appendix 9.2.3.c



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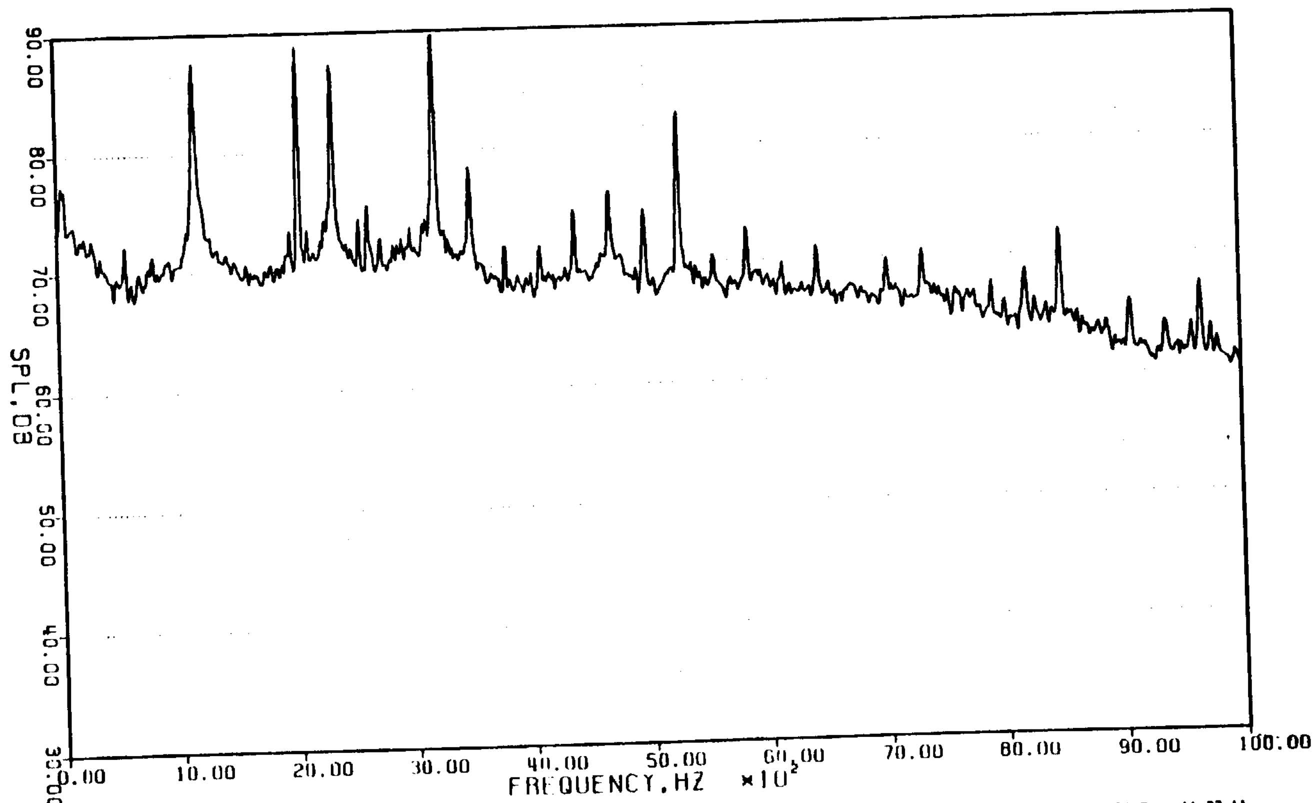
AVERAGED SPECTRUM

40 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2190 RPM. CORE = 11480 RPM

RUN NO. =9
POINT NO. =239
BPF =1168
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.6
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
A/A FILTER (KHZ) =10.000
AVERAGES =100
BANDWIDTH (HZ) =13
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB) =10
SENSOR DIST (FT) =150.0



PLOT DATE 12-JUL-83 PLOT TIME 11:32:11
DATAFILE NAME: DP102398 DAT

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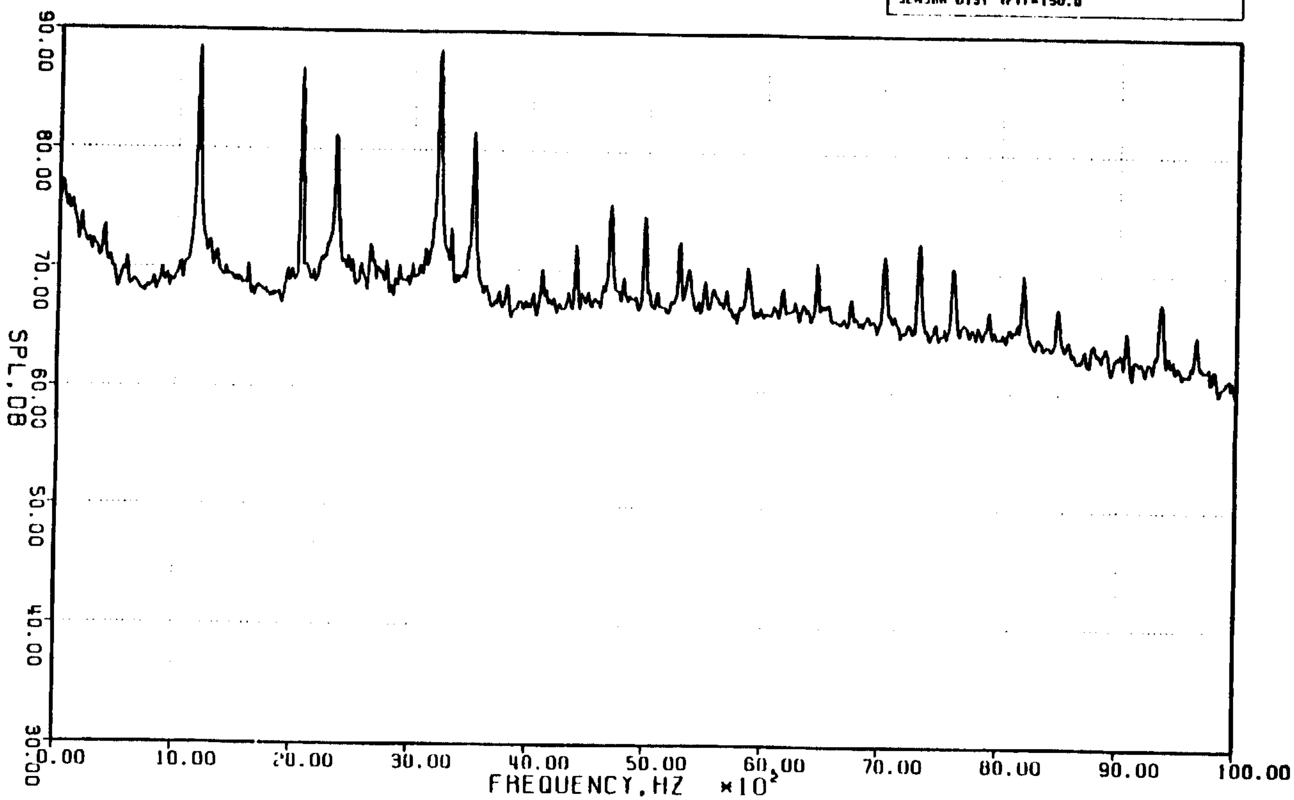
Appendix 9.2.3.e

AVERAGED SPECTRUM

50 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2190 RPM. CORE = 11480 RPM

RUN NO.	=9
POINT NO.	=238
BPF	=1168
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0005
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=0.93
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OP10239C DAT

PLOT DATE 12-JUL-83 PLOT TIME 11:32:56

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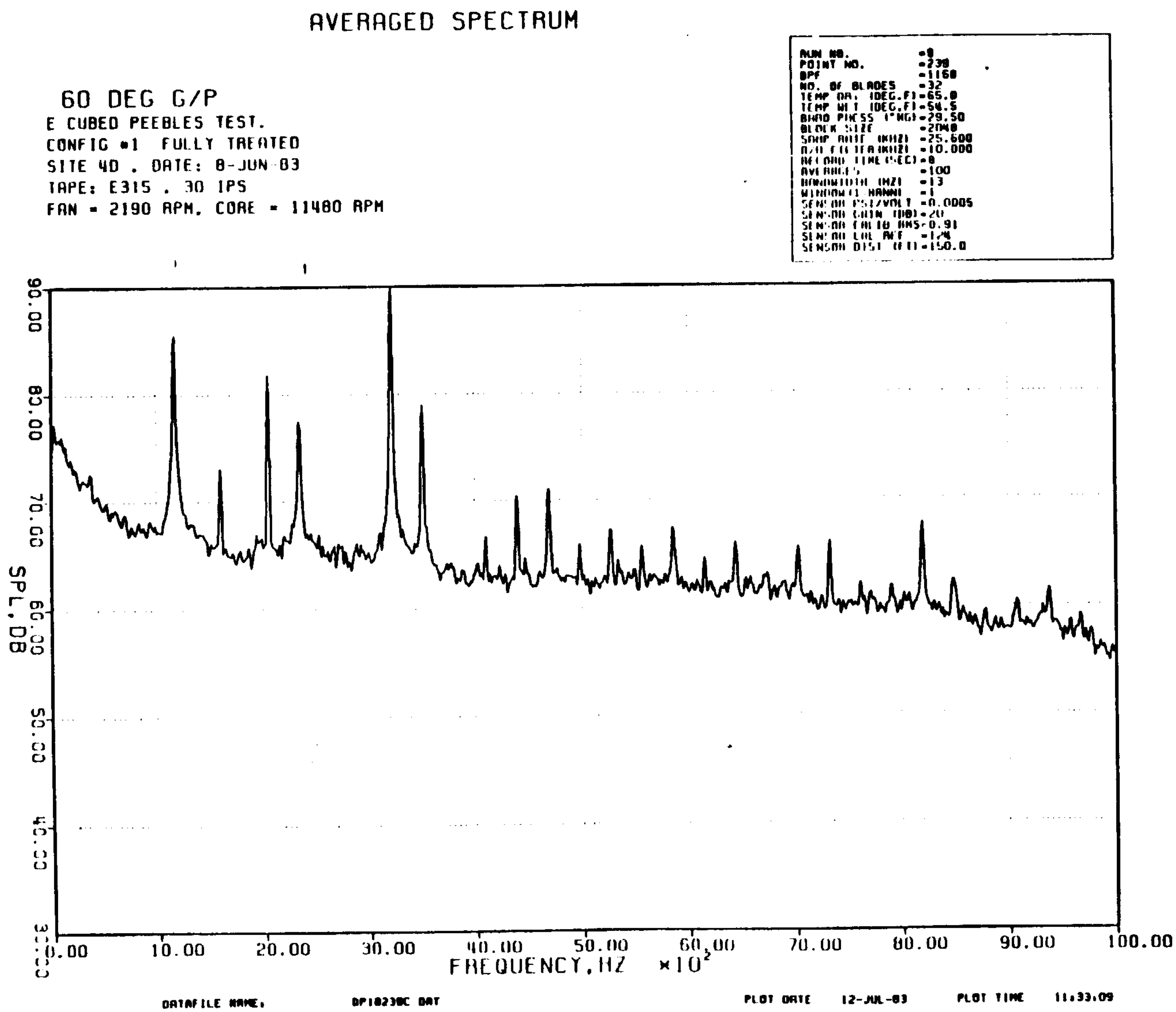
Appendix 9.2.3.f



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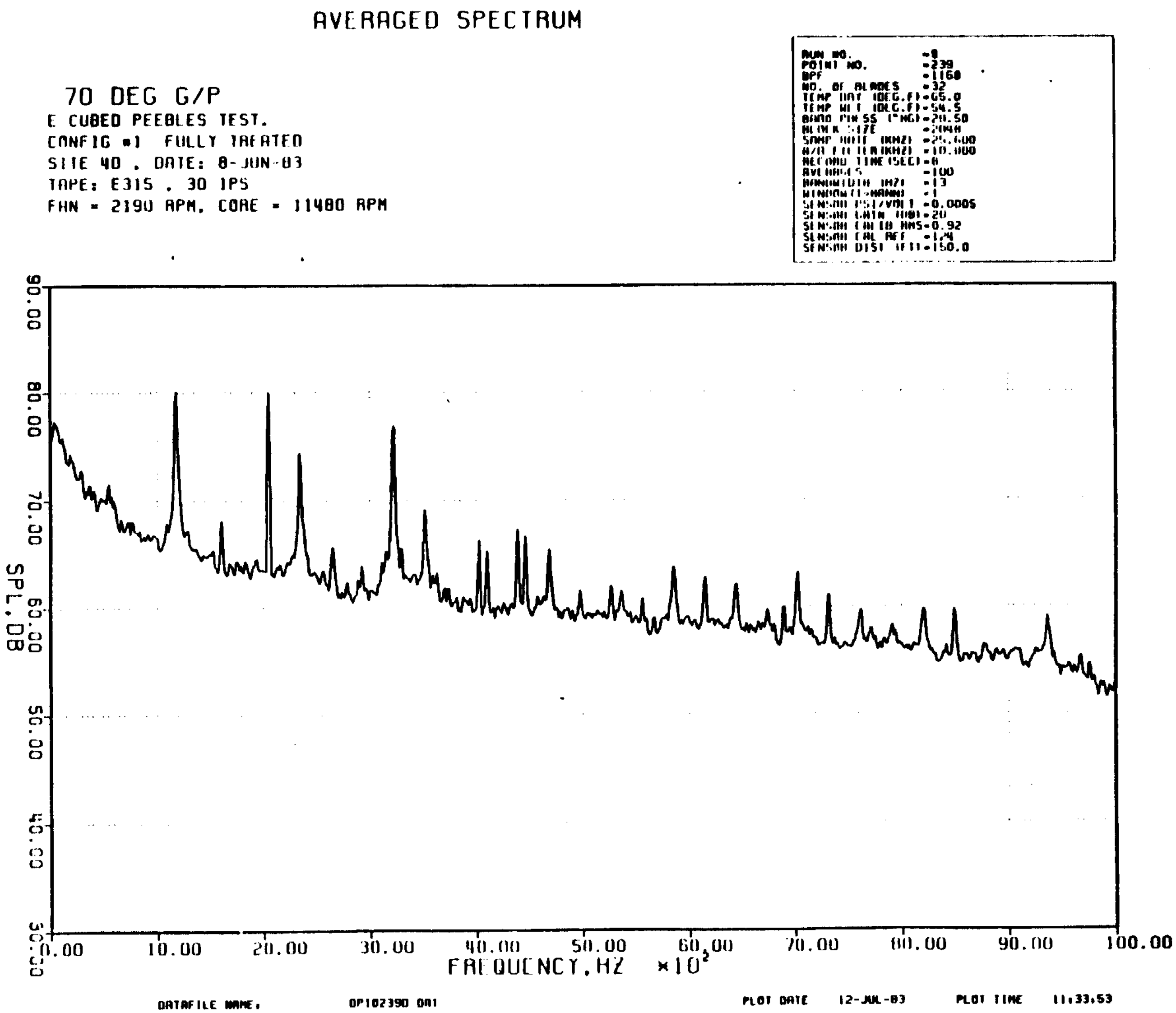
Appendix 9.2.3.g



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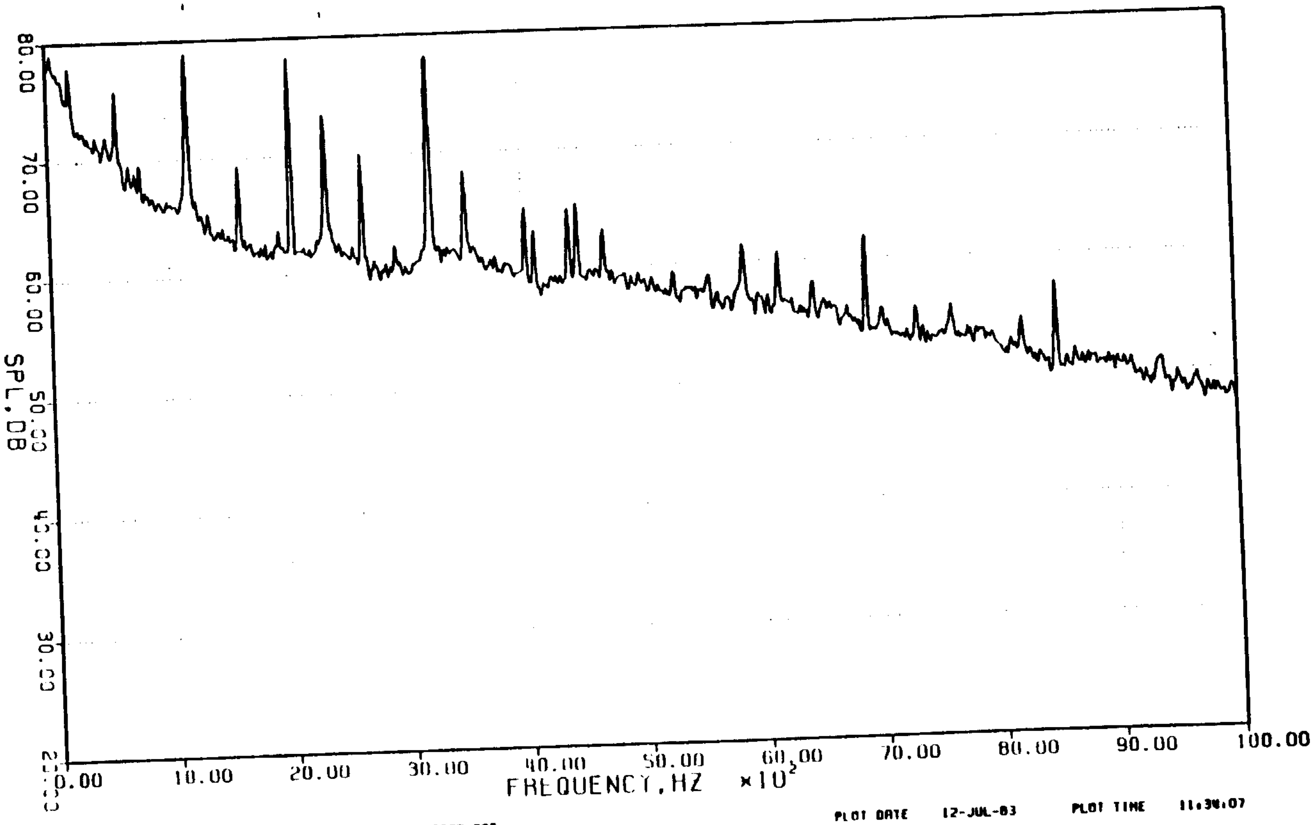
Appendix 9.2.3.h

AVERAGED SPECTRUM

80 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2190 RPM. CORE = 11480 RPM

RUN NO.	=9
POINT NO.	=238
BPF	=1168
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.6
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0005
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=0.91
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP182390 DAT

PLOT DATE 12-JUN-83 PLOT TIME 11:34:07

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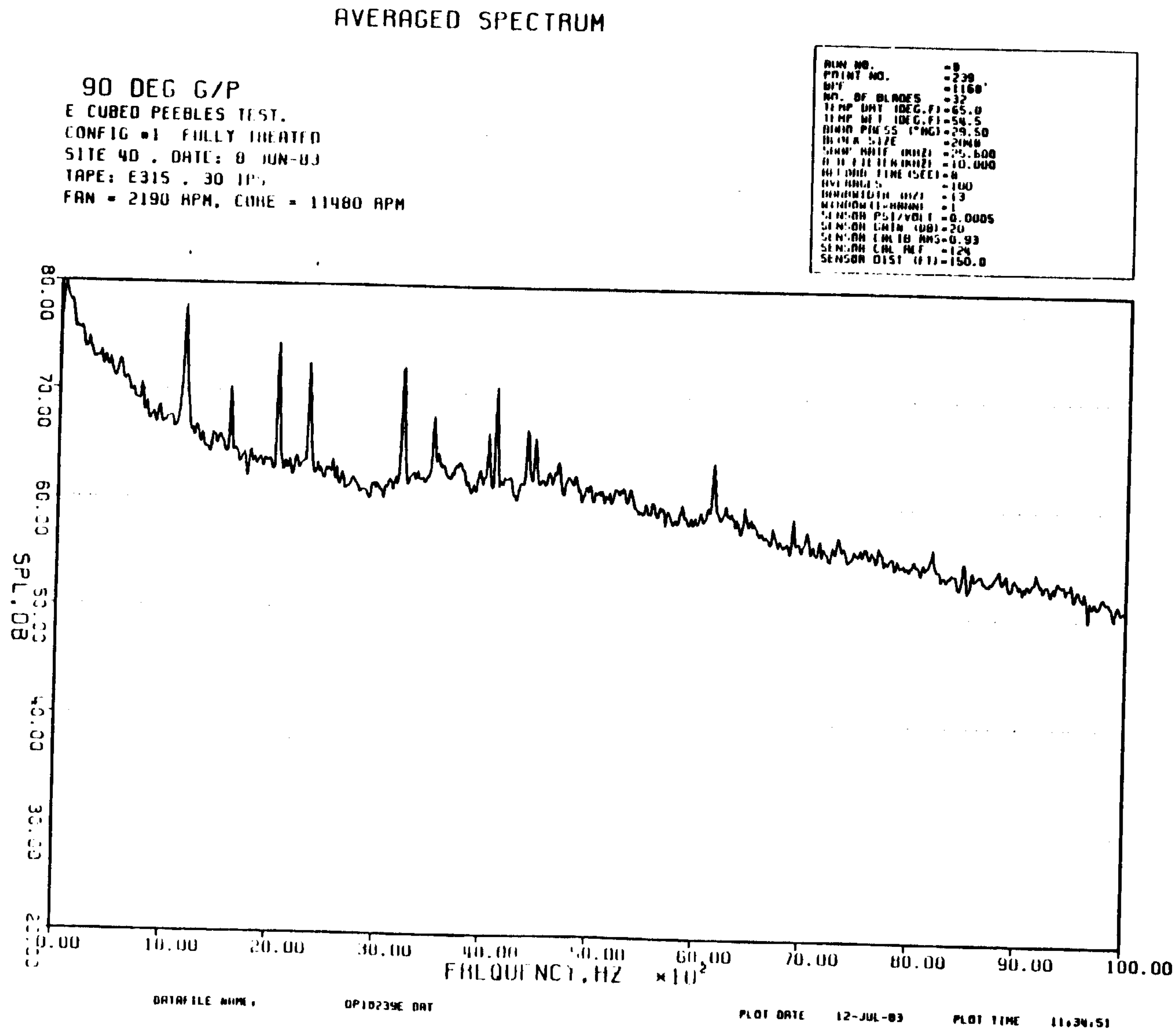
Appendix 9.2.3.1



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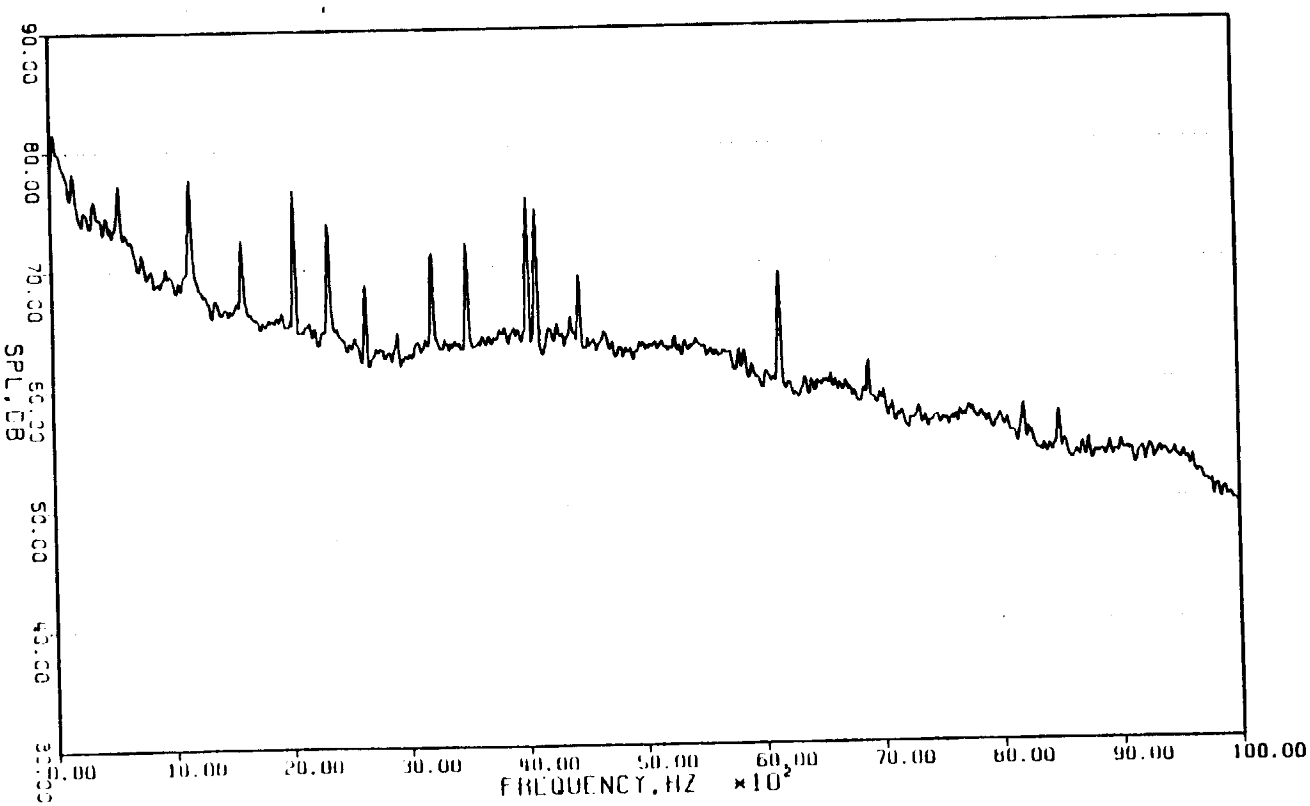
Appendix 9.2.3.j

AVERAGED SPECTRUM

100 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2190 RPM, CORE = 11480 RPM

RUN NO.	=8
POINT NO.	=239
BPF	=1168
NO. OF BLADES	=32
TEMP DAT (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1-HANN)	=1
SENSOR PSI/VOLT	=0.0005
SENSOR GAIN (DB)	=20
SENSOR CAL(0 RMS)	=0.95
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OP10239E DAT

PLOT DATE 12-JUL-83 PLOT TIME 11:35:05

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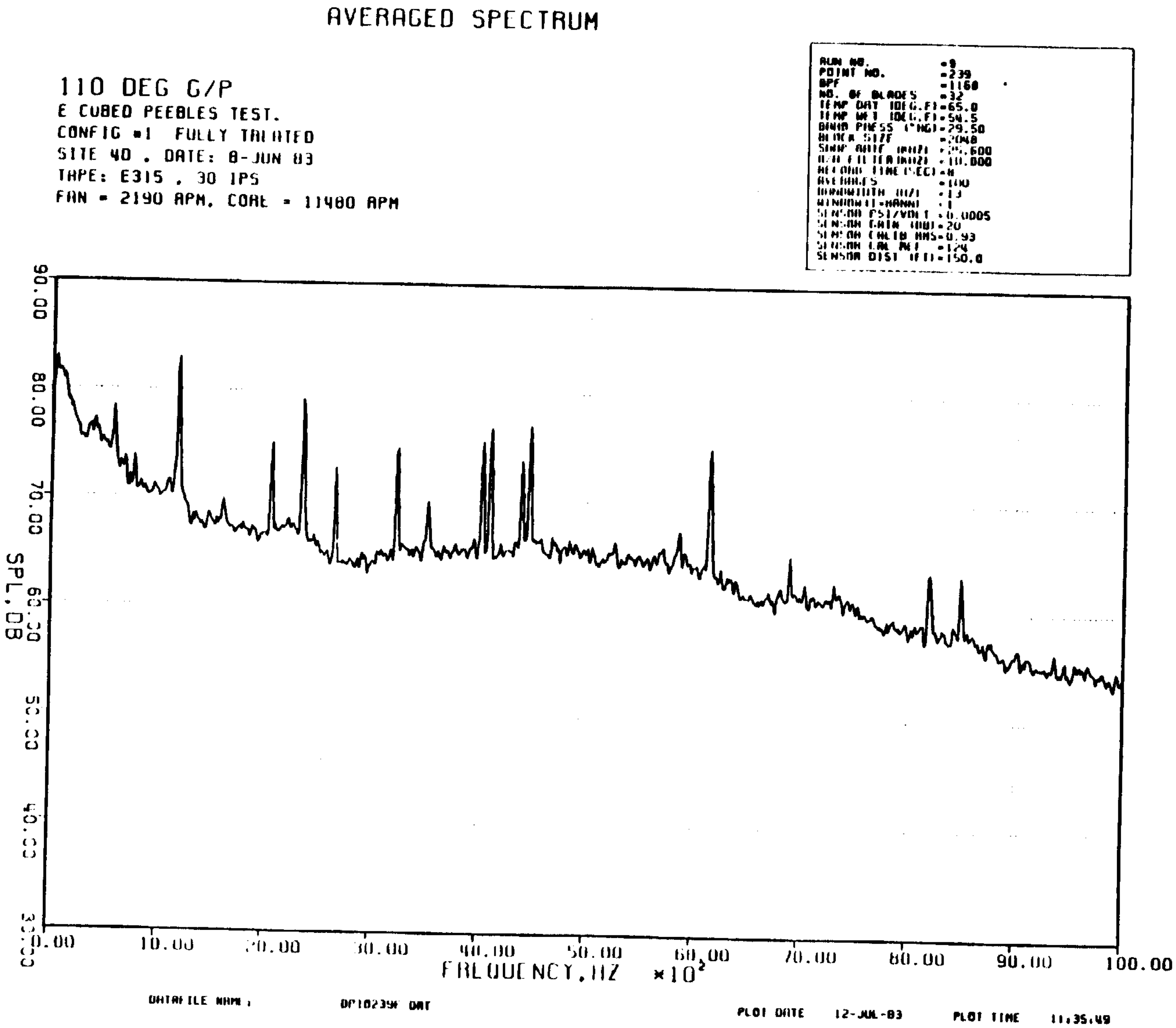
Appendix 9.2.3.k



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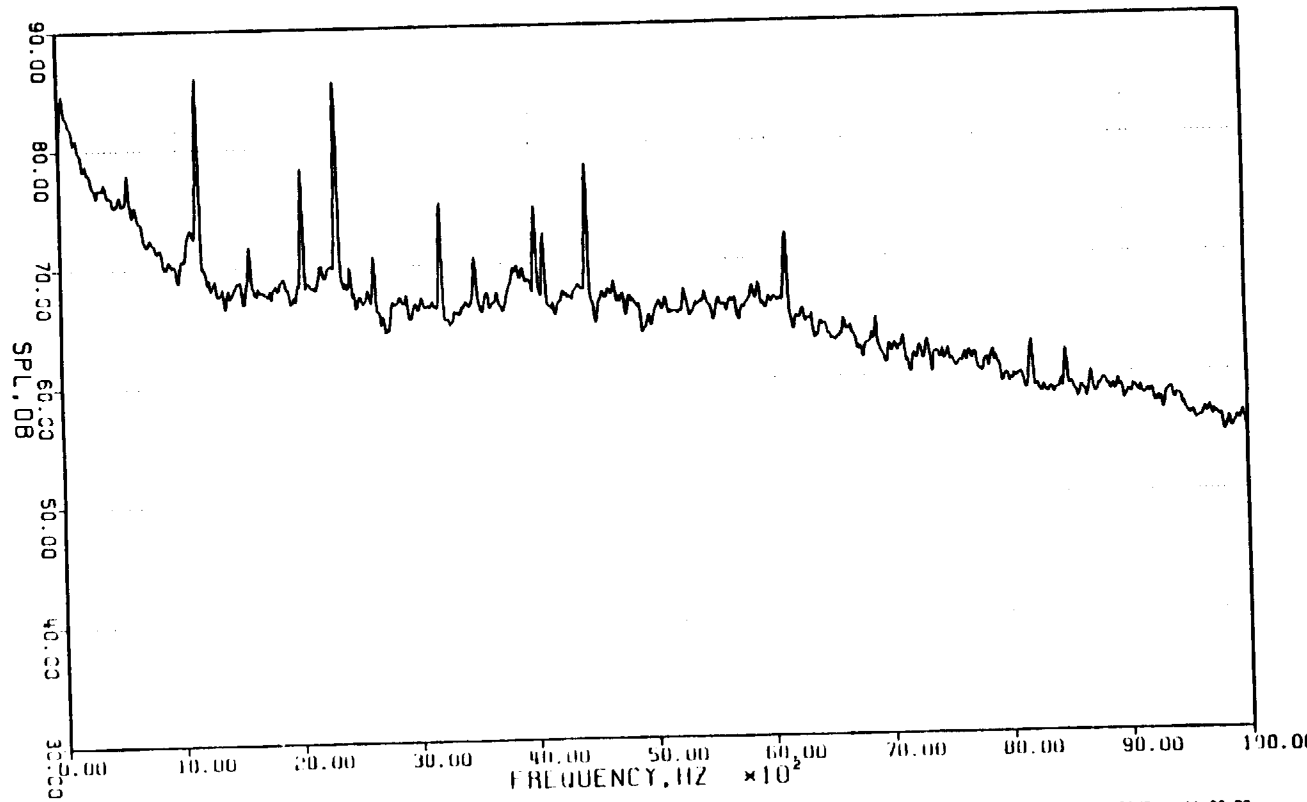
Appendix 9.2.3.1

AVERAGED SPECTRUM

120 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2190 RPM, CORE = 11480 RPM

RUN NO.	=9
POINT NO.	=239
BPF	=1168
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.92
SENSOR CAL (DB)	=124
SENSOR DIST (FT)	=150.0



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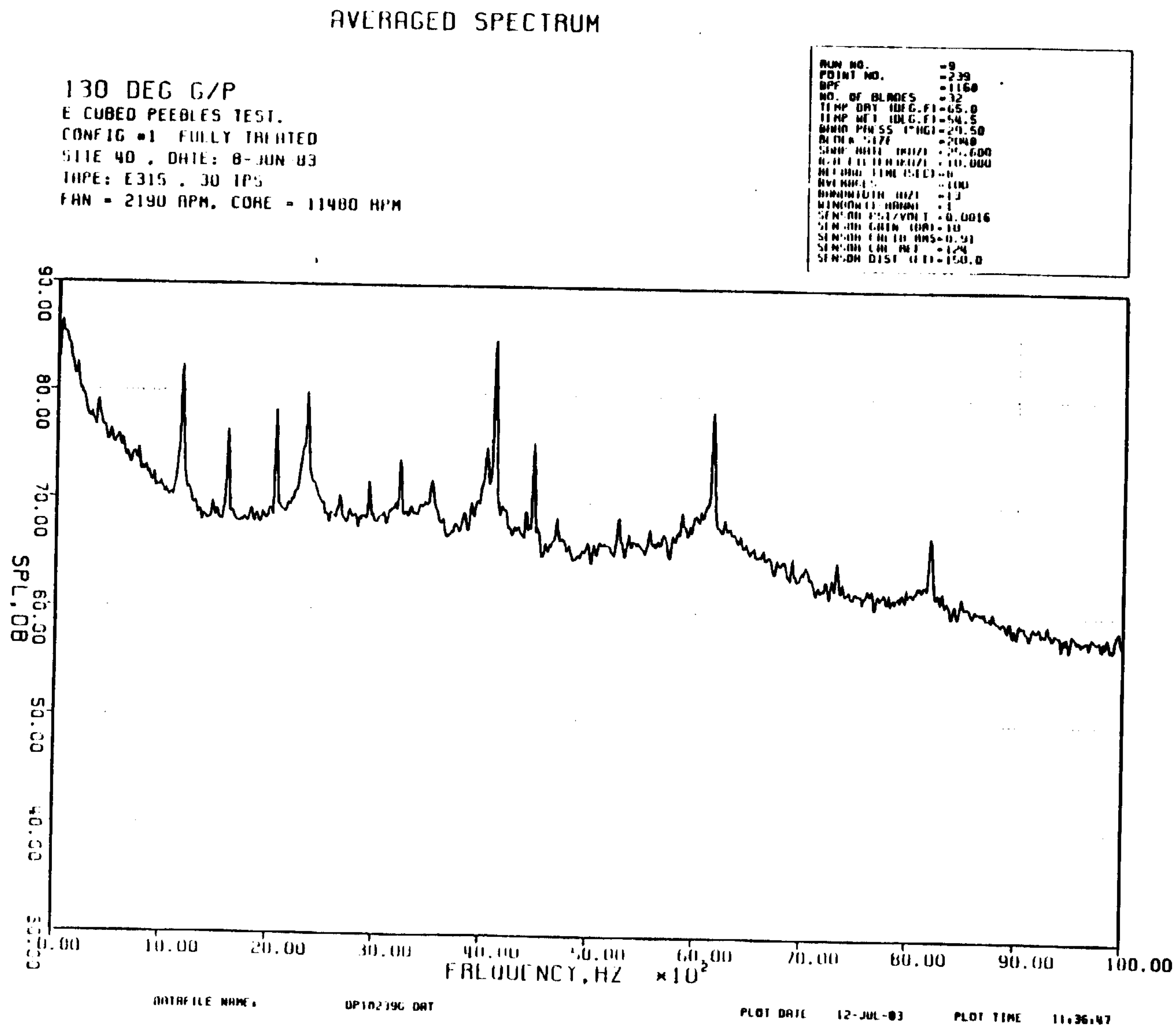
Appendix 9.2.3.m



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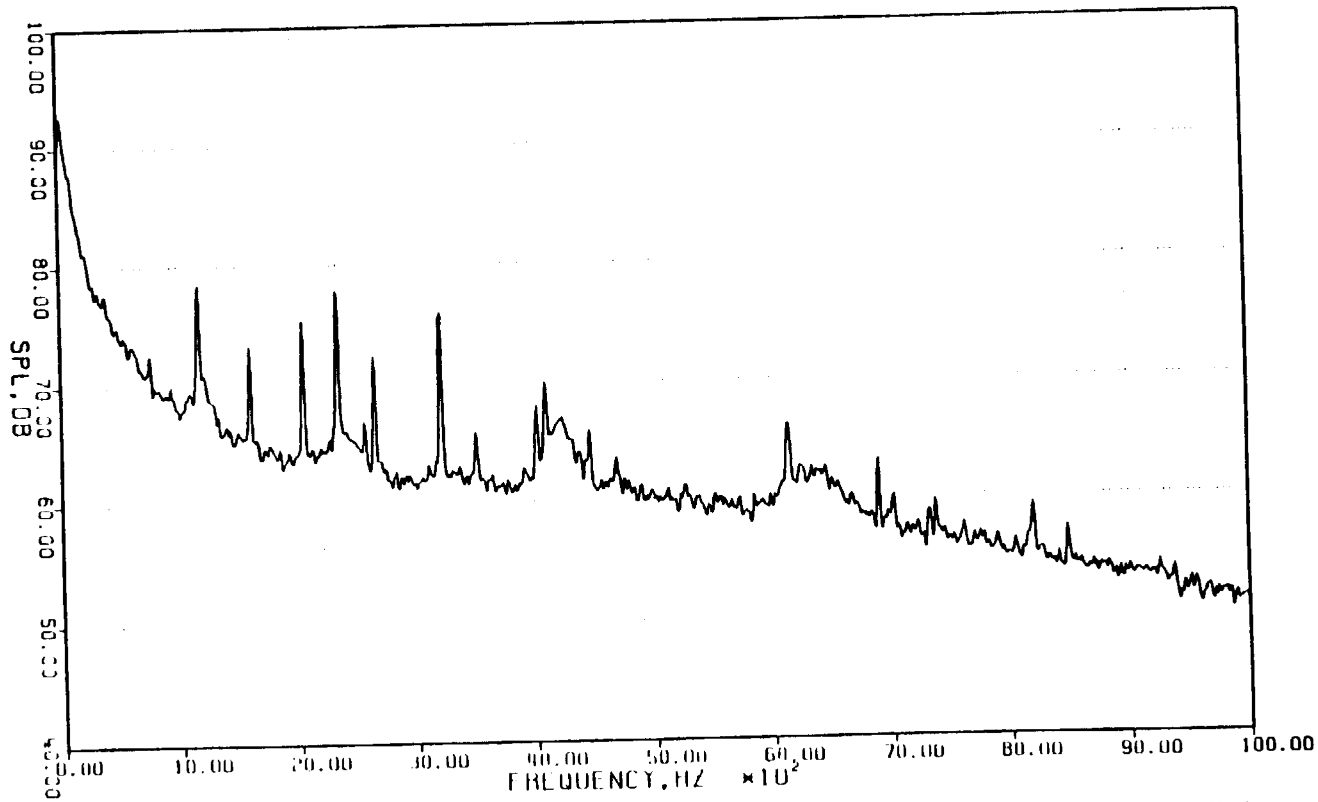
Appendix 9.2.3.n

AVERAGED SPECTRUM

150 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2190 RPM, CORE = 11480 RPM

RUN NO. =9
POINT NO. =239
BPF =1160
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
SENSOR PSI/VOLT =0.0016
SENSOR DIST (FT)=150.0



DATAFILE NAME : DP10239H DAT PLOT DATE 12-JUL-83 PLOT TIME 11:37:45

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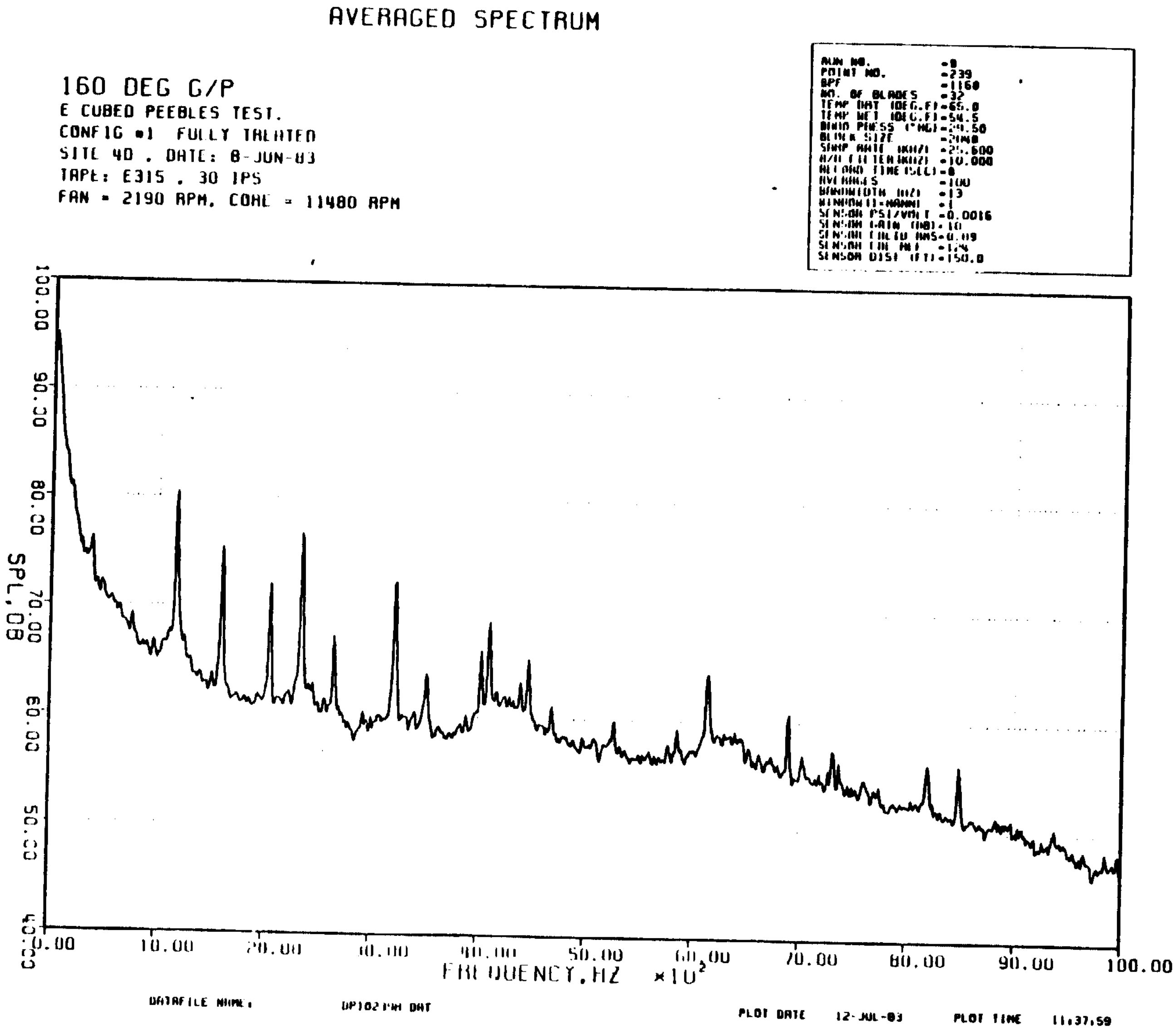
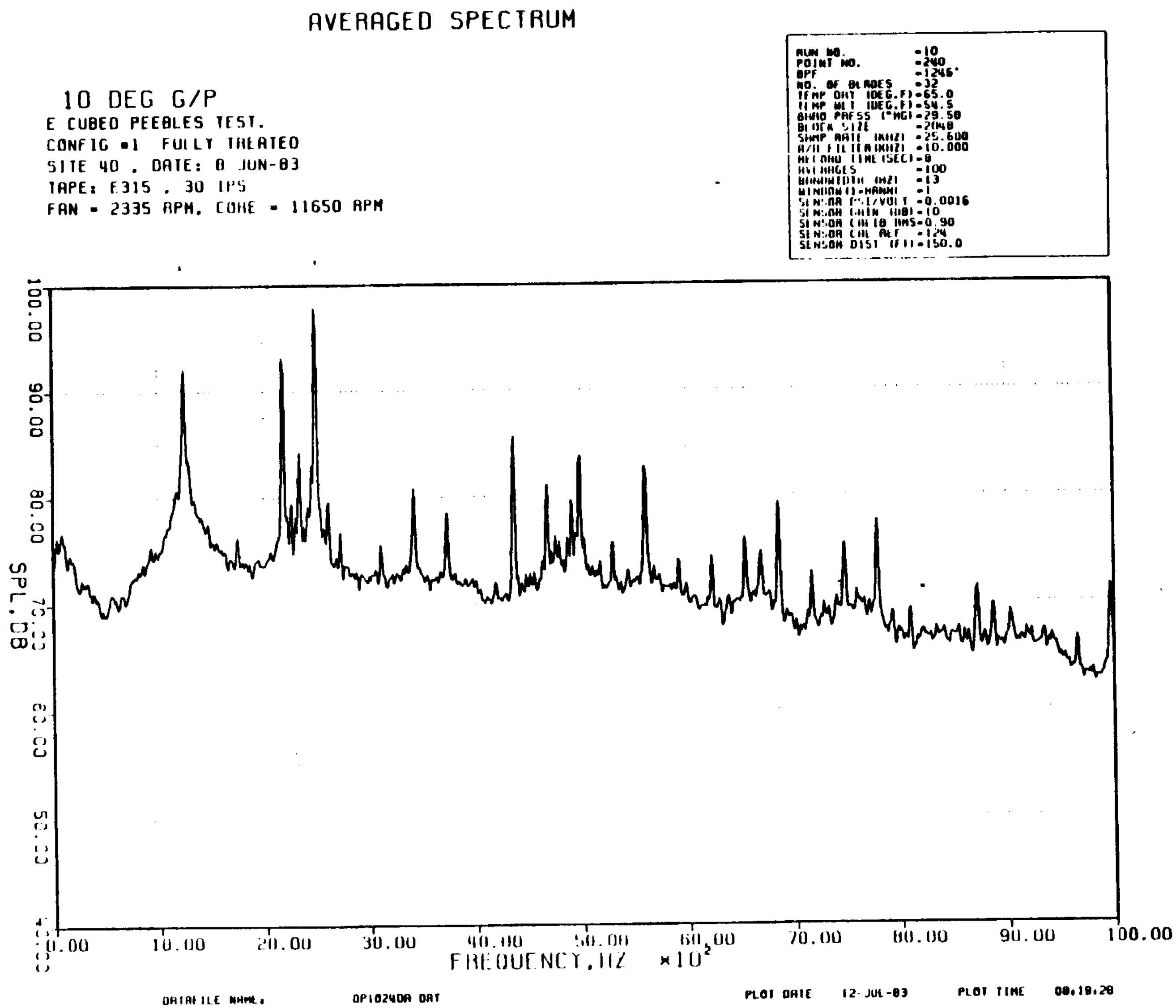
Appendix 9.2.3.o



Appendix 9.2.4.a



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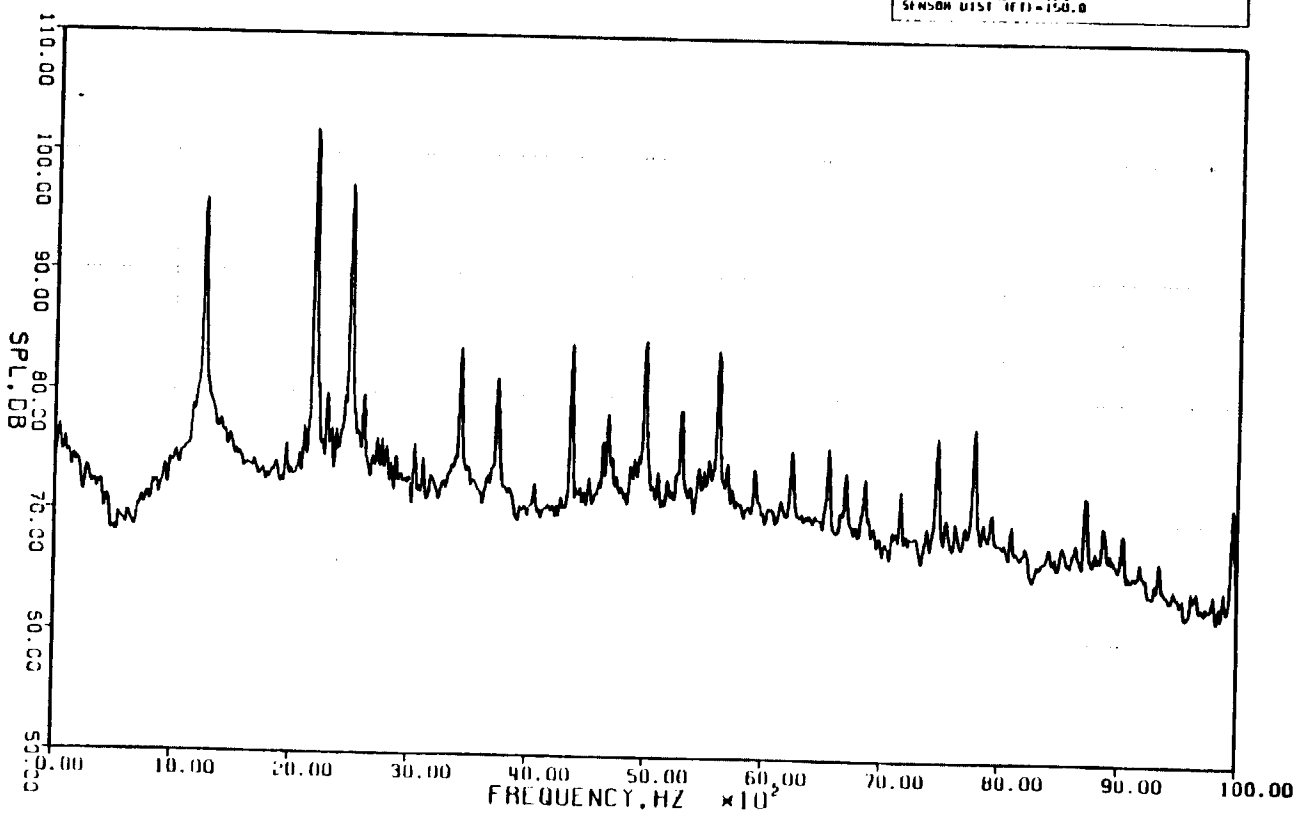
Appendix 9.2.4.b

AVERAGED SPECTRUM

20 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2335 RPM. CORE = 11650 RPM

RUN NO.	=10
POINT NO.	=240
BPF	=1245
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CAL TO RMS	=0.89
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP1024OA DAT

PLOT DATE 12-JUL-83 PLOT TIME 08:18:42

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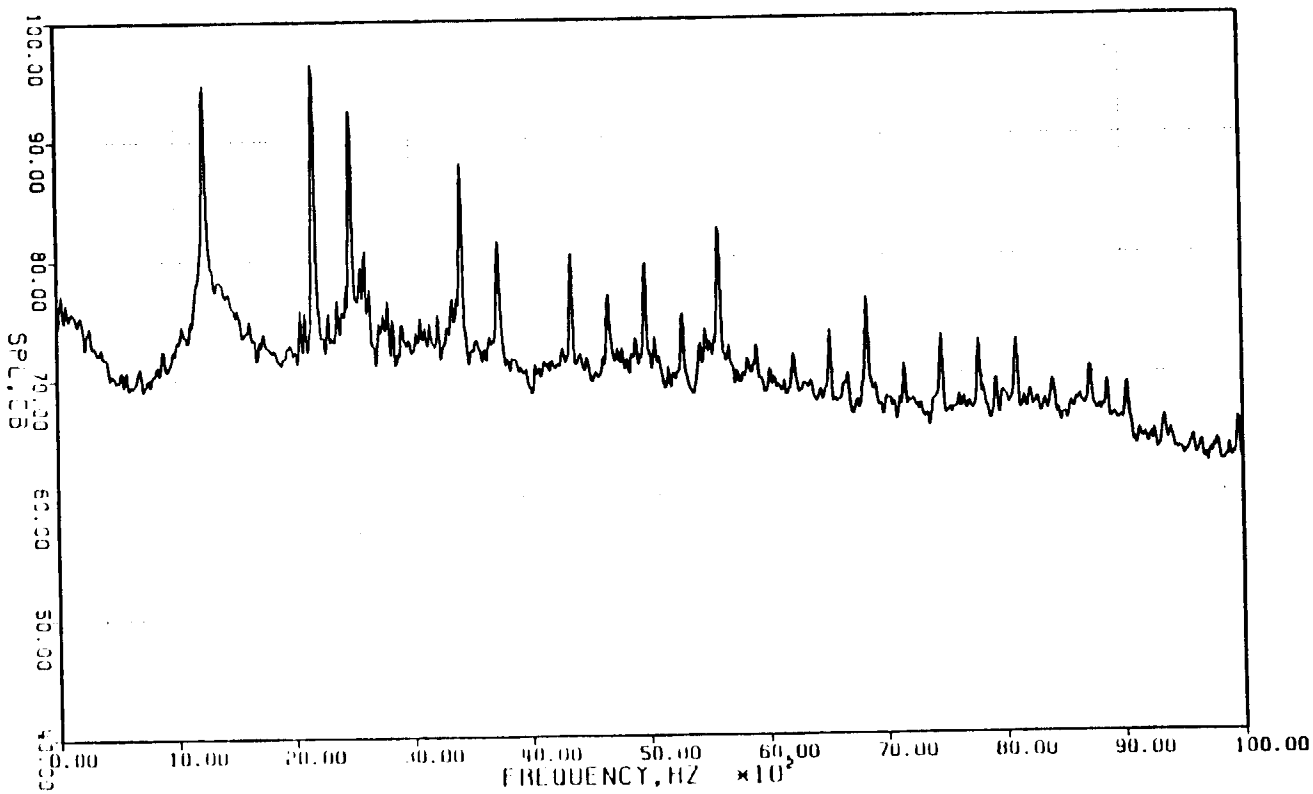
Appendix 9.2.4.c

AVERAGED SPECTRUM

30 DEG G/P

E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2335 RPM, CORE = 11650 RPM

RUN NO.	=10
POINT NO.	=240
BPF	=1245
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.90
SENSOR CAL RLF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OP102400 DAT

PLOT DATE 12-JUL-83 PLOT TIME 08:20:26

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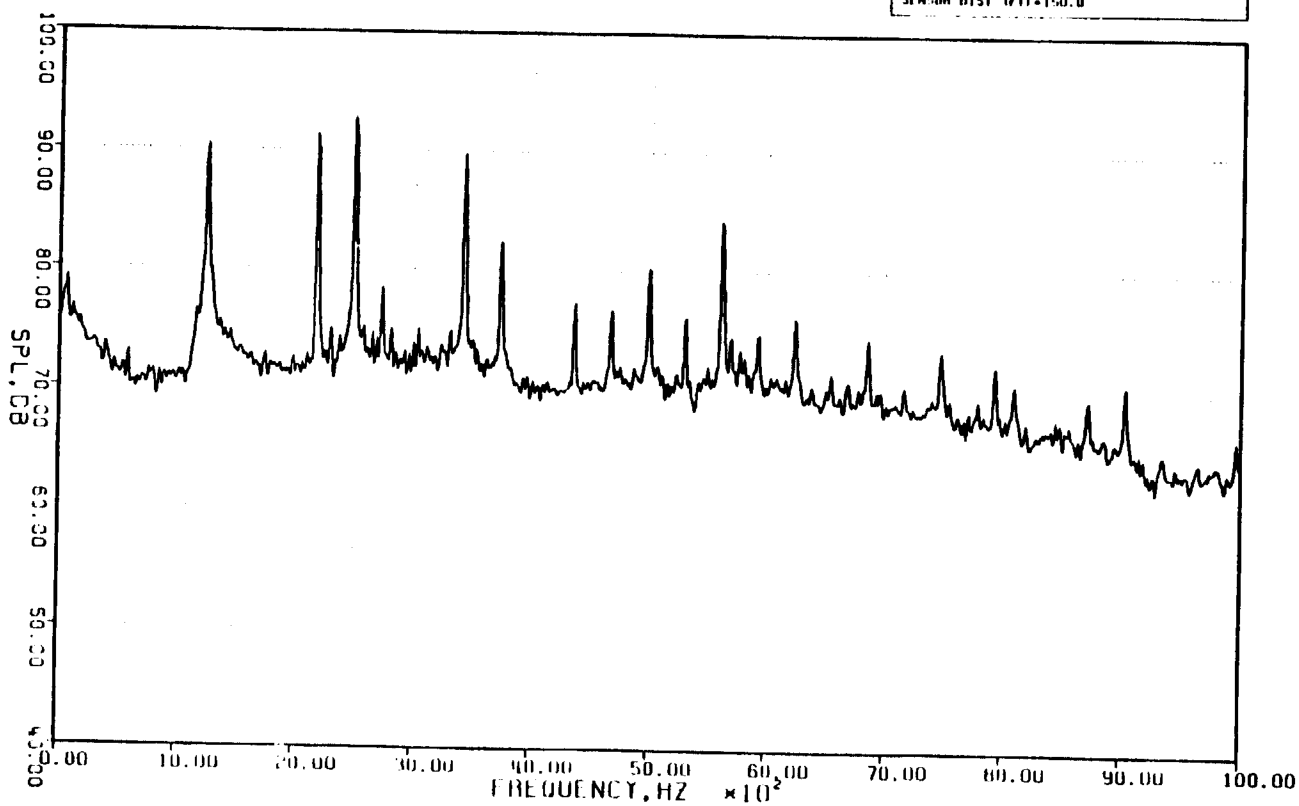
Appendix 9.2.4.d

AVERAGED SPECTRUM

40 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2335 RPM, CORE = 11650 RPM

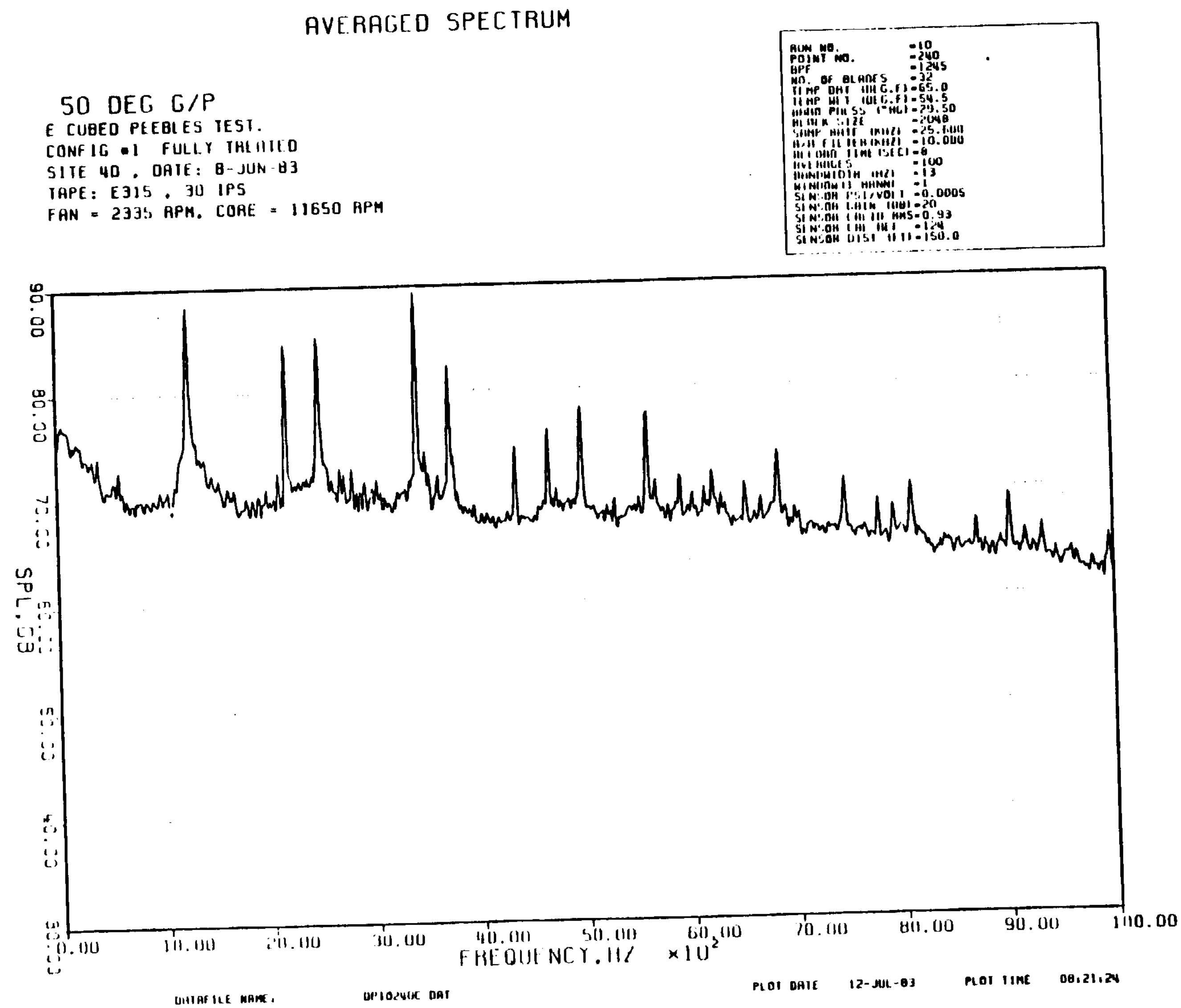
RUN NO.	=10
POINT NO.	=240
BPF	=1245
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1-HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.93
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OP10240B DAT

PLOT DATE 12-JUL-83 PLOT TIME 08:20:40

Appendix 9.2.4.e



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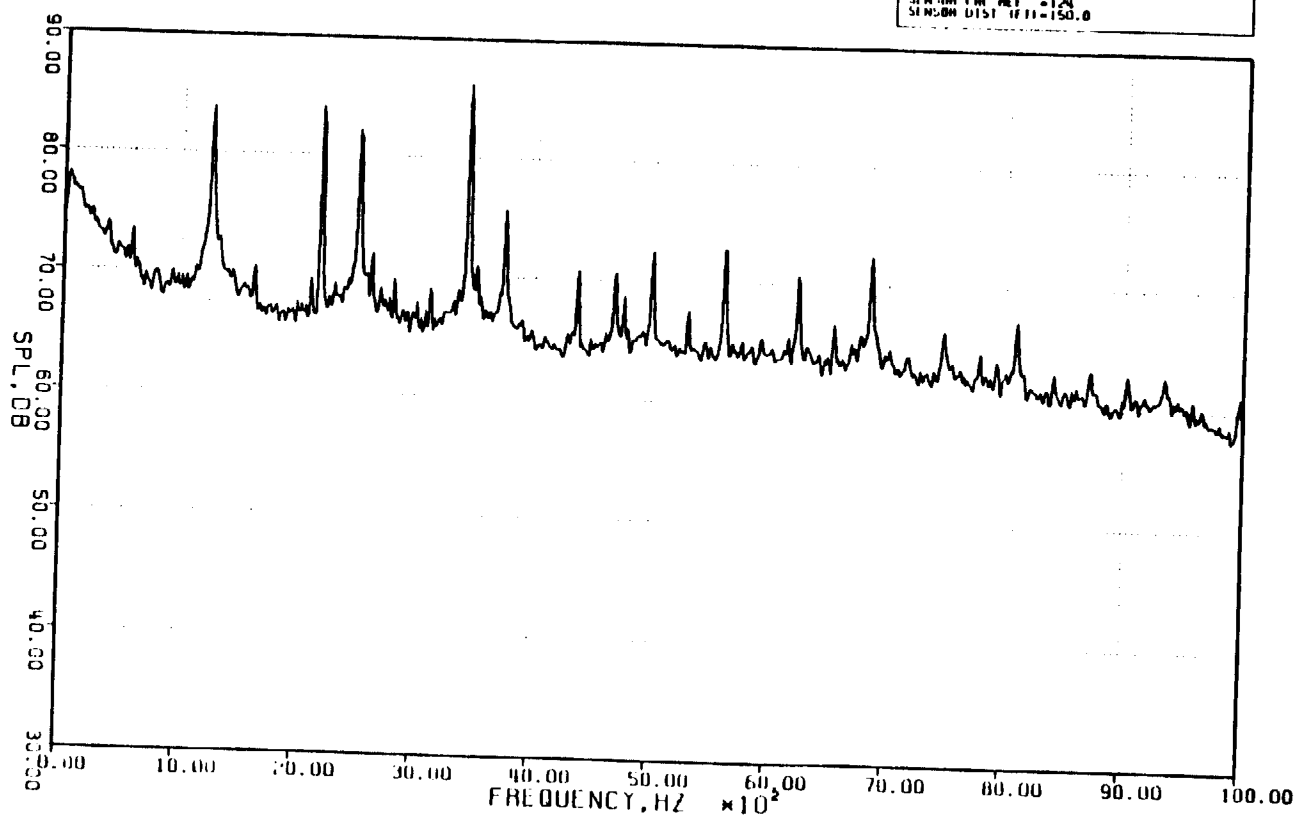
Appendix 9.2.4.f

AVERAGED SPECTRUM

60 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2335 RPM, CORE = 11650 RPM

RUN NO. =10
POINT NO. =240
BPF =1246
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0005
SENSOR GAIN (DB) =20
SENSOR CALIB RMS =0.91
SENSOR CH REF =124
SENSOR DIST (FT) =150.0



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DATAFILE NAME: DP10240C DAT

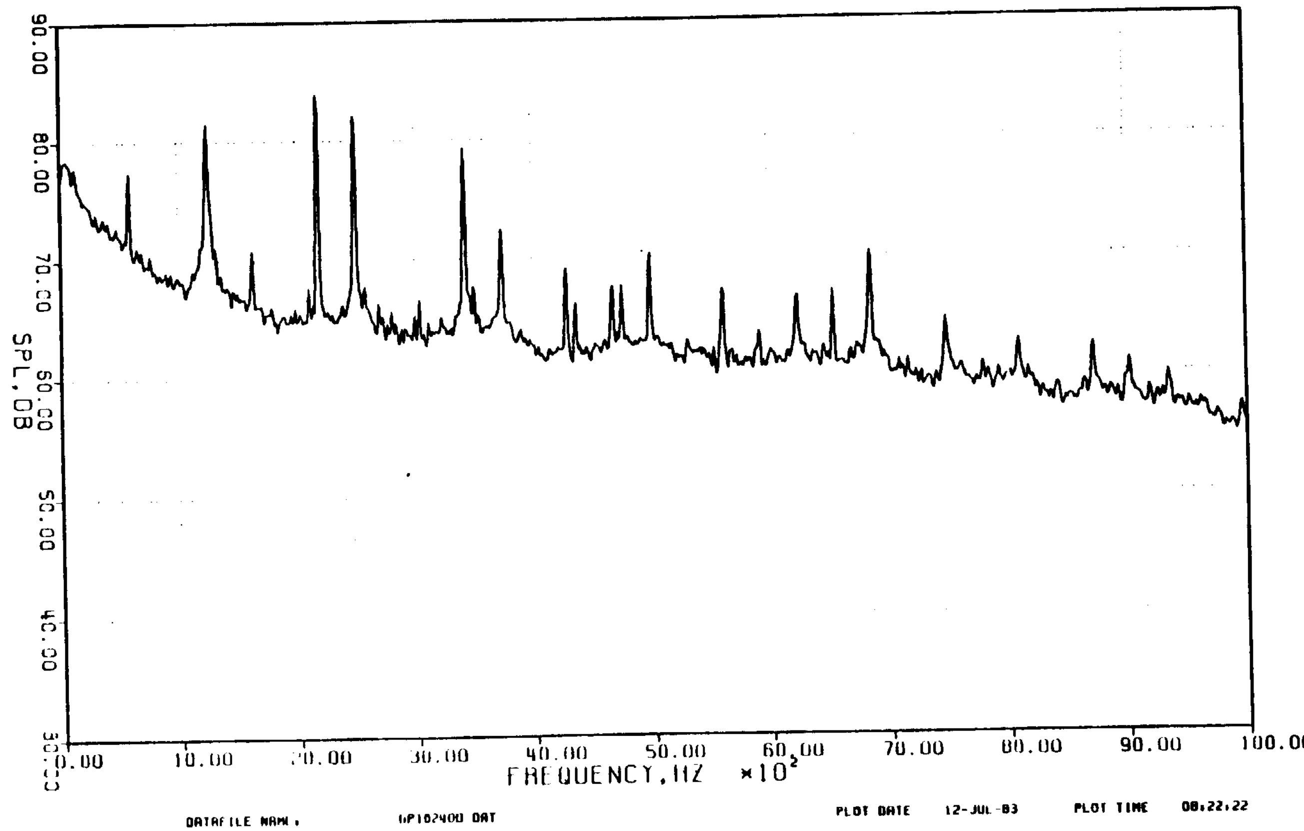
PLOT DATE 12-JUL-83 PLOT TIME 08:21:30

Appendix 9.2.4.g

AVERAGED SPECTRUM

70 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2335 RPM, CORE = 11650 RPM

RUN NO.	=10
POINT NO.	=240
BPF	=1245
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1-HANN)	=1
SENSOR PSI/VOLT	=0.0006
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=0.92
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



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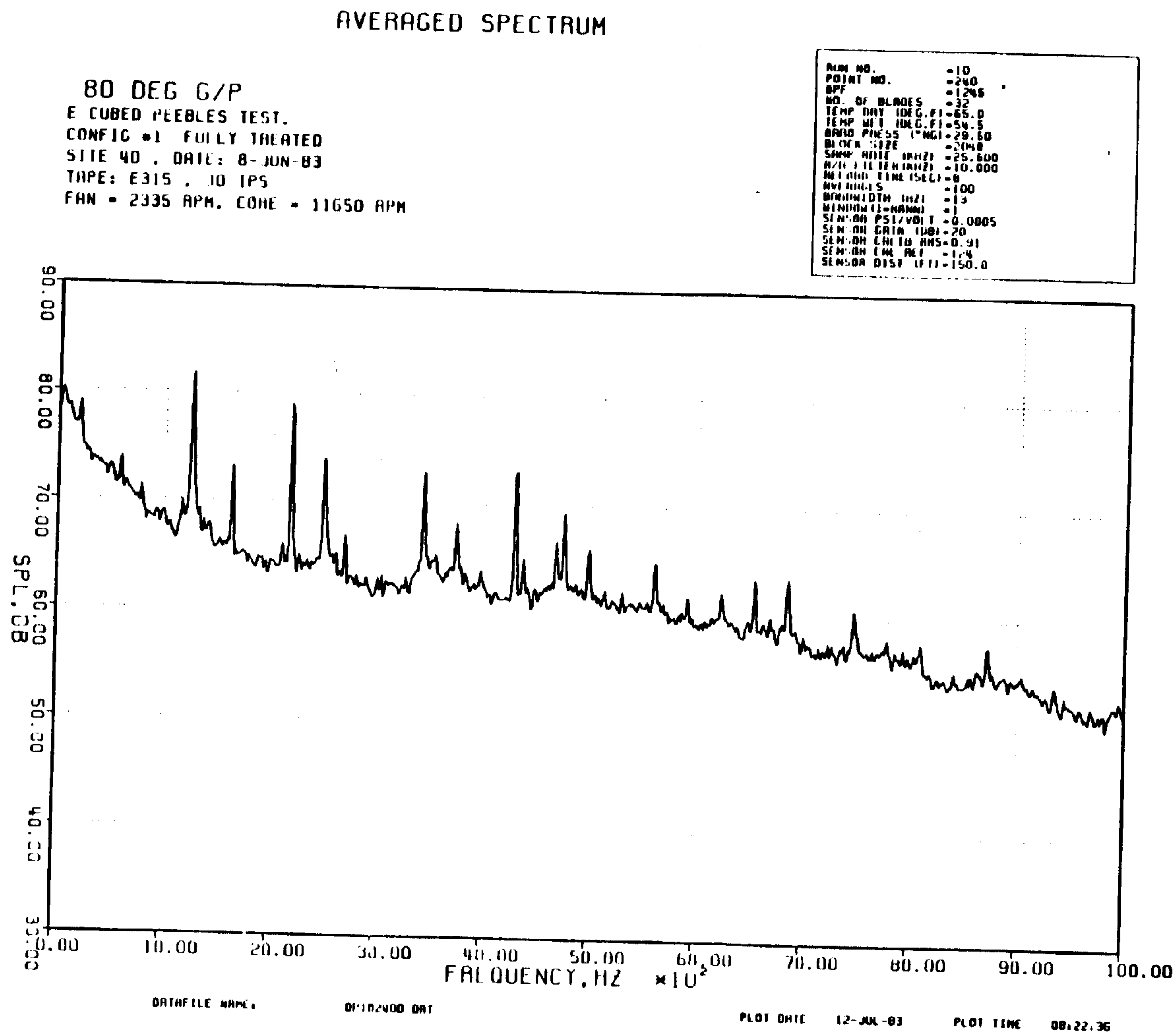
Appendix 9.2.4.h



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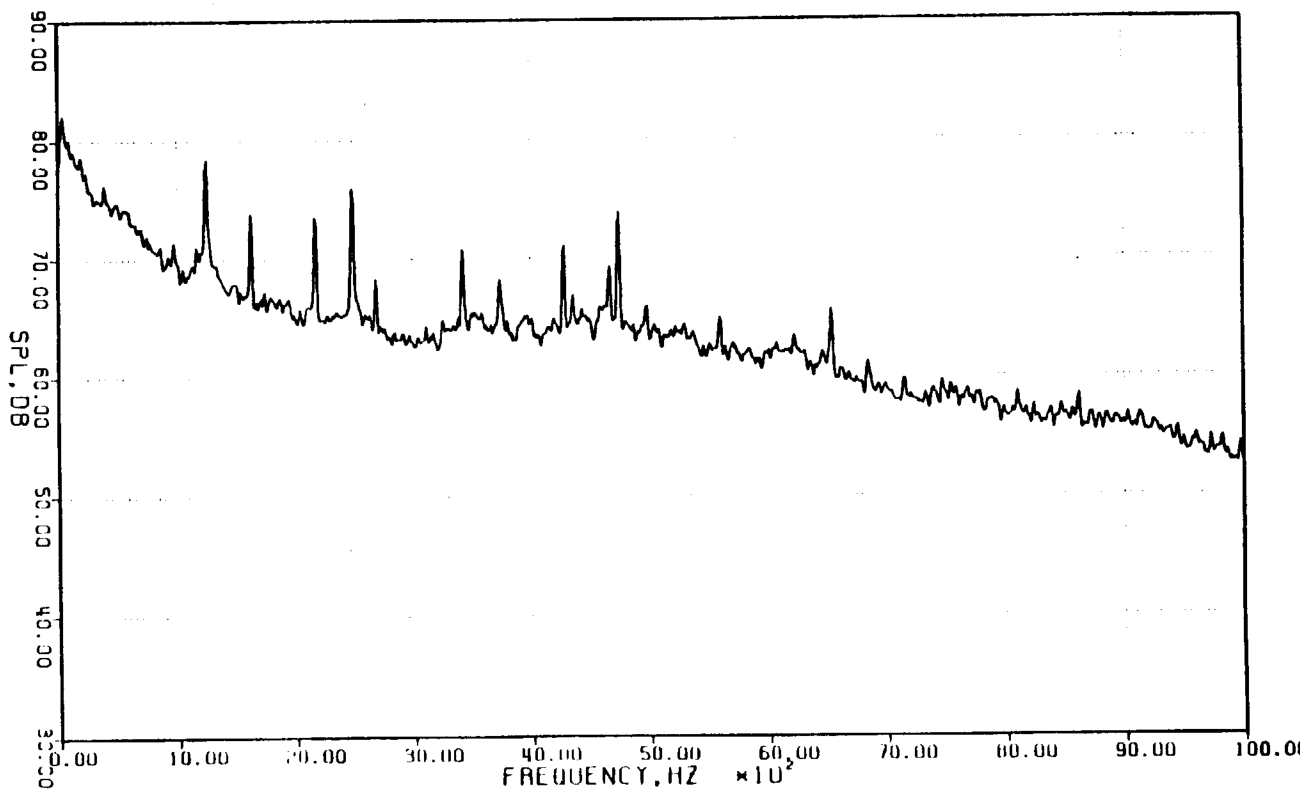
Appendix 9.2.4.i

AVERAGED SPECTRUM

RUN NO.	=10
POINT NO.	=240
BPF	=1245
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR (SI/VOLT)	=0.0005
SENSOR GAIN (DB)	=20
SENSOR CAL (B RMS	=0.93
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0

90 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2335 RPM, CORE = 11650 RPM



DATAFILE NAME: DP1024DE.DAT PLOT DATE 12-JUL-83 PLOT TIME 08:23:20

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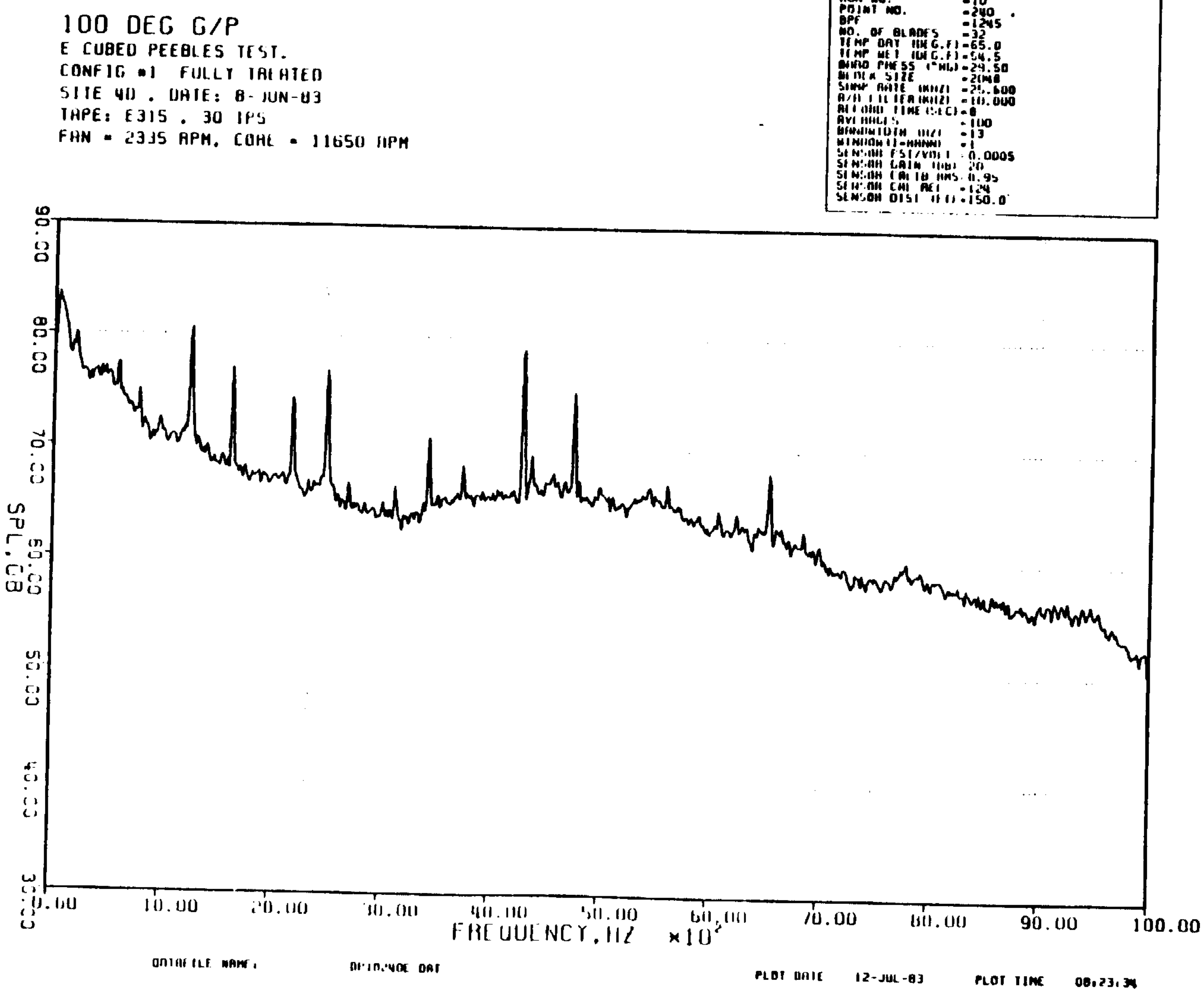
Appendix 9.2.4.j

AVERAGED SPECTRUM

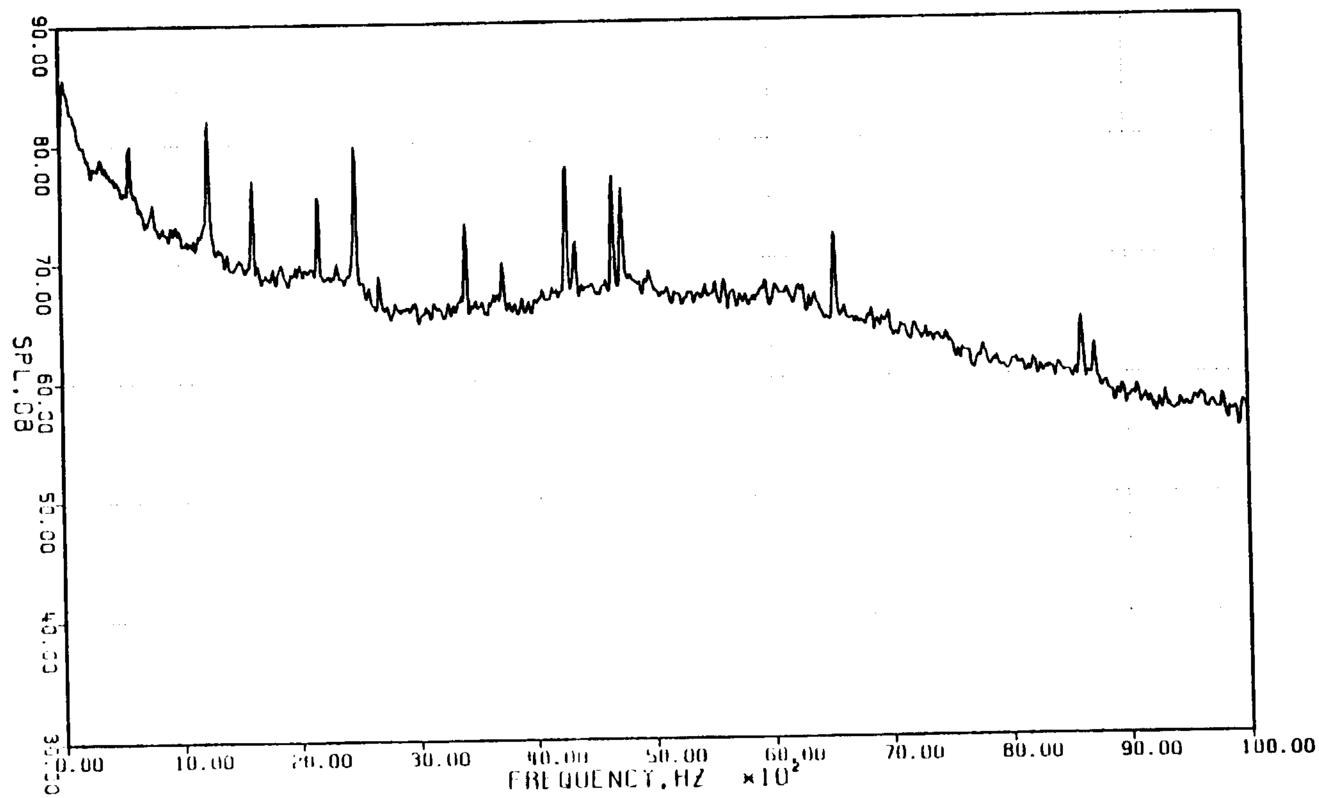


Appendix 9.2.4.k

AVERAGED SPECTRUM

RUN NO.	=10
POINT NO.	=240
BPF	=1245
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0005
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=0.93
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0

110 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2335 RPM, CORE = 11650 RPM



DATAFILE NAME: OP10240F DAT PLOT DATE 12-JUL-83 PLOT TIME 08:24:18

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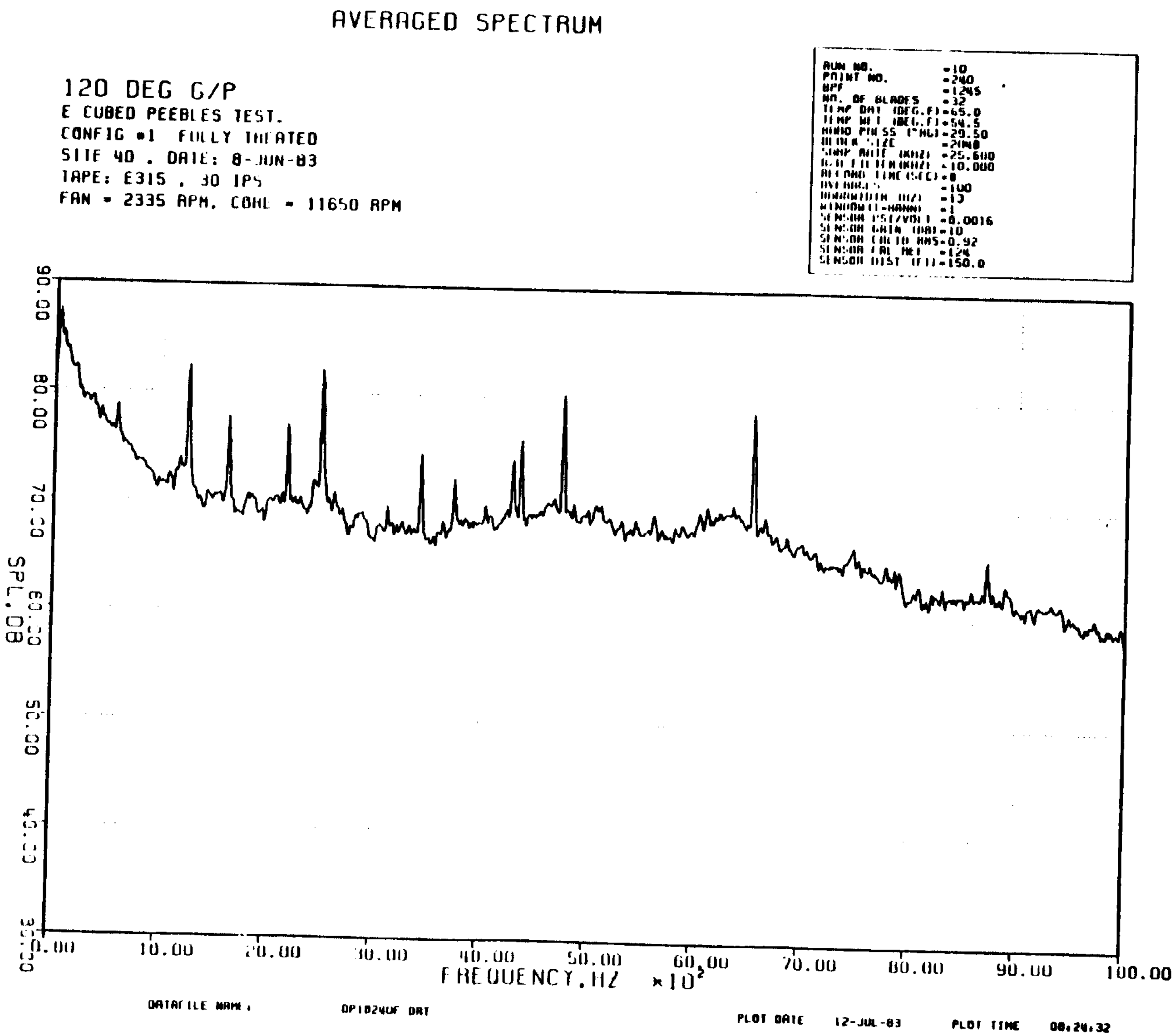
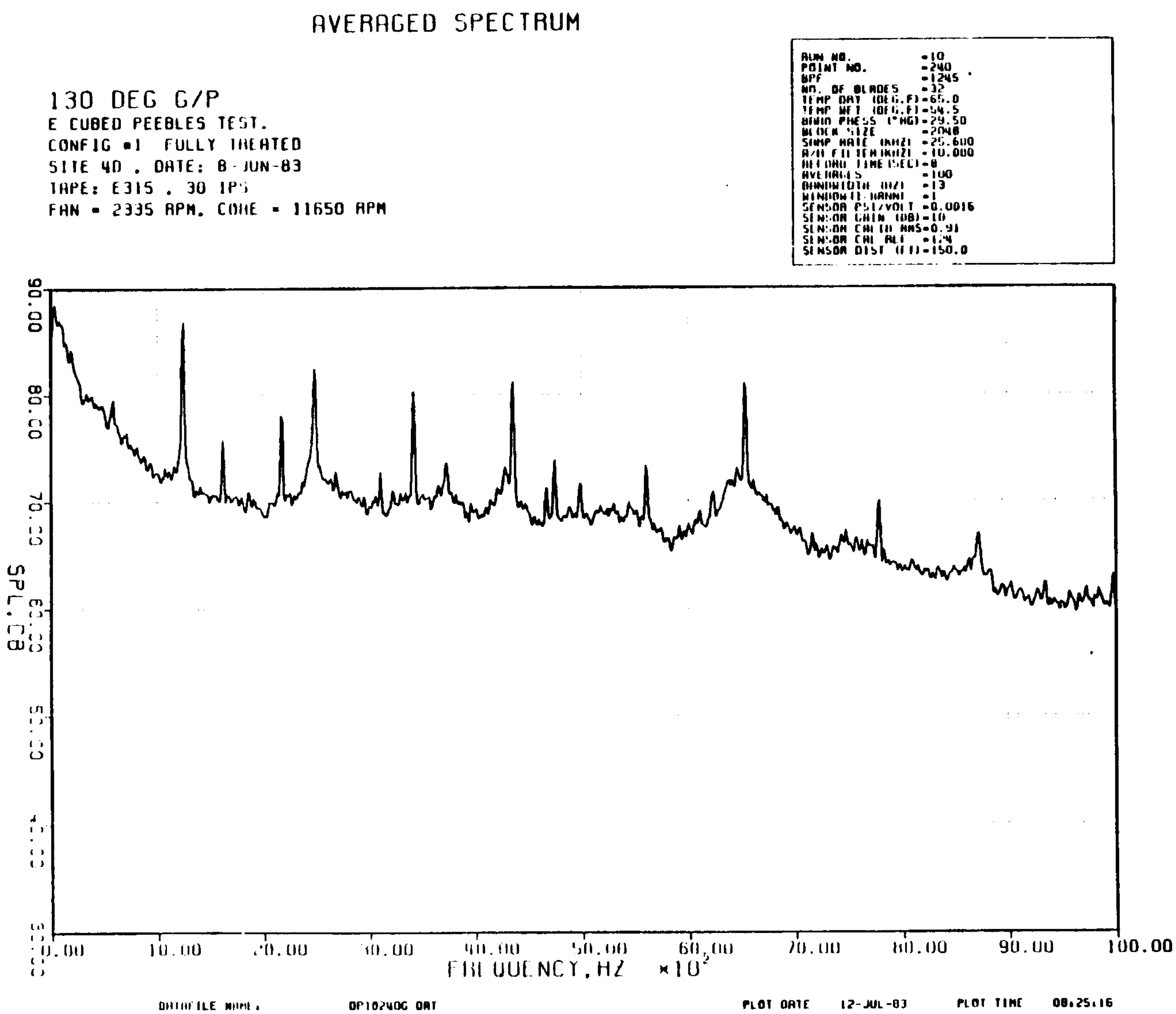
Appendix 9.2.4.1



Appendix 9.2.4.m



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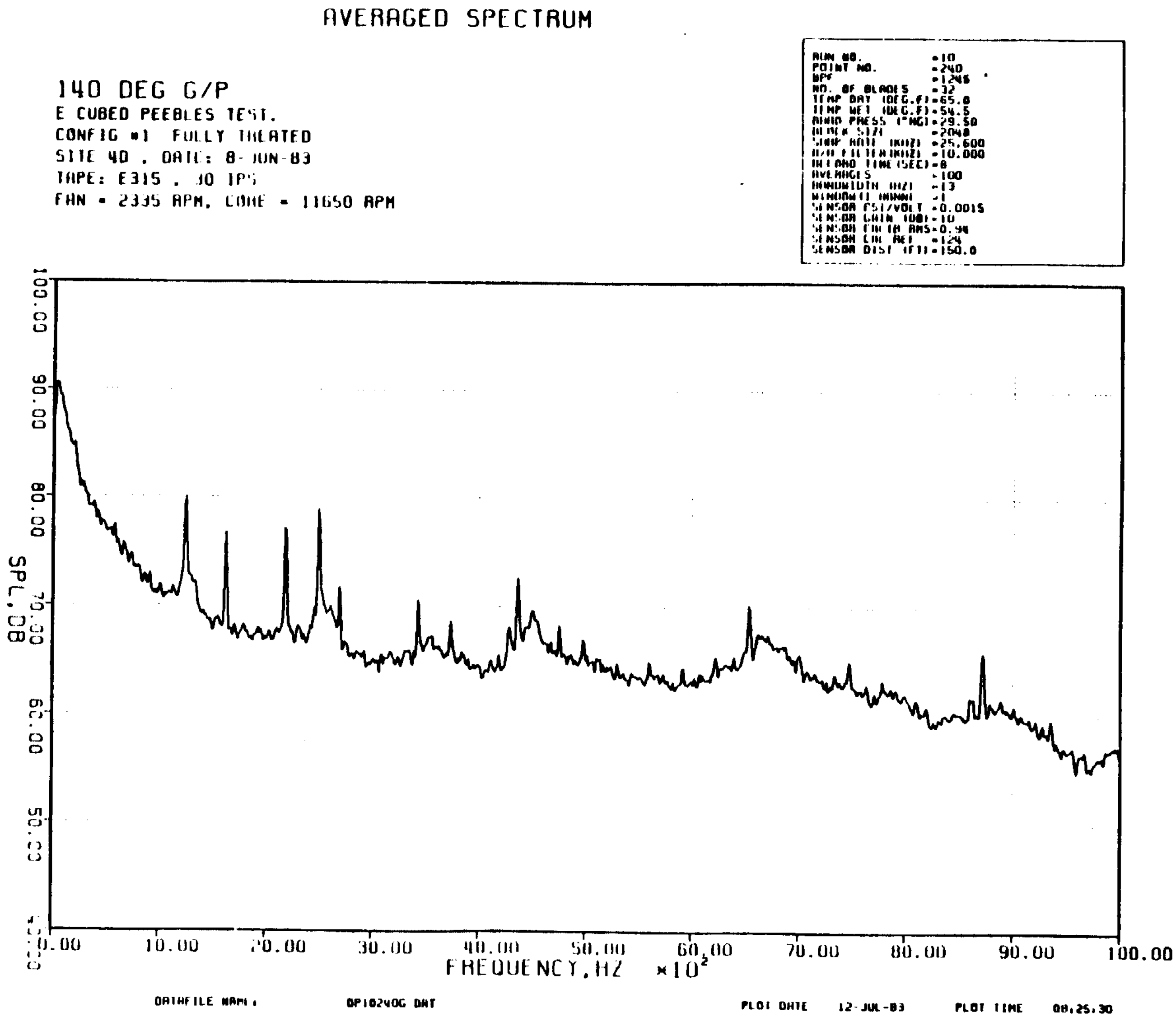
Appendix 9.2.4.n

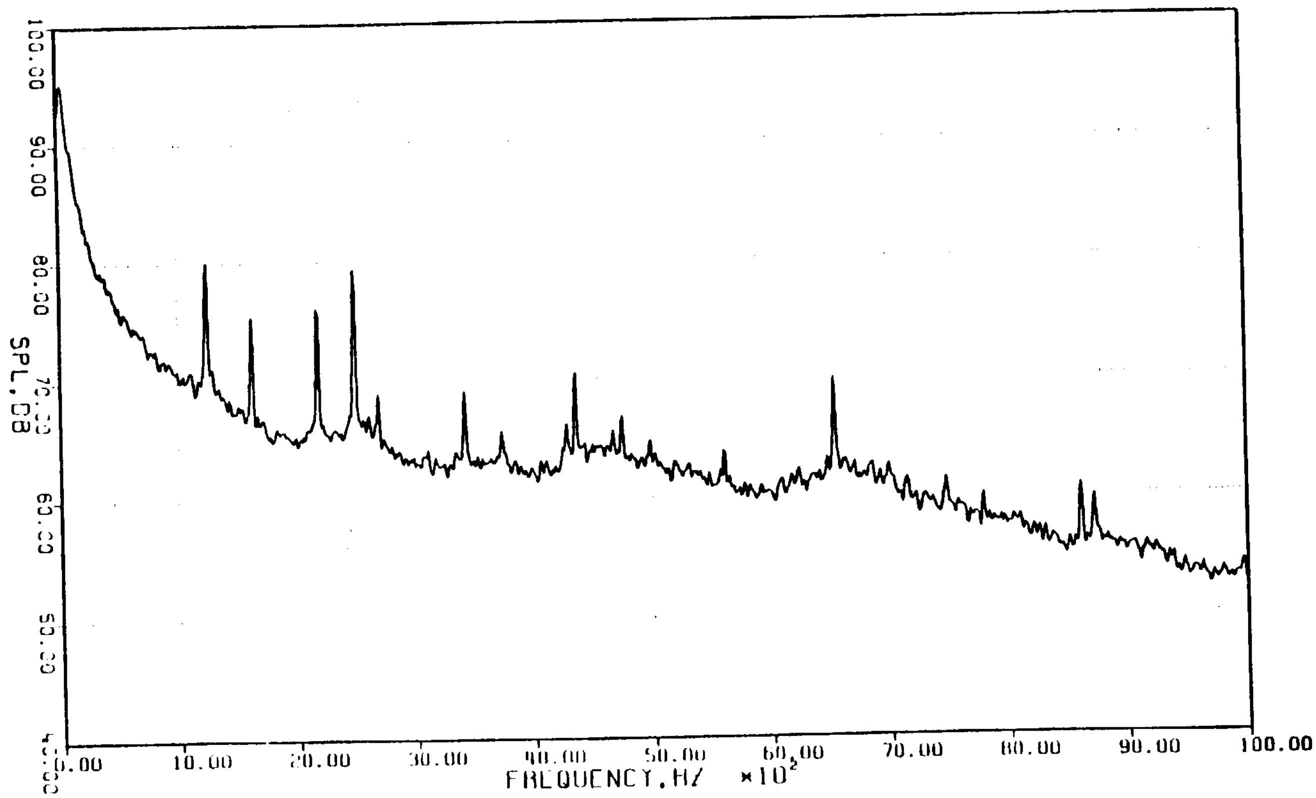


Appendix 9.2.4.o

AVERAGED SPECTRUM

150 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2335 RPM, CORE = 11650 RPM

RUN NO. =10
POINT NO. =240
BPF =1246
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A-A FILTER(KHZ) =10.000
RECORD TIME(SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR (PSI/VOLT) =0.0016
SENSOR GAIN (DB)=10
SENSOR CALIB RMS=0.91
SENSOR CAL REF =124
SENSOR DIST (FT)=150.0



DATAFILE NAME: DP10240H DAT PLOT DATE 12-JUL-83 PLOT TIME 08:26:14

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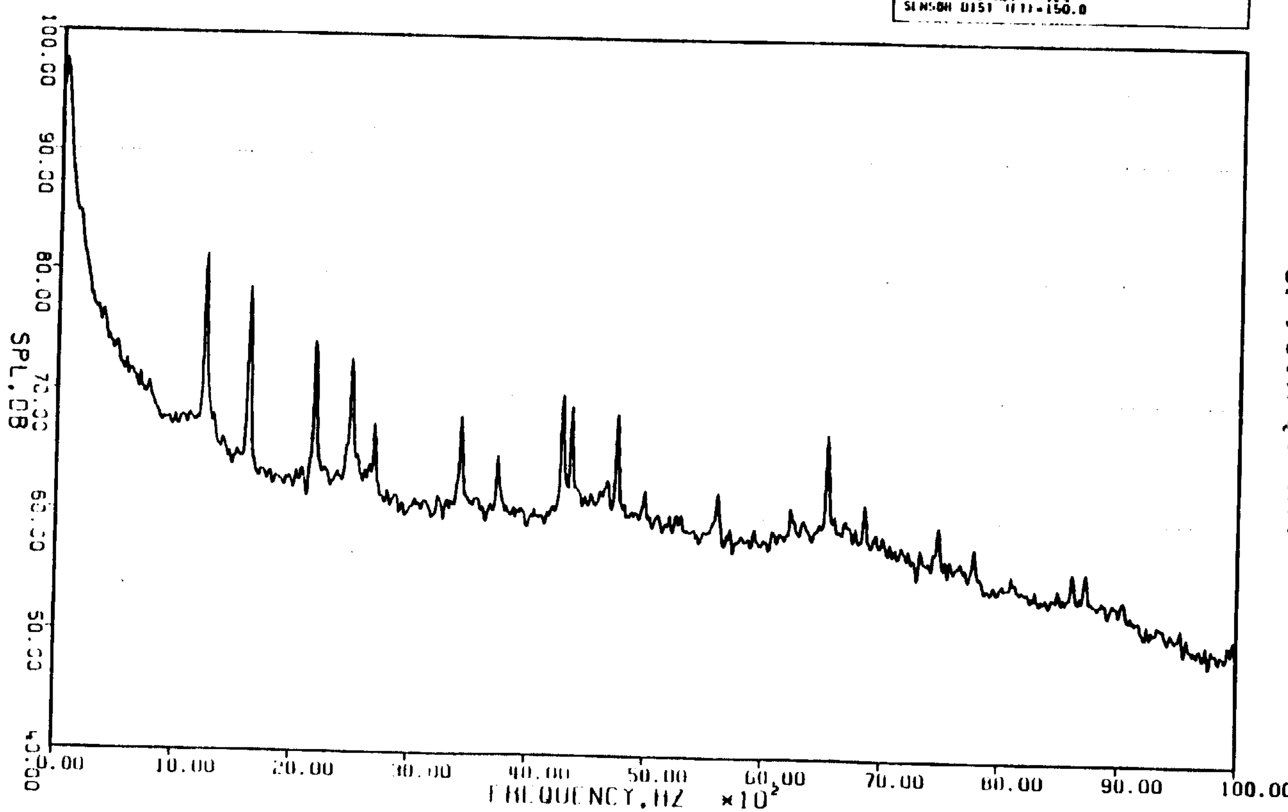
Appendix 9.2.4.p

AVERAGED SPECTRUM

160 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2335 RPM. CORE = 11650 RPM

RUN NO.	=10
POINT NO.	=240
BPF	=1245
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS (" HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.89
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: UP102404 DAT

PLOT DATE 12-JUL-83 PLOT TIME 08:26:28

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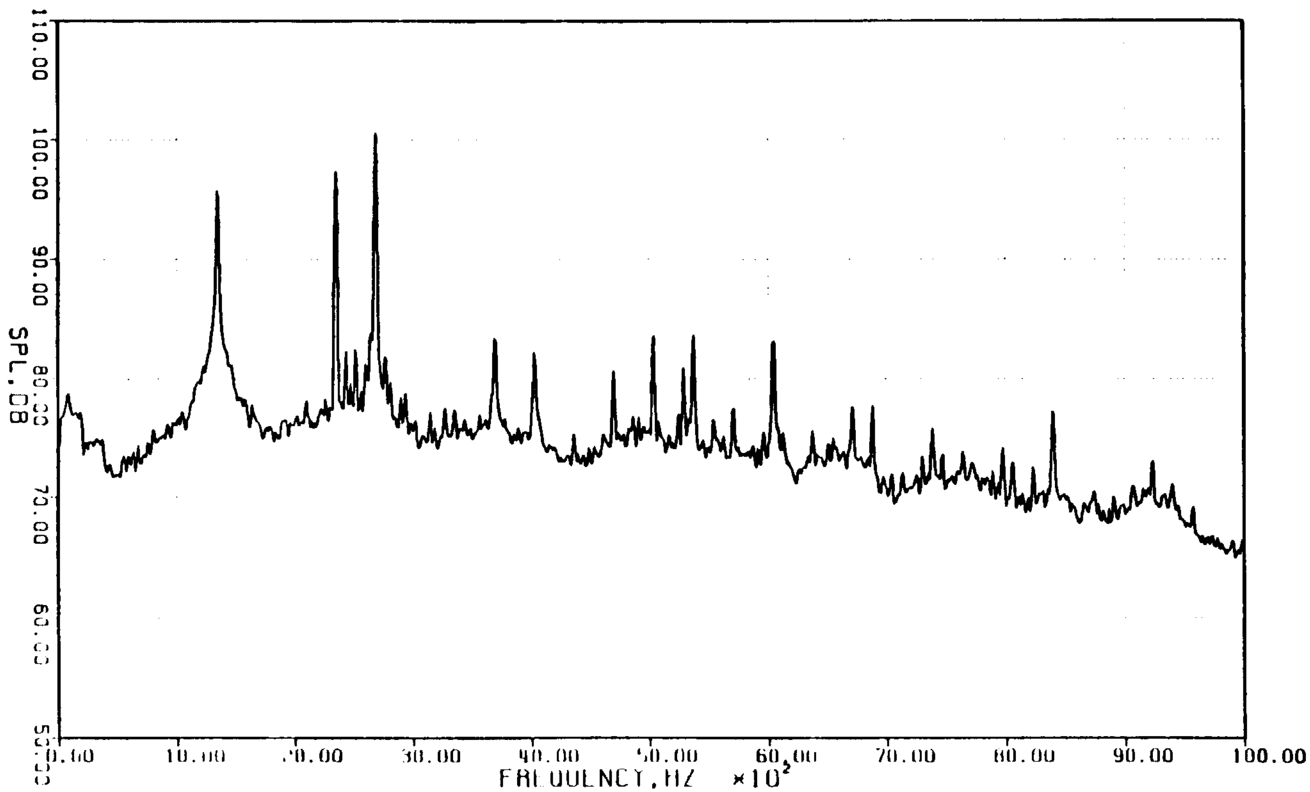
AVERAGED SPECTRUM

10 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2519 RPM, CORE = 11066 RPM

RUN NO.	=11
POINT NO.	=241
BPF	=1343
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1-HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CAL(B RMS	=0.90
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OP10241A DAT PLOT DATE 12-JUL-83 PLOT TIME 08:39:17

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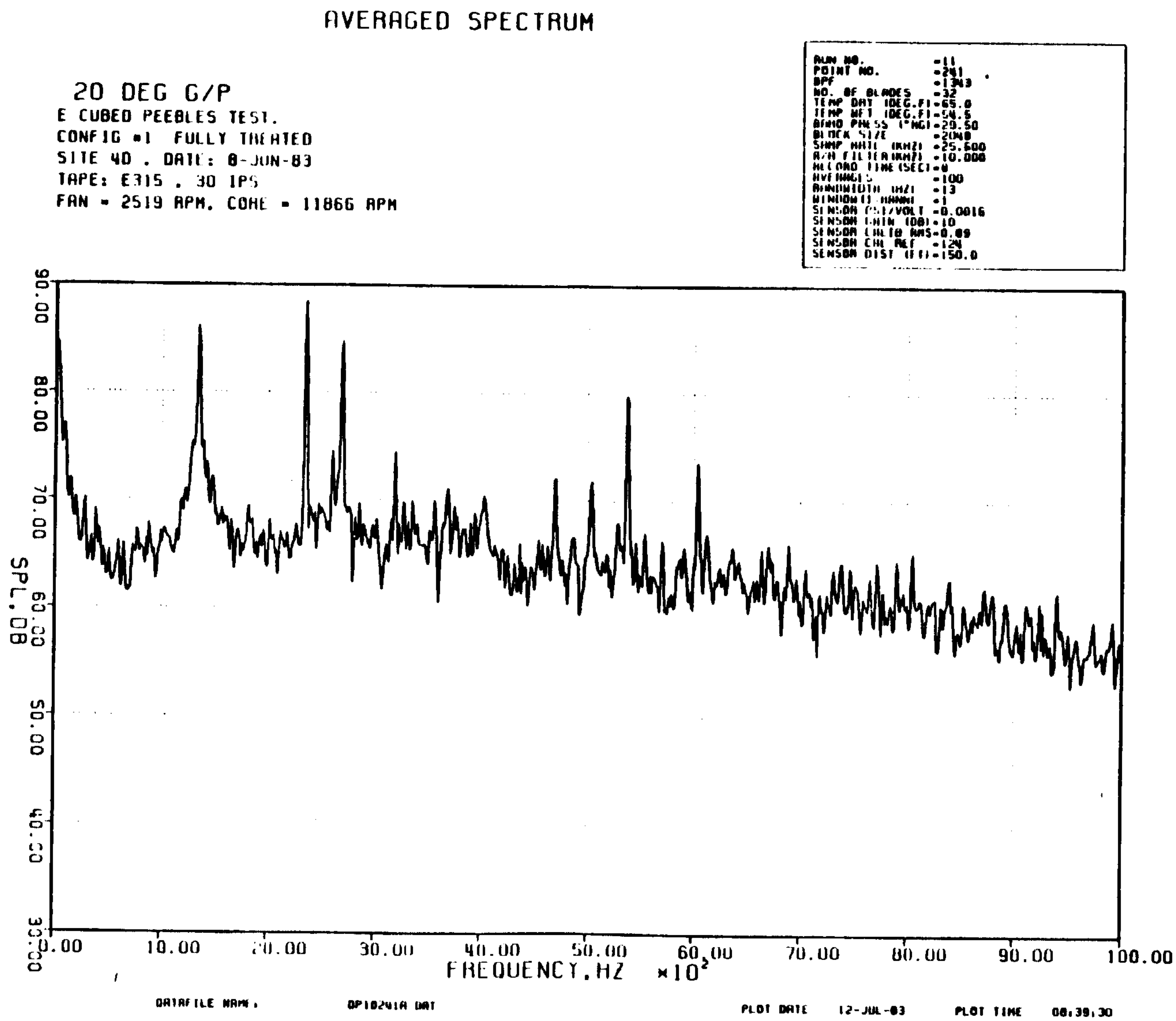
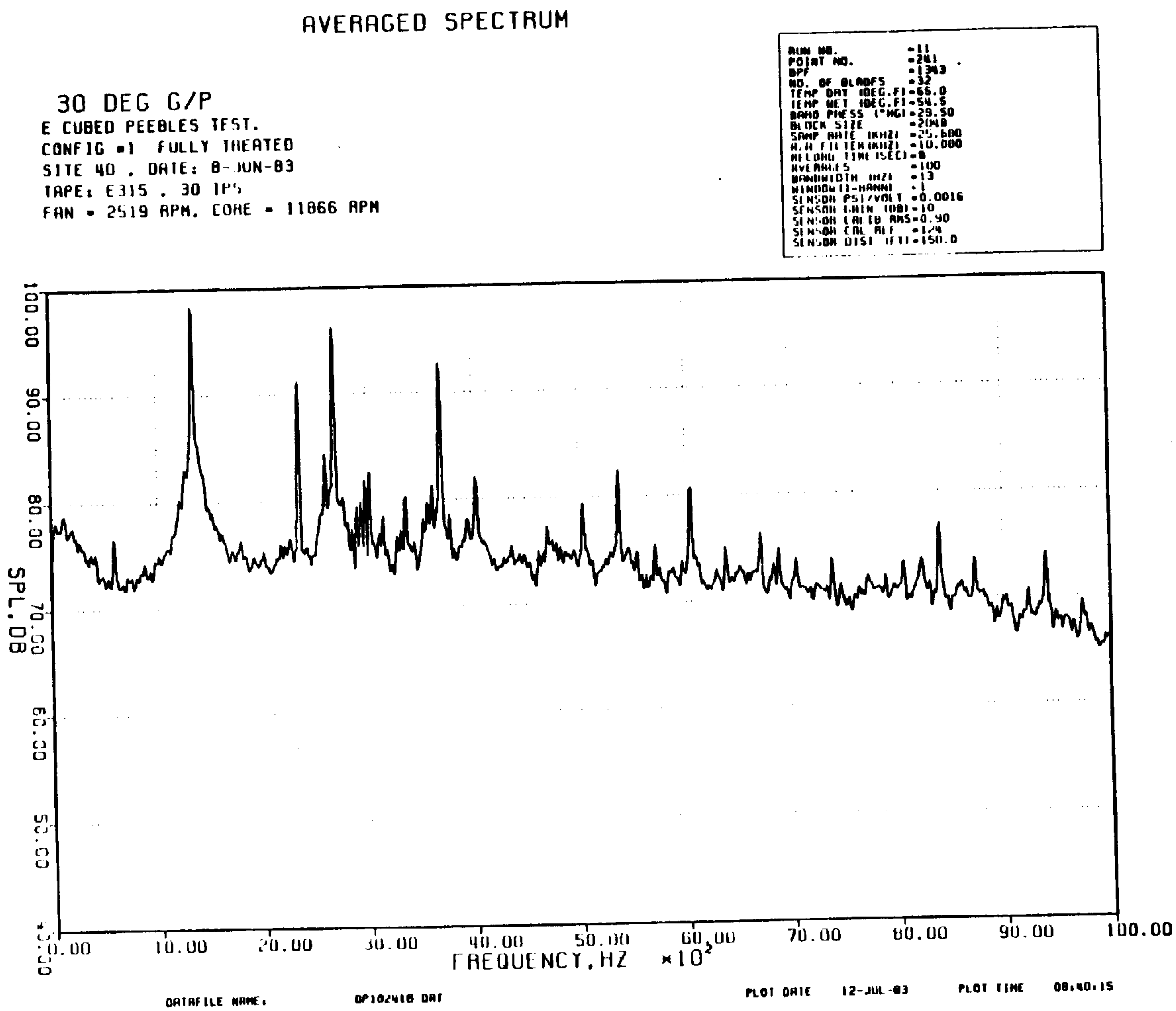
Appendix 9.2.5.b



Appendix 9.2.5.c



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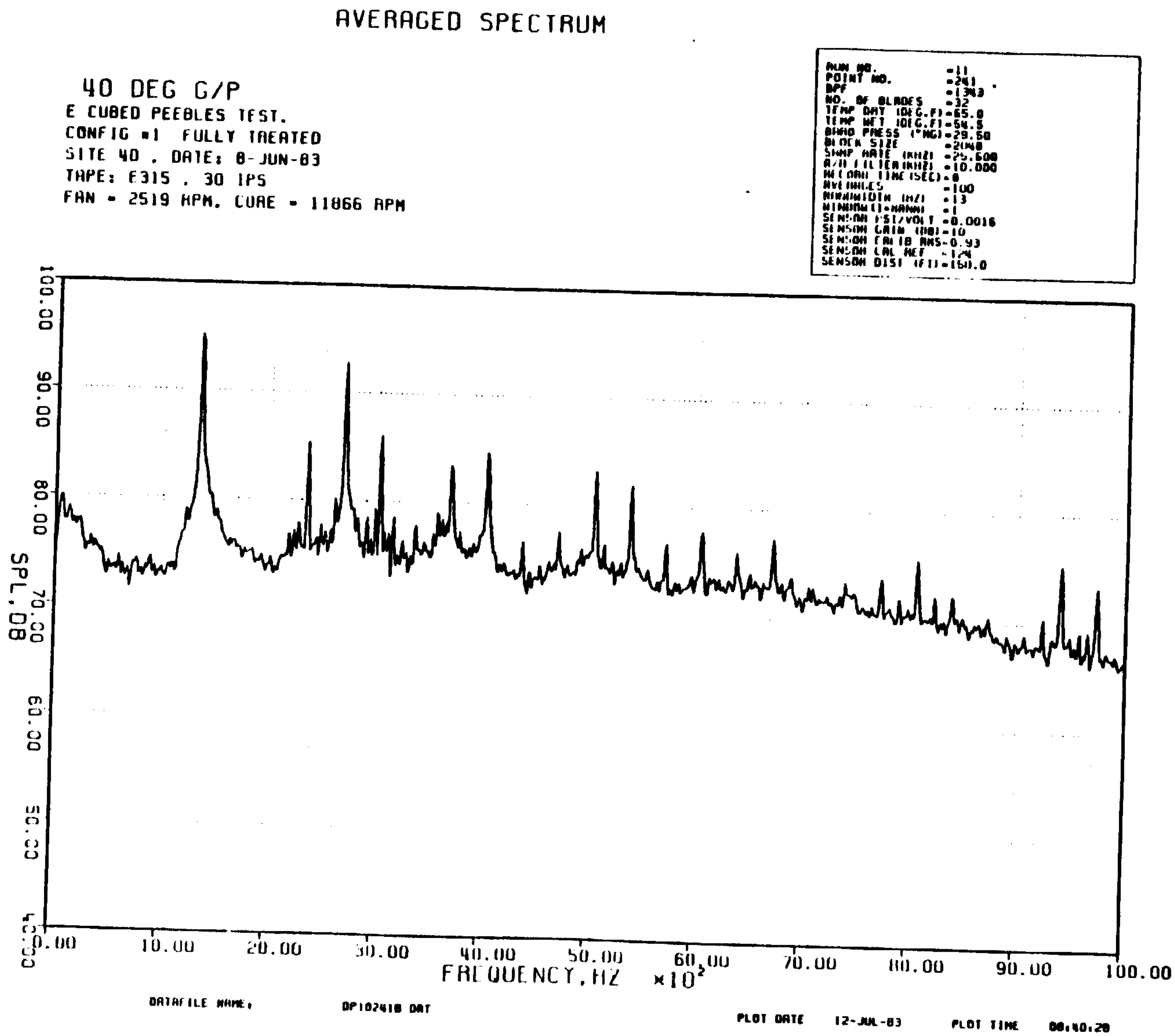
Appendix 9.2.5.d



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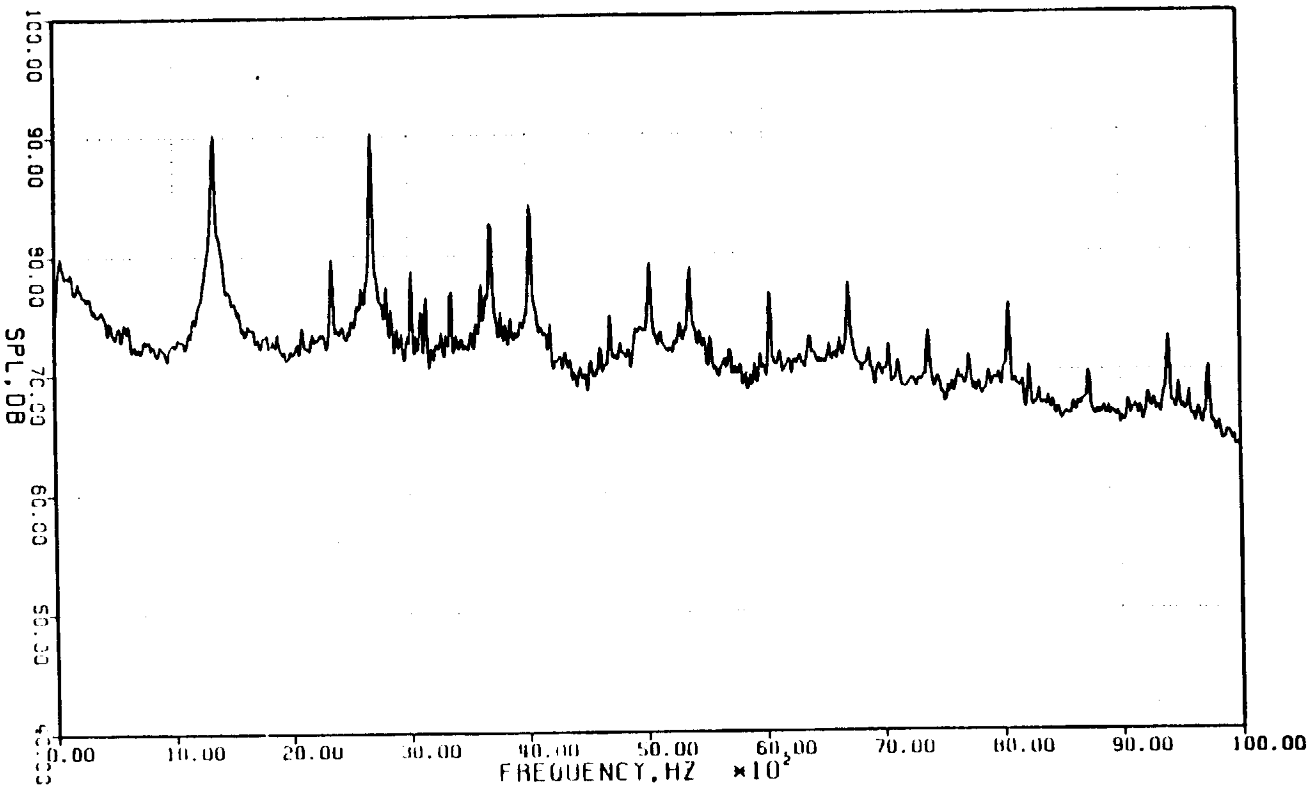
Appendix 9.2.5.e

AVERAGED SPECTRUM

50 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2519 RPM. CORE = 11866 RPM

RUN NO. =11
POINT NO. =241
BPF =1343
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER(KHZ) =10.000
RECORD TIME (SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB)=10
SENSOR CAL TO RMS=0.93
SENSOR CAL REF =124
SENSOR DIST (FT)=150.0



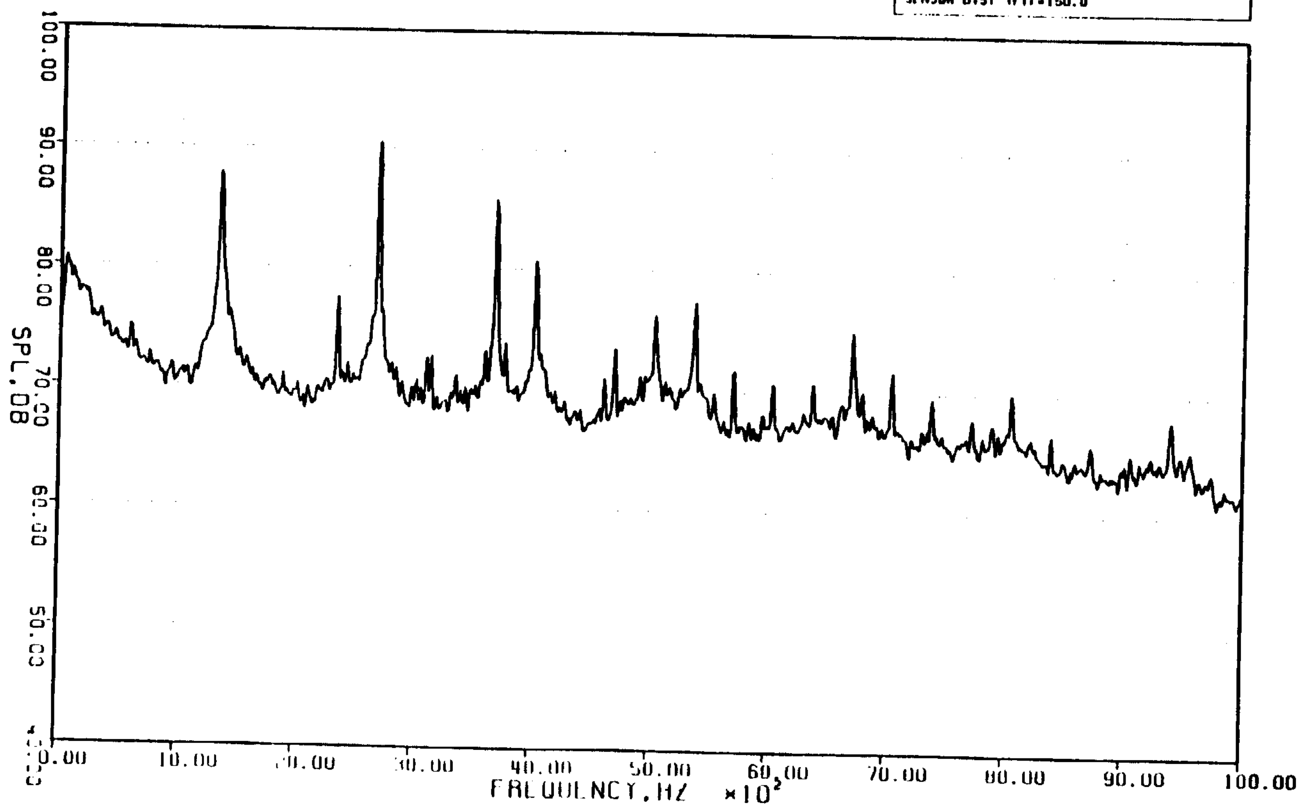
DATAFILE NAME: OP1024IC DAT PLOT DATE 12-JUL-83 PLOT TIME 08:41:13

Appendix 9.2.5.f

AVERAGED SPECTRUM

60 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2519 RPM, CORE = 11866 RPM

RUN NO.	=11
POINT NO.	=241
BPF	=1343
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CAL ID RMS	=0.91
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP10241C DAT

PLOT DATE 12-JUL-83 PLOT TIME 08:41:26

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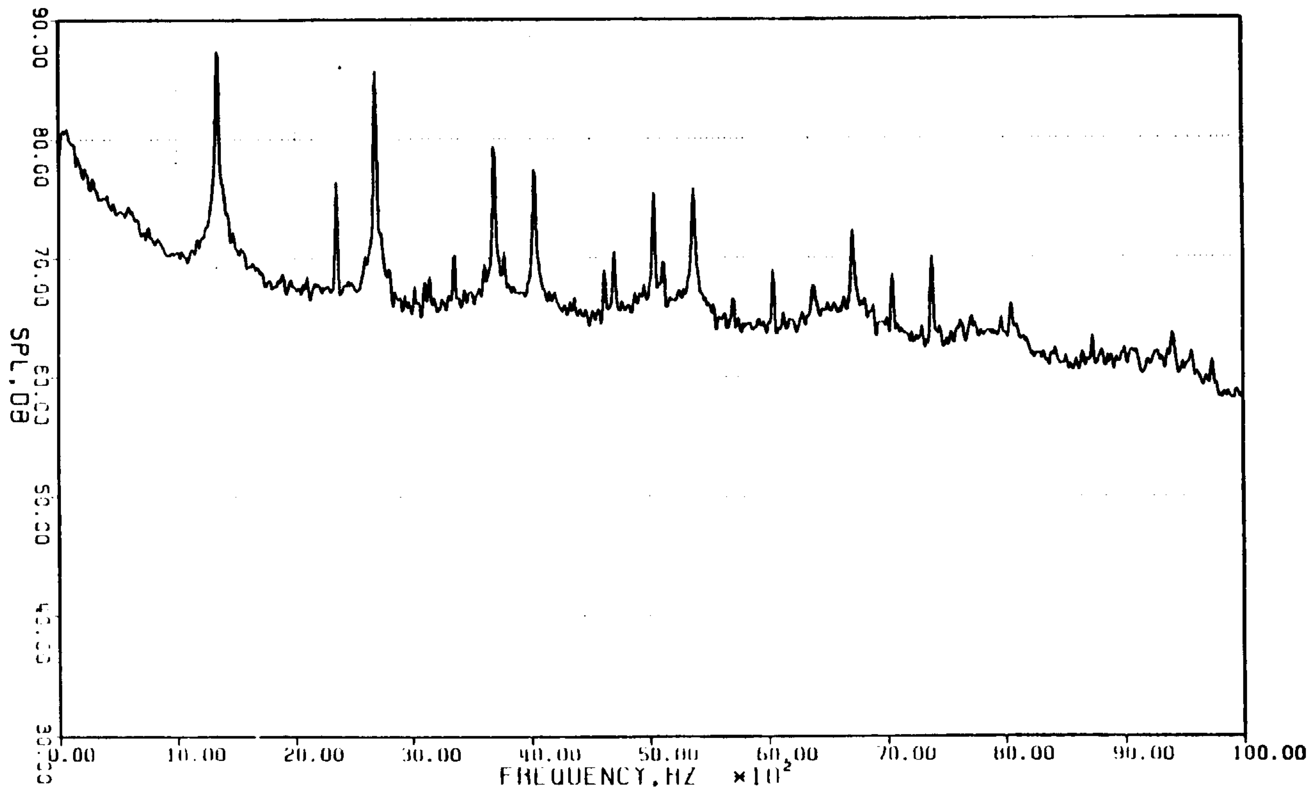
Appendix 9.2.5.g

AVERAGED SPECTRUM

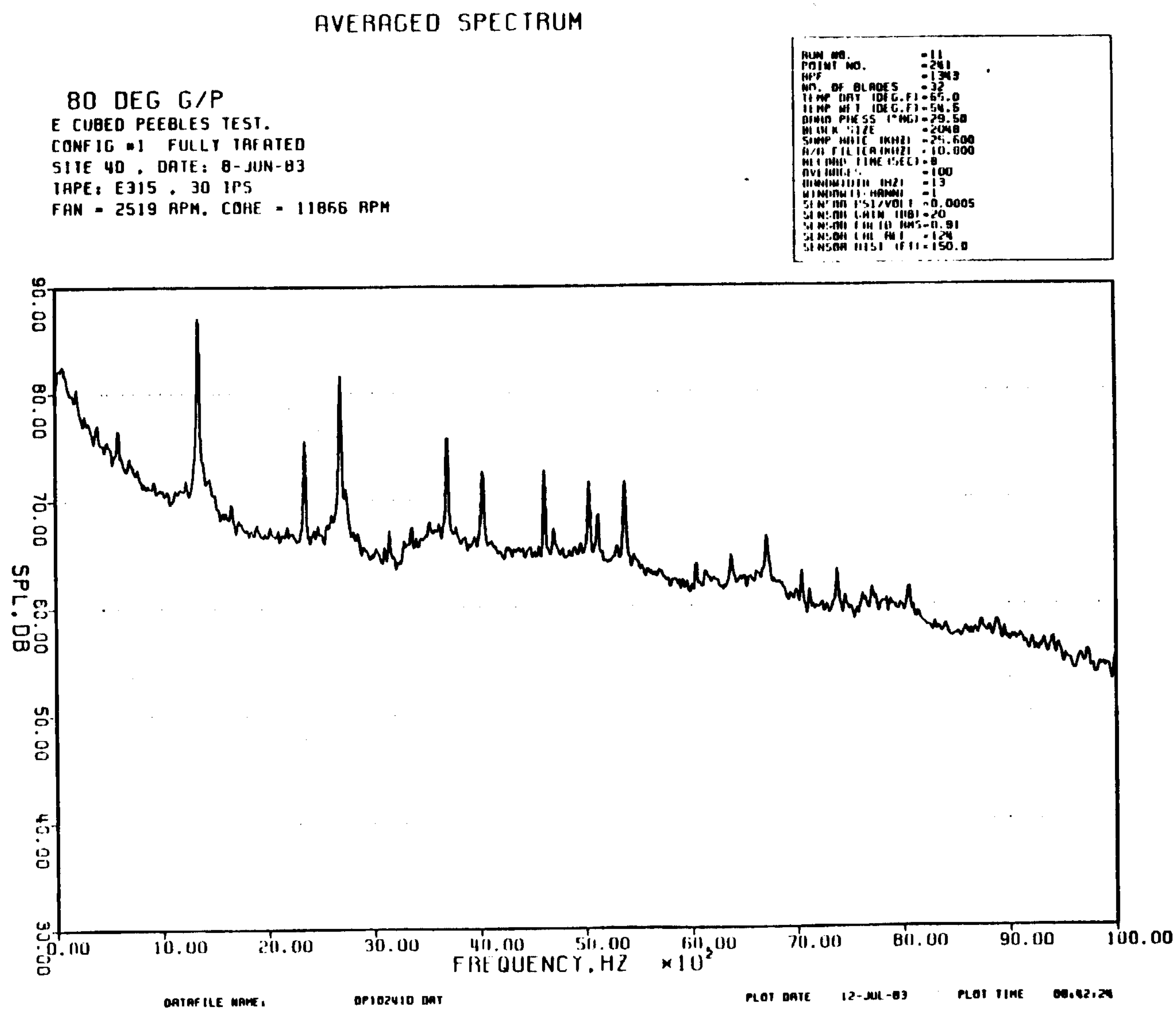
70 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2519 RPM, CORE = 11866 RPM

RUN NO.	=11
POINT NO.	=241
BPF	=1343
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.6
BARO PRESS (*HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1-HANN)	=1
SENSOR PSI/VOLT	=0.0005
SENSOR GAIN (DB)	=20
SENSOR CAL (V RMS)	=0.92
SENSOR CAL (DB)	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OP102410 DAT PLOT DATE 12-JUL-83 PLOT TIME 08:42:11

Appendix 9.2.5.h



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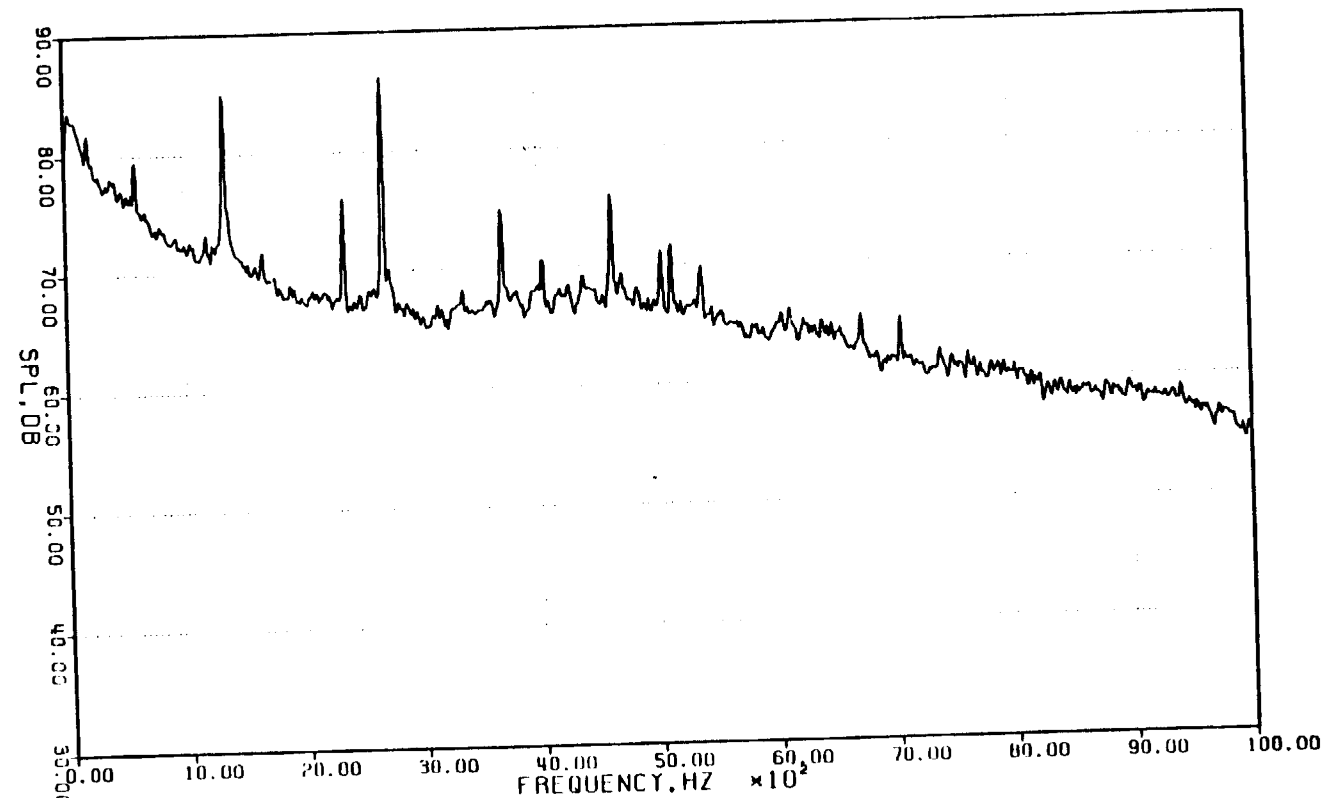
Appendix 9.2.5.i

AVERAGED SPECTRUM

90 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2519 RPM. CORE = 11866 RPM

RUN NO. =11
POINT NO. =241
BPF =1343
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1=HANN) =1
SENSOR PSI/VOLT =0.0005
SENSOR GAIN (DB) =20
SENSOR CALIB RMS =0.93
SENSOR CAL ALT =124
SENSOR DIST (FT) =150.0



DATAFILE NAME: DP10241E DAT

PLOT DATE 12-JUL-83 PLOT TIME 08:43:09

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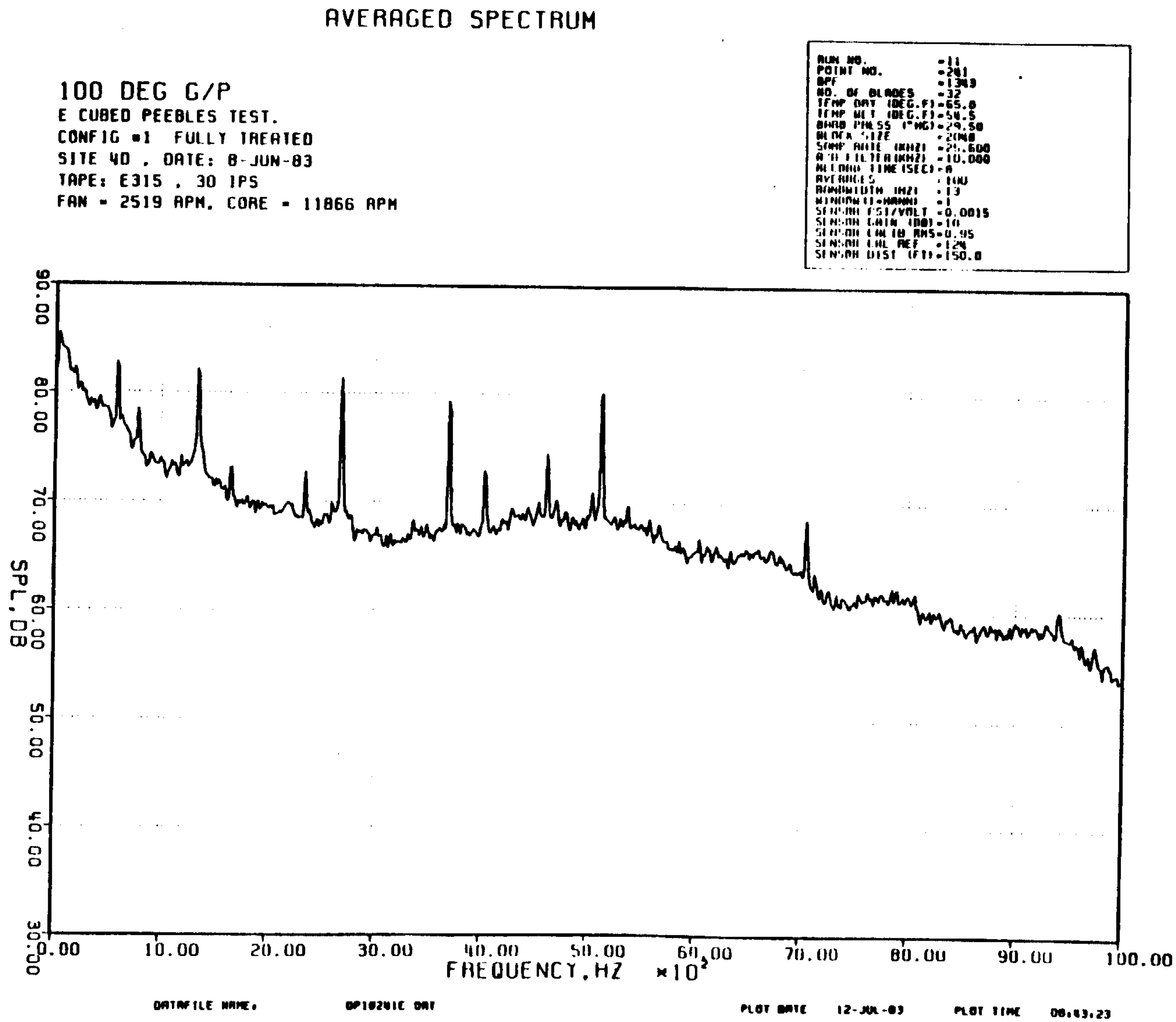
Appendix 9.2.5.j



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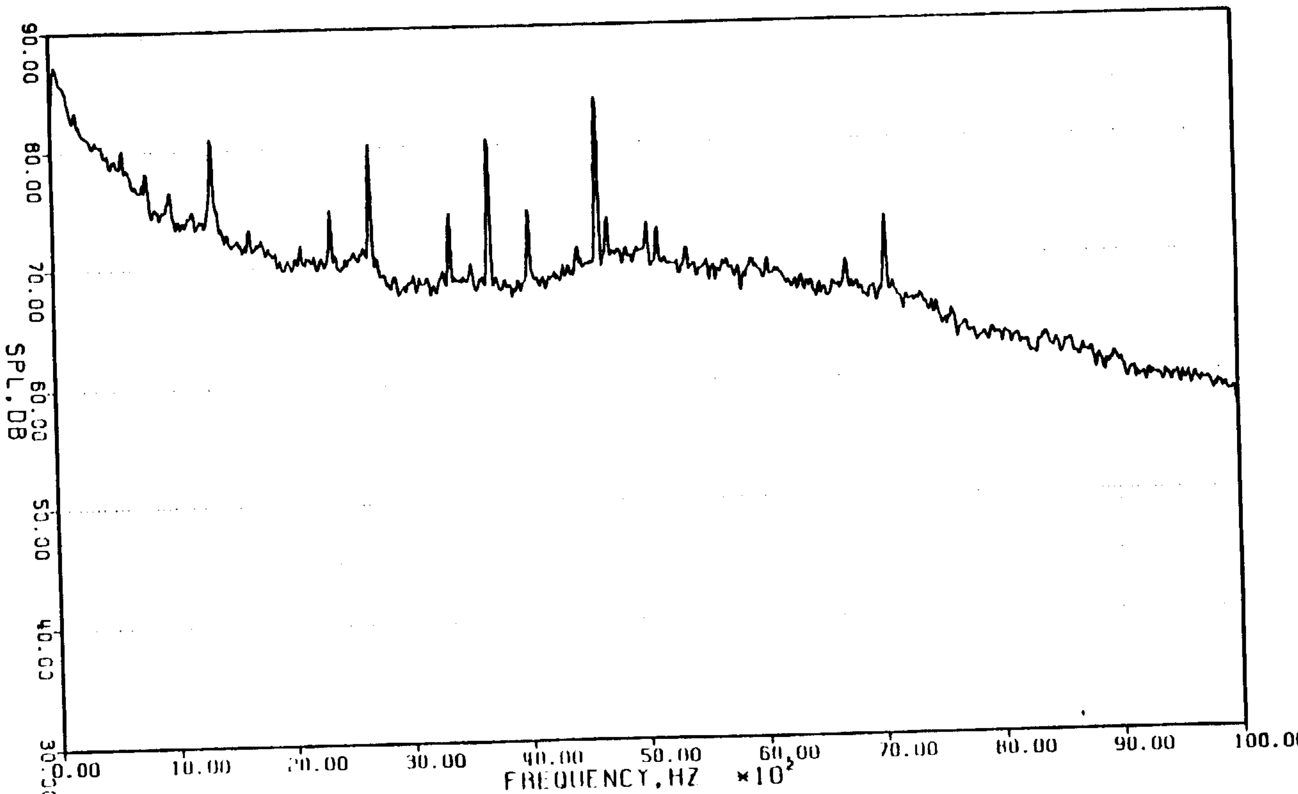
Appendix 9.2.5.k

AVERAGED SPECTRUM

110 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2519 RPM, CORE = 11866 RPM

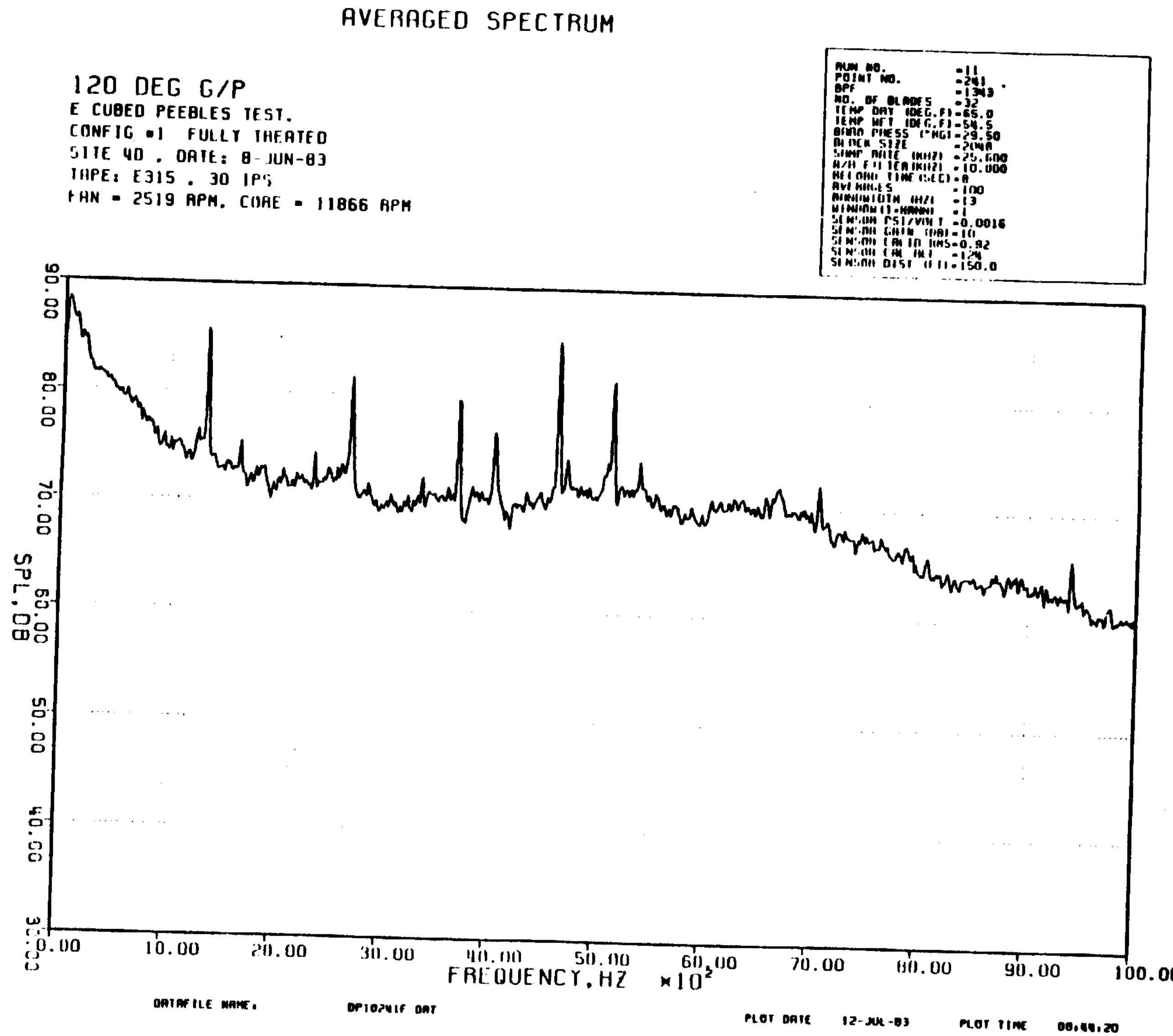
RUN NO.	=11
POINT NO.	=241
BPF	=1343
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A.A. FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW HANNING	=1
SENSOR EST/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.93
SENSOR CAL AMP	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OP10241F DAT

PLOT DATE 12-JUL-83 PLOT TIME 08:44:07

Appendix 9.2.5.1



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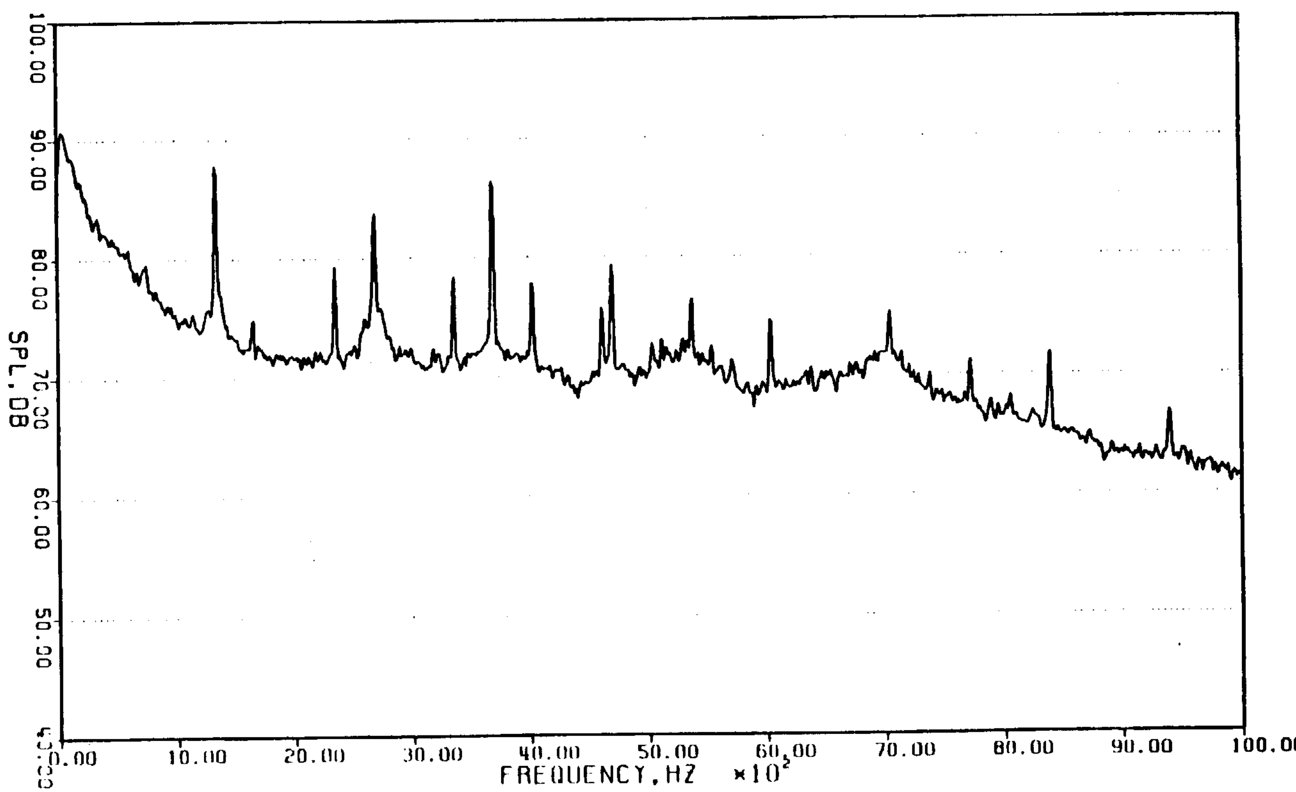
Appendix 9.2.5.m

AVERAGED SPECTRUM

130 DEG G/P
E CUBED PEBBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2519 RPM. CORE = 11866 RPM

RUN NO.	=11
POINT NO.	=241
RPF	=1343
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.91
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP10241G DAT PLOT DATE 12-JUL-83 PLOT TIME 08:45:04

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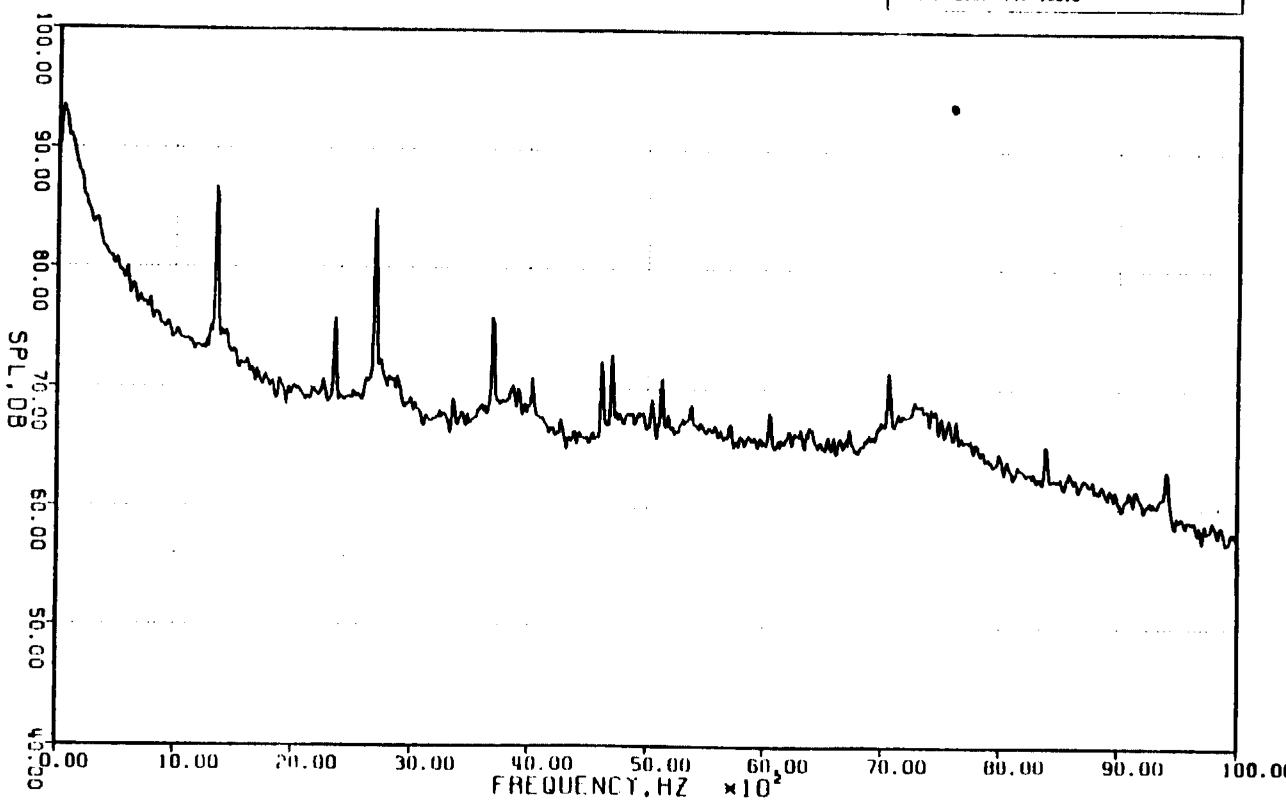
Appendix 9.2.5.n

AVERAGED SPECTRUM

140 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2519 RPM, CORE = 11866 RPM

RUN NO.	=11
POINT NO.	=241
BPF	=1343
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A.A FILTER(KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0015
SENSOR GAIN (DB)	=10
SENSOR FIELD RMS	=0.94
SENSOR CAL REF	=1.4
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP1024IG DAT PLOT DATE 12-JUL-83 PLOT TIME 08:45:18

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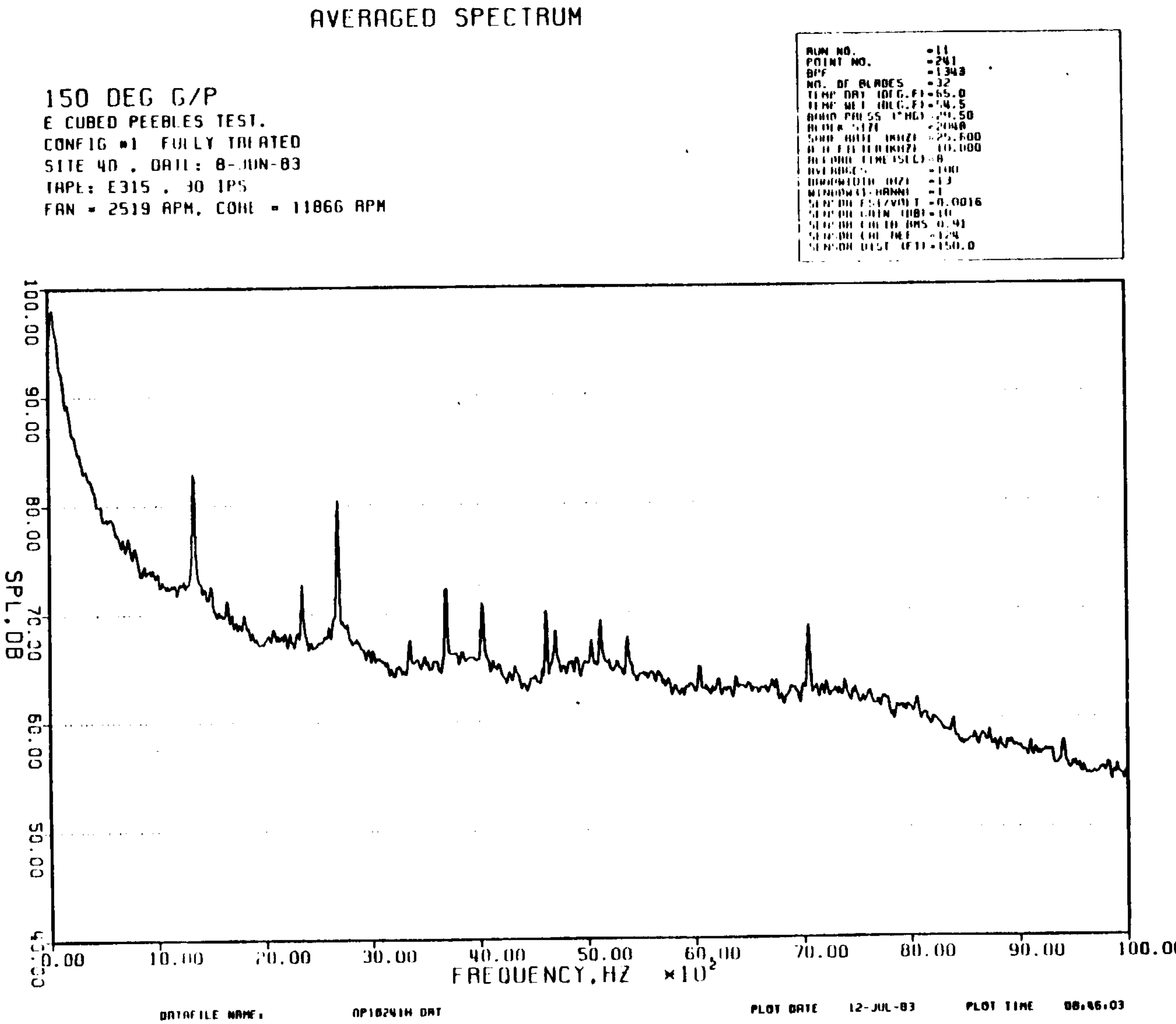
Appendix 9.2.5.o



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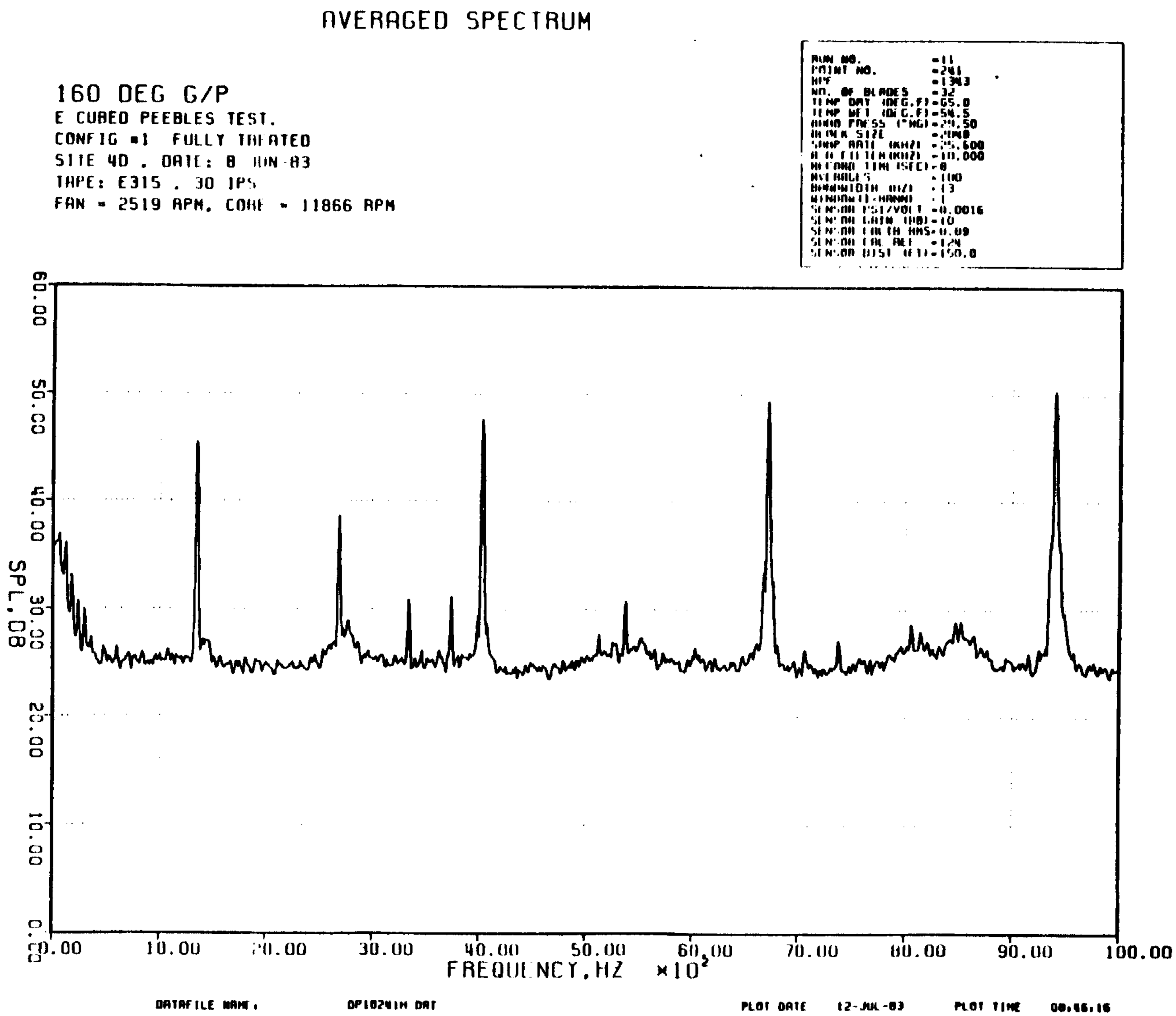
Appendix 9.2.5.p



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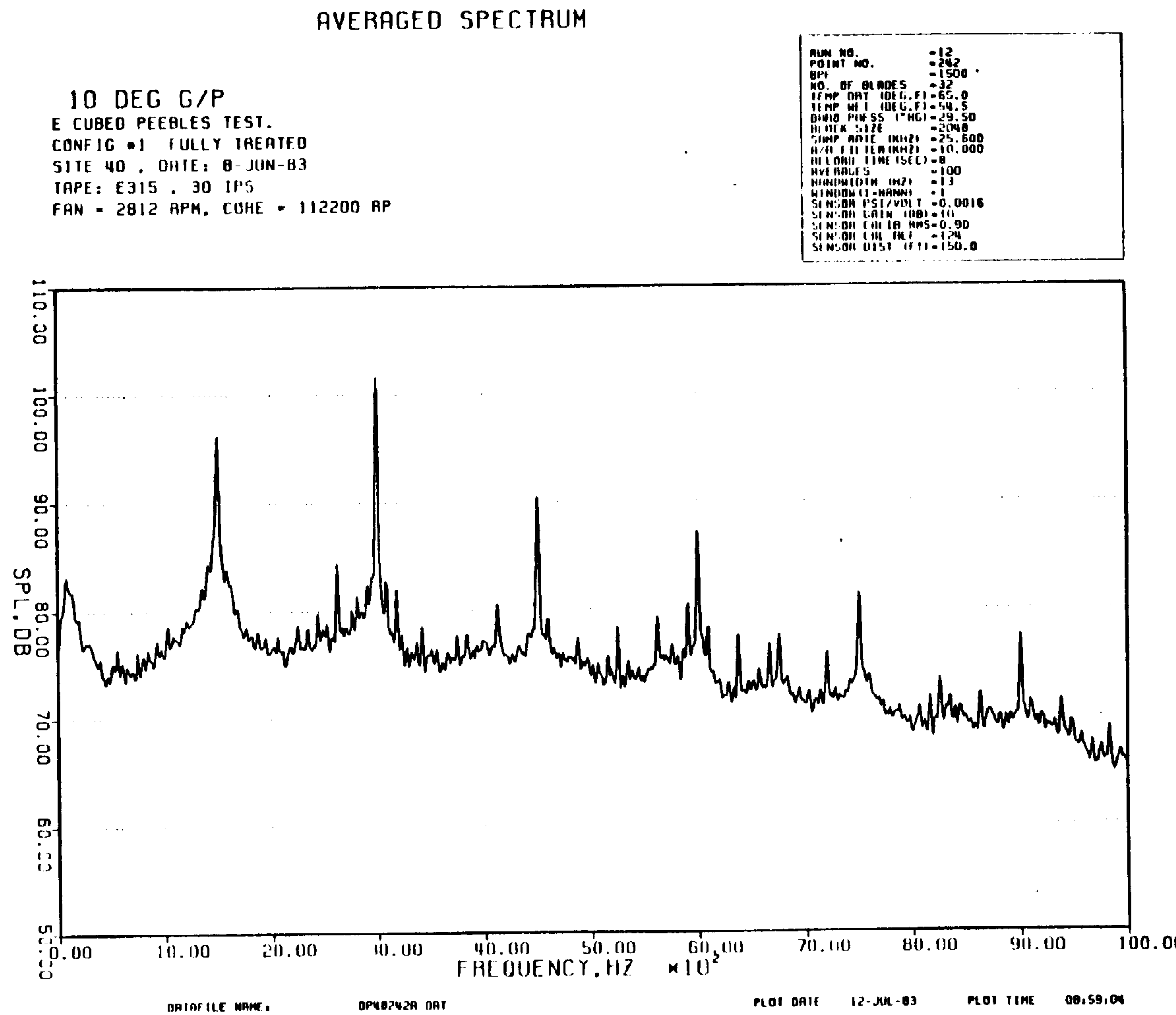
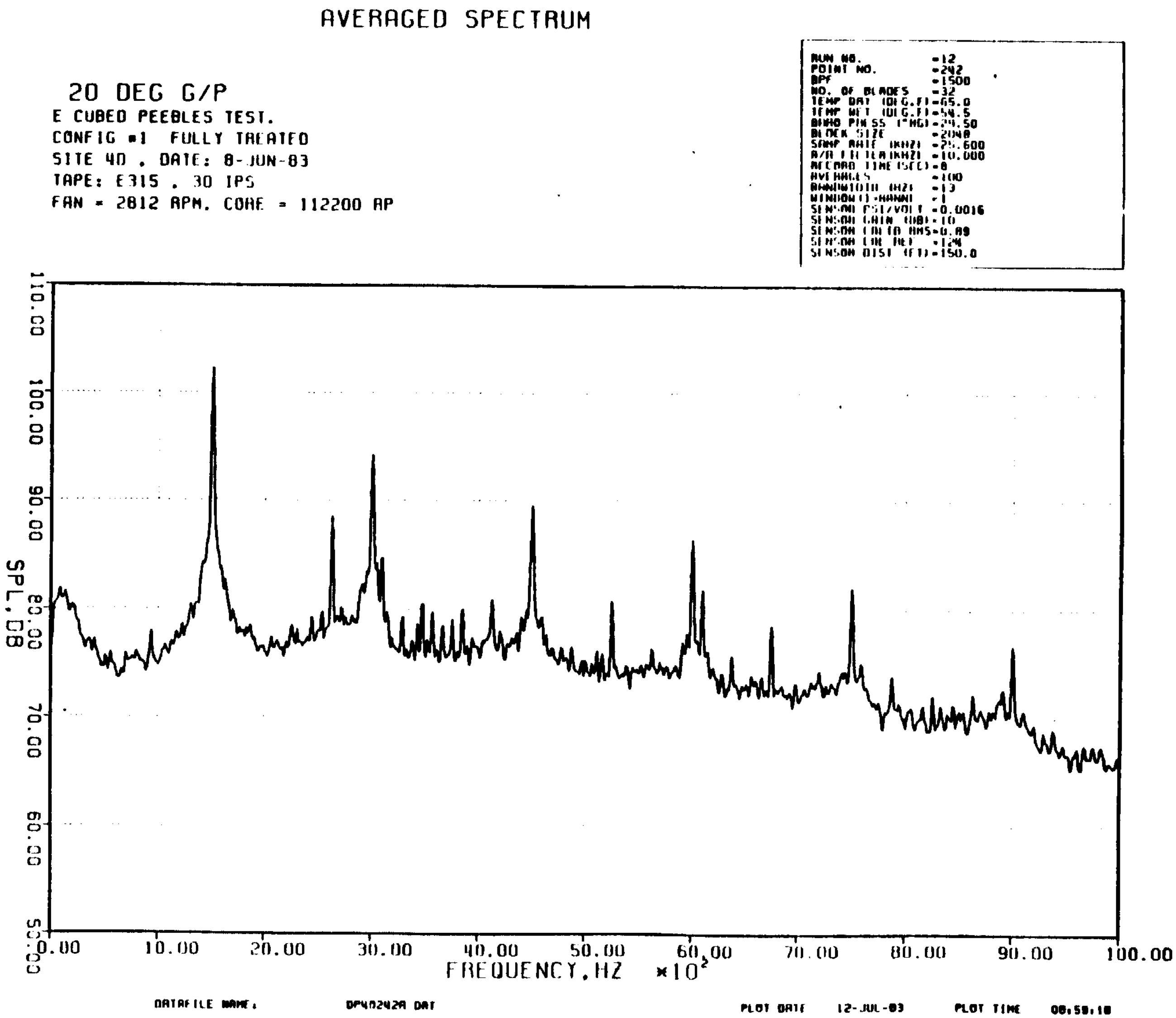
Appendix 9.2.6.a



Appendix 9.2.6.b

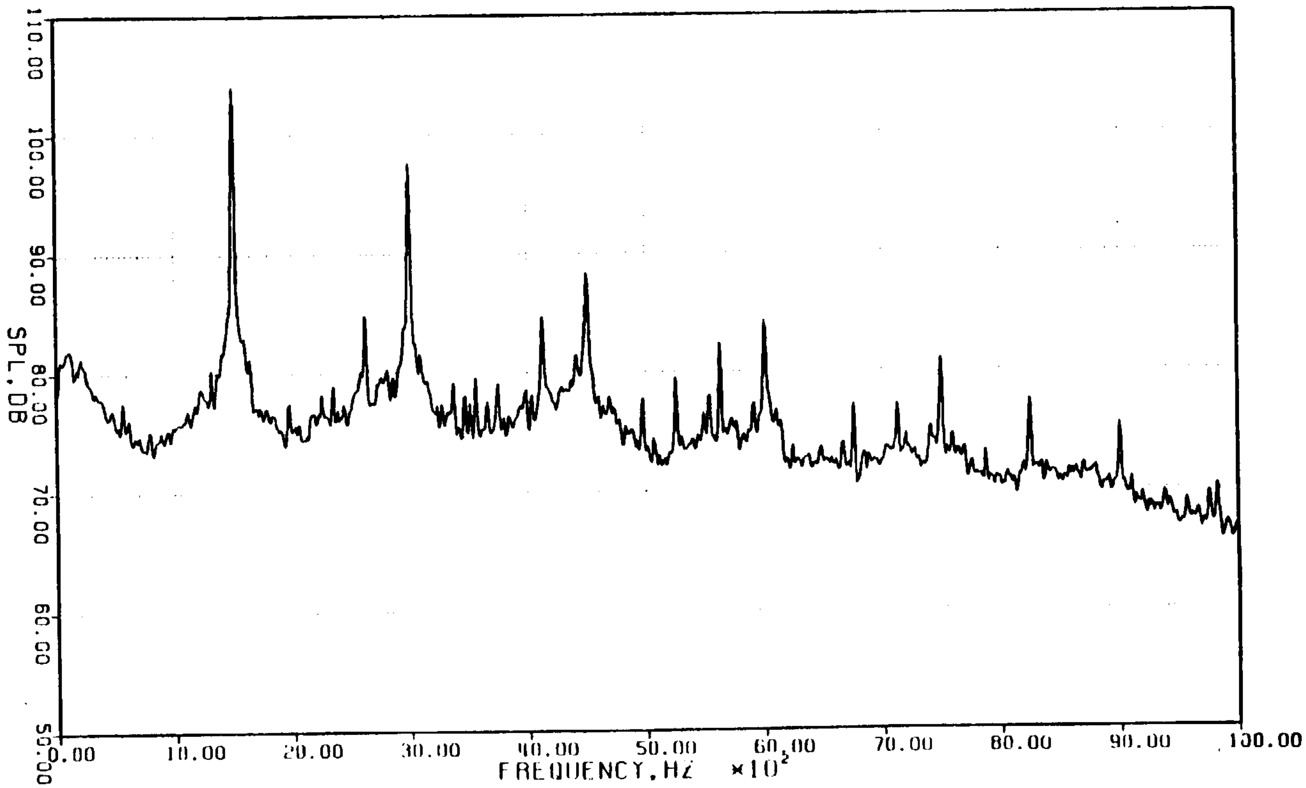


Appendix 9.2.6.c

AVERAGED SPECTRUM

30 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2812 RPM, CORE = 112200 RP

RUN NO.	=12
POINT NO.	=242
BPF	=1500
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=2[illegible].50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
[illegible] (KHZ)	=10.000
[illegible] TIME (SEC)	=0
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1-HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CAL [illegible] RMS	=0.40
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP4D242B DAT

PLOT DATE 12-JUL-83

PLOT TIME 09:00:02

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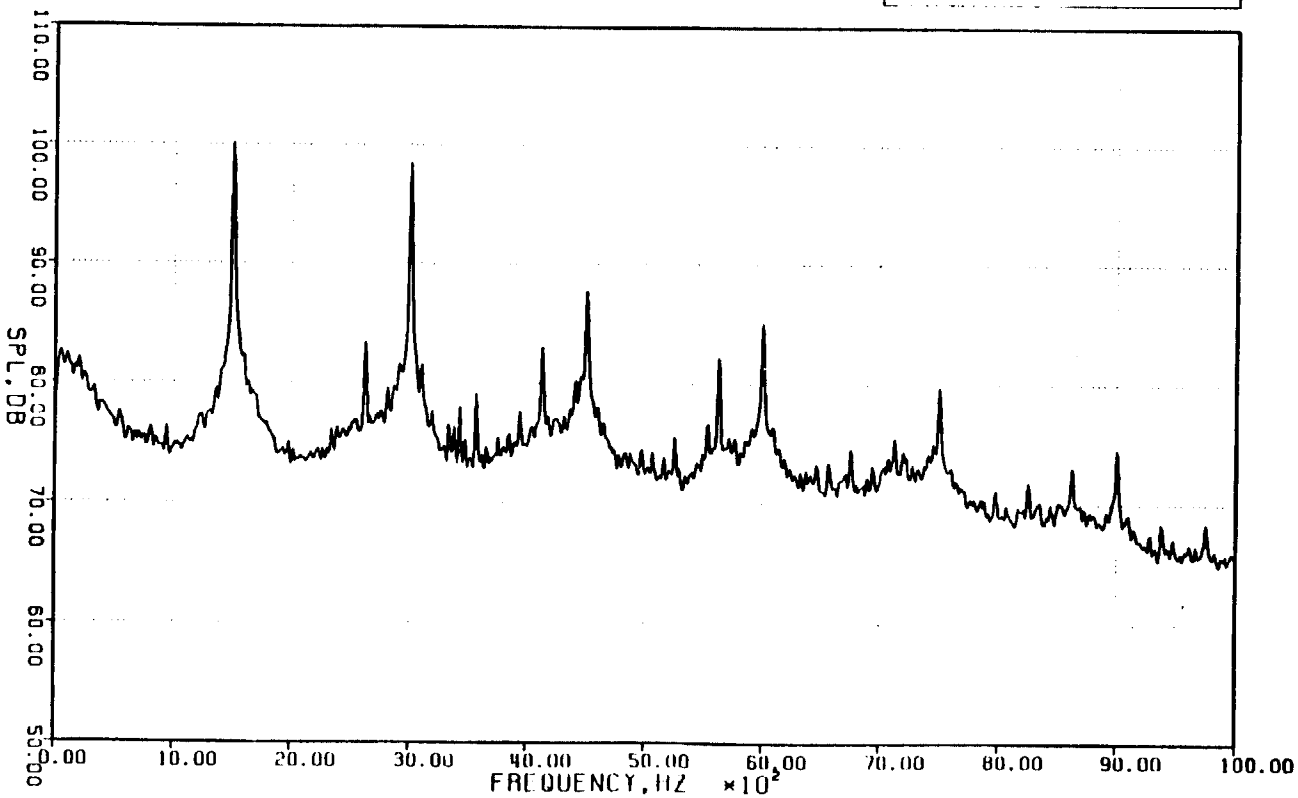
Appendix 9.2.6.d

AVERAGED SPECTRUM

40 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2812 RPM, CORE = 112200 RP

RUN NO. =12
POINT NO. =242
BPF =1500
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER(KHZ) =10.000
RECORD TIME(SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB)=10
SENSOR CALIB RMS=0.93
SENSOR CAL REF =1.4
SENSOR DIST (FT)=150.0



DATAFILE NAME: DP402428 DAT   PLOT DATE 12-JUL-83   PLOT TIME 09:00:16

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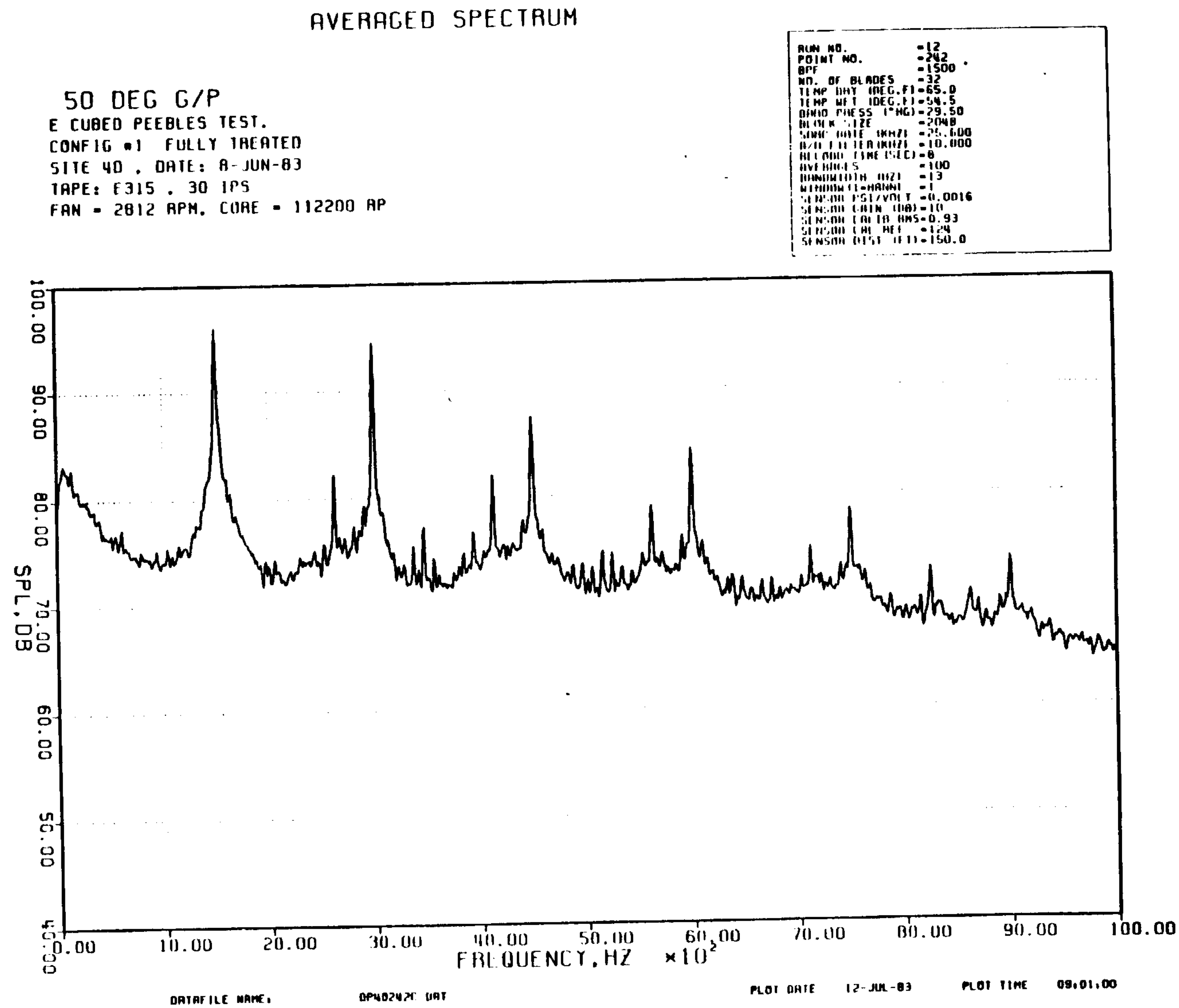
Appendix 9.2.6.e



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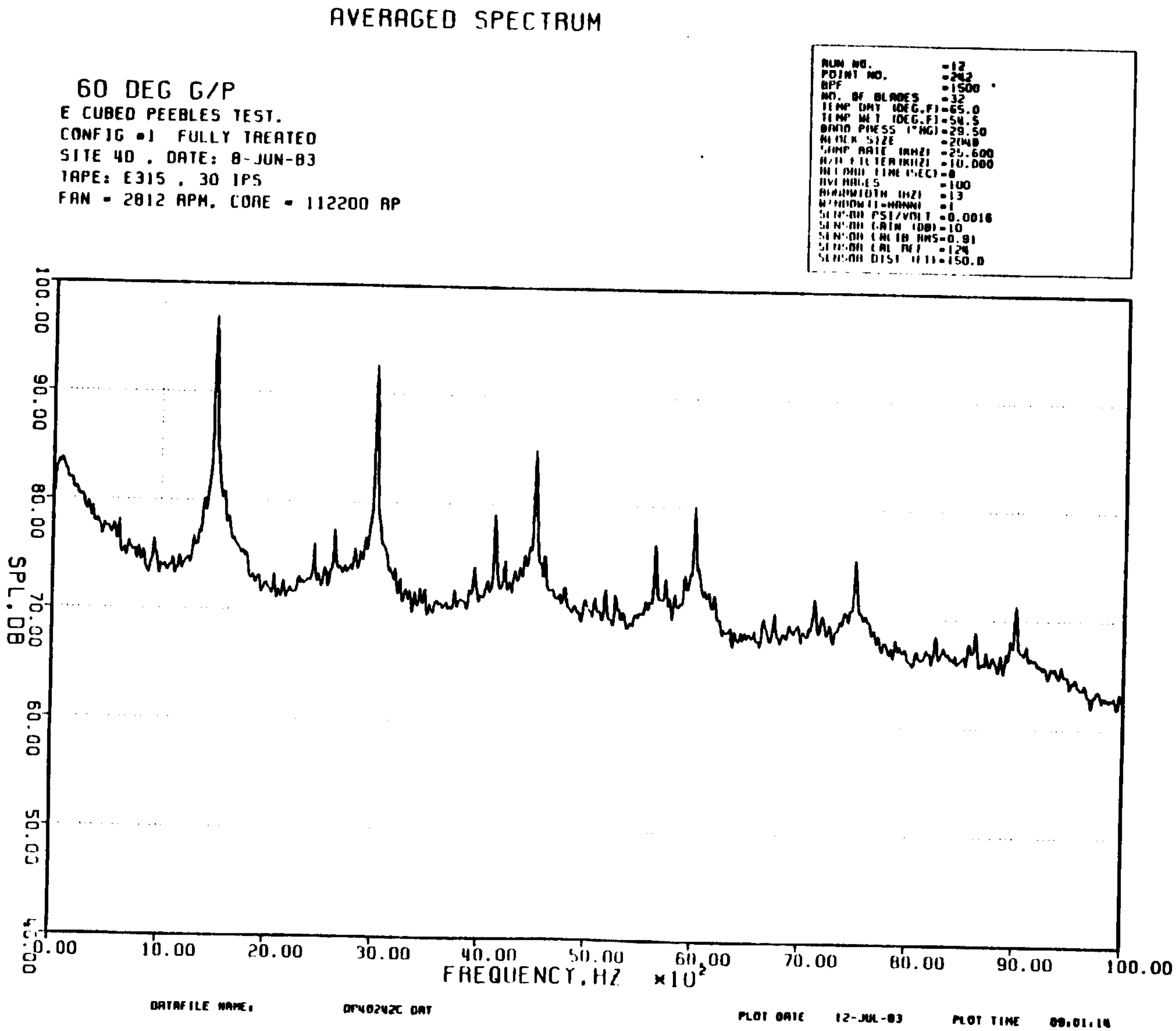
Appendix 9.2.6.f



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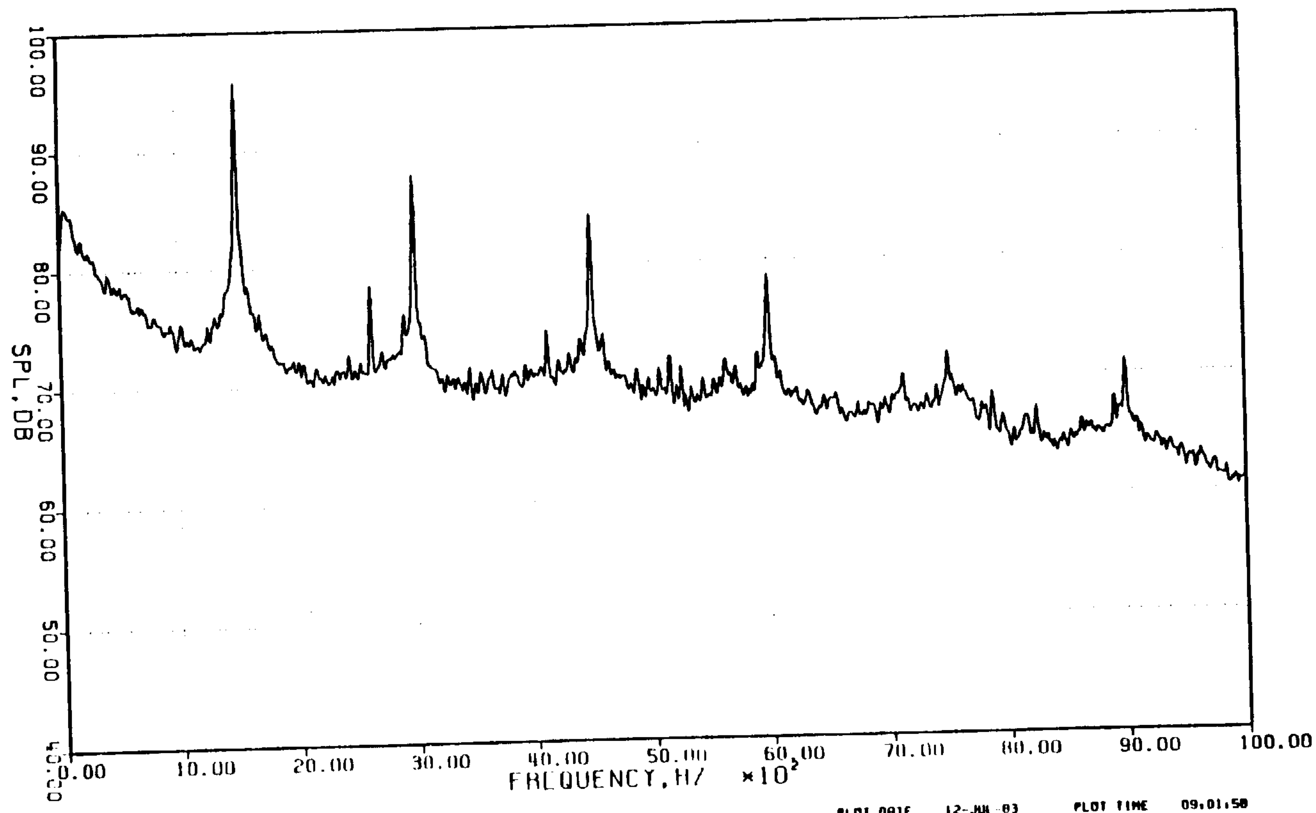
Appendix 9.2.6.g

AVERAGED SPECTRUM

70 DEG G/P
E CUBED PEFBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2812 RPM, CORE = 112200 RP

RUN NO.	=12
POINT NO.	=242
RPF	=1500
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A.A FILTER(KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1-HANN)	=1
SENSOR FS1/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CAL (A RMS	=0.92
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP402420 DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:01:58

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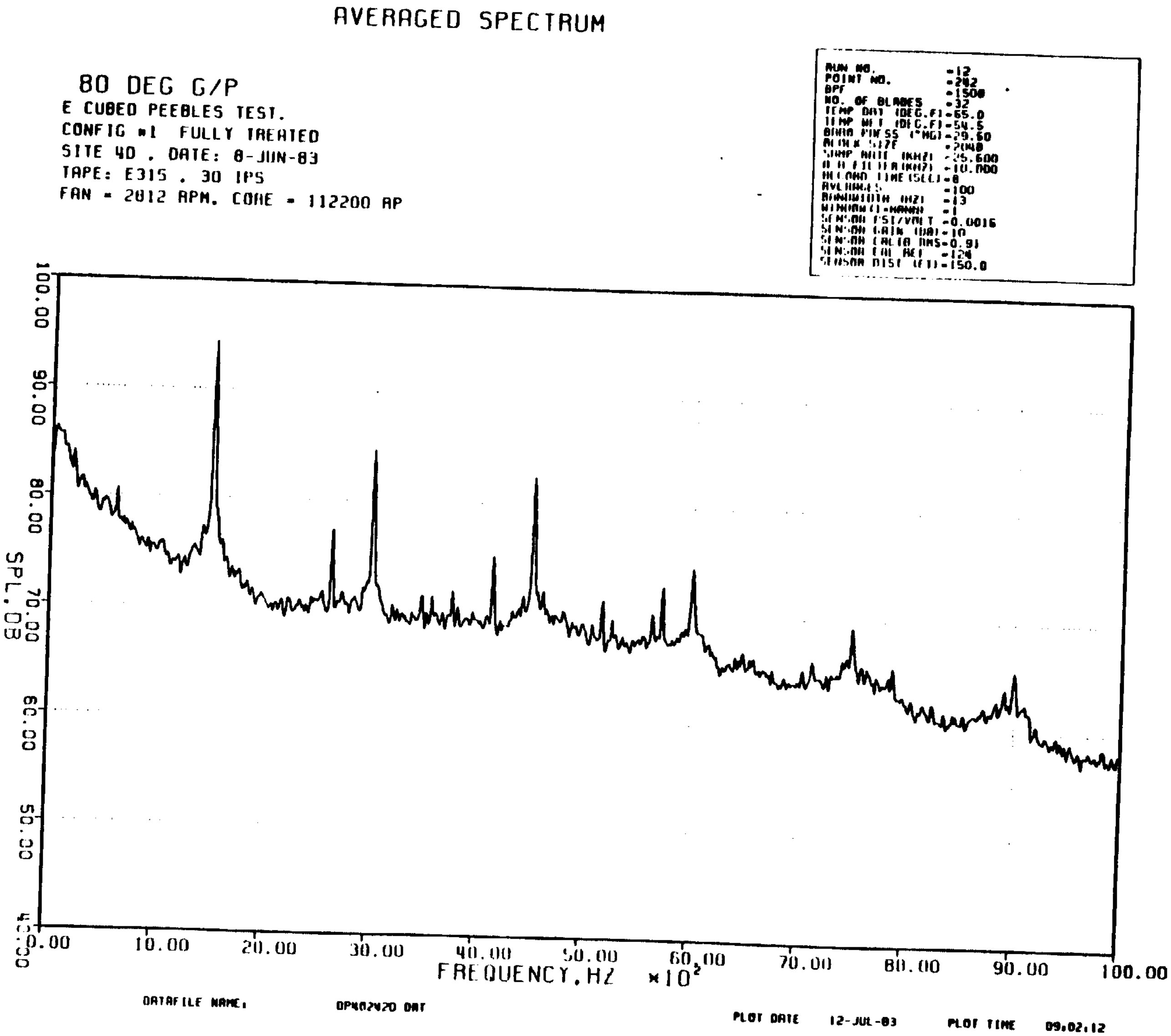
Appendix 9.2.6.h



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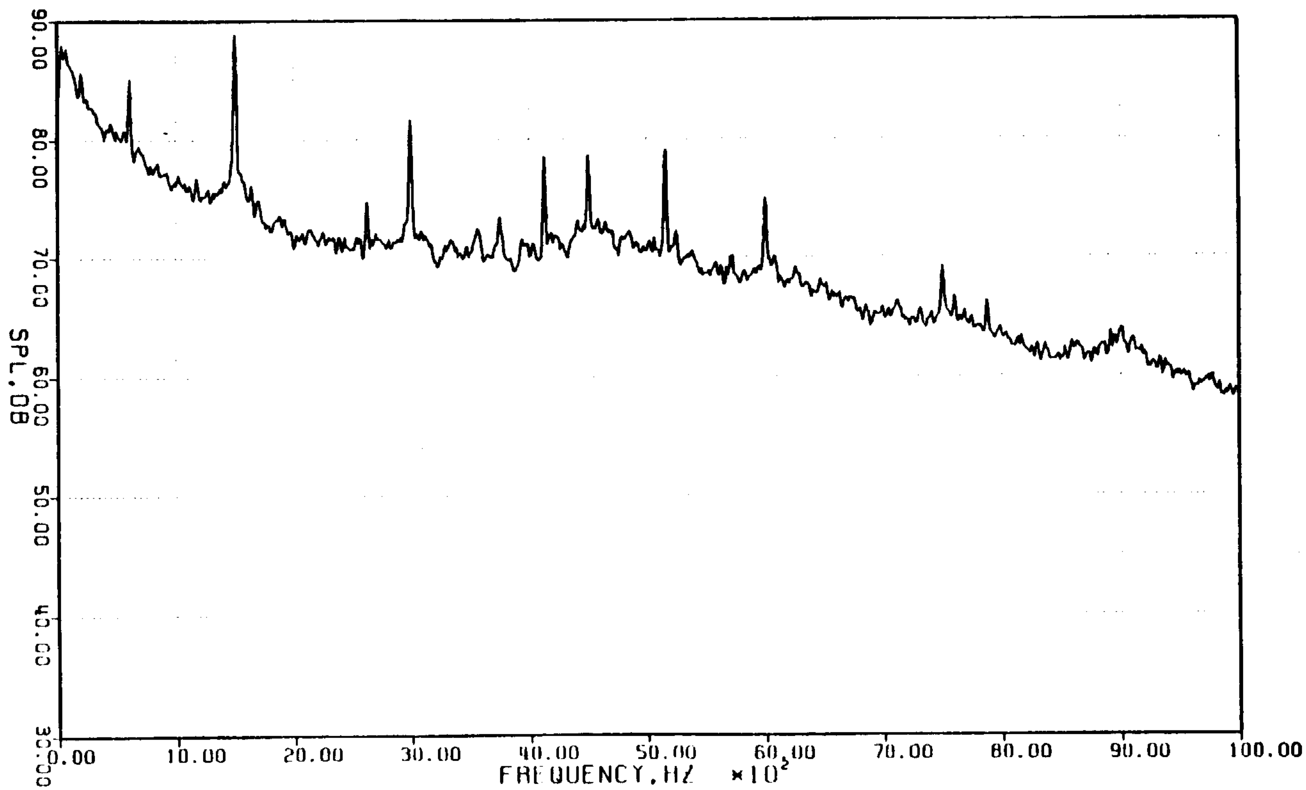
Appendix 9.2.6.i

AVERAGED SPECTRUM

90 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8 JUN-83
TAPE: E315 , 30 IPS
FAN = 2812 RPM, CORE = 112200 RP

RUN NO.	=12
POINT NO.	=242
BPF	=1500
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.93
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME, DPN0242E DAT   PLOT DATE 12-JUL-83   PLOT TIME 09:02:56

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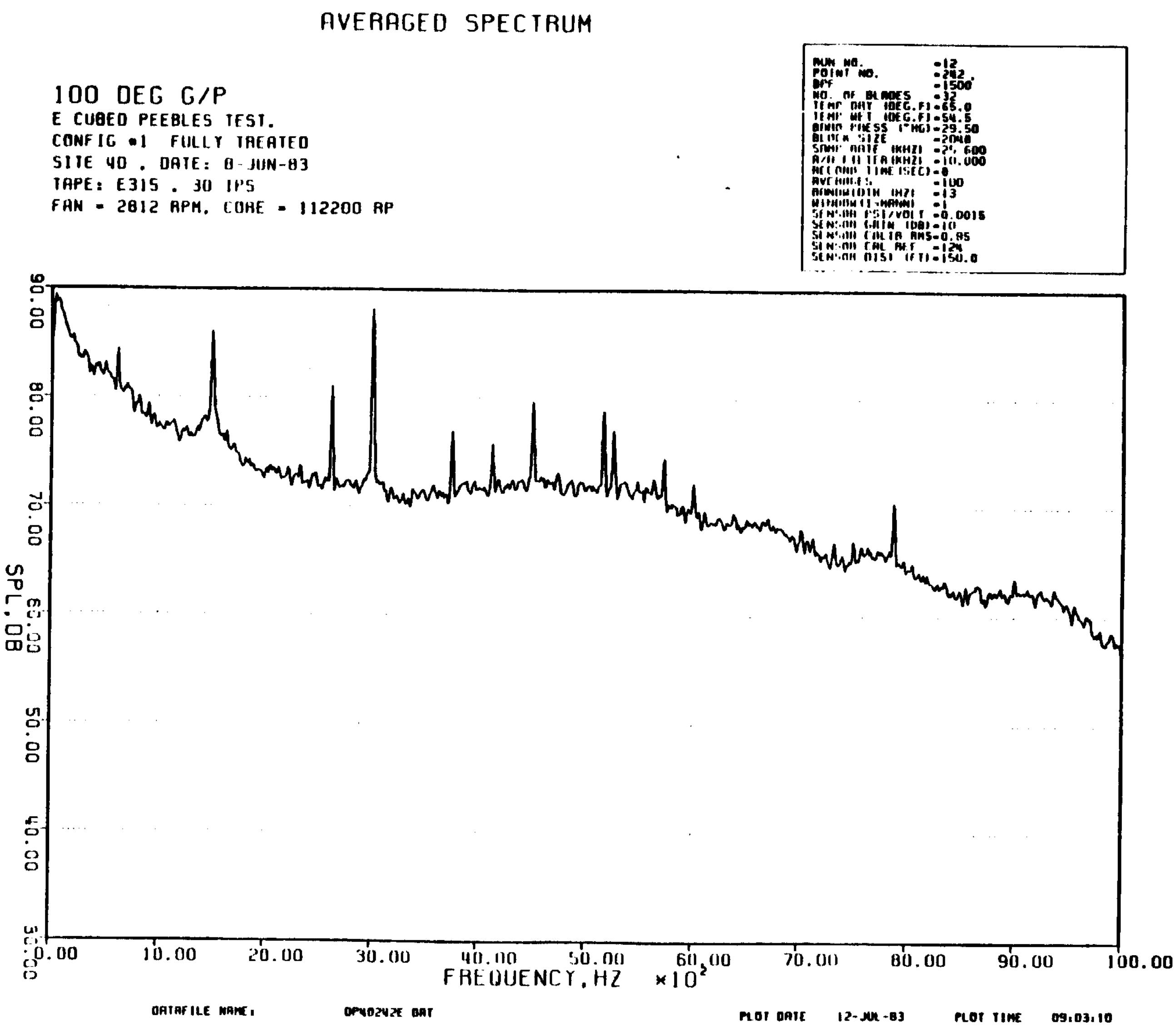
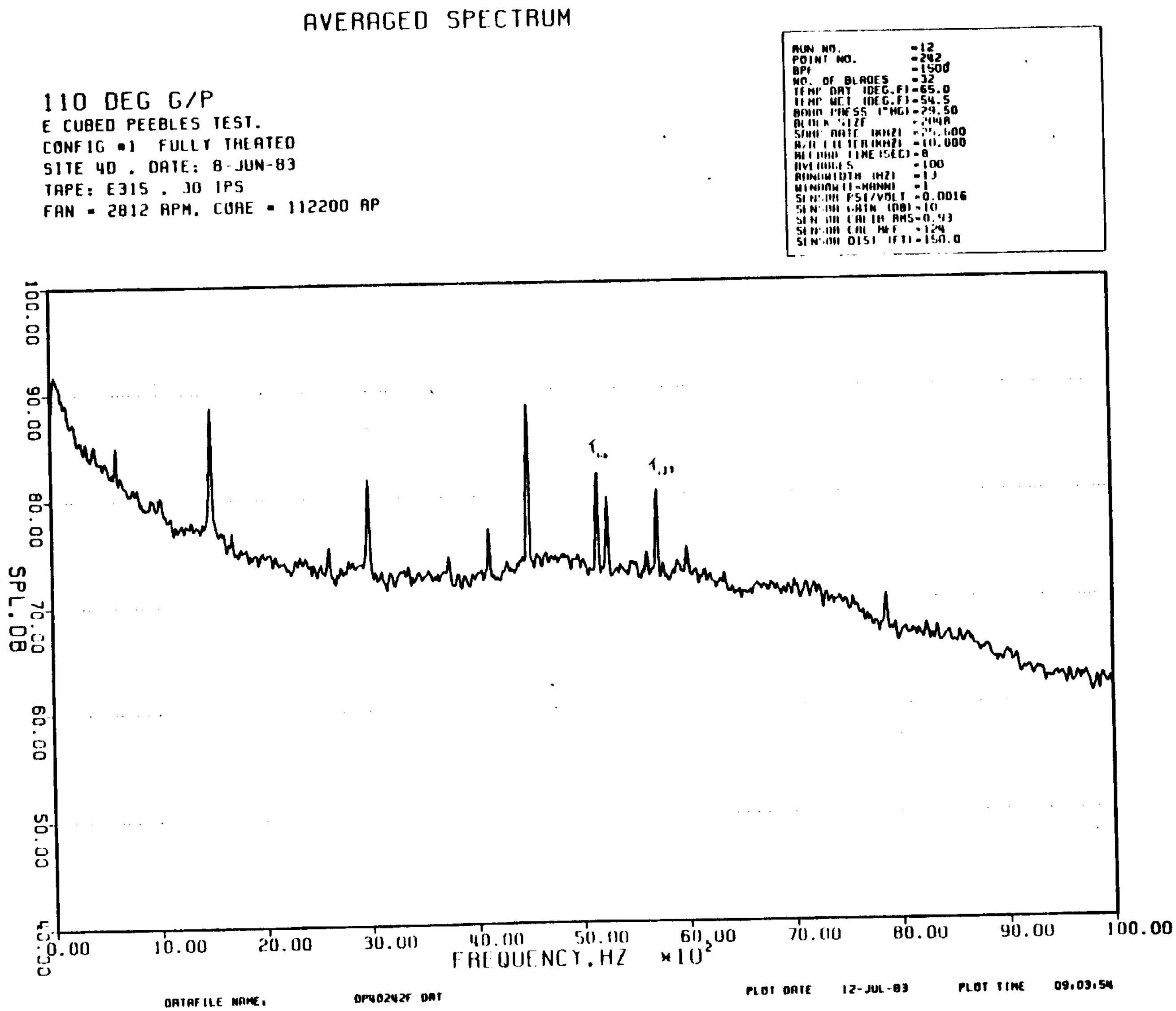
Appendix 9.2.6.j



Appendix 9.2.6.k



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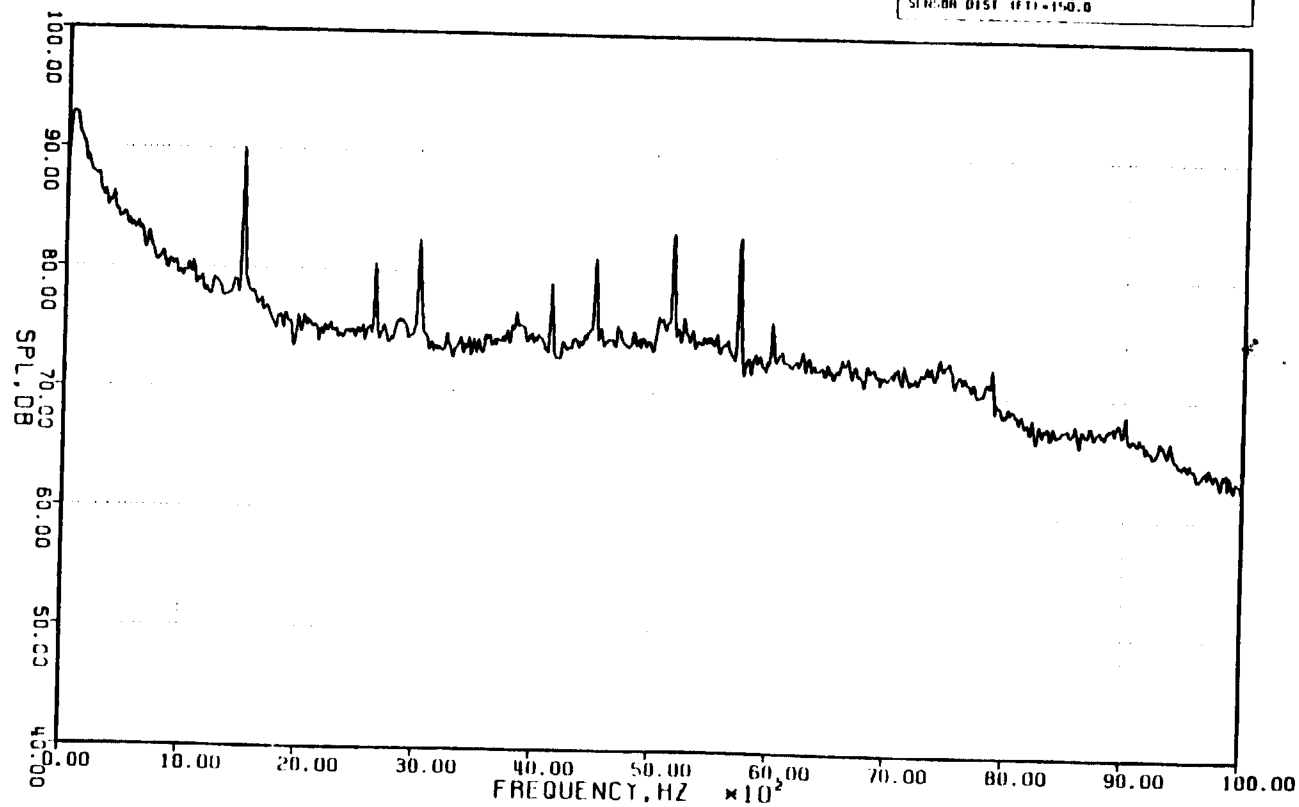
Appendix 9.2.6.1

AVERAGED SPECTRUM

120 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2812 RPM, CORE = 112200 RP

RUN NO.	=12
POINT NO.	=242
BPF	=1500
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.8
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1)=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.92
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP402420F DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:04:08

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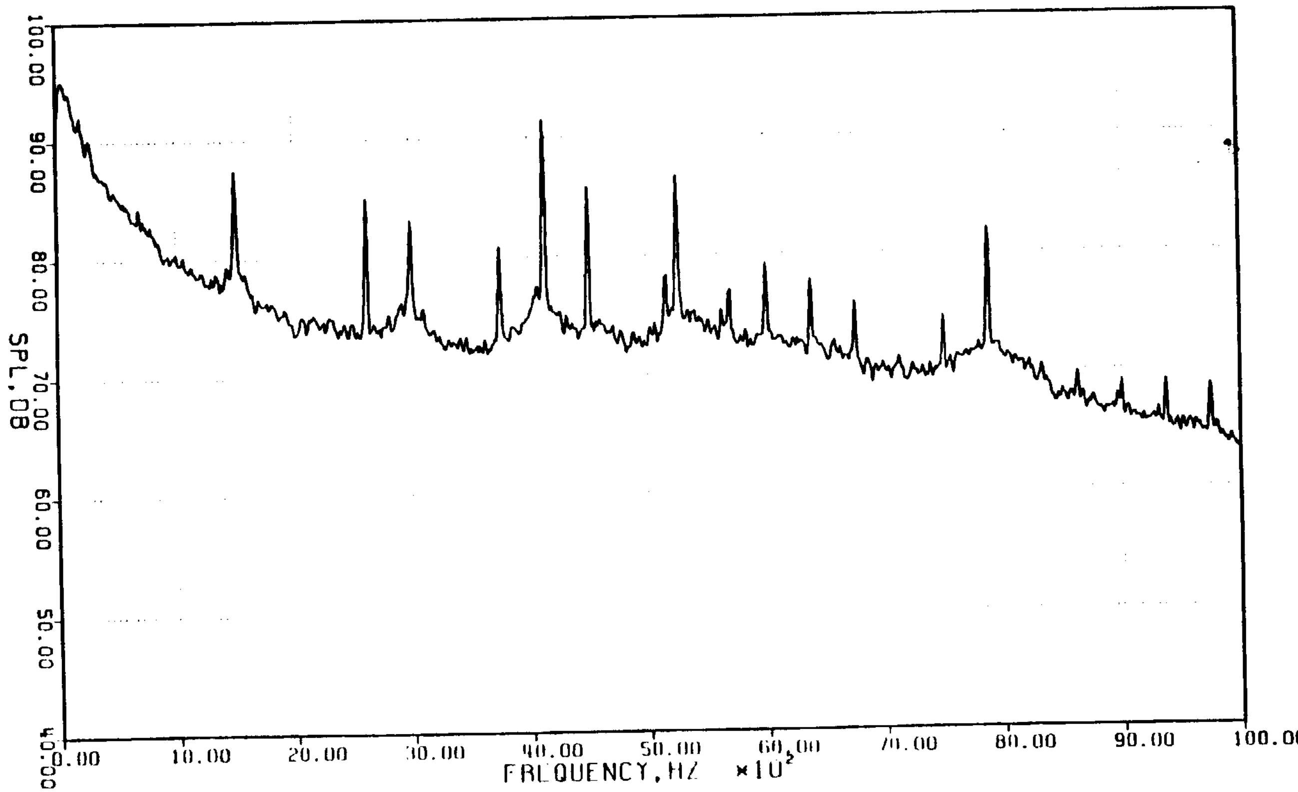
Appendix 9.2.6.m

AVERAGED SPECTRUM

130 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2812 RPM. CORE = 112200 RP

RUN NO. =12
POINT NO. =242
BPF =1500
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
BARO PRESS (\"HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER(KHZ) =10.000
RECORD TIME(SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB)=10
SENSOR CALIB RMS=0.91
SENSOR CAL REF =124
SENSOR DIST (FT)=150.0



DATAFILE NAME: OP402426 DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:04:52

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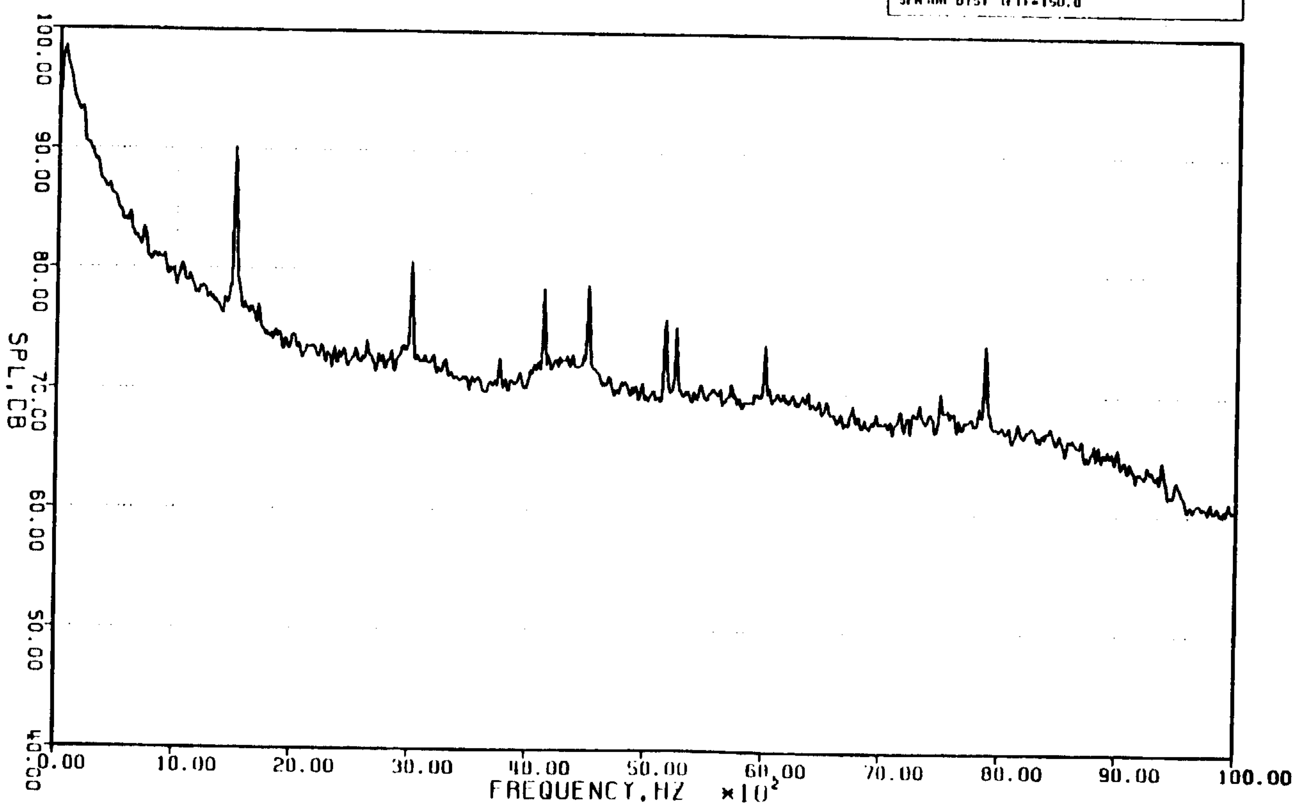
Appendix 9.2.6.n

AVERAGED SPECTRUM

140 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2812 RPM. CORE = 112200 RP

RUN NO.	=12
POINT NO.	=242
BPF	=1500
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
AMBIENT PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=0
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0049
SENSOR GAIN (DB)	=0
SENSOR CALIB RMS	=0.94
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP40242G DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:05:06

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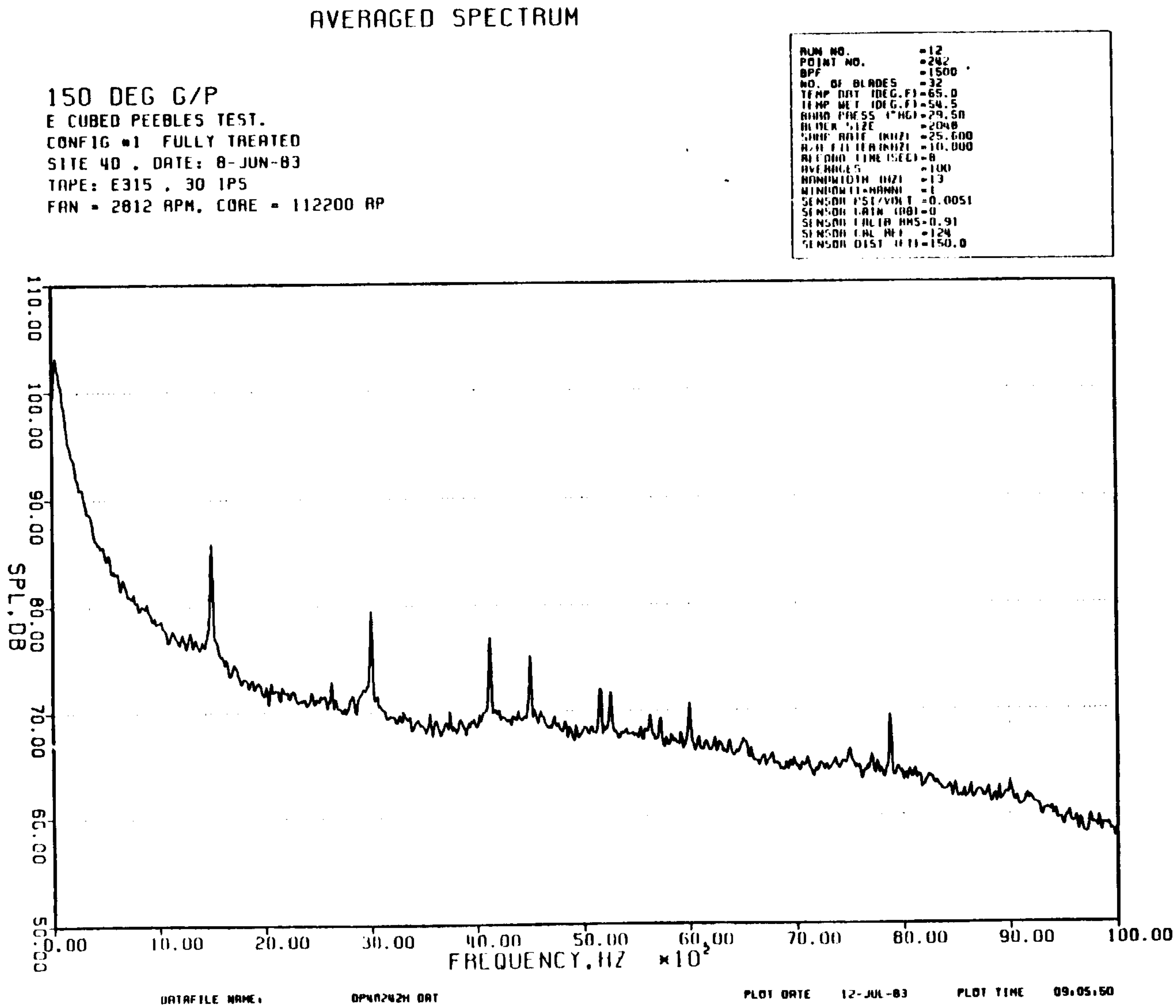
Appendix 9.2.6.o

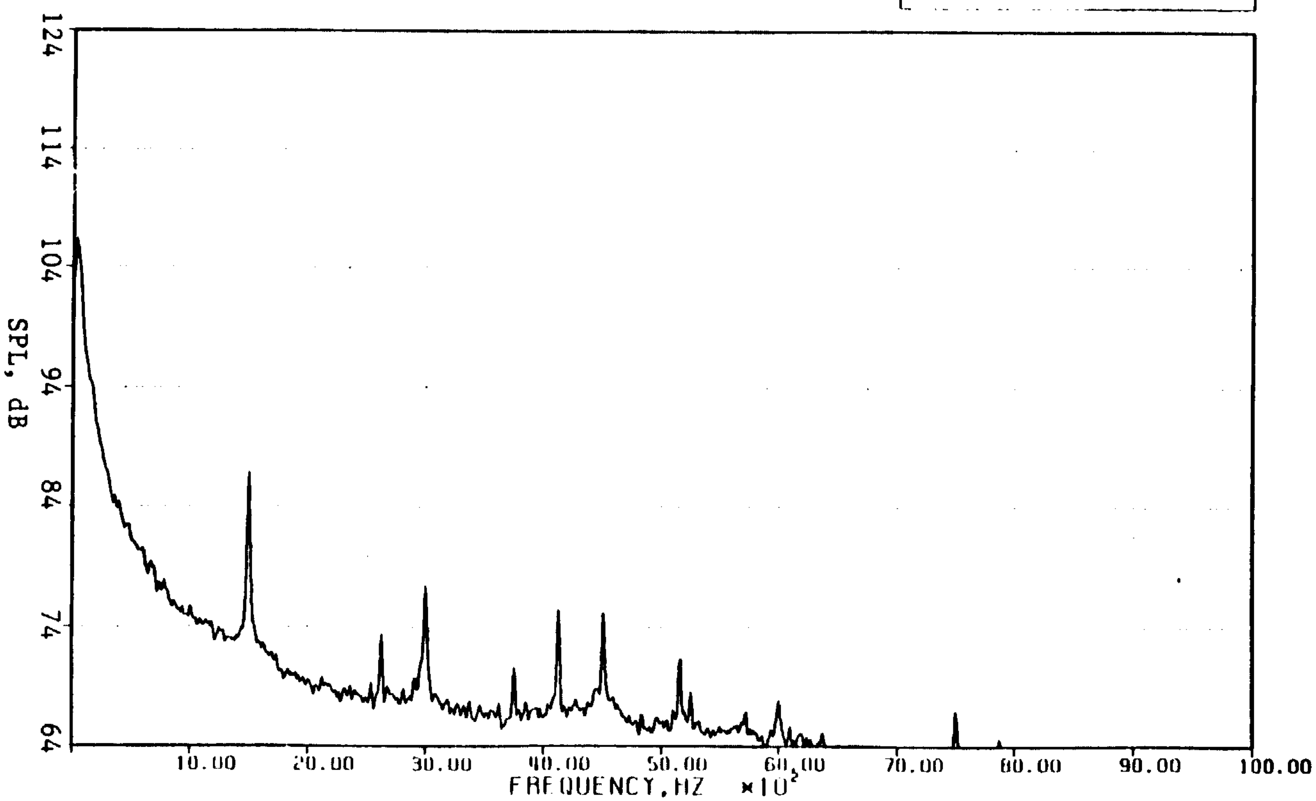


Appendix9.2.6.p

AVERAGED SPECTRUM

160 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2812 RPM, CORE = 11220D RP

RUN NO. =12
POINT NO. =242
BPF =1500
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS (" HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A.A. FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW =1
SENSOR (SI/VOLT) =0.0000
SENSOR GAIN (DB) =0
SENSOR CALIB RMS =0.89
SENSOR CAL NET =0
SENSOR DIST (FT) =150.0



DATAFILE NAME: DP40242H DAT
PLOT DATE 12-JUL-83
PLOT TIME 09:06:03

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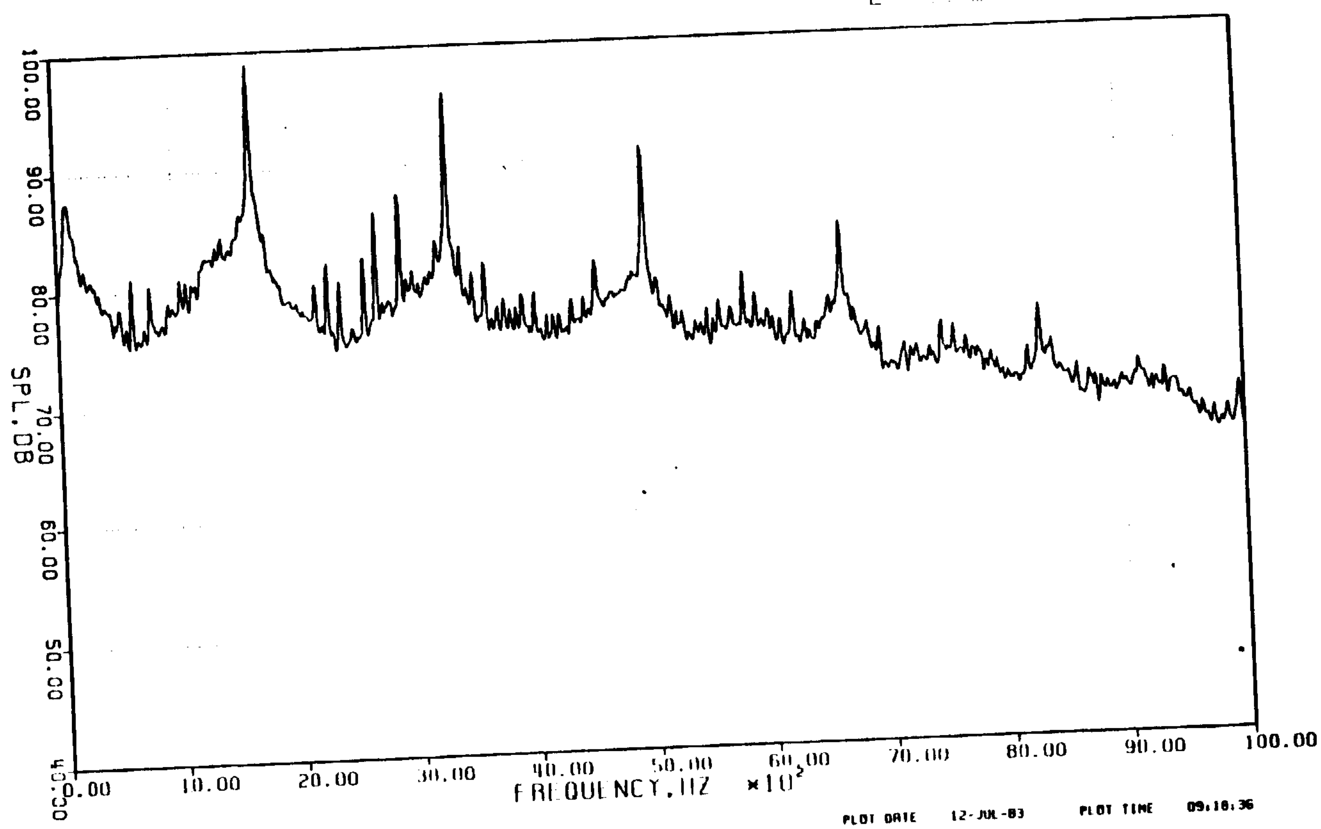
Appendix 9.2.7.a

AVERAGED SPECTRUM

10 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM. COR =FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.90
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



PLOT DATE 12-JUL-83 PLOT TIME 09:18:36

DATAFILE NAME: DP4D243A DAT

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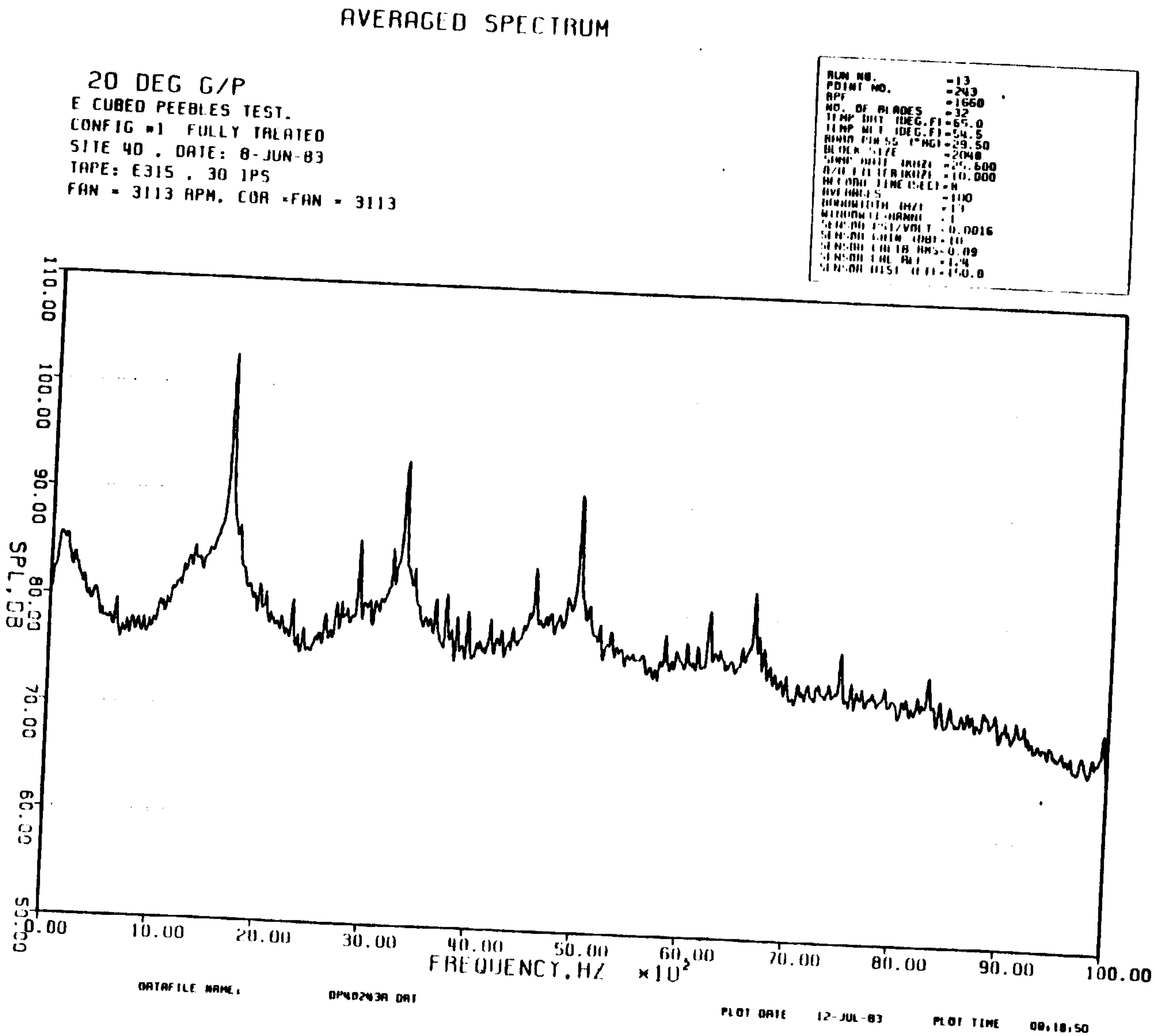
Appendix 9.2.7.b



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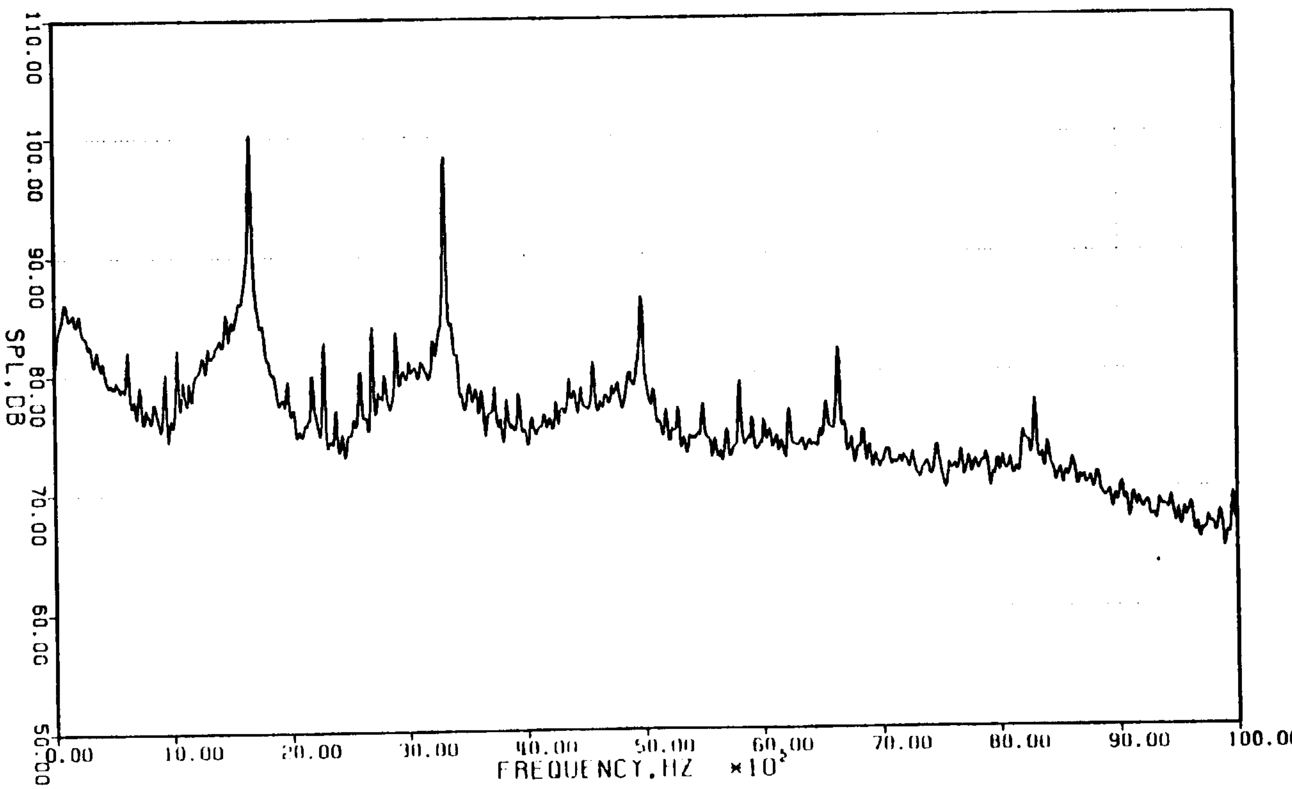
Appendix 9.2.7.c

AVERAGED SPECTRUM

30 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO.	=13
POINT NO.	=243
RPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
AMB PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=[illegible]
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=[illegible]
WINDOW (1-HANN)	=1
SENSOR (PSI/VOLT)	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.90
SENSOR CAL REF	=1.4
SENSOR DIST (FT)	=[illegible]



DATAFILE NAME: DP402438 DAT

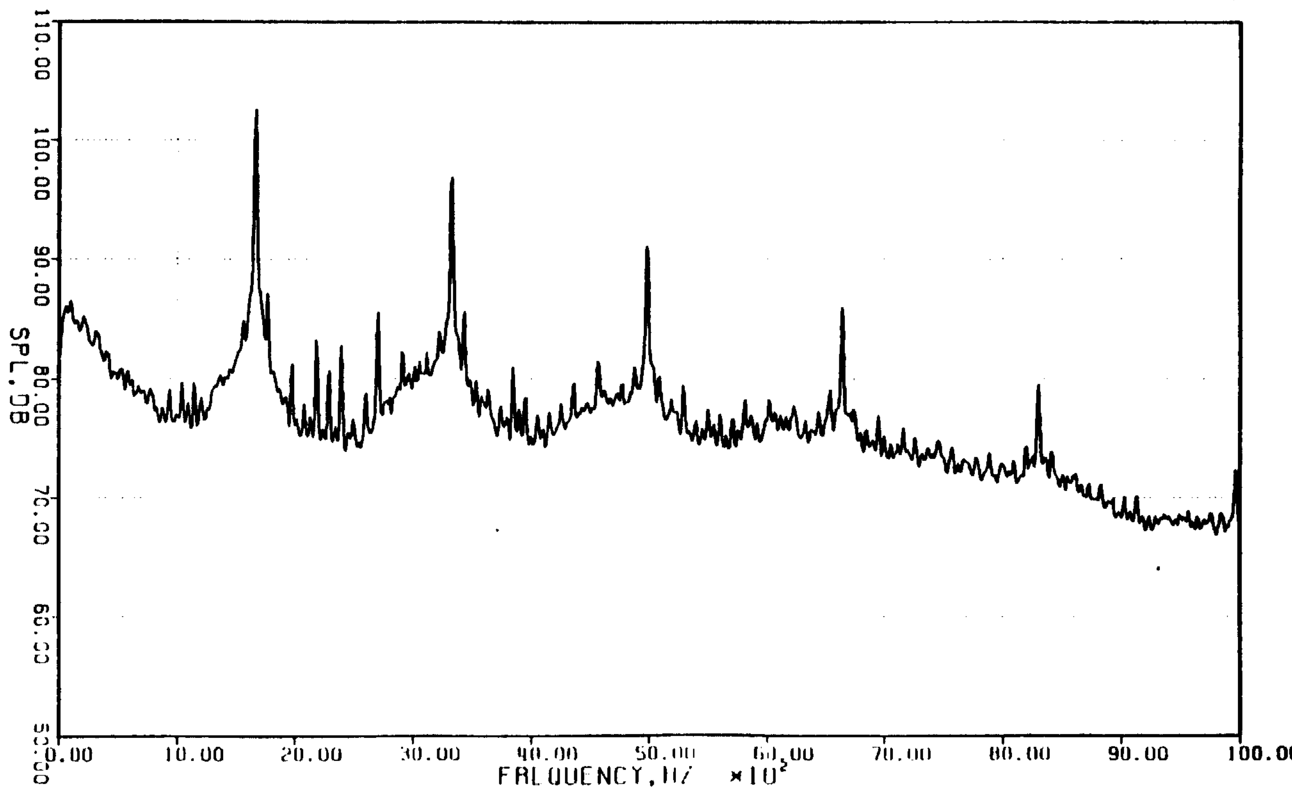
PLOT DATE 12-JUL-83 PLOT TIME 09:19:34

Appendix 9.2.7.d

AVERAGED SPECTRUM

40 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPI =1660
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A.A. FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR ESI/VOLT =0.0016
SENSOR GAIN (DB) =10
SENSOR CALIB RMS =0.93
SENSOR CAL REF =124
SENSOR DIST (FT)=150.0



DATAFILE NAME: DP402430 DAT PLOT DATE 12-JUL-83 PLOT TIME 09:19:48

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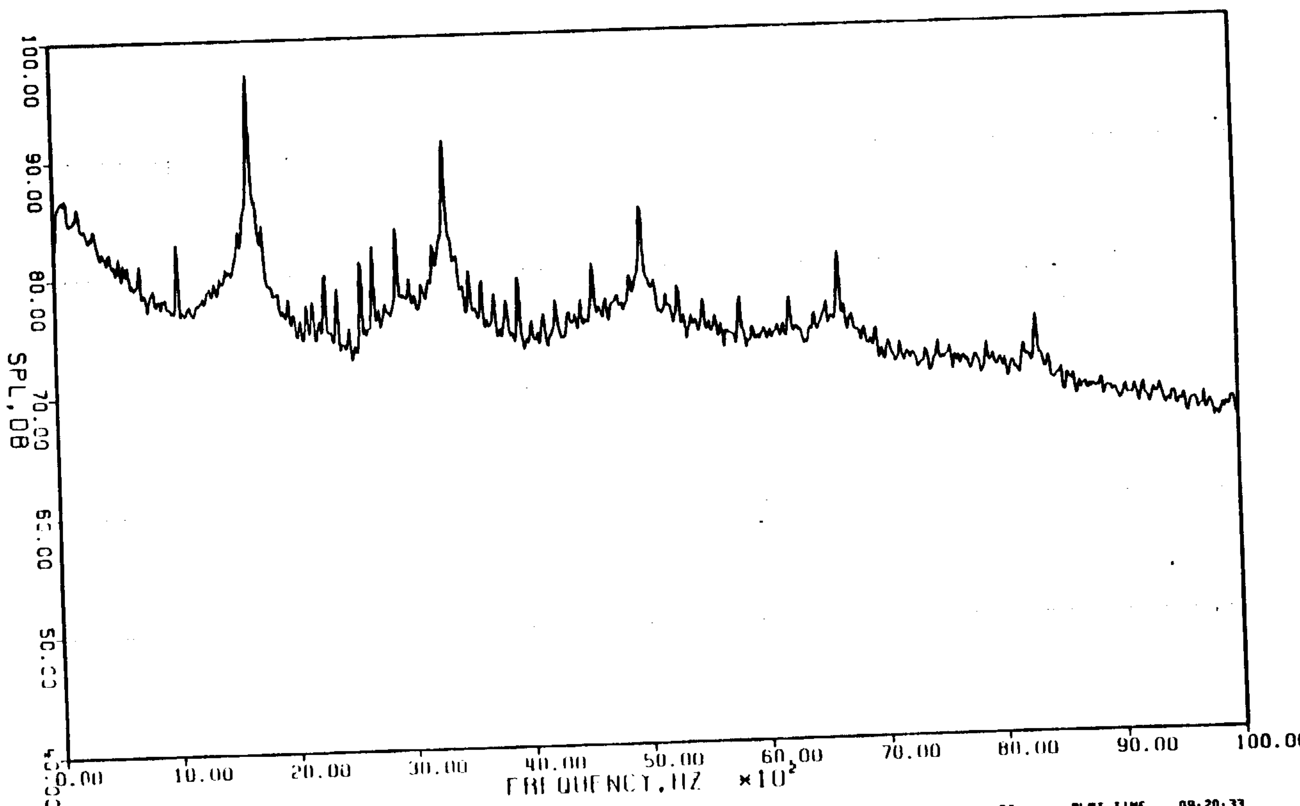
Appendix 9.2.7.e

AVERAGED SPECTRUM

50 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM. COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.0
TEMP WET (DEG.F)=54.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER (KHZ) =10.000
RECORD TIME (SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1-HANN) =1
SENSOR (PSI/VOLT) =0.0016
SENSOR GAIN (DB)=10
SENSOR CALIB RMS=0.93
SENSOR CAL REF =1.24
SENSOR DIST (FT)=150.0



DATAFILE NAME: DP40243C DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:20:33

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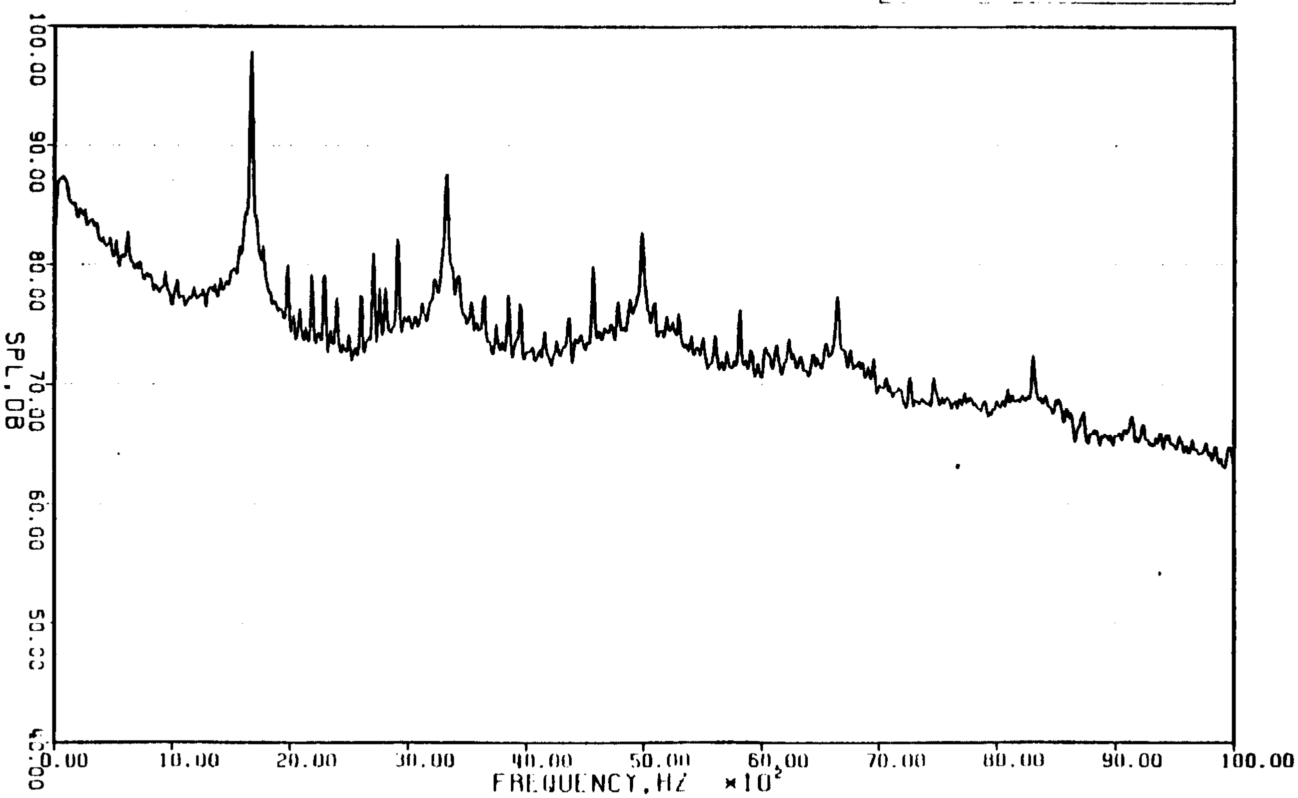
Appendix 9.2.7.f

AVERAGED SPECTRUM

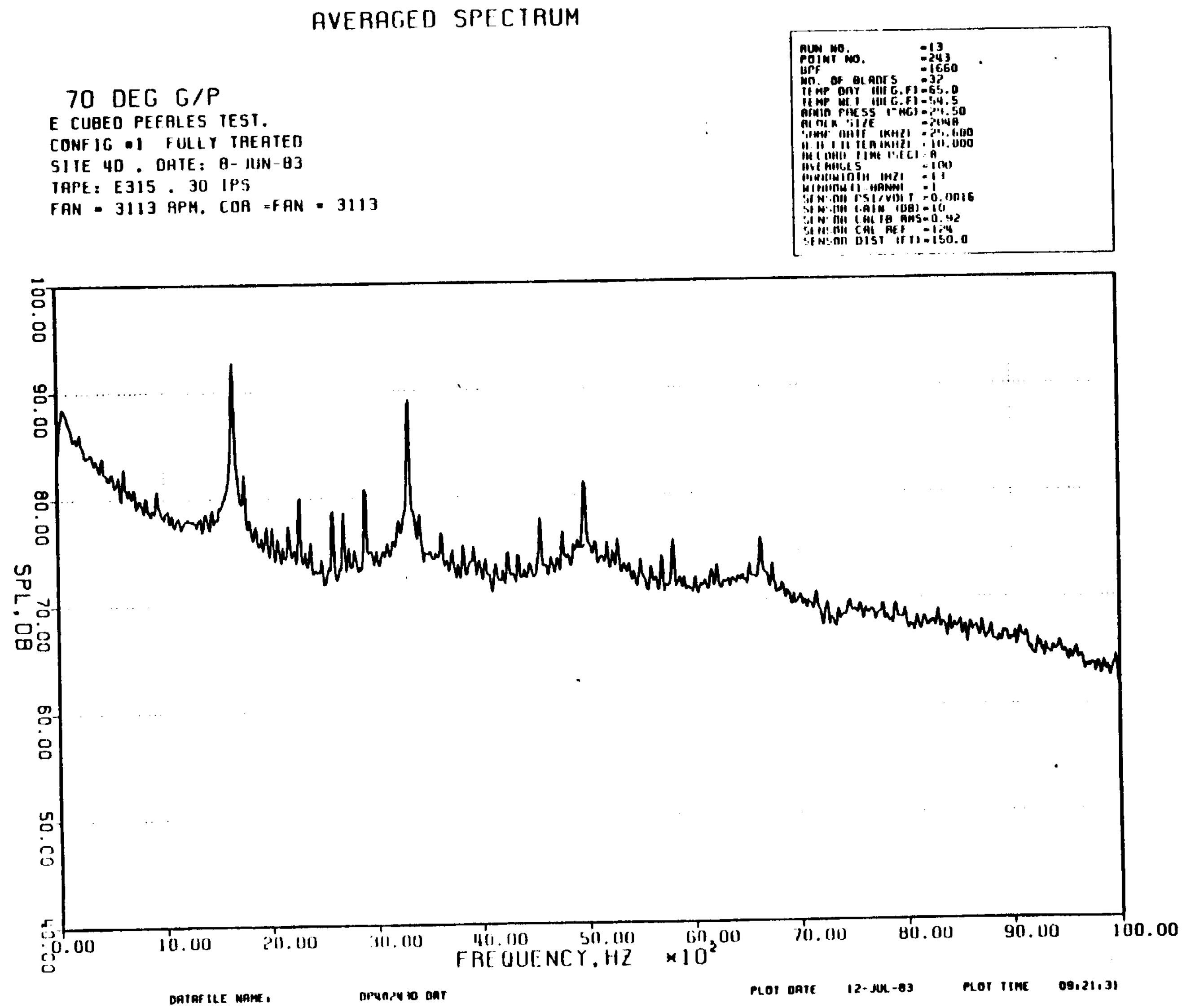
60 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM. COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
AMB PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A-A FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1-HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB) =10
SENSOR CAL (D RMS =0.91
SENSOR CAL REF =124
SENSOR DIST (FT) =150.0



DATAFILE NAME: DP40243C DAT   PLOT DATE 12-JUL-83   PLOT TIME 09:20:46

Appendix 9.2.7.g

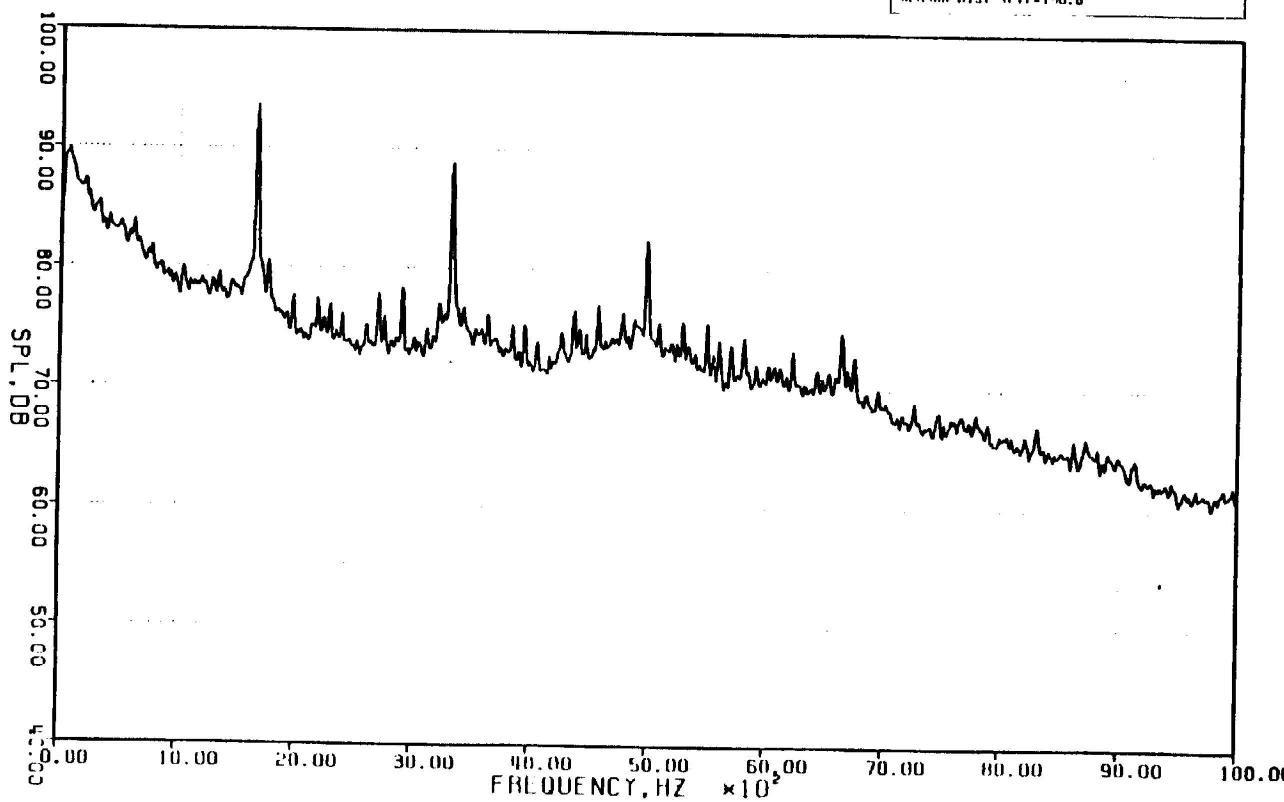


Appendix 9.2.7.h

AVERAGED SPECTRUM

80 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4O , DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS (" HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CAL IN RMS	=0.91
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP402430 DAT

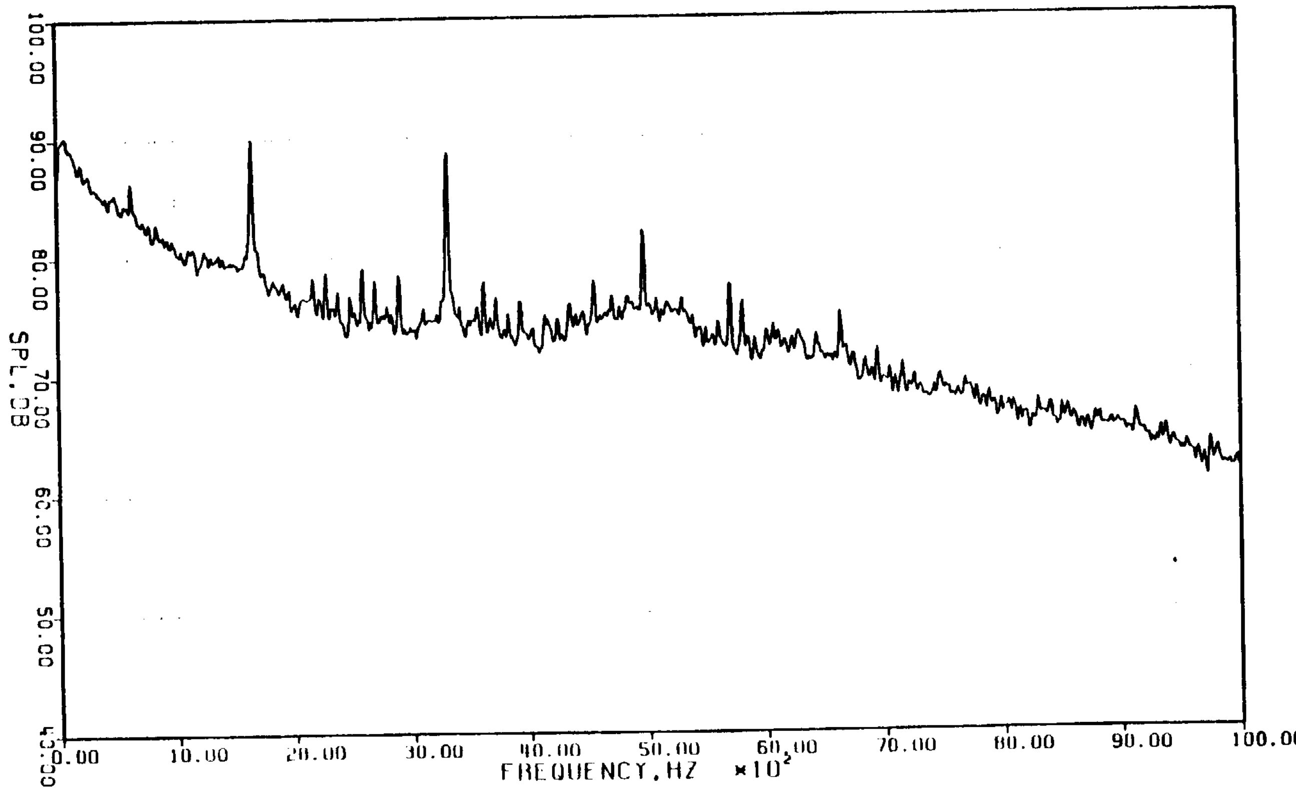
PLOT DATE 12-JUL-83 PLOT TIME 09:21:44

Appendix 9.2.7.i

AVERAGED SPECTRUM

90 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
AMB PRESS (" HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =11
WINDOW (1=HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB) =10
SENSOR CAL TO RMS =0.93
SENSOR CAL REF =124
SENSOR DIST (FT) =150.0



DATAFILE NAME: DP40243E DAT PLOT DATE 12-JUL-83 PLOT TIME 09:22:29

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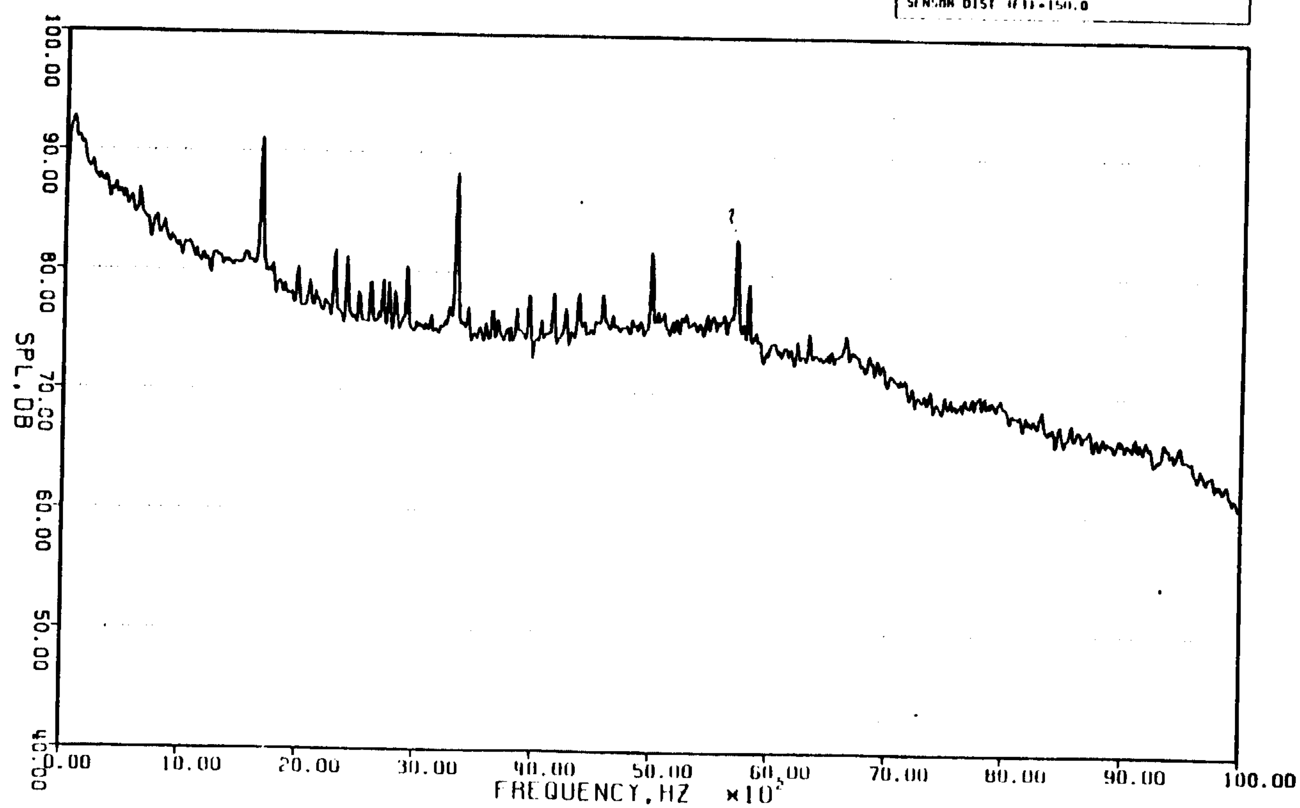
Appendix 9.2.7.j

AVERAGED SPECTRUM

100 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR -FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER(KHZ) =10.000
RECORD TIME(SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0015
SENSOR GAIN (DB) =10
SENSOR CALIB RMS =0.95
SENSOR CAL REF =124
SENSOR DIST (FT) =150.0



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PLOT DATE 12-JUL-83
PLOT TIME 09:22:42

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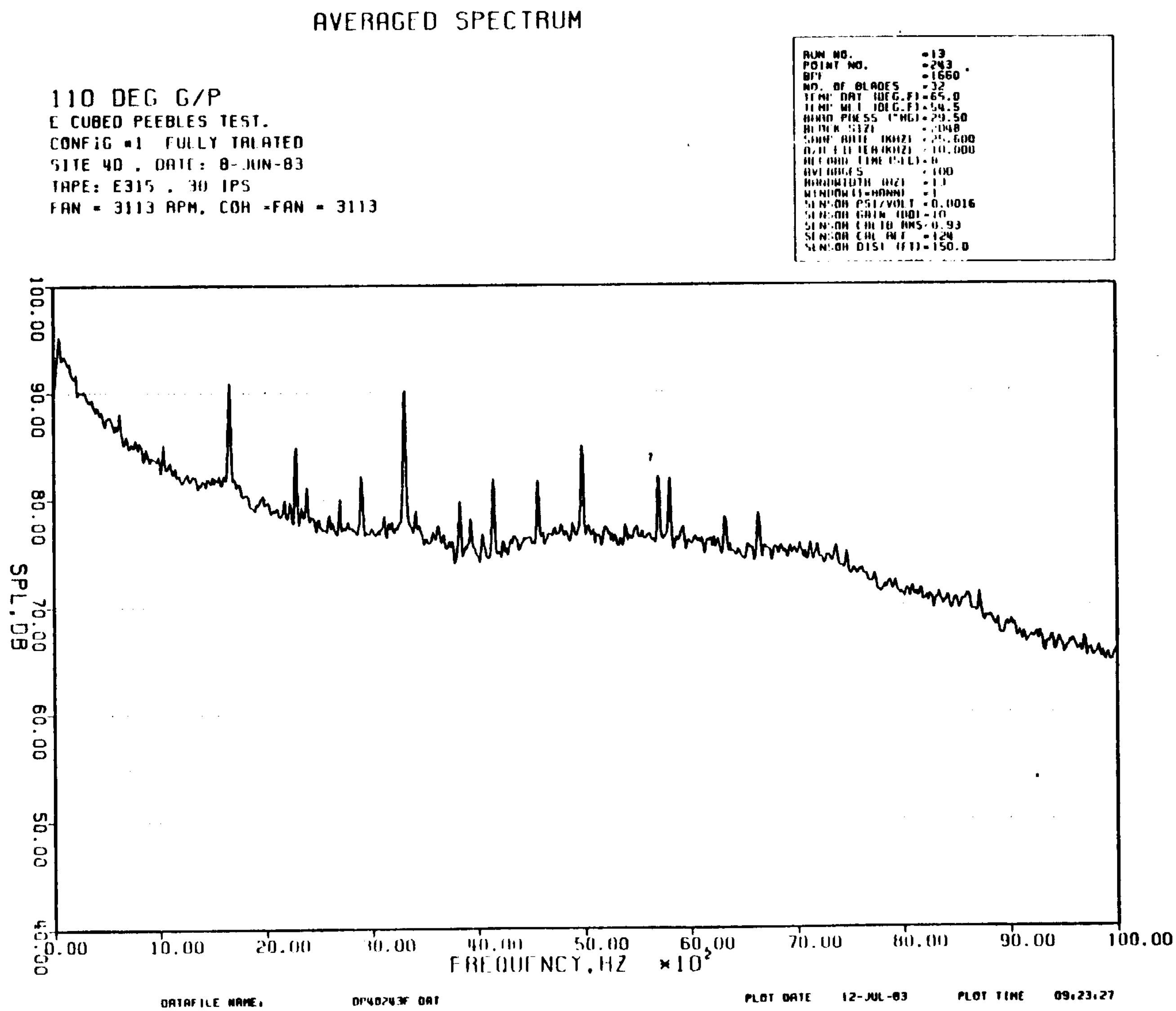
Appendix 9.2.7.k



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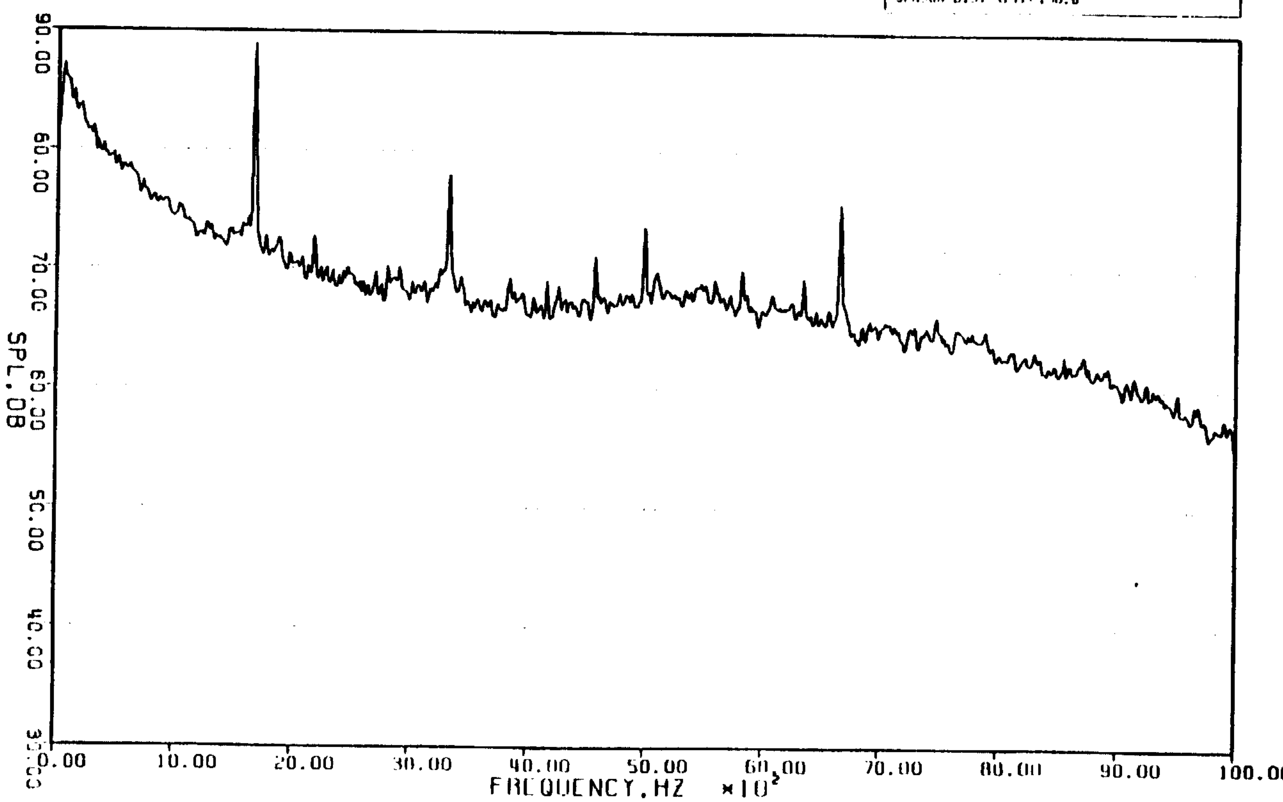
Appendix 9.2.7.1

AVERAGED SPECTRUM

120 DEG G/P
E CUBED PEBBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO. =13
POINT NO. =243.
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
AMB PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A.A. FILTER (KHZ) 10.000
RECORD TIME (SEC) 8
AVERAGES 100
BANDWIDTH (HZ) =12
WINDOW(1=HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB) =10
SENSOR CAL (A RMS) =0.92
SENSOR CAL REF =124
SENSOR DIST (FT) =150.0



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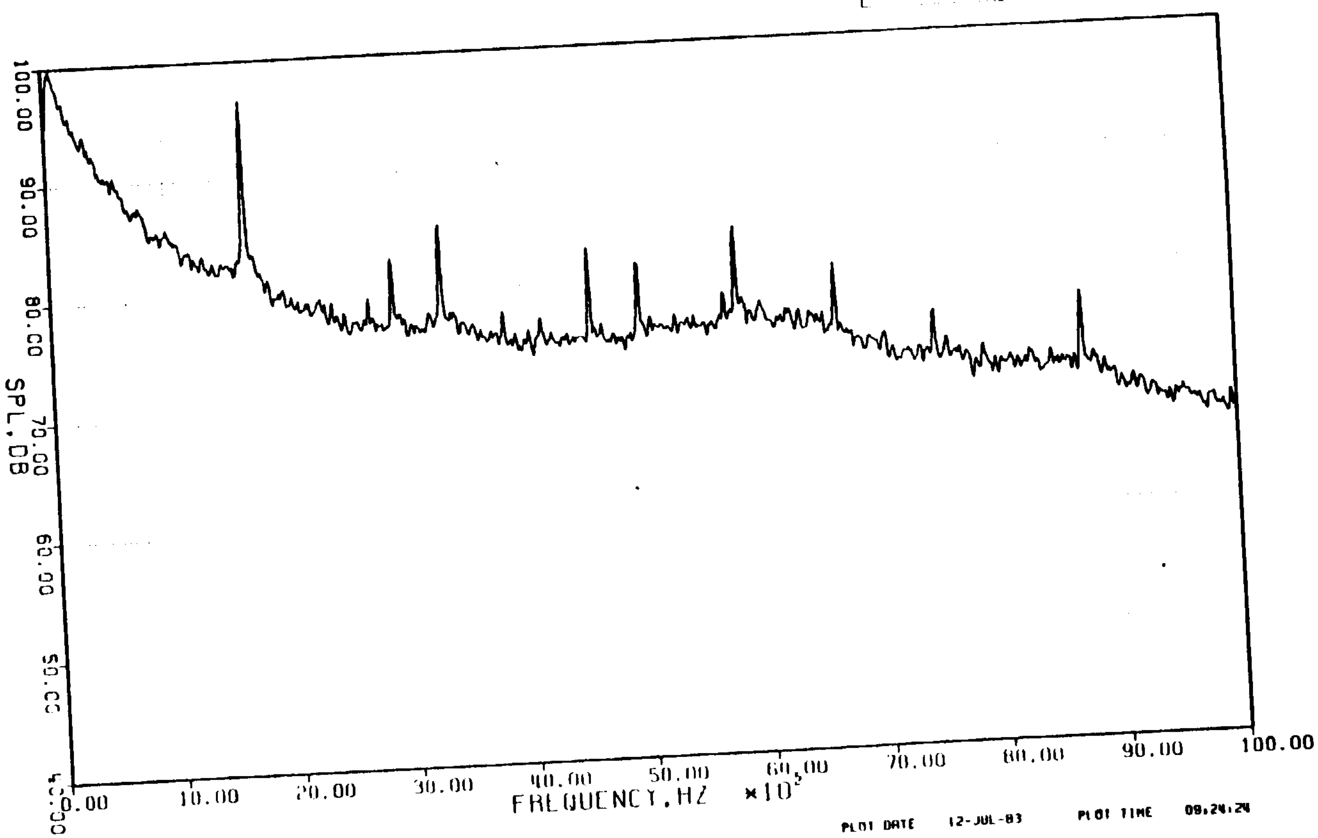
Appendix 9.2.7.m

AVERAGED SPECTRUM

130 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO. =13
POINT NO. =243
RPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A-A FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1-HANN) =1
SENSOR PSI/VOLT =0.0051
SENSOR GAIN (DB) =0
SENSOR CALIB RMS=0.41
SENSOR CAL REF =1.94
SENSOR DIST (FT)=150.0



PLOT DATE 12-JUL-83 PLOT TIME 09:24:24

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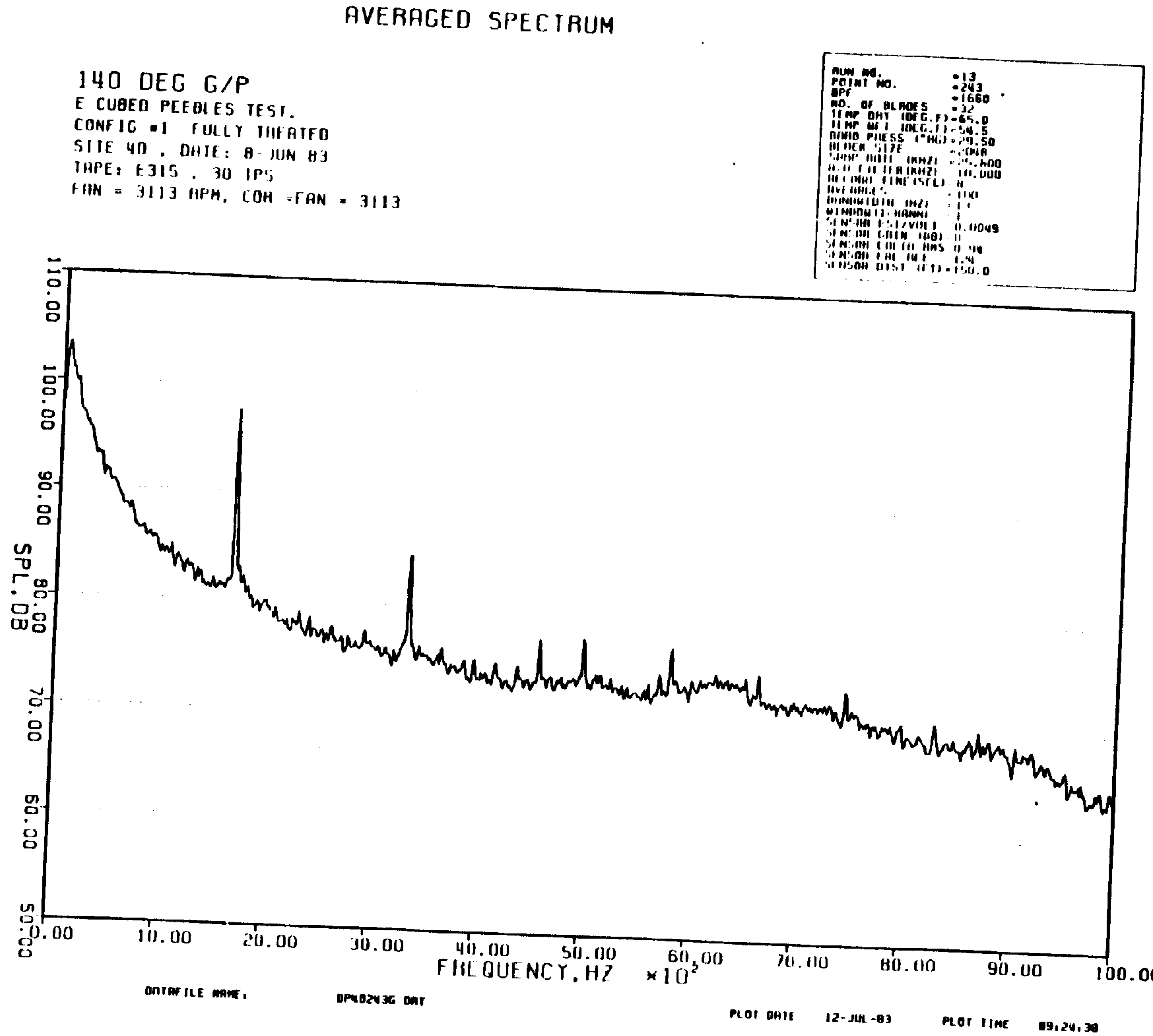
Appendix 9.2.7.n



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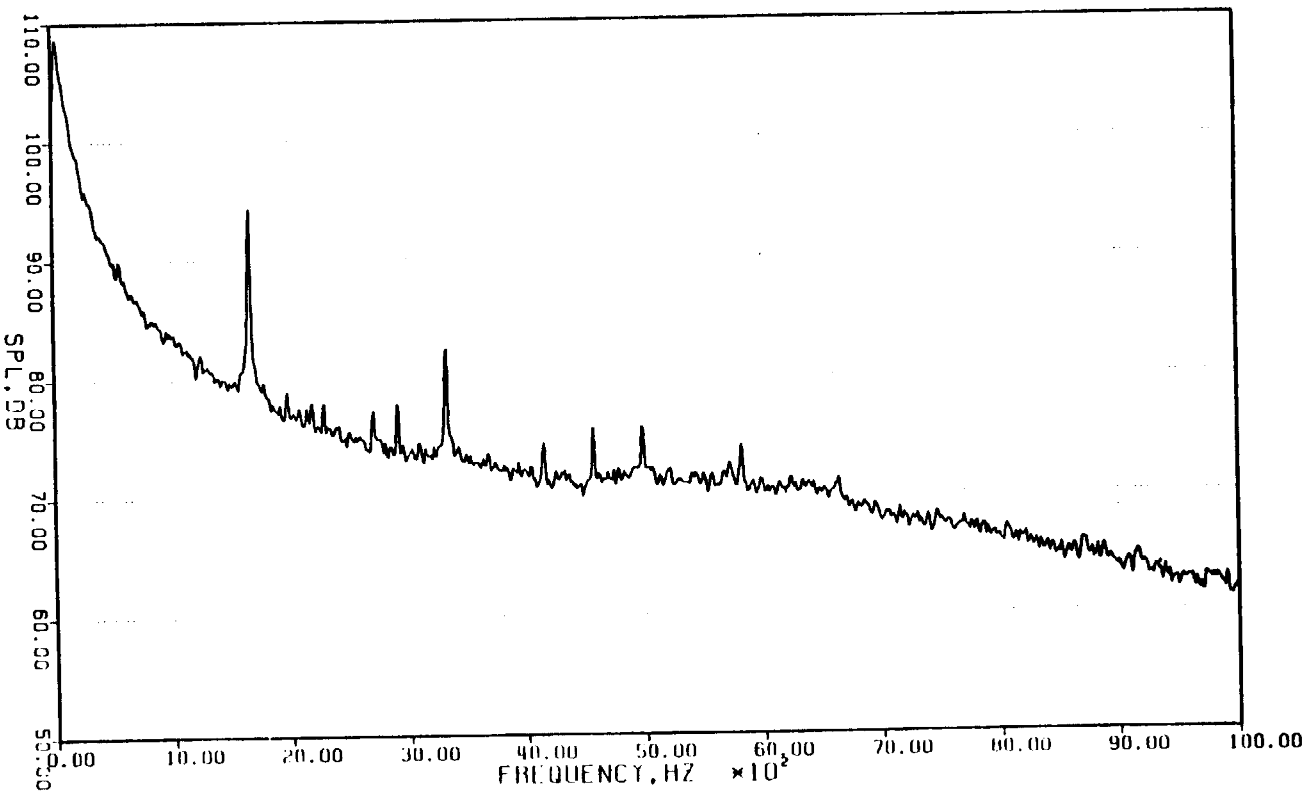
Appendix 9.2.7.o

AVERAGED SPECTRUM

150 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN 83
TAPE: E315 . 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP OUT (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A.A FILTER (KHZ) =10.000
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1=HANN) =1
SENSOR PSI/VOLT =0.0051
SENSOR GAIN (DB) =0
SENSOR CALIB RMS =0.91
SENSOR DIST (FT) =150.0



DATAFILE NAME: DP402434 DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:25:22

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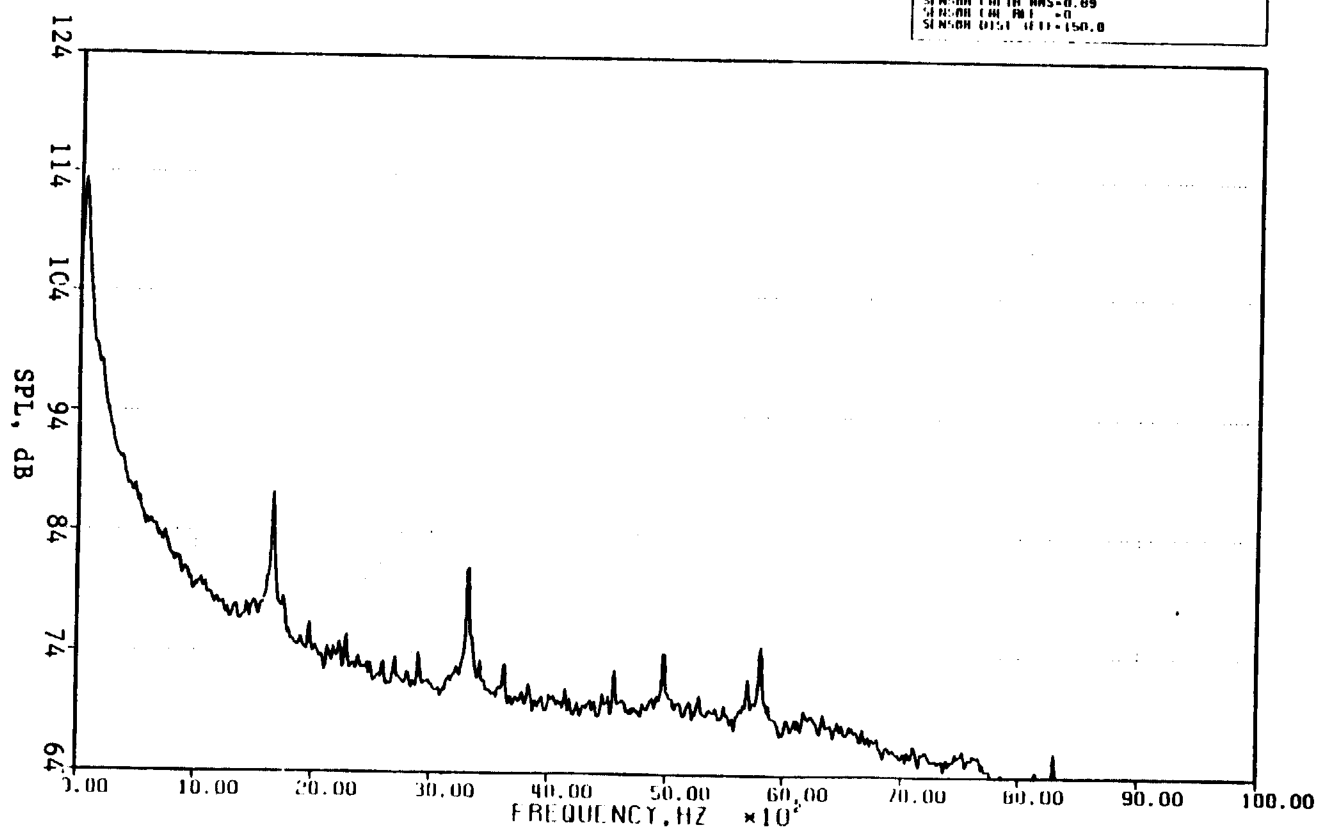
Appendix 9.2.7.p

AVERAGED SPECTRUM

160 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.6
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=0
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR (SI/VOLT)	=0.0000
SENSOR GAIN (DB)	=0
SENSOR CALIB RMS	=0.89
SENSOR CAL ALT	=0
SENSOR DIST (FT)	=150.0



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PLOT DATE 12-JUL-83 PLOT TIME 09:25:36

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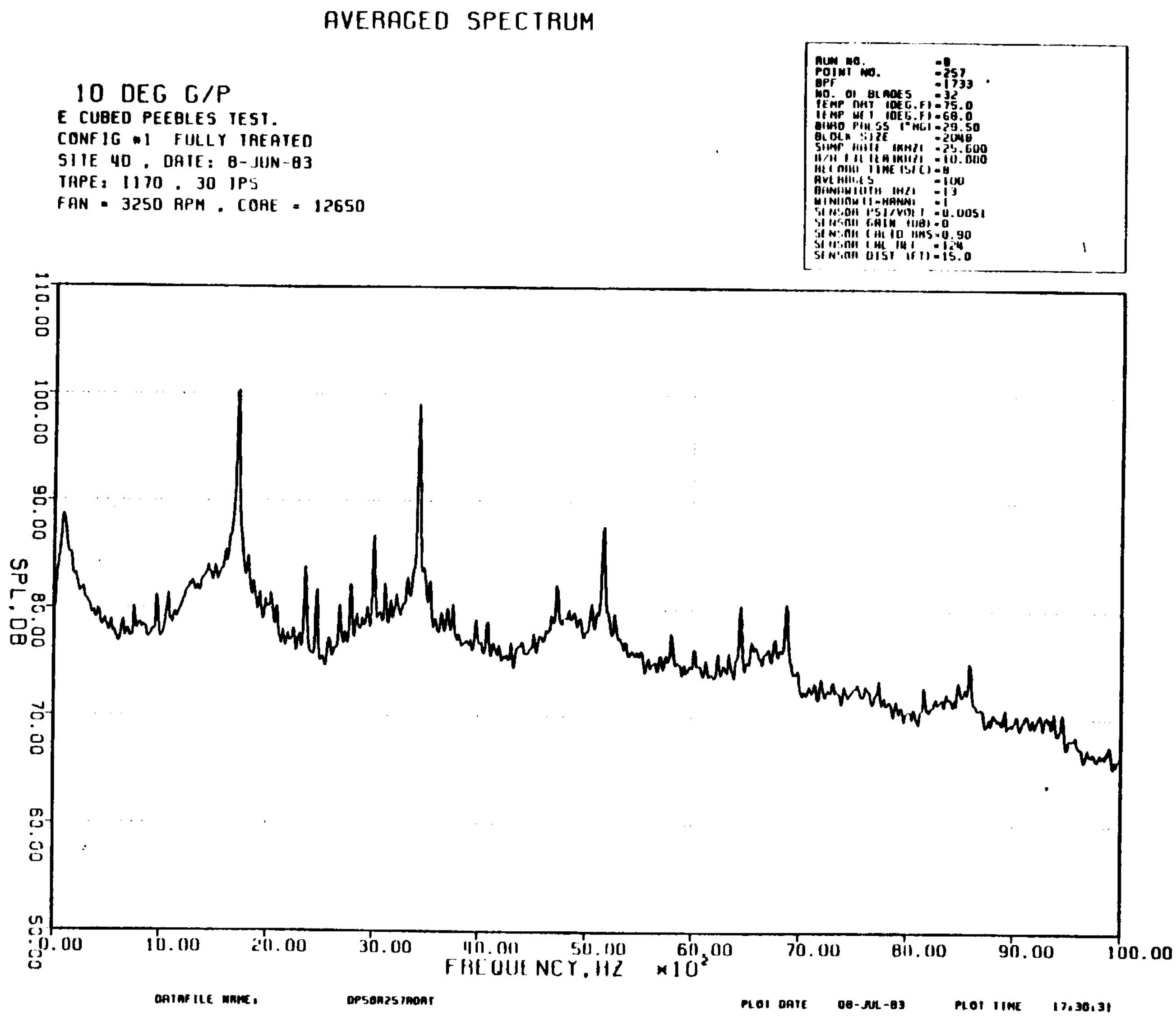
Appendix 9.2.8.a



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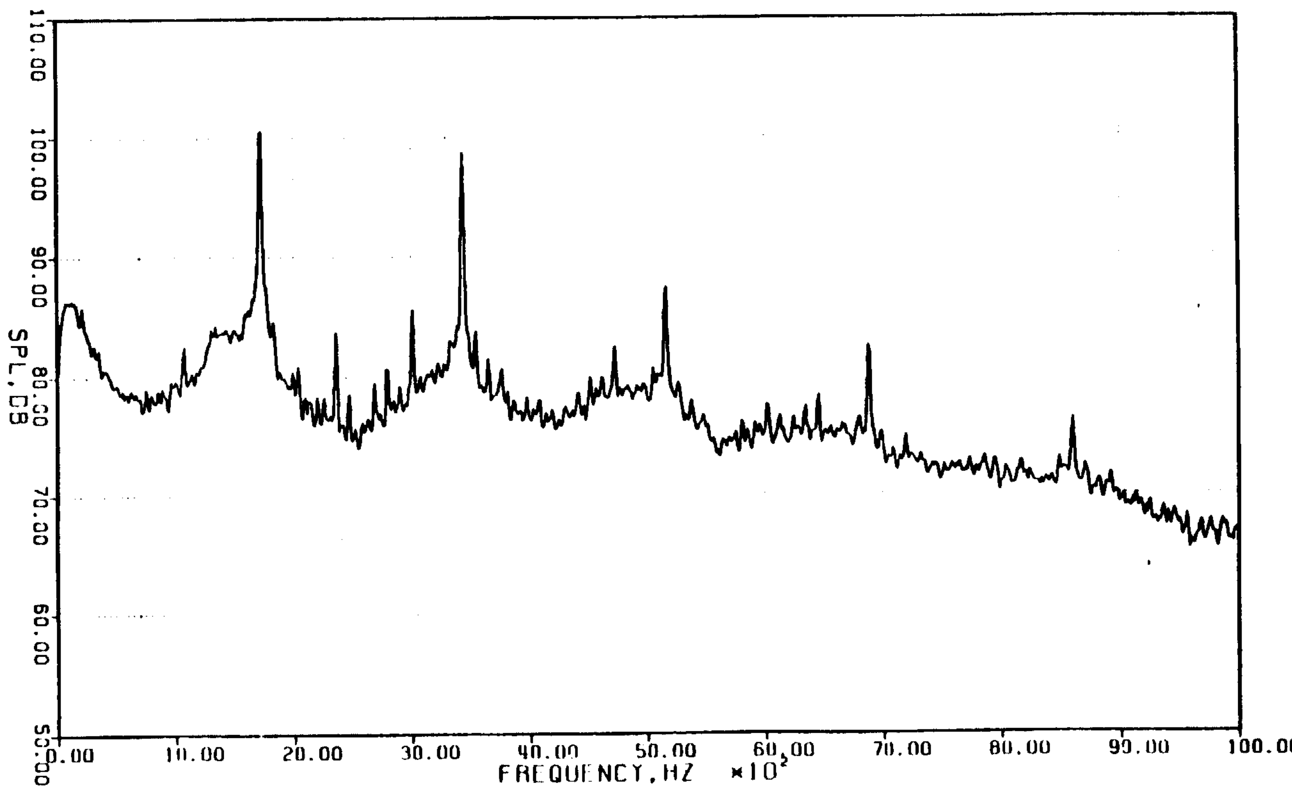
Appendix 9.2.8.b

AVERAGED SPECTRUM

20 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: 1170 , 30 IPS
FAN = 3250 RPM , CORE = 12650

RUN NO.	=8
POINT NO.	=257
BPF	=1733
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=75.0
TEMP WET (DEG.F)	=68.0
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0052
SENSOR GAIN (DB)	=0
SENSOR CAL 1B RMS	=0.89
SENSOR CAL ALT	=124
SENSOR DIST (FT)	=15.0



DATAFILE NAME: OPS8A257ADAT PLOT DATE 08-JUL-83 PLOT TIME 17:38:44

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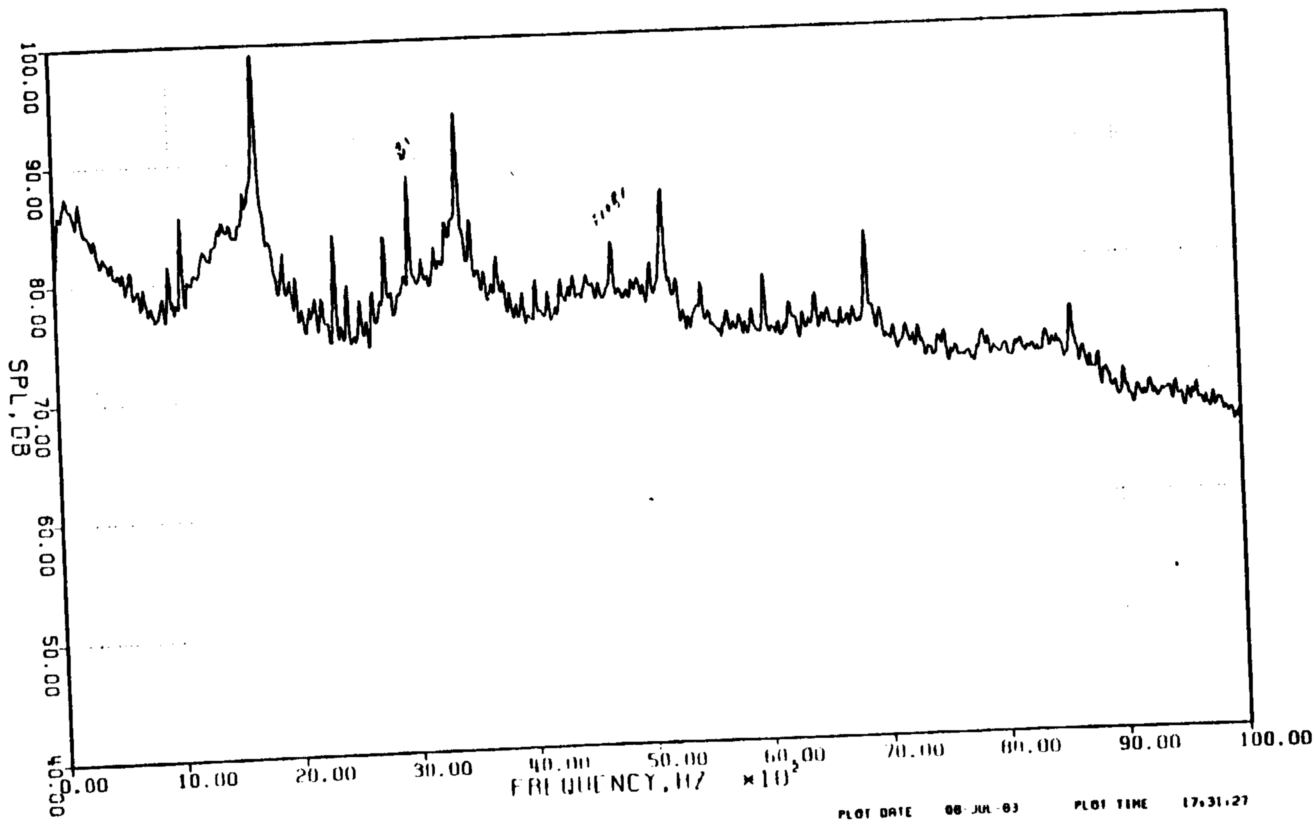
Appendix 9.2.8.c

AVERAGED SPECTRUM

30 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: 1170 . 30 IPS
FAN = 3250 RPM . CORE = 12650

RUN NO. =0
POINT NO. =257
BPF =1733
NO. OF BLADES =32
TEMP DRY (DEG.F) =75.0
TEMP WET (DEG.F) =68.0
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A.A FILTER (KHZ) =10.000
RECORD TIME (SEC) =0
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1=HANN) =1
SENSOR PSI/VOLT =0.0051
SENSOR GAIN (DB) =0
SENSOR CALIB RMS =0.90
SENSOR CAL REF =124
SENSOR DIST (FT) =15.0



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PLOT DATE 08-JUL-83 PLOT TIME 17:31:27

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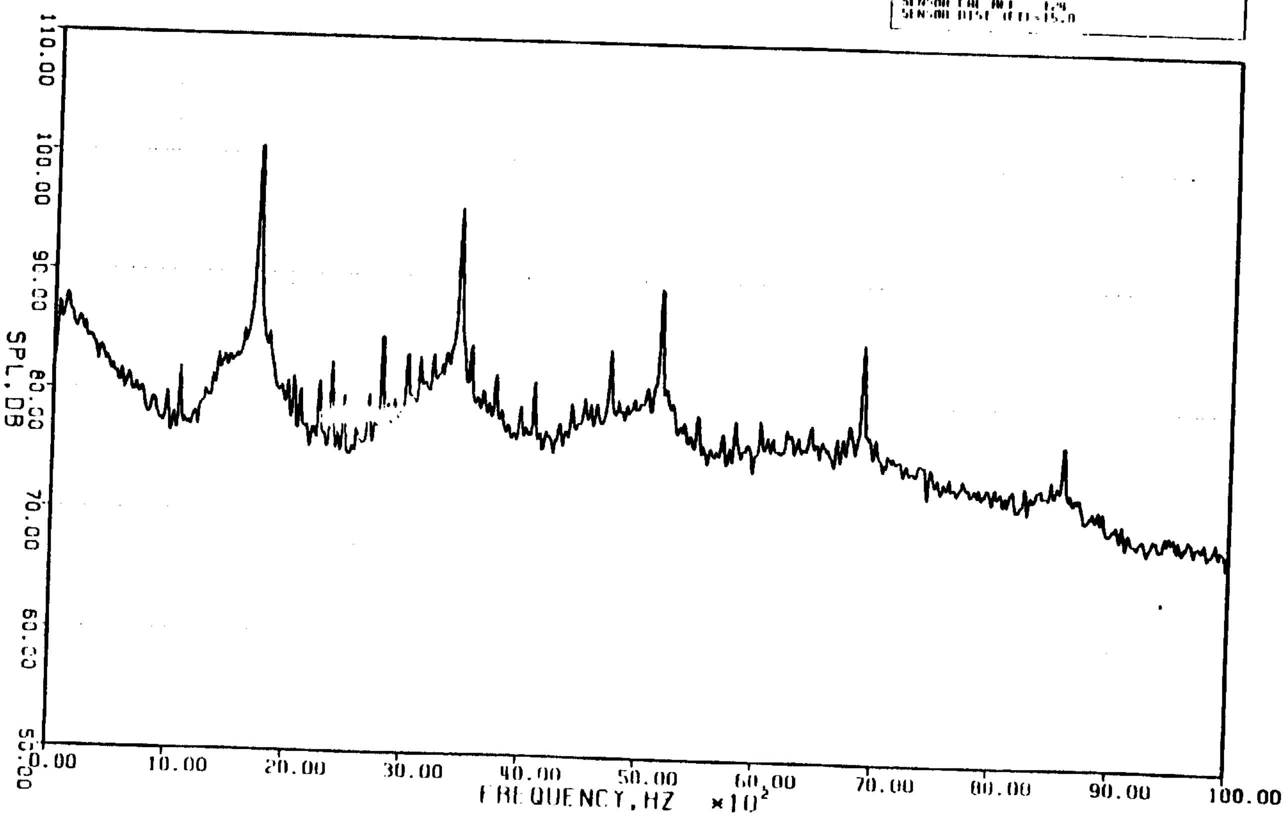
Appendix 9.2.8.d

AVERAGED SPECTRUM

40 DEG G/P

E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: 1170 , 30 IPS
FAN = 3250 RPM , CORE = 12650

RUN NO. =8
POINT NO. =257
BPF =1733
NO. OF BLADES =32
SENSOR DIST (FT) =15.0



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PLOT DATE 08-JUL-83 PLOT TIME 17:31:41

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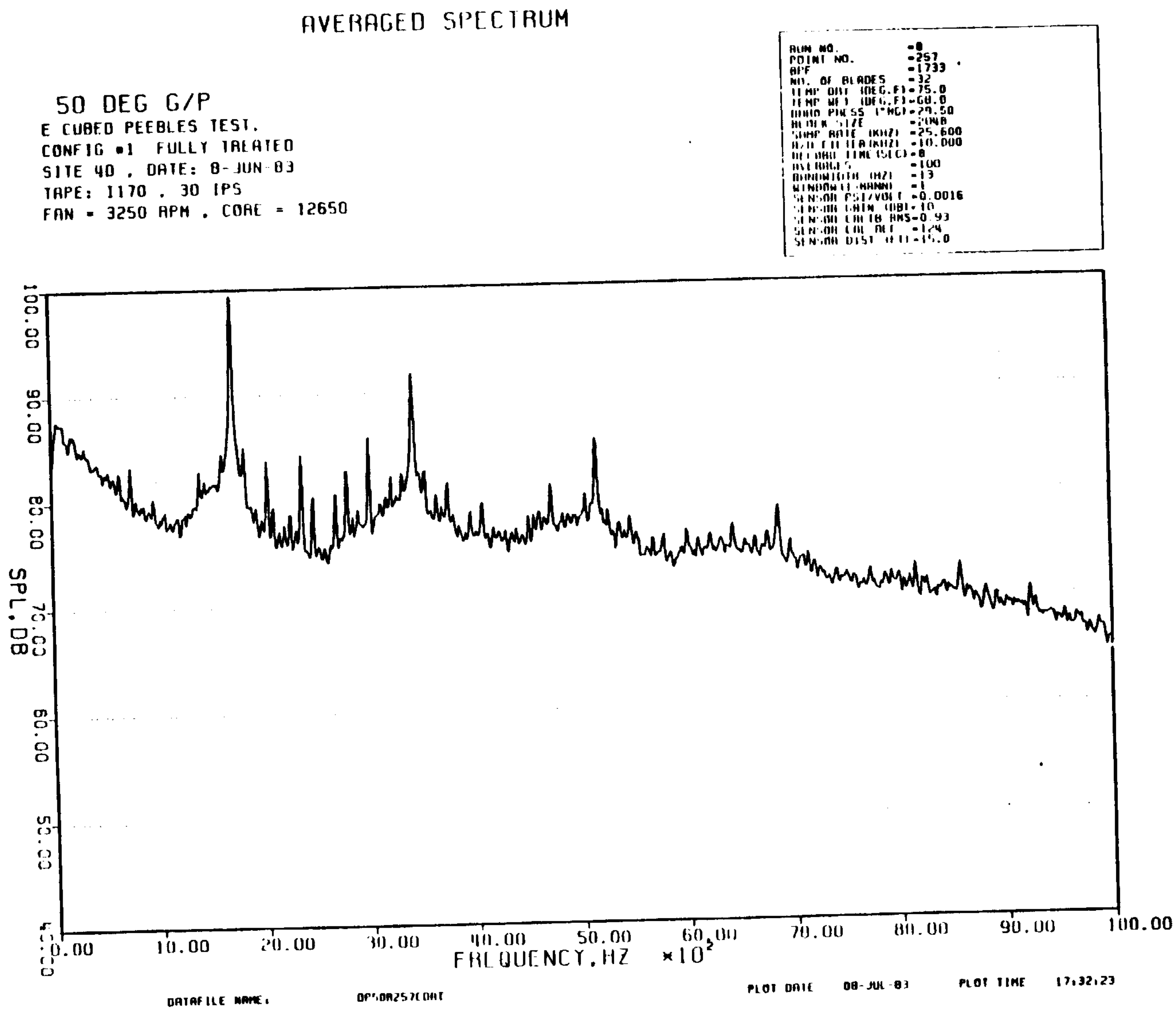
Appendix 9.2.8.e



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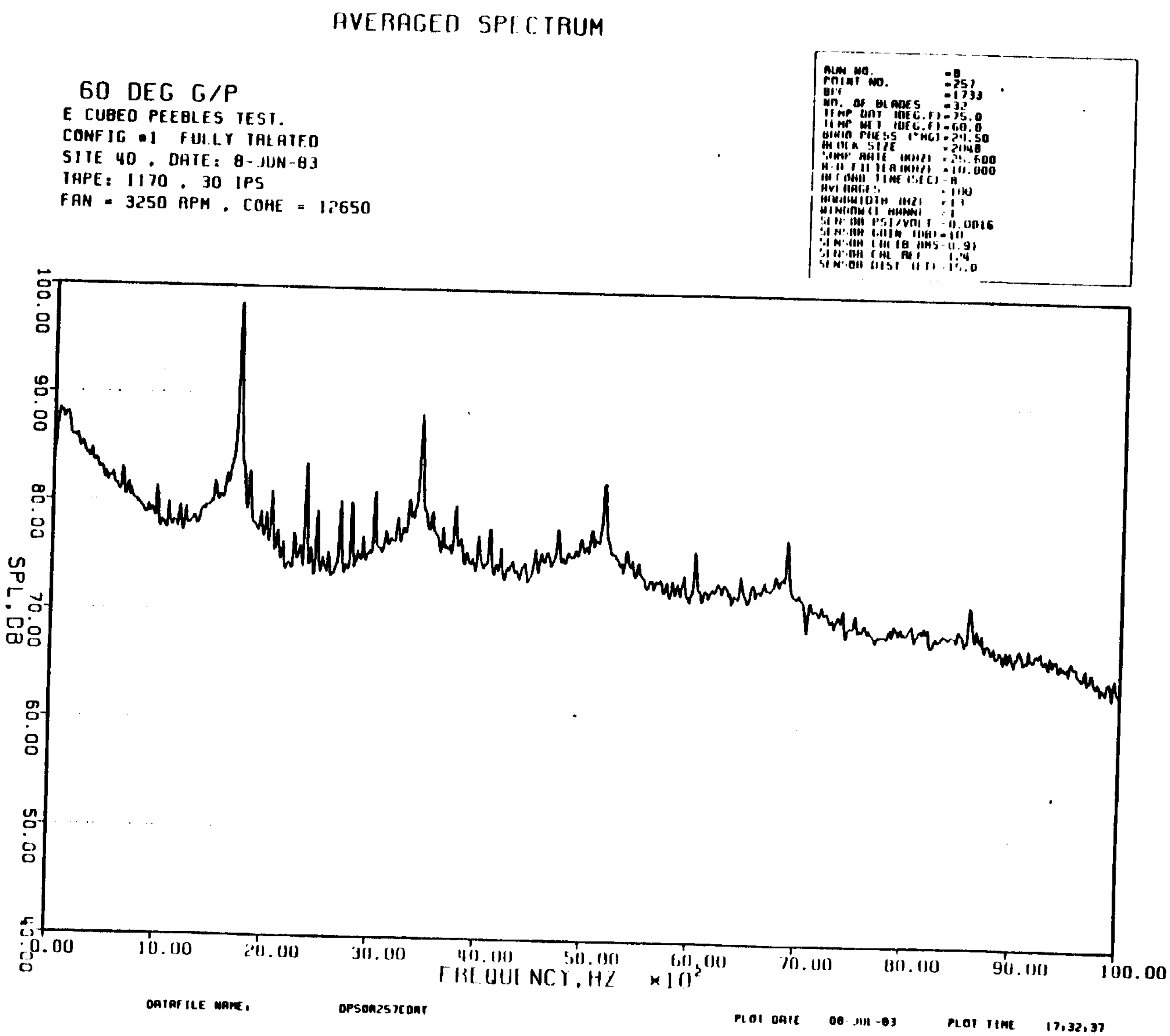
Appendix 9.2.8.f



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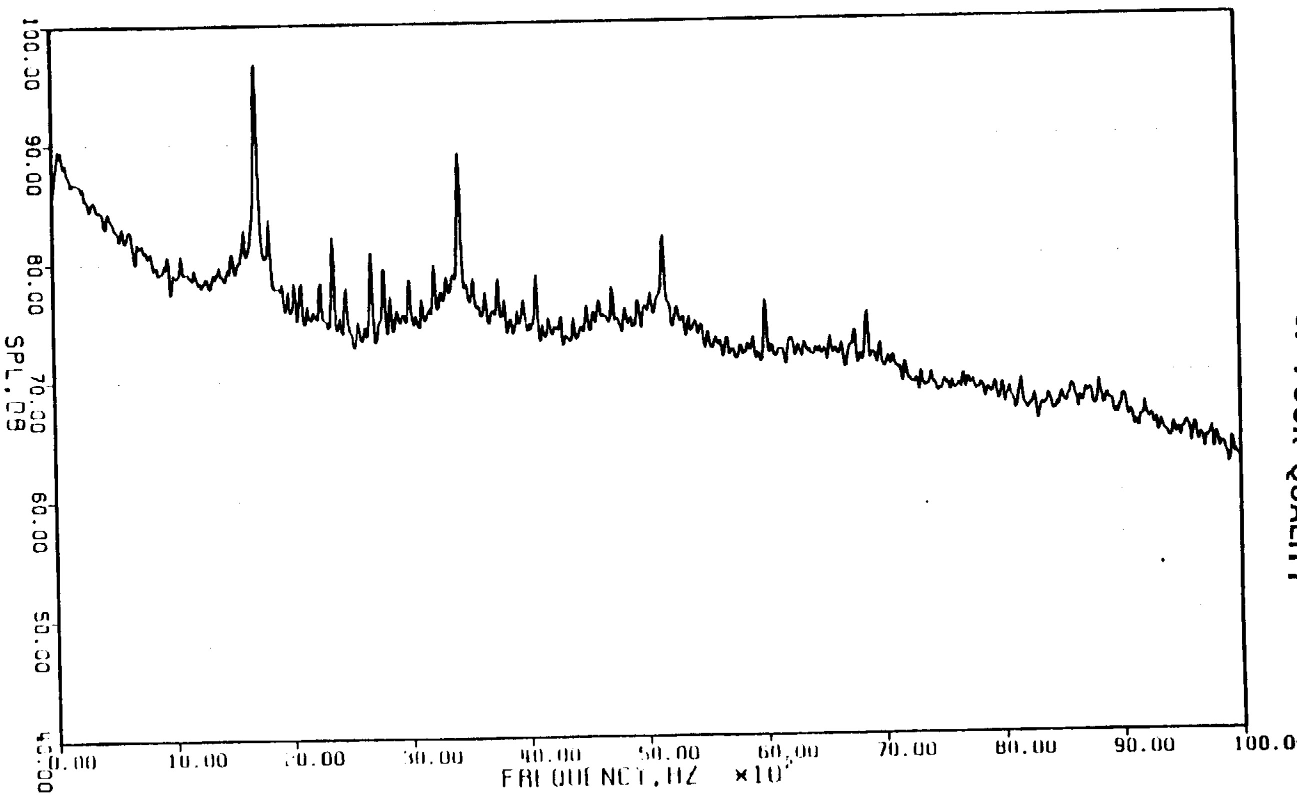
Appendix 9.2.8.g

AVERAGED SPECTRUM

70 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: 1170 . 30 IPS
FAN = 3250 RPM . CORE = 12650



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PLOT DATE 08-JUL-83 PLOT TIME 17:33:20

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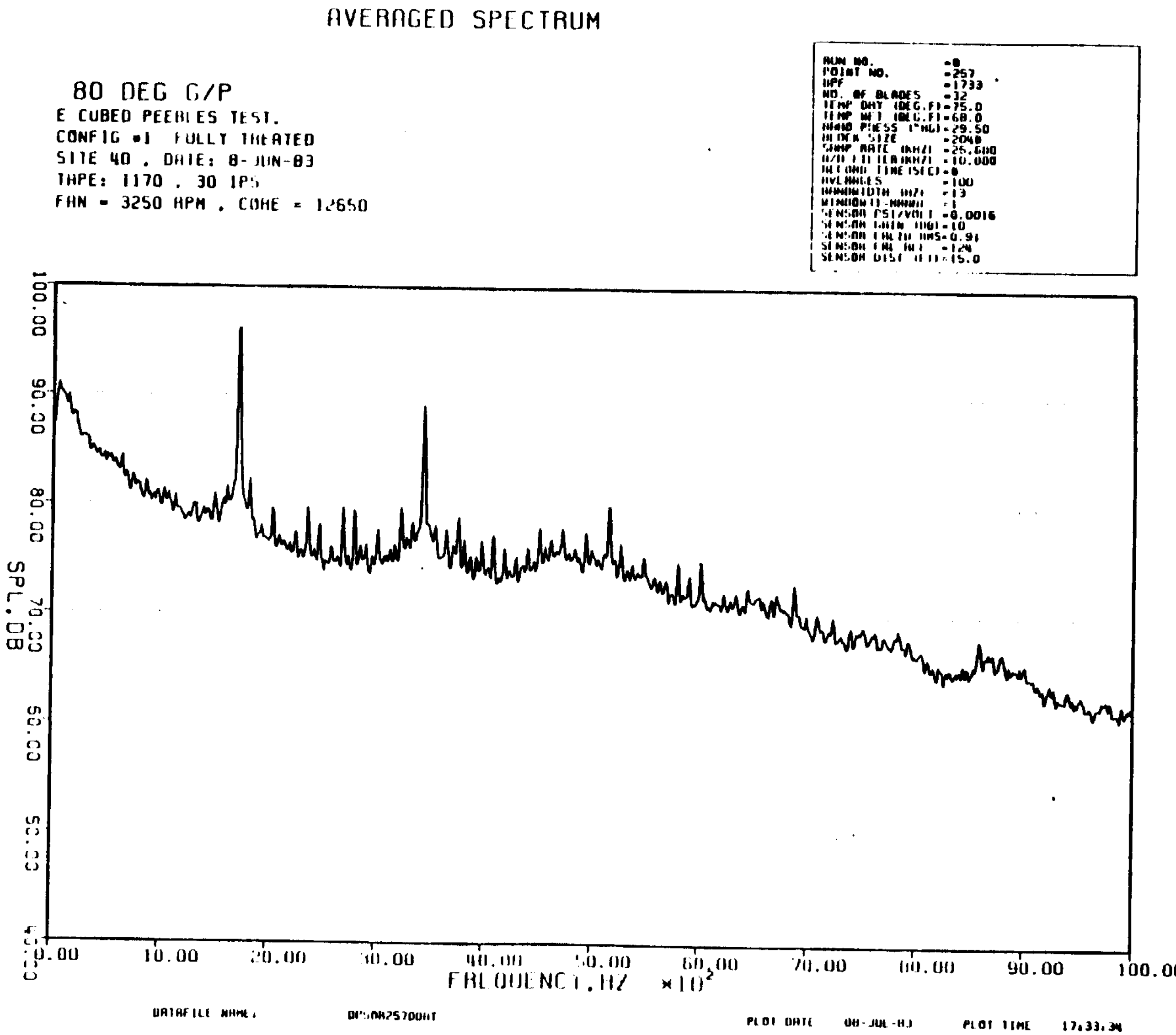
Appendix 9.2.8.h



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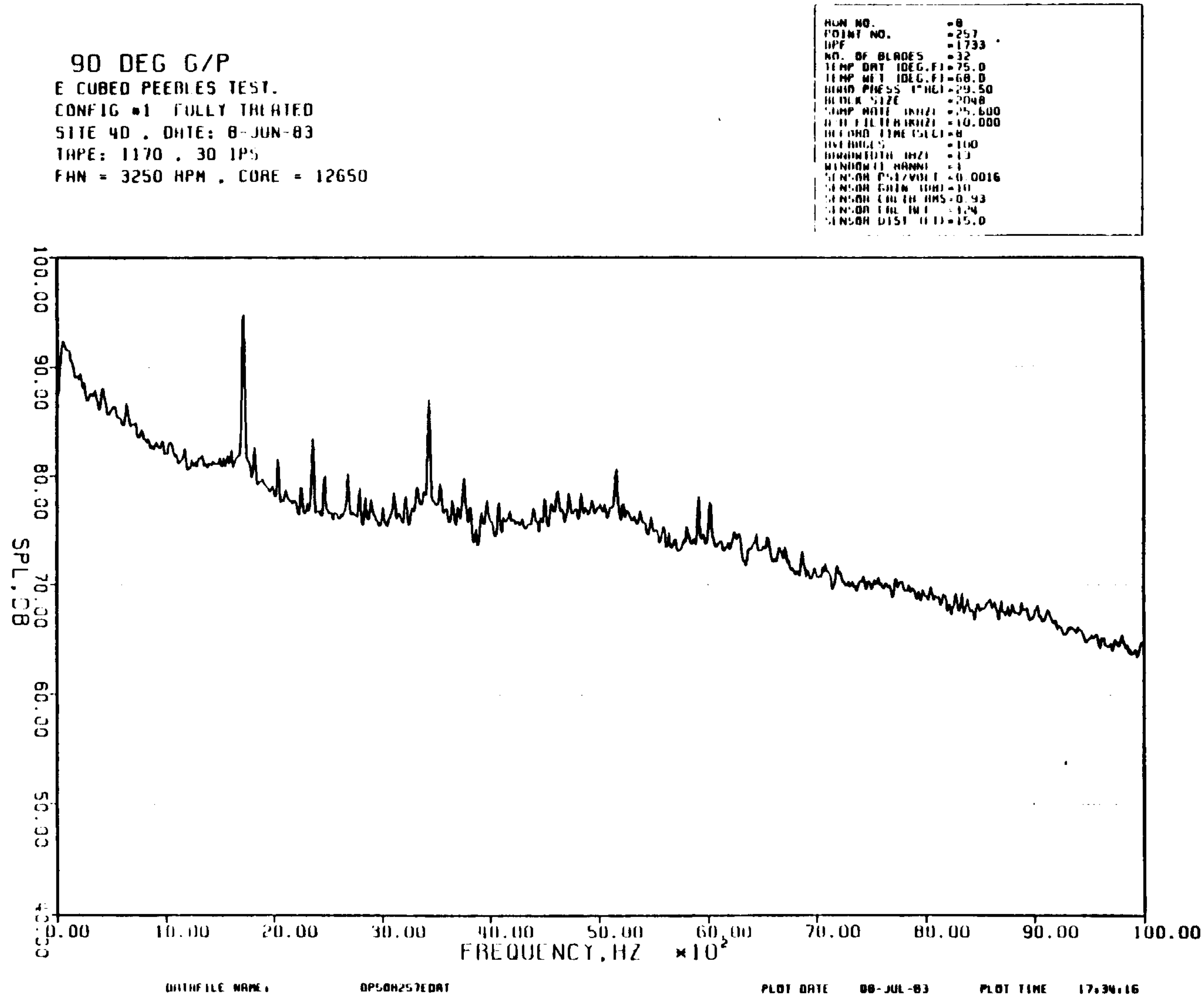
Appendix 9.2.8.i

AVERAGED SPECTRUM



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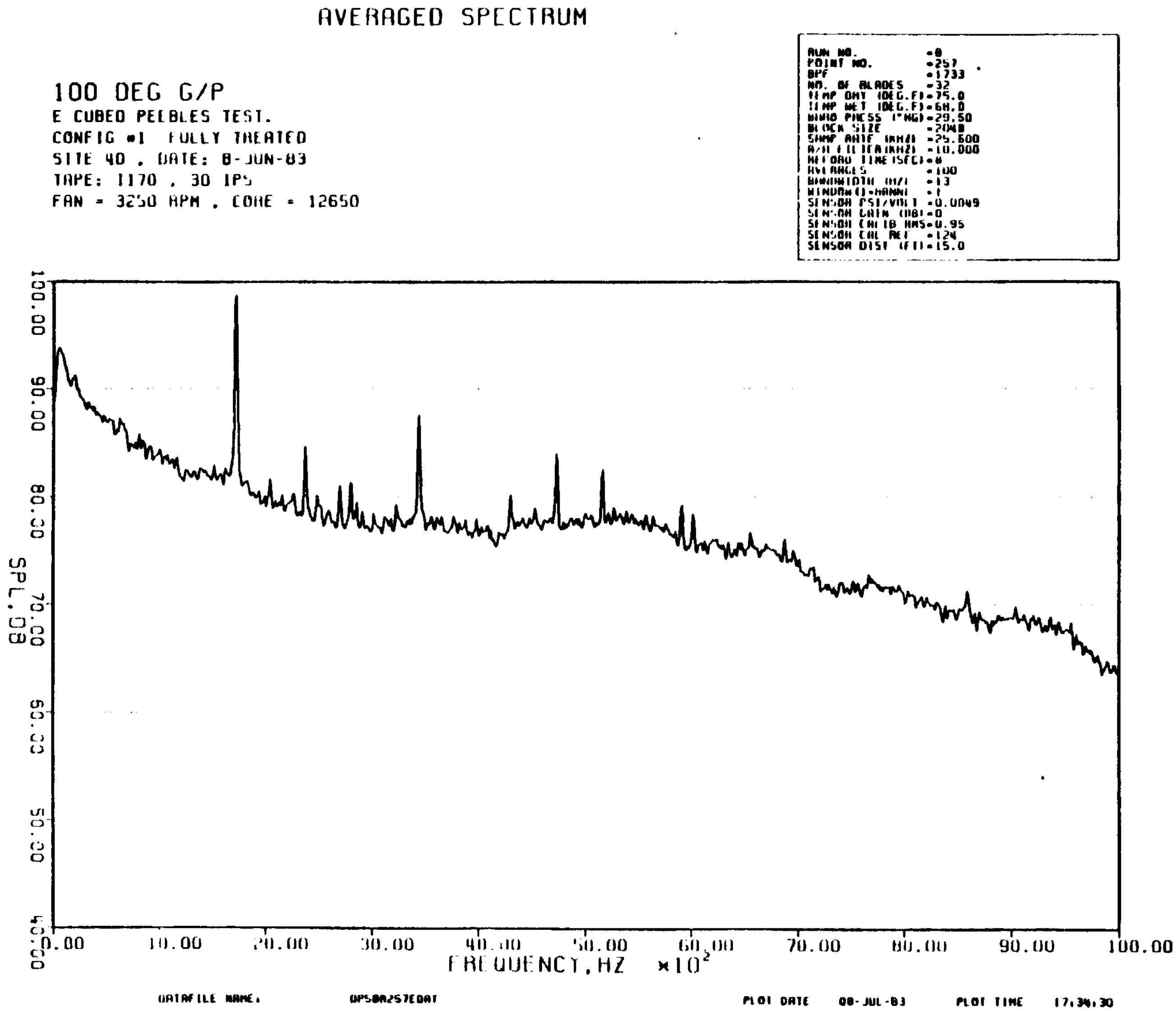
Appendix 9.2.8.j



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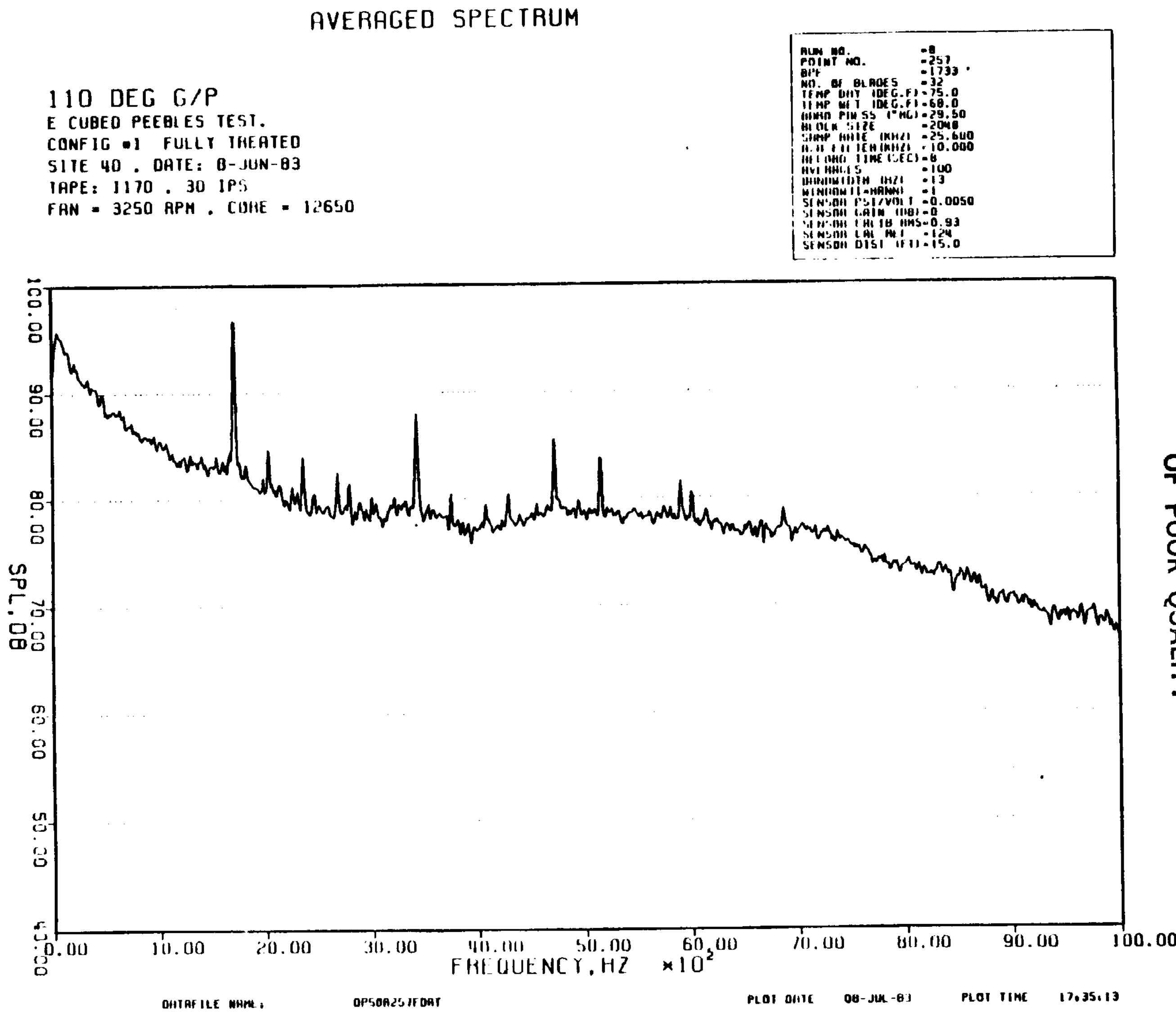
Appendix 9.2.8.k



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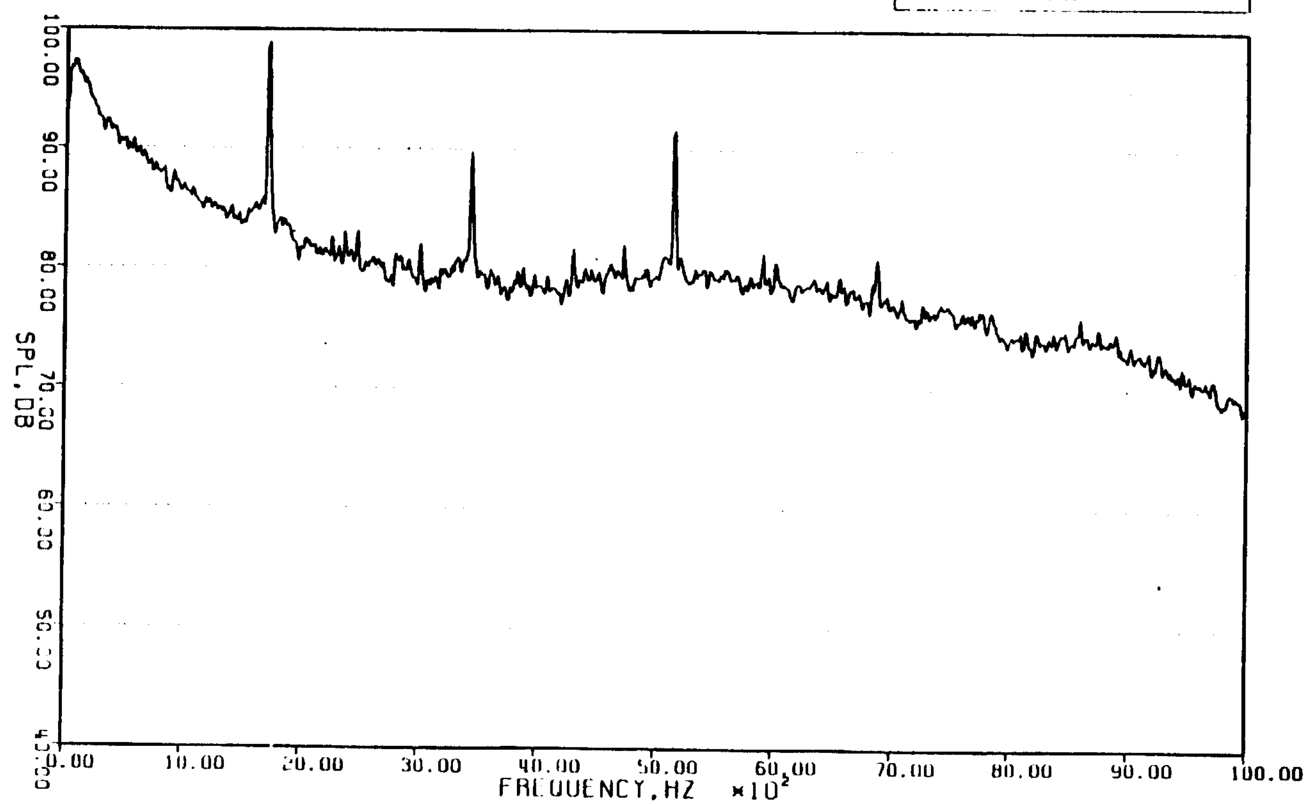
Appendix 9.2.8.1

AVERAGED SPECTRUM

120 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: 1170 , 30 IPS
FAN = 3250 RPM , CORE = 12650

RUN NO.	=0
POINT NO.	=257
BPF	=1733
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=75.0
TEMP WET (DEG.F)	=68.0
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0050
SENSOR GAIN (DB)	=0
SENSOR CAL (V RMS)	=0.92
SENSOR CAL (DB)	=124
SENSOR DIST (FT)	=15.0



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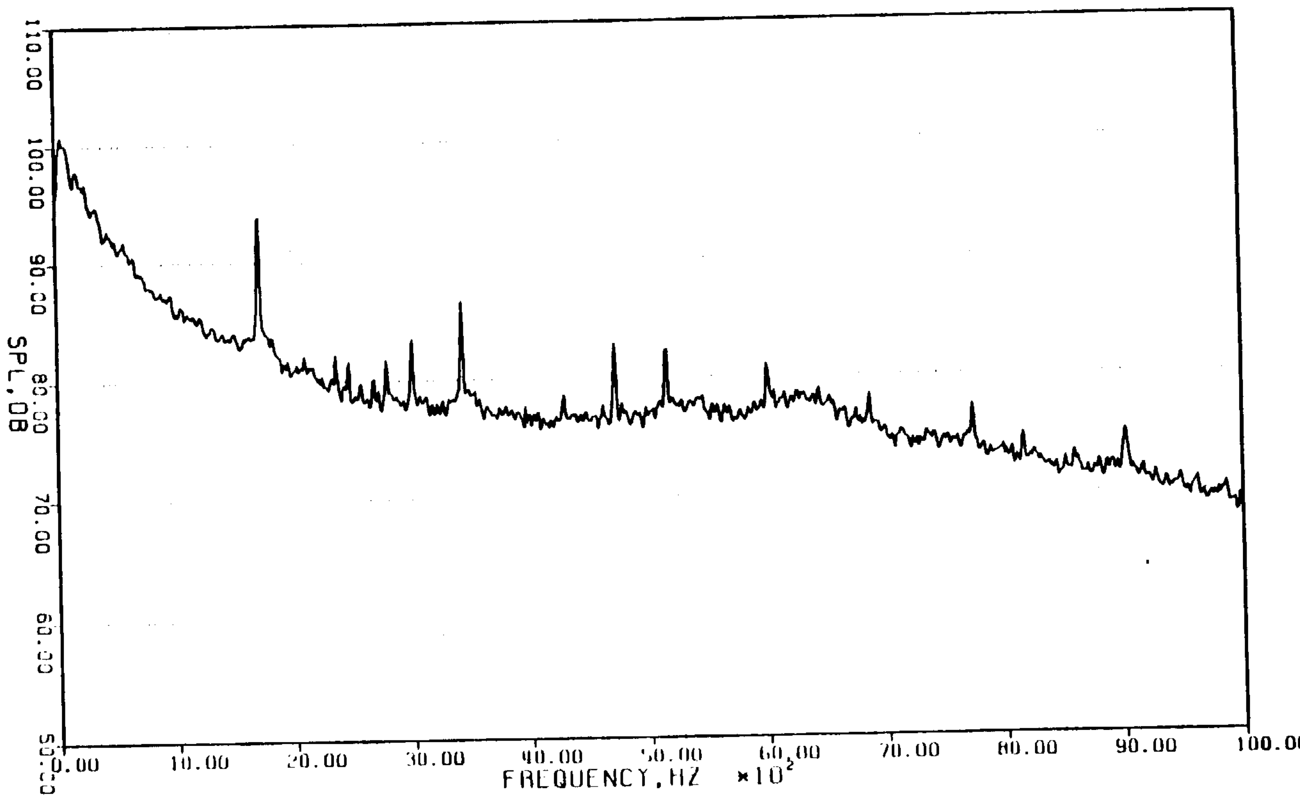
Appendix 9.2.8.m

AVERAGED SPECTRUM

130 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: 1170 . 30 IPS
FAN = 3250 RPM , CORE = 12650

RUN NO.	=8
POINT NO.	=257
BPF	=1733
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=75.0
TEMP WET (DEG.F)	=68.0
BARO PRESS ("HG)	=28.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0051
SENSOR GAIN (DB)	=0
SENSOR CAL (V RMS)	=0.91
SENSOR CAL REF	=124
SENSOR DIST (FT)	=15.0



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PLOT DATE 08-JUL-83 PLOT TIME 17:36:09

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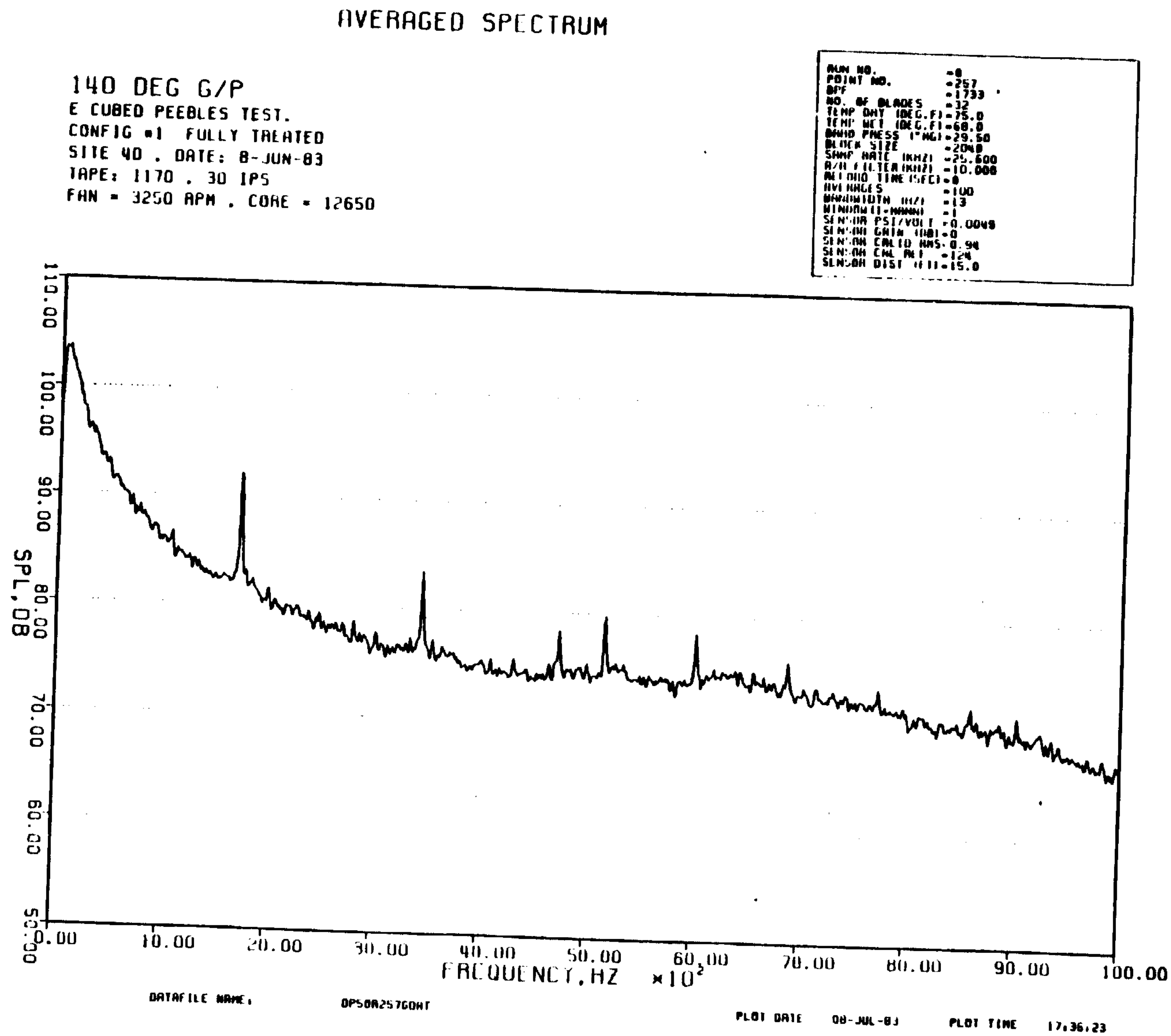
Appendix 9.2.8.n

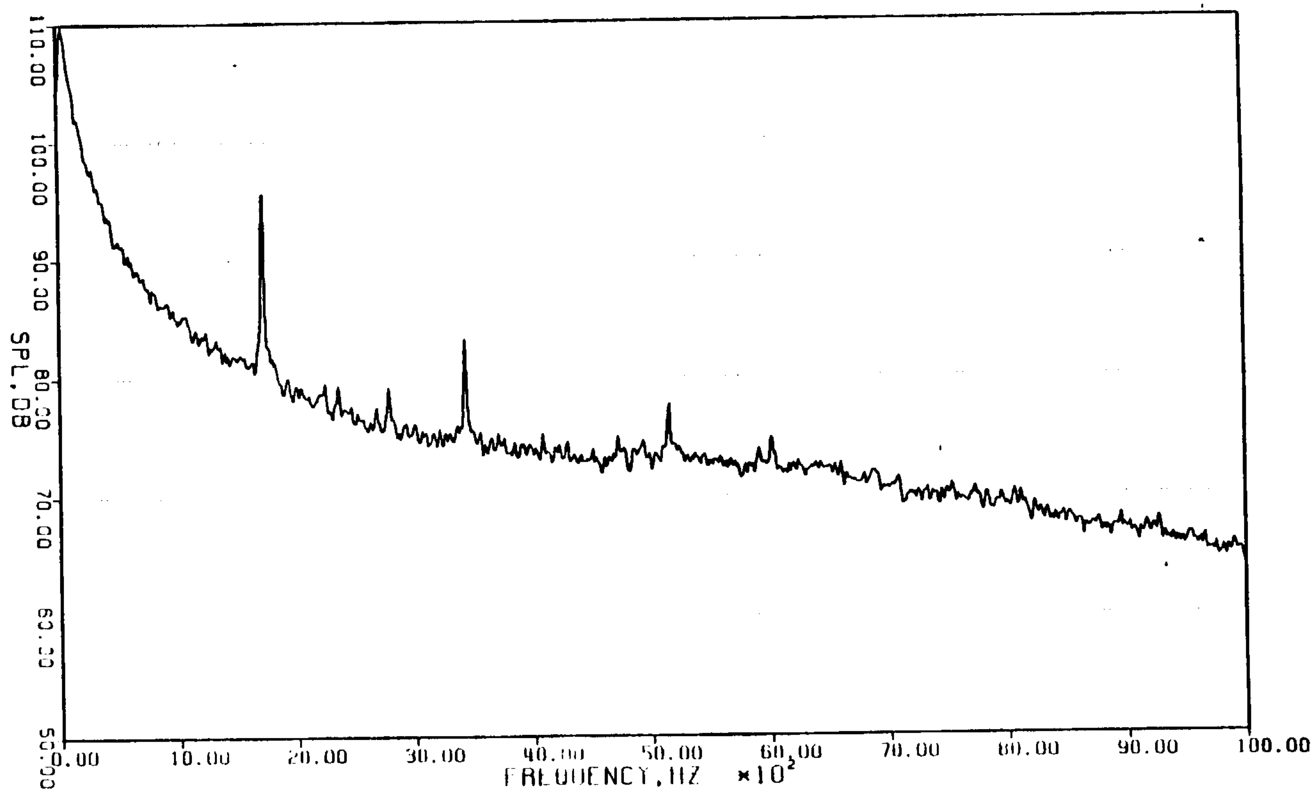


Appendix 9.2.8.o

AVERAGED SPECTRUM

150 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: 1170 . 30 IPS
FAN = 3250 RPM . CORE = 12650

RUN NO.	=8
POINT NO.	=257
BPF	=1733
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=75.0
TEMP WET (DEG.F)	=68.0
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RELOAD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0051
SENSOR GAIN (DB)	=0
SENSOR CALIB RMS	=0.91
SENSOR CAL REF	=124
SENSOR DIST (FT)	=15.0



DATAFILE NAME: DPS0025780AT

PLOT DATE 08-JUL-83 PLOT TIME 17:37:06

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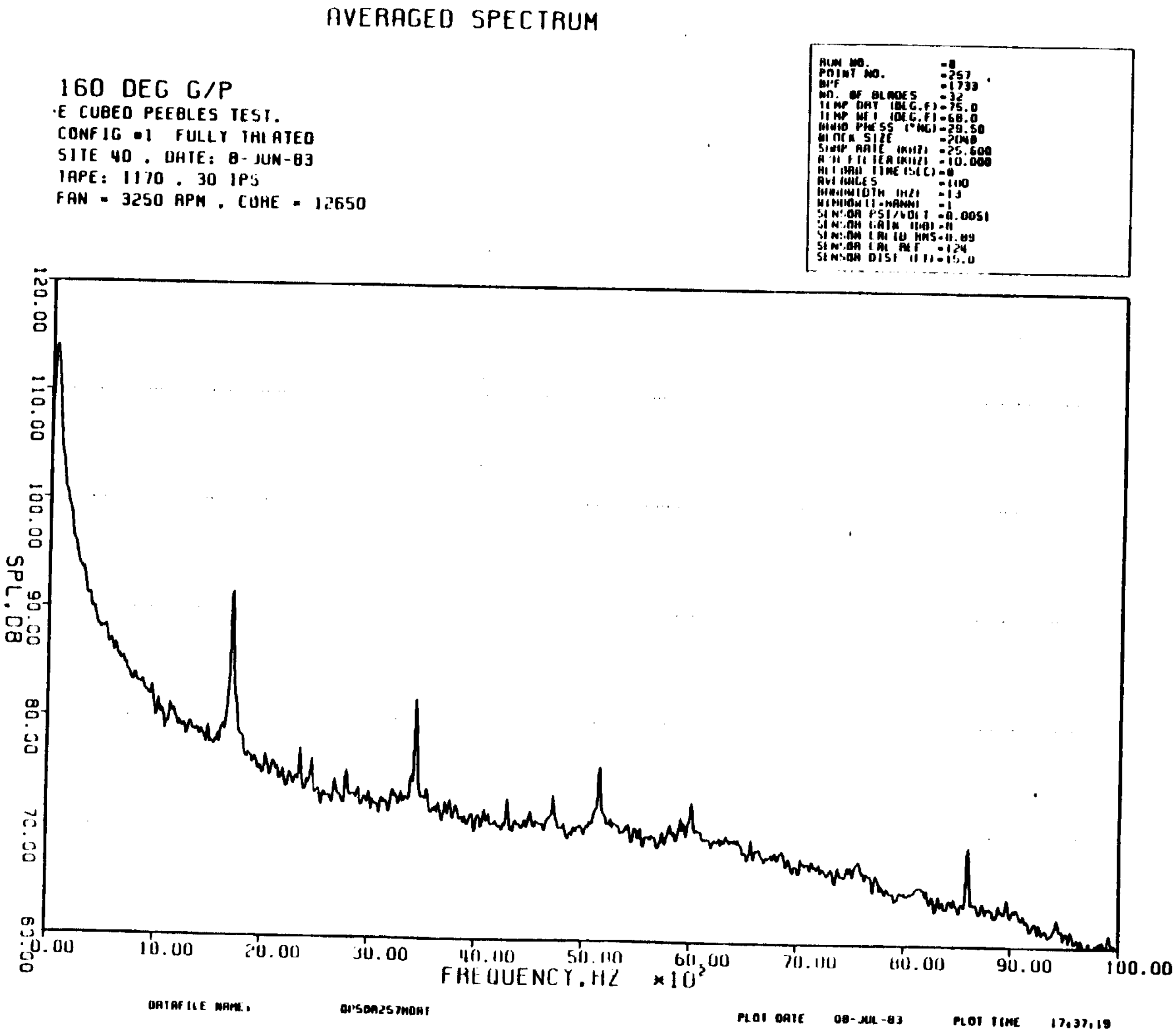
Appendix 9.2.8.p



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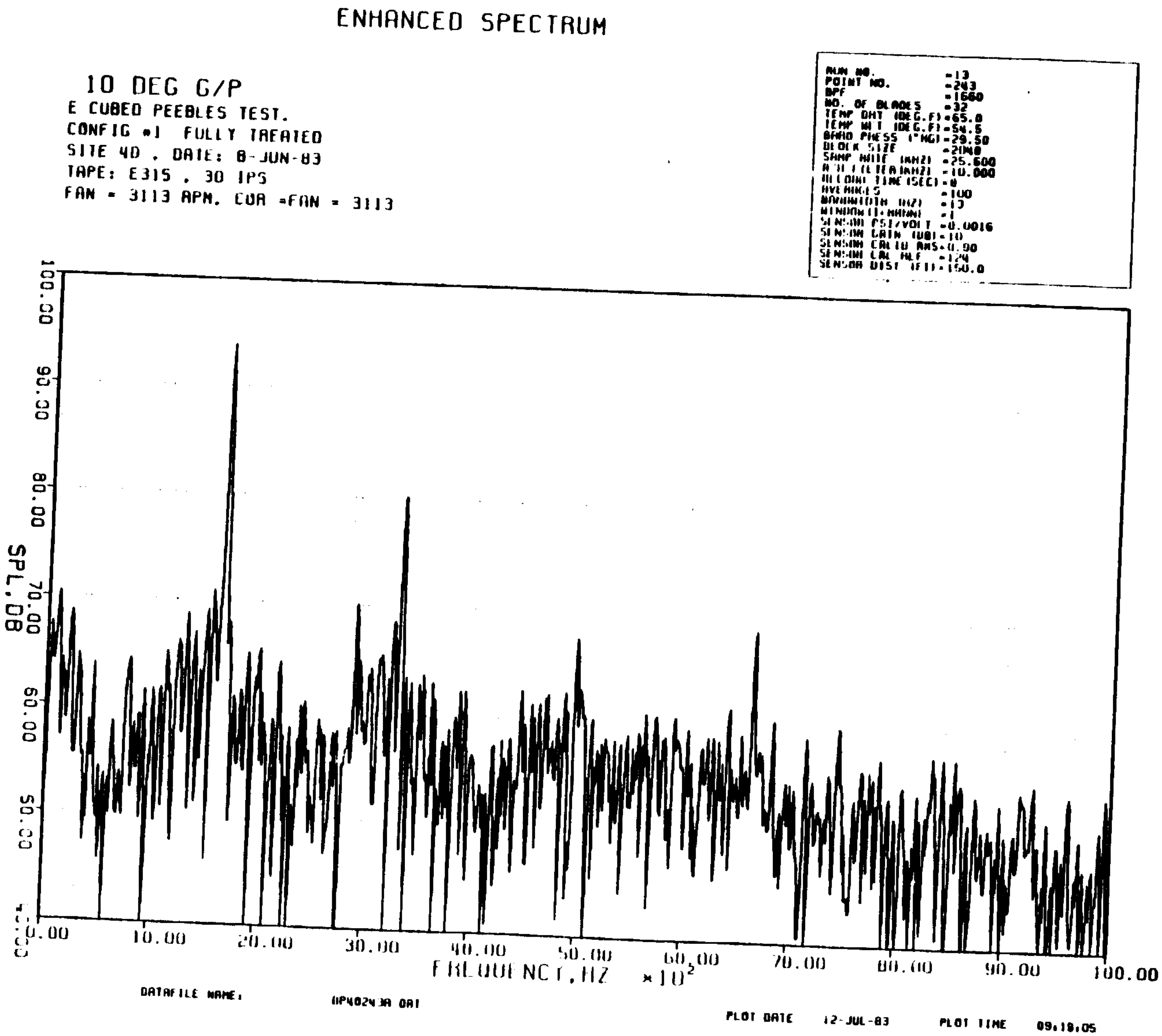
9.3 ENHANCED SPECTRUM

Appendix 9.3.1



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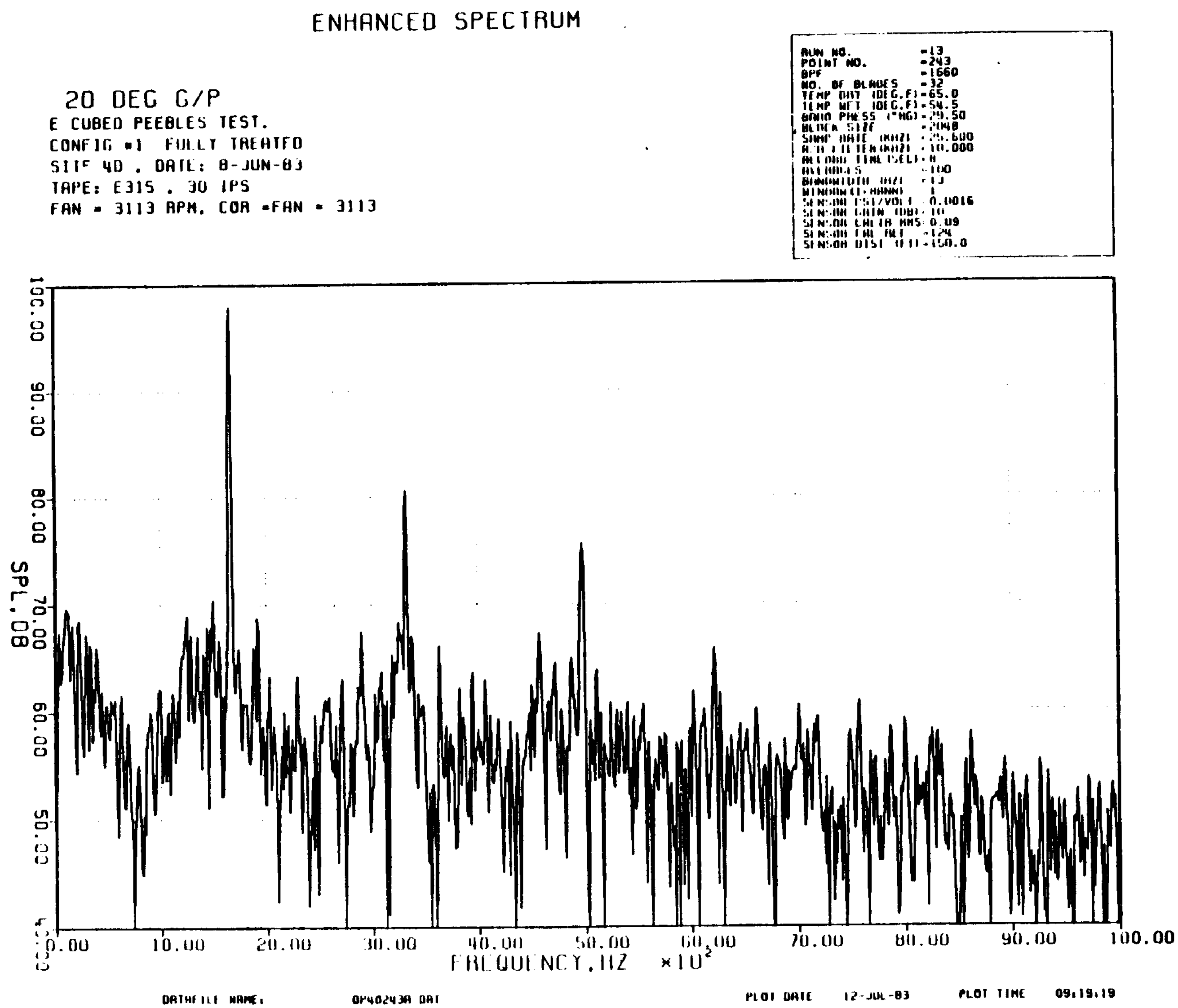
Appendix 9.3.2



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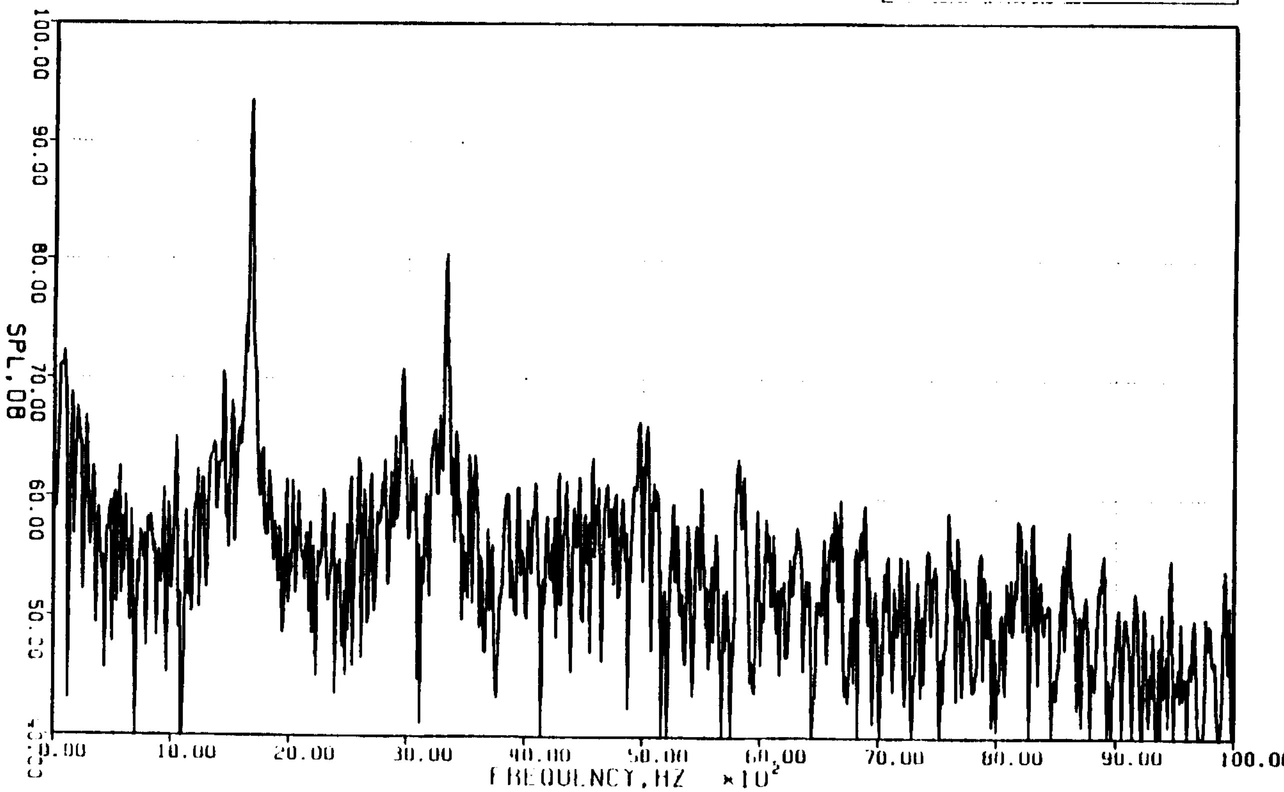
Appendix 9.3.3

ENHANCED SPECTRUM

30 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=28.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0016
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.90
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP40243B DAT PLOT DATE 12-JUL-83 PLOT TIME 09:20:03

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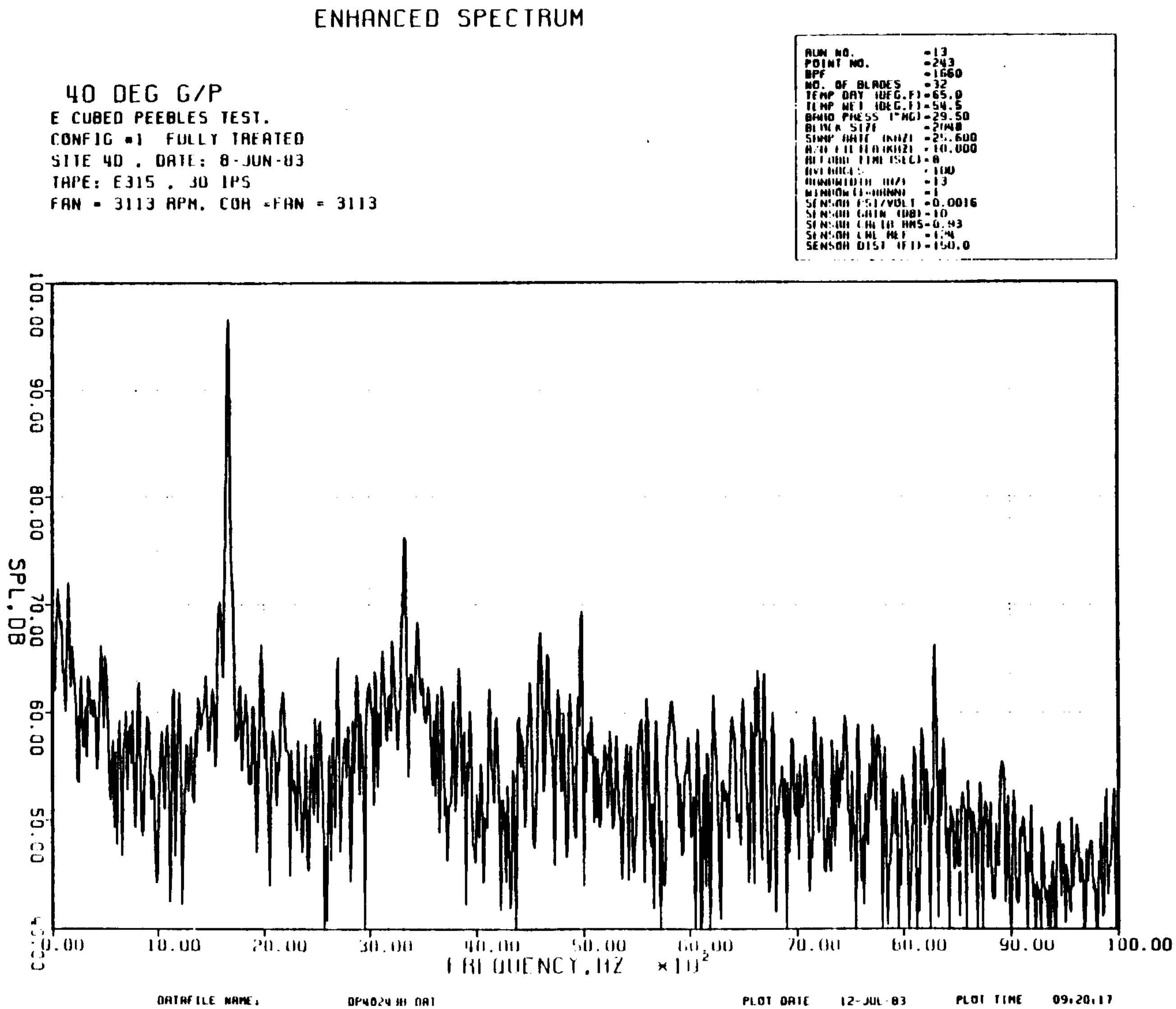
Appendix 9.3.4



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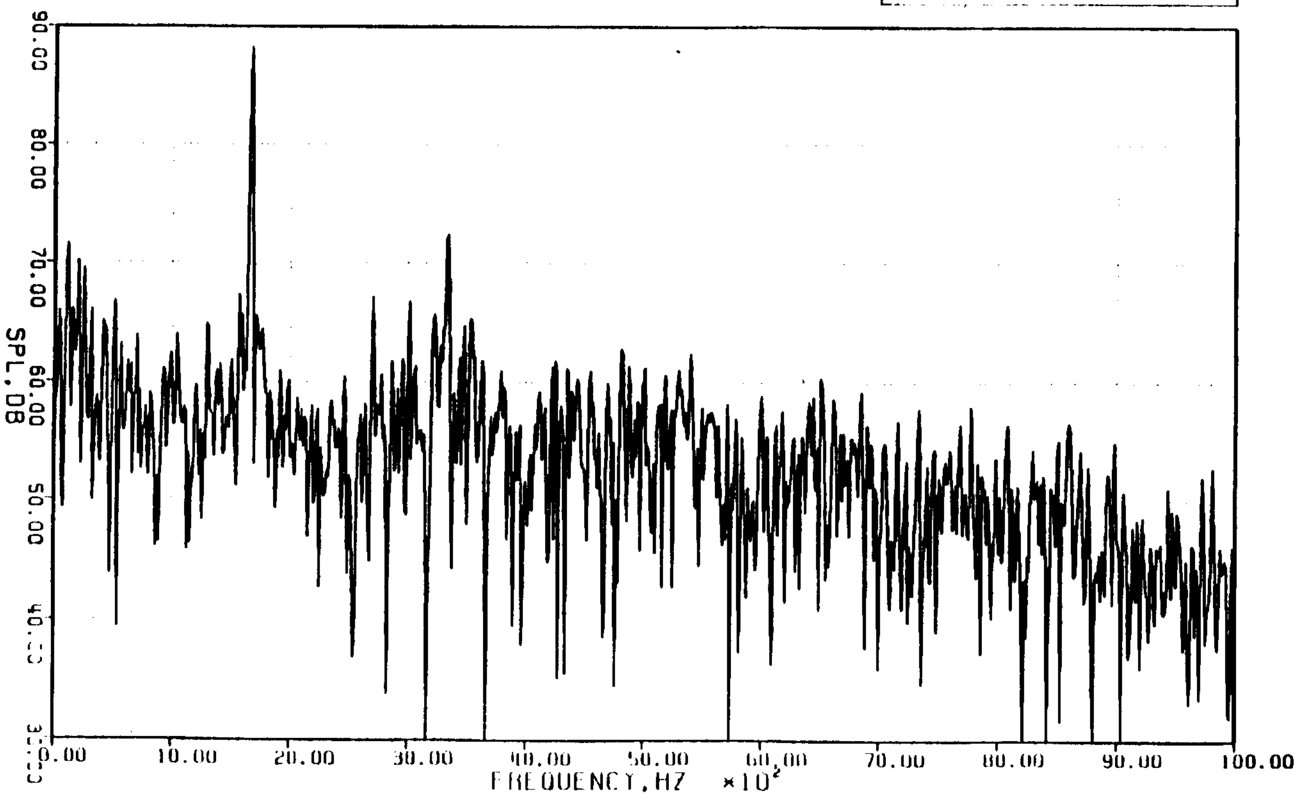
Appendix 9.3.5

ENHANCED SPECTRUM

50 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER (KHZ) =10.000
RECORD TIME (SEC) =0
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1=HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB) =10
SENSOR CAL TO RMS =0.93
SENSOR CAL REF =1.4
SENSOR DIST (FT) =150.0



DATAFILE NAME: DP4024 3C DAT

PLOT DATE 12-JUL-83

PLOT TIME 09:21:01

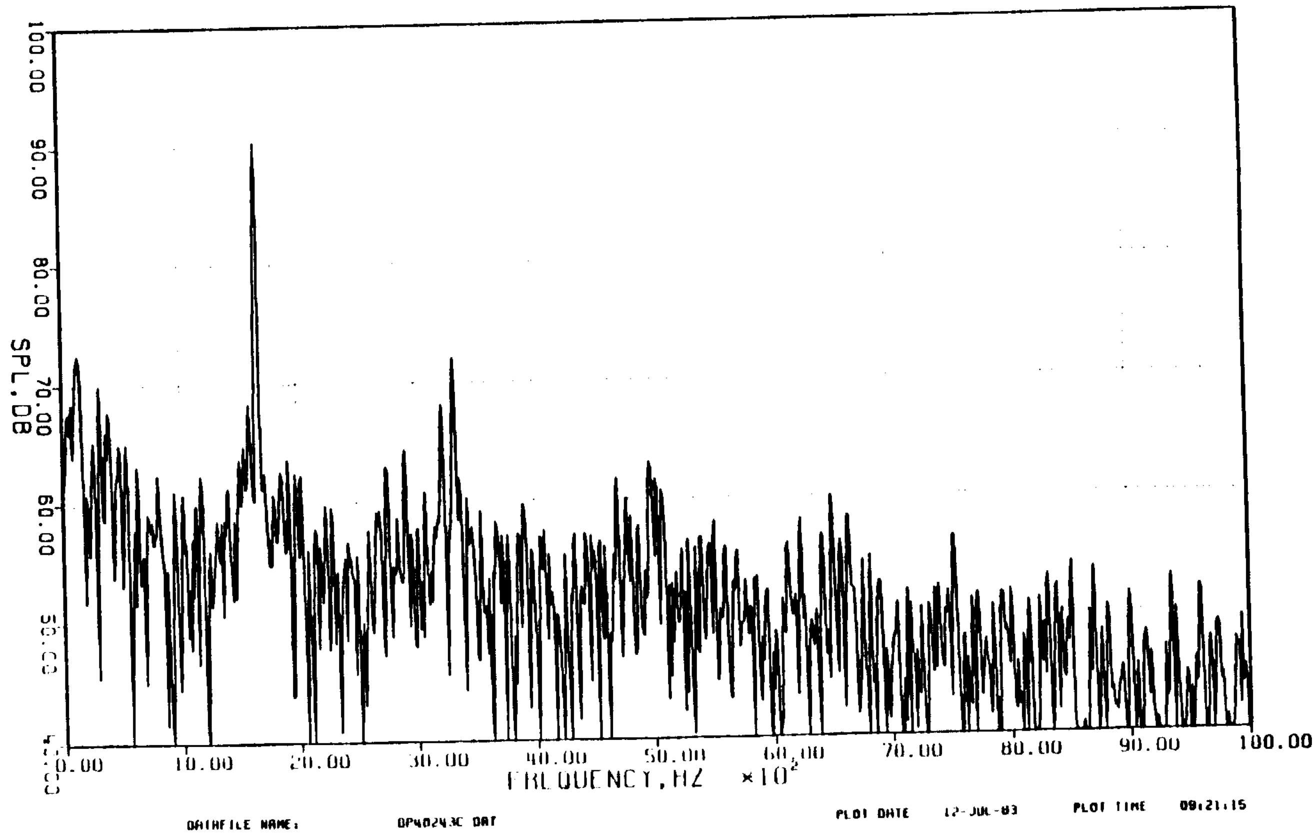
Appendix 9.3.6

ENHANCED SPECTRUM

60 DEG G/P

E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM. COR =FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS (''HG)	=29.50
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	=10.000
[illegible]	=0
[illegible]	=100
[illegible]	=13
[illegible]	=1
[illegible]	=0.0016
[illegible]	=10
[illegible]	=0.91
[illegible]	[illegible]
SENSOR DIST (FT)	[illegible]



DATAFILE NAME: OP4024 3C DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:21:15

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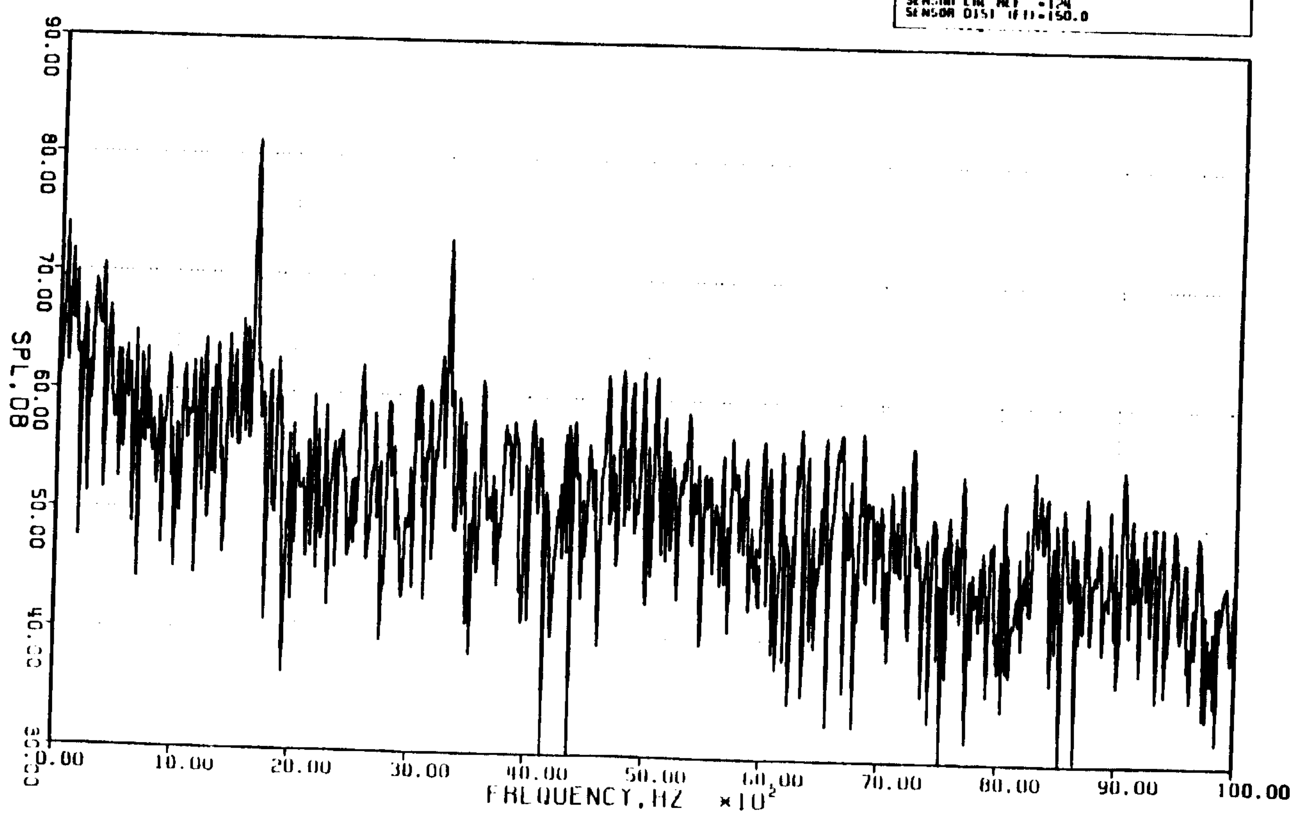
Appendix 9.3.7

ENHANCED SPECTRUM

70 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.58
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1-HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB) =10
SENSOR CAL LB RMS =0.92
SENSOR CAL REF =124
SENSOR DIST (FT) =150.0



DATAFILE NAME: OP4024301 DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:21:59

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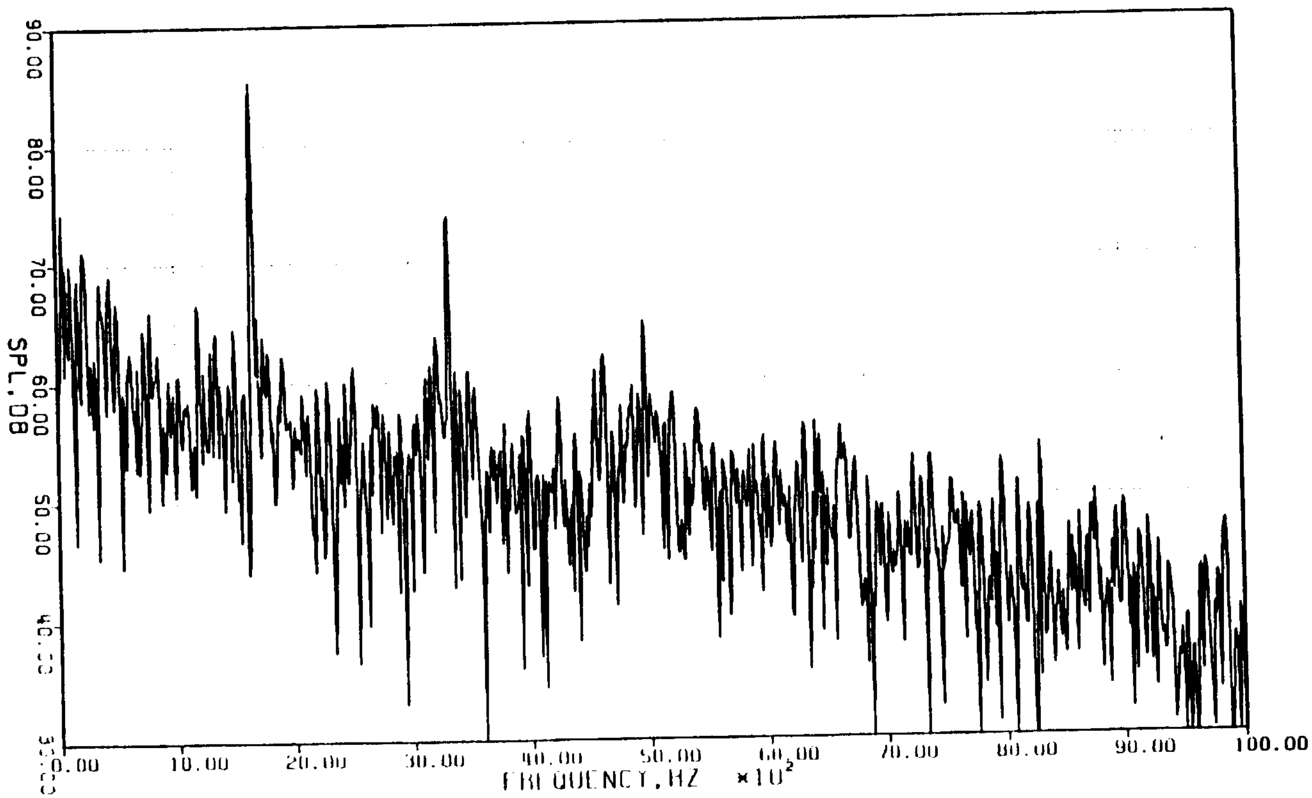
Appendix 9.3.8

ENHANCED SPECTRUM

80 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F)=66.0
TEMP WET (DEG.F)=54.5
AMBIO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A-A FILTER (KHZ) =10.000
RECORD TIME (SEC)=0
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1 HANN) =1
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB)=10
SENSOR CALIB RMS=0.91
SENSOR CAL REF =1.4
SENSOR DIST (FT)=150.0



DATAFILE NAME: DP4D2430 DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:22:13

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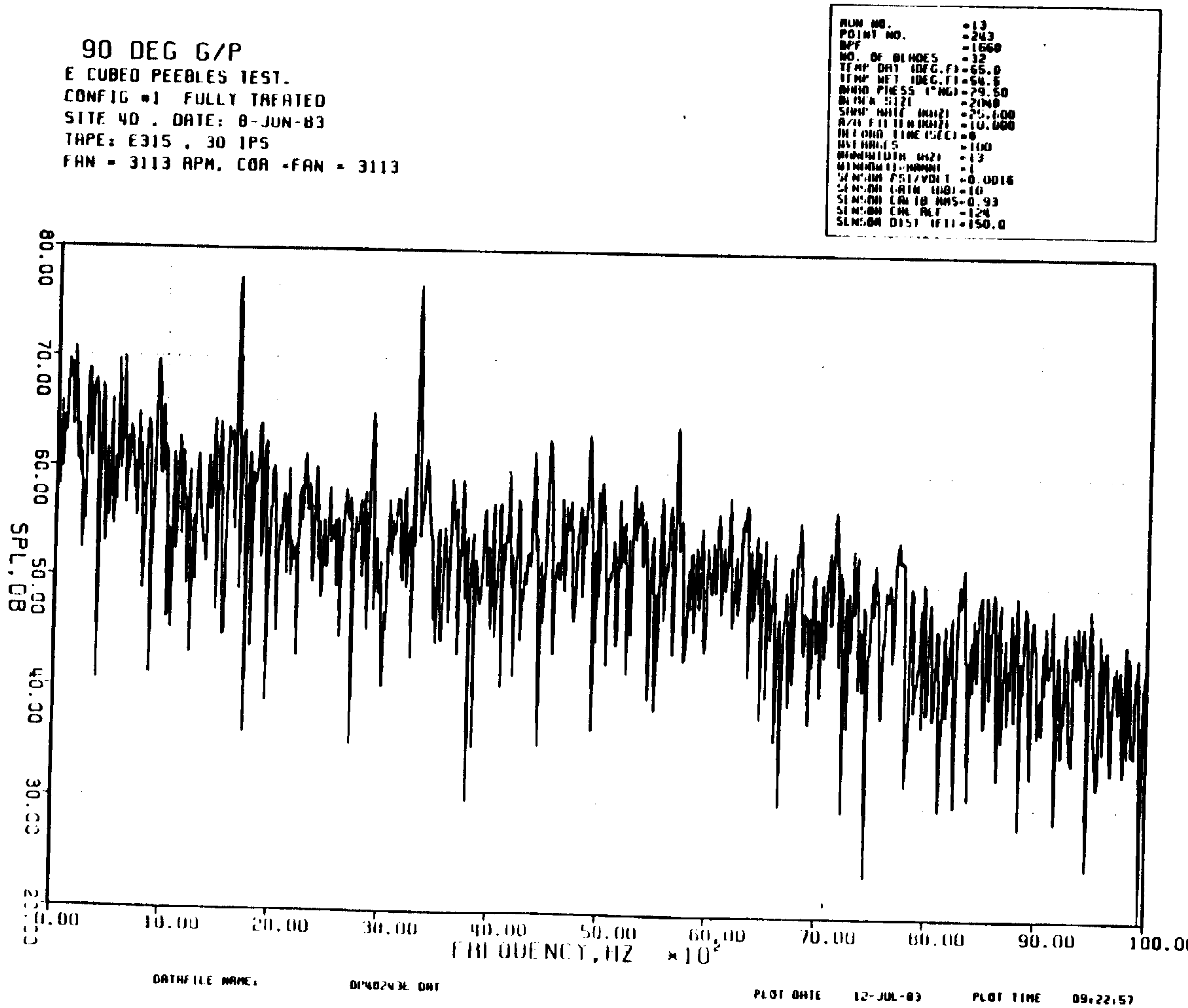
Appendix 9.3.9

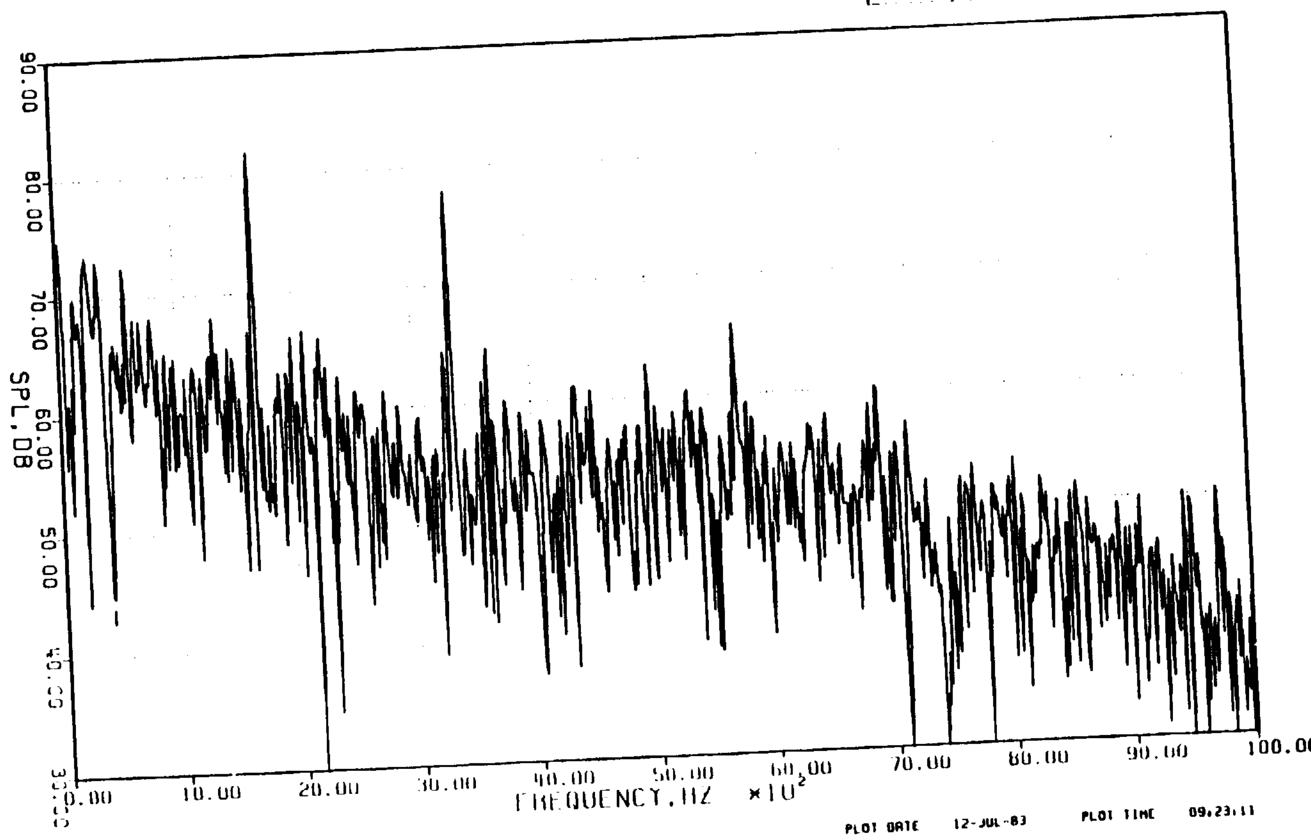
ENHANCED SPECTRUM



ENHANCED SPECTRUM

100 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM. COR -FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A.A. FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0015
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=0.95
SENSOR CAL HT	=1.4
SENSOR DIST (FT)	=150.0



PLOT DATE 12-JUL-83 PLOT TIME 09:23:11

DATAFILE NAME: DP40243E DAT

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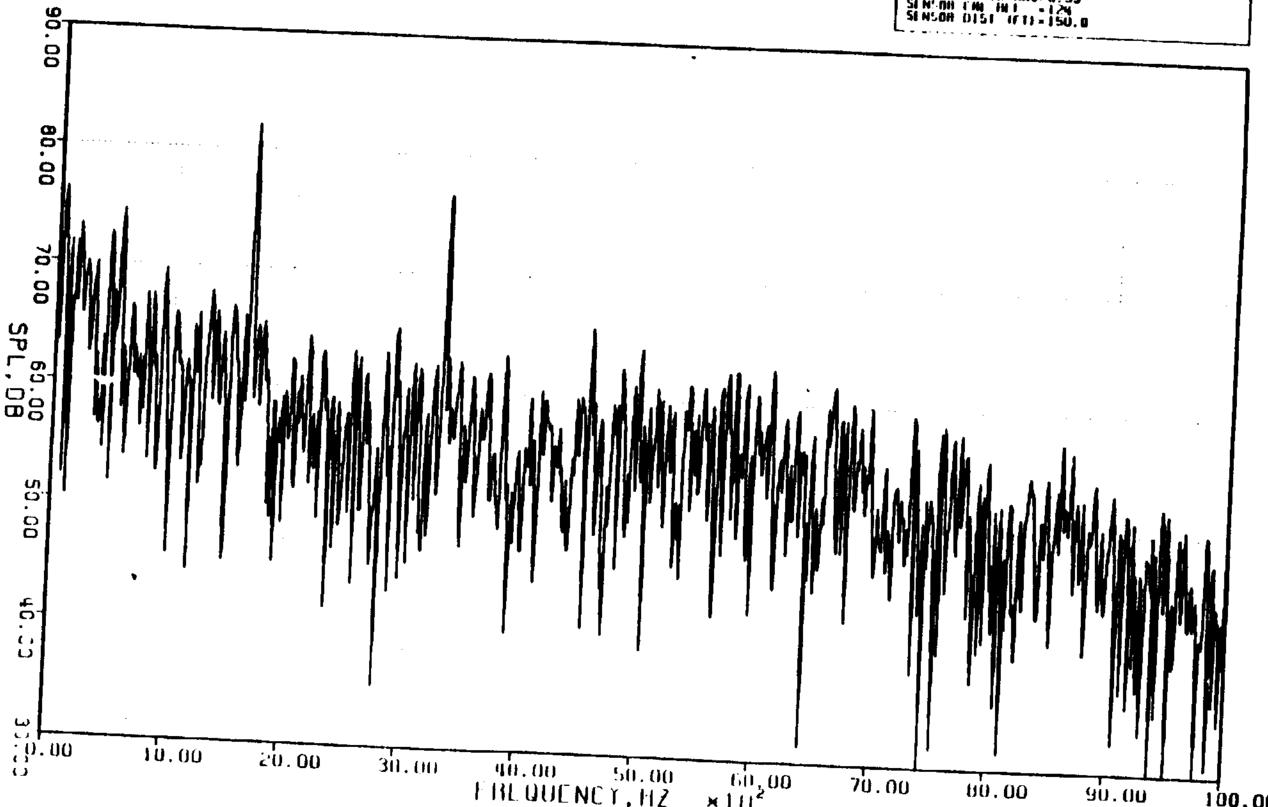
Appendix 9.3.11

ENHANCED SPECTRUM

110 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM. COR -FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DAT (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
SENSOR PSI/VOLT =0.0016
SENSOR GAIN (DB) =10
SENSOR DIST (FT) =150.0



DATAFILE NAME: DP4024 3F DAT

PLOT DATE 12-JUL-83 PLOT TIME 09:23.55

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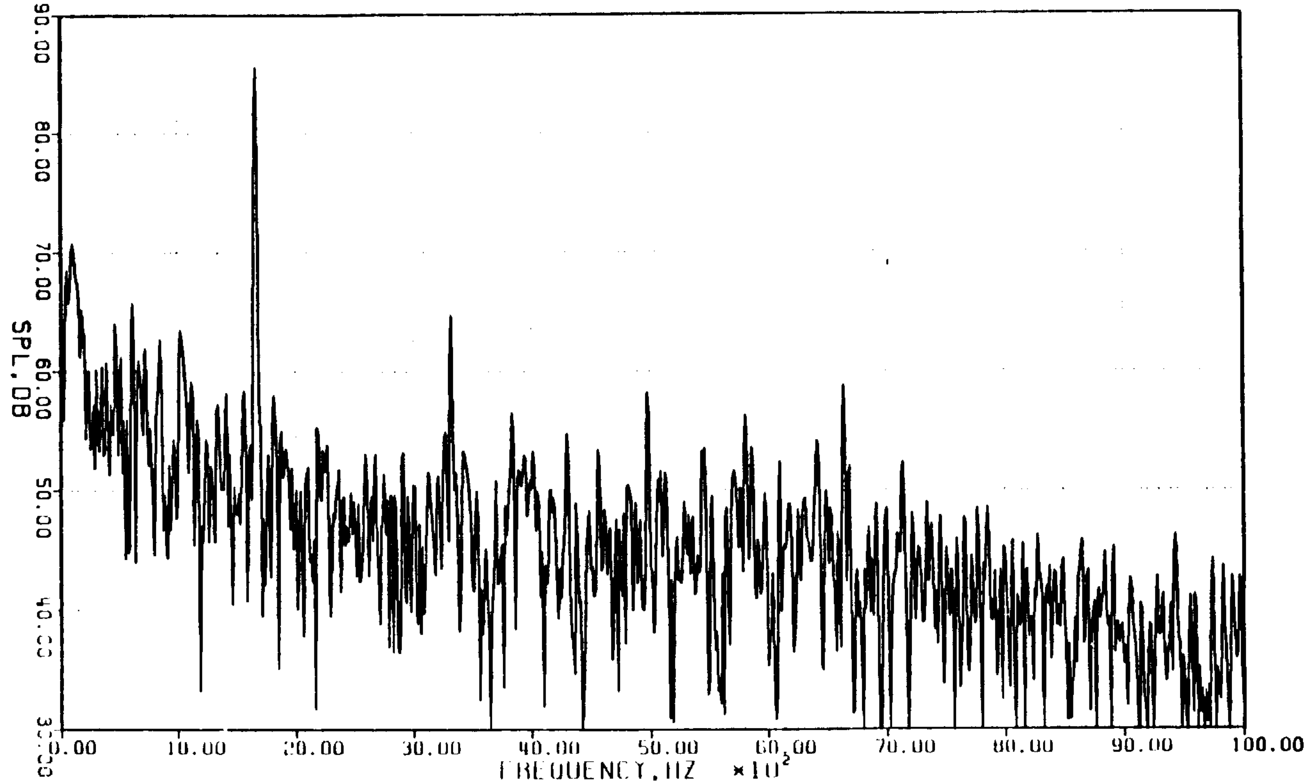
Appendix 9.3.12

ENHANCED SPECTRUM

120 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR =FAN = 3113



DATAFILE NAME: OP40243F DAT PLOT DATE 12-JUL-83 PLOT TIME 09:24:09

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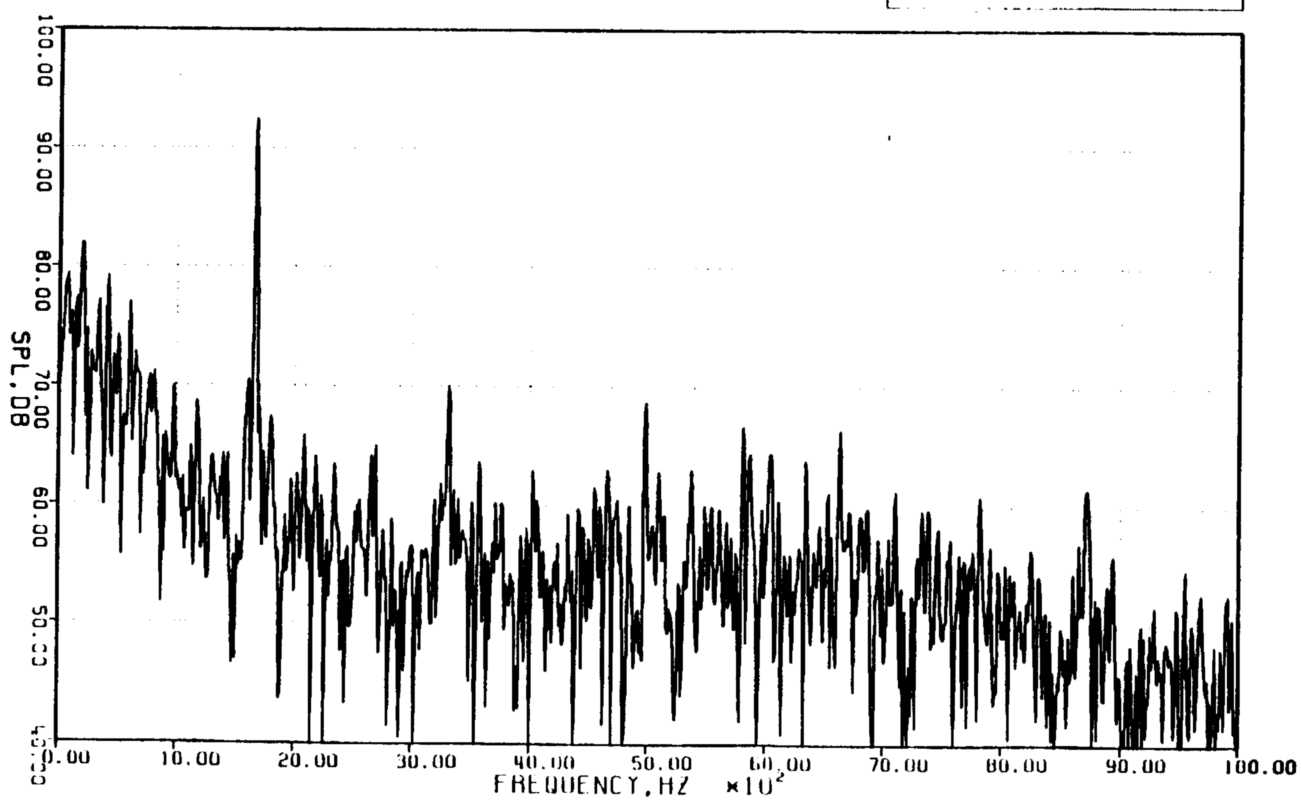
Appendix 9.3.13

ENHANCED SPECTRUM

130 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8 JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR -FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1-HANN)	=1
SENSOR PSI/VOLT	=0.0051
SENSOR GAIN (DB)	=0
SENSOR CALIB RMS	=0.91
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



DATAFILE NAME: OP40243G DAT   PLOT DATE 12-JUL-83   PLOT TIME 09:24:53

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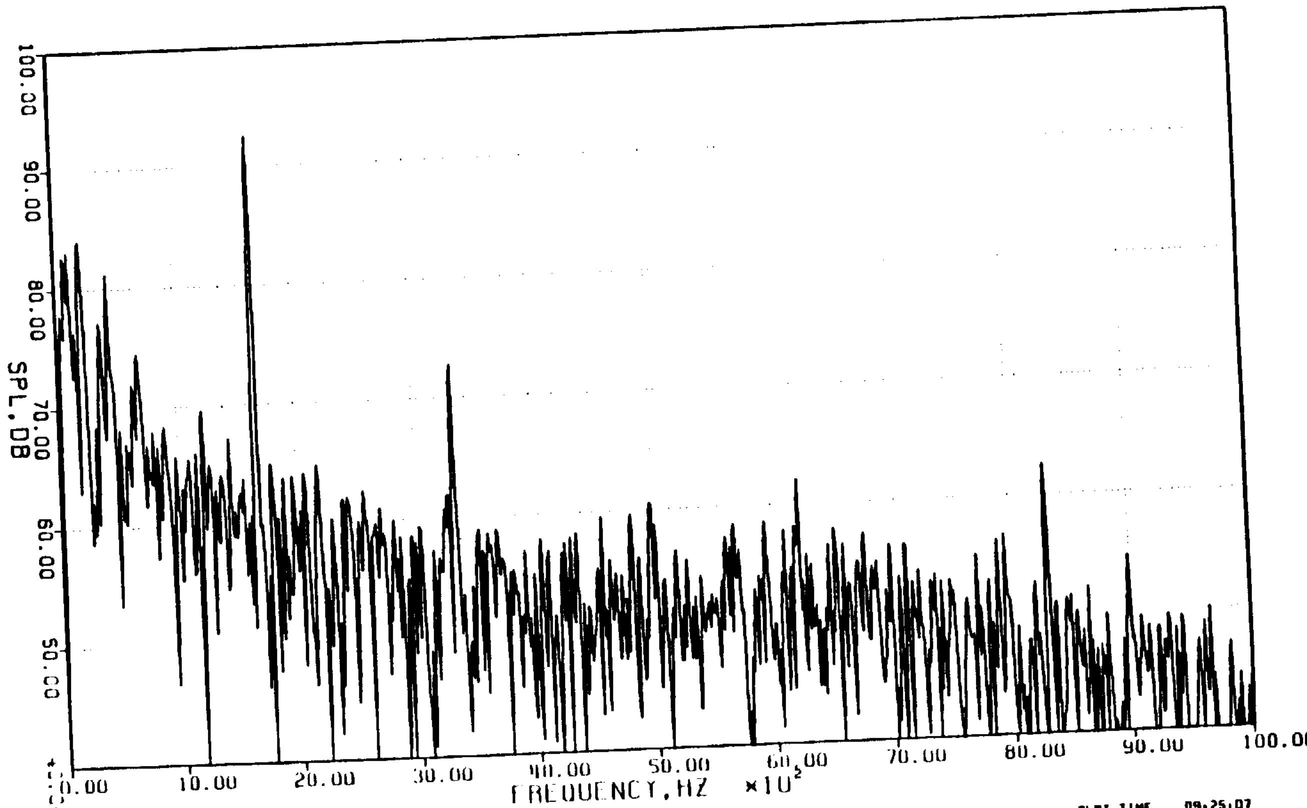
Appendix 9.3.14

ENHANCED SPECTRUM

140 DEG G/P
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR -FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=66.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.60
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.0049
SENSOR GAIN (DB)	=0
SENSOR CAL 10 RMS	=0.94
SENSOR CAL REF	=124
SENSOR DIST (FT)	=150.0



PLOT DATE 12-JUL-83 PLOT TIME 09:25:07

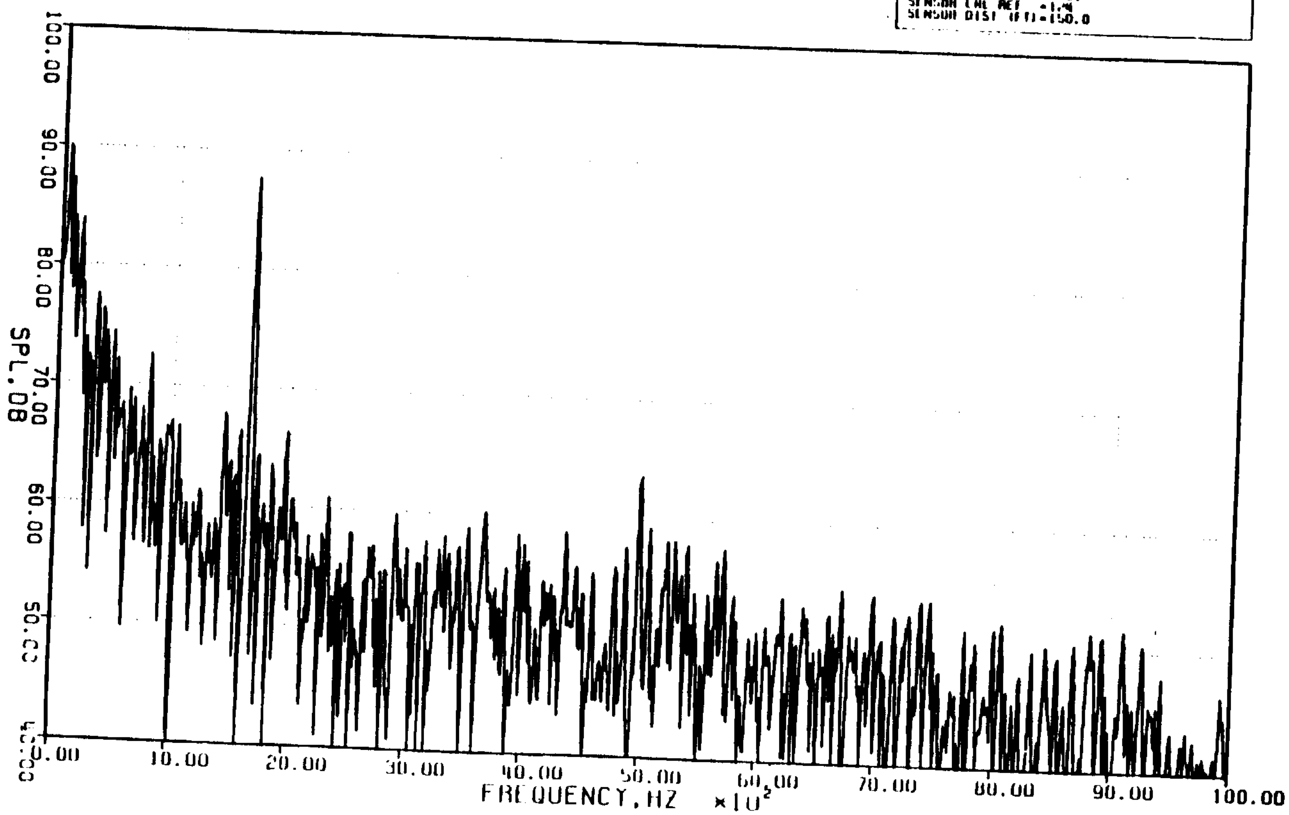
DATAFILE NAME: DP402436 DAT

Appendix 9.3.15

ENHANCED SPECTRUM

150 DEG G/P
E CUBED PEEBLES TEST.
CONFIG =1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM. COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F)=65.8
TEMP WET (DEG.F)=54.5
BARO PRESS ("HG)=29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER(KHZ) =10.000
RECORD TIME(SEC)=8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1-HANN) =1
SENSOR PSI/VOLT =0.0051
SENSOR GAIN (DB)=0
SENSOR CALIB RMS=0.91
SENSOR CAL REF =1.4
SENSOR DIST (FT)=150.0



DATAFILE NAME: UP40243H DAT

PLOT DATE 12-JUL-83 PLOT TIME 08:25:51

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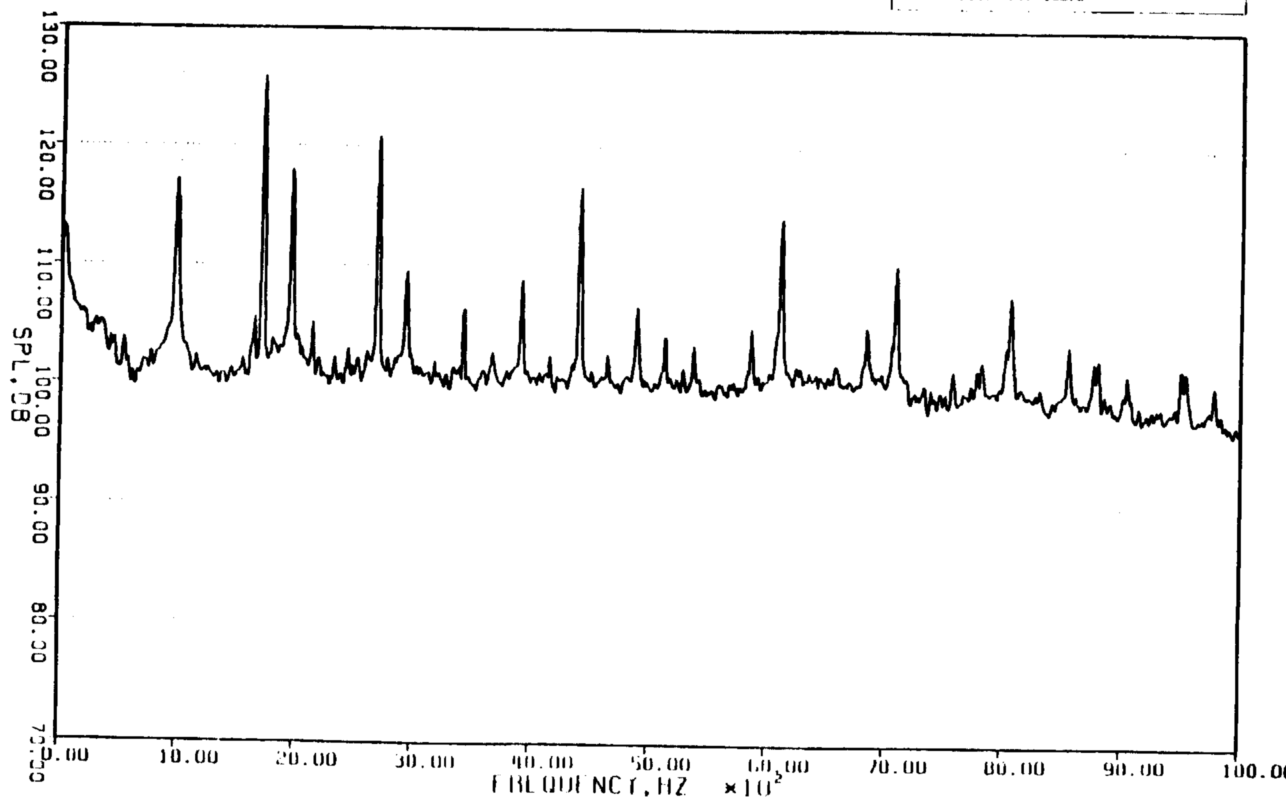
9.4 AVERAGED SPECTRUM

Appendix 9.4.1

AVERAGED SPECTRUM

KULITE PX10LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 1831 RPM. CORE = 10910 RPM

RUN NO.	=7
POINT NO.	=237
BPF	=977
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0316
SENSOR GAIN (DB)	=30
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



DATAFILE NAME, DPS02371.DAT

PLOT DATE 11-JUL-83 PLOT TIME 16:34:17

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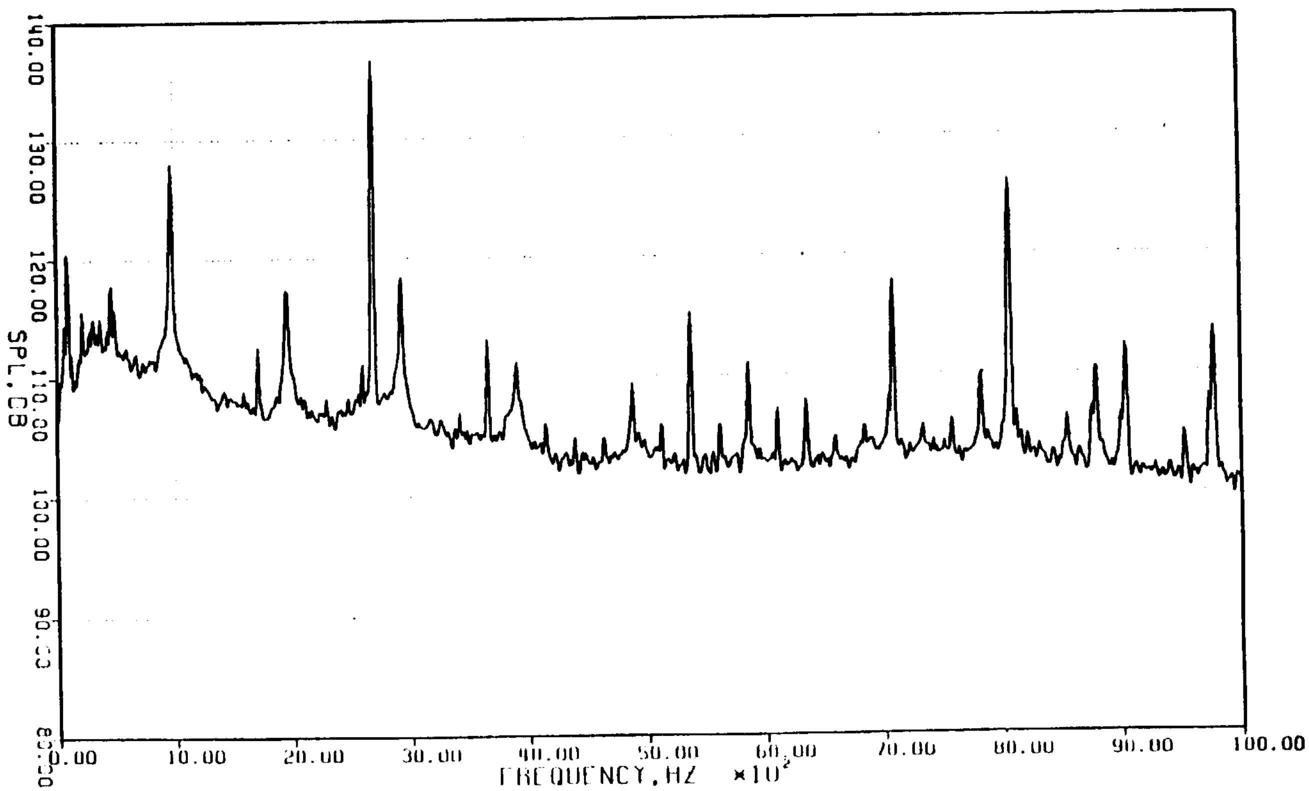
Appendix 9.4.2

AVERAGED SPECTRUM

KULITE PX12LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 1831 RPM. CORE = 10910 RPM

RUN NO. =7
POINT NO. =237
BPF =977
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER(KHZ) =10.000
RECORD TIME(SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW(1-HANN) =1
SENSOR PSI/VOLT =0.1000
SENSOR GAIN (DB) =20
SENSOR CAL(V RMS) =1.00
SENSOR CAL AMP =171
SENSOR DIST (FT) =150.0



DATAFILE NAME: DPS02371 DAT

PLOT DATE 11-JUL-83 PLOT TIME 16:34:30

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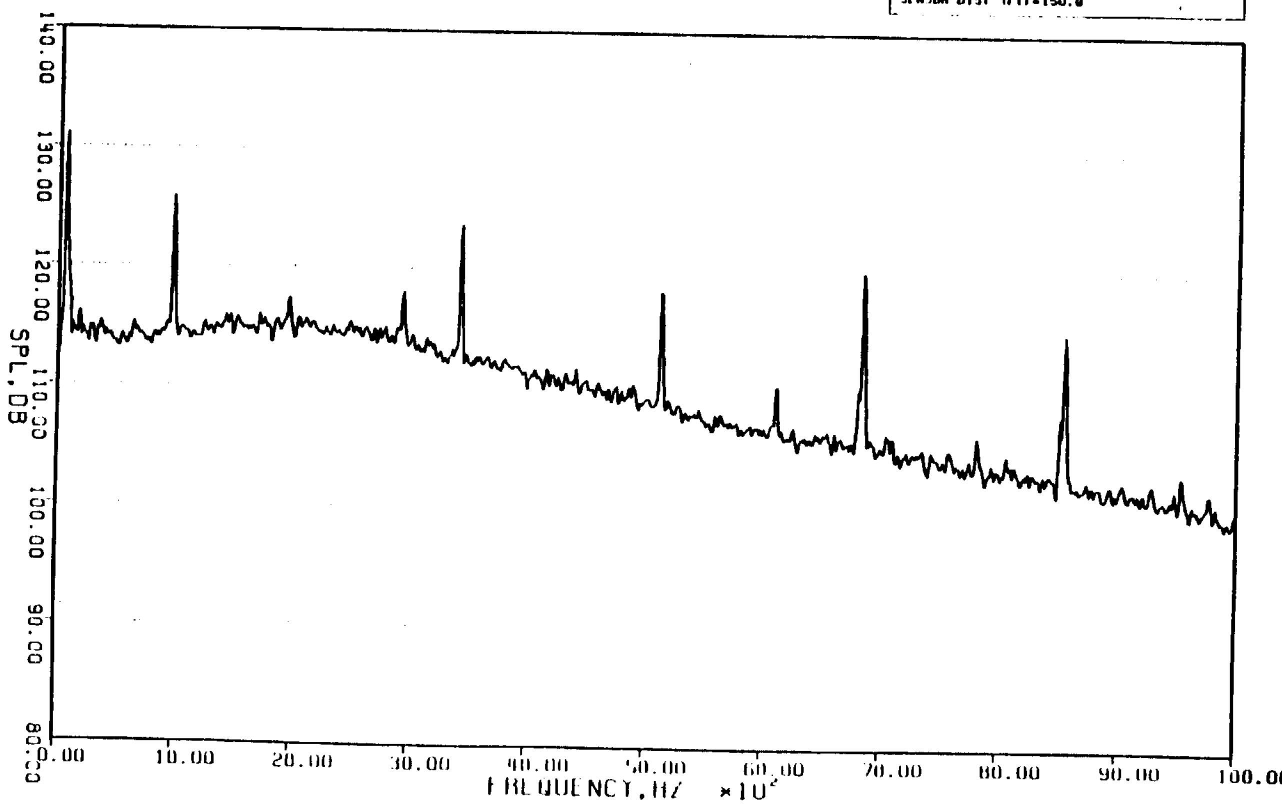
Appendix 9.4.3

AVERAGED SPECTRUM

KULITE PX12LE
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 1831 RPM. CORE = 10910 RPM

RUN NO.	=7
POINT NO.	=237
BPF	=977
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
AMB PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=0
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR (PSI/VOLT)	=0.1000
SENSOR GAIN (DB)	=20
SENSOR CAL IN RMS	=1.00
SENSOR CAL (DB)	=171
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DPS02373.DAT

PLOT DATE 11-JUL-83 PLOT TIME 16:35:14

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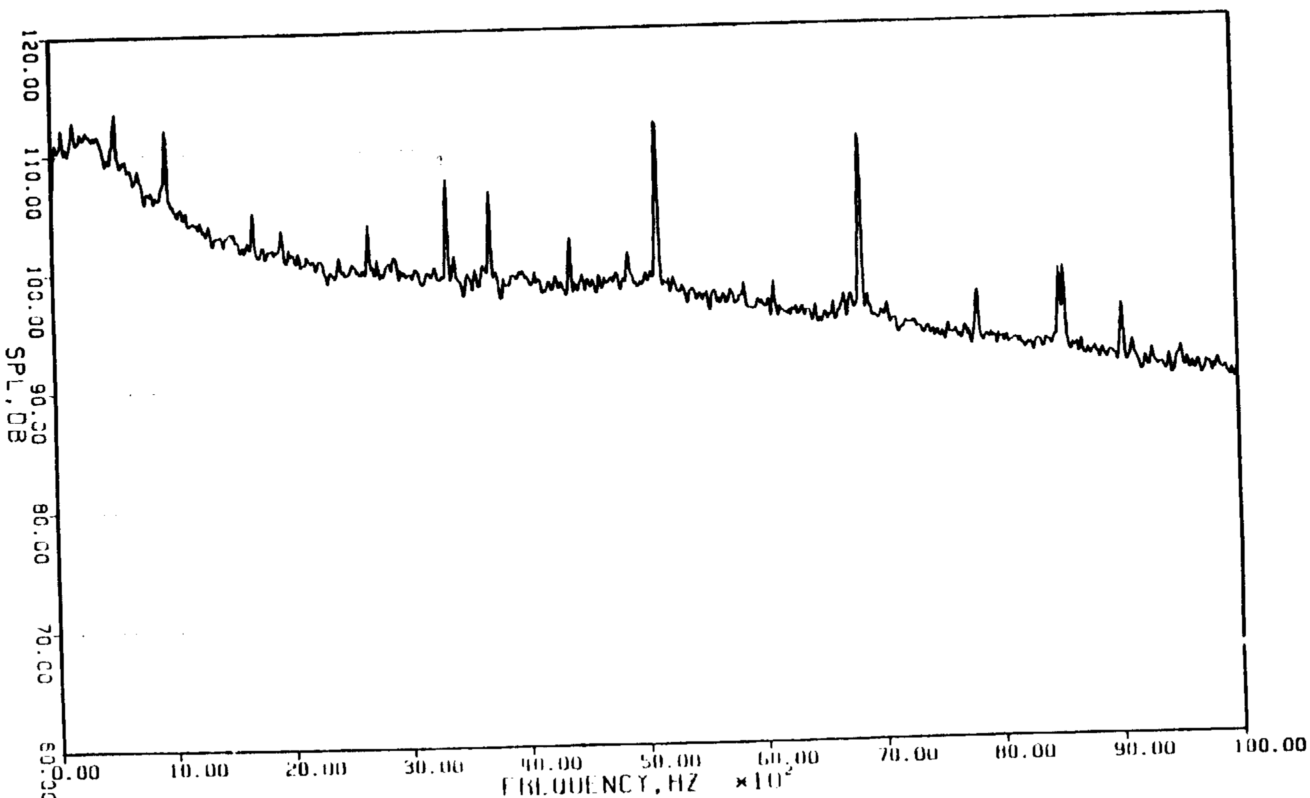
Appendix 9.4.4

AVERAGED SPECTRUM

KULITE PX14LF
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 1831 RPM. CORE = 10910 RPM

RUN NO.	=7
POINT NO.	=237
BPF	=977
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.0316
SENSOR GAIN (DB)	=30
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



DATAFILE NAME: DP50237J DAT

PLOT DATE 11-JUL-83 PLOT TIME 16:35:28

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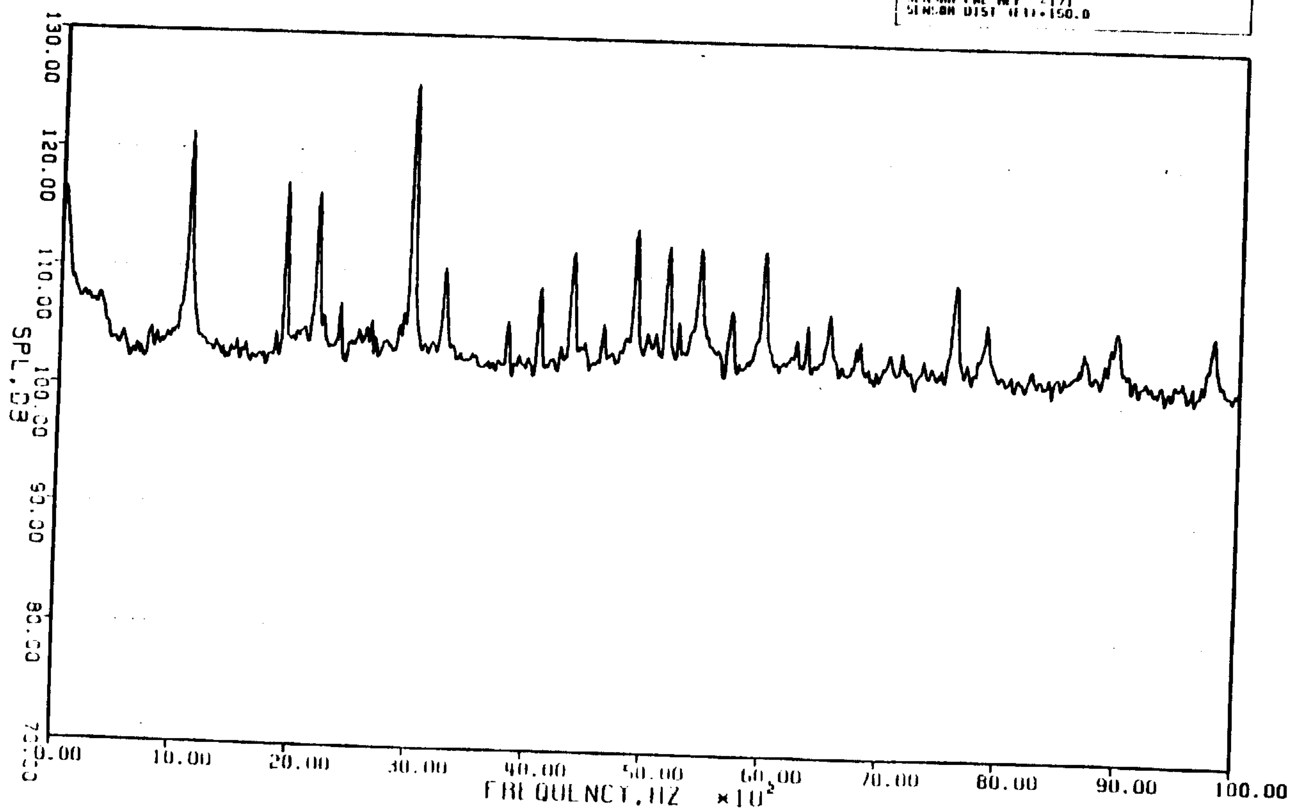
Appendix 9.4.5

AVERAGED SPECTRUM

KULITE PX10LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2037 RPM. CORE = 11250 RPM

RUN NO.	=8
POINT NO.	=230
BPF	=1086
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
[illegible] FILTER (KHZ)	=10.000
[illegible] TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1=HANN)	=1
SENSOR PSI/VOLT	=0.1000
SENSOR GAIN (DB)	=20
SENSOR CAL TO RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



DATAFILE NAME, DP50230T DAT

PLOT DATE 11-JUL-83 PLOT TIME 21:23:59

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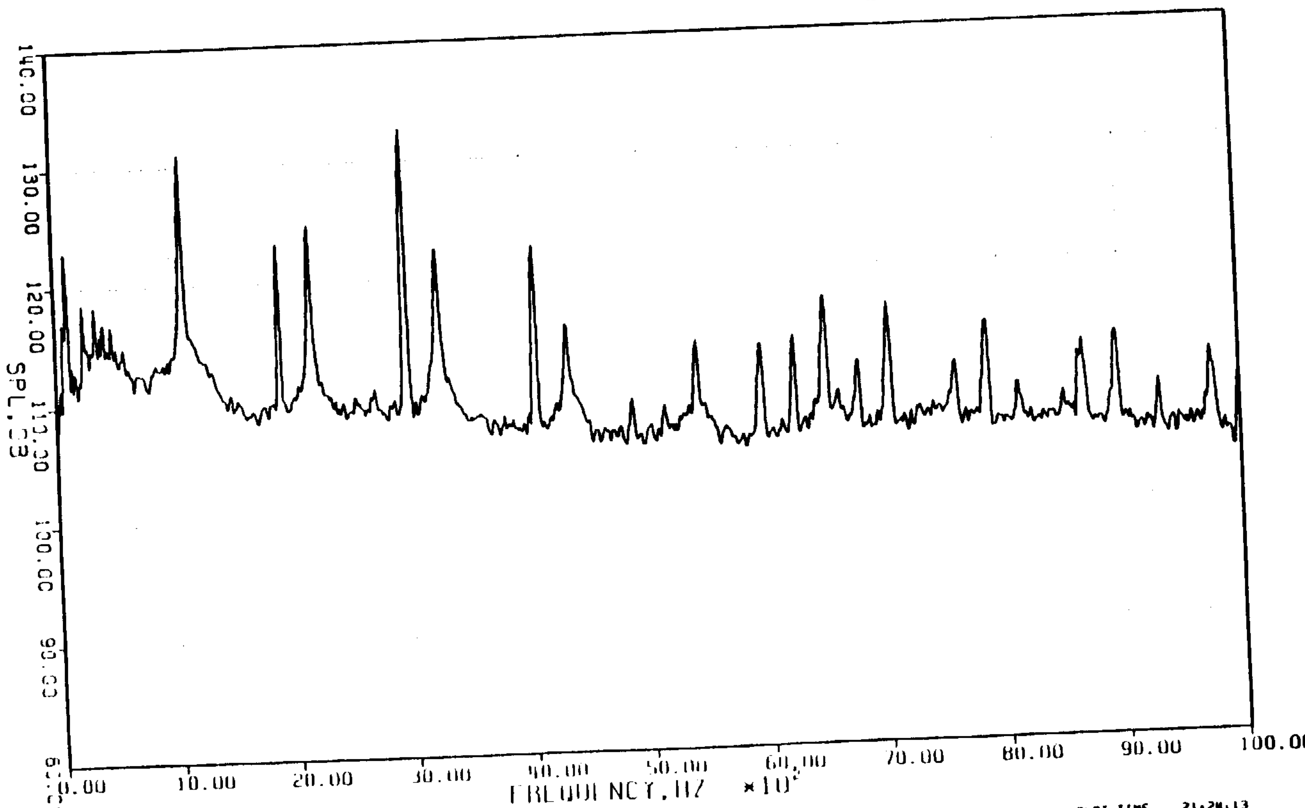
Appendix 9.4.6

AVERAGED SPECTRUM

RUN NO.	=8
POINT NO.	=238
BPF	=1086
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1-HANN)	=1
SENSOR PSI/VOLT	=0.1000
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0

KULITE PX12LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2037 RPM, CORE = 11250 RPM



PLOT DATE 11-JUL-83 PLOT TIME 21:24:13

DATAFILE NAME: DP502381 DAT

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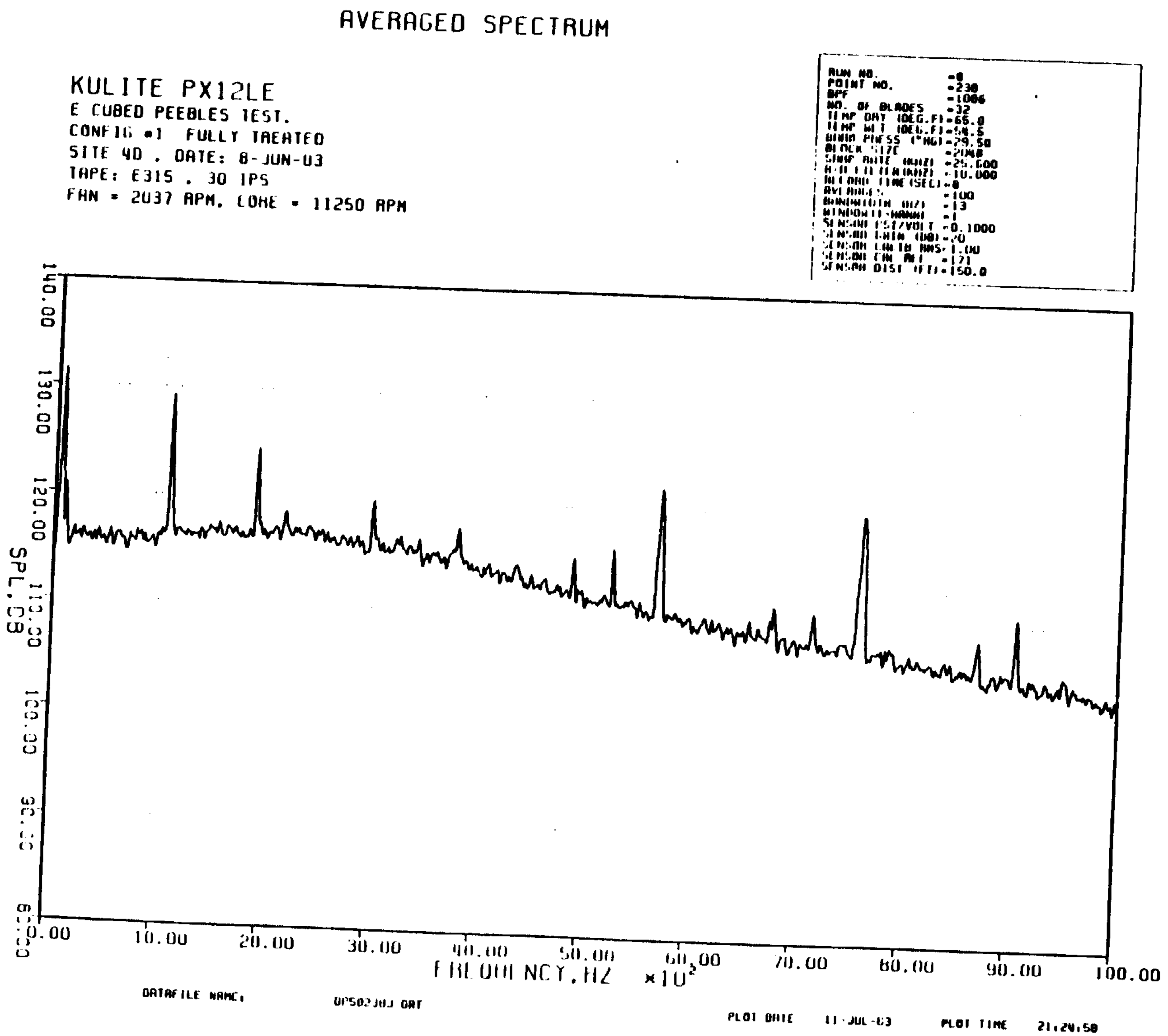
Appendix 9.4.7

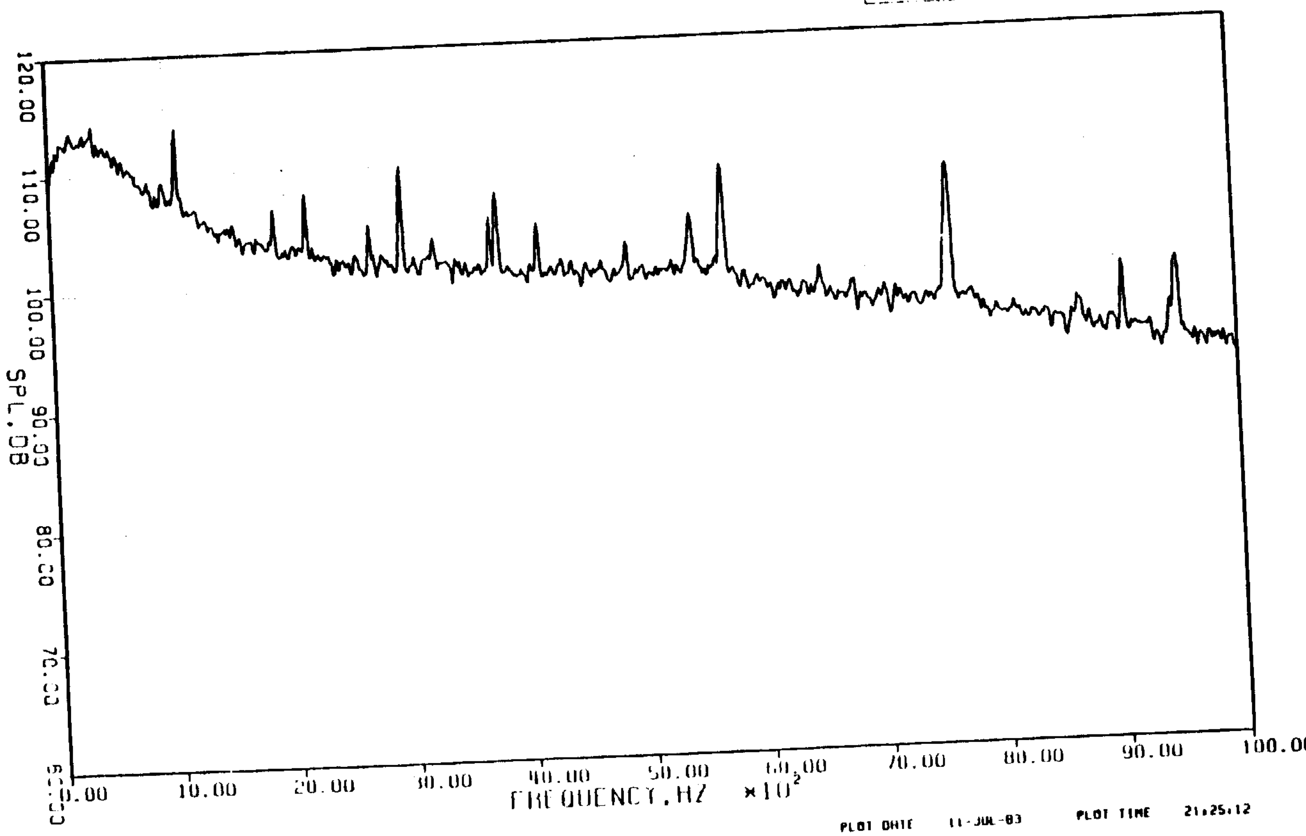


Appendix 9.4.8

AVERAGED SPECTRUM

KULITE PX14LF
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2037 RPM. CORE = 11250 RPM

RUN NO. =8
POINT NO. =230
BPF =1086
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1=HANN) =1
SENSOR PSI/VOLT =0.0316
SENSOR GAIN (DB) =30
SENSOR CALIB RMS=1.00
SENSOR CAL REF =171
SENSOR DIST (FT) =150.0



PLOT DATE 11-JUL-83 PLOT TIME 21:25:12

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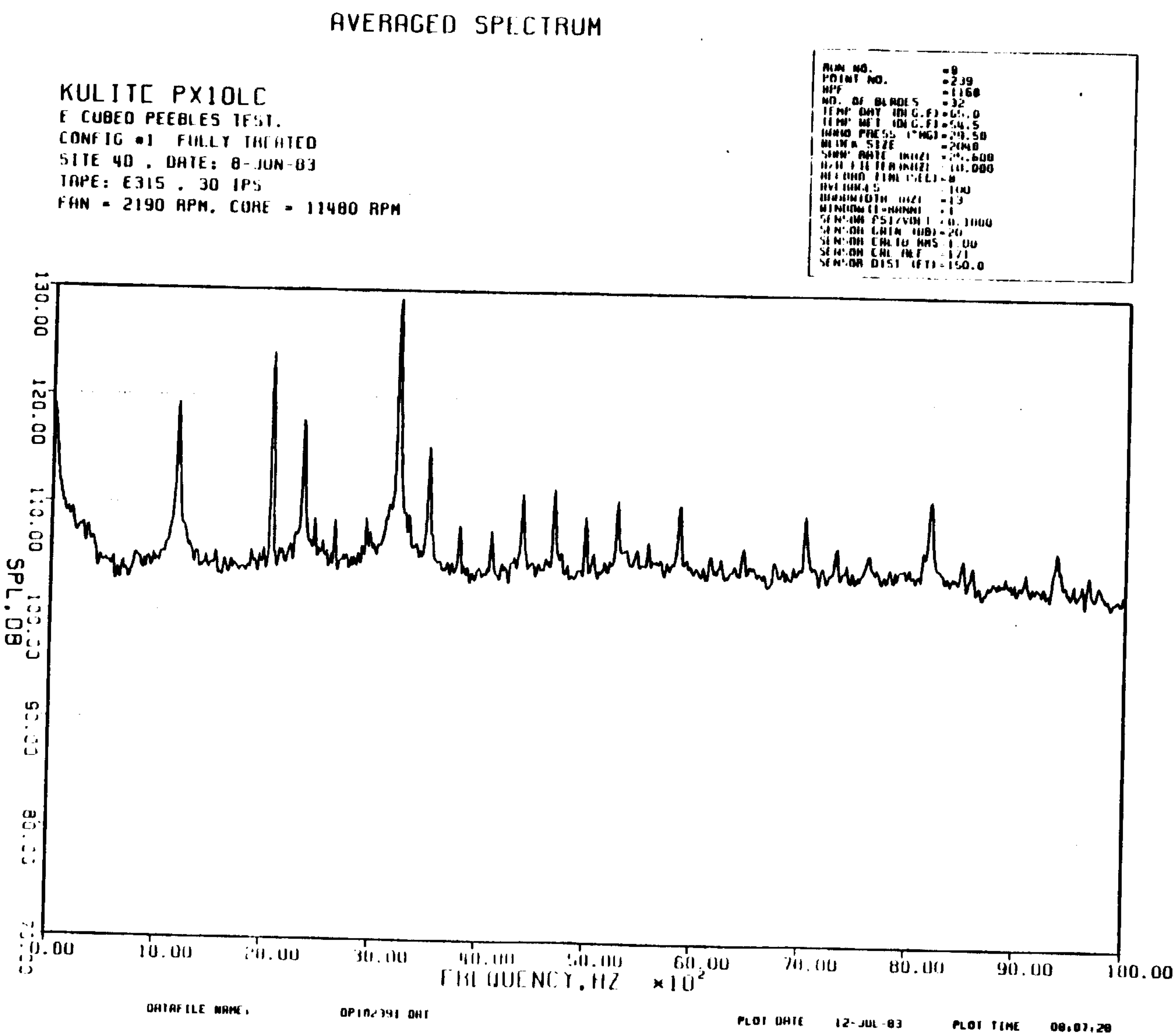
Appendix 9.4.9



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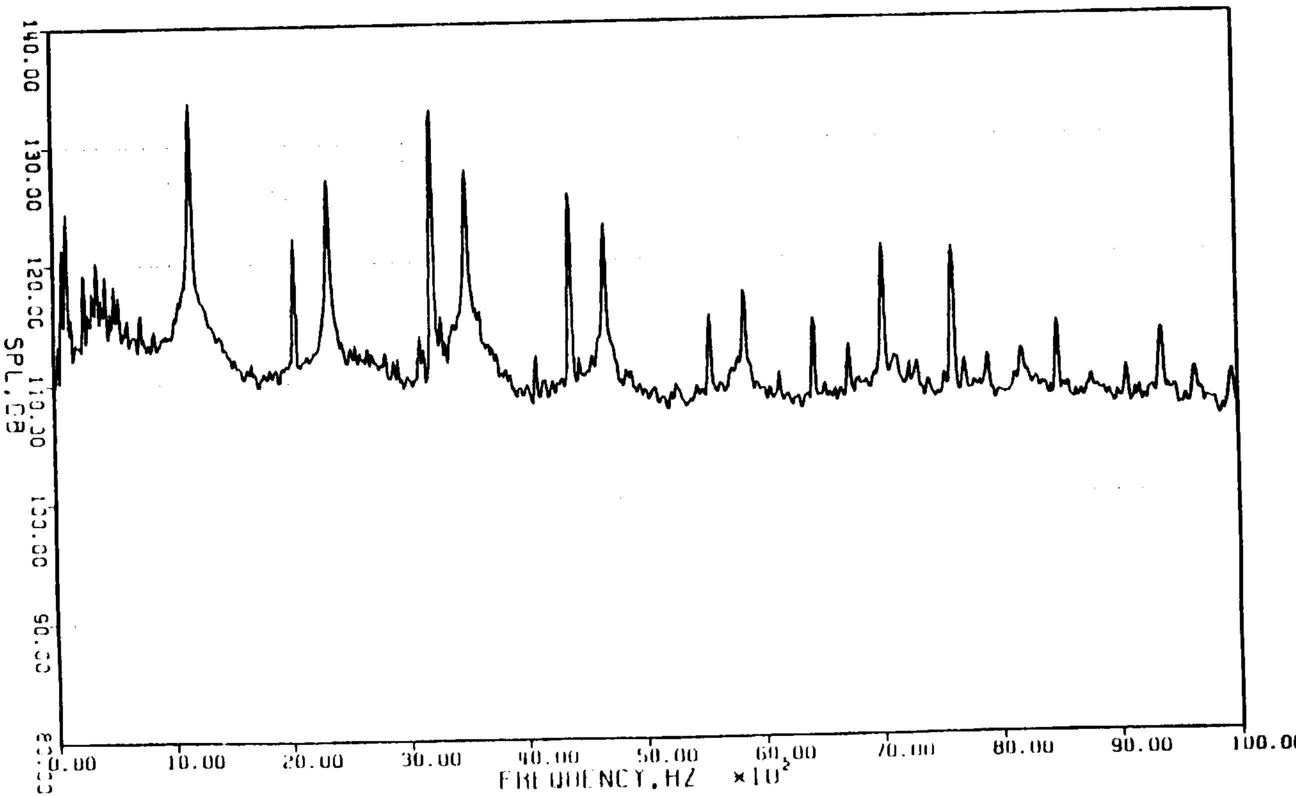
Appendix 9.4.10

AVERAGED SPECTRUM

KULITE PX12LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2190 RPM, CORE = 11480 RPM

RUN NO.	=9
POINT NO.	=239
BPF	=1168
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
AMB PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.1000
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



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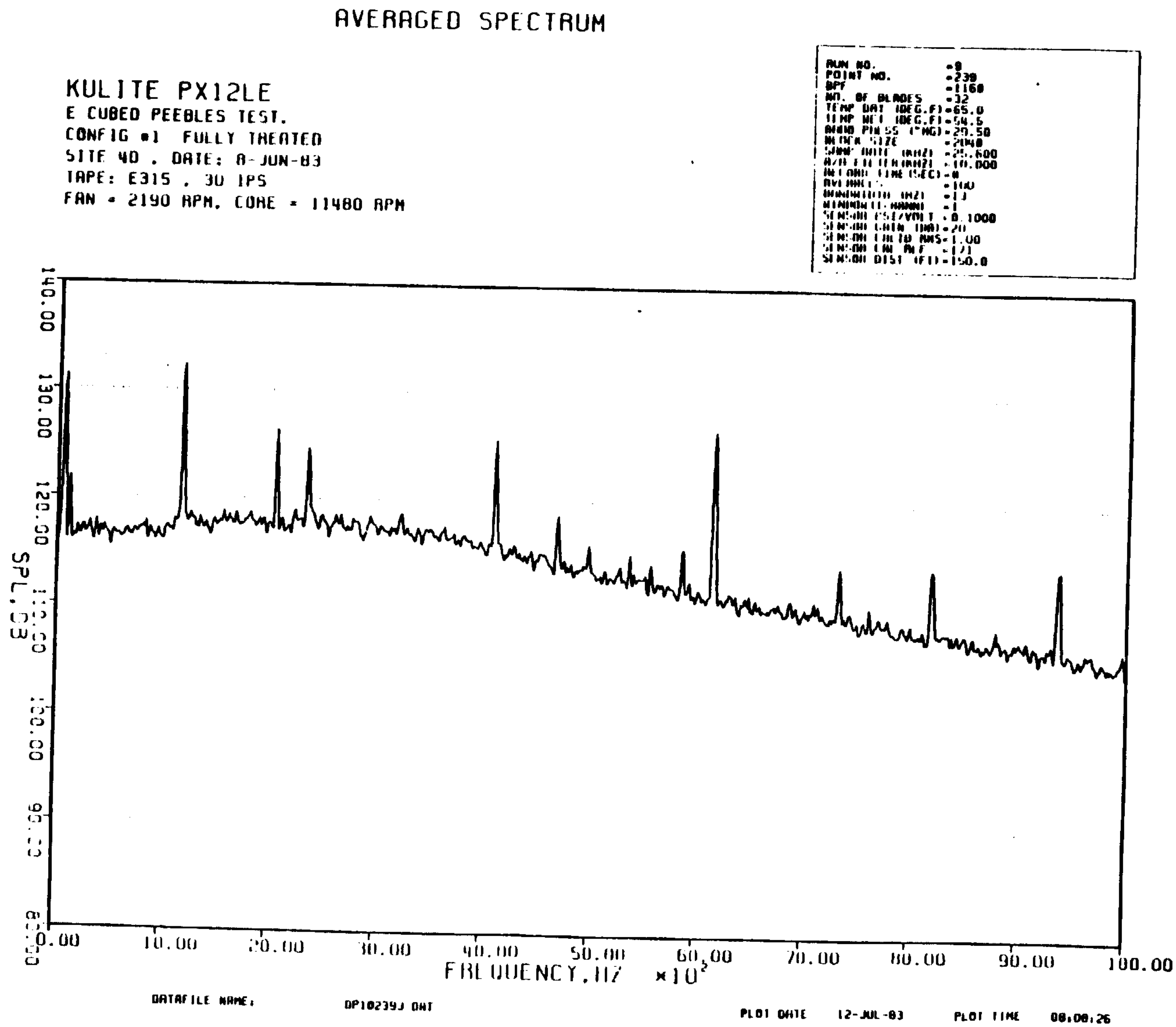
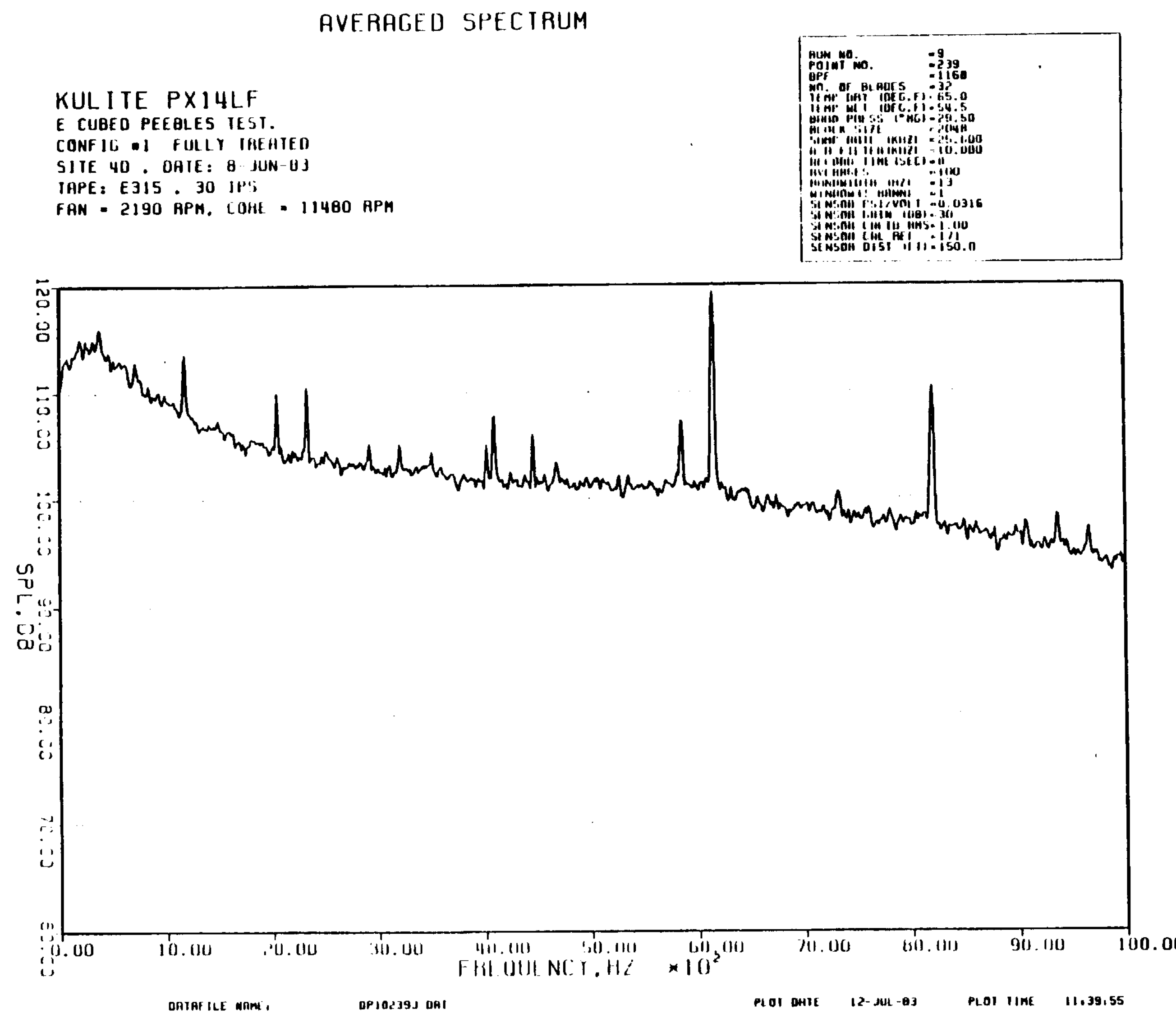
PLOT DATE 12-JUL-83 PLOT TIME 08:07:42

Appendix 9.4.11



Appendix 9.4.12



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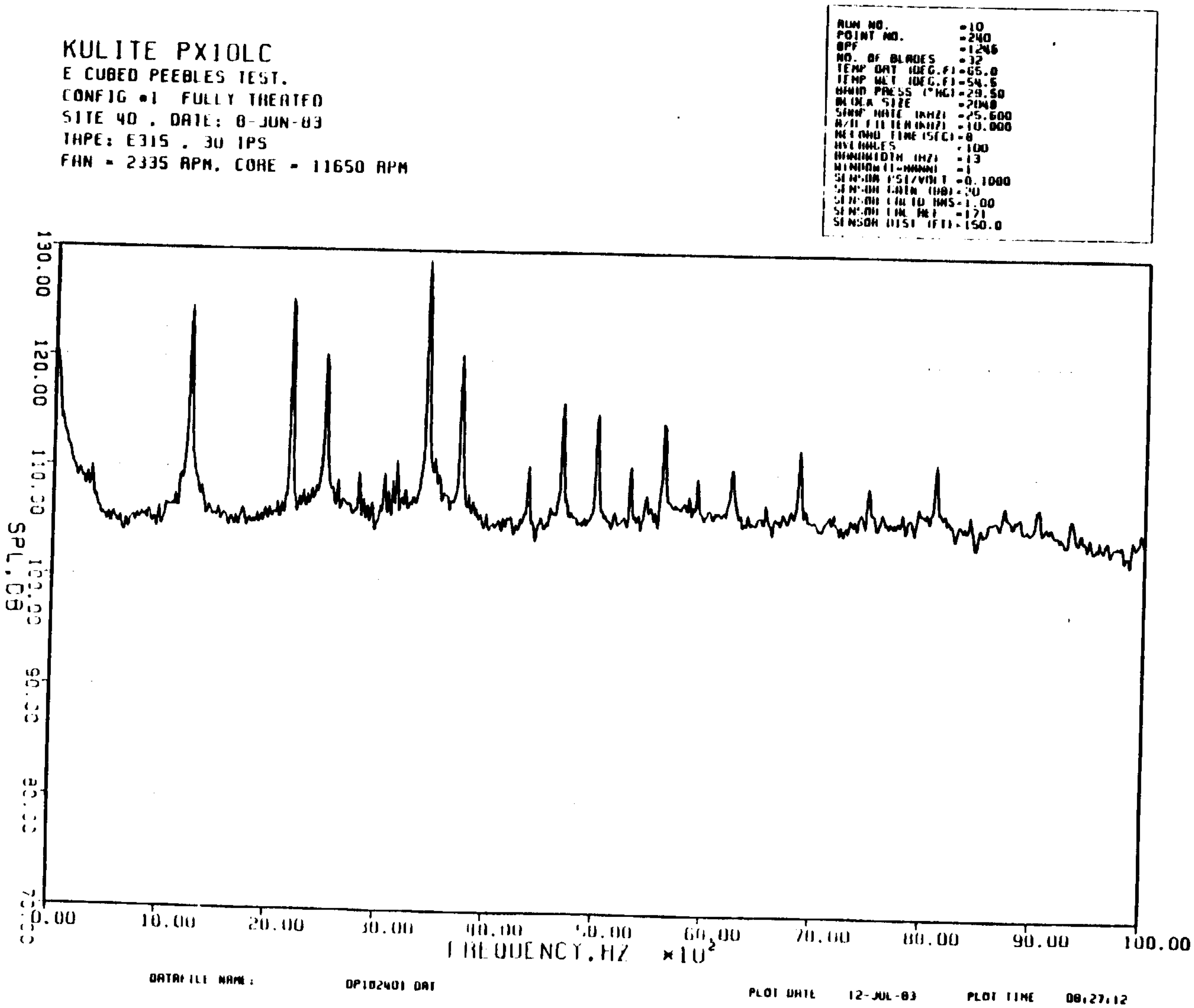
Appendix 9.4.13

AVERAGED SPECTRUM

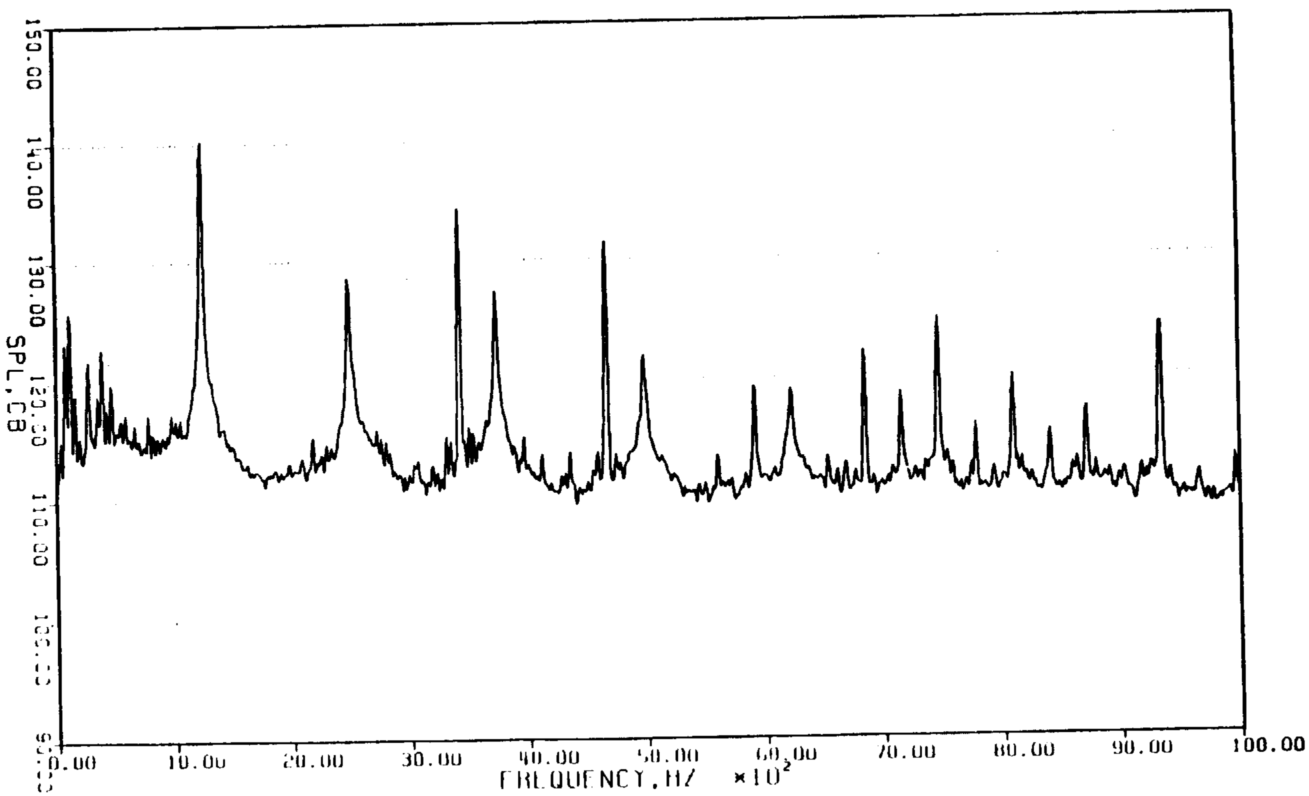


Appendix 9.4.14

AVERAGED SPECTRUM

KULITE PX12LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2335 RPM. CORE = 11650 RPM

RUN NO.	=10
POINT NO.	=240
BPF	=1245
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1-HANN)	=1
SENSOR PSI/VOLT	=0.1000
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=1.00
SENSOR CHL NO.	=171
SENSOR DIST (FT)	=150.0



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PLOT DATE 12-JUL-83 PLOT TIME 08:27:26

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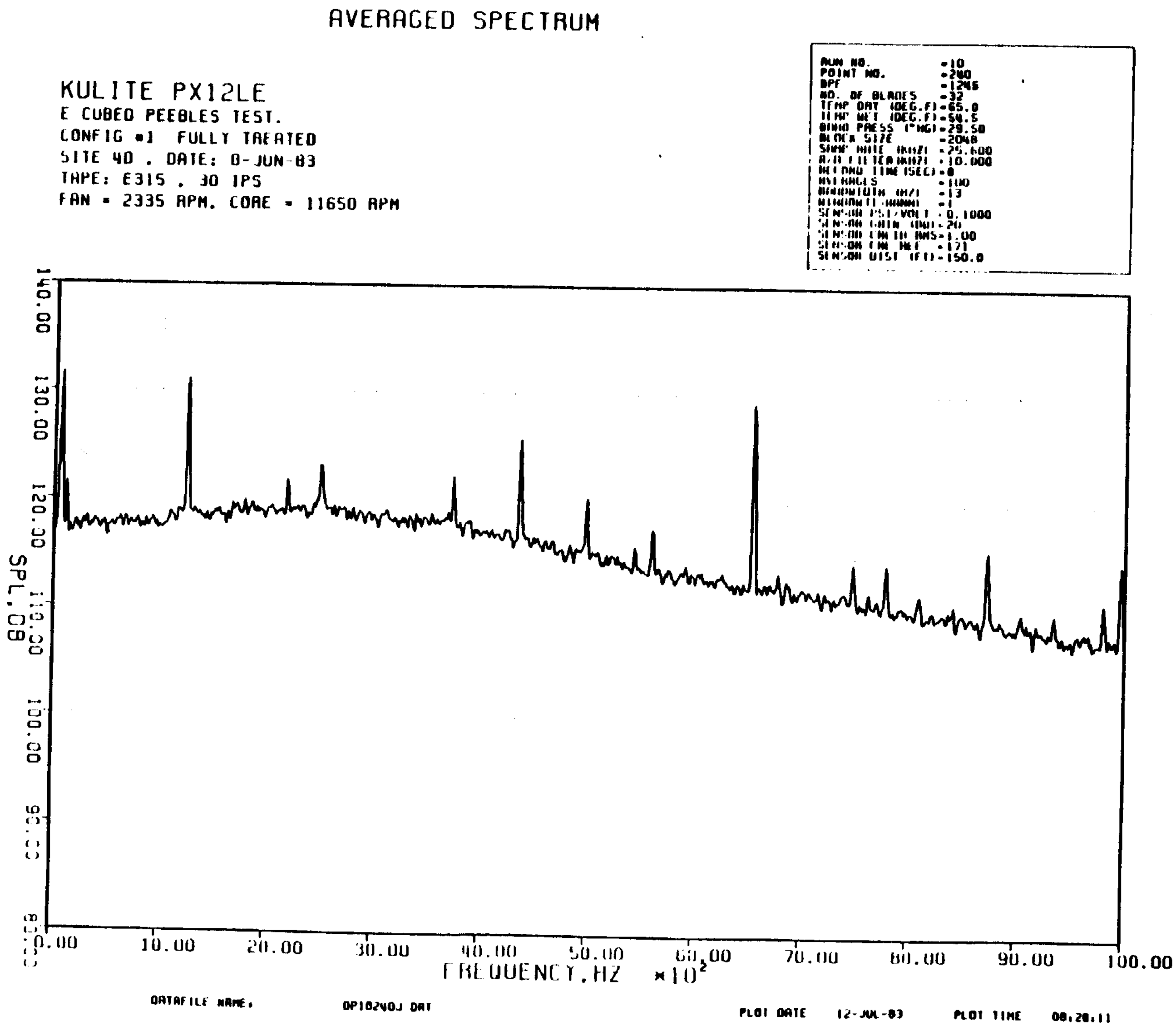
Appendix 9.4.15



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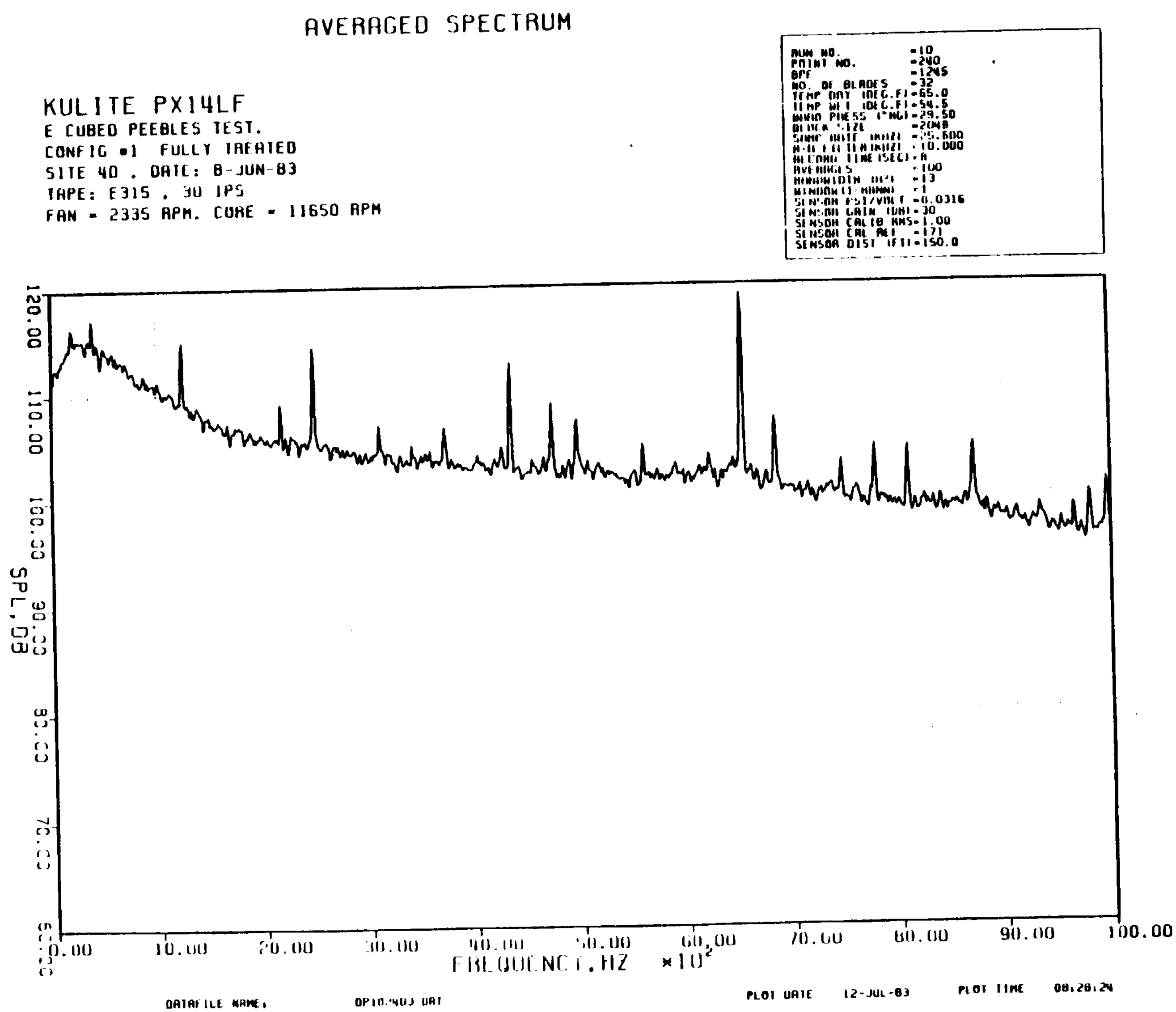
Appendix 9.4.16



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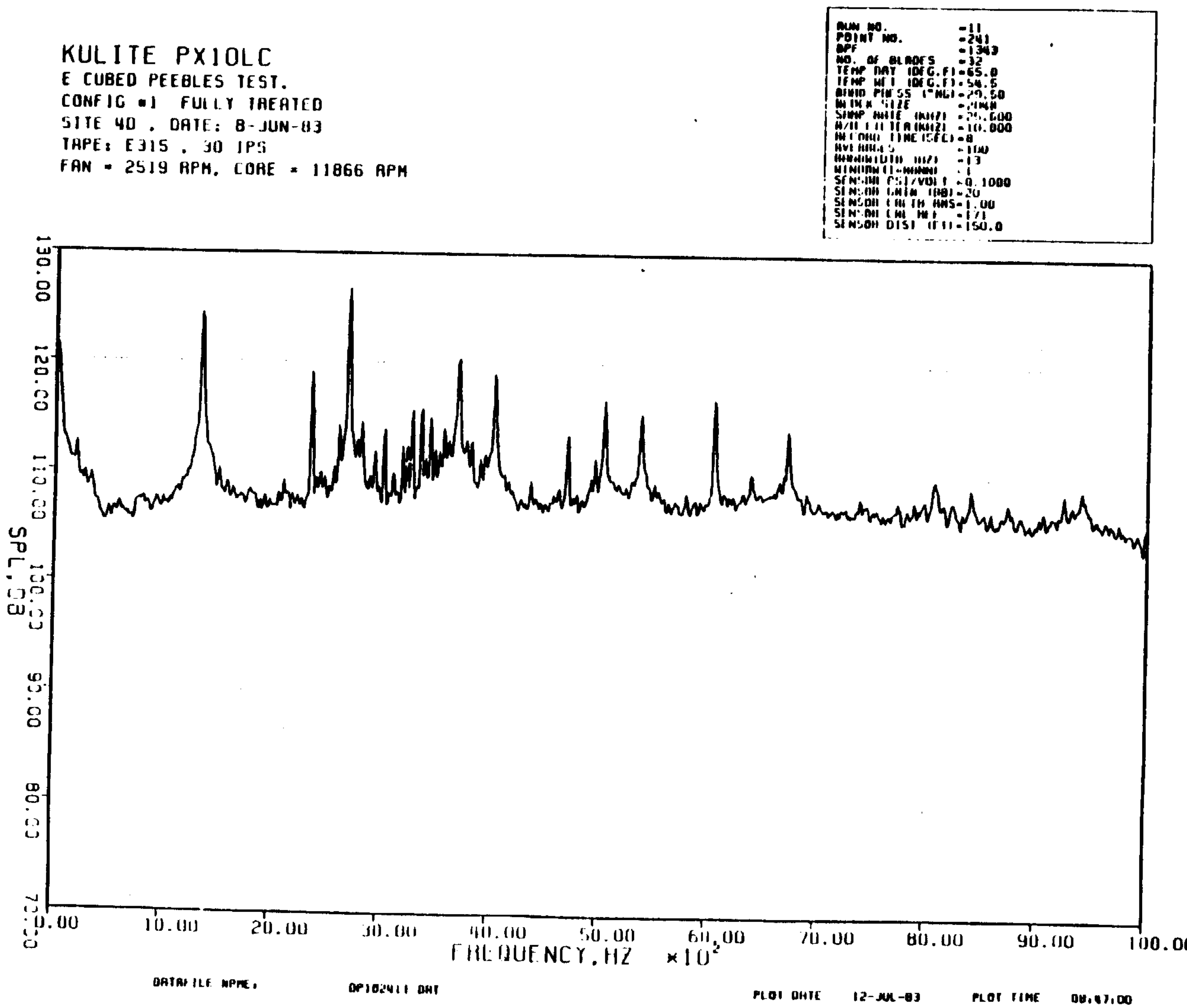
Appendix 9.4.17

AVERAGED SPECTRUM



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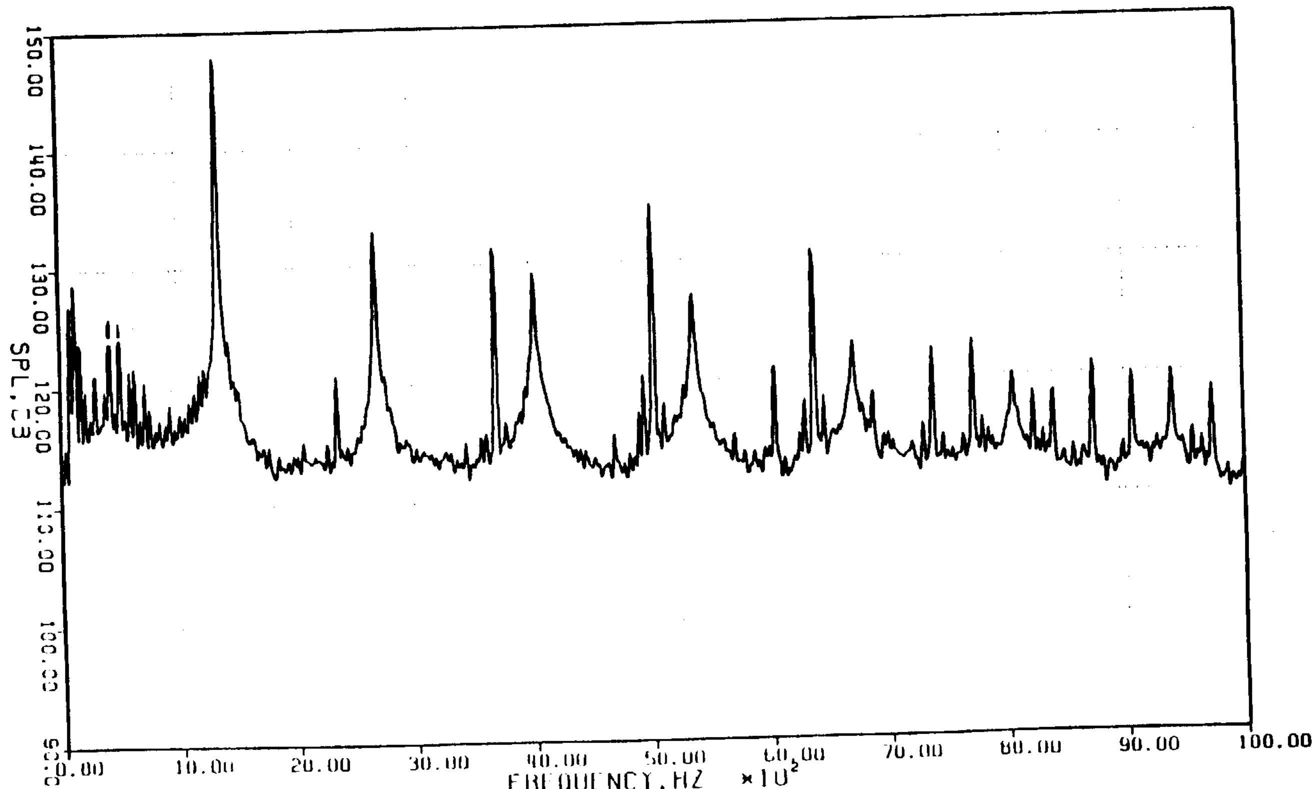
Appendix 9.4.18

AVERAGED SPECTRUM

KULITE PX12LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2519 RPM. CORE = 11866 RPM

RUN NO.	=11
POINT NO.	=241
BPF	=1343
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.3162
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



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PLOT DATE 12-JUL-83 PLOT TIME 08:47:14

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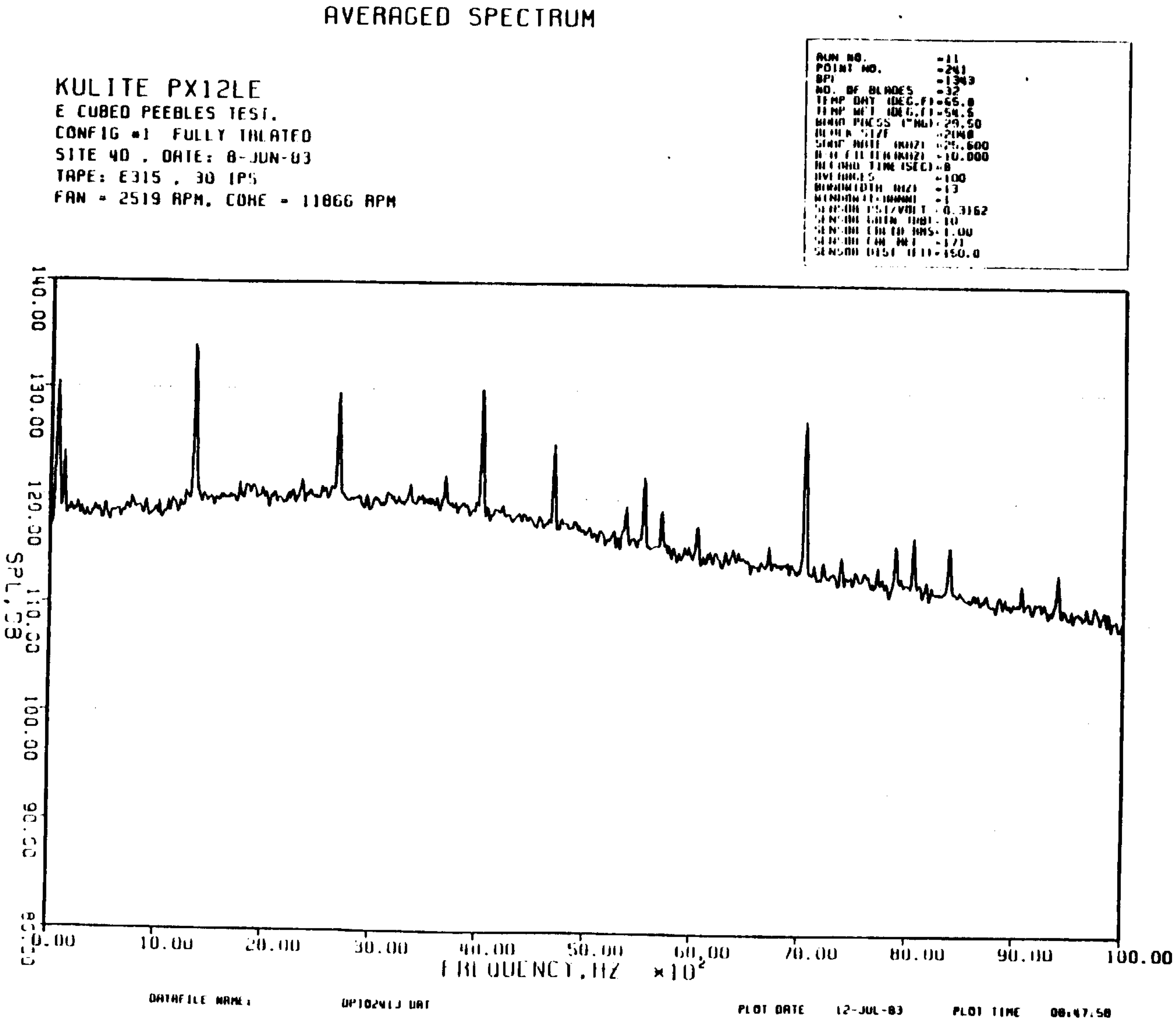
Appendix 9.4.19



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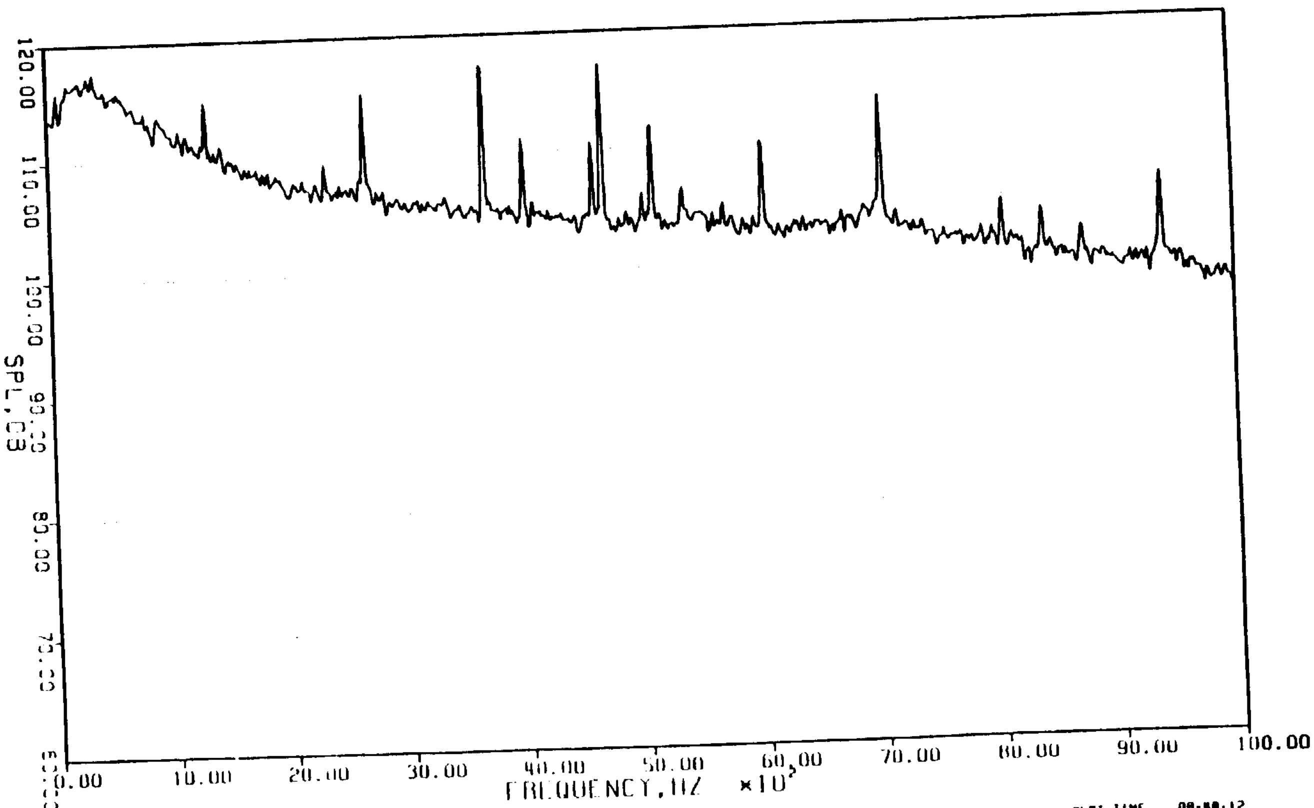
Appendix 9.4.20

AVERAGED SPECTRUM

KULITE PX14LF
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2519 RPM, CORE = 11866 RPM

RUN NO.	=11
POINT NO.	=241
BPF	=1343
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=0
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1 HANN)	=1
SENSOR PSI/VOLT	=0.1000
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



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PLOT DATE 12-JUL-83 PLOT TIME 08:48:12

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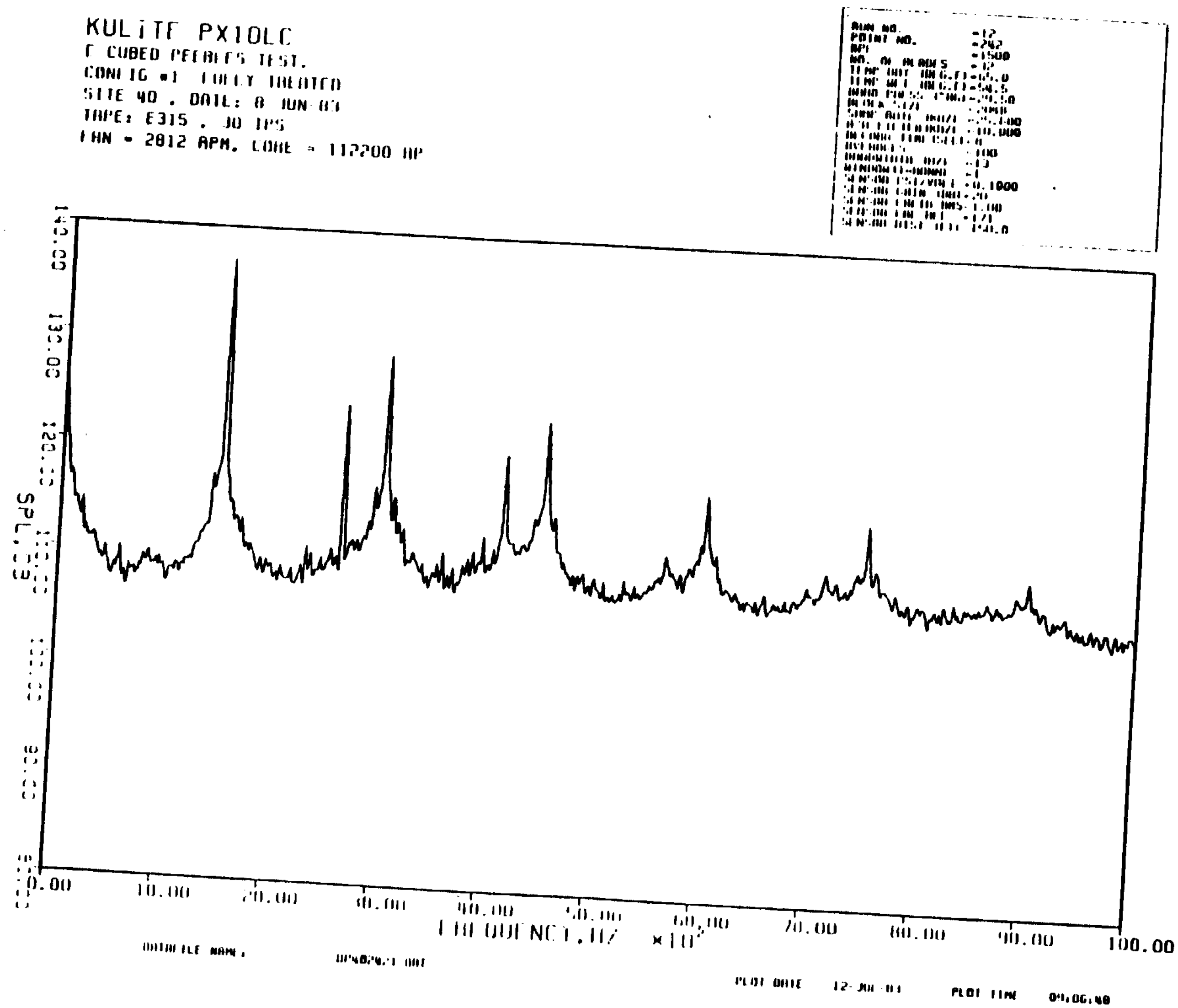
Appendix 9.4.21

AVERAGED SPECTRUM



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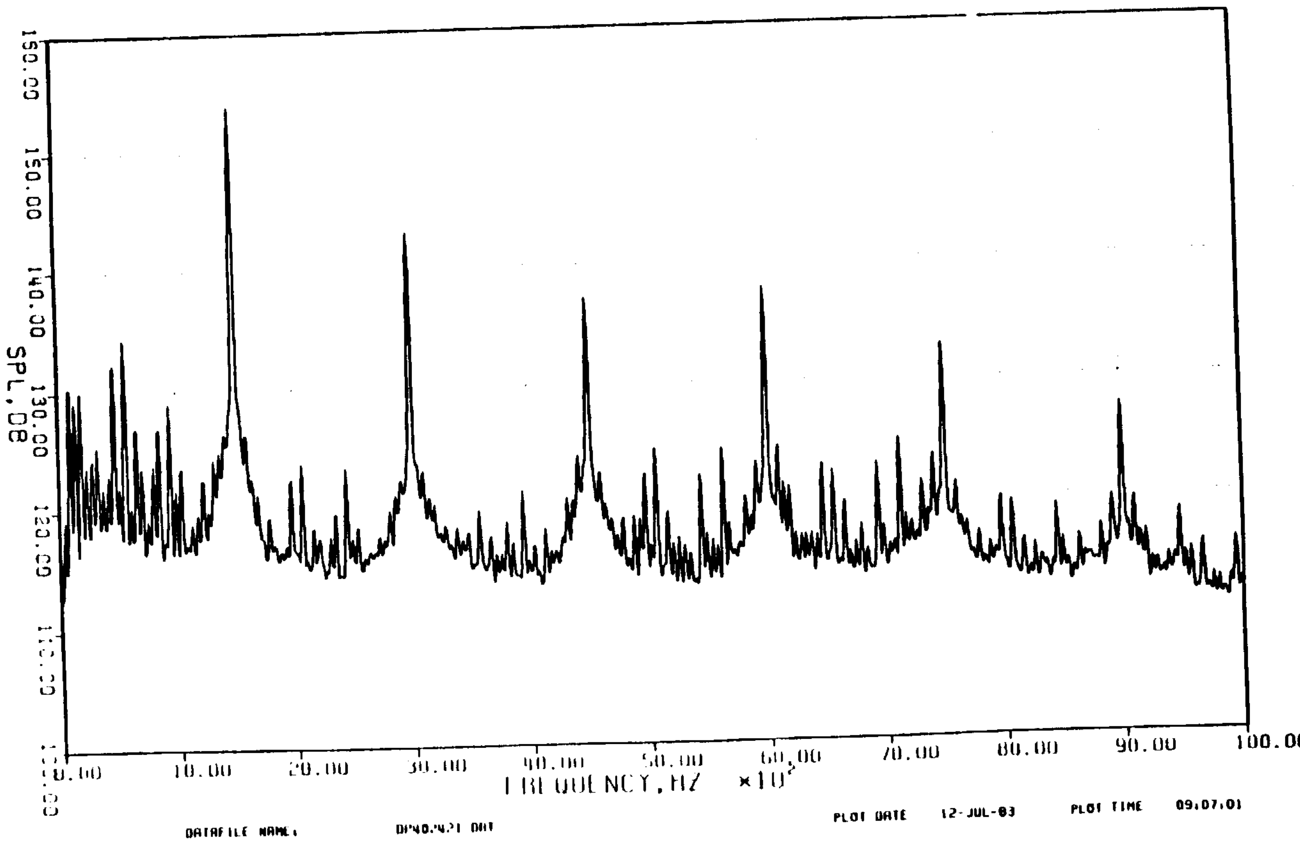
Appendix 9.4.22

AVERAGED SPECTRUM

KULITE PX12LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 2812 RPM, CORE = 112200 RP

RUN NO.	=12
POINT NO.	=242
BPF	=1500
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1-HANN)	=1
SENSOR PSI/VOLT	=0.3162
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



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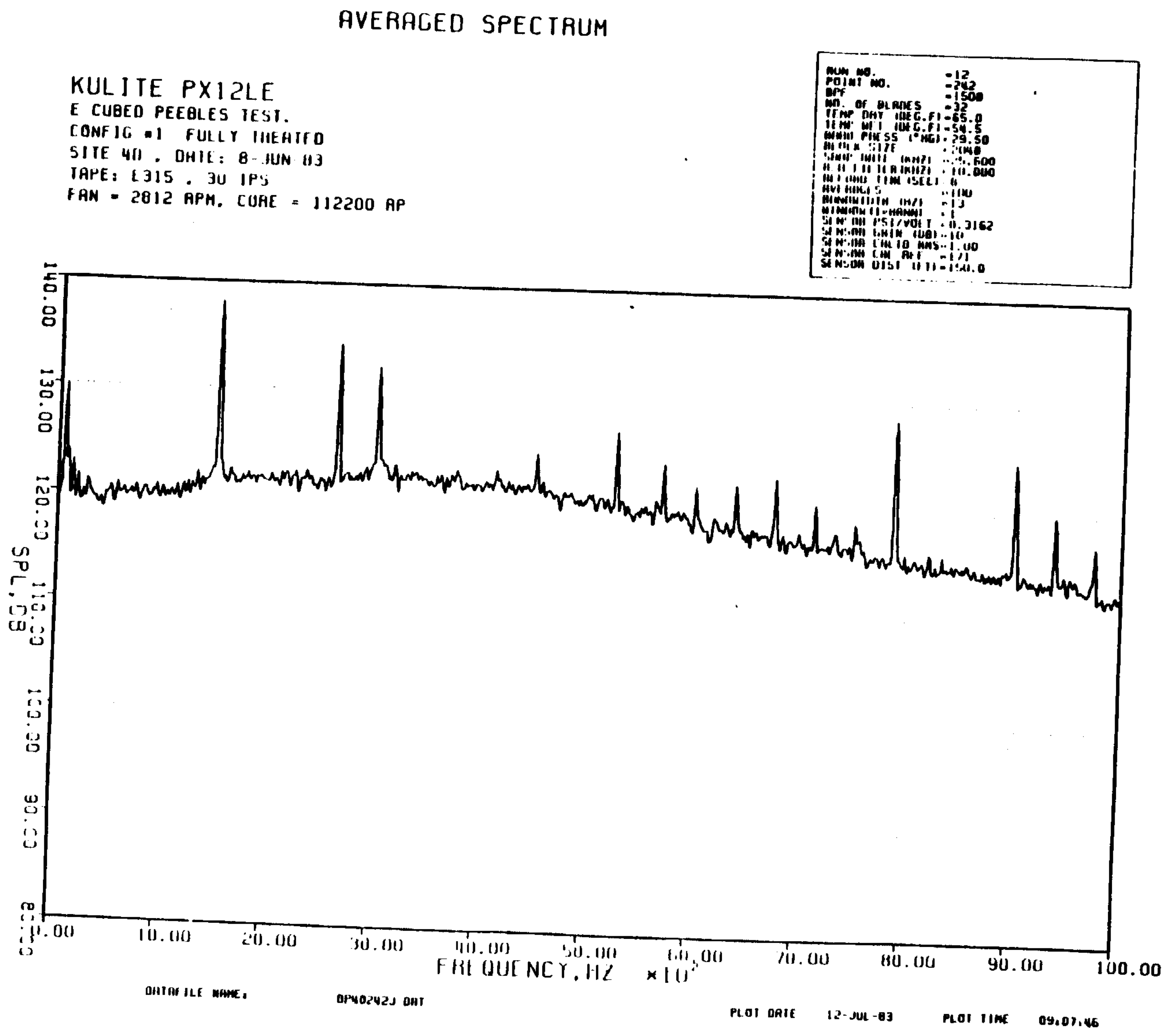
Appendix 9.4.23



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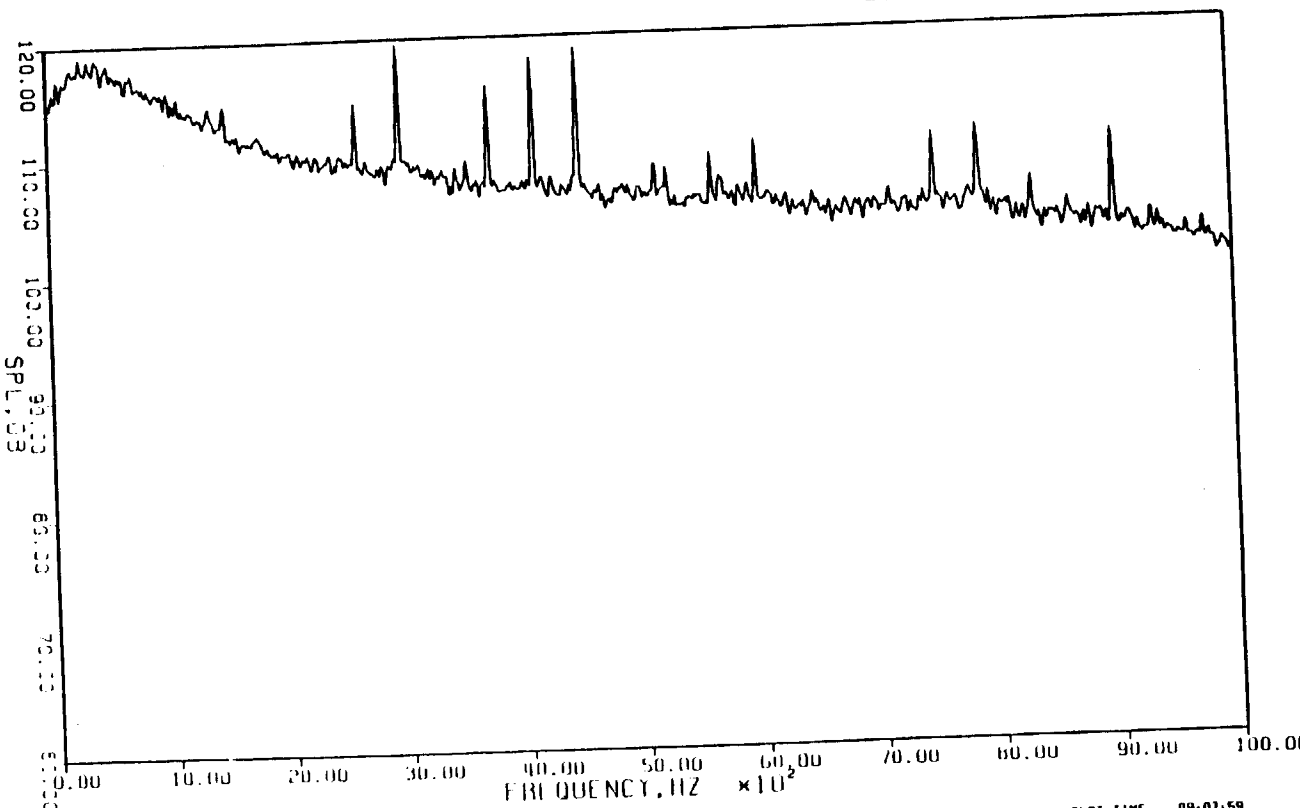
Appendix 9.4.24

AVERAGED SPECTRUM

KULITE PX14LF
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 2812 RPM. CORE = 112200 RP

RUN NO.	=12
POINT NO.	=242
BPF	=1500
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
AMB PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=0
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.1000
SENSOR GAIN (DB)	=20
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



PLOT DATE 12-JUL-83 PLOT TIME 09:07:59

DATAFILE NAME: OP402423 DAT

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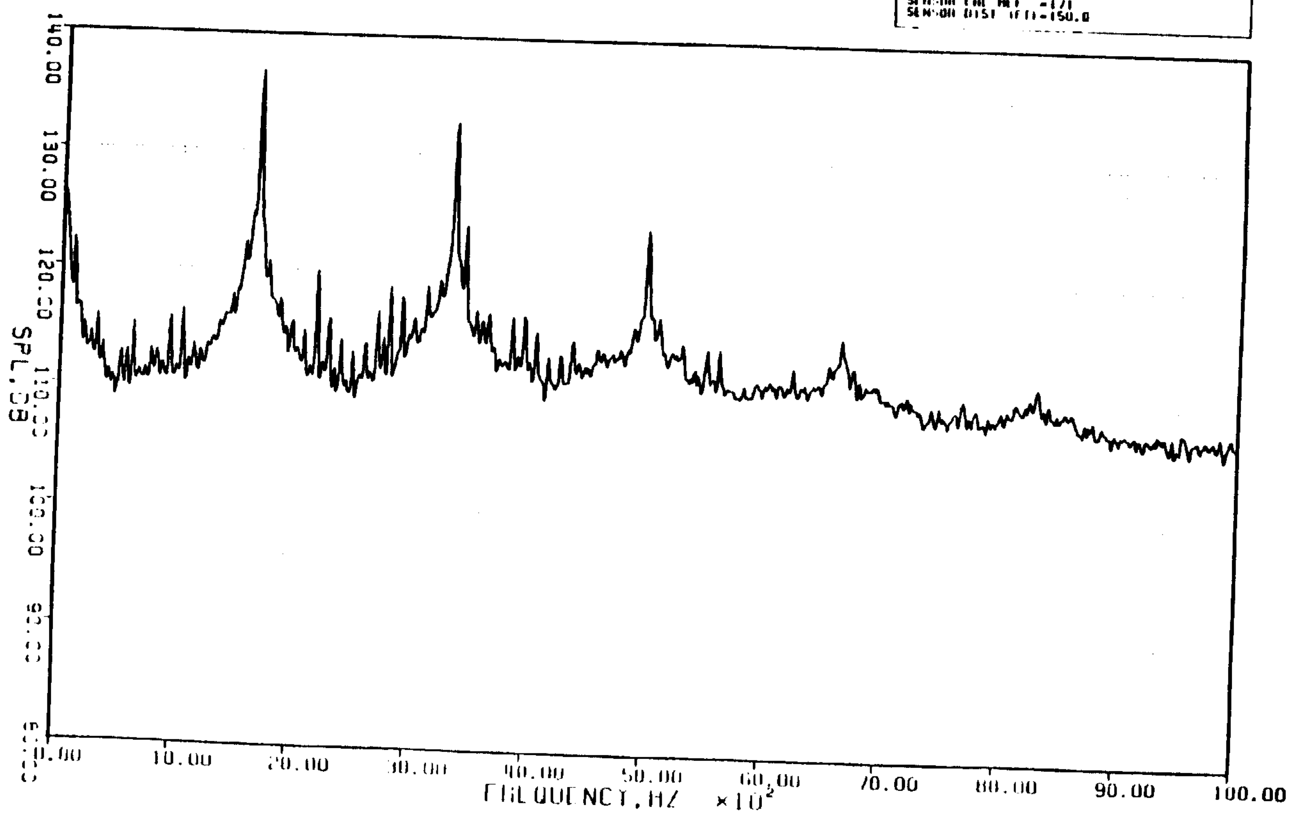
Appendix 9.4.25

AVERAGED SPECTRUM

KULITE PX10LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: E315 . 30 IPS
FAN = 3113 RPM. COR =FAN = 3113

RUN NO. =13
POINT NO. =243
BPF =1660
NO. OF BLADES =32
TEMP DRY (DEG.F) =65.0
TEMP WET (DEG.F) =54.5
BARO PRESS (" HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/D FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1-HANN) =1
SENSOR PSI/VOLT =0.1000
SENSOR GAIN (DB) =20
SENSOR CAL (B RMS =1.00
SENSOR CAL REF =171
SENSOR DIST (FT) =150.0



DATAFILE NAME: DP40/431 DAT
PLOT DATE 12-JUL-83 PLOT TIME 09:26:21

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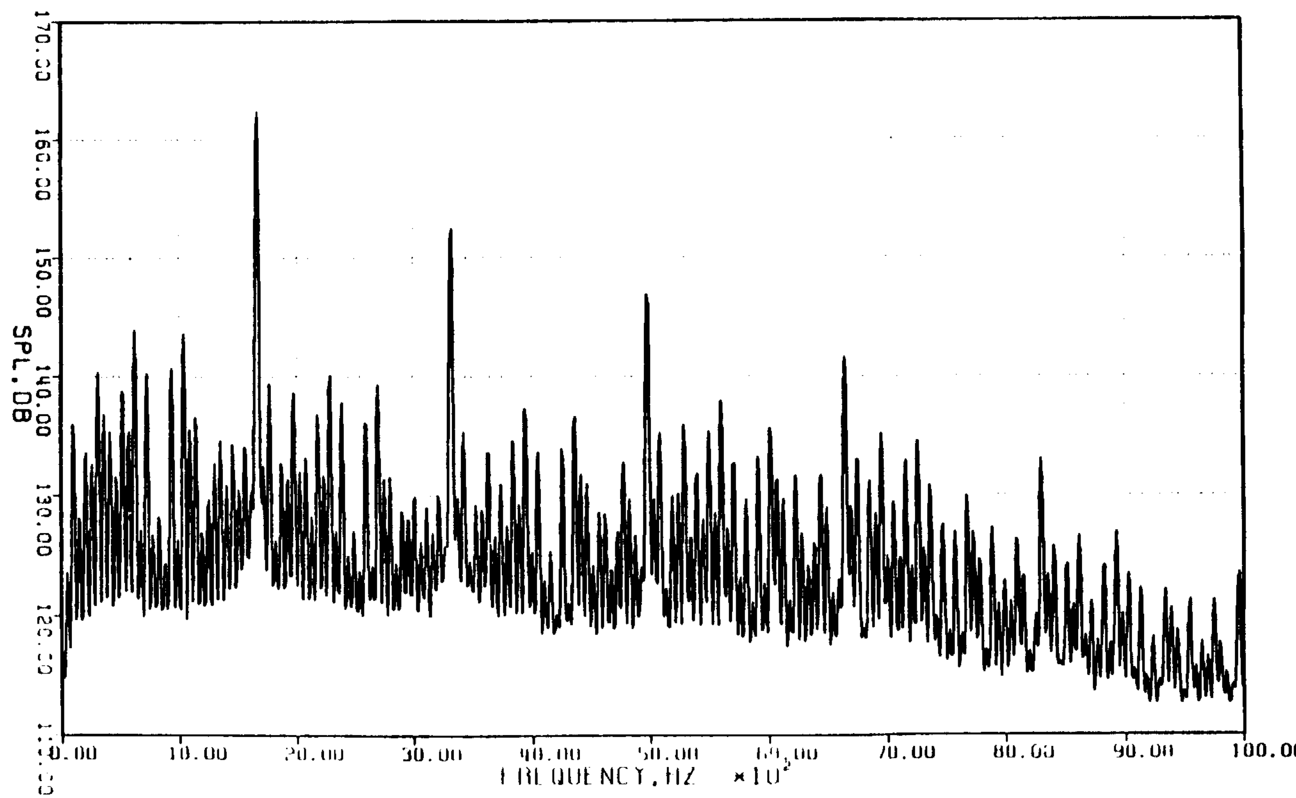
Appendix 9.4.26

AVERAGED SPECTRUM

KULITE PX12LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D , DATE: 8-JUN 83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
AMB PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/A FILTER(KHZ)	=10.000
RECORD TIME (SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1-HANN)	=1
SENSOR PSI/VOLT	=1.0000
SENSOR GAIN (DB)	=0
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



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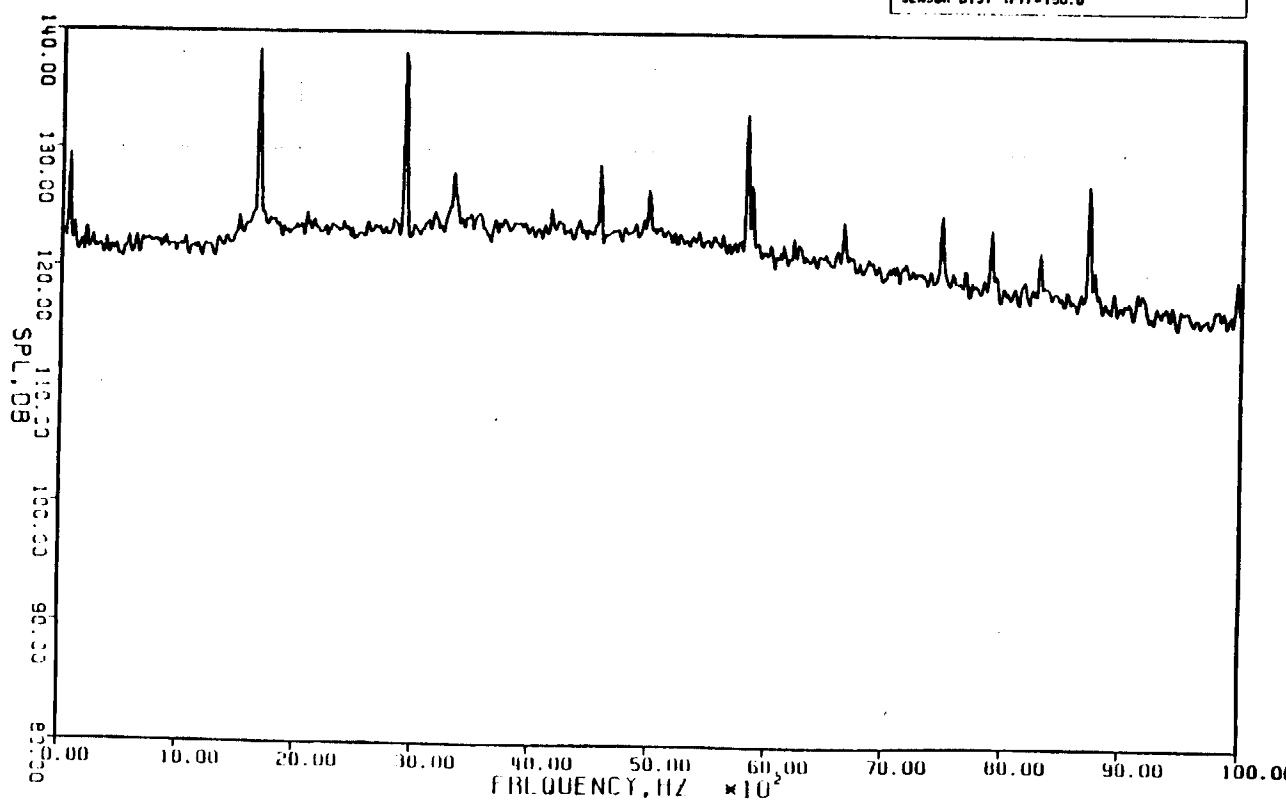
Appendix 9.4.27

AVERAGED SPECTRUM

KULITE PX12LE
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: E315 , 30 IPS
FAN = 3113 RPM, COR =FAN = 3113

RUN NO.	=13
POINT NO.	=243
BPF	=1660
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=65.0
TEMP WET (DEG.F)	=54.5
BARO PRESS (*HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER (KHZ)	=10.000
RECORD TIME (SEC)	=0
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW (1-HANN)	=1
SENSOR PSI/VOLT	=0.3162
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=150.0



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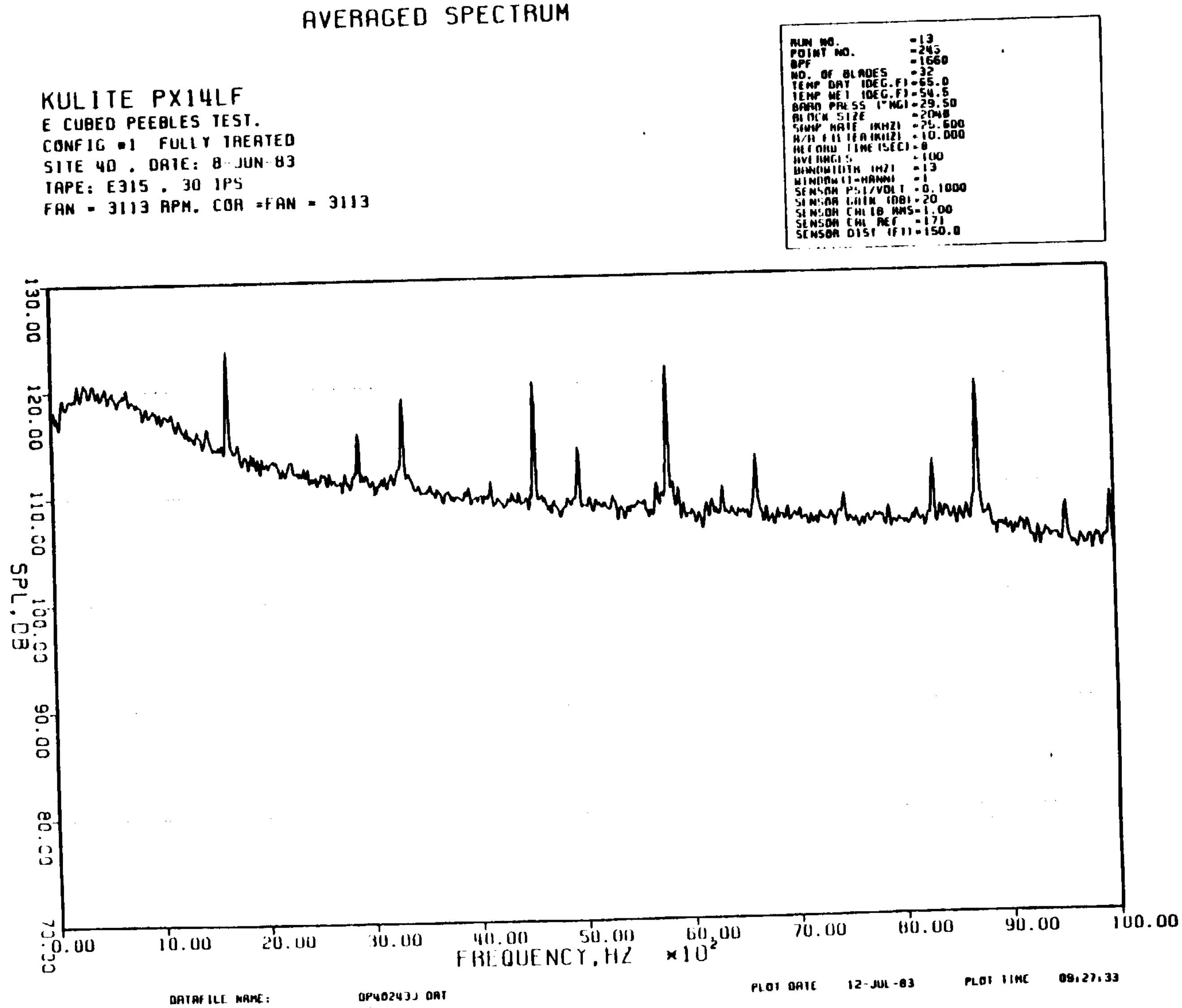
Appendix 9.4.28



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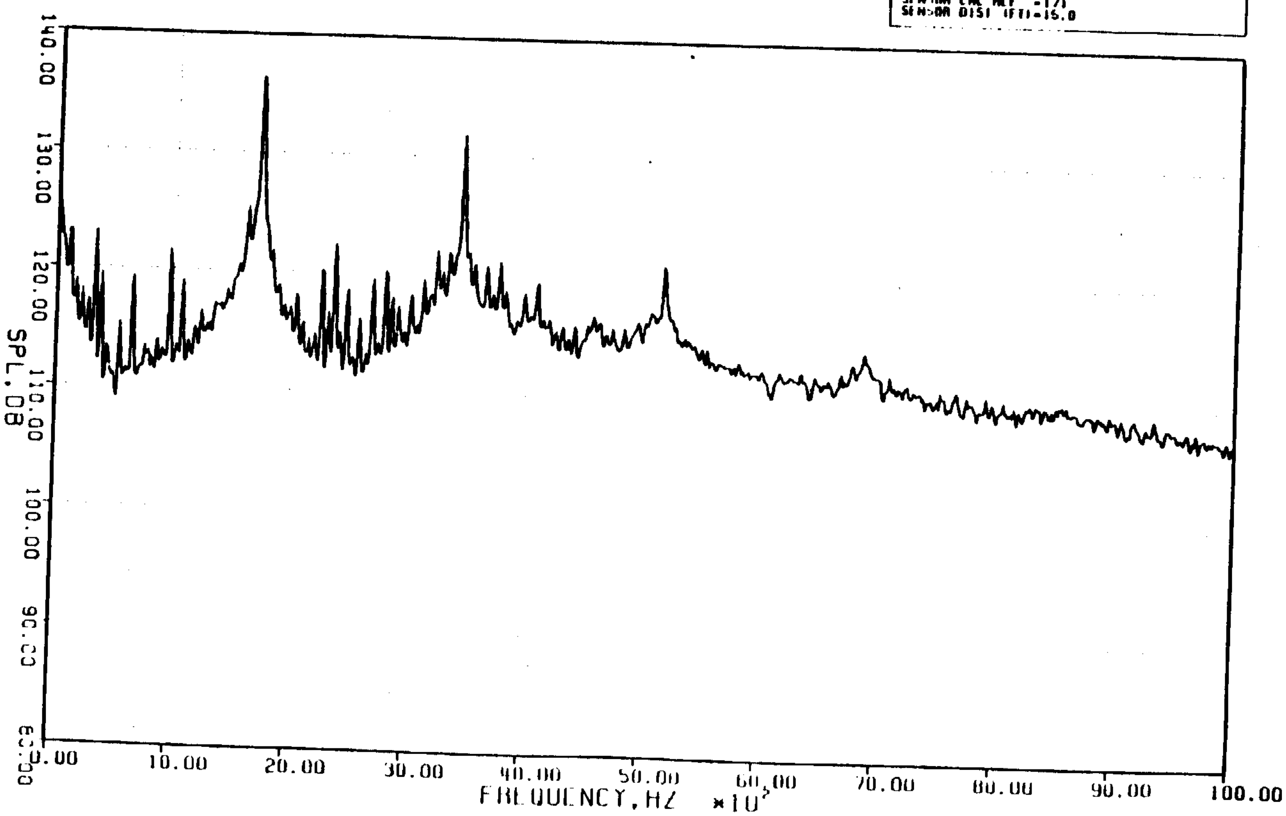
Appendix 9.4.29

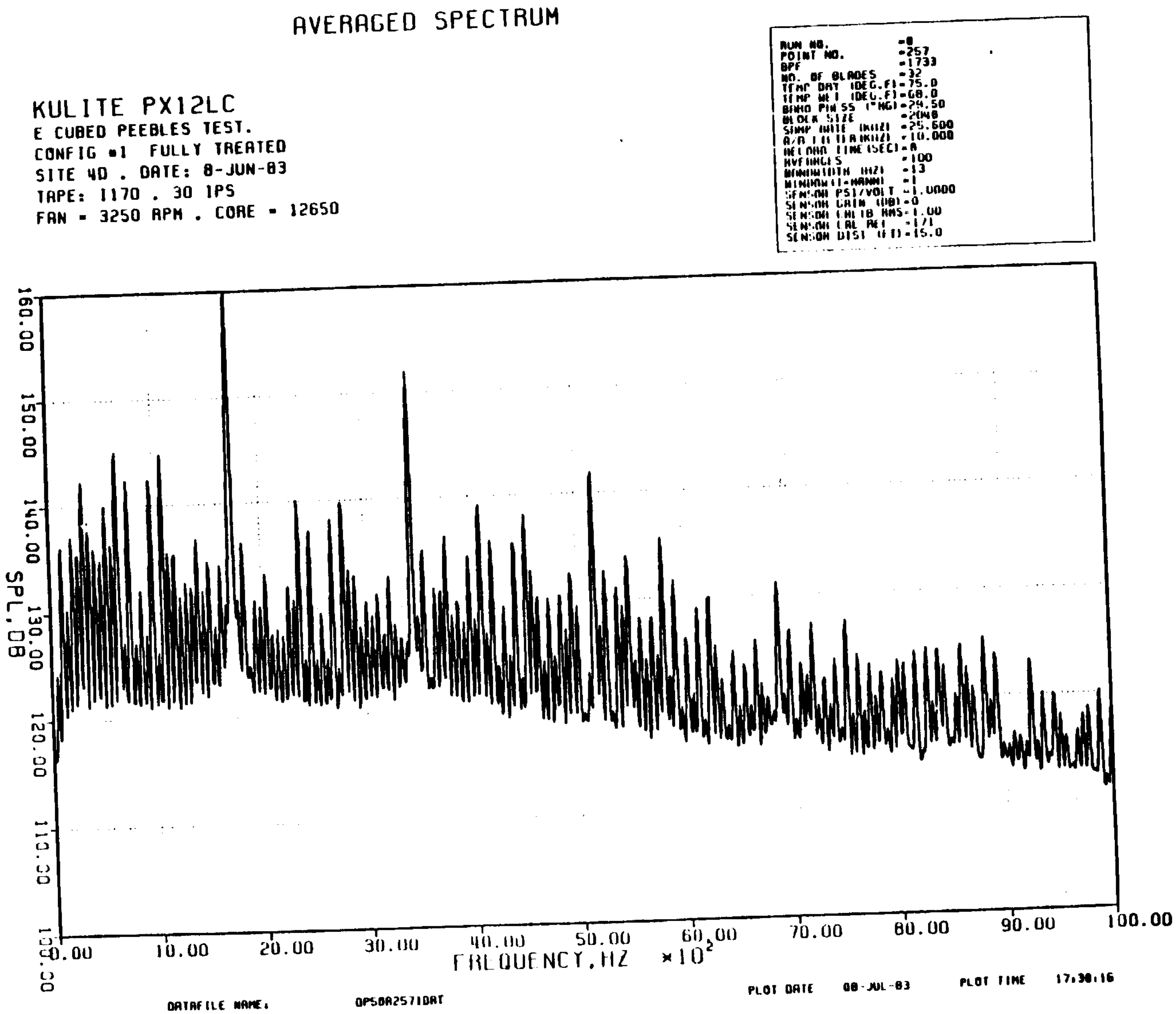
AVERAGED SPECTRUM

KULITE PX10LC
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 40 . DATE: 8-JUN-83
TAPE: 1170 . 30 IPS
FAN = 3250 RPM . CORE = 12650

RUN NO.	=8
POINT NO.	=257
BPF	=1733
NO. OF BLADES	=32
TEMP DRY (DEG.F)	=75.0
TEMP WET (DEG.F)	=68.0
BARO PRESS ("HG)	=29.50
BLOCK SIZE	=2048
SAMP RATE (KHZ)	=25.600
A/D FILTER(KHZ)	=10.000
RECORD TIME(SEC)	=8
AVERAGES	=100
BANDWIDTH (HZ)	=13
WINDOW(1=HANN)	=1
SENSOR PSI/VOLT	=0.3162
SENSOR GAIN (DB)	=10
SENSOR CALIB RMS	=1.00
SENSOR CAL REF	=171
SENSOR DIST (FT)	=15.0



Appendix 9.4.30



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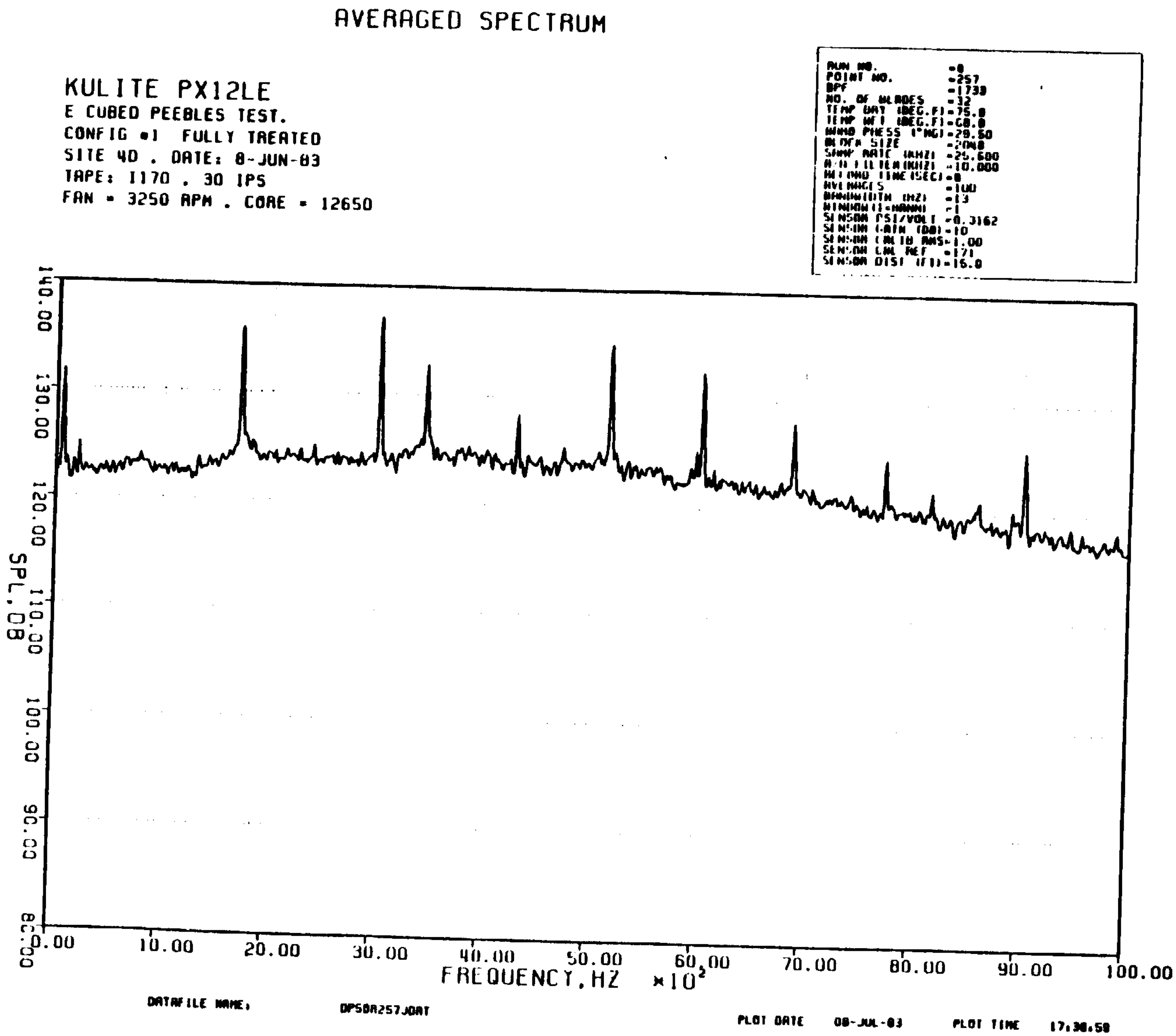
Appendix 9.4.31

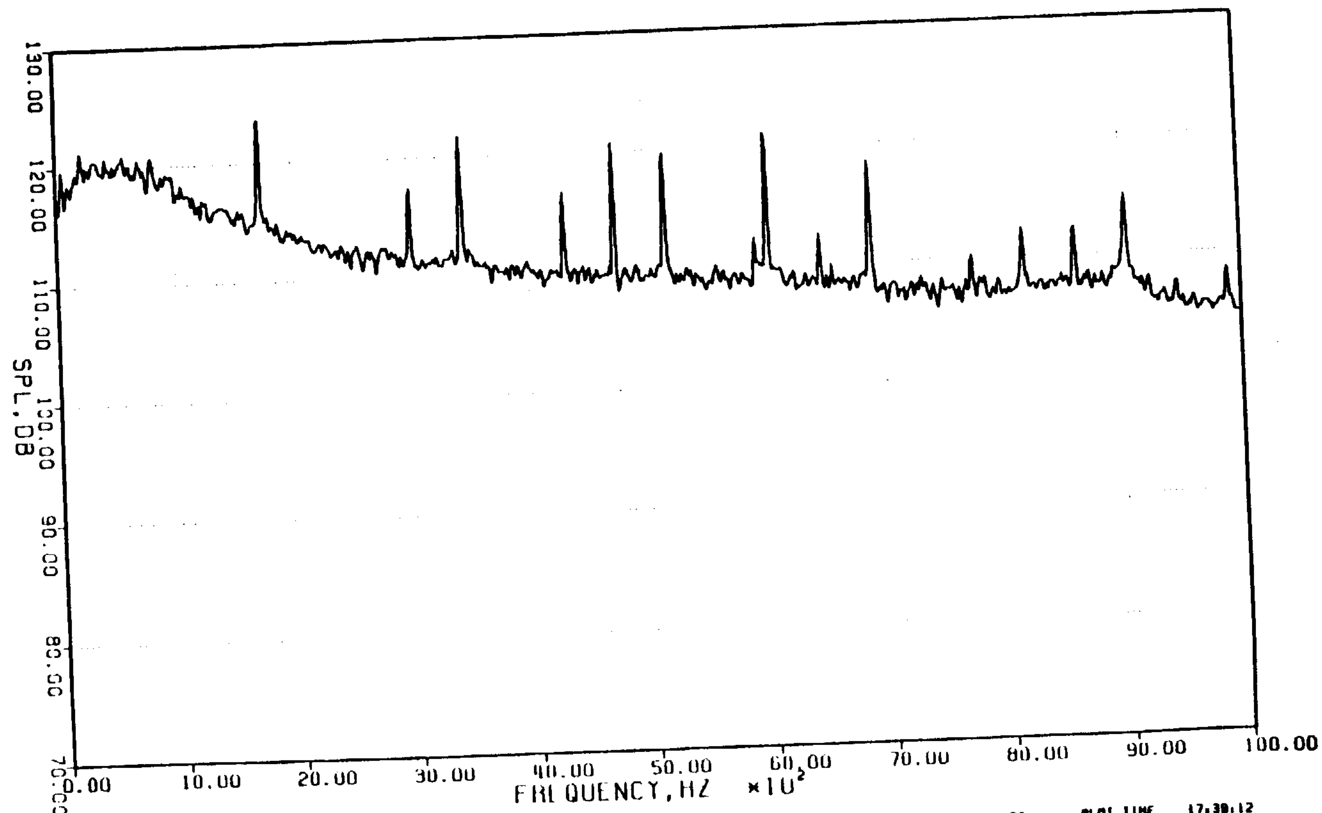


Appendix 9.4.32

AVERAGED SPECTRUM

KULITE PX14LF
E CUBED PEEBLES TEST.
CONFIG #1 FULLY TREATED
SITE 4D . DATE: 8-JUN-83
TAPE: 1170 . 30 IPS
FAN 3250 RPM . CORE = 12650

RUN NO. =8
POINT NO. =257
BPF =1733
NO. OF BLADES =32
TEMP DRY (DEG.F) =75.0
TEMP WET (DEG.F) =68.0
BARO PRESS ("HG) =29.50
BLOCK SIZE =2048
SAMP RATE (KHZ) =25.600
A/A FILTER (KHZ) =10.000
RECORD TIME (SEC) =8
AVERAGES =100
BANDWIDTH (HZ) =13
WINDOW (1=HANN) =1
SENSOR PSI/VOLT =0.1000
SENSOR GAIN (DB) =20
SENSOR CALIB RMS =1.00
SENSOR CAL REF =171
SENSOR DIST (FT) =15.0



PLOT DATE 08-JUL-83 PLOT TIME 17:38:12

DATAFILE NAME: DPS0R257JDAT

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