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VOLUME III

13

**THE GENERATION AND RADIATION OF SUPERSONIC JET
NOISE
VOLUME III TURBULENT MIXING NOISE DATA**

LOCKHEED-GEORGIA COMPANY
MARIETTA, GEORGIA 30063

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FINAL REPORT FOR PERIOD 6 NOVEMBER 1972 - 6 NOVEMBER 1975

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This report has been reviewed by the Information Office (ASD/OIP) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report is published in four volumes. Volume I summarizes the work accomplished. Volume II contains a detailed discussion of work accomplished since the publication of the interim report, and all the major conclusions reached during the program. Volume III (this volume) is a data report which presents a detailed compilation of the turbulent mixing noise 1/3-octave spectra. Volume IV, another data report, contains the narrow-band spectra for broadband shock-associated noise.			

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PREFACE

This report was prepared by the Lockheed-Georgia Company, Marietta, Georgia, for the Air Force Aero Propulsion Laboratory, Wright-Patterson Air Force Base under Contract F33615-73-C-2032. The report covers work done in the period 6 November 1972 through 6 November 1975. The work described herein is part of the Air Force Aero Propulsion Laboratory's joint program with the Department of Transportation to define and control the noise emission of aircraft propulsion systems.

Mr. Paul Shahady was the Air Force Aero Propulsion Laboratory's Project Engineer. The program is being conducted under Project 3066, Task 14. Dr. Gordon Banerian was the Project Manager for the Department of Transportation. Lockheed's Program Manager was Harry E. Plumblee, Jr.

Major contributors to the work performed under this contract and presented in this report are: Robert H. Burrin, Peter D. Dean, Philip E. Doak, Michael J. Fisher, Sham S. Kapur, Jark C. Lau, Geoffrey M. Lilley, William T. Mayo, Donald M. Meadows, Christopher L. Morfey, Philip J. Morris, David M. Smith, H. K. "Bob" Tanna, Brian J. Tester, and M. Clay Whiffen.

The assistance of the following individuals is gratefully acknowledged: C. Benton Reid and L. V. Mazzaella, who operated the test facilities and data acquisition systems; C. R. Huie, who helped in the buildup and operation of the laser velocimeter; R. B. Harrison and C. T. Walker, who constructed and maintained the acoustic and flow facilities; J. P. McKenna, who kept up with the budget and other administrative details, and last, but certainly not least, most gracious appreciation is extended to Barbara C. Reagan for her superb typing of all the manuscripts.

Gratitude is expressed to the University of Southampton for permitting Professor Philip E. Doak, Professor Geoffrey M. Lilley, Dr. Michael J. Fisher, and Dr. Christopher L. Morfey to participate in the performance of the research reported herein.

This report was submitted on 23 June 1976.

Publication of this report does not constitute Air Force approval of the report's findings or conclusions. It is published only for the exchange and stimulation of ideas.

TURBULENT MIXING NOISE EXPERIMENTS

The characteristics, both spectral and directivity, of the sound field of supersonic shock-free jets are studied by measuring the turbulent mixing noise in the far field from four two-inch diameter nozzles, namely a convergent nozzle for pressure ratios up to critical and three convergent-divergent nozzles having nominal design Mach numbers of 1.4, 1.7, and 2.0, respectively. The measurements were conducted in the Lockheed anechoic facility, which provides a free-field environment. The results from 75 jet exit conditions (combinations of jet exit velocity ratio V_j/a_0 and jet static temperature ratio T_j/T_0) are presented in this Volume in a systematic manner in the form of tabulated one-third octave spectra. The test program, described below, was carefully planned in order to obtain results (i) at constant jet efflux temperature with varying jet velocity, and conversely (ii) at constant exit velocity while varying jet efflux temperature. The effects of jet velocity and exhaust temperature on turbulent mixing noise can therefore be assessed independently.

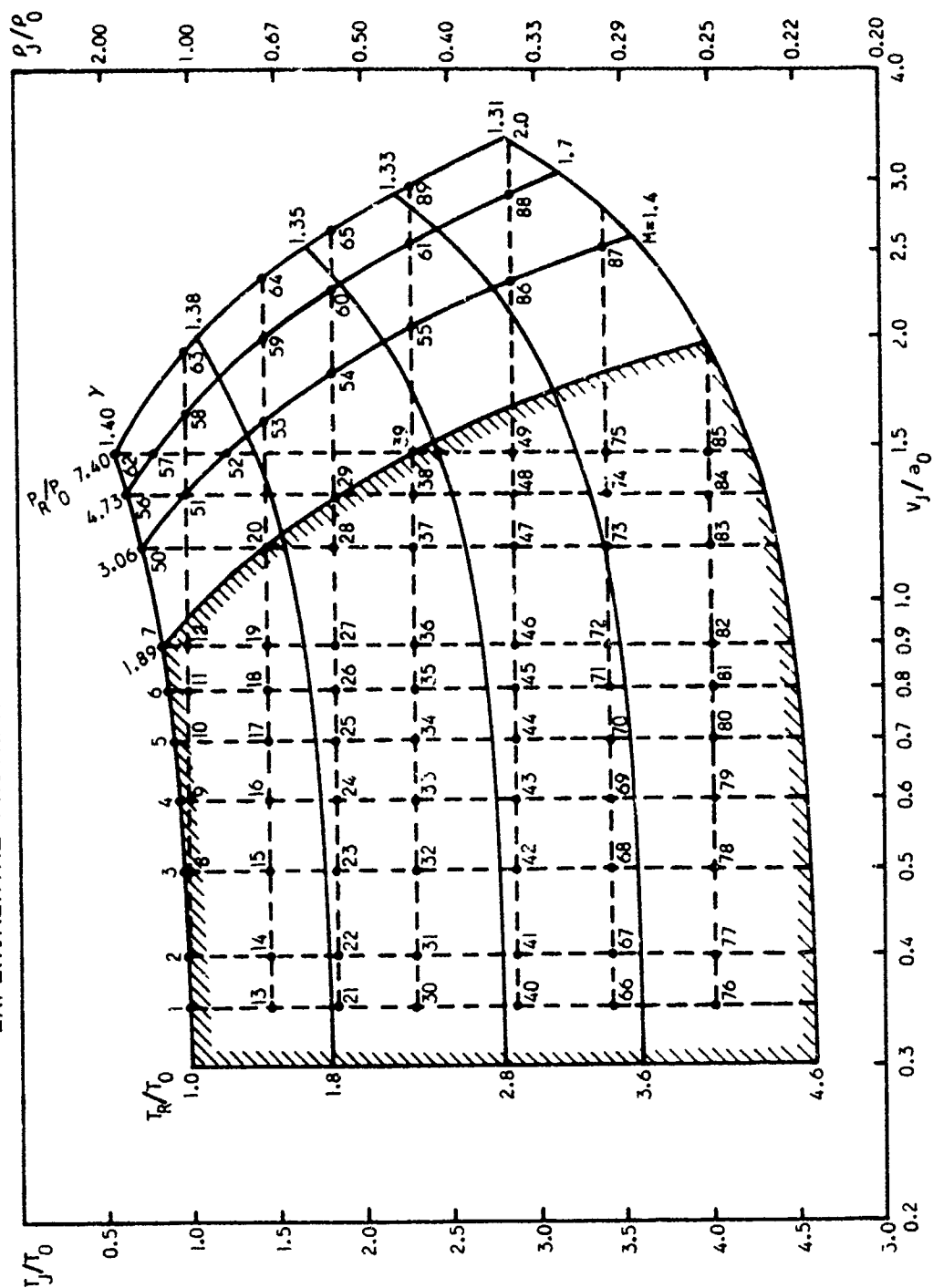
EXPERIMENTAL PROGRAM CHART

The experimental program is now described in detail with the help of the experimental program chart shown on the following page. The chart essentially shows the envelope of jet static temperature ratio T_j/T_0 (and hence also jet density ratio, ρ_j/ρ_0), and jet exit velocity ratio V_j/a_0 , as a function of stagnation temperature ratio T_R/T_0 , and pressure ratio P_R/P_0 . The lower limit of V_j/a_0 is set by the measuring instrumentation (electronic) noise, and not by the rig generated internal noise. The four nozzles employed are the convergent nozzle and the $M=1.4$, 1.7, and 2.0 convergent-divergent nozzles. In this study of turbulent mixing noise, the nozzles must be operated at on-design pressure ratios so that the data will not be contaminated by contributions from shock-associated noise. The convergent nozzle can therefore be operated at any pressure ratio up to 1.89, and the corresponding ranges of T_j/T_0 and V_j/a_0 are shown by the shaded area of the chart. In contrast, the three con-div nozzles can be operated at fixed pressure ratios only, and hence the jet exit conditions available with these nozzles are represented by the three curves on the right of the shaded area. The variation of the specific heat ratio, γ , with temperature was incorporated in the preparation of this chart.

The jet operating conditions originally selected for the experimental program are identified by test point numbers (TPN) in the chart. It can be seen that by considering test points on each horizontal line, the jet efflux temperature remains constant while efflux velocity varies. Conversely, on each vertical line, constant efflux velocity is maintained while jet exit temperature is varied.

It should be noted that all data given in this Volume are obtained from two-inch diameter nozzles with the measurement points at 72 nozzle diameters. The normal scaling laws must therefore be applied for application to other measurement configurations.

EXPERIMENTAL PROGRAM CHART - TURBULENT MIXING NOISE



MEASUREMENT AND DATA REDUCTION PROCEDURES

The complete experimental program was executed in two parts. The measurements in the rear arc were conducted first with twelve microphones positioned at $7\frac{1}{2}^\circ$ intervals from 15° to $97\frac{1}{2}^\circ$ to the downstream jet axis. The entire test program was then repeated to obtain corresponding results in the forward arc, where ten microphones were again placed at $7\frac{1}{2}^\circ$ intervals over the angular range from $82\frac{1}{2}^\circ$ to 150° to the jet exhaust. Half-inch B&K microphones Type 4133 with FET cathode followers Type 2619 were utilized throughout the test program. The responses were recorded simultaneously on a 14-channel Honeywell FM tape recorder at 120 inches per second (ips). In order to obtain the 1/3-octave spectra from 200 Hz to 40 KHz by using a Hewlett-Packard real time 1/3-octave audio spectrum analyzer, the tape speed was reduced to 30 ips on playback. The 1/3-octave levels then were recorded on an incremental tape recorder for subsequent detailed analysis by means of a data reduction program developed for use on the Univac 418 digital computer. This program incorporates the microphone frequency response corrections and atmospheric absorption corrections. The values of atmospheric absorption corrections were obtained from Evans, Bass and Sutherland (*The Journal of the Acoustical Society of America*, 1972, Vol. 51, No. 5, Part 2, pp. 1565-1575). The data are corrected to laboratory conditions at the time of each test, and are *not* corrected to standard day conditions. The results finally are displayed to include test conditions and computed jet flow parameters, 1/3-octave acoustic spectra, and computed overall sound pressure levels.

DATA PRESENTATION

The nominal values of jet operating conditions defining the test points covering the entire experimental program are tabulated in detail, and the various parameters are defined in the list of symbols. It can be seen that for every test point number (TPN), there are two corresponding run numbers (RN); the first run number refers to measurements in the rear arc, whereas the second run number refers to measurements in the forward arc. For every run number, there are three data pages. The first page gives all the information about the test conditions and various jet flow parameters, while the 1/3-octave spectrum levels and the overall sound pressure levels at all microphone positions are tabulated on the second and third pages.

In using the data presented in this report, the following points *must* be considered at all times:

(1) The spectra measured by the $\theta = 15^\circ$ microphone are in some cases affected by the air-flow generated noise over this microphone.

(2) For $V_j/a_0 < 0.5$, although there is no contamination from rig internal noise sources, the spectra are affected by the background noise and the measuring instrumentation (electronic) noise. The background noise produces a slight lift in the spectra at the low frequency end, whereas the instrumentation noise produces a slight lift at the high frequency end. The levels over the majority of the (middle) frequency range, however, are considered to be accurate.

(3) Due to the presence of the kaowool wrapping upstream of the nozzle exit, there is no direct line of sight between the nozzle lip and a microphone placed at large angle in the forward arc. The spectra at $\theta = 142\frac{1}{2}^\circ$ and 150° are therefore likely to be affected (normally resulting into slightly lower levels than expected), and should be treated with caution. No such problem exists, however, for results at all other angles in the range $15^\circ \leq \theta \leq 135^\circ$.

(4) Although the supersonic nozzle calibration tests (shadowgraph tests) revealed no significant shock pattern in the jet flow at design pressure ratios for all con-div nozzles, close examination of the acoustic data indicates that for $\theta > 105^\circ$, some of the spectra obtained with these con-div nozzles are slightly contaminated by shock-associated noise at the higher frequencies. This indicates slight imperfections in the machining of the nozzle contour.

TURBULENT MIXING NOISE EXPERIMENTS

TEST POINT CONDITIONS
(NOMINAL)

LIST OF SYMBOLS

a_o	ambient speed of sound
a_J	speed of sound in jet flow at nozzle exit plane
D	jet nozzle diameter
M	convergent-divergent nozzle design Mach number (nominal)
M_J	jet Mach number, V_J/a_J
P_R/P_o	pressure ratio
R	microphone distance from nozzle exit plane
RN	run number
TPN	test point number
T_J/T_o	static (or jet exit) temperature ratio
T_R/T_o	stagnation (or total) temperature ratio
V_J/a_o	jet exit velocity ratio
γ	ratio of specific heats
θ	microphone angle relative to downstream jet axis
ρ_J/ρ_o	jet exit density ratio

DATA PRINTOUT NOMENCLATURE:

DJ/DO	$= \rho_J/\rho_o$
DR/DO	$= \rho_R/\rho_o$
DR/DJ	$= \rho_R/\rho_J$
MJ	$= M_J$
PR	$= P_R/P_o$
PSI	$=$ pounds per square inch
TJ/TO	$= T_J/T_o$
TR	$= T_R/T_o$
TR/TJ	$= T_R/T_J$
VJ	$= V_J$
VJ/AO	$= V_J/a_o$

CONVERGENT NOZZLE

TPN	V_J/a_0	T_J/T_0	ρ_J/ρ_0	M_J	γ	P_R/P_0	T_R/T_0	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
1	0.35	0.980	1.020	0.353	1.40	1.090	1.000	19	17 - 19	201	20 - 22
2	0.40	0.971	1.030	0.406		1.120		20	23 - 25	202	26 - 28
3	0.50	0.952	1.050	0.512		1.196		21	29 - 31	203	32 - 34
4	0.60	0.935	1.070	0.621		1.297		22	35 - 37	204	38 - 40
5	0.70	0.893	1.120	0.741		1.440		23	41 - 43	205	44 - 46
6	0.80	0.870	1.150	0.858		1.617		24	47 - 49	206	50 - 52
7	0.90	0.840	1.190	0.982	1.40	1.853	1.000	25	53 - 55	127	56 - 58

CONVERGENT NOZZLE

TPN	V_J/a_0	T_J/T_0	ρ_J/ρ_0	M_J	γ	P_R/P_0	T_R/T_0	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
8	0.50	0.976	1.025	0.506	1.40	1.191	1.026	29	59 - 61	207	62 - 64
9	0.60			0.607		1.283	1.048	30	65 - 67	208	68 - 70
10	0.70			0.709		1.398	1.074	31	71 - 73	130	74 - 76
11	0.80			0.810		1.540	1.104	32	77 - 79	131	80 - 82
12	0.90	0.976	1.025	0.911	1.40	1.712	1.138	33	83 - 85	132	86 - 88

CONVERGENT NOZZLE

TPN	V_J/a_o	T_J/T_o	ρ_J/ρ_o	M_J	γ	P_R/P_o	T_R/T_o	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
13	0.35	1.429	0.700	0.293	1.39	1.061	1.452	26	89 - 91	234	92 - 94
14	0.40	↑	↑	0.335	↑	1.080	1.460	34	95 - 97	210	98 - 100
15	0.50			0.418		1.127	1.477	35	101 - 103	211	104 - 106
16	0.60			0.502		1.186	1.499	36	107 - 109	212	110 - 112
17	0.70			0.586		1.260	1.524	37	113 - 115	137	116 - 118
18	0.80			0.669		1.348	1.553	38	119 - 121	138	122 - 124
19	0.90	↓	↓	0.753	↓	1.453	1.587	39	125 - 127	139	128 - 130
20	1.16	1.429	0.700	0.971	1.39	1.824	1.691	40	131 - 133	140	134 - 136

CONVERGENT NOZZLE

TPN	V_J/a_0	T_J/T_0	ρ_J/ρ_0	M_J	γ	P_R/P_0	T_R/T_0	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
21	0.35	1.818	0.550	0.260	1.380	1.047	1.841	27	137 - 139	213	140 - 142
22	0.40			0.297	1.380	1.062	1.849	41	143 - 145	214	146 - 148
23	0.50			0.371	1.380	1.098	1.866	42	149 - 151	215	152 - 154
24	0.60			0.445	1.380	1.144	1.887	43	155 - 157	216	158 - 160
25	0.70			0.519	1.380	1.199	1.911	44	161 - 163	217	164 - 166
26	0.80			0.593	1.377	1.264	1.939	45	167 - 169	146	170 - 172
27	0.90			0.667	1.375	1.342	1.970	46	173 - 175	147	176 - 178
28	1.16			0.860	1.373	1.610	2.069	47	179 - 181	148	182 - 184
29	1.33	1.818	0.550	0.986	1.370	1.846	2.145	48	185 - 187	149	188 - 190

CONVERGENT NOZZLE

TPN	V_J/a_0	T_J/T_0	ρ_J/ρ_0	M_J	γ	P_R/P_0	T_R/T_0	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
30	0.35	2.273	0.440	0.232	1.365	1.037	2.295	28	191 - 193	218	194 - 196
31	0.40			0.265	1.365	1.049	2.302	49	197 - 199	219	200 - 202
32	0.50			0.332	1.363	1.077	2.318	50	203 - 205	220	206 - 208
33	0.60			0.398	1.362	1.112	2.338	51	209 - 211	221	212 - 214
34	0.70			0.464	1.362	1.155	2.361	52	215 - 217	222	218 - 220
35	0.80			0.531	1.362	1.206	2.389	72	221 - 223	155	224 - 226
36	0.90			0.597	1.360	1.265	2.419	71	227 - 229	156	230 - 232
37	1.16			0.769	1.355	1.464	2.512	70	233 - 235	157	236 - 238
38	1.33			0.882	1.353	1.638	2.585	69	239 - 241	158	242 - 244
39	1.48	2.273	0.440	0.982	1.352	1.825	2.658	68	245 - 247	159	248 - 250

CONVERGENT NOZZLE

TPN	V_J/a_0	T_J/T_0	ρ_J/ρ_0	M_J	γ	P_R/P_0	T_R/T_0	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
40	0.35	2.857	0.350	0.207	1.345	1.029	2.878	58	251 - 253	223	254 - 256
41	0.40	↑	↑	0.237	1.345	1.038	2.885	59	257 - 259	224	260 - 262
42	0.50			0.296	1.345	1.060	2.900	60	263 - 265	225	266 - 268
43	0.60			0.355	1.345	1.087	2.919	61	269 - 271	226	272 - 274
44	0.70			0.414	1.345	1.120	2.942	62	275 - 277	227	278 - 280
45	0.80			0.473	1.345	1.159	2.968	63	281 - 283	165	284 - 286
46	0.90			0.532	1.345	1.205	2.997	64	287 - 289	166	290 - 292
47	1.16			0.686	1.340	1.355	3.086	65	293 - 295	167	296 - 298
48	1.33	↓	↓	0.787	1.340	1.483	3.158	66	299 - 301	168	302 - 304
49	1.48	2.857	0.350	0.876	1.340	1.621	3.229	67	305 - 307	169	308 - 310

CONVERGENT NOZZLE

TPN	v_J/a_0	T_J/T_0	ρ_J/ρ_0	M_J	γ	P_R/P_0	T_R/T_0	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
66	0.35	3.400	0.294	0.190	1.33	1.024	3.422	97	311 - 313	228	314 - 316
67	0.40			0.217		1.032	3.428	98	317 - 319	229	320 - 322
68	0.50			0.271		1.050	3.443	100	323 - 325	230	326 - 328
69	0.60			0.325		1.072	3.461	101	329 - 331	231	332 - 334
70	0.70			0.380		1.099	3.482	102	335 - 337	232	338 - 340
71	0.80			0.434		1.131	3.507	103	341 - 343	233	344 - 346
72	0.90			0.488		1.168	3.535	104	347 - 349	176	350 - 352
73	1.16			0.629		1.290	3.623	105	353 - 355	177	356 - 358
74	1.33			0.721		1.393	3.693	106	359 - 361	178	362 - 364
75	1.48	3.400	0.294	0.802	1.33	1.502	3.763	107	365 - 367	179	368 - 370

M = 1.4 CONVERGENT-DIVERGENT NOZZLE

TPN	V_J/a_0	T_J/T_0	ρ_J/ρ_0	M_J	γ	P_R/P_0	T_R/T_0	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
50	1.16	0.717	1.395	1.37	1.400	3.051	1.000	73	371 - 373	180	374 - 376
51	1.33	0.942	1.061		1.398	3.049	1.294	74	377 - 379	181	380 - 382
52	1.48	1.167	0.857		1.387	3.036	1.591	75	383 - 385	182	386 - 388
53	1.61	1.381	0.724		1.377	3.023	1.870	76	389 - 391	183	392 - 394
54	1.83	1.784	0.560		1.361	3.004	2.389	77	395 - 397	184	398 - 400
55	2.04	2.217	0.451		1.344	2.983	2.933	78	401 - 403	185	404 - 406
86	2.30	2.818	0.355	1.37	1.327	2.963	3.683	111	407 - 409	186	410 - 412

M = 1.7 CONVERGENT-DIVERGENT NOZZLE

TPN	V_J/a_0	T_J/T_0	ρ_J/ρ_0	M_J	γ	P_R/P_0	T_R/T_0	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
56	1.33	0.634	1.577	1.67	1.400	4.718	1.000	79	413 - 415	187	416 - 418
57	1.48	0.785	1.273	↑	1.399	4.716	1.222	80	419 - 421	188	422 - 424
58	1.65	0.976	1.025		1.392	4.704	1.510	81	425 - 427	189	428 - 430
59	2.02	1.463	0.683		1.370	4.667	2.218	82	431 - 433	190	434 - 436
60	2.27	1.848	0.541	↓	1.350	4.633	2.749	83	437 - 439	191	440 - 442
61	2.55	2.332	0.429	1.67	1.336	4.609	3.424	112	443 - 445	192	446 - 448

M = 2.0 CONVERGENT-DIVERGENT NOZZLE

TPN	V_J/a_o	T_J/T_o	ρ_J/ρ_o	M_J	γ	P_R/P_o	T_R/T_o	REAR ARC		FORWARD ARC	
								RN	PAGE NO.	RN	PAGE NO.
62	1.48	0.570	1.754	1.96	1.400	7.353	1.000	84	449 - 451	193	452 - 454
63	1.95	0.990	1.010	1.96	1.386	7.328	1.724	85	455 - 457	194	458 - 460
64	2.35	1.438	0.696	1.96	1.362	7.287	2.437	86	461 - 463	195	464 - 466

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.28 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 69.00 DEG.F, CHAMBER TEMPERATURE = 72.00 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 19

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.090$
TEMPERATURE RATIO $TR = 0.994$
MACH NUMBER $MJ = 0.354$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 0.970$
JET DENSITY RATIO $DJ/D0 = 1.031$
JET VELOCITY RATIO $VJ/A0 = 0.348$
JET VELOCITY $VJ = 393.7$ FPS

$TR/TJ = 1.025$
 $OR/D0 = 1.096$
 $DR/DJ = 1.064$
MASS FLOW = 0.657 POUNDS PER SECOND
THRUST = 8.06 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	56.9	0.0	55.7	49.5	50.5	50.1
250.0	57.8	0.0	57.8	52.6	53.3	52.2
315.2	58.8	0.0	58.6	52.5	52.2	52.4
400.0	60.6	0.0	58.1	53.8	53.4	52.9
500.0	60.3	0.0	59.2	54.7	55.1	54.3
630.0	60.2	0.0	59.3	55.9	56.1	55.6
800.0	62.3	0.0	60.3	56.6	57.0	56.3
1000.0	61.2	0.0	60.3	57.6	57.5	57.1
1250.0	61.3	0.0	61.4	58.9	59.0	58.1
1600.0	60.1	0.0	60.9	58.7	59.0	58.9
2000.0	58.7	0.0	61.0	58.8	59.6	58.8
2500.0	57.5	0.0	60.2	58.7	59.6	58.8
3150.0	55.9	0.0	59.8	58.6	59.2	58.8
4000.0	57.4	0.0	59.1	58.2	59.4	58.9
5000.0	55.8	0.0	57.9	57.2	58.9	58.4
6300.0	56.4	0.0	57.1	56.9	58.4	58.2
8000.0	55.7	0.0	56.1	55.7	57.9	57.4
10000.0	55.2	0.0	55.0	55.0	57.5	57.2
12500.0	54.2	0.0	54.3	54.5	57.2	56.8
16000.0	51.4	0.0	53.1	53.6	56.5	56.2
20000.0	50.4	0.0	52.1	52.9	55.8	55.8
25000.0	51.7	0.0	51.9	52.6	55.4	55.7
31500.0	56.0	0.0	52.1	53.1	55.9	56.1
40000.0	57.6	0.0	53.3	54.4	58.2	56.3
OVERALL SPL	72.0	0.0	72.0	69.9	71.1	70.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	49.8	51.4	47.8	48.4	50.8	50.3
250.0	51.6	51.6	51.0	49.9	49.5	49.0
315.2	51.0	51.4	50.4	49.9	49.8	49.8
400.0	51.6	51.6	50.6	50.4	50.2	49.3
500.0	53.2	52.5	52.1	51.8	52.1	51.0
630.0	54.3	53.8	53.2	53.2	53.4	52.2
800.0	55.3	54.8	54.3	54.1	54.1	53.0
1000.0	56.5	55.6	55.2	55.0	54.4	54.0
1250.0	57.5	56.6	56.7	55.7	55.8	55.2
1600.0	58.1	57.2	56.8	56.2	56.1	55.4
2000.0	58.2	57.9	57.4	56.7	56.7	56.2
2500.0	58.4	57.9	57.7	57.2	57.4	56.6
3150.0	58.3	57.9	57.6	57.6	57.7	57.0
4000.0	58.4	58.1	57.9	57.6	57.7	57.2
5000.0	58.1	57.8	57.5	57.5	57.7	57.3
6300.0	57.9	57.8	57.2	57.5	57.5	57.3
8000.0	57.3	57.3	56.7	56.7	57.1	56.8
10000.0	57.1	56.9	56.1	56.3	56.7	56.6
12500.0	56.7	56.4	55.8	55.9	56.2	56.2
16000.0	55.8	55.9	55.5	54.8	55.6	55.4
20000.0	55.3	55.1	55.0	54.0	54.9	54.3
25000.0	55.1	54.6	54.9	53.5	54.5	53.7
31500.0	55.8	54.7	54.8	53.8	54.7	53.7
40000.0	61.2	55.2	55.3	54.0	55.7	53.9
OVERALL SPL	70.5	69.7	69.4	69.0	69.3	68.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.28 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 60.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 50.0 PERCENT
GAMMA = 1.400

RUN NUMBER 201

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.090
TEMPERATURE RATIO TR = 1.000
MACH NUMBER MJ = 0.354
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.976
JET DENSITY RATIO DJ/D0 = 1.025
JET VELOCITY RATIO VJ/A0 = 0.349
JET VELOCITY VJ = 390.3 FPS

TR/TJ = 1.025
DR/D0 = 1.090
DR/DJ = 1.064
MASS FLOW = 0.655 POUNDS PER SECOND
THRUST = 8.06 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	44.8	47.3	50.8	47.3	45.9	52.1
250.0	48.1	49.0	50.5	46.9	46.5	47.7
315.2	48.6	49.0	50.8	48.9	48.4	49.0
400.0	50.4	50.6	51.0	49.9	49.8	50.5
500.0	52.3	52.0	52.3	51.4	50.8	50.3
630.0	53.8	53.2	52.8	52.2	51.7	51.3
800.0	54.7	54.6	54.0	53.1	52.8	52.5
1000.0	55.7	54.8	54.2	53.8	53.0	52.7
1250.0	56.5	56.1	55.3	54.6	54.6	53.9
1600.0	56.9	56.3	55.4	54.9	54.5	53.9
2000.0	57.4	57.0	56.5	55.9	55.5	55.0
2500.0	57.4	57.1	56.3	56.1	55.8	55.2
3150.0	57.5	57.2	56.5	56.6	56.2	55.7
4000.0	57.5	57.2	56.8	56.6	56.4	55.8
5000.0	57.0	57.5	56.9	56.4	56.6	55.6
6300.0	56.8	57.7	56.5	56.4	56.7	56.3
8000.0	56.7	57.7	55.0	55.6	55.7	55.3
10000.0	56.9	56.9	54.8	55.0	54.9	54.5
12500.0	56.2	55.3	54.3	54.9	54.5	54.1
16000.0	55.3	55.6	52.9	54.4	54.2	53.5
20000.0	54.6	55.6	52.9	54.2	54.2	53.3
25000.0	55.0	54.3	51.5	53.5	53.3	53.3
31500.0	54.9	54.7	50.7	53.9	53.4	53.4
40000.0	54.6	55.1	50.3	55.8	53.7	54.7
OVERALL SPL	69.3	69.2	68.1	68.2	67.9	67.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	52.4	55.8	50.3	51.3
250.0	47.8	47.9	49.0	49.0
315.2	50.0	50.8	48.8	49.9
400.0	50.7	49.3	48.8	50.2
500.0	50.2	48.9	48.6	49.0
630.0	50.9	50.0	49.3	48.6
800.0	51.8	50.7	50.1	49.0
1000.0	52.2	51.0	50.0	48.9
1250.0	53.0	51.8	50.5	49.0
1600.0	53.2	51.5	50.2	48.8
2000.0	54.3	52.5	51.6	49.6
2500.0	54.5	52.8	51.0	49.1
3150.0	55.0	53.5	51.5	49.5
4000.0	55.2	53.7	51.7	49.6
5000.0	55.1	53.3	51.1	49.0
6300.0	55.2	52.8	50.5	49.0
8000.0	54.6	53.1	50.0	48.1
10000.0	54.1	52.1	49.2	47.2
12500.0	53.7	51.9	48.9	47.0
16000.0	53.6	51.7	49.0	46.7
20000.0	53.9	51.5	49.6	47.3
25000.0	52.6	50.8	47.8	45.2
31500.0	52.4	50.8	47.6	44.9
40000.0	52.8	51.6	47.7	46.7
OVERALL SPL	67.0	65.8	63.7	62.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.70 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 68.00 DEG.F, CHAMBER TEMPERATURE = 72.00 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 20

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_R = 1.120$
TEMPERATURE RATIO $T_R = 0.992$
MACH NUMBER $M_J = 0.405$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 0.961$
JET DENSITY RATIO $\rho_J/\rho_0 = 1.041$
JET VELOCITY RATIO $V_J/A_0 = 0.397$
JET VELOCITY $V_J = 449.4$ FPS

$T_R/T_J = 1.033$
 $D_R/D_0 = 1.128$
 $D_R/D_J = 1.084$
MASS FLOW = 0.757 POUNDS PER SECOND
THRUST = 10.60 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	0.0	0.0	0.0	51.5	52.5	50.6
250.0	0.0	0.0	0.0	55.3	55.3	54.0
315.2	0.0	0.0	0.0	55.7	55.4	54.4
400.0	0.0	0.0	0.0	57.5	56.7	56.0
500.0	0.0	0.0	0.0	58.5	58.5	57.1
630.0	0.0	0.0	0.0	60.1	60.1	58.6
800.0	0.0	0.0	0.0	61.3	61.0	60.1
1000.0	0.0	0.0	0.0	62.1	62.1	61.0
1250.0	0.0	0.0	0.0	63.4	63.6	62.3
1600.0	0.0	0.0	0.0	63.2	63.4	62.9
2000.0	0.0	0.0	0.0	63.7	63.9	63.1
2500.0	0.0	0.0	0.0	63.4	63.9	63.2
3150.0	0.0	0.0	0.0	63.1	63.9	63.3
4000.0	0.0	0.0	0.0	62.8	64.1	63.2
5000.0	0.0	0.0	0.0	62.0	63.7	63.0
6300.0	0.0	0.0	0.0	61.5	63.4	62.8
8000.0	0.0	0.0	0.0	60.4	62.7	62.2
10000.0	0.0	0.0	0.0	59.5	62.2	61.9
12500.0	0.0	0.0	0.0	58.8	61.9	61.7
16000.0	0.0	0.0	0.0	57.8	60.9	61.0
20000.0	0.0	0.0	0.0	56.8	60.1	60.3
25000.0	0.0	0.0	0.0	56.0	59.4	59.8
31500.0	0.0	0.0	0.0	55.6	59.2	59.8
40000.0	0.0	0.0	0.0	56.0	59.7	59.5
OVERALL SPL	72.0	0.0	72.0	74.3	75.4	74.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	50.6	52.3	50.2	50.1	51.9	51.3
250.0	53.7	53.6	53.2	51.7	51.7	50.8
315.2	53.9	53.3	52.7	52.2	52.1	52.0
400.0	55.2	54.4	53.1	53.3	53.2	52.4
500.0	56.4	55.8	54.7	54.3	54.2	53.7
630.0	57.7	57.4	56.7	56.6	56.2	55.9
800.0	59.0	58.4	57.7	57.4	56.8	56.4
1000.0	60.3	59.3	58.7	58.2	58.0	57.7
1250.0	61.6	60.6	60.1	59.4	59.4	58.7
1600.0	61.9	61.0	60.5	60.1	59.6	59.0
2000.0	62.6	62.0	61.4	60.6	60.6	60.1
2500.0	62.6	62.1	61.4	60.7	61.1	60.5
3150.0	62.8	62.1	61.9	61.4	61.5	61.1
4000.0	63.1	62.6	62.0	61.6	61.6	61.4
5000.0	62.9	62.4	61.5	61.5	61.6	61.5
6300.0	63.0	62.4	61.6	61.6	61.7	61.6
8000.0	62.3	61.9	61.0	60.9	61.2	61.3
10000.0	62.0	61.5	60.6	60.3	60.8	61.0
12500.0	61.8	61.1	60.2	59.9	60.3	60.6
16000.0	61.1	60.6	59.9	59.0	59.8	59.8
20000.0	60.7	59.7	59.3	58.1	58.8	58.6
25000.0	60.5	59.1	59.0	57.4	58.2	57.8
31500.0	60.9	58.6	58.7	56.9	58.0	57.1
40000.0	63.0	58.5	58.5	56.6	58.5	56.9
OVERALL SPL	74.8	73.9	73.3	72.7	73.0	72.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.70 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 60.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 50.0 PERCENT
GAMMA = 1.400

RUN NUMBER 202

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.120
TEMPERATURE RATIO TR = 1.000
MACH NUMBER MJ = 0.405
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.968
JET DENSITY RATIO DJ/D0 = 1.033
JET VELOCITY RATIO VJ/A0 = 0.399
JET VELOCITY VJ = 446.0 FPS

TR/TJ = 1.033
DR/D0 = 1.120
DR/DJ = 1.084
MASS FLOW = 0.754 POUNDS PER SECOND
THRUST = 10.60 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	48.6	50.8	50.9	50.4	49.0	52.0
250.0	50.7	51.9	51.0	50.3	49.3	49.6
315.2	51.6	52.3	51.6	52.0	51.0	51.3
400.0	53.5	53.6	53.0	52.7	52.8	53.7
500.0	56.0	55.4	55.2	54.9	54.4	54.1
630.0	56.8	56.5	56.0	55.6	55.0	54.7
800.0	58.3	58.1	57.1	56.8	56.1	55.8
1000.0	59.5	58.7	57.8	57.3	56.7	56.1
1250.0	60.4	59.8	59.2	58.6	58.0	57.3
1600.0	60.6	60.1	59.4	58.9	58.2	57.6
2000.0	61.3	60.6	60.2	59.9	59.2	58.8
2500.0	61.6	60.8	60.1	60.2	59.8	59.1
3150.0	61.6	61.4	60.6	60.7	60.2	59.6
4000.0	61.7	61.7	60.9	60.7	60.6	59.6
5000.0	61.3	61.9	61.1	60.7	60.6	59.6
6300.0	61.0	62.1	61.0	60.8	60.6	60.1
8000.0	61.0	62.2	59.9	60.2	60.1	59.3
10000.0	61.5	61.5	59.7	59.8	59.6	58.9
12500.0	61.3	60.1	59.6	59.4	59.3	58.2
16000.0	59.9	60.3	58.1	58.8	58.8	57.6
20000.0	58.7	60.2	58.2	58.2	58.3	57.2
25000.0	59.8	59.0	57.8	57.8	57.8	57.2
31500.0	59.6	59.4	57.8	57.9	57.7	57.5
40000.0	59.2	59.9	58.0	58.8	57.6	58.4
OVERALL SPL	73.4	73.4	72.3	72.2	71.9	71.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0		52.9		56.5		51.5		53.3	
250.0		51.0		50.6		51.7		52.1	
315.2		51.9		52.4		51.0		51.0	
400.0		53.5		52.1		51.5		52.2	
500.0		53.4		52.7		51.7		51.8	
630.0		54.1		53.4		52.3		51.6	
800.0		55.2		54.2		52.9		52.2	
1000.0		55.8		54.4		53.5		52.3	
1250.0		56.6		55.5		54.2		52.4	
1600.0		56.9		55.7		54.0		52.4	
2000.0		58.1		56.8		55.2		53.3	
2500.0		58.4		56.9		55.1		53.3	
3150.0		59.2		57.9		55.8		53.9	
4000.0		59.5		58.0		56.1		53.8	
5000.0		59.4		57.5		55.5		53.3	
6300.0		59.8		57.7		55.6		53.8	
8000.0		59.0		57.3		54.6		52.7	
10000.0		58.8		56.4		54.8		52.2	
12500.0		58.3		56.0		53.5		51.5	
16000.0		58.0		55.6		53.3		50.8	
20000.0		57.6		55.1		53.1		50.6	
25000.0		57.0		54.6		52.4		49.3	
31500.0		56.9		54.4		52.3		48.8	
40000.0		57.2		55.0		52.2		49.0	
OVERALL									
SPL		71.0		69.5		67.6		66.0	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.78 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 68.00 DEG.F, CHAMBER TEMPERATURE = 72.00 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 21

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.196
TEMPERATURE RATIO TR = 0.992
MACH NUMBER MJ = 0.512
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.943
JET DENSITY RATIO DJ/D0 = 1.060
JET VELOCITY RATIO VJ/A0 = 0.497
JET VELOCITY VJ = 562.4 FPS

TR/TJ = 1.052
DR/D0 = 1.205
DR/DJ = 1.136
MASS FLOW = 0.966 POUNDS PER SECOND
THRUST = 16.91 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	0.0	0.0	61.0	56.9	56.2	55.5
250.0	0.0	0.0	63.4	60.6	59.5	58.1
315.2	0.0	0.0	66.4	62.5	61.0	59.9
400.0	0.0	0.0	67.2	64.8	63.0	61.7
500.0	0.0	0.0	69.0	65.8	64.8	62.7
630.0	0.0	0.0	70.4	67.8	66.6	65.3
800.0	0.0	0.0	71.7	68.4	68.4	66.9
1000.0	0.0	0.0	72.6	70.3	69.4	67.9
1250.0	0.0	0.0	73.0	71.2	70.8	69.3
1600.0	0.0	0.0	72.4	71.2	70.9	69.9
2000.0	0.0	0.0	73.0	71.5	71.7	70.7
2500.0	0.0	0.0	72.6	71.2	71.5	70.6
3150.0	0.0	0.0	71.8	71.5	71.5	70.8
4000.0	0.0	0.0	70.9	70.8	71.7	70.9
5000.0	0.0	0.0	69.8	70.0	71.4	70.9
6300.0	0.0	0.0	68.9	69.7	71.0	70.9
8000.0	0.0	0.0	67.3	68.7	70.5	70.4
10000.0	0.0	0.0	66.6	68.2	70.1	70.1
12500.0	0.0	0.0	65.5	67.0	69.7	69.9
16000.0	0.0	0.0	64.2	66.0	68.8	69.4
20000.0	0.0	0.0	62.7	64.7	67.8	68.9
25000.0	0.0	0.0	61.9	63.7	67.1	68.8
31500.0	0.0	0.0	60.9	62.7	66.3	69.0
40000.0	0.0	0.0	60.5	62.6	65.8	70.2
OVERALL SPL	72.0	0.0	83.2	82.2	82.9	82.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	55.5	55.5	54.9	55.0	54.5	55.0
250.0	57.8	57.4	57.2	56.6	56.2	55.6
315.2	58.7	58.7	58.4	57.1	56.9	57.2
400.0	61.2	60.4	59.0	58.9	58.9	57.5
500.0	62.6	61.0	60.2	60.1	59.0	58.5
630.0	64.4	63.4	62.8	62.2	62.2	61.6
800.0	65.6	65.0	64.1	63.0	63.3	62.5
1000.0	67.0	66.2	65.2	64.2	64.4	63.6
1250.0	68.6	67.6	66.7	66.1	65.6	65.2
1600.0	68.7	67.7	67.1	66.5	66.3	65.5
2000.0	69.3	68.8	68.0	67.6	67.0	66.4
2500.0	69.5	68.8	68.2	67.5	67.5	67.2
3150.0	69.9	69.3	68.7	68.3	68.1	67.9
4000.0	69.9	69.7	68.9	68.6	68.5	68.2
5000.0	70.1	69.7	68.7	68.7	68.8	68.5
6300.0	70.3	69.9	68.6	68.9	69.0	69.0
8000.0	69.9	69.5	68.4	68.2	68.5	68.7
10000.0	69.7	69.2	67.9	68.0	68.1	68.6
12500.0	69.4	68.7	67.5	67.6	67.6	68.0
16000.0	68.5	68.2	67.1	66.9	67.1	67.3
20000.0	68.1	67.3	66.6	65.8	66.1	65.9
25000.0	67.8	66.6	66.2	65.1	65.2	64.9
31500.0	67.4	65.9	65.6	64.1	64.4	63.9
40000.0	67.9	65.7	65.1	63.5	64.3	63.1
OVERALL SPL	81.7	81.0	80.1	79.7	79.7	79.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.78 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 59.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 50.0 PERCENT
GAMMA = 1.400

RUN NUMBER 203

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.196
TEMPERATURE RATIO TR = 0.998
MACH NUMBER MJ = 0.512
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.948
JET DENSITY RATIO DJ/D0 = 1.055
JET VELOCITY RATIO VJ/A0 = 0.499
JET VELOCITY VJ = 557.6 FPS

TR/TJ = 1.052
DR/D0 = 1.198
DR/DJ = 1.136
MASS FLOW = 0.963 POUNDS PER SECOND
THRUST = 16.91 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	52.5	54.4	55.4	54.2	54.2	54.8
250.0	55.0	56.0	55.2	54.5	54.4	54.1
315.2	56.1	56.5	56.9	56.2	56.3	55.7
400.0	58.9	58.9	58.9	57.9	58.7	57.8
500.0	60.8	60.4	60.8	60.5	60.2	59.5
630.0	62.7	62.2	62.1	61.7	60.8	60.4
800.0	64.0	64.2	63.6	62.6	62.0	61.6
1000.0	65.7	65.0	64.0	63.8	62.9	62.3
1250.0	66.9	66.2	65.4	64.8	64.4	63.6
1600.0	67.2	66.2	65.9	65.0	64.8	64.0
2000.0	68.0	67.3	66.7	66.2	65.6	65.0
2500.0	68.3	67.3	67.0	66.7	66.5	65.7
3150.0	68.7	67.8	67.7	67.4	67.2	66.4
4000.0	68.8	68.3	68.1	67.7	67.5	66.5
5000.0	68.6	68.6	68.4	67.7	67.7	66.6
6300.0	68.8	68.7	68.4	67.8	68.2	67.3
8000.0	68.8	69.2	67.3	67.4	67.1	66.4
10000.0	69.3	68.7	67.1	67.0	66.7	65.5
12500.0	69.1	67.1	67.1	66.8	66.5	65.6
16000.0	67.7	67.3	65.8	66.2	65.9	65.0
20000.0	66.3	67.1	65.7	65.5	65.0	64.7
25000.0	67.3	66.0	65.5	65.1	64.6	64.8
31500.0	67.0	66.3	65.4	64.8	64.5	65.1
40000.0	66.5	66.6	65.6	65.4	64.1	65.8
OVERALL SPL	80.5	80.0	79.4	79.0	78.7	78.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	55.3	57.0	54.1	54.9
250.0	54.5	54.8	55.0	55.0
315.2	56.1	56.2	55.2	55.6
400.0	58.6	56.8	55.8	57.5
500.0	59.3	58.2	57.1	57.0
630.0	60.1	58.9	57.4	57.1
800.0	60.8	59.9	58.6	58.1
1000.0	61.8	60.3	59.3	58.0
1250.0	62.9	61.6	60.4	58.1
1600.0	63.4	61.9	60.4	59.0
2000.0	64.6	63.1	61.7	59.9
2500.0	65.5	64.0	62.3	60.4
3150.0	66.2	64.8	62.9	61.2
4000.0	66.6	64.9	63.2	60.9
5000.0	66.6	64.7	62.7	60.5
6300.0	66.7	64.7	62.6	61.0
8000.0	66.5	64.7	61.9	60.0
10000.0	65.7	63.7	61.5	60.0
12500.0	65.8	63.6	60.7	58.7
16000.0	65.3	63.1	60.5	57.9
20000.0	64.8	62.4	59.9	57.0
25000.0	64.3	62.0	59.6	56.2
31500.0	64.2	61.9	59.4	55.8
40000.0	64.4	62.3	59.3	55.5
OVERALL SPL	77.9	76.1	74.1	72.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.21 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 68.00 DEG.F, CHAMBER TEMPERATURE = 72.00 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 22

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.297$
TEMPERATURE RATIO $TR = 0.992$
MACH NUMBER $MJ = 0.621$
JET STATIC TEMPERATURE RATIO $TJ/TO = 0.921$
JET DENSITY RATIO $DJ/DO = 1.085$
JET VELOCITY RATIO $VJ/AO = 0.596$
JET VELOCITY $VJ = 673.9$ FPS

$TR/TJ = 1.077$
 $OR/DO = 1.307$
 $OR/DJ = 1.204$
MASS FLOW = 1.184 POUNDS PER SECOND
THRUST = 24.85 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	74.1	78.8	68.9	62.4	61.9	60.1
250.0	75.6	78.6	70.8	66.2	64.7	62.4
315.2	77.5	78.3	73.4	68.1	67.3	64.6
400.0	78.8	80.0	73.6	71.0	69.6	66.8
500.0	80.4	79.3	76.2	72.4	71.0	68.7
630.0	80.1	80.0	77.7	74.1	73.2	70.6
800.0	82.5	81.6	78.8	75.9	74.9	71.8
1000.0	81.0	81.0	79.5	76.9	75.9	73.6
1250.0	80.2	81.4	80.6	78.3	77.7	75.0
1600.0	78.6	80.7	80.1	78.6	78.1	75.7
2000.0	76.7	79.9	7.9	78.8	78.7	76.6
2500.0	75.1	78.5	79.2	78.5	78.6	76.7
3150.0	73.5	77.4	78.4	78.5	78.7	76.8
4000.0	74.4	76.7	77.5	78.1	79.3	76.9
5000.0	73.5	75.7	76.1	77.1	78.8	77.1
6300.0	73.8	74.6	74.8	76.7	78.4	77.2
8000.0	73.6	73.3	73.0	75.7	77.9	76.5
10000.0	73.4	72.1	71.5	74.6	77.4	76.5
12500.0	72.0	71.9	69.9	74.0	77.2	76.4
16000.0	68.7	70.3	67.5	72.7	76.2	75.7
20000.0	65.3	68.2	64.9	71.4	75.1	75.2
25000.0	64.4	67.9	63.3	70.4	74.2	74.9
31500.0	63.8	68.1	61.8	69.3	73.4	74.6
40000.0	63.2	69.8	61.5	69.1	72.9	74.9
OVERALL SPL	90.6	91.6	89.9	89.2	90.0	88.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	58.8	60.1	59.5	59.5	59.4	59.7
250.0	61.9	61.7	61.3	60.4	60.3	59.7
315.2	64.1	64.0	63.4	62.6	62.2	62.3
400.0	66.0	65.8	64.6	64.0	63.8	63.4
500.0	67.9	67.3	66.3	66.2	65.9	65.0
630.0	69.2	69.3	68.1	67.8	67.5	66.9
800.0	70.7	70.7	69.5	69.3	68.7	68.4
1000.0	72.1	71.9	70.9	70.1	69.9	69.3
1250.0	73.6	73.2	72.3	71.7	71.5	70.9
1600.0	74.4	74.0	72.6	72.1	72.2	71.4
2000.0	75.2	74.7	73.5	73.0	73.2	72.0
2500.0	75.6	75.3	73.8	73.6	73.5	72.8
3150.0	76.0	75.7	74.3	74.2	74.1	73.5
4000.0	76.3	76.2	74.9	74.6	74.7	74.0
5000.0	76.4	76.1	74.7	74.9	74.9	74.3
6300.0	76.7	76.2	74.8	75.0	75.0	74.7
8000.0	76.3	76.1	74.7	74.5	74.8	74.6
10000.0	76.3	76.0	74.2	74.4	74.5	74.9
12500.0	76.3	75.7	74.2	74.1	74.1	74.3
16000.0	75.6	74.9	73.8	73.3	73.5	73.5
20000.0	75.3	74.0	73.2	72.4	72.6	72.2
25000.0	75.0	73.2	72.8	71.8	72.0	71.2
31500.0	74.8	72.3	72.2	71.1	71.4	70.3
40000.0	75.6	72.2	71.7	70.9	71.5	69.7
OVERALL SPL	88.1	87.4	86.2	85.9	85.9	85.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.21 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 58.00 DEG.F, CHAMBER TEMPERATURE = 59.00 DEG.F
RELATIVE HUMIDITY = 53.0 PERCENT
GAMMA = 1.400

RUN NUMBER 204

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.297$
TEMPERATURE RATIO $TR = 0.998$
MACH NUMBER $MJ = 0.621$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 0.927$
JET DENSITY RATIO $DJ/D_0 = 1.079$
JET VELOCITY RATIO $VJ/A_0 = 0.598$
JET VELOCITY $VJ = 667.5$ FPS

$TR/TJ = 1.077$
 $DR/D_0 = 1.299$
 $DR/DJ = 1.204$
MASS FLOW = 1.181 POUNDS PER SECOND
THRUST = 24.85 POUNDS

SHOCK CELL LENGTH $s = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3	MICRO		MICRO		MICRO		MICRO		MICRO	
OCTAVE	PHONE		PHONE		PHONE		PHONE		PHONE	
CENTER	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
FREQ.	10	82.5	11	90.0	12	97.5	13	105.0	14	112.5
HZ										
200.0	56.2		58.1		59.0		58.0		57.5	
250.0	59.7		60.0		59.4		58.6		58.5	
315.2	60.5		61.4		61.3		60.6		60.2	
400.0	63.2		63.7		62.6		62.5		62.2	
500.0	64.8		64.7		64.8		64.9		64.3	
630.0	66.9		67.0		67.0		66.5		65.8	
800.0	69.2		69.0		68.5		67.4		66.8	
1000.0	70.2		70.0		69.0		68.5		67.8	
1250.0	72.0		71.0		70.4		70.0		69.2	
1600.0	72.5		71.6		70.9		70.3		70.1	
2000.0	73.2		72.5		71.9		71.3		70.7	
2500.0	73.4		72.7		72.1		71.8		71.7	
3150.0	74.1		73.1		73.0		72.6		72.5	
4000.0	74.1		73.7		73.3		72.8		72.6	
5000.0	74.1		74.2		73.6		72.8		72.8	
6300.0	74.0		74.6		73.9		73.0		73.3	
8000.0	74.3		74.9		72.6		72.8		72.5	
10000.0	74.5		74.5		72.7		72.4		72.4	
12500.0	74.9		72.9		72.6		72.1		72.0	
16000.0	73.5		73.2		71.3		71.5		71.3	
20000.0	72.2		73.0		71.3		70.8		70.7	
25000.0	73.0		71.8		70.9		70.5		70.2	
31500.0	72.7		72.2		70.7		70.3		70.1	
40000.0	72.2		72.4		70.6		70.7		69.6	
OVERALL										
SPL	85.9		85.6		84.6		84.2		84.0	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	57.5	58.8	57.4	58.2
250.0	59.3	59.8	60.0	59.8
315.2	60.7	60.5	59.4	59.2
400.0	62.4	61.3	60.5	61.3
500.0	64.2	63.2	62.1	61.7
630.0	65.4	64.1	62.8	62.0
800.0	66.3	65.0	63.9	63.0
1000.0	67.2	65.7	64.3	63.6
1250.0	68.5	66.8	65.7	64.1
1600.0	69.0	67.4	66.1	65.1
2000.0	70.2	68.8	67.9	65.9
2500.0	71.2	69.8	68.5	67.0
3150.0	71.9	70.6	69.2	67.6
4000.0	72.3	70.6	69.4	67.3
5000.0	72.6	70.6	69.3	67.4
6300.0	72.6	71.8	69.3	67.8
8000.0	72.6	70.8	68.5	66.8
10000.0	72.1	71.0	68.6	67.0
12500.0	72.1	69.9	67.2	65.3
16000.0	71.7	69.3	66.8	64.0
20000.0	71.1	68.5	66.1	63.1
25000.0	70.8	68.0	65.8	62.2
31500.0	70.6	67.9	65.6	61.7
40000.0	70.9	68.4	65.6	61.2
OVERALL SPL	83.8	82.1	80.3	78.5

SUPERSONIC JET EXHAUST NOISE

MAC 1.0 NOZZLE

RESERVOIR PRESSURE = 6.24 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 68.00 DEG.F, CHAMBER TEMPERATURE = 72.00 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 23

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.440
TEMPERATURE RATIO TR = 0.992
MACH NUMBER MJ = 0.741
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.894
JET DENSITY RATIO DJ/D0 = 1.118
JET VELOCITY RATIO VJ/A0 = 0.701
JET VELOCITY VJ = 792.3 FPS

TR/TJ = 1.110
DR/D0 = 1.451
DR/DJ = 1.298
MASS FLOW = 1.435 POUNDS PER SECOND
THRUST = 35.39 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	80.3	80.9	74.5	67.6	67.1	64.4
250.0	80.3	80.7	75.5	70.6	69.6	67.4
315.2	81.9	80.9	78.3	73.4	72.1	70.1
400.0	84.0	83.9	79.4	76.5	74.1	72.6
500.0	86.3	83.8	82.1	77.7	77.0	74.2
630.0	86.1	86.1	84.5	80.4	78.7	76.2
800.0	88.5	87.6	85.9	82.0	80.3	77.7
1000.0	87.1	87.4	86.6	83.1	81.7	79.6
1250.0	86.4	87.8	87.6	84.5	83.3	80.8
1600.0	84.2	86.4	87.0	84.9	83.8	81.8
2000.0	82.5	85.6	86.8	85.3	84.5	82.6
2500.0	80.6	83.8	86.0	85.0	84.6	83.0
3150.0	78.8	82.6	85.0	85.0	84.8	83.1
4000.0	79.4	81.7	84.0	84.7	85.2	83.4
5000.0	78.0	80.4	82.7	83.4	84.7	83.4
6300.0	78.5	79.8	81.8	82.9	84.3	83.5
8000.0	77.7	78.6	80.4	82.1	83.6	83.0
10000.0	79.0	77.7	79.5	80.1	83.1	82.9
12500.0	76.7	77.0	78.0	80.6	82.8	82.8
16000.0	73.8	75.3	76.2	79.5	81.9	82.1
20000.0	70.6	73.5	74.3	78.3	80.6	81.5
25000.0	69.0	73.5	72.7	77.1	79.8	81.2
31500.0	68.8	74.6	70.7	75.8	78.8	80.9
40000.0	69.0	77.8	69.0	75.4	78.0	80.5
OVERALL SPL	96.2	96.9	96.8	95.5	95.8	94.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	7	60.0	8	67.5	9	75.0
	10	82.5	11	90.0	12	97.5
200.0	63.4		65.0		64.5	
250.0	66.2		65.8		64.5	
315.2	69.0		68.4		65.7	
400.0	71.2		70.6		67.6	
500.0	73.0		71.7		69.2	
630.0	74.6		74.0		70.9	
800.0	76.6		75.7		70.2	
1000.0	78.4		77.0		72.6	
1250.0	79.7		79.0		72.5	
1600.0	80.2		79.5		74.1	
2000.0	81.4		80.6		74.2	
2500.0	81.7		81.1		75.6	
3150.0	82.1		81.4		77.0	
4000.0	82.4		82.0		77.8	
5000.0	82.6		82.2		78.4	
6300.0	82.9		82.5		79.4	
8000.0	82.5		82.1		78.6	
10000.0	82.4		82.2		79.4	
12500.0	82.3		82.0		80.0	
16000.0	81.7		81.4		80.5	
20000.0	81.2		80.8		80.0	
25000.0	80.7		80.3		80.1	
31500.0	79.8		79.6		80.4	
40000.0	79.3		79.6		80.4	
					80.5	
					80.8	
					80.2	
					80.6	
					80.6	
					79.9	
					80.2	
					79.7	
					79.0	
					78.2	
					77.5	
					78.5	
					78.0	
					76.7	
					75.9	
					77.9	
					76.5	
OVERALL						
SPL	94.0		93.5		91.5	
					91.7	
					91.4	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 6.24 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 55.00 DEG.F, CHAMBER TEMPERATURE = 57.00 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 205

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.440
TEMPERATURE RATIO TR = 0.996
MACH NUMBER MJ = 0.741
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.898
JET DENSITY RATIO DJ/D0 = 1.114
JET VELOCITY RATIO VJ/A0 = 0.702
JET VELOCITY VJ = 782.5 FPS

TR/TJ = 1.110
DR/D0 = 1.446
DR/CJ = 1.298
MASS FLOW = 1.432 POUNDS PER SECOND
THRUST = 35.39 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	59.9	62.8	62.8	62.3	61.4	60.7
250.0	63.5	63.8	63.3	62.2	62.3	61.6
315.2	64.7	65.3	64.6	65.0	63.8	63.4
400.0	67.2	67.5	66.8	66.8	66.4	66.6
500.0	69.6	69.6	69.7	69.5	68.6	68.3
630.0	71.7	71.2	71.9	71.0	70.1	70.0
800.0	73.4	73.4	73.2	72.1	71.5	71.0
1000.0	75.2	74.8	73.8	73.4	72.4	71.7
1250.0	77.0	76.0	75.6	74.8	74.3	73.5
1600.0	77.5	76.3	76.0	75.4	74.8	74.1
2000.0	78.5	77.5	77.1	76.4	75.7	75.3
2500.0	78.8	78.1	77.6	77.2	76.8	76.3
3150.0	79.2	78.8	78.4	78.1	77.5	77.0
4000.0	79.3	78.9	78.7	78.0	77.5	76.9
5000.0	79.1	79.3	78.9	78.0	77.8	76.9
6300.0	79.5	80.0	79.0	78.6	78.3	78.0
8000.0	79.6	80.3	77.9	78.1	77.9	77.0
10000.0	80.4	80.0	78.0	77.8	78.0	77.3
12500.0	80.1	78.7	78.0	77.5	77.4	76.5
16000.0	78.5	78.6	76.8	76.9	76.7	75.9
20000.0	77.3	78.5	76.6	76.3	76.0	75.4
25000.0	78.3	77.4	76.6	75.8	75.6	75.1
31500.0	77.8	77.7	76.5	75.6	75.3	75.2
40000.0	77.4	77.9	76.5	76.1	74.8	75.8
OVERALL SPL	91.1	90.9	89.9	89.5	89.1	88.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3		1/3		1/3		1/3	
OCTAVE CENTER FREQ.	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
16	127.5	17	135.0	18	142.5	19	150.0
200.0	60.1	60.9	60.4	61.2			
250.0	61.6	62.0	62.6	62.8			
315.2	63.7	63.3	62.4	62.4			
400.0	66.1	64.6	63.9	64.1			
500.0	67.6	66.5	65.4	64.7			
630.0	69.2	68.3	66.7	65.7			
800.0	70.2	69.0	68.0	66.7			
1000.0	71.3	69.8	68.8	67.2			
1250.0	72.6	71.4	70.1	68.1			
1600.0	73.4	72.1	70.9	69.8			
2000.0	74.8	73.6	72.6	71.0			
2500.0	76.1	74.8	73.6	72.1			
3150.0	76.5	75.5	74.2	72.7			
4000.0	76.8	75.7	74.6	72.7			
5000.0	76.9	75.5	74.2	72.4			
6300.0	77.7	76.2	74.8	72.7			
8000.0	77.3	76.2	73.8	72.1			
10000.0	77.0	75.7	73.4	71.4			
12500.0	76.8	75.1	72.6	70.7			
16000.0	76.2	74.4	71.9	69.5			
20000.0	75.4	73.7	71.2	68.4			
25000.0	75.0	73.2	70.9	67.5			
31500.0	74.8	73.1	70.8	66.9			
40000.0	75.0	73.6	70.6	66.5			
OVERALL SPL	88.3	87.0	85.2	83.3			

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 8.75 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 68.00 DEG.F, CHAMBER TEMPERATURE = 72.00 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 24

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.617$
TEMPERATURE RATIO $TR = 0.992$
MACH NUMBER $MJ = 0.858$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 0.865$
JET DENSITY RATIO $DJ/D0 = 1.156$
JET VELOCITY RATIO $VJ/A0 = 0.798$
JET VELOCITY $VJ = 902.2$ FPS

$TR/TJ = 1.147$
 $DR/D0 = 1.629$
 $DR/DJ = 1.410$
MASS FLOW = 1.689 POUNDS PER SECOND
THRUST = 47.44 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 1 ANGLE 15.0	NO. 2 ANGLE 22.5	NO. 3 ANGLE 30.0	NO. 4 ANGLE 37.5	NO. 5 ANGLE 45.0	NO. 6 ANGLE 52.5
200.0	83.1	84.9	74.2	71.0	68.5	67.9
250.0	83.7	85.0	78.4	75.0	72.5	70.1
315.2	86.8	86.0	82.3	77.6	76.2	73.4
400.0	88.3	89.0	83.8	80.9	78.3	76.3
500.0	91.3	89.5	87.2	82.9	80.2	77.4
630.0	91.5	91.3	89.5	85.4	83.0	80.4
800.0	94.2	93.7	91.4	87.4	85.2	82.3
1000.0	93.4	94.1	92.7	89.0	86.4	84.0
1250.0	92.9	93.9	93.8	90.1	88.0	85.7
1600.0	90.7	92.4	92.7	90.1	88.6	86.8
2000.0	88.4	91.4	92.4	90.6	89.8	87.9
2500.0	86.1	89.3	91.2	90.1	89.7	88.3
3150.0	84.2	87.6	90.3	90.2	89.9	88.4
4000.0	84.5	86.8	89.4	89.7	90.4	88.8
5000.0	82.3	85.4	88.0	88.6	90.0	88.8
6300.0	82.5	84.6	86.8	88.0	89.6	88.8
8000.0	82.8	83.5	85.2	87.0	89.0	88.5
10000.0	84.2	82.4	84.1	86.3	88.6	88.4
12500.0	81.5	81.4	82.6	85.5	88.1	88.0
16000.0	78.9	80.1	80.9	84.3	86.9	87.2
20000.0	75.8	78.0	79.2	82.9	85.7	86.7
25000.0	74.3	77.1	77.6	81.7	84.8	86.2
31500.0	73.5	77.1	75.4	80.2	83.7	85.8
40000.0	72.6	78.6	73.4	79.6	82.8	85.4
OVERALL SPL	101.8	102.5	102.2	100.7	100.9	100.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	67.0	67.5	67.2	66.9	66.4	65.6
250.0	70.2	69.3	69.3	69.2	68.8	68.3
315.2	72.0	71.3	71.2	70.8	70.8	70.1
400.0	75.2	74.8	72.9	72.4	72.8	71.9
500.0	76.3	75.5	74.4	73.5	73.5	73.3
630.0	78.5	77.3	77.0	76.6	76.3	75.8
800.0	80.5	80.0	78.8	77.8	77.4	77.0
1000.0	82.1	81.3	79.9	79.4	78.8	78.1
1250.0	83.8	82.6	81.5	80.8	80.5	79.8
1600.0	85.0	83.5	82.2	81.7	81.4	80.6
2000.0	85.9	84.6	83.5	82.7	82.3	81.7
2500.0	86.4	85.3	83.9	83.3	83.0	82.5
3150.0	86.7	85.6	84.4	83.8	83.3	83.0
4000.0	87.2	86.1	85.1	84.4	84.1	83.6
5000.0	87.2	86.3	84.9	84.7	84.3	83.9
6300.0	87.6	86.6	85.3	84.9	84.5	84.5
8000.0	87.2	86.4	85.0	84.5	84.6	84.6
10000.0	87.1	87.3	85.3	85.0	84.5	85.3
12500.0	87.1	86.1	84.8	84.3	84.1	84.9
16000.0	86.6	85.7	84.6	83.7	83.9	84.3
20000.0	86.0	85.0	84.1	83.0	83.2	83.3
25000.0	85.4	84.4	83.9	82.4	82.8	82.6
31500.0	84.7	83.9	83.6	81.7	82.2	81.8
40000.0	84.1	83.9	83.2	80.9	82.2	81.1
OVERALL SPL	98.6	97.7	96.5	95.8	95.7	95.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 8.75 PSI, ATMOSPHERIC PRESSURE = 14.7 PSI
RESERVOIR TEMPERATURE = 53.00 DEG.F, CHAMBER TEMPERATURE = 57.00 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 206

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.617
TEMPERATURE RATIO TR = 0.992
MACH NUMBER MJ = 0.858
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.865
JET DENSITY RATIO DJ/D0 = 1.156
JET VELOCITY RATIO VJ/A0 = 0.798
JET VELOCITY VJ = 889.3 FPS

TR/TJ = 1.147
DR/D0 = 1.630
DR/DJ = 1.410
MASS FLOW = 1.689 POUNDS PER SECOND
THRUST = 47.44 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10	ANGLE 82.5	MICRO PHONE NO. 11	ANGLE 90.0	MICRO PHONE NO. 12	ANGLE 97.5	MICRO PHONE NO. 13	ANGLE 105.0	MICRO PHONE NO. 14	ANGLE 112.5	MICRO PHONE NO. 15	ANGLE 120.0
200.0	64.0		66.2		67.2		66.4		65.3		63.6	
250.0	66.6		67.4		66.9		65.8		65.4		64.5	
315.2	68.2		68.9		68.5		68.2		68.1		66.8	
400.0	70.3		71.0		70.8		70.4		70.6		70.4	
500.0	73.6		73.1		73.4		73.3		73.0		71.7	
630.0	75.2		74.9		75.3		75.2		74.4		73.7	
800.0	77.0		77.4		77.2		76.1		75.7		74.6	
1000.0	79.2		79.0		78.4		77.2		76.7		75.7	
1250.0	81.0		80.6		79.8		79.3		78.4		77.7	
1600.0	81.9		80.8		80.2		79.6		79.3		78.4	
2000.0	83.0		82.0		81.4		80.5		80.2		79.5	
2500.0	83.4		82.6		82.0		81.4		81.2		80.5	
3150.0	83.5		83.0		82.5		82.0		81.5		80.7	
4000.0	83.9		83.5		83.2		82.5		82.0		81.1	
5000.0	83.6		83.6		83.4		82.1		81.9		80.9	
6300.0	83.2		84.2		83.2		82.5		82.3		81.6	
8000.0	84.1		85.0		83.0		82.4		82.2		81.4	
10000.0	84.1		84.1		82.5		82.1		81.8		81.0	
12500.0	84.7		83.4		83.1		82.0		82.2		81.1	
16000.0	83.5		83.2		81.9		81.5		81.7		80.7	
20000.0	82.1		83.3		81.7		80.9		80.9		80.5	
25000.0	82.8		82.2		81.4		80.8		80.6		80.2	
31500.0	82.7		82.5		81.5		80.7		80.4		80.1	
40000.0	82.2		82.6		81.5		81.1		79.8		80.4	
OVERALL SPL	95.5		95.4		94.5		93.8		93.5		92.8	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO		MICRO	
CENTER	PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE
HZ	16	127.5	17	135.0
	18	142.5	19	150.0
200.0	62.8		63.4	
250.0	64.9		64.7	
315.2	67.1		66.5	
400.0	69.8		68.5	
500.0	71.7		70.4	
630.0	73.7		72.4	
800.0	74.2		72.7	
1000.0	75.4		73.8	
1250.0	77.1		75.9	
1600.0	78.1		76.8	
2000.0	79.3		78.7	
2500.0	80.0		79.3	
3150.0	80.5		79.9	
4000.0	80.9		80.3	
5000.0	81.1		80.4	
6300.0	82.0		81.0	
8000.0	81.8		81.4	
10000.0	81.4		80.8	
12500.0	81.6		80.9	
16000.0	80.9		80.3	
20000.0	80.5		79.7	
25000.0	80.0		79.1	
31500.0	79.7		78.7	
40000.0	79.7		78.9	
OVERALL				
SPL	92.8		92.0	
			90.5	
				88.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 12.10 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 68.00 DEG.F, CHAMBER TEMPERATURE = 71.00 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 25

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.853$
TEMPERATURE RATIO $TR = 0.994$
MACH NUMBER $MJ = 0.982$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 0.834$
JET DENSITY RATIO $DJ/D_0 = 1.200$
JET VELOCITY RATIO $VJ/A_0 = 0.896$
JET VELOCITY $VJ = 1012.5$ FPS

$TR/TJ = 1.193$
 $DR/D_0 = 1.864$
 $DR/DJ = 1.554$
MASS FLOW = 1.969 POUNDS PER SECOND
THRUST = 62.13 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	1 15.0	2 22.5	3 30.0	4 37.5	5 45.0	6 52.5
200.0	88.8	88.8	76.5	73.9	72.7	71.5
250.0	88.4	88.9	81.5	77.5	76.1	74.0
315.2	90.5	89.4	86.5	80.6	78.7	76.6
400.0	93.0	92.8	88.1	84.9	81.9	79.9
500.0	95.8	93.4	91.5	86.8	84.4	81.5
630.0	95.6	96.2	94.5	89.9	86.9	83.8
800.0	98.9	98.9	96.7	91.9	88.8	85.9
1000.0	98.9	99.4	97.9	93.7	90.6	87.8
1250.0	98.5	100.1	99.4	95.3	92.3	89.4
1600.0	96.9	99.4	98.3	95.4	93.0	90.7
2000.0	94.7	97.5	97.6	95.6	94.1	91.8
2500.0	91.7	94.8	96.2	95.1	94.5	92.3
3150.0	89.3	93.3	94.8	94.7	94.5	92.4
4000.0	87.9	91.6	94.0	94.1	94.8	92.7
5000.0	86.4	90.4	92.5	93.1	94.3	92.7
6300.0	86.1	89.3	91.3	92.3	93.9	92.7
8000.0	85.5	87.4	90.0	91.4	93.2	92.1
10000.0	85.0	84.5	87.1	90.1	92.7	92.1
12500.0	83.7	85.1	87.9	89.5	92.1	91.7
16000.0	81.4	83.9	86.6	88.4	90.8	90.9
20000.0	78.4	81.9	85.4	87.1	89.5	90.4
25000.0	76.9	80.8	84.4	86.0	88.6	89.9
31500.0	75.8	79.7	82.9	84.6	87.5	89.4
40000.0	74.5	80.2	81.7	83.9	86.6	89.0
OVERALL SPL	106.8	107.9	107.3	105.3	105.1	103.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	71.3	70.5	71.4	70.7	70.5	69.7
250.0	72.9	73.4	72.6	71.8	72.2	70.6
315.2	75.5	75.3	74.9	74.5	74.3	73.5
400.0	78.1	77.9	76.9	76.0	76.4	75.4
500.0	79.9	79.2	79.5	77.5	77.6	76.6
630.0	82.3	81.4	81.0	80.3	79.8	79.5
800.0	84.3	83.4	82.9	81.0	81.0	80.8
1000.0	86.2	84.9	83.8	82.9	82.6	81.7
1250.0	87.7	86.6	85.7	84.6	84.4	83.7
1600.0	88.8	87.5	86.6	85.6	85.4	84.4
2000.0	90.0	88.8	87.7	86.8	86.4	85.6
2500.0	90.4	89.0	88.1	86.9	87.0	86.3
3150.0	91.0	89.9	89.1	87.9	87.7	86.9
4000.0	91.5	90.5	89.7	88.2	88.1	87.5
5000.0	91.6	90.6	89.4	88.7	88.5	88.0
6300.0	91.9	90.8	89.6	89.0	88.8	88.7
8000.0	91.6	90.8	89.5	88.6	88.7	88.7
10000.0	91.7	90.7	89.3	88.7	88.9	89.4
12500.0	91.5	90.5	89.3	88.5	88.4	89.0
16000.0	90.8	90.2	88.9	87.9	88.2	88.5
20000.0	90.3	89.5	88.5	87.3	87.4	87.5
25000.0	89.8	88.9	88.2	86.7	87.0	86.8
31500.0	89.0	88.3	87.8	85.9	86.3	86.0
40000.0	88.5	88.4	87.4	85.2	86.3	85.4
OVERALL SPL	102.8	101.9	100.9	99.8	99.8	99.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 11.94 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 58.00 DEG.F, CHAMBER TEMPERATURE = 68.00 DEG.F
RELATIVE HUMIDITY = 76.0 PERCENT
GAMMA = 1.400

RUN NUMBER 127

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.853$
TEMPERATURE RATIO $TR = 0.981$
MACH NUMBER $MJ = 0.982$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 0.823$
JET DENSITY RATIO $DJ/D0 = 1.216$
JET VELOCITY RATIO $VJ/A0 = 0.890$
JET VELOCITY $VJ = 1002.7$ FPS

$TR/TJ = 1.193$
 $DR/D0 = 1.889$
 $DR/DJ = 1.554$
MASS FLOW = 1.981 POUNDS PER SECOND
THRUST = 62.10 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	66.0	68.3	69.0	68.7	67.8	66.9
250.0	69.3	70.1	69.7	68.5	68.0	66.8
315.2	70.6	71.3	70.6	70.5	69.8	69.3
400.0	73.4	73.6	73.4	72.6	73.0	73.0
500.0	76.0	75.8	76.0	75.8	75.7	74.9
630.0	78.3	78.1	77.9	77.8	77.2	77.0
800.0	80.1	80.2	80.1	79.5	78.6	77.9
1000.0	82.0	82.5	81.2	80.3	80.0	79.3
1250.0	84.4	84.2	82.7	82.4	81.6	81.2
1600.0	85.5	84.5	83.4	83.0	82.6	81.8
2000.0	86.9	85.8	84.7	84.2	83.7	83.2
2500.0	86.8	85.9	84.8	84.4	84.2	83.8
3150.0	87.4	86.6	85.7	85.6	85.3	84.3
4000.0	87.6	87.2	86.2	85.8	85.5	84.6
5000.0	87.4	87.2	86.4	85.8	85.6	85.1
6300.0	87.6	88.0	87.4	86.4	86.5	86.2
8000.0	87.6	88.5	85.9	86.4	86.4	85.9
10000.0	88.3	88.4	86.7	86.2	86.7	85.9
12500.0	88.1	87.2	86.0	86.2	86.4	86.0
16000.0	87.1	86.9	84.6	85.7	86.1	85.6
20000.0	85.3	87.0	84.1	84.8	84.9	84.8
25000.0	85.0	85.6	83.0	83.9	84.1	84.1
31500.0	83.9	85.3	81.8	82.7	83.1	83.2
40000.0	82.4	84.6	80.2	82.0	81.5	82.4
OVERALL SPL	98.9	98.9	97.3	97.3	97.2	96.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	75.0	64.9	66.5	66.5
250.0	67.5	68.0	67.6	67.4
315.2	69.4	69.3	68.1	68.1
400.0	72.4	71.4	70.7	69.9
500.0	74.2	72.9	72.4	70.8
630.0	76.5	75.4	74.1	72.3
800.0	77.4	76.6	75.6	73.7
1000.0	78.6	77.3	76.6	75.0
1250.0	80.4	79.5	78.8	76.4
1600.0	81.4	80.8	80.2	78.8
2000.0	82.7	82.4	81.9	79.9
2500.0	83.1	82.8	82.5	80.7
3150.0	84.2	83.9	83.6	82.4
4000.0	84.6	84.5	84.6	82.7
5000.0	85.2	84.8	85.4	83.4
6300.0	86.1	86.7	86.7	84.8
8000.0	86.4	86.5	86.4	84.9
10000.0	86.6	87.0	86.8	84.6
12500.0	86.2	86.1	85.5	84.0
16000.0	85.7	85.6	84.9	82.7
20000.0	84.7	84.2	83.5	80.9
25000.0	83.6	82.9	82.4	79.2
31500.0	82.1	81.6	81.0	77.1
40000.0	80.7	80.7	79.4	75.0
OVERALL SPL	96.7	96.5	96.2	94.2

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.72 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 85.00 DEG.F, CHAMBER TEMPERATURE = 70.00 DEG.F
RELATIVE HUMIDITY = 66.0 PERCENT
GAMMA = 1.400

RUN NUMBER 29

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.192
TEMPERATURE RATIO TR = 1.028
MACH NUMBER MJ = 0.507
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.978
JET DENSITY RATIO ρ_J/ρ_0 = 1.022
JET VELOCITY RATIO V_J/A_0 = 0.501
JET VELOCITY VJ = 565.5 FPS

TR/TJ = 1.051
DR/D0 = 1.159
DR/DJ = 1.133
MASS FLOW = 0.938 POUNDS PER SECOND
THRUST = 16.55 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	65.6	71.7	59.6	58.2	55.7	56.6
250.0	66.8	71.0	63.4	60.9	59.7	58.5
315.2	69.2	70.0	66.8	62.7	62.0	60.6
400.0	71.0	72.3	67.6	65.3	63.4	62.5
500.0	73.0	70.9	69.9	66.9	65.4	64.0
630.0	72.3	72.1	70.8	68.4	67.1	65.8
800.0	74.0	73.2	72.1	70.0	68.2	67.3
1000.0	72.9	72.9	73.0	70.7	69.6	68.8
1250.0	73.0	73.5	74.0	71.7	70.6	69.5
1600.0	71.3	73.2	73.3	71.5	71.0	70.4
2000.0	70.2	72.6	73.5	71.9	71.5	71.0
2500.0	68.0	71.1	73.0	71.7	71.4	71.1
3150.0	66.8	69.9	72.0	71.6	71.6	71.1
4000.0	67.7	69.4	71.4	71.2	72.0	71.3
5000.0	66.0	68.1	70.0	69.9	71.6	70.9
6300.0	66.8	67.0	69.0	69.3	71.2	71.0
8000.0	66.2	65.5	67.8	68.3	70.6	70.3
10000.0	66.6	64.3	66.8	66.6	70.0	70.1
12500.0	64.7	64.0	65.7	66.5	69.9	69.8
16000.0	61.5	62.6	64.2	65.1	69.0	69.0
20000.0	58.3	60.8	62.7	63.9	68.0	68.5
25000.0	57.9	61.4	61.9	62.7	67.4	68.3
31500.0	58.4	62.7	61.2	61.7	67.1	68.1
40000.0	59.4	65.4	60.5	61.4	67.5	68.6
OVERALL SPL	82.9	83.9	83.6	82.4	83.0	82.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	54.9	56.0	54.9	55.4	55.7	55.7
250.0	56.4	56.8	57.5	56.5	56.6	55.4
315.2	58.6	58.4	58.8	58.1	57.5	57.5
400.0	60.8	60.1	59.9	59.6	59.0	58.1
500.0	61.5	62.0	61.8	61.0	60.8	60.1
630.0	64.4	63.2	63.4	62.6	62.4	61.5
800.0	64.7	64.7	64.6	63.8	63.4	62.9
1000.0	66.6	66.1	65.4	64.6	64.4	63.7
1250.0	68.4	67.7	67.0	66.6	66.1	65.5
1600.0	68.8	68.2	67.6	66.9	66.6	65.8
2000.0	69.3	68.8	68.4	67.5	67.4	66.6
2500.0	69.6	69.1	68.6	68.1	68.0	67.2
3150.0	69.6	69.6	69.3	68.7	68.4	67.9
4000.0	70.1	70.0	69.5	68.9	68.8	68.4
5000.0	70.0	70.0	69.4	69.1	68.9	68.7
6300.0	70.2	70.0	69.3	69.3	69.3	69.0
8000.0	69.5	69.7	69.0	68.8	68.8	68.7
10000.0	69.5	69.5	68.6	68.5	68.4	68.7
12500.0	69.1	69.1	68.4	68.1	67.8	68.2
16000.0	68.6	68.5	68.0	67.1	67.3	67.4
20000.0	68.2	67.6	67.2	66.1	66.3	66.1
25000.0	68.0	67.0	66.9	65.2	65.7	65.1
31500.0	68.1	66.2	66.4	64.2	65.1	64.1
40000.0	69.4	66.0	65.9	63.6	65.2	63.4
OVERALL SPL	81.7	81.2	80.8	80.1	80.1	79.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.71 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 71.00 DEG.F, CHAMBER TEMPERATURE = 57.00 DEG.F
RELATIVE HUMIDITY = 56.0 PERCENT
GAMMA = 1.400

RUN NUMBER 207

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.191
TEMPERATURE RATIO TR = 1.027
MACH NUMBER MJ = 0.506
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.977
JET DENSITY RATIO DJ/D0 = 1.024
JET VELOCITY RATIO VJ/A0 = 0.500
JET VELOCITY VJ = 557.6 FPS

TR/TJ = 1.051
DR/D0 = 1.160
DR/DJ = 1.133
MASS FLOW = 0.938 POUNDS PER SECOND
THRUST = 16.51 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	52.6	55.2	55.6	54.3	53.4	54.8
250.0	55.0	56.2	55.4	54.8	54.1	54.0
315.2	56.0	57.5	56.6	57.3	56.0	56.2
400.0	58.8	59.4	58.3	58.3	58.4	58.4
500.0	60.6	60.8	60.3	60.7	59.9	59.2
630.0	63.0	62.6	61.9	61.8	60.8	60.4
800.0	64.4	64.4	63.6	62.5	61.6	61.5
1000.0	65.6	65.3	63.9	63.9	62.7	62.2
1250.0	66.6	66.5	65.0	65.4	64.2	63.6
1600.0	67.4	66.6	65.5	65.5	64.6	63.8
2000.0	68.0	67.3	66.2	66.4	65.4	65.0
2500.0	68.2	67.6	66.5	66.7	66.1	65.6
3150.0	68.5	68.0	67.1	67.7	66.7	66.4
4000.0	68.8	68.6	67.6	68.0	67.1	66.6
5000.0	68.7	68.9	67.9	67.9	67.4	66.6
6300.0	68.6	69.0	67.9	68.0	68.0	67.1
8000.0	68.7	69.7	66.7	67.7	67.0	66.4
10000.0	69.0	68.9	66.7	67.4	67.0	65.9
12500.0	69.0	67.5	66.5	66.9	66.3	65.6
16000.0	67.5	67.8	65.0	66.4	65.7	65.0
20000.0	66.2	67.7	64.6	65.7	64.9	64.6
25000.0	67.3	66.4	63.9	65.3	64.5	64.5
31500.0	66.8	66.7	63.1	65.4	64.4	64.7
40000.0	66.3	67.0	62.7	66.0	64.1	65.4
OVERALL SPL	80.5	80.4	78.7	79.3	78.5	78.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0		54.9		56.7		53.8		55.4	
250.0		54.4		54.7		54.5		55.2	
315.2		55.8		56.0		54.6		55.2	
400.0		57.9		56.4		56.1		56.2	
500.0		58.3		57.7		56.7		56.4	
630.0		59.6		58.7		58.0		57.1	
800.0		60.4		59.8		58.6		57.8	
1000.0		61.3		60.1		59.2		58.3	
1250.0		62.9		61.5		60.2		58.3	
1600.0		63.2		61.9		60.4		59.2	
2000.0		64.0		63.0		61.8		59.9	
2500.0		64.7		63.9		61.9		60.4	
3150.0		65.6		64.7		63.0		61.2	
4000.0		66.2		65.1		63.3		61.1	
5000.0		66.3		64.6		62.8		60.6	
6300.0		66.8		64.9		62.8		60.5	
8000.0		66.1		64.7		62.0		60.1	
10000.0		66.1		64.3		61.7		59.5	
12500.0		65.3		63.8		60.8		58.6	
16000.0		64.9		63.4		60.5		57.9	
20000.0		64.3		62.6		59.7		56.9	
25000.0		64.0		62.1		59.4		56.1	
31500.0		63.9		62.2		59.3		55.6	
40000.0		64.2		62.6		59.1		55.2	
OVERALL									
SPL		77.5		76.2		74.1		72.3	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.02 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 97.00 DEG.F, CHAMBER TEMPERATURE = 70.50 DEG.F
RELATIVE HUMIDITY = 63.0 PERCENT
GAMMA = 1.400

RUN NUMBER 30

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.283$
TEMPERATURE RATIO $TR = 1.050$
MACH NUMBER $MJ = 0.608$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 0.978$
JET DENSITY RATIO $DJ/D_0 = 1.023$
JET VELOCITY RATIO $VJ/A_0 = 0.601$
JET VELOCITY $VJ = 678.3$ FPS

$TR/TJ = 1.074$
 $DR/D_0 = 1.222$
 $DR/DJ = 1.195$
MASS FLOW = 1.125 POUNDS PER SECOND
THRUST = 23.79 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	73.0	74.1	66.0	62.8	61.4	59.2
250.0	73.6	74.5	69.5	66.5	64.4	62.2
315.2	76.6	75.4	73.0	68.4	66.6	63.4
400.0	78.3	78.7	73.6	71.0	68.4	66.5
500.0	80.3	78.7	76.7	72.7	70.7	68.1
630.0	80.3	80.0	78.6	75.0	72.8	69.9
800.0	82.2	81.9	79.3	76.1	74.0	71.9
1000.0	80.7	80.9	79.8	77.2	75.6	73.2
1250.0	80.1	81.4	81.0	78.6	77.0	74.5
1600.0	78.5	80.6	80.9	78.6	77.5	75.4
2000.0	76.8	79.8	80.8	79.1	78.2	75.9
2500.0	75.0	78.2	80.1	78.6	78.1	76.1
3150.0	73.4	76.9	79.1	78.8	78.5	76.4
4000.0	73.8	76.2	78.6	78.2	78.7	76.6
5000.0	72.3	74.8	77.2	77.2	78.1	76.5
6300.0	72.7	74.0	76.3	76.6	78.0	76.5
8000.0	72.3	72.7	75.0	75.6	77.5	75.9
10000.0	72.0	71.4	73.9	74.8	77.0	75.9
12500.0	70.8	70.7	72.9	74.0	76.5	75.8
16000.0	67.7	69.1	71.6	72.8	75.4	75.1
20000.0	64.3	67.0	70.3	71.5	74.3	74.7
25000.0	63.4	66.6	69.5	70.5	73.4	74.4
31500.0	62.7	66.5	68.7	69.3	72.6	74.1
40000.0	62.2	67.8	67.9	68.8	72.2	74.6
OVERALL SPL	90.2	91.0	90.8	89.3	89.5	88.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	58.7	59.0	59.3	59.4	58.5	58.9
250.0	60.8	61.0	61.2	60.5	60.4	59.3
315.2	62.8	63.0	62.6	61.8	61.7	60.9
400.0	65.0	65.5	64.2	63.8	63.4	62.4
500.0	66.0	66.4	66.3	65.0	65.0	64.1
630.0	68.6	68.4	68.1	66.9	66.9	66.2
800.0	70.1	70.0	69.6	68.8	68.4	67.6
1000.0	71.4	71.2	70.8	69.9	69.4	68.8
1250.0	72.8	72.8	72.3	71.4	70.8	70.1
1600.0	73.6	73.4	72.9	71.8	71.6	71.0
2000.0	74.7	74.4	73.6	72.8	72.3	71.9
2500.0	75.0	74.7	74.2	73.3	73.1	72.5
3150.0	75.3	75.0	74.7	73.9	73.7	73.4
4000.0	76.0	75.6	75.2	74.3	74.1	73.7
5000.0	75.9	75.6	75.1	74.5	74.4	74.1
6300.0	76.0	75.7	75.0	74.7	74.6	74.6
8000.0	75.7	75.5	74.9	74.2	74.3	74.4
10000.0	75.6	75.4	74.6	74.2	74.5	74.7
12500.0	75.5	75.1	74.5	73.8	73.7	74.0
16000.0	74.9	74.5	74.1	72.9	73.2	73.4
20000.0	74.6	73.8	73.4	72.1	72.4	72.1
25000.0	74.3	73.1	73.1	71.4	71.9	71.2
31500.0	74.1	72.3	72.4	70.4	71.4	70.1
40000.0	74.6	72.1	71.9	69.8	71.7	69.2
OVERALL SPL	87.4	86.9	86.4	85.5	85.6	85.2

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.01 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 82.00 DEG.F, CHAMBER TEMPERATURE = 56.00 DEG.F
RELATIVE HUMIDITY = 66.0 PERCENT
GAMMA = 1.400

RUN NUMBER 208

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.283
TEMPERATURE RATIO TR = 1.050
MACH NUMBER MJ = 0.607
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.978
JET DENSITY RATIO DJ/D0 = 1.022
JET VELOCITY RATIO VJ/A0 = 0.601
JET VELOCITY VJ = 668.8 FPS

TR/TJ = 1.074
DR/D0 = 1.221
DR/DJ = 1.195
MASS FLOW = 1.124 POUNDS PER SECOND
THRUST = 23.77 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	57.2	58.7	59.0	58.7	57.4	57.6
250.0	59.8	59.8	59.0	58.4	58.4	57.5
315.2	61.2	61.6	61.2	60.8	60.4	59.9
400.0	62.9	63.7	63.0	62.8	62.4	62.8
500.0	65.6	65.1	65.7	64.9	64.8	63.8
630.0	67.3	67.1	67.0	66.7	65.9	65.3
800.0	69.0	69.4	68.4	67.7	67.0	66.4
1000.0	70.6	70.1	69.0	68.7	67.8	67.2
1250.0	72.0	71.3	70.7	70.1	69.4	68.9
1600.0	72.6	72.0	71.0	70.3	70.2	69.0
2000.0	73.2	72.8	72.0	71.4	70.8	70.3
2500.0	73.6	73.2	72.4	71.9	71.9	71.0
3150.0	74.1	73.8	73.2	72.8	72.6	71.9
4000.0	74.3	74.1	73.7	73.0	72.9	72.1
5000.0	74.1	74.4	74.0	73.1	72.9	72.0
6300.0	74.5	75.3	74.3	73.7	73.4	72.8
8000.0	74.6	75.4	73.2	73.3	72.9	72.2
10000.0	75.0	75.0	73.8	73.4	73.2	72.1
12500.0	75.4	73.6	73.3	72.7	72.5	71.6
16000.0	73.7	73.6	71.8	72.0	71.8	70.9
20000.0	72.4	73.4	71.7	71.4	70.9	70.5
25000.0	73.4	72.0	71.2	71.0	70.6	70.4
31500.0	73.1	72.4	71.1	70.9	70.4	70.6
40000.0	72.8	72.6	70.9	71.4	70.1	71.1
OVERALL SPL	86.2	86.0	85.0	84.6	84.3	83.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0		57.3		57.9		57.3		58.0	
250.0		58.6		58.3		58.9		58.9	
315.2		60.1		58.8		59.0		58.3	
400.0		62.2		60.6		60.4		60.3	
500.0		63.3		61.8		61.4		60.6	
630.0		64.7		63.6		62.7		61.3	
800.0		66.0		64.3		63.6		62.3	
1000.0		66.6		65.0		64.1		62.8	
1250.0		67.9		66.4		65.6		63.6	
1600.0		68.6		66.9		65.9		64.8	
2000.0		69.8		68.5		67.5		65.6	
2500.0		70.8		69.2		68.1		66.4	
3150.0		71.9		70.1		68.8		67.3	
4000.0		72.1		70.4		69.3		67.2	
5000.0		72.1		70.0		68.9		66.9	
6300.0		72.7		70.6		69.0		67.2	
8000.0		72.6		70.4		68.4		66.6	
10000.0		72.3		69.9		68.2		65.5	
12500.0		71.9		69.6		67.1		65.1	
16000.0		71.4		69.0		66.6		64.1	
20000.0		70.8		68.2		65.9		63.0	
25000.0		70.4		67.7		65.5		62.3	
31500.0		70.3		67.6		65.4		61.8	
40000.0		70.6		68.1		65.1		61.4	
OVERALL									
SPL		83.6		81.5		80.0		78.1	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 5.65 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 112.00 DEG.F, CHAMBER TEMPERATURE = 70.50 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 31

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.398
TEMPERATURE RATIO TR = 1.078
MACH NUMBER MJ = 0.709
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.980
JET DENSITY RATIO DJ/D0 = 1.021
JET VELOCITY RATIO VJ/A0 = 0.701
JET VELOCITY VJ = 792.0 FPS

TR/TJ = 1.100
DR/D0 = 1.296
DR/DJ = 1.270
MASS FLOW = 1.311 POUNDS PER SECOND
THRUST = 32.37 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	76.0	77.8	70.6	67.7	65.7	63.8
250.0	78.1	79.3	73.9	70.9	68.8	66.3
315.2	81.5	81.0	79.9	73.6	71.3	69.6
400.0	83.8	84.3	79.7	76.2	74.3	71.7
500.0	86.2	84.4	82.7	78.1	76.2	73.8
630.0	85.8	86.5	84.4	80.7	78.5	75.7
800.0	88.7	88.0	86.2	82.5	80.5	77.7
1000.0	87.9	87.8	86.6	83.1	81.7	79.5
1250.0	86.9	88.2	87.7	84.4	83.2	80.8
1600.0	84.6	86.6	87.1	84.4	83.5	81.9
2000.0	82.5	85.7	86.8	84.8	84.3	83.0
2500.0	80.7	83.9	85.9	84.2	84.5	83.1
3150.0	79.3	82.8	84.8	84.2	84.5	83.4
4000.0	79.3	81.9	84.0	83.6	84.8	83.4
5000.0	78.2	80.9	82.5	82.5	84.3	83.5
6300.0	78.3	80.1	81.6	82.1	84.0	83.6
8000.0	77.9	78.7	80.2	81.0	83.3	82.9
10000.0	78.0	77.8	79.0	80.1	82.7	82.8
12500.0	76.4	77.0	78.7	79.5	82.2	82.6
16000.0	73.3	75.5	77.4	78.3	81.3	82.0
20000.0	70.2	73.4	76.2	77.0	80.3	81.3
25000.0	68.8	72.8	75.2	75.8	79.3	81.1
31500.0	67.8	71.8	74.2	74.3	78.3	80.6
40000.0	66.6	71.7	73.3	73.7	77.3	80.2
OVERALL SPL	96.3	97.1	96.8	94.9	95.5	94.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	63.0	63.8	63.4	63.0	62.1	62.5
250.0	66.1	65.0	65.5	63.9	63.8	62.8
315.2	68.1	67.5	67.2	66.2	65.3	65.3
400.0	70.8	69.9	68.7	67.8	67.4	66.9
500.0	72.0	71.0	71.0	69.6	68.7	68.5
630.0	74.6	73.3	72.7	71.2	70.4	70.2
800.0	76.5	75.3	74.2	72.6	72.1	71.8
1000.0	77.8	76.7	75.5	74.1	73.2	73.1
1250.0	79.3	78.1	77.1	75.6	74.9	74.5
1600.0	80.2	79.3	77.7	76.3	75.5	75.5
2000.0	81.1	80.1	78.8	77.2	76.4	76.4
2500.0	81.8	80.2	79.2	77.9	77.1	77.1
3150.0	82.0	80.8	79.9	78.8	78.0	78.2
4000.0	82.4	81.6	80.3	79.2	78.4	78.4
5000.0	82.6	81.7	80.3	79.5	78.7	79.1
6300.0	82.8	81.9	80.3	79.8	79.0	79.5
8000.0	82.6	81.7	80.4	79.5	78.9	79.4
10000.0	82.5	82.0	80.5	79.3	78.8	79.5
12500.0	82.3	81.6	80.1	78.9	78.6	79.3
16000.0	81.6	81.1	79.8	78.0	78.2	78.7
20000.0	81.0	80.4	79.4	77.3	77.5	77.5
25000.0	80.5	79.9	79.2	76.6	77.2	76.6
31500.0	79.7	79.1	78.8	75.7	76.8	75.6
40000.0	79.1	79.0	78.3	75.1	77.2	75.0
OVERALL SPL	93.9	93.0	91.9	90.4	90.1	90.1

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 5.57 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 107.00 DEG.F, CHAMBER TEMPERATURE = 68.00 DEG.F
RELATIVE HUMIDITY = 76.0 PERCENT
GAMMA = 1.400

RUN NUMBER 130

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_R = 1.398$
TEMPERATURE RATIO $T_R = 1.074$
MACH NUMBER $M_J = 0.709$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 0.976$
JET DENSITY RATIO $\rho_J/\rho_0 = 1.025$
JET VELOCITY RATIO $V_J/A_0 = 0.700$
JET VELOCITY $V_J = 788.5$ FPS

$T_R/T_J = 1.100$
 $D_R/D_0 = 1.302$
 $D_R/D_J = 1.270$
MASS FLOW = 1.313 POUNDS PER SECOND
THRUST = 32.37 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	61.0	62.3	63.0	61.5	61.6	60.0
250.0	63.3	63.4	62.8	61.8	61.6	61.0
315.2	64.6	64.8	64.3	64.0	63.2	62.7
400.0	67.4	67.6	66.8	66.1	65.9	66.3
500.0	69.2	69.0	68.8	69.0	68.1	67.7
630.0	71.3	70.8	70.7	70.5	69.4	69.5
800.0	73.5	73.1	72.6	71.6	70.7	70.1
1000.0	75.0	74.5	73.5	72.5	71.8	71.0
1250.0	76.9	75.8	75.1	74.1	73.7	72.9
1600.0	77.9	76.4	75.7	74.7	74.3	73.6
2000.0	78.6	77.3	76.6	75.9	75.2	74.8
2500.0	78.8	77.9	77.0	76.4	76.0	75.5
3150.0	79.4	78.4	77.9	77.7	77.1	76.6
4000.0	79.7	78.9	78.5	77.8	77.1	76.6
5000.0	79.2	79.2	78.9	77.9	77.4	76.9
6300.0	79.4	79.8	79.3	78.1	78.3	78.0
8000.0	79.5	80.5	78.3	78.1	77.6	77.3
10000.0	80.0	80.1	78.6	77.8	77.8	76.7
12500.0	80.0	78.9	78.5	77.5	77.1	76.8
16000.0	78.5	79.0	77.4	77.1	76.6	76.5
20000.0	76.8	78.9	77.1	76.2	75.5	75.7
25000.0	77.3	77.5	76.5	75.5	75.1	75.4
31500.0	76.2	77.2	75.8	74.4	74.3	74.7
40000.0	74.4	76.6	74.9	73.9	73.2	74.4
OVERALL SPL	90.9	90.8	89.8	89.1	88.6	88.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. ANGLE	NO. ANGLE	NO. ANGLE	NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	59.4	61.3	61.0	60.7
250.0	61.5	61.3	61.7	61.4
315.2	62.9	62.6	62.1	62.3
400.0	65.5	64.1	63.8	63.4
500.0	67.2	66.1	65.4	64.2
630.0	68.9	68.0	67.0	64.9
800.0	69.4	68.9	68.0	66.0
1000.0	70.6	69.6	68.4	66.9
1250.0	72.4	71.2	69.9	67.3
1600.0	73.0	71.8	70.6	69.0
2000.0	74.2	73.4	72.2	70.2
2500.0	75.4	74.0	73.2	71.3
3150.0	76.3	75.0	73.9	72.1
4000.0	76.3	75.3	74.4	71.9
5000.0	76.6	75.1	74.0	71.7
6300.0	77.5	75.5	74.4	72.1
8000.0	77.0	75.8	73.8	71.7
10000.0	77.2	75.0	73.4	70.9
12500.0	76.6	74.9	72.9	70.5
16000.0	76.4	74.6	72.5	69.7
20000.0	75.5	73.7	71.6	68.5
25000.0	74.6	72.9	71.0	67.1
31500.0	73.7	72.3	70.2	65.8
40000.0	73.0	71.9	69.0	64.3
OVERALL SPL	88.0	86.5	85.1	82.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 7.66 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 126.00 DEG.F, CHAMBER TEMPERATURE = 70.50 DEG.F
RELATIVE HUMIDITY = 61.0 PERCENT
GAMMA = 1.400

RUN NUMBER 32

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.539
TEMPERATURE RATIO TR = 1.105
MACH NUMBER MJ = 0.810
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.977
JET DENSITY RATIO DJ/D0 = 1.024
JET VELOCITY RATIO VJ/A0 = 0.800
JET VELOCITY VJ = 903.6 FPS

TR/TJ = 1.131
DR/D0 = 1.394
DR/DJ = 1.361
MASS FLOW = 1.500 POUNDS PER SECOND
THRUST = 42.28 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	81.0	82.0	74.8	70.6	69.6	66.8
250.0	82.2	82.6	78.6	74.6	73.2	70.4
315.2	86.7	84.5	82.4	78.1	75.4	73.3
400.0	88.1	88.5	84.1	80.9	78.4	75.8
500.0	91.0	89.0	86.9	83.0	80.7	77.5
630.0	91.0	91.0	90.1	85.8	82.9	79.8
800.0	94.1	93.8	91.6	87.6	85.0	82.2
1000.0	93.1	94.0	92.6	89.0	86.5	84.0
1250.0	92.9	94.3	93.9	90.2	88.1	85.0
1600.0	90.4	92.3	92.7	90.1	88.7	86.3
2000.0	88.8	90.8	92.1	90.5	89.6	87.5
2500.0	86.8	88.8	91.0	90.0	89.9	87.7
3150.0	84.7	87.5	90.0	89.8	89.9	88.0
4000.0	84.8	86.7	89.2	88.9	90.0	88.2
5000.0	83.1	85.3	87.6	87.8	89.5	88.3
6300.0	83.4	84.5	86.6	87.1	89.2	88.1
8000.0	82.7	83.3	85.2	85.9	88.7	87.6
10000.0	82.6	82.0	84.1	84.8	87.6	87.8
12500.0	82.0	81.8	83.2	84.1	87.6	87.4
16000.0	79.5	80.4	81.7	82.7	86.5	86.6
20000.0	76.6	78.7	80.4	81.2	85.2	86.1
25000.0	75.2	77.6	79.4	79.6	84.3	85.6
31500.0	74.1	76.7	78.3	77.7	83.4	85.0
40000.0	73.4	76.4	77.2	76.6	82.4	84.5
OVERALL SPL	101.6	102.3	102.2	100.3	100.6	99.4

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	66.7	67.3	67.1	66.3	66.4	65.8
250.0	69.7	68.3	68.8	68.5	68.3	67.0
315.2	71.0	70.8	70.4	70.1	69.8	69.4
400.0	74.4	73.7	72.6	72.1	71.6	71.2
500.0	75.5	74.8	74.4	72.8	72.2	71.8
630.0	78.4	76.7	76.2	75.2	75.0	74.4
800.0	80.4	79.0	77.7	76.8	76.7	76.4
1000.0	81.8	80.1	79.0	78.2	77.7	77.2
1250.0	83.3	82.1	80.6	80.1	79.7	79.0
1600.0	84.3	82.7	81.6	80.6	80.4	79.8
2000.0	85.6	83.9	82.8	81.6	81.2	80.8
2500.0	86.1	84.6	83.2	82.5	82.4	81.9
3150.0	86.4	84.8	83.7	83.1	83.0	82.7
4000.0	86.9	85.6	84.4	83.5	83.4	83.0
5000.0	87.2	85.8	84.4	83.8	83.8	83.4
6300.0	87.4	86.2	84.6	84.3	84.1	84.2
8000.0	87.2	86.1	84.7	84.1	84.1	84.2
10000.0	87.0	86.1	85.0	84.3	84.3	84.6
12500.0	86.8	85.9	84.6	84.0	83.8	84.3
16000.0	86.3	85.7	84.4	83.3	83.4	83.8
20000.0	85.9	84.9	83.9	82.6	82.7	82.7
25000.0	85.3	84.3	83.7	82.0	82.3	82.0
31500.0	84.4	83.7	83.4	81.3	81.8	81.3
40000.0	83.9	83.7	83.0	80.5	81.7	80.6
OVERALL SPL	98.4	97.2	96.1	95.1	95.1	95.0

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 7.56 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 123.00 DEG.F, CHAMBER TEMPERATURE = 68.00 DEG.F
RELATIVE HUMIDITY = 76.0 PERCENT
GAMMA = 1.400

RUN NUMBER 131

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.540
TEMPERATURE RATIO TR = 1.104
MACH NUMBER MJ = 0.810
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.976
JET DENSITY RATIO DJ/D0 = 1.025
JET VELOCITY RATIO VJ/A0 = 0.800
JET VELOCITY VJ = 901.6 FPS

TR/TJ = 1.131
DR/D0 = 1.395
DR/DJ = 1.361
MASS FLOW = 1.502 POUNDS PER SECOND
THRUST = 42.31 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. Hz	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	62.7	65.2	65.4	65.6	64.6	62.6
250.0	66.0	66.5	65.6	65.0	64.5	63.6
315.2	67.2	67.7	67.5	66.3	67.0	66.1
400.0	70.8	70.2	69.9	69.2	69.3	69.4
500.0	72.7	72.3	72.2	72.1	71.9	70.7
630.0	74.8	74.1	74.4	73.7	73.7	73.0
800.0	76.4	76.6	76.1	75.0	74.5	73.8
1000.0	78.7	78.2	77.0	76.2	75.4	74.8
1250.0	80.6	79.7	78.6	77.8	77.3	76.3
1600.0	81.6	80.1	79.0	78.5	78.2	77.3
2000.0	82.4	81.3	80.4	79.8	79.2	78.5
2500.0	82.9	82.0	81.3	80.7	80.3	79.9
3150.0	83.4	82.3	81.6	81.4	81.1	80.5
4000.0	83.8	82.9	82.3	81.8	81.4	80.7
5000.0	83.5	83.2	82.6	81.7	81.5	80.7
6300.0	83.7	84.2	83.0	82.3	82.1	81.6
8000.0	83.8	84.6	82.2	82.2	81.8	81.0
10000.0	84.4	84.9	82.4	82.3	81.6	80.8
12500.0	84.5	83.3	82.4	81.9	81.7	80.9
16000.0	83.4	83.4	81.3	81.6	81.4	80.7
20000.0	81.5	83.3	80.9	80.7	80.6	80.4
25000.0	81.8	82.2	80.2	80.1	80.2	79.8
31500.0	81.1	81.9	79.2	79.1	79.3	79.3
40000.0	79.3	81.3	77.8	78.4	78.0	78.9
OVERALL SPL	95.1	95.1	93.6	93.2	92.9	92.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO		MICRO	
CENTER	PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE
HZ	16	127.5	17	135.0
	18	142.5	19	150.0
200.0	63.7		63.0	62.8
250.0	64.7		63.9	64.1
315.2	66.9		65.3	65.4
400.0	69.4		67.4	66.6
500.0	70.9		69.4	68.7
630.0	72.7		71.6	70.2
800.0	72.9		72.1	71.3
1000.0	74.3		73.0	71.8
1250.0	75.5		74.6	73.3
1600.0	76.8		75.6	74.3
2000.0	78.0		77.2	76.3
2500.0	79.5		78.5	77.4
3150.0	79.9		79.2	77.7
4000.0	80.4		79.8	78.4
5000.0	80.5		79.4	78.3
6300.0	81.3		80.2	78.8
8000.0	81.2		80.4	78.4
10000.0	81.3		79.9	78.6
12500.0	80.8		79.8	77.6
16000.0	80.6		79.6	77.4
20000.0	79.9		78.7	76.5
25000.0	79.1		78.0	76.1
31500.0	78.2		77.2	75.3
40000.0	77.2		76.7	74.3
OVERALL				
SPL	92.0		91.0	89.4
				87.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 10.10 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 145.00 DEG.F, CHAMBER TEMPERATURE = 72.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.400

RUN NUMBER 33

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.711$
TEMPERATURE RATIO $TR = 1.137$
MACH NUMBER $MJ = 0.911$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 0.975$
JET DENSITY RATIO $DJ/D_0 = 1.025$
JET VELOCITY RATIO $VJ/A_0 = 0.900$
JET VELOCITY $VJ = 1017.0$ FPS

$TR/TJ = 1.166$
 $DR/D_0 = 1.505$
 $OR/DJ = 1.468$
MASS FLOW = 1.688 POUNDS PER SECOND
THRUST = 53.47 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 1 15.0	MICRO PHONE NO. ANGLE 2 22.5	MICRO PHONE NO. ANGLE 3 30.0	MICRO PHONE NO. ANGLE 4 37.5	MICRO PHONE NO. ANGLE 5 45.0	MICRO PHONE NO. ANGLE 6 52.5
200.0	83.0	84.3	77.3	73.3	81.3	70.1
250.0	85.4	86.9	82.1	77.9	75.2	72.8
315.2	89.6	87.4	86.0	80.4	77.6	75.8
400.0	91.9	92.4	87.4	83.7	81.2	79.0
500.0	95.0	92.9	90.9	85.9	83.3	80.7
630.0	95.2	95.4	94.1	89.0	86.3	82.8
800.0	98.3	98.1	95.9	91.6	88.6	85.1
1000.0	98.3	99.0	97.5	93.3	90.5	87.3
1250.0	98.3	100.1	98.5	94.8	92.4	88.6
1600.0	96.8	98.8	98.1	94.6	92.7	89.5
2000.0	94.6	97.4	97.1	95.0	93.5	90.8
2500.0	91.8	95.1	95.5	94.3	93.6	91.6
3150.0	89.2	92.8	94.1	93.9	93.8	91.9
4000.0	88.5	91.6	92.9	93.3	94.2	92.2
5000.0	86.6	90.2	91.5	92.2	93.7	92.3
6300.0	86.1	89.0	90.1	91.2	93.1	92.5
8000.0	86.3	87.8	88.8	90.1	92.2	91.6
10000.0	86.3	86.5	88.0	89.0	91.8	91.5
12500.0	85.1	85.7	86.9	88.2	91.1	91.1
16000.0	82.8	84.8	85.8	87.2	90.5	90.6
20000.0	79.9	83.0	84.5	86.1	89.4	90.1
25000.0	78.1	81.7	83.3	84.6	88.3	89.5
31500.0	77.1	80.9	81.9	83.1	87.4	89.0
40000.0	75.6	81.0	80.5	82.2	86.2	88.4
OVERALL SPL	106.3	107.5	106.7	104.6	104.5	103.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	69.5	70.0	69.8	69.9	69.0	68.6
250.0	72.2	72.6	71.2	71.3	70.3	70.1
315.2	74.1	74.2	73.8	72.8	72.5	72.3
400.0	77.5	76.9	76.2	75.0	75.4	74.4
500.0	79.0	77.9	77.4	76.4	75.9	75.5
630.0	81.8	80.4	79.6	78.8	78.5	77.5
800.0	83.6	82.3	81.2	80.4	79.8	79.5
1000.0	85.4	84.1	82.7	81.8	81.0	80.7
1250.0	86.8	85.6	84.5	83.4	82.7	82.4
1600.0	88.1	86.5	85.2	84.2	83.7	83.2
2000.0	89.4	87.9	86.4	85.5	85.0	84.3
2500.0	89.9	88.5	87.2	86.0	85.7	85.4
3150.0	90.4	89.0	87.6	86.7	86.2	85.9
4000.0	91.1	89.8	88.6	87.2	86.9	86.7
5000.0	91.6	90.3	88.7	87.8	87.6	87.3
6300.0	91.5	90.5	88.8	88.3	87.9	88.2
8000.0	91.5	90.3	88.8	87.7	88.0	87.9
10000.0	91.4	90.4	88.6	87.8	87.9	88.2
12500.0	91.4	90.4	88.8	87.7	88.0	88.2
16000.0	91.0	90.3	88.7	87.4	87.9	88.1
20000.0	90.5	89.7	88.4	86.8	87.3	87.3
25000.0	89.9	89.2	88.2	86.2	86.8	86.6
31500.0	89.2	88.8	87.9	85.6	86.4	85.9
40000.0	88.6	88.7	87.4	84.7	86.4	85.2
OVERALL SPL	102.6	101.6	100.2	98.9	99.0	98.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 9.97 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 141.00 DEG.F, CHAMBER TEMPERATURE = 68.00 DEG.F
RELATIVE HUMIDITY = 76.0 PERCENT
GAMMA = 1.400

RUN NUMBER 132

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_r = 1.712$
TEMPERATURE RATIO $T_r = 1.138$
MACH NUMBER $M_J = 0.911$
JET STATIC TEMPERATURE RATIO $T_{J/T_0} = 0.976$
JET DENSITY RATIO $\rho_J/\rho_0 = 1.024$
JET VELOCITY RATIO $V_J/A_0 = 0.900$
JET VELOCITY $V_J = 1014.1$ FPS

$T_r/T_J = 1.166$
 $D_r/D_0 = 1.504$
 $D_r/D_J = 1.468$
MASS FLOW = 1.689 POUNDS PER SECOND
THRUST = 53.52 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	66.3	68.0	68.9	68.6	66.5	65.5
250.0	69.0	69.3	68.5	67.1	67.0	66.0
315.2	69.9	70.6	70.2	69.5	69.4	69.0
400.0	72.8	73.1	72.4	71.7	71.8	72.3
500.0	75.3	75.2	75.2	74.9	74.5	74.2
630.0	77.5	77.0	77.4	77.3	76.5	76.3
800.0	79.3	79.6	79.5	78.1	78.0	77.2
1000.0	81.3	81.3	80.4	79.6	78.9	78.4
1250.0	83.7	82.9	82.2	81.4	80.4	80.1
1600.0	84.7	83.7	82.9	81.9	81.3	80.6
2000.0	85.2	84.8	83.9	83.3	82.5	82.0
2500.0	86.2	85.3	84.3	83.9	83.4	82.7
3150.0	86.7	85.8	85.1	84.8	83.9	83.4
4000.0	86.8	86.7	85.9	85.4	84.7	83.9
5000.0	86.9	86.9	86.3	85.3	84.9	84.1
6300.0	87.2	87.8	86.8	85.9	85.5	85.0
8000.0	87.5	88.4	86.1	86.1	85.4	84.8
10000.0	88.1	88.5	86.3	86.1	85.8	85.0
12500.0	88.3	87.3	86.5	86.1	85.7	84.9
16000.0	87.2	87.4	85.5	85.8	85.5	85.0
20000.0	85.6	87.5	85.3	85.2	84.7	84.5
25000.0	85.8	86.3	84.9	84.5	84.3	84.0
31500.0	85.0	86.1	84.2	83.7	83.5	83.4
40000.0	83.6	85.5	83.5	83.1	82.2	83.0
OVERALL SPL	98.7	98.8	97.5	97.0	96.5	96.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	65.0	65.4	66.2	66.7
250.0	65.9	66.1	66.8	66.6
315.2	68.7	68.3	67.8	67.7
400.0	71.6	70.4	69.6	69.2
500.0	74.0	72.9	71.8	71.0
630.0	76.3	75.0	73.6	71.8
800.0	76.6	75.6	74.7	73.3
1000.0	77.7	76.3	75.4	74.1
1250.0	79.7	78.4	77.2	75.4
1600.0	80.4	79.4	78.2	77.4
2000.0	81.8	81.1	79.9	78.6
2500.0	82.6	81.9	80.7	79.6
3150.0	83.4	82.6	81.4	80.3
4000.0	84.1	83.2	82.4	80.9
5000.0	84.4	83.5	82.7	81.4
6300.0	85.2	84.6	83.6	82.5
8000.0	85.4	85.2	83.8	82.4
10000.0	85.6	85.2	83.9	82.2
12500.0	85.6	85.1	83.6	81.9
16000.0	85.4	84.7	83.4	80.9
20000.0	84.6	83.9	82.4	79.6
25000.0	84.0	83.0	81.6	78.2
31500.0	82.7	81.8	80.5	76.4
40000.0	81.8	81.1	79.2	74.6
OVERALL SPL	96.1	95.4	94.2	92.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.87 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 312.00 DEG.F, CHAMBER TEMPERATURE = 77.00 DEG.F
RELATIVE HUMIDITY = 56.0 PERCENT
GAMMA = 1.390

RUN NUMBER 26

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.061$
TEMPERATURE RATIO $TR = 1.438$
MACH NUMBER $MJ = 0.294$
JET STATIC TEMPERATURE RATIO $TJ/TO = 1.414$
JET DENSITY RATIO $DJ/DO = 0.707$
JET VELOCITY RATIO $VJ/AO = 0.349$
JET VELOCITY $VJ = 397.0$ FPS

$TR/TJ = 1.017$
 $DR/DO = 0.738$
 $DR/DJ = 1.044$
MASS FLOW = 0.453 POUNDS PER SECOND
THRUST = 5.57 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	58.6	61.2	54.4	52.4	52.4	51.0
250.0	58.8	61.2	57.3	55.2	55.4	53.1
315.2	60.4	61.5	59.9	57.2	56.8	55.4
400.0	62.9	64.3	60.8	59.0	58.7	57.5
500.0	65.3	63.5	62.7	60.0	60.1	58.8
630.0	63.0	63.7	63.3	61.3	61.5	59.9
800.0	65.5	65.0	63.8	62.2	62.2	60.7
1000.0	63.1	64.5	64.2	62.4	62.1	61.3
1250.0	62.7	64.4	64.4	62.7	63.0	61.6
1600.0	60.5	63.0	63.3	62.0	62.6	61.7
2000.0	58.2	61.7	62.5	61.6	62.0	61.6
2500.0	54.8	59.7	60.8	60.4	61.5	61.0
3150.0	53.1	57.2	59.5	59.6	60.7	60.1
4000.0	53.9	56.3	57.9	58.6	60.5	59.3
5000.0	52.6	55.0	56.2	57.0	59.7	58.8
6300.0	52.2	53.5	54.4	55.9	58.6	57.9
8000.0	52.0	51.8	53.2	54.5	57.6	56.9
10000.0	52.4	50.7	52.2	53.5	57.1	56.4
12500.0	52.2	50.7	51.1	52.6	56.2	55.8
16000.0	50.2	50.3	50.3	51.7	55.3	55.2
20000.0	49.1	49.7	49.6	50.9	54.5	54.6
25000.0	49.2	51.0	49.8	50.6	54.1	54.4
31500.0	50.2	53.1	50.4	51.0	55.0	54.6
40000.0	52.4	56.3	52.1	52.5	57.6	54.8
OVERALL SPL	73.3	74.4	73.6	72.4	73.3	72.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	49.7	51.7	49.0	49.3	51.9	50.6
250.0	52.1	51.4	50.4	50.1	49.7	49.2
315.2	53.5	53.5	52.6	51.8	52.0	51.2
400.0	56.1	55.0	53.8	52.8	52.6	51.9
500.0	57.4	56.6	55.8	54.8	54.5	53.1
630.0	58.5	57.9	57.0	56.0	55.5	54.8
800.0	59.6	58.8	57.7	56.7	56.4	55.5
1000.0	60.1	59.2	58.2	57.6	57.2	56.2
1250.0	60.5	59.8	59.3	58.4	57.7	56.9
1600.0	60.7	59.6	58.9	58.3	58.1	57.3
2000.0	60.6	60.0	59.3	58.4	58.1	57.2
2500.0	60.0	59.6	58.8	58.0	57.6	57.1
3150.0	59.6	59.2	58.4	58.1	57.4	57.1
4000.0	59.2	58.9	58.1	57.6	57.0	56.7
5000.0	58.7	58.5	57.5	57.3	56.9	56.6
6300.0	57.9	57.8	56.5	56.7	56.3	56.2
8000.0	56.9	57.0	55.9	55.7	55.7	55.7
10000.0	56.4	56.3	55.0	55.0	55.0	55.4
12500.0	55.8	55.8	54.7	54.7	54.5	55.0
16000.0	55.1	55.3	54.5	54.0	54.2	54.5
20000.0	54.5	54.6	53.9	53.2	53.6	53.6
25000.0	54.2	54.1	53.9	52.8	53.5	53.1
31500.0	54.4	54.0	53.9	53.0	53.8	52.9
40000.0	58.5	54.4	54.3	53.5	55.1	53.4
OVERALL SPL	71.7	71.1	70.3	69.7	69.5	68.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.86 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 295.00 DEG.F, CHAMBER TEMPERATURE = 62.00 DEG.F
RELATIVE HUMIDITY = 56.0 PERCENT
GAMMA = 1.390

RUN NUMBER 234

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.861
TEMPERATURE RATIO TR = 1.446
MACH NUMBER MJ = 0.292
JET STATIC TEMPERATURE RATIO TJ/T0 = 1.423
JET DENSITY RATIO DJ/D0 = 0.703
JET VELOCITY RATIO VJ/A0 = 0.349
JET VELOCITY VJ = 390.4 FPS

TR/TJ = 1.017
DR/D0 = 0.733
DR/DJ = 1.043
MASS FLOW = 0.449 POUNDS PER SECOND
THRUST = 5.51 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10	ANGLE 82.5	MICRO PHONE NO. 11	ANGLE 90.0	MICRO PHONE NO. 12	ANGLE 97.5	MICRO PHONE NO. 13	ANGLE 105.0	MICRO PHONE NO. 14	ANGLE 112.5	MICRO PHONE NO. 15	ANGLE 120.0
200.0	47.0		47.7		50.1		47.8		47.3		50.1	
250.0	49.9		49.5		48.7		48.8		48.8		49.0	
315.2	51.8		52.2		52.1		51.7		51.3		51.7	
400.0	54.4		54.7		53.3		53.0		52.6		53.0	
500.0	56.3		56.0		55.1		54.9		53.5		53.3	
630.0	58.2		57.0		56.5		55.6		54.4		54.7	
800.0	59.0		58.3		56.4		56.2		55.7		55.7	
1000.0	59.6		57.8		57.0		56.3		55.8		55.6	
1250.0	59.7		58.4		57.7		57.4		56.6		56.1	
1600.0	59.4		58.5		57.3		57.2		56.6		55.8	
2000.0	59.2		58.6		57.8		57.5		56.8		56.6	
2500.0	58.8		57.8		57.0		57.3		57.1		56.3	
3150.0	58.3		57.4		57.0		57.2		56.8		56.2	
4000.0	57.9		57.3		56.8		57.0		56.5		55.9	
5000.0	56.9		56.8		56.4		56.2		56.2		55.5	
6300.0	56.4		56.8		56.1		56.1		56.1		55.5	
8000.0	56.3		57.0		54.5		55.4		55.3		54.9	
10000.0	56.4		56.5		54.3		54.7		54.9		54.3	
12500.0	56.2		55.3		54.4		54.5		54.7		54.0	
16000.0	55.7		55.3		54.6		54.7		55.3		54.1	
20000.0	53.5		55.2		53.7		53.7		53.7		52.9	
25000.0	54.0		54.2		53.0		53.3		53.4		52.8	
31500.0	54.1		54.8		53.1		53.8		53.6		53.1	
40000.0	53.6		54.8		53.3		54.8		53.7		54.0	
OVERALL SPL	70.6		70.2		69.2		69.2		68.8		68.4	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	53.6	56.0	50.8	51.4
250.0	47.7	48.1	48.2	47.9
315.2	49.9	51.5	50.2	50.7
400.0	52.7	51.5	51.5	50.6
500.0	53.3	52.2	51.9	51.2
630.0	54.3	53.4	52.9	51.4
800.0	54.6	53.6	53.6	52.2
1000.0	55.0	53.7	53.8	52.3
1250.0	55.6	54.7	53.6	52.2
1600.0	55.6	54.1	53.0	51.5
2000.0	56.0	54.8	53.3	50.8
2500.0	55.6	54.6	52.9	50.2
3150.0	55.7	54.8	52.5	50.3
4000.0	55.6	54.1	52.5	49.5
5000.0	55.1	53.5	51.8	48.8
6300.0	55.0	53.0	51.2	48.4
8000.0	54.1	52.5	50.2	47.4
10000.0	53.7	51.7	49.4	46.1
12500.0	53.2	51.1	48.5	45.5
16000.0	54.4	51.3	50.5	48.5
20000.0	52.7	49.5	47.8	44.7
25000.0	51.7	48.3	46.2	42.6
31500.0	51.9	49.0	46.3	46.7
40000.0	51.7	49.0	45.6	45.6
OVERALL SPL	67.9	66.6	65.2	63.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.13 PSI; ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 317.00 DEG.F; CHAMBER TEMPERATURE = 76.00 DEG.F
RELATIVE HUMIDITY = 53.0 PERCENT
GAMMA = 1.390

RUN NUMBER 34

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.080$
TEMPERATURE RATIO $TR = 1.450$
MACH NUMBER $MJ = 0.334$
JET STATIC TEMPERATURE RATIO $TJ/TO = 1.419$
JET DENSITY RATIO $DJ/DO = 0.705$
JET VELOCITY RATIO $VJ/AO = 0.397$
JET VELOCITY $VJ = 451.1$ FPS

$TR/TJ = 1.022$
 $OR/DO = 0.745$
 $OR/DJ = 1.057$
MASS FLOW = 0.513 POUNDS PER SECOND
THRUST = 7.18 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	60.7	62.2	56.1	55.7	54.4	52.8
250.0	62.8	62.6	60.6	57.9	57.7	55.8
315.2	66.1	64.4	64.7	60.8	60.3	58.9
400.0	68.1	67.6	64.8	62.7	62.0	60.6
500.0	70.1	67.2	66.6	63.6	63.6	61.6
630.0	68.1	68.0	67.8	65.6	65.0	63.4
800.0	69.8	69.0	68.5	66.1	66.1	64.3
1000.0	68.6	68.7	68.9	66.5	66.7	65.6
1250.0	67.8	68.6	69.6	67.7	67.5	66.0
1600.0	65.0	67.3	68.3	66.9	67.3	66.2
2000.0	63.3	66.0	67.4	66.7	67.4	66.2
2500.0	60.8	64.0	66.1	65.7	66.7	65.7
3150.0	58.6	61.8	64.4	64.8	65.9	65.0
4000.0	58.5	60.9	63.3	63.9	65.5	64.5
5000.0	56.6	59.5	61.5	62.4	64.5	63.8
6300.0	56.8	57.7	59.6	61.0	63.4	62.9
8000.0	56.3	55.7	58.1	59.7	62.3	61.6
10000.0	56.4	53.9	56.8	58.4	61.4	60.9
12500.0	56.3	53.7	55.5	57.3	60.8	60.3
16000.0	54.2	53.3	54.5	56.1	59.9	59.6
20000.0	52.2	52.3	53.3	54.9	58.9	58.8
25000.0	51.7	53.9	52.9	54.1	58.2	58.4
31500.0	52.8	56.3	52.7	53.5	58.0	58.0
40000.0	55.2	60.0	53.3	54.0	58.3	57.9
OVERALL SPL	78.1	78.1	78.3	77.0	77.7	76.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	52.1	53.3	51.2	51.0	52.4	52.1
250.0	54.5	53.7	52.9	52.1	51.8	51.6
315.2	57.7	56.1	55.5	54.9	54.8	54.7
400.0	59.7	57.5	56.3	56.1	55.0	54.8
500.0	61.3	59.4	58.1	57.5	57.4	56.2
630.0	62.5	60.7	60.1	59.6	58.9	58.4
800.0	63.6	62.3	61.0	60.1	60.1	59.4
1000.0	64.4	62.7	62.1	61.3	61.0	60.1
1250.0	65.2	63.9	62.9	62.6	62.5	61.2
1600.0	65.5	63.7	63.1	62.5	62.2	61.6
2000.0	65.7	64.4	63.5	62.8	62.5	61.9
2500.0	65.4	64.0	63.3	62.7	62.6	61.7
3150.0	65.1	63.7	63.2	62.7	62.5	62.1
4000.0	64.6	63.6	63.1	62.3	62.2	61.8
5000.0	64.2	63.2	62.5	62.2	62.2	61.8
6300.0	63.5	62.5	61.7	61.5	61.6	61.4
8000.0	62.4	61.6	60.9	60.5	60.9	60.8
10000.0	61.8	60.9	60.1	60.1	60.2	60.5
12500.0	61.3	60.2	59.9	59.4	59.7	60.0
16000.0	60.8	59.8	59.5	58.6	59.3	59.3
20000.0	60.2	58.8	58.8	57.6	58.5	58.1
25000.0	59.9	58.1	58.4	56.9	57.8	57.2
31500.0	59.8	57.5	58.0	56.2	57.6	56.5
40000.0	60.9	57.5	57.8	55.9	58.1	56.2
OVERALL SPL	76.5	75.2	74.5	73.9	73.9	73.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.13 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 299.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.390

RUN NUMBER 210

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.080
TEMPERATURE RATIO TR = 1.465
MACH NUMBER MJ = 0.334
JET STATIC TEMPERATURE RATIO TJ/T0 = 1.434
JET DENSITY RATIO DJ/D0 = 0.697
JET VELOCITY RATIO VJ/A0 = 0.400
JET VELOCITY VJ = 446.1 FPS

TR/TJ = 1.022
DR/D0 = 0.737
DR/DJ = 1.057
MASS FLOW = 0.511 POUNDS PER SECOND
THRUST = 7.19 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	50.1	52.6	53.8	53.4	52.3	52.9
250.0	53.7	55.0	54.6	53.0	51.9	52.2
315.2	56.7	56.6	56.3	55.6	55.0	54.0
400.0	59.0	58.4	56.7	56.8	55.9	57.1
500.0	59.8	58.5	58.5	57.6	56.9	56.6
630.0	61.7	60.5	59.8	58.9	58.6	58.1
800.0	63.2	61.8	60.7	60.0	59.7	59.0
1000.0	63.6	62.1	61.4	60.5	60.1	59.2
1250.0	64.1	62.9	62.7	61.8	61.3	60.6
1600.0	64.2	63.1	62.4	61.7	61.2	60.5
2000.0	64.1	63.5	62.9	62.5	61.5	60.8
2500.0	64.3	63.3	62.7	62.2	61.7	60.8
3150.0	63.9	63.1	62.6	62.2	61.8	61.0
4000.0	63.5	63.1	62.7	62.0	61.5	60.5
5000.0	62.7	62.8	62.4	61.6	61.4	60.2
6300.0	61.9	62.9	61.8	61.5	61.0	60.1
8000.0	61.8	62.5	60.4	60.6	60.1	59.3
10000.0	61.6	62.3	60.1	60.2	59.7	59.0
12500.0	61.7	60.3	60.1	59.6	59.1	58.4
16000.0	60.2	60.2	58.8	59.1	58.6	57.9
20000.0	58.6	60.2	58.7	58.4	57.6	57.3
25000.0	59.5	58.8	58.3	58.0	57.2	57.1
31500.0	59.5	59.1	58.3	57.8	57.1	57.1
40000.0	58.8	59.4	58.3	58.4	56.9	58.1
OVERALL SPL	75.5	75.1	74.3	73.8	73.2	72.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	53.5	56.3	53.3	53.8
250.0	53.8	51.8	52.0	52.8
315.2	54.7	54.2	52.9	53.6
400.0	55.8	56.3	56.0	58.9
500.0	56.7	55.2	55.2	55.0
630.0	57.8	56.6	56.2	55.0
800.0	58.7	57.4	57.3	55.6
1000.0	59.3	57.8	57.0	55.9
1250.0	60.1	58.8	57.7	55.9
1600.0	59.9	58.4	57.2	55.7
2000.0	60.6	59.1	57.8	55.4
2500.0	60.7	59.2	57.5	55.2
3150.0	60.8	59.2	57.4	55.0
4000.0	60.6	58.9	57.3	54.2
5000.0	60.4	58.3	56.7	53.5
6300.0	60.5	58.3	55.9	53.9
8000.0	59.7	57.7	55.4	52.5
10000.0	58.7	56.7	54.5	51.5
12500.0	58.5	56.3	53.9	50.9
16000.0	58.3	55.8	53.7	50.2
20000.0	57.6	55.0	52.9	49.3
25000.0	56.9	54.2	52.4	48.0
31500.0	56.7	54.0	52.0	47.2
40000.0	56.7	54.1	51.5	47.2
OVERALL SPL	72.5	70.9	69.4	67.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.80 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 326.00 DEG.F, CHAMBER TEMPERATURE = 78.00 DEG.F
RELATIVE HUMIDITY = 47.0 PERCENT
GAMMA = 1.390

RUN NUMBER 35

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.127$
TEMPERATURE RATIO $TR = 1.461$
MACH NUMBER $MJ = 0.418$
JET STATIC TEMPERATURE RATIO $TJ/TO = 1.413$
JET DENSITY RATIO $DJ/DO = 0.708$
JET VELOCITY RATIO $VJ/AO = 0.497$
JET VELOCITY $VJ = 564.8$ FPS

$TR/TJ = 1.034$
 $DR/DO = 0.771$
 $OR/DJ = 1.090$
MASS FLOW = 0.644 POUNDS PER SECOND
THRUST = 11.26 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
					4	37.5
					5	45.0
					6	52.5
200.0	66.8		67.1		61.7	
250.0	68.4		69.0		65.4	
315.2	71.8		70.7		69.0	
400.0	73.6		73.9		70.0	
500.0	75.8		73.9		72.8	
630.0	74.9		75.0		73.9	
800.0	76.8		76.4		75.1	
1000.0	75.2		75.9		75.4	
1250.0	74.5		76.1		76.3	
1600.0	72.3		74.6		74.8	
2000.0	69.9		73.5		74.3	
2500.0	68.0		71.6		73.2	
3150.0	65.7		69.7		71.8	
4000.0	65.6		68.7		70.4	
5000.0	63.9		67.3		68.9	
6300.0	63.8		65.6		67.2	
8000.0	63.5		64.0		65.8	
10000.0	64.3		62.8		64.5	
12500.0	63.5		61.5		63.1	
16000.0	61.2		61.0		61.7	
20000.0	58.2		59.8		60.3	
25000.0	57.2		61.0		59.7	
31500.0	58.2		63.0		58.8	
40000.0	60.1		66.2		58.3	
					58.6	
					62.6	
OVERALL						
SPL	84.5		85.3		84.9	
					83.6	
					84.0	
						83.4

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	55.6	56.5	54.6	54.4	55.0	55.0
250.0	57.7	57.0	56.0	55.4	55.9	54.9
315.2	61.0	59.5	59.0	57.4	58.1	57.7
400.0	63.4	61.9	60.9	59.9	59.0	58.9
500.0	65.0	63.2	63.1	61.8	61.6	60.4
630.0	66.8	65.4	64.3	63.9	63.2	62.1
800.0	68.1	67.2	65.9	64.7	64.2	63.7
1000.0	69.3	68.1	67.0	66.0	65.9	64.9
1250.0	70.5	69.3	68.4	67.5	67.3	66.2
1600.0	71.0	69.9	68.9	68.0	67.5	66.8
2000.0	71.6	70.4	69.4	68.6	68.0	67.4
2500.0	71.6	70.7	69.6	68.8	68.2	67.6
3150.0	71.5	70.5	69.8	69.2	68.7	67.9
4000.0	71.4	70.6	69.8	69.1	68.6	68.0
5000.0	71.3	70.5	69.3	69.0	68.8	68.2
6300.0	70.5	69.9	68.7	68.6	68.4	68.0
8000.0	70.0	69.4	68.3	67.9	67.8	67.7
10000.0	68.8	68.8	67.5	67.7	67.2	67.3
12500.0	68.6	68.2	67.1	66.7	66.7	66.8
16000.0	67.8	67.6	66.7	65.8	66.1	66.1
20000.0	67.1	66.6	65.9	64.7	65.0	64.8
25000.0	66.6	65.9	65.7	64.1	64.4	64.0
31500.0	65.8	64.9	64.8	62.8	63.3	62.8
40000.0	65.6	64.5	64.1	61.8	63.1	61.9
OVERALL SPL	82.6	81.7	80.8	80.0	79.8	79.3

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.80 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 307.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.390

RUN NUMBER 211

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.127$
TEMPERATURE RATIO $TR = 1.481$
MACH NUMBER $MJ = 0.418$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 1.432$
JET DENSITY RATIO $DJ/D_0 = 0.698$
JET VELOCITY RATIO $VJ/A_0 = 0.500$
JET VELOCITY $VJ = 558.3$ FPS

$TR/TJ = 1.034$
 $DR/D_0 = 0.761$
 $DR/DJ = 1.090$
MASS FLOW = 0.640 POUNDS PER SECOND
THRUST = 11.27 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	55.6	56.5	54.6	54.4	55.0	55.0
250.0	57.7	57.0	56.0	55.4	55.9	54.9
315.2	61.0	59.5	59.0	57.4	58.1	57.7
400.0	63.4	61.9	60.9	59.9	59.0	58.9
500.0	65.0	63.2	63.1	61.8	61.6	60.4
630.0	66.8	65.4	64.3	63.9	63.2	62.1
800.0	68.1	67.2	65.9	64.7	64.2	63.7
1000.0	69.3	68.1	67.0	66.0	65.9	64.9
1250.0	70.5	69.3	68.4	67.5	67.3	66.2
1600.0	71.0	69.9	68.9	68.0	67.5	66.8
2000.0	71.6	70.4	69.4	68.6	68.0	67.4
2500.0	71.6	70.7	69.6	68.8	68.2	67.6
3150.0	71.5	70.5	69.8	69.2	68.7	67.9
4000.0	71.4	70.6	69.8	69.1	68.6	68.0
5000.0	71.3	70.5	69.3	69.0	68.8	68.2
6300.0	70.5	69.9	68.7	68.6	68.4	68.0
8000.0	70.0	69.4	68.3	67.9	67.8	67.7
10000.0	68.8	68.8	67.5	67.7	67.2	67.3
12500.0	68.6	68.2	67.1	66.7	66.7	66.8
16000.0	67.8	67.6	66.7	65.8	66.1	66.1
20000.0	67.1	66.6	65.9	64.7	65.0	64.8
25000.0	66.6	65.9	65.7	64.1	64.4	64.0
31500.0	65.8	64.9	64.8	62.8	63.3	62.8
40000.0	65.6	64.5	64.1	61.8	63.1	61.9
OVERALL SPL	82.6	81.7	80.8	80.0	79.8	79.3

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	54.4	55.5	56.4	55.7	54.8	54.8
250.0	56.7	57.2	57.0	56.1	56.1	55.3
315.2	59.7	59.6	59.0	59.0	58.7	57.5
400.0	61.7	61.2	60.2	60.2	60.0	59.8
500.0	63.9	63.7	62.5	62.1	61.6	60.4
630.0	66.1	65.7	64.1	63.4	62.6	62.6
800.0	68.0	67.0	65.4	64.9	64.1	63.5
1000.0	68.9	67.2	66.2	65.7	64.9	64.3
1250.0	70.0	68.4	67.9	67.4	66.8	65.4
1600.0	69.9	69.2	67.8	67.8	67.0	66.0
2000.0	70.3	69.9	68.6	68.5	67.4	66.9
2500.0	70.5	69.8	68.7	68.6	67.9	67.1
3150.0	70.6	69.9	68.7	68.8	68.1	67.3
4000.0	70.5	70.0	68.9	68.8	68.1	67.1
5000.0	70.0	69.9	68.8	68.6	68.0	66.9
6300.0	69.8	70.1	68.6	68.3	68.0	67.2
8000.0	69.6	70.0	67.0	67.8	67.2	66.3
10000.0	69.7	69.3	66.9	67.2	66.6	65.8
12500.0	69.5	67.6	66.6	66.8	66.2	65.3
16000.0	67.9	67.5	65.3	66.3	65.6	64.8
20000.0	66.5	67.3	65.1	65.7	64.8	64.4
25000.0	67.4	66.0	64.8	65.3	64.4	64.4
31500.0	67.3	66.3	64.6	65.1	64.4	64.6
40000.0	67.5	66.5	64.6	65.7	64.4	65.3
OVERALL SPL	82.1	81.5	80.1	80.1	79.4	78.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO		MICRO	
CENTER	PHONE	PHONE	PHONE	PHONE
FREQ.	NO.	ANGLE	NO.	ANGLE
HZ	16	127.5	17	135.0
	18	142.5	19	150.0
200.0	55.2	57.4	54.9	55.2
250.0	56.4	55.0	54.5	54.8
315.2	58.1	56.7	54.5	55.8
400.0	59.4	58.3	57.6	58.4
500.0	60.7	59.0	58.9	58.6
630.0	62.5	61.0	59.4	59.0
800.0	63.3	61.8	61.2	59.9
1000.0	64.1	62.7	62.0	60.8
1250.0	65.0	63.8	62.2	60.7
1600.0	65.6	64.0	63.0	61.0
2000.0	66.2	65.2	63.2	61.4
2500.0	66.6	65.2	63.9	61.3
3150.0	67.0	65.6	63.9	61.2
4000.0	67.2	65.5	63.9	60.8
5000.0	67.0	65.0	63.5	60.3
6300.0	67.0	65.0	63.2	60.4
8000.0	66.5	64.6	62.6	59.6
10000.0	65.9	63.7	61.8	58.6
12500.0	65.5	63.4	61.1	58.2
16000.0	65.0	62.9	60.5	57.2
20000.0	64.5	62.1	59.7	56.3
25000.0	64.1	61.6	59.5	55.3
31500.0	64.0	61.4	59.2	54.6
40000.0	64.3	61.6	59.6	54.0
OVERALL				
SPL	78.5	76.8	75.2	72.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.64 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 337.00 DEG.F, CHAMBER TEMPERATURE = 78.00 DEG.F
RELATIVE HUMIDITY = 47.0 PERCENT
GAMMA = 1.390

RUN NUMBER 36

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.186
TEMPERATURE RATIO TR = 1.481
MACH NUMBER MJ = 0.501
JET STATIC TEMPERATURE RATIO TJ/TO = 1.412
JET DENSITY RATIO DJ/DO = 0.708
JET VELOCITY RATIO VJ/A0 = 0.596
JET VELOCITY VJ = 677.3 FPS

TR/TJ = 1.049
DR/DO = 0.801
DR/DJ = 1.131
MASS FLOW = 0.772 POUNDS PER SECOND
THRUST = 16.20 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	71.0	70.3	66.2	63.9	63.1	60.4
250.0	72.9	72.8	70.9	67.6	65.2	63.8
315.2	77.4	74.7	74.2	70.1	68.6	66.0
400.0	78.8	78.9	75.0	72.9	71.3	68.8
500.0	81.5	79.2	78.2	74.9	74.0	70.9
630.0	80.5	81.0	80.1	76.9	75.5	72.7
800.0	83.0	82.8	80.6	78.2	76.9	74.7
1000.0	81.6	82.2	81.4	79.0	78.1	76.1
1250.0	80.3	82.1	81.8	80.1	79.4	77.2
1600.0	77.6	80.7	80.9	79.6	79.4	77.7
2000.0	75.8	79.4	80.3	79.5	79.9	78.4
2500.0	73.7	77.4	79.1	78.8	79.6	78.3
3150.0	71.7	75.7	77.7	78.0	79.4	78.4
4000.0	71.3	74.4	76.3	77.1	79.2	78.1
5000.0	69.7	73.1	74.9	75.7	78.3	77.6
6300.0	69.4	71.8	73.2	74.6	77.4	77.2
8000.0	69.0	70.3	71.8	73.2	76.4	76.3
10000.0	68.4	68.5	70.4	72.0	75.4	75.4
12500.0	68.8	67.8	68.9	70.6	74.5	74.3
16000.0	66.3	66.6	67.4	69.3	73.3	73.9
20000.0	63.2	64.6	65.7	67.6	71.9	72.8
25000.0	61.8	64.5	64.8	66.4	71.1	72.2
31500.0	61.3	65.0	63.3	64.4	69.9	71.3
40000.0	61.5	67.0	62.5	63.4	69.1	70.8
OVERALL SPL	90.3	91.0	90.7	89.4	90.1	89.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	59.9	58.7	57.5	58.1	58.1	58.4
250.0	61.7	60.0	59.8	59.3	59.0	58.4
315.2	63.5	62.4	62.5	62.1	61.3	61.2
400.0	66.3	65.3	64.3	63.8	62.9	61.8
500.0	69.0	67.2	66.3	64.7	64.6	63.3
630.0	70.4	69.0	68.4	67.4	66.5	66.2
800.0	72.3	70.9	69.9	69.0	68.3	67.3
1000.0	73.8	72.6	71.3	70.3	69.7	68.9
1250.0	75.4	74.0	72.8	72.0	71.5	70.6
1600.0	76.0	74.4	73.3	72.4	71.9	71.0
2000.0	76.6	75.3	74.1	73.3	72.8	72.1
2500.0	76.8	75.6	74.6	73.8	73.4	72.5
3150.0	77.0	75.9	74.8	74.3	73.9	73.1
4000.0	76.9	76.3	75.3	74.4	74.1	73.2
5000.0	76.7	76.2	75.1	74.6	74.5	73.6
6300.0	76.5	75.9	74.5	74.3	74.3	73.6
8000.0	76.3	75.4	74.4	73.9	74.0	73.5
10000.0	75.8	74.8	73.8	73.5	73.6	73.2
12500.0	75.2	74.0	73.4	72.9	72.9	72.7
16000.0	74.4	73.5	73.1	72.0	72.5	72.1
20000.0	73.8	72.4	72.4	71.1	71.3	70.8
25000.0	73.2	71.7	72.0	70.5	70.8	69.9
31500.0	72.2	70.5	71.3	69.2	69.7	68.4
40000.0	71.7	69.9	70.4	68.1	69.3	67.3
OVERALL SPL	88.1	87.0	86.1	85.3	85.2	84.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.64 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 315.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.390

RUN NUMBER 212

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.186$
TEMPERATURE RATIO $TR = 1.496$
MACH NUMBER $MJ = 0.502$
JET STATIC TEMPERATURE RATIO $TJ/TO = 1.426$
JET DENSITY RATIO $DJ/DO = 0.701$
JET VELOCITY RATIO $VJ/AO = 0.599$
JET VELOCITY $VJ = 668.3$ FPS

$TR/TJ = 1.049$
 $DR/DO = 0.793$
 $DR/DJ = 1.131$
MASS FLOW = 0.769 POUNDS PER SECOND
THRUST = 16.22 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	56.4	58.5	58.4	58.0	56.5	56.0
250.0	59.5	60.1	59.0	58.5	58.4	58.1
315.2	61.7	62.7	62.1	61.4	61.0	60.1
400.0	63.9	64.1	63.1	62.7	62.2	61.9
500.0	66.6	66.3	65.7	65.4	64.0	63.4
630.0	68.9	68.4	67.4	66.8	65.7	65.9
800.0	71.0	70.4	68.9	67.9	67.2	66.5
1000.0	72.7	71.3	70.0	69.6	68.3	67.8
1250.0	73.6	72.4	71.5	71.0	70.1	69.6
1600.0	74.0	73.1	72.0	71.6	70.6	70.0
2000.0	74.3	73.9	72.7	72.3	71.2	70.8
2500.0	74.6	74.2	72.9	72.6	72.0	71.2
3150.0	75.1	74.6	73.4	73.4	72.2	71.8
4000.0	75.3	74.8	73.7	73.5	72.5	71.9
5000.0	74.8	74.9	74.1	73.5	72.7	71.9
6300.0	74.7	75.3	73.9	73.4	72.4	72.2
8000.0	74.6	75.5	72.7	72.8	72.1	71.6
10000.0	75.0	74.9	72.7	72.2	71.6	71.0
12500.0	74.8	73.4	72.5	71.9	71.4	70.8
16000.0	73.2	73.2	71.1	71.2	70.7	70.4
20000.0	71.6	73.0	70.9	70.8	70.0	69.7
25000.0	72.4	71.7	70.6	70.2	69.6	69.6
31500.0	72.2	72.0	70.5	70.0	69.3	69.8
40000.0	71.7	72.2	70.6	70.3	68.8	70.3
OVERALL SPL	86.6	86.3	84.9	84.6	83.7	83.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16	ANGLE 127.5	MICRO PHONE NO. 17	ANGLE 135.0	MICRO PHONE NO. 18	ANGLE 142.5	MICRO PHONE NO. 19	ANGLE 150.0
200.0	56.8		58.4		56.9		56.9	
250.0	58.7		58.0		57.6		58.3	
315.2	59.7		59.0		58.3		59.0	
400.0	61.5		60.8		60.8		61.2	
500.0	63.0		62.1		61.7		60.9	
630.0	65.3		64.8		62.9		62.1	
800.0	65.9		65.2		64.5		63.4	
1000.0	66.9		66.0		65.0		64.1	
1250.0	68.4		67.7		65.9		64.6	
1600.0	69.2		67.7		66.6		65.0	
2000.0	70.1		69.2		67.6		65.5	
2500.0	70.6		69.4		67.7		65.9	
3150.0	71.2		70.1		68.3		66.1	
4000.0	71.6		70.4		68.7		66.1	
5000.0	71.8		69.9		68.2		65.6	
6300.0	71.8		70.1		68.1		65.7	
8000.0	71.4		70.0		67.4		65.0	
10000.0	71.0		69.0		66.7		64.0	
12500.0	70.6		68.7		66.1		63.3	
16000.0	70.2		68.3		65.6		62.4	
20000.0	69.6		67.4		64.7		61.5	
25000.0	69.1		66.9		64.2		60.6	
31500.0	68.7		66.7		63.9		59.9	
40000.0	68.8		67.2		63.7		59.3	
OVERALL SPL	82.9		81.4		79.4		77.3	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 3.69 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 351.00 DEG.F, CHAMBER TEMPERATURE = 79.00 DEG.F
RELATIVE HUMIDITY = 46.0 PERCENT
GAMMA = 1.390

RUN NUMBER 37

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.260$
TEMPERATURE RATIO $TR = 1.505$
MACH NUMBER $MJ = 0.586$
JET STATIC TEMPERATURE RATIO $TJ/TO = 1.410$
JET DENSITY RATIO $DJ/DO = 0.709$
JET VELOCITY RATIO $VJ/A0 = 0.696$
JET VELOCITY $VJ = 791.9$ FPS

$TR/TJ = 1.067$
 $DR/DO = 0.837$
 $OR/DJ = 1.181$
MASS FLOW = 0.903 POUNDS PER SECOND
THRUST = 22.13 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	74.9		75.8		71.3	
250.0	77.2		77.1		75.2	
315.2	81.3		80.3		79.0	
400.0	83.5		84.2		80.8	
500.0	86.5		84.3		83.8	
630.0	86.0		86.3		85.8	
800.0	88.8		88.5		87.2	
1000.0	87.5		88.5		88.1	
1250.0	86.4		88.4		88.7	
1600.0	83.5		86.3		87.5	
2000.0	81.2		84.8		86.8	
2500.0	79.2		83.0		85.4	
3150.0	77.0		81.6		84.0	
4000.0	76.5		80.3		83.1	
5000.0	75.0		79.0		81.7	
6300.0	74.4		77.6		80.3	
8000.0	74.2		76.2		79.1	
10000.0	73.9		74.7		78.1	
12500.0	73.5		73.6		76.7	
16000.0	71.0		72.3		75.2	
20000.0	67.8		70.1		73.8	
25000.0	66.1		69.3		72.8	
31500.0	64.7		68.7		71.3	
40000.0	63.9		69.0		70.2	
OVERALL						
SPL	95.7		96.7		97.1	
					95.6	
					94.9	
						93.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	62.4	62.7	62.0	61.3	61.2	61.4
250.0	64.4	63.5	63.6	63.4	62.8	61.8
315.2	66.8	66.2	65.6	65.3	64.3	64.1
400.0	69.6	69.0	67.5	66.7	66.7	65.8
500.0	71.2	70.8	69.6	68.7	68.1	67.4
630.0	73.4	72.9	71.5	70.9	70.2	69.6
800.0	75.3	74.7	73.5	72.3	71.8	71.0
1000.0	77.0	76.3	74.9	73.9	73.5	72.7
1250.0	77.9	78.2	76.7	75.6	75.0	74.4
1600.0	79.3	78.9	77.3	76.2	75.9	75.0
2000.0	80.1	80.0	78.4	77.3	76.7	76.1
2500.0	80.4	80.2	78.8	77.8	77.5	76.7
3150.0	80.8	80.6	79.6	78.7	78.0	77.5
4000.0	81.2	81.3	80.0	78.9	78.5	77.9
5000.0	81.3	81.5	80.2	79.1	78.8	78.4
6300.0	81.2	81.3	79.9	79.2	78.8	78.5
8000.0	80.9	81.1	79.7	78.8	78.7	78.6
10000.0	80.7	80.7	79.1	78.5	78.3	78.7
12500.0	80.3	80.2	78.9	78.0	78.0	78.3
16000.0	79.7	79.5	78.6	77.2	77.7	77.7
20000.0	79.0	78.5	77.8	76.3	76.8	76.5
25000.0	78.8	77.9	77.6	75.6	76.4	75.8
31500.0	78.1	76.6	76.7	74.4	75.5	74.4
40000.0	78.3	76.0	75.7	73.5	75.3	73.3
OVERALL SPL	92.4	92.2	91.0	89.9	89.8	89.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 3.64 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 326.00 DEG.F, CHAMBER TEMPERATURE = 54.00 DEG.F
RELATIVE HUMIDITY = 70.0 PERCENT
GAMMA = 1.390

RUN NUMBER 137

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $Pr = 1.260$
TEMPERATURE RATIO $Tr = 1.529$
MACH NUMBER $MJ = 0.586$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.433$
JET DENSITY RATIO $DJ/D0 = 0.698$
JET VELOCITY RATIO $VJ/A0 = 0.702$
JET VELOCITY $VJ = 779.8$ FPS

$TR/TJ = 1.067$
 $DR/DU = 0.824$
 $DR/DJ = 1.181$
MASS FLOW = 0.896 POUNDS PER SECOND
THRUST = 22.14 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3		MICRO		MICRO		MICRO		MICRO		MICRO		
OCTAVE	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	
CENTER	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	10	82.5	11	90.0	12	97.5	13	105.0	14	112.5	15	120.0
200.0	58.8		61.0		60.7		60.6		58.9		57.6	
250.0	62.2		62.3		61.2		60.7		61.0		60.5	
315.2	64.4		64.9		64.0		64.4		63.6		62.9	
400.0	67.9		67.4		66.1		65.6		65.0		65.4	
500.0	70.2		69.4		69.0		68.2		67.3		67.0	
630.0	72.4		71.3		70.7		69.9		69.0		69.2	
800.0	74.9		73.8		72.2		70.9		70.6		70.2	
1000.0	76.1		74.8		73.0		72.3		71.6		70.8	
1250.0	78.0		76.1		75.3		74.2		73.4		72.5	
1600.0	78.6		76.8		75.7		74.8		74.3		73.5	
2000.0	79.0		77.9		76.8		75.9		75.3		74.6	
2500.0	79.4		78.4		77.1		76.3		75.9		75.0	
3150.0	79.9		78.8		77.7		77.1		76.6		75.9	
4000.0	80.1		79.2		78.1		77.3		76.7		76.1	
5000.0	79.6		79.4		78.1		77.2		76.7		76.0	
6300.0	79.8		80.1		78.4		77.5		77.3		76.6	
8000.0	79.7		80.2		77.1		77.2		76.6		76.0	
10000.0	79.8		79.9		77.4		76.9		76.4		75.9	
12500.0	79.6		78.0		76.9		76.1		75.9		74.9	
16000.0	77.8		78.2		75.5		75.5		75.3		74.6	
20000.0	75.6		77.5		74.9		74.4		74.2		73.8	
25000.0	76.0		76.2		74.2		73.6		73.6		73.6	
31500.0	75.1		76.1		73.5		72.7		73.1		73.5	
40000.0	73.8		75.9		73.0		72.8		72.3		73.9	
OVERALL												
SPL	91.0		90.7		88.9		88.3		87.9		87.3	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	58.3	59.4	58.7	59.2
250.0	60.9	60.4	60.2	59.9
315.2	62.3	61.4	61.6	61.4
400.0	64.4	63.4	63.2	62.8
500.0	66.6	64.7	64.8	63.6
630.0	69.0	68.1	66.6	64.6
800.0	69.6	68.4	67.8	66.4
1000.0	70.6	69.3	68.7	67.6
1250.0	72.1	71.0	69.9	67.9
1600.0	72.9	71.6	70.3	69.0
2000.0	74.1	73.0	71.6	69.6
2500.0	74.8	73.5	71.9	69.9
3150.0	75.6	74.2	72.6	70.4
4000.0	76.2	74.5	72.9	70.3
5000.0	76.1	74.1	72.5	70.0
6300.0	76.6	74.8	72.7	70.7
8000.0	76.3	74.5	72.0	70.1
10000.0	76.1	73.7	71.5	69.4
12500.0	75.4	73.2	70.6	68.7
16000.0	75.1	72.7	70.1	67.7
20000.0	74.2	71.8	68.9	66.5
25000.0	73.5	71.2	68.2	65.5
31500.0	72.9	70.7	67.6	64.4
40000.0	72.6	70.9	66.7	63.6
OVERALL SPL	87.3	85.5	83.6	81.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.94 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 366.00 DEG.F, CHAMBER TEMPERATURE = 79.50 DEG.F
RELATIVE HUMIDITY = 44.0 PERCENT
GAMMA = 1.390

RUN NUMBER 38

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.348$
TEMPERATURE RATIO $TR = 1.531$
MACH NUMBER $MJ = 0.669$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.408$
JET DENSITY RATIO $DJ/D0 = 0.710$
JET VELOCITY RATIO $VJ/A0 = 0.794$
JET VELOCITY $VJ = 904.3$ FPS

$TR/TJ = 1.087$
 $DR/D0 = 0.880$
 $DR/DJ = 1.240$
MASS FLOW = 1.033 POUNDS PER SECOND
THRUST = 28.88 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3		MICRO		MICRO		MICRO		MICRO		MICRO		
OCTAVE	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	
CENTER	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0	4	37.5	5	45.0	6	52.5
200.0	78.5	78.1	73.7	70.4	70.1	66.8						
250.0	81.5	80.6	78.4	75.2	72.6	70.0						
315.2	84.9	83.2	82.5	78.0	76.2	73.2						
400.0	87.4	87.1	83.9	80.8	79.0	76.6						
500.0	90.2	88.3	87.3	83.1	81.4	78.4						
630.0	89.5	90.2	90.3	86.1	83.9	80.4						
800.0	93.1	92.8	91.9	88.2	85.9	82.9						
1000.0	92.2	93.2	92.8	89.6	87.4	84.3						
1250.0	91.8	94.1	93.7	90.6	88.9	85.7						
1600.0	89.5	91.8	92.1	90.2	89.2	87.0						
2000.0	86.6	90.0	91.4	90.4	89.9	87.9						
2500.0	83.9	87.9	89.8	89.6	89.9	88.0						
3150.0	81.9	86.2	88.1	89.0	89.7	88.1						
4000.0	80.9	84.9	87.1	88.0	89.7	88.1						
5000.0	79.6	83.6	85.6	86.7	89.1	88.2						
6300.0	78.9	82.3	84.3	85.8	88.3	87.6						
8000.0	78.5	80.9	83.0	84.8	87.6	87.2						
10000.0	78.8	80.7	81.9	83.2	86.8	86.7						
12500.0	77.5	78.4	80.8	82.5	86.1	86.0						
16000.0	75.0	77.2	79.3	81.3	85.0	85.1						
20000.0	71.8	75.1	77.8	79.8	83.5	84.2						
25000.0	70.0	74.3	76.9	78.5	82.5	83.7						
31500.0	68.1	73.2	75.3	76.5	81.0	82.7						
40000.0	66.4	72.4	73.9	75.4	79.6	81.9						
OVERALL												
SPL	100.2	101.4	101.6	100.0	100.3	99.0						

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 7 ANGLE 60.0	NO. 8 ANGLE 67.5	NO. 9 ANGLE 75.0	NO. 10 ANGLE 82.5	NO. 11 ANGLE 90.0	NO. 12 ANGLE 97.5
200.0	64.2	64.9	64.0	63.8	64.8	62.8
250.0	67.9	66.6	66.3	66.7	66.0	65.2
315.2	70.5	69.0	68.7	68.6	67.4	67.0
400.0	73.5	72.0	70.4	70.3	69.8	68.8
500.0	74.9	73.2	72.3	71.3	70.7	69.6
630.0	78.1	76.3	74.9	74.3	73.7	72.3
800.0	80.1	78.2	76.5	76.1	75.4	74.8
1000.0	81.8	80.1	78.4	77.4	76.7	75.7
1250.0	83.6	81.7	80.3	79.4	78.4	77.9
1600.0	84.8	82.4	81.0	80.1	79.4	78.6
2000.0	85.8	83.6	82.5	81.2	80.4	79.6
2500.0	86.0	84.2	83.0	81.7	81.2	80.5
3150.0	86.4	84.8	83.6	82.7	82.0	81.3
4000.0	87.0	85.5	84.0	83.2	82.5	81.9
5000.0	87.3	85.9	84.3	83.6	82.8	82.3
6300.0	87.0	85.8	84.2	83.6	83.0	82.8
8000.0	86.7	85.7	84.1	83.4	82.8	82.7
10000.0	86.3	85.4	83.6	83.0	82.6	82.7
12500.0	86.1	85.1	83.4	82.5	82.4	82.4
16000.0	85.3	84.7	83.3	81.9	82.1	82.0
20000.0	84.5	83.9	82.6	81.0	81.1	80.9
25000.0	83.9	83.2	82.4	80.6	80.6	80.2
31500.0	82.6	82.2	81.6	79.2	79.7	78.9
40000.0	81.4	81.8	80.7	78.2	79.2	78.0
OVERALL SPL	97.9	96.6	95.2	94.2	93.8	93.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.87 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 338.00 DEG.F, CHAMBER TEMPERATURE = 54.00 DEG.F
RELATIVE HUMIDITY = 70.0 PERCENT
GAMMA = 1.390

RUN NUMBER 138

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.348
TEMPERATURE RATIO TR = 1.553
MACH NUMBER MJ = 0.669
JET STATIC TEMPERATURE RATIO TJ/T0 = 1.428
JET DENSITY RATIO DJ/D0 = 0.700
JET VELOCITY RATIO VJ/A0 = 0.800
JET VELOCITY VJ = 888.8 FPS

TR/TJ = 1.087
DR/D0 = 0.868
DR/DJ = 1.240
MASS FLOW = 1.026 POUNDS PER SECOND
THRUST = 28.88 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10	ANGLE 82.5	MICRO PHONE NO. 11	ANGLE 90.0	MICRO PHONE NO. 12	ANGLE 97.5	MICRO PHONE NO. 13	ANGLE 105.0	MICRO PHONE NO. 14	ANGLE 112.5	MICRO PHONE NO. 15	ANGLE 120.0
200.0	61.8		64.1		64.0		62.8		62.2		59.8	
250.0	65.3		65.3		63.6		63.0		63.3		62.4	
315.2	67.6		67.4		67.0		66.9		66.5		65.8	
400.0	70.2		70.0		69.2		68.1		68.0		67.6	
500.0	72.7		71.9		71.5		71.5		70.7		70.1	
630.0	75.3		74.2		73.8		73.0		72.4		72.4	
800.0	77.5		76.6		75.5		74.0		73.6		73.2	
1000.0	79.5		77.9		76.5		75.4		74.7		73.9	
1250.0	81.0		79.3		78.5		77.4		76.6		75.6	
1600.0	81.8		80.2		79.0		78.0		77.4		76.5	
2000.0	82.6		81.4		80.2		79.3		78.1		77.6	
2500.0	82.8		81.9		80.6		79.9		79.1		78.4	
3150.0	83.5		82.3		81.5		80.8		79.9		79.3	
4000.0	83.8		83.1		82.1		81.4		80.4		79.7	
5000.0	83.5		83.1		82.3		81.2		80.5		79.8	
6300.0	83.8		84.0		82.4		81.8		81.0		80.4	
8000.0	83.8		84.2		81.6		81.3		80.4		79.8	
10000.0	84.0		83.6		81.6		80.9		80.1		79.6	
12500.0	83.8		82.2		81.6		80.5		79.7		78.9	
16000.0	82.2		82.3		80.2		80.1		79.1		78.6	
20000.0	80.3		81.9		79.9		79.2		78.0		77.9	
25000.0	80.6		80.6		79.2		78.5		77.5		77.6	
31500.0	80.0		80.6		78.7		78.0		77.0		77.5	
40000.0	78.7		80.4		78.3		78.2		76.2		77.8	
OVERALL SPL	94.9		94.5		93.0		92.3		91.4		91.0	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO.	ANGLE NO.	MICRO PHONE NO.	ANGLE NO.	MICRO PHONE NO.	ANGLE NO.	MICRO PHONE NO.	ANGLE NO.
	16	127.5	17	135.0	18	142.5	19	150.0
200.0	60.1		61.2		61.2		61.6	
250.0	63.5		62.6		62.2		63.1	
315.2	65.0		64.0		63.4		64.1	
400.0	67.3		66.0		65.6		66.2	
500.0	69.9		68.5		67.7		66.6	
630.0	72.0		71.3		69.7		67.2	
800.0	72.1		71.5		70.7		69.2	
1000.0	73.4		72.2		71.7		70.4	
1250.0	74.9		74.0		72.7		71.0	
1600.0	75.7		74.6		73.4		72.1	
2000.0	77.2		76.2		75.0		73.0	
2500.0	77.8		76.6		75.5		73.5	
3150.0	78.8		77.8		76.3		74.3	
4000.0	79.5		78.1		76.9		74.3	
5000.0	79.5		77.9		76.6		73.9	
6300.0	80.1		78.5		76.8		74.5	
8000.0	79.7		78.4		76.1		73.8	
10000.0	79.4		77.8		75.7		73.0	
12500.0	78.9		77.5		74.9		72.4	
16000.0	78.6		77.1		74.6		71.4	
20000.0	77.7		76.1		73.5		70.0	
25000.0	77.1		75.4		72.9		68.8	
31500.0	76.7		75.0		72.3		67.8	
40000.0	76.2		75.1		71.6		66.7	
OVERALL SPL	90.6		89.2		87.4		85.1	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 6.43 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 384.00 DEG.F, CHAMBER TEMPERATURE = 80.00 DEG.F
RELATIVE HUMIDITY = 44.0 PERCENT
GAMMA = 1.390

RUN NUMBER 39

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_r = 1.453$
TEMPERATURE RATIO $T_r = 1.563$
MACH NUMBER $M_J = 0.753$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 1.407$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.710$
JET VELOCITY RATIO $V_J/A_0 = 0.893$
JET VELOCITY $V_J = 1017.2$ FPS

$T_r/T_J = 1.110$
 $\rho_r/\rho_0 = 0.930$
 $\rho_r/\rho_J = 1.308$
MASS FLOW = 1.162 POUNDS PER SECOND
THRUST = 36.52 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 1 15.0	MICRO PHONE NO. ANGLE 2 22.5	MICRO PHONE NO. ANGLE 3 30.0	MICRO PHONE NO. ANGLE 4 37.5	MICRO PHONE NO. ANGLE 5 45.0	MICRO PHONE NO. ANGLE 6 52.5
200.0	80.5	80.9	77.0	74.8	72.7	69.8
250.0	83.4	83.4	80.8	77.8	75.9	72.8
315.2	87.8	86.0	85.0	80.8	79.4	76.3
400.0	90.7	91.0	87.2	85.0	82.2	79.7
500.0	93.6	92.2	90.4	87.5	85.2	81.0
630.0	93.4	94.2	93.6	90.1	87.2	83.7
800.0	96.6	96.8	95.6	92.3	89.9	86.4
1000.0	96.2	97.6	97.4	94.2	92.2	88.6
1250.0	96.3	98.7	98.8	95.9	93.4	90.1
1600.0	94.8	97.1	98.0	95.4	93.7	90.8
2000.0	92.7	95.3	96.6	95.3	94.6	91.9
2500.0	89.2	92.7	94.5	94.1	94.3	92.0
3150.0	86.3	90.7	92.5	93.4	94.4	92.4
4000.0	84.9	89.2	91.8	92.6	94.3	92.5
5000.0	83.2	88.1	90.2	91.1	93.7	92.5
6300.0	82.4	86.6	88.9	90.2	92.9	92.3
8000.0	81.8	85.7	87.6	89.2	92.0	91.6
10000.0	81.1	84.9	84.9	88.2	91.2	91.1
12500.0	80.6	83.3	85.3	87.2	90.5	90.7
16000.0	78.3	81.9	83.8	85.8	89.4	89.9
20000.0	75.3	80.2	82.3	84.5	87.9	89.0
25000.0	73.5	79.4	81.2	83.3	86.9	88.4
31500.0	72.2	78.7	79.5	81.3	85.3	87.6
40000.0	72.1	79.7	78.4	80.1	84.0	86.8
OVERALL SPL	104.3	105.9	106.2	104.7	104.8	103.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	68.3	67.7	67.5	67.2	66.2	66.8
250.0	71.0	69.8	69.0	68.6	68.7	68.5
315.2	73.8	72.0	71.4	71.5	71.0	70.1
400.0	76.8	74.8	73.3	72.9	73.3	72.3
500.0	78.7	76.4	75.3	74.4	74.0	72.9
630.0	80.9	79.0	77.8	76.7	76.3	75.3
800.0	83.3	81.0	79.5	78.9	78.4	77.5
1000.0	85.0	82.8	81.4	80.4	79.5	78.7
1250.0	86.8	84.9	83.5	82.7	81.6	80.8
1600.0	88.3	85.8	84.6	83.4	82.5	81.7
2000.0	89.3	87.3	85.9	84.5	83.4	82.8
2500.0	89.8	87.9	86.3	85.2	84.4	83.9
3150.0	90.4	88.7	87.2	86.2	85.6	84.7
4000.0	90.8	89.5	87.7	86.6	85.8	85.1
5000.0	91.1	89.8	88.1	87.0	86.4	85.8
6300.0	91.0	89.8	88.0	87.3	86.5	86.1
8000.0	90.9	89.9	88.2	87.0	86.5	86.1
10000.0	90.7	89.7	87.8	86.8	86.4	86.1
12500.0	90.4	89.3	87.7	86.6	86.1	85.9
16000.0	89.8	89.1	87.7	86.1	85.9	85.4
20000.0	89.0	88.2	87.2	85.3	85.2	84.4
25000.0	88.4	87.7	87.1	84.8	84.6	83.7
31500.0	87.0	86.6	86.3	83.6	83.7	82.6
40000.0	86.0	86.0	85.5	82.6	83.3	81.7
OVERALL SPL	101.9	100.6	99.2	97.9	97.4	96.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 6.34 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 360.00 DEG.F, CHAMBER TEMPERATURE = 55.00 DEG.F
RELATIVE HUMIDITY = 70.0 PERCENT
GAMMA = 1.390

RUN NUMBER 139

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_r = 1.453$
TEMPERATURE RATIO $T_r = 1.592$
MACH NUMBER $M_J = 0.753$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 1.434$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.697$
JET VELOCITY RATIO $V_J/A_0 = 0.901$
JET VELOCITY $V_J = 1002.7$ FPS

$T_r/T_J = 1.110$
 $\rho_r/\rho_0 = 0.912$
 $\rho_r/\rho_J = 1.308$
MASS FLOW = 1.151 POUNDS PER SECOND
THRUST = 36.52 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	64.8	66.8	67.0	66.1	63.8	63.1
250.0	67.5	67.7	65.9	65.8	65.0	65.5
315.2	69.7	69.9	69.0	68.7	69.0	68.2
400.0	72.4	72.1	71.7	70.8	70.5	70.1
500.0	74.9	74.9	74.4	73.6	73.6	72.9
630.0	77.6	76.8	76.4	75.8	75.6	75.4
800.0	79.4	79.2	78.1	77.0	76.3	76.2
1000.0	81.6	80.6	79.0	78.2	77.2	76.9
1250.0	84.1	82.3	81.0	80.4	79.6	78.9
1600.0	84.5	82.8	82.1	81.0	80.4	79.7
2000.0	85.5	84.1	83.2	82.3	81.2	80.6
2500.0	86.0	85.0	83.7	82.9	82.3	81.5
3150.0	86.9	85.8	84.8	84.1	83.4	82.3
4000.0	87.1	86.2	85.5	84.3	83.8	82.7
5000.0	86.9	86.5	85.9	84.4	84.1	82.9
6300.0	87.3	87.5	86.2	85.0	84.8	83.6
8000.0	87.4	87.9	85.2	85.0	84.2	83.2
10000.0	87.9	87.7	85.4	84.6	84.1	82.9
12500.0	87.6	86.1	85.3	84.4	83.7	82.5
16000.0	86.2	86.1	84.0	83.7	83.0	82.1
20000.0	84.2	85.9	83.6	82.8	82.0	81.3
25000.0	84.5	84.4	83.0	82.2	81.5	81.1
31500.0	83.8	84.4	82.7	81.7	81.1	81.0
40000.0	82.7	84.2	82.3	81.7	80.2	81.2
OVERALL SPL	98.3	98.0	96.5	95.7	95.0	94.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	62.6	63.5	63.5	64.6
250.0	65.0	65.0	64.7	65.2
315.2	67.2	66.8	66.3	66.7
400.0	69.6	68.9	68.8	68.5
500.0	72.7	71.5	70.5	69.3
630.0	75.5	74.5	72.8	70.1
800.0	75.4	74.6	74.1	71.9
1000.0	76.4	75.4	75.0	72.7
1250.0	77.8	77.0	76.3	74.0
1600.0	79.0	77.8	76.6	75.3
2000.0	80.1	79.2	78.1	76.1
2500.0	80.8	79.9	78.8	76.8
3150.0	81.9	80.7	79.9	77.6
4000.0	82.7	81.5	80.3	77.7
5000.0	82.9	81.1	80.0	77.7
6300.0	83.5	82.0	80.3	78.2
8000.0	83.2	81.8	80.0	77.6
10000.0	82.8	81.3	79.4	76.8
12500.0	82.4	80.9	78.7	76.1
16000.0	82.1	80.4	78.2	75.1
20000.0	81.3	79.3	76.9	73.6
25000.0	80.7	78.7	76.3	72.3
31500.0	80.1	78.3	75.6	71.3
40000.0	79.7	78.3	74.8	70.2
OVERALL SPL	93.9	92.5	90.9	88.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 11.70 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 440.00 DEG.F, CHAMBER TEMPERATURE = 82.00 DEG.F
RELATIVE HUMIDITY = 44.0 PERCENT
GAMMA = 1.390

RUN NUMBER 40

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.824$
TEMPERATURE RATIO $TR = 1.561$
MACH NUMBER $MJ = 0.971$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 1.403$
JET DENSITY RATIO $DJ/D_0 = 0.713$
JET VELOCITY RATIO $VJ/A_0 = 1.150$
JET VELOCITY $VJ = 1311.8$ FPS

$TR/TJ = 1.184$
 $DR/D_0 = 1.098$
 $DR/DJ = 1.541$
MASS FLOW = 1.500 POUNDS PER SECOND
THRUST = 60.71 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	87.8	87.4	82.3	0.0	78.0	75.2
250.0	90.1	89.8	87.7	0.0	81.8	78.4
315.2	95.3	93.0	92.5	0.0	85.3	81.5
400.0	97.5	98.2	94.4	0.0	88.6	85.3
500.0	100.7	99.2	97.8	0.0	91.5	87.7
630.0	100.6	101.9	101.3	0.0	95.0	90.4
800.0	104.0	105.3	103.8	0.0	97.7	92.8
1000.0	103.6	105.8	106.3	0.0	100.2	95.7
1250.0	104.6	107.9	108.5	0.0	102.8	97.9
1600.0	104.7	108.0	108.7	0.0	103.7	99.4
2000.0	104.8	108.3	109.0	0.0	104.5	100.1
2500.0	104.1	107.5	107.9	0.0	104.0	100.7
3150.0	102.7	106.1	106.1	0.0	103.7	101.2
4000.0	100.9	103.8	104.2	0.0	103.3	101.3
5000.0	97.9	101.3	101.8	0.0	102.6	101.5
6300.0	95.4	99.0	99.9	0.0	101.8	101.0
8000.0	93.3	97.0	98.4	0.0	101.0	100.3
10000.0	91.6	94.5	96.1	0.0	100.0	100.0
12500.0	90.1	93.8	95.8	0.0	99.3	99.1
16000.0	87.9	92.2	94.3	0.0	98.1	98.1
20000.0	85.2	90.2	92.8	0.0	96.7	97.3
25000.0	83.3	88.9	91.7	0.0	95.7	96.9
31500.0	80.8	87.1	89.9	0.0	94.3	95.7
40000.0	78.7	85.9	88.3	0.0	92.8	94.8
OVERALL SPL	113.9	116.6	116.9	104.7	113.9	111.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	72.7	74.1	73.9	72.6	73.0	72.3
250.0	76.4	75.6	75.0	74.6	75.0	73.9
315.2	79.0	78.4	78.1	77.5	76.7	76.4
400.0	82.2	81.0	80.0	79.6	79.6	78.1
500.0	83.6	82.7	81.6	80.8	80.3	79.4
630.0	86.8	85.0	84.2	83.1	82.5	81.6
800.0	89.0	87.2	86.2	85.0	84.7	83.8
1000.0	91.2	89.3	88.1	86.8	85.9	85.2
1250.0	93.7	91.6	90.2	88.9	87.9	87.3
1600.0	95.2	93.0	91.4	89.9	89.3	88.5
2000.0	96.9	94.5	93.0	91.2	90.5	89.6
2500.0	97.5	95.4	93.8	92.0	91.5	90.6
3150.0	98.3	96.5	94.5	92.9	92.3	91.4
4000.0	98.9	97.3	95.7	93.7	93.0	92.1
5000.0	99.1	97.9	96.0	94.2	93.8	92.9
6300.0	99.2	98.1	96.1	94.6	94.1	93.5
8000.0	99.1	98.1	96.3	94.6	94.3	93.8
10000.0	98.8	98.1	96.1	94.7	94.3	94.1
12500.0	98.4	97.9	96.3	94.6	94.1	94.3
16000.0	97.7	97.6	96.3	94.2	94.0	94.0
20000.0	97.0	96.8	95.7	93.6	93.4	93.1
25000.0	96.1	96.3	95.8	93.2	93.0	92.5
31500.0	94.6	95.3	95.0	92.1	92.2	91.6
40000.0	93.5	94.7	94.2	91.0	91.8	90.6
OVERALL SPL	109.7	108.7	107.3	105.4	105.0	104.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 11.54 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 412.00 DEG.F, CHAMBER TEMPERATURE = 57.00 DEG.F
RELATIVE HUMIDITY = 62.0 PERCENT
GAMMA = 1.390

RUN NUMBER 140

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO P_R = 1.824
TEMPERATURE RATIO T_R = 1.587
MACH NUMBER M_J = 0.971
JET STATIC TEMPERATURE RATIO T_J/T_0 = 1.425
JET DENSITY RATIO D_J/D_0 = 0.702
JET VELOCITY RATIO V_J/A_0 = 1.159
JET VELOCITY V_J = 1291.4 FPS

T_R/T_J = 1.184
 D_R/D_0 = 1.082
 D_R/D_J = 1.541
MASS FLOW = 1.489 POUNDS PER SECOND
THRUST = 60.73 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 10 ANGLE 82.5	NO. 11 ANGLE 90.0	NO. 12 ANGLE 97.5	NO. 13 ANGLE 105.0	NO. 14 ANGLE 112.5	NO. 15 ANGLE 120.0
200.0	69.4	71.7	71.8	71.0	70.1	67.7
250.0	73.2	72.4	71.8	70.5	69.8	69.0
315.2	74.1	74.0	73.9	72.3	73.0	72.5
400.0	76.9	77.3	76.2	75.6	75.8	75.5
500.0	79.8	79.0	78.9	79.0	79.0	78.7
630.0	82.1	81.9	81.6	81.4	81.5	81.5
800.0	84.4	84.7	83.4	82.3	82.2	81.7
1000.0	86.9	86.1	84.6	83.6	82.5	82.4
1250.0	89.3	88.1	86.7	85.9	85.0	84.6
1600.0	90.6	89.0	87.6	87.0	85.9	85.5
2000.0	91.8	90.4	89.1	88.4	87.1	86.6
2500.0	92.2	91.3	89.8	89.2	88.4	87.6
3150.0	93.3	92.1	90.7	90.0	89.1	88.6
4000.0	93.8	92.8	91.5	90.6	89.8	89.3
5000.0	93.8	93.1	91.9	90.7	90.1	89.6
6300.0	94.3	94.4	92.5	91.6	90.8	90.4
8000.0	94.5	95.0	91.7	91.4	90.6	90.2
10000.0	95.0	95.0	91.9	91.3	90.7	90.1
12500.0	95.3	94.0	92.2	91.3	90.7	90.1
16000.0	93.8	93.6	90.7	90.6	90.0	89.3
20000.0	92.1	93.7	90.6	90.0	89.1	88.8
25000.0	92.2	92.4	90.0	89.3	88.7	88.6
31500.0	91.7	92.5	89.6	88.7	88.2	88.3
40000.0	90.4	92.3	89.2	88.6	87.3	88.4
OVERALL SPL	105.3	105.0	102.9	102.2	101.4	101.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	66.8	66.2	68.9	68.7
250.0	69.4	68.9	70.2	70.3
315.2	72.1	70.8	71.3	72.4
400.0	74.4	73.0	73.0	74.0
500.0	78.6	76.8	76.5	75.6
630.0	82.2	81.3	79.0	75.7
800.0	81.2	80.4	80.2	78.3
1000.0	81.6	80.5	80.6	79.4
1250.0	83.3	82.9	83.0	80.7
1600.0	84.3	83.7	83.3	82.6
2000.0	85.8	85.7	84.8	83.2
2500.0	87.0	86.5	85.8	84.4
3150.0	87.8	87.4	86.7	85.4
4000.0	88.8	88.1	87.7	85.9
5000.0	89.1	88.2	88.0	86.4
6300.0	90.0	89.3	88.9	87.4
8000.0	90.1	89.7	88.9	87.4
10000.0	90.1	89.6	88.7	86.9
12500.0	90.0	89.5	88.3	86.4
16000.0	89.4	88.6	87.4	84.8
20000.0	88.6	87.6	86.3	83.3
25000.0	87.9	86.8	85.5	82.0
31500.0	87.1	86.1	84.7	80.7
40000.0	86.5	85.9	83.8	79.5
OVERALL SPL	100.5	99.9	99.0	97.1

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.67 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 519.00 DEG.F, CHAMBER TEMPERATURE = 80.00 DEG.F
RELATIVE HUMIDITY = 52.0 PERCENT
GAMMA = 1.380

RUN NUMBER 27

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.047
TEMPERATURE RATIO TR = 1.813
MACH NUMBER MJ = 0.259
JET STATIC TEMPERATURE RATIO TJ/T0 = 1.790
JET DENSITY RATIO DJ/D0 = 0.559
JET VELOCITY RATIO VJ/A0 = 0.347
JET VELOCITY VJ = 395.5 FPS

TR/TJ = 1.013
DR/D0 = 0.578
DR/DJ = 1.034
MASS FLOW = 0.355 POUNDS PER SECOND
THRUST = 4.34 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	57.0		58.6		56.2	
250.0	60.0		60.3		59.6	
315.2	64.8		62.9		64.0	
400.0	65.5		66.0		63.9	
500.0	67.6		65.3		64.9	
630.0	64.0		65.0		65.3	
800.0	65.8		66.2		63.9	
1000.0	63.9		64.9		65.7	
1250.0	62.0		64.4		65.6	
1600.0	58.9		62.6		63.9	
2000.0	56.7		61.1		63.0	
2500.0	53.8		58.6		60.8	
3150.0	50.7		56.4		59.1	
4000.0	51.6		55.7		57.3	
5000.0	50.4		54.8		55.3	
6300.0	50.1		53.3		53.5	
8000.0	49.8		51.7		52.4	
10000.0	49.9		50.6		51.7	
12500.0	49.7		50.2		50.5	
16000.0	48.1		50.1		49.8	
20000.0	47.2		49.0		49.1	
25000.0	47.9		50.1		49.3	
31500.0	49.6		52.3		49.9	
40000.0	52.2		55.6		51.7	
					52.1	
					57.2	
OVERALL						
SPL	74.3		74.9		75.1	
					73.5	
					74.2	
						73.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	51.5	53.1	51.0	51.0	52.5	52.1
250.0	53.8	53.0	52.4	51.6	51.8	51.3
315.2	57.6	57.0	55.9	55.2	54.8	55.0
400.0	59.0	58.0	56.4	56.1	55.5	55.0
500.0	59.8	58.7	57.8	57.2	56.9	56.0
630.0	60.8	59.7	59.0	58.1	57.8	57.0
800.0	61.0	60.8	59.3	56.8	58.6	57.6
1000.0	61.8	61.0	59.8	59.4	59.0	58.1
1250.0	61.6	61.4	60.2	59.6	59.6	58.9
1600.0	61.7	61.0	60.1	59.2	59.0	58.4
2000.0	61.4	60.8	60.0	59.3	59.1	58.5
2500.0	60.5	60.2	59.1	58.6	58.6	58.1
3150.0	59.9	59.5	58.6	58.3	58.2	57.6
4000.0	59.1	59.1	58.2	57.5	57.6	56.9
5000.0	58.7	58.4	57.3	57.1	57.1	56.8
6300.0	57.8	57.7	56.5	56.5	56.7	56.3
8000.0	57.0	57.0	55.7	55.6	56.1	55.6
10000.0	57.0	56.3	55.0	55.0	55.6	55.5
12500.0	55.9	55.8	54.6	54.5	55.1	55.1
16000.0	55.3	55.3	54.6	54.1	55.0	54.9
20000.0	54.9	54.8	54.1	53.3	54.3	54.0
25000.0	54.5	54.4	54.0	53.0	54.1	53.4
31500.0	54.8	54.1	53.8	53.0	54.3	53.1
40000.0	57.8	54.4	54.1	53.6	55.6	53.4
OVERALL SPL	72.7	72.1	71.1	70.6	70.7	70.0

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.67 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 495.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.380

RUN NUMBER 213

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.047
TEMPERATURE RATIO TR = 1.844
MACH NUMBER MJ = 0.259
JET STATIC TEMPERATURE RATIO TJ/T0 = 1.820
JET DENSITY RATIO DJ/D0 = 0.549
JET VELOCITY RATIO VJ/A0 = 0.350
JET VELOCITY VJ = 390.6 FPS

TR/TJ = 1.013
DR/D0 = 0.568
DR/DJ = 1.034
MASS FLOW = 0.352 POUNDS PER SECOND
THRUST = 4.34 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	54.6	57.0	54.9	53.3	53.0	54.4
250.0	56.7	56.2	54.6	55.0	55.2	54.4
315.2	59.4	58.9	58.2	57.7	57.2	57.5
400.0	60.3	59.9	57.8	59.0	57.5	59.6
500.0	59.7	59.0	58.1	58.2	57.4	56.9
630.0	61.2	60.5	59.3	59.2	58.4	58.4
800.0	62.2	61.5	60.4	59.5	58.9	58.9
1000.0	62.0	60.7	60.1	59.7	58.6	58.3
1250.0	61.8	61.0	60.6	59.9	59.0	58.6
1600.0	61.3	60.8	59.8	59.6	59.5	58.4
2000.0	61.1	60.5	59.9	59.7	58.8	58.5
2500.0	60.7	59.7	59.3	59.1	58.5	58.2
3150.0	59.9	59.3	58.6	58.7	58.4	57.9
4000.0	59.4	58.9	58.3	58.1	57.6	57.0
5000.0	58.4	58.3	58.1	57.7	57.5	56.7
6300.0	58.1	58.3	57.5	57.5	57.3	56.9
8000.0	57.6	58.2	55.8	56.4	56.5	56.2
10000.0	57.7	57.6	55.6	55.6	56.1	55.6
12500.0	57.7	56.3	55.6	55.4	55.4	55.1
16000.0	56.7	56.5	54.5	54.8	55.3	54.6
20000.0	56.0	56.8	54.9	54.5	55.1	54.3
25000.0	55.8	55.1	54.3	54.0	54.2	53.7
31500.0	56.0	55.5	54.3	54.0	54.3	53.7
40000.0	55.2	55.6	54.2	54.8	54.3	54.5
OVERALL SPL	73.1	72.6	71.6	71.4	71.0	70.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	54.6	56.7	53.9	55.6
250.0	54.7	54.6	55.2	53.6
315.2	57.7	57.1	55.6	56.2
400.0	58.2	57.8	56.8	60.1
500.0	56.9	56.1	56.1	55.8
630.0	57.8	56.9	56.4	55.7
800.0	58.6	58.1	56.8	56.1
1000.0	58.6	57.2	56.2	55.5
1250.0	58.1	56.9	56.3	54.5
1600.0	58.0	56.6	55.4	53.9
2000.0	58.2	56.7	55.1	53.3
2500.0	58.2	56.7	54.9	52.8
3150.0	57.7	56.4	54.9	52.3
4000.0	57.3	56.0	54.5	51.7
5000.0	56.8	55.2	53.6	50.7
6300.0	56.6	54.8	53.3	50.4
8000.0	56.0	54.2	52.4	49.6
10000.0	55.4	53.0	51.4	48.6
12500.0	54.9	52.4	50.4	48.0
16000.0	54.5	51.8	50.1	47.1
20000.0	54.4	51.3	49.7	46.9
25000.0	53.1	49.9	47.6	44.0
31500.0	52.6	49.3	46.5	43.1
40000.0	52.3	49.3	45.9	44.5
OVERALL SPL	70.5	69.3	68.0	67.3

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.88 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 524.00 DEG.F, CHAMBER TEMPERATURE = 88.00 DEG.F
RELATIVE HUMIDITY = 31.0 PERCENT
GAMMA = 1.380

RUN NUMBER 41

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.062$
TEMPERATURE RATIO $TR = 1.796$
MACH NUMBER $MJ = 0.296$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.766$
JET DENSITY RATIO $DJ/D0 = 0.566$
JET VELOCITY RATIO $VJ/A0 = 0.394$
JET VELOCITY $VJ = 452.0$ FPS

$TR/TJ = 1.017$
 $DR/D0 = 0.591$
 $DR/DJ = 1.045$
MASS FLOW = 0.408 POUNDS PER SECOND
THRUST = 5.66 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
MZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	62.4	0.0	58.7	57.0	56.7	55.4
250.0	63.3	0.0	62.8	60.1	59.9	57.8
315.2	67.0	0.0	66.0	63.0	62.9	60.2
400.0	69.4	0.0	67.0	64.9	64.6	62.4
500.0	72.1	0.0	68.7	66.4	66.3	64.1
630.0	69.0	0.0	69.8	67.2	67.0	65.5
800.0	71.0	0.0	70.1	68.2	67.9	66.2
1000.0	68.1	0.0	70.1	68.3	68.1	67.1
1250.0	67.0	0.0	70.1	68.5	68.6	67.2
1600.0	64.2	0.0	68.6	67.4	67.7	67.0
2000.0	61.2	0.0	67.4	66.7	67.6	66.7
2500.0	59.0	0.0	65.6	65.3	66.5	65.9
3150.0	55.7	0.0	63.6	63.8	65.5	65.0
4000.0	56.6	0.0	62.1	62.7	65.3	64.2
5000.0	55.1	0.0	60.0	60.7	63.8	63.5
6300.0	54.5	0.0	58.3	59.2	62.8	62.6
8000.0	54.3	0.0	57.0	57.8	61.2	61.4
10000.0	54.5	0.0	55.8	56.9	60.5	61.0
12500.0	54.5	0.0	54.4	55.9	59.9	60.6
16000.0	52.6	0.0	53.7	55.1	59.4	60.1
20000.0	50.7	0.0	52.5	54.0	58.1	59.3
25000.0	51.0	0.0	52.4	53.4	57.7	58.9
31500.0	52.1	0.0	51.9	52.5	57.0	58.1
40000.0	54.9	0.0	52.8	53.5	57.5	57.7
OVERALL						
SPL	78.7	116.6	79.2	77.7	78.4	77.4

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	7 60.0	8 67.5	9 75.0	10 82.5	11 90.0	12 97.5
200.0	54.3	54.1	53.1	52.8	53.9	54.0
250.0	56.2	55.3	54.8	54.0	54.3	53.8
315.2	58.6	57.5	57.0	56.9	55.8	56.1
400.0	61.4	60.0	59.2	58.0	57.5	56.8
500.0	62.7	61.5	60.9	60.1	59.4	58.8
630.0	64.1	62.5	62.1	61.5	60.7	60.5
800.0	65.2	63.9	62.8	61.9	61.3	61.0
1000.0	65.8	64.4	63.5	63.0	62.5	61.7
1250.0	65.9	65.2	64.1	63.6	63.3	62.7
1600.0	66.1	65.0	63.9	63.5	63.3	62.4
2000.0	66.0	65.1	63.9	63.5	63.4	62.4
2500.0	65.3	64.6	63.6	63.1	63.0	62.1
3150.0	64.6	63.9	63.2	63.0	62.6	62.0
4000.0	64.2	63.7	62.8	62.5	62.2	61.7
5000.0	63.5	63.0	61.7	61.7	61.6	61.1
6300.0	62.8	62.5	60.9	61.2	61.1	60.9
8000.0	61.8	61.5	60.3	60.2	60.3	60.3
10000.0	61.3	61.1	59.8	59.9	60.0	60.2
12500.0	60.7	60.6	59.3	59.4	59.4	59.7
16000.0	60.3	60.5	59.5	58.8	59.3	59.5
20000.0	59.5	59.5	58.9	57.8	58.2	58.4
25000.0	59.0	58.8	58.6	57.2	57.6	57.8
31500.0	58.1	57.9	58.0	56.1	56.6	56.6
40000.0	58.6	57.7	57.6	55.7	57.1	56.0
OVERALL SPL	76.8	76.0	75.0	74.5	74.4	73.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.88 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 500.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.380

RUN NUMBER 214

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.062$
TEMPERATURE RATIO $TR = 1.853$
MACH NUMBER $MJ = 0.297$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.823$
JET DENSITY RATIO $DJ/D0 = 0.549$
JET VELOCITY RATIO $VJ/A0 = 0.400$
JET VELOCITY $VJ = 446.8$ FPS

$TR/TJ = 1.017$
 $DR/D0 = 0.573$
 $DR/DJ = 1.045$
MASS FLOW = 0.402 POUNDS PER SECOND
THRUST = 5.67 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	56.3	57.2	56.6	54.4	55.4	55.6
250.0	57.5	57.6	56.7	55.9	56.7	56.4
315.2	59.7	59.6	59.3	59.4	59.0	58.6
400.0	61.4	61.5	60.0	60.6	59.5	60.7
500.0	62.1	61.3	61.5	60.9	60.3	59.9
630.0	64.2	63.4	62.6	62.0	61.5	61.7
800.0	65.5	64.2	63.2	62.8	62.3	62.0
1000.0	65.1	64.0	63.9	63.2	62.3	62.1
1250.0	65.2	64.2	64.3	64.0	62.9	62.6
1600.0	64.7	63.8	64.1	63.5	63.0	62.6
2000.0	64.8	64.4	64.7	63.8	62.9	63.1
2500.0	64.4	63.7	64.0	63.4	62.7	62.8
3150.0	63.8	63.1	63.6	63.2	62.1	62.3
4000.0	63.2	63.1	63.2	62.7	61.8	61.8
5000.0	62.3	62.3	62.8	62.0	61.4	61.3
6300.0	61.6	62.3	62.3	61.7	61.4	61.5
8000.0	61.3	62.1	60.6	60.8	60.3	60.6
10000.0	61.4	61.3	60.2	60.1	59.8	60.1
12500.0	61.3	59.8	60.3	59.7	59.5	59.6
16000.0	59.8	59.9	59.1	59.2	59.0	58.9
20000.0	58.7	60.0	59.3	58.7	58.4	58.5
25000.0	59.1	58.6	58.8	58.3	57.7	58.2
31500.0	59.3	59.1	58.9	58.2	57.7	58.5
40000.0	58.6	59.3	59.2	58.7	57.4	59.2
OVERALL SPL	76.3	75.8	75.6	75.1	74.5	74.6

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0	55.7		57.2		55.5		56.5		
250.0	56.2		55.3		55.2		54.6		
315.2	58.3		57.8		56.6		56.3		
400.0	59.7		59.8		59.3		61.5		
500.0	59.3		58.7		58.4		57.5		
630.0	61.3		59.8		58.7		57.7		
800.0	61.9		60.5		59.0		58.5		
1000.0	62.3		60.5		59.3		58.3		
1250.0	62.1		60.3		59.3		57.6		
1600.0	61.9		59.8		58.6		56.8		
2000.0	62.2		60.4		59.2		56.7		
2500.0	62.0		60.3		58.6		56.2		
3150.0	62.2		60.1		58.4		55.7		
4000.0	61.8		60.0		58.2		54.7		
5000.0	61.1		59.1		57.1		53.7		
6300.0	60.8		58.8		56.7		53.7		
8000.0	60.1		58.2		55.6		52.7		
10000.0	59.7		57.3		54.7		51.6		
12500.0	59.1		56.5		53.8		50.8		
16000.0	58.6		56.0		53.4		49.9		
20000.0	58.0		55.0		53.0		49.3		
25000.0	57.2		53.8		51.4		46.9		
31500.0	56.8		53.4		50.6		45.7		
40000.0	56.6		53.2		49.6		45.9		
OVERALL									
SPL	74.1		72.3		70.9		69.5		

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.39 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 533.00 DEG.F, CHAMBER TEMPERATURE = 88.00 DEG.F
RELATIVE HUMIDITY = 31.0 PERCENT
GAMMA = 1.380

RUN NUMBER 42

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_r = 1.098$
TEMPERATURE RATIO $T_r = 1.812$
MACH NUMBER $M_J = 0.370$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 1.766$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.566$
JET VELOCITY RATIO $V_J/A_0 = 0.492$
JET VELOCITY $V_J = 564.6$ FPS

$T_r/T_J = 1.026$
 $D_r/D_0 = 0.506$
 $D_r/D_J = 1.070$
MASS FLOW = 0.610 POUNDS PER SECOND
THRUST = 8.84 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	66.9		66.4		63.3	
250.0	68.9		69.5		67.3	
315.2	71.7		71.4		72.0	
400.0	73.7		75.6		72.9	
500.0	77.4		76.0		75.0	
630.0	75.3		76.8		76.4	
800.0	77.8		78.6		77.3	
1000.0	76.0		77.3		77.4	
1250.0	74.3		76.8		77.6	
1600.0	71.5		74.8		75.6	
2000.0	69.6		73.0		74.7	
2500.0	66.7		70.6		73.2	
3150.0	64.5		68.4		71.4	
4000.0	64.2		67.6		69.9	
5000.0	62.7		65.9		67.9	
6300.0	62.1		64.2		65.9	
8000.0	61.2		62.4		64.1	
10000.0	61.3		60.2		63.1	
12500.0	61.4		59.5		61.5	
16000.0	59.5		59.4		60.5	
20000.0	57.3		57.4		58.8	
25000.0	57.1		57.4		58.1	
31500.0	57.7		58.0		56.8	
40000.0	60.5		60.4		56.4	
					57.3	
					61.6	
					61.2	
					63.7	
					67.4	
					69.7	
					71.6	
					72.6	
					74.3	
					75.0	
					75.7	
					75.0	
					74.6	
					75.1	
					74.2	
					73.3	
					72.9	
					71.5	
					70.7	
					69.0	
					68.0	
					67.0	
					65.9	
					64.5	
					63.6	
					62.3	
					61.6	
OVERALL						
SPL	84.9		86.2		84.8	
					85.3	
					84.2	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	57.4	57.8	56.6	56.1	57.0	56.9
250.0	59.8	59.0	58.0	57.2	58.0	57.0
315.2	63.2	61.8	61.3	60.3	60.2	59.9
400.0	65.9	63.8	62.5	61.9	61.7	60.7
500.0	67.8	66.2	65.0	64.0	63.8	62.7
630.0	69.3	67.9	66.5	66.1	66.0	64.8
800.0	70.6	69.0	68.1	67.2	67.1	66.0
1000.0	71.6	70.2	69.4	68.4	68.2	66.9
1250.0	72.5	71.6	70.2	69.6	69.0	68.4
1600.0	72.5	71.5	70.3	69.6	69.7	68.5
2000.0	72.8	71.9	70.6	69.9	69.9	68.8
2500.0	72.3	71.5	70.2	69.8	69.8	68.8
3150.0	71.9	71.1	70.1	69.9	69.7	68.8
4000.0	71.5	71.1	70.4	69.7	69.7	68.7
5000.0	70.9	70.5	69.4	69.1	69.1	68.4
6300.0	70.4	70.0	68.7	68.7	68.7	68.1
8000.0	69.2	69.1	67.9	67.5	67.8	67.4
10000.0	68.7	68.5	67.1	66.9	67.2	67.2
12500.0	68.0	67.8	66.6	66.3	66.5	66.7
16000.0	67.3	67.4	66.4	65.6	66.1	66.4
20000.0	66.4	66.3	65.5	64.5	64.9	65.0
25000.0	65.8	65.4	65.0	63.8	64.1	64.0
31500.0	64.7	64.2	64.1	62.3	62.9	62.5
40000.0	64.4	63.7	63.4	61.3	62.4	61.5
OVERALL SPL	83.3	82.5	81.4	80.8	80.9	80.1

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.39 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 510.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.380

RUN NUMBER 215

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.098$
TEMPERATURE RATIO $TR = 1.873$
MACH NUMBER $MJ = 0.371$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.825$
JET DENSITY RATIO $DJ/D0 = 0.548$
JET VELOCITY RATIO $VJ/A0 = 0.501$
JET VELOCITY $VJ = 558.4$ FPS

$TR/TJ = 1.026$
 $DR/D0 = 0.586$
 $DR/DJ = 1.070$
MASS FLOW = 0.502 POUNDS PER SECOND
THRUST = 8.85 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	56.8	58.7	58.5	57.5	57.2	57.3
250.0	59.4	59.6	58.2	58.5	60.0	58.6
315.2	61.8	62.3	61.8	60.9	61.5	61.6
400.0	64.2	64.1	63.3	63.6	62.5	63.1
500.0	66.7	65.6	64.9	65.3	64.1	63.8
630.0	68.6	68.0	66.3	65.9	65.9	65.8
800.0	70.8	69.2	67.8	67.0	67.6	66.6
1000.0	70.9	69.4	68.4	68.1	67.6	66.6
1250.0	72.0	70.3	69.9	69.2	68.8	68.1
1600.0	71.7	70.8	69.6	69.3	69.0	68.2
2000.0	71.5	71.0	70.0	69.6	69.1	68.6
2500.0	72.0	71.2	69.9	69.5	69.6	68.7
3150.0	71.8	70.6	69.8	69.6	69.0	68.7
4000.0	71.2	70.5	69.8	69.4	68.9	68.5
5000.0	70.2	70.1	69.4	68.9	68.7	67.9
6300.0	69.8	70.2	68.8	68.5	68.4	68.0
8000.0	69.3	70.1	67.2	67.7	67.6	66.9
10000.0	69.3	69.3	66.8	66.8	66.9	66.2
12500.0	69.1	67.6	66.7	66.4	66.5	65.9
16000.0	67.6	67.3	65.3	65.8	65.7	65.3
20000.0	65.9	67.2	65.3	65.3	65.1	64.6
25000.0	66.4	65.9	64.8	64.8	64.6	64.2
31500.0	66.6	66.4	64.8	64.9	64.4	64.4
40000.0	66.0	66.5	65.0	65.4	64.1	65.0
OVERALL SPL	83.0	82.4	81.1	80.9	80.6	80.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	56.5	58.0	56.7	58.1
250.0	58.8	58.3	57.7	57.7
315.2	61.2	59.8	59.0	59.4
400.0	62.7	61.8	62.2	61.9
500.0	63.3	62.5	62.4	61.4
630.0	65.7	64.8	63.2	62.4
800.0	66.4	65.2	64.2	63.0
1000.0	66.6	65.4	64.3	63.7
1250.0	67.7	66.0	64.7	63.0
1600.0	67.7	65.8	64.3	62.7
2000.0	68.2	66.7	64.8	62.8
2500.0	68.5	66.7	64.8	62.7
3150.0	68.4	66.5	64.9	62.3
4000.0	68.3	66.4	64.9	61.8
5000.0	67.9	65.6	64.1	60.9
6300.0	67.6	65.8	63.3	61.3
8000.0	66.9	65.0	62.5	59.8
10000.0	66.1	63.9	61.6	58.8
12500.0	65.5	63.3	60.5	58.2
16000.0	65.0	62.6	59.9	56.8
20000.0	64.2	61.7	58.9	55.7
25000.0	63.5	60.9	58.1	54.4
31500.0	63.1	60.4	57.7	53.4
40000.0	63.2	60.5	57.1	52.7
OVERALL SPL	79.8	78.0	76.3	74.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.04 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 544.00 DEG.F, CHAMBER TEMPERATURE = 88.00 DEG.F
RELATIVE HUMIDITY = 31.0 PERCENT
GAMMA = 1.380

RUN NUMBER 43

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.144$
TEMPERATURE RATIO $TR = 1.832$
MACH NUMBER $MJ = 0.445$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.766$
JET DENSITY RATIO $DJ/D0 = 0.566$
JET VELOCITY RATIO $VJ/A0 = 0.592$
JET VELOCITY $VJ = 678.8$ FPS

$TR/TJ = 1.038$
 $DR/D0 = 0.624$
 $DR/DJ = 1.102$
MASS FLOW = 0.613 POUNDS PER SECOND
THRUST = 12.77 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	70.7		71.7		68.3	
250.0	73.6		73.7		71.9	
315.2	78.1		75.6		76.1	
400.0	79.8		80.5		77.8	
500.0	82.8		80.8		80.2	
630.0	81.8		82.1		82.2	
800.0	84.4		84.5		83.2	
1000.0	82.6		83.4		83.5	
1250.0	80.5		83.0		83.4	
1600.0	77.6		80.7		81.7	
2000.0	75.4		78.8		80.6	
2500.0	73.1		76.8		78.6	
3150.0	70.3		74.8		76.4	
4000.0	70.0		74.0		75.4	
5000.0	68.1		72.3		73.4	
6300.0	67.7		70.8		71.2	
8000.0	66.9		69.2		69.7	
10000.0	67.0		67.1		68.0	
12500.0	67.0		66.0		66.6	
16000.0	65.1		65.4		65.4	
20000.0	62.5		63.4		63.7	
25000.0	61.2		63.3		62.8	
31500.0	60.4		64.1		61.6	
40000.0	61.0		66.2		61.4	
OVERALL						
SPL	91.1		91.8		91.8	
					90.8	
					90.7	
						89.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3		MICRO		MICRO		MICRO		MICRO		MICRO		
OCTAVE	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	MICRO	
CENTER	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	7	60.0	8	67.5	9	75.0	10	82.5	11	90.0	12	97.5
200.0	59.5	60.2	59.0	58.6	59.0	59.3						
250.0	63.5	62.1	60.6	60.4	60.6	59.6						
315.2	65.9	64.8	63.4	63.6	62.7	62.5						
400.0	68.9	67.4	65.8	65.0	64.8	63.4						
500.0	70.4	69.5	68.3	67.3	66.8	65.9						
630.0	73.0	71.2	70.1	69.3	68.4	68.3						
800.0	74.6	73.5	71.8	70.9	70.2	69.8						
1000.0	75.9	74.7	73.3	72.1	71.6	71.2						
1250.0	76.7	76.1	74.8	73.7	73.2	72.6						
1600.0	77.3	76.3	75.3	74.1	73.5	72.8						
2000.0	78.1	77.2	75.7	74.8	74.0	73.3						
2500.0	77.7	77.2	75.7	74.8	74.1	73.4						
3150.0	77.5	77.1	75.7	75.2	74.5	73.9						
4000.0	77.6	77.2	75.9	75.1	74.4	74.1						
5000.0	77.1	76.8	75.1	75.0	74.3	73.8						
6300.0	76.7	76.4	74.6	74.7	74.0	73.7						
8000.0	75.8	75.4	73.9	73.6	72.9	72.9						
10000.0	75.3	74.9	73.2	73.1	72.5	72.8						
12500.0	74.8	74.2	72.6	72.3	71.8	72.2						
16000.0	74.2	73.9	72.4	71.5	71.5	71.6						
20000.0	73.2	72.7	71.3	70.3	70.5	70.1						
25000.0	72.8	71.8	71.0	69.3	69.7	69.1						
31500.0	72.0	70.5	69.9	67.6	68.5	67.5						
40000.0	72.3	69.7	68.7	66.2	68.2	66.1						
OVERALL												
SPL	88.8	88.1	86.6	85.9	85.4	85.0						

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.04 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 520.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.380

RUN NUMBER 216

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.144$
TEMPERATURE RATIO $TR = 1.892$
MACH NUMBER $MJ = 0.445$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.823$
JET DENSITY RATIO $DJ/D0 = 0.549$
JET VELOCITY RATIO $VJ/A0 = 0.602$
JET VELOCITY $VJ = 671.1$ FPS

$TR/TJ = 1.038$
 $DR/D0 = 0.605$
 $DR/DJ = 1.102$
MASS FLOW = 0.604 POUNDS PER SECOND
THRUST = 12.79 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	58.4	60.2	61.0	58.7	58.9	57.9
250.0	61.0	61.0	60.8	60.5	61.0	60.5
315.2	62.9	63.7	64.0	63.4	62.9	62.1
400.0	65.5	66.1	64.9	65.1	64.4	64.7
500.0	67.8	68.1	67.8	66.5	65.9	65.6
630.0	70.8	70.3	69.8	68.2	68.4	68.1
800.0	73.1	72.4	70.7	70.6	69.4	69.5
1000.0	74.0	73.0	71.8	71.7	70.1	69.8
1250.0	75.1	73.7	73.6	72.7	71.6	71.5
1600.0	75.3	74.5	73.9	73.2	72.2	72.1
2000.0	75.4	75.1	74.7	73.9	72.8	72.3
2500.0	75.8	75.2	74.2	73.9	73.1	72.8
3150.0	75.8	75.3	74.4	74.0	73.2	72.9
4000.0	75.6	75.2	74.7	73.7	72.9	72.6
5000.0	74.9	75.0	74.5	73.4	72.7	72.2
6300.0	73.9	75.3	74.0	73.3	72.9	72.3
8000.0	73.9	74.9	72.4	72.4	71.7	71.4
10000.0	73.8	74.2	72.1	71.8	71.0	70.7
12500.0	73.7	72.3	71.9	71.1	70.7	70.2
16000.0	72.0	72.1	70.4	70.5	70.1	69.7
20000.0	70.4	71.9	70.5	69.7	69.4	69.1
25000.0	70.8	70.4	69.8	69.2	68.7	68.7
31500.0	70.7	70.6	69.8	69.0	68.5	68.8
40000.0	70.1	70.6	69.8	69.3	68.1	69.2
OVERALL SPL	86.7	86.6	85.6	85.0	84.2	84.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO		MICRO	
CENTER	PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE
HZ	16	127.5	17	135.0
	18	142.5	19	150.0
200.0	57.0		59.7	
250.0	60.3		60.2	
315.2	61.8		62.0	
400.0	63.8		64.1	
500.0	65.6		64.9	
630.0	67.6		67.9	
800.0	68.6		68.6	
1000.0	69.4		69.3	
1250.0	70.6		70.4	
1600.0	70.7		70.1	
2000.0	71.6		71.0	
2500.0	72.0		71.5	
3150.0	72.2		71.6	
4000.0	72.1		71.6	
5000.0	71.9		71.1	
6300.0	71.9		70.8	
8000.0	71.0		70.4	
10000.0	70.4		69.5	
12500.0	69.9		68.9	
16000.0	69.3		68.2	
20000.0	68.8		67.2	
25000.0	67.9		66.3	
31500.0	67.4		65.9	
40000.0	67.2		66.1	
OVERALL				
SPL	83.3		82.7	
			80.7	
				79.3

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.82 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 557.00 DEG.F, CHAMBER TEMPERATURE = 88.00 DEG.F
RELATIVE HUMIDITY = 31.0 PERCENT
GAMMA = 1.380

RUN NUMBER 44

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_R = 1.199$
TEMPERATURE RATIO $T_R = 1.856$
MACH NUMBER $M_J = 0.519$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 1.766$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.566$
JET VELOCITY RATIO $V_J/A_0 = 0.689$
JET VELOCITY $V_J = 791.1$ FPS

$T_R/T_J = 1.051$
 $D_R/D_0 = 0.646$
 $D_R/D_J = 1.140$
MASS FLOW = 0.715 POUNDS PER SECOND
THRUST = 17.35 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	74.6	73.9	70.4	0.0	67.4	65.6
250.0	77.3	77.0	75.0	0.0	71.0	68.3
315.2	81.4	79.4	79.9	0.0	73.9	71.0
400.0	83.4	83.7	80.7	0.0	77.0	73.8
500.0	87.1	84.5	83.4	0.0	79.9	75.7
630.0	86.1	86.8	86.1	0.0	82.1	78.0
800.0	89.0	89.2	88.3	0.0	83.8	80.1
1000.0	88.0	89.0	89.4	0.0	85.3	81.6
1250.0	86.7	88.9	89.5	0.0	86.4	82.7
1600.0	83.7	86.6	87.9	0.0	86.3	83.3
2000.0	81.0	84.6	86.6	0.0	86.5	83.6
2500.0	78.2	82.3	84.6	0.0	85.9	83.5
3150.0	75.8	80.2	82.9	0.0	85.6	83.2
4000.0	75.4	79.1	81.8	0.0	85.3	82.9
5000.0	73.4	77.1	79.8	0.0	84.0	82.4
6300.0	72.9	75.7	77.9	0.0	82.7	81.9
8000.0	71.8	73.8	76.3	0.0	81.5	80.8
10000.0	71.8	71.9	75.0	0.0	80.5	80.2
12500.0	71.7	70.7	73.3	0.0	79.1	79.3
16000.0	69.9	69.8	71.9	0.0	77.9	78.6
20000.0	66.7	67.4	70.0	0.0	76.1	77.5
25000.0	64.8	66.6	68.8	0.0	75.0	77.0
31500.0	63.0	66.1	67.1	0.0	73.3	76.0
40000.0	62.2	66.8	65.5	0.0	71.8	75.7
OVERALL SPL	95.9	96.8	97.3	90.8	96.3	94.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	63.6	62.2	61.9	61.3	61.6	62.2
250.0	66.2	64.9	63.6	62.7	63.0	62.5
315.2	68.2	66.8	66.3	65.8	65.6	65.5
400.0	71.0	69.8	68.2	67.6	67.6	66.6
500.0	73.3	72.5	70.8	70.0	69.7	68.7
630.0	75.5	74.2	73.4	72.2	71.7	71.3
800.0	77.0	76.4	75.0	74.1	73.5	72.8
1000.0	79.3	78.2	76.5	75.9	74.8	74.2
1250.0	80.1	79.9	78.2	77.1	76.4	75.9
1600.0	81.0	80.4	78.8	77.6	77.0	76.6
2000.0	81.6	81.2	79.8	78.6	78.0	77.5
2500.0	81.9	81.5	80.0	78.8	78.2	77.8
3150.0	81.8	81.6	80.2	79.4	78.7	78.4
4000.0	82.0	81.9	80.5	79.6	79.1	78.7
5000.0	81.7	81.8	80.1	79.3	79.0	78.5
6300.0	81.6	81.2	79.8	79.1	78.9	78.6
8000.0	80.8	80.6	79.2	78.4	78.2	78.0
10000.0	80.5	80.2	78.5	78.1	77.9	78.0
12500.0	79.8	79.4	77.9	77.4	77.3	77.5
16000.0	79.0	78.9	77.7	76.7	77.0	77.0
20000.0	78.0	77.7	76.6	75.6	75.7	75.5
25000.0	77.5	76.6	75.9	74.6	75.0	74.5
31500.0	76.3	75.1	74.6	73.0	73.7	72.9
40000.0	76.2	74.3	73.6	71.7	73.2	71.6
OVERALL SPL	92.9	92.5	91.1	90.2	89.9	89.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.82 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 538.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.380

RUN NUMBER 217

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.199$
TEMPERATURE RATIO $TR = 1.927$
MACH NUMBER $MJ = 0.519$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 1.833$
JET DENSITY RATIO $DJ/D_0 = 0.546$
JET VELOCITY RATIO $VJ/A_0 = 0.703$
JET VELOCITY $VJ = 784.1$ FPS

$TR/TJ = 1.051$
 $DR/D_0 = 0.622$
 $DR/DJ = 1.140$
MASS FLOW = 0.702 POUNDS PER SECOND
THRUST = 17.37 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	10	82.5	11	90.0	12	97.5
					13	105.0
					14	112.5
					15	120.0
200.0	61.0		62.2		61.2	61.5
250.0	63.3		63.4		62.9	62.9
315.2	65.0		65.8		66.6	66.2
400.0	68.7		68.2		67.7	67.1
500.0	70.8		70.4		70.6	69.7
630.0	73.4		72.8		72.3	71.4
800.0	76.4		75.0		74.1	72.4
1000.0	78.0		76.1		74.8	74.3
1250.0	79.0		77.2		77.3	76.0
1600.0	79.4		78.0		77.4	76.7
2000.0	79.8		79.0		78.2	77.5
2500.0	80.0		79.2		78.2	77.7
3150.0	80.3		79.5		78.5	78.0
4000.0	80.4		79.7		79.1	78.1
5000.0	79.8		79.5		79.1	77.9
6300.0	79.5		79.8		78.8	77.7
8000.0	79.3		79.9		77.4	77.2
10000.0	79.3		79.0		76.9	76.5
12500.0	79.1		77.3		76.7	76.0
16000.0	77.6		77.1		75.0	75.3
20000.0	75.8		76.9		74.9	74.6
25000.0	76.1		75.3		74.2	74.0
31500.0	76.2		75.4		73.8	73.8
40000.0	75.3		75.4		73.6	74.2
OVERALL						
SPL	91.4		90.8		89.7	89.1
						88.5
						88.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	59.0	60.4	59.4	60.9
250.0	63.1	62.3	62.2	61.2
315.2	64.4	64.0	63.4	63.0
400.0	66.5	65.5	65.6	65.4
500.0	67.8	66.7	66.4	65.8
630.0	70.7	69.9	67.9	66.5
800.0	71.6	70.6	70.0	68.5
1000.0	72.0	71.5	70.7	69.4
1250.0	73.4	72.8	71.6	69.7
1600.0	74.2	73.1	72.1	70.3
2000.0	75.2	74.0	72.8	70.6
2500.0	75.7	74.5	73.1	71.0
3150.0	76.0	74.9	73.3	71.0
4000.0	76.2	74.9	73.4	70.9
5000.0	76.2	74.5	72.7	70.5
6300.0	76.0	74.5	72.7	70.6
8000.0	75.6	74.1	71.8	69.6
10000.0	74.9	73.2	70.7	68.5
12500.0	74.4	72.8	69.8	67.7
16000.0	73.8	72.1	69.1	66.4
20000.0	73.0	71.1	68.2	65.2
25000.0	72.4	70.2	67.3	63.8
31500.0	71.9	69.7	66.9	63.0
40000.0	71.6	70.0	66.6	62.4
OVERALL SPL	87.2	85.8	84.1	82.0

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 3.75 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 571.00 DEG.F, CHAMBER TEMPERATURE = 88.00 DEG.F
RELATIVE HUMIDITY = 31.0 PERCENT
GAMMA = 1.377

RUN NUMBER 45

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.264$
TEMPERATURE RATIO $TR = 1.881$
MACH NUMBER $MJ = 0.593$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.764$
JET DENSITY RATIO $DJ/D0 = 0.567$
JET VELOCITY RATIO $VJ/A0 = 0.788$
JET VELOCITY $VJ = 903.7$ FPS

$TR/TJ = 1.066$
 $DR/D0 = 0.672$
 $DR/DJ = 1.186$
MASS FLOW = 0.817 POUNDS PER SECOND
THRUST = 22.66 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	77.2	77.2	74.0	70.8	70.4	67.4
250.0	80.3	80.1	78.2	75.4	73.8	70.6
315.2	84.3	82.9	82.6	79.2	76.8	74.6
400.0	86.3	87.6	84.1	81.7	80.2	77.8
500.0	89.8	88.7	88.0	84.0	82.4	79.2
630.0	89.3	90.8	90.2	87.0	85.0	81.9
800.0	92.7	93.3	92.3	89.2	87.3	84.2
1000.0	91.6	93.2	93.8	91.0	89.4	86.0
1250.0	91.3	93.8	94.4	91.7	90.4	87.6
1600.0	88.7	91.9	92.9	91.0	90.4	88.3
2000.0	85.9	89.7	91.6	90.6	90.7	89.0
2500.0	82.6	87.3	89.5	89.4	90.3	88.8
3150.0	79.9	85.4	87.6	88.1	89.9	88.8
4000.0	79.0	83.8	86.6	87.3	89.7	88.7
5000.0	76.8	82.2	84.8	85.5	88.4	88.1
6300.0	75.9	80.7	83.4	84.3	87.5	87.5
8000.0	74.9	78.9	81.5	82.7	86.1	86.3
10000.0	74.9	77.1	80.3	81.4	85.2	85.4
12500.0	74.8	75.8	78.9	80.3	84.1	84.6
16000.0	73.0	74.7	77.5	78.8	82.9	83.7
20000.0	69.9	72.1	75.6	77.0	81.2	82.4
25000.0	67.8	71.4	74.2	75.6	80.0	81.5
31500.0	65.6	70.3	72.5	73.5	78.2	80.1
40000.0	63.8	70.1	70.9	72.3	76.8	78.9
OVERALL SPL	99.6	101.3	101.9	100.1	100.5	99.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	65.4	64.4	64.6	63.0	64.6	64.1
250.0	69.0	67.3	66.6	65.9	66.6	65.6
315.2	71.3	69.5	68.2	68.4	67.7	67.3
400.0	74.7	72.4	70.8	70.6	70.1	69.2
500.0	76.8	74.0	73.0	71.8	71.4	70.7
630.0	79.7	76.8	75.7	74.6	74.1	73.3
800.0	81.5	79.4	77.8	76.7	76.2	75.9
1000.0	83.4	81.0	79.7	78.4	77.5	77.0
1250.0	85.0	82.9	81.7	80.5	79.5	79.2
1600.0	86.2	83.9	82.4	81.0	80.2	79.9
2000.0	86.8	85.1	83.4	82.0	81.0	80.7
2500.0	87.0	85.2	83.9	82.5	81.6	81.3
3150.0	87.3	85.6	84.2	83.4	82.3	81.9
4000.0	87.5	86.3	85.0	83.5	82.9	82.3
5000.0	87.2	86.2	84.6	83.5	82.9	82.5
6300.0	87.0	85.9	84.4	83.7	82.8	82.6
8000.0	86.3	85.2	83.9	82.9	82.3	82.2
10000.0	86.0	84.8	83.3	82.7	82.0	82.2
12500.0	85.3	84.3	83.0	82.1	81.4	81.9
16000.0	84.5	83.9	83.0	81.4	81.3	81.3
20000.0	83.3	82.7	81.9	80.4	80.3	80.1
25000.0	82.3	81.8	81.5	79.5	79.5	79.2
31500.0	80.6	80.4	80.2	77.9	78.2	77.7
40000.0	79.1	79.5	79.0	76.4	77.6	76.4
OVERALL SPL	98.1	96.7	95.4	94.2	93.6	93.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 3.70 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 542.00 DEG.F, CHAMBER TEMPERATURE = 55.00 DEG.F
RELATIVE HUMIDITY = 64.0 PERCENT
GAMMA = 1.377

RUN NUMBER 146

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.264
TEMPERATURE RATIO TR = 1.946
MACH NUMBER MJ = 0.593
JET STATIC TEMPERATURE RATIO TJ/T0 = 1.825
JET DENSITY RATIO DJ/D0 = 0.548
JET VELOCITY RATIO VJ/A0 = 0.801
JET VELOCITY VJ = 891.2 FPS

TR/TJ = 1.066
DR/D0 = 0.650
DR/DJ = 1.186
MASS FLOW = 0.804 POUNDS PER SECOND
THRUST = 22.67 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	63.0	64.4	65.4	63.7	62.9	61.6
250.0	66.2	65.6	65.0	64.9	65.0	65.4
315.2	68.0	68.0	68.6	68.3	68.4	67.9
400.0	70.9	71.0	70.5	69.9	70.1	69.6
500.0	73.8	72.8	73.2	72.6	71.7	71.3
630.0	76.6	75.8	75.2	74.4	73.9	74.2
800.0	79.0	78.1	77.0	75.4	75.2	75.2
1000.0	80.8	79.5	78.1	77.2	76.2	75.9
1250.0	82.6	80.5	80.2	78.9	78.1	77.7
1600.0	83.1	81.5	80.5	79.5	79.0	78.6
2000.0	83.5	82.5	81.7	80.5	79.7	79.4
2500.0	84.0	82.9	82.0	80.8	80.3	80.0
3150.0	84.5	83.1	82.6	81.6	80.8	80.4
4000.0	84.5	83.6	82.8	81.6	81.1	80.5
5000.0	84.1	83.3	82.9	81.4	80.7	80.4
6300.0	83.8	83.9	83.1	81.4	81.0	80.8
8000.0	83.8	83.9	81.8	80.9	80.4	80.1
10000.0	83.7	83.4	81.6	80.3	79.9	80.0
12500.0	83.3	81.8	81.5	79.9	79.6	79.1
16000.0	81.3	81.1	79.9	78.9	78.7	78.4
20000.0	79.5	81.1	79.5	78.0	77.8	77.8
25000.0	79.7	79.6	79.0	77.2	77.2	77.4
31500.0	78.8	79.6	78.4	76.5	76.7	77.1
40000.0	77.6	79.5	78.1	76.5	75.9	77.4
OVERALL SPL	95.3	94.6	93.7	92.4	91.9	91.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0		61.2		62.1		62.0		63.9	
250.0		65.3		64.8		64.6		64.3	
315.2		66.8		66.1		65.7		65.6	
400.0		68.8		68.0		68.2		67.5	
500.0		71.0		69.8		69.6		68.5	
630.0		73.6		72.8		71.0		69.0	
800.0		74.2		73.3		72.6		70.5	
1000.0		75.0		74.3		73.9		71.8	
1250.0		76.5		76.1		74.8		72.6	
1600.0		77.6		76.5		75.2		73.3	
2000.0		78.5		77.9		76.3		73.9	
2500.0		79.0		78.3		76.4		74.3	
3150.0		79.6		78.8		77.0		74.5	
4000.0		80.0		79.1		77.4		74.5	
5000.0		79.9		78.4		76.9		74.0	
6300.0		80.1		78.8		76.9		74.3	
8000.0		79.6		78.4		76.0		73.7	
10000.0		79.0		77.0		76.3		72.1	
12500.0		78.4		77.1		74.4		72.2	
16000.0		77.6		76.2		73.5		70.7	
20000.0		76.7		75.2		72.2		69.4	
25000.0		76.0		74.4		71.4		68.0	
31500.0		75.2		73.8		70.7		66.9	
40000.0		74.8		73.7		70.0		66.0	
OVERALL									
SPL		90.8		89.7		87.9		85.4	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.86 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 588.00 DEG.F, CHAMBER TEMPERATURE = 89.00 DEG.F
RELATIVE HUMIDITY = 30.0 PERCENT
GAMMA = 1.375

RUN NUMBER 46

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.342
TEMPERATURE RATIO TR = 1.909
MACH NUMBER MJ = 0.668
JET STATIC TEMPERATURE RATIO TJ/T0 = 1.762
JET DENSITY RATIO DJ/D0 = 0.568
JET VELOCITY RATIO VJ/A0 = 0.886
JET VELOCITY VJ = 1017.8 FPS

TR/TJ = 1.084
DR/D0 = 0.703
DR/DJ = 1.239
MASS FLOW = 0.921 POUNDS PER SECOND
THRUST = 28.73 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	79.9	80.3	76.7	73.7	73.3	69.8
250.0	83.4	83.4	80.6	77.7	75.8	73.0
315.2	87.4	85.8	85.4	81.3	79.5	76.6
400.0	90.0	90.7	87.4	84.5	83.2	80.2
500.0	93.4	91.8	90.6	87.4	86.2	82.1
630.0	92.6	93.8	93.4	90.3	88.6	84.8
800.0	96.2	97.0	95.8	92.8	90.7	87.3
1000.0	95.6	97.3	97.6	95.0	92.8	89.6
1250.0	95.7	98.7	98.8	96.5	94.8	91.0
1600.0	94.6	97.5	98.0	96.1	94.6	91.9
2000.0	92.2	95.5	96.7	95.2	95.0	92.5
2500.0	88.7	92.5	93.9	93.8	94.3	92.6
3150.0	85.4	90.1	92.0	92.5	93.9	92.7
4000.0	84.2	88.6	90.8	91.6	93.7	92.7
5000.0	82.2	86.6	89.0	89.9	92.5	92.3
6300.0	81.1	85.2	87.4	88.5	91.8	91.8
8000.0	79.9	83.7	86.0	86.8	90.4	90.7
10000.0	79.4	82.1	84.7	85.8	89.4	90.2
12500.0	79.0	80.7	83.2	84.5	88.6	89.2
16000.0	77.1	79.8	81.7	83.2	87.5	88.3
20000.0	74.0	77.8	80.1	81.5	85.5	86.9
25000.0	72.0	76.5	79.0	80.1	84.1	86.1
31500.0	70.0	74.9	77.1	78.0	82.2	84.6
40000.0	68.4	74.0	75.5	76.5	80.4	83.5
OVERALL						
SPL	103.8	105.8	106.1	104.5	104.6	103.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	67.3	68.1	67.2	66.8	67.0	66.4
250.0	71.0	70.3	69.0	69.0	68.8	67.9
315.2	73.5	72.1	71.7	71.2	70.8	70.4
400.0	77.0	74.5	73.7	73.0	72.7	72.2
500.0	79.2	76.7	75.7	74.4	73.9	73.4
630.0	81.8	79.3	78.1	77.2	77.0	75.8
800.0	84.7	81.9	80.4	78.8	78.6	78.2
1000.0	86.4	84.0	82.3	80.8	80.1	79.7
1250.0	88.2	86.1	84.4	82.9	82.2	81.6
1600.0	89.0	86.9	85.3	84.0	83.4	82.5
2000.0	90.3	88.4	86.6	85.0	84.4	83.3
2500.0	90.7	88.8	87.0	85.7	84.8	83.9
3150.0	91.1	89.2	87.5	86.5	85.8	84.8
4000.0	91.5	90.0	88.3	86.9	86.3	85.4
5000.0	91.3	89.9	88.1	87.0	86.4	85.5
6300.0	91.0	89.9	88.0	86.9	86.5	85.9
8000.0	90.5	89.4	87.5	86.3	86.3	85.2
10000.0	90.1	89.2	87.2	86.3	86.0	85.3
12500.0	89.3	88.6	86.8	85.8	85.5	84.8
16000.0	88.5	88.3	86.6	85.1	85.3	84.5
20000.0	87.3	87.1	85.7	84.0	84.1	83.2
25000.0	86.2	86.2	85.1	83.2	83.2	82.2
31500.0	84.5	84.8	83.9	81.6	81.8	80.6
40000.0	83.2	83.9	82.8	80.0	80.9	79.2
OVERALL SPL	101.8	100.5	98.9	97.5	97.2	96.3

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.79 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 556.00 DEG.F, CHAMBER TEMPERATURE = 55.00 DEG.F
RELATIVE HUMIDITY = 64.0 PERCENT
GAMMA = 1.375

RUN NUMBER 147

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.342
TEMPERATURE RATIO TR = 1.973
MACH NUMBER MJ = 0.668
JET STATIC TEMPERATURE RATIO TJ/TO = 1.821
JET DENSITY RATIO DJ/DO = 0.549
JET VELOCITY RATIO VJ/AO = 0.901
JET VELOCITY VJ = 1002.0 FPS

TR/TJ = 1.084
DR/DO = 0.680
DR/DJ = 1.239
MASS FLOW = 0.906 POUNDS PER SECOND
THRUST = 28.73 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	65.3	67.2	67.1	66.1	65.0	64.0
250.0	67.8	68.7	66.9	66.9	67.4	67.3
315.2	70.4	70.6	70.6	70.3	70.1	70.4
400.0	72.8	73.0	72.7	71.8	71.8	70.9
500.0	76.2	75.4	75.5	74.7	74.8	73.6
630.0	78.9	78.1	77.2	76.8	76.4	76.3
800.0	80.9	80.2	79.2	77.6	77.8	77.3
1000.0	83.2	81.6	80.5	79.4	78.6	77.9
1250.0	85.0	83.2	82.6	81.2	80.9	79.9
1600.0	85.5	84.1	83.0	82.1	81.5	80.7
2000.0	86.3	85.3	84.4	83.3	82.2	81.8
2500.0	86.7	85.6	84.8	83.9	83.1	82.2
3150.0	87.7	86.3	85.3	84.7	83.6	82.8
4000.0	87.6	86.8	85.8	84.8	84.0	83.1
5000.0	87.1	86.7	85.8	84.6	84.0	83.0
6300.0	87.2	87.4	86.1	84.9	84.4	83.6
8000.0	87.2	87.5	84.9	84.3	83.6	82.9
10000.0	87.2	86.5	85.0	83.4	83.3	82.5
12500.0	87.1	85.4	84.7	83.4	82.9	82.1
16000.0	85.1	84.9	83.0	82.3	82.0	81.1
20000.0	83.1	84.8	82.7	81.5	81.1	80.6
25000.0	83.3	83.3	82.0	80.9	80.7	80.3
31500.0	82.6	83.4	81.7	80.3	80.3	80.1
40000.0	81.6	83.2	81.3	80.2	79.5	80.4
OVERALL SPL	98.4	97.8	96.6	95.5	94.9	94.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16	ANGLE 127.5	MICRO PHONE NO. 17	ANGLE 135.0	MICRO PHONE NO. 18	ANGLE 142.5	MICRO PHONE NO. 19	ANGLE 150.0
200.0	63.6		63.4		64.1		65.1	
250.0	66.8		66.2		66.7		65.9	
315.2	68.9		68.1		67.2		67.4	
400.0	70.7		69.3		69.0		69.3	
500.0	73.4		72.2		71.3		70.4	
630.0	76.8		75.4		73.5		71.2	
800.0	76.6		75.6		74.5		73.6	
1000.0	77.6		76.2		76.1		74.6	
1250.0	79.2		78.2		77.3		75.4	
1600.0	80.2		78.8		77.8		76.3	
2000.0	81.1		80.2		78.8		76.9	
2500.0	81.8		80.6		79.5		77.3	
3150.0	82.5		81.4		79.9		77.6	
4000.0	83.2		81.7		80.3		78.0	
5000.0	83.1		81.4		80.0		77.6	
6300.0	83.3		81.7		80.1		77.8	
8000.0	82.9		81.5		79.4		77.4	
10000.0	82.6		80.8		79.0		76.6	
12500.0	82.0		80.6		77.8		76.1	
16000.0	81.3		79.8		77.0		74.6	
20000.0	80.6		78.8		75.9		73.4	
25000.0	79.7		78.0		75.2		72.0	
31500.0	79.1		77.4		74.5		70.9	
40000.0	78.6		77.4		73.8		70.0	
OVERALL SPL	94.0		92.6		90.8		88.7	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 8.66 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 641.00 DEG.F, CHAMBER TEMPERATURE = 90.00 DEG.F
RELATIVE HUMIDITY = 30.0 PERCENT
GAMMA = 1.373

RUN NUMBER 47

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.610
TEMPERATURE RATIO TR = 2.002
MACH NUMBER MJ = 0.860
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 1.759$
JET DENSITY RATIO $D_J/D_0 = 0.569$
JET VELOCITY RATIO $V_J/A_0 = 1.141$
JET VELOCITY $V_J = 1311.9$ FPS

TR/TJ = 1.138
DR/D0 = 0.804
DR/DJ = 1.415
MASS FLOW = 1.188 POUNDS PER SECOND
THRUST = 47.73 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3													
OCTAVE	MICRO		MICRO		MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	1	15.0	2	22.5	3	30.0	4	37.5	5	45.0	6	52.5	
200.0		86.4		86.0		81.5		79.0		77.6		74.4	
250.0		89.0		89.0		87.2		83.6		81.5		78.4	
315.2		93.5		91.5		91.7		87.3		85.2		81.4	
400.0		96.0		96.6		93.3		91.2		88.6		85.2	
500.0	100.1			98.1		97.3		93.7		91.4		88.1	
630.0	99.0			100.3		100.6		97.4		95.0		91.0	
800.0	102.7			103.8		103.2		100.1		98.4		93.6	
1000.0	101.9			104.7		105.4		103.2		100.7		96.2	
1250.0	103.0			106.7		107.5		105.5		103.3		98.4	
1600.0	103.4			106.6		107.7		106.4		104.4		100.2	
2000.0	103.4			107.1		107.9		106.7		104.8		100.8	
2500.0	102.4			106.4		106.4		105.3		103.7		101.2	
3150.0	100.3			104.5		104.5		103.2		102.7		101.2	
4000.0	97.7			102.1		102.5		102.0		102.5		101.1	
5000.0	94.0			99.1		99.7		99.9		101.1		100.7	
6300.0	91.5			96.9		97.9		98.7		100.2		100.3	
8000.0	89.1			94.5		96.0		97.0		98.9		99.4	
10000.0	87.4			92.6		94.6		95.9		98.1		98.7	
12500.0	86.0			90.9		93.1		94.6		97.1		97.8	
16000.0	84.1			89.4		91.4		93.3		95.9		96.8	
20000.0	81.1			87.1		89.6		91.6		93.9		95.4	
25000.0	78.8			85.5		88.2		90.1		92.5		94.3	
31500.0	76.4			83.3		86.3		87.6		90.6		92.7	
40000.0	74.2			82.3		84.2		85.9		88.7		91.5	
OVERALL													
SPL		112.1		115.2		115.7		114.3		113.3		111.3	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 7 ANGLE 60.0	NO. 8 ANGLE 67.5	NO. 9 ANGLE 75.0	NO. 10 ANGLE 82.5	NO. 11 ANGLE 90.0	NO. 12 ANGLE 97.5
200.0	72.8	73.6	72.7	71.8	71.8	71.3
250.0	75.9	74.7	74.5	73.5	73.9	73.1
315.2	78.5	77.6	77.4	76.5	76.2	75.8
400.0	81.9	80.2	79.0	78.7	78.9	77.0
500.0	83.9	82.2	81.4	80.2	80.1	79.3
630.0	87.3	85.0	83.8	82.9	82.6	81.5
800.0	90.1	87.5	86.0	85.0	84.5	83.7
1000.0	92.5	89.9	88.2	86.9	86.3	85.2
1250.0	94.6	92.1	90.2	88.9	88.1	87.2
1600.0	96.2	93.6	91.4	90.2	89.4	88.3
2000.0	97.3	95.0	93.2	91.5	90.5	89.2
2500.0	98.2	95.8	93.8	92.3	91.3	90.1
3150.0	98.7	96.7	94.6	93.3	92.3	91.3
4000.0	99.1	97.7	95.5	94.0	93.1	92.0
5000.0	99.4	97.9	95.7	94.3	93.5	92.3
6300.0	99.4	98.1	95.8	94.7	93.7	92.8
8000.0	98.6	97.7	95.5	94.1	93.6	92.7
10000.0	98.5	97.8	95.3	94.2	93.5	93.0
12500.0	97.8	97.4	95.1	93.9	93.2	92.9
16000.0	97.1	97.1	95.2	93.3	93.1	92.5
20000.0	96.0	95.9	94.2	92.4	92.1	91.2
25000.0	94.9	95.0	93.8	91.5	91.5	90.3
31500.0	92.9	93.4	92.6	89.9	90.2	88.8
40000.0	91.3	92.4	91.5	88.3	89.5	87.5
OVERALL SPL	109.6	108.4	106.5	104.9	104.3	103.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 8.54 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 608.00 DEG.F, CHAMBER TEMPERATURE = 55.00 DEG.F
RELATIVE HUMIDITY = 64.0 PERCENT
GAMMA = 1.373

RUN NUMBER 148

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.610$
TEMPERATURE RATIO $TR = 2.074$
MACH NUMBER $MJ = 0.861$
JET STATIC TEMPERATURE RATIO $TJ/TO = 1.322$
JET DENSITY RATIO $DJ/DO = 0.549$
JET VELOCITY RATIO $VJ/AO = 1.162$
JET VELOCITY $VJ = 1292.2$ FPS

$TR/TJ = 1.138$
 $DR/DO = 0.776$
 $DR/DJ = 1.415$
MASS FLOW = 1.167 POUNDS PER SECOND
THRUST = 47.74 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	69.4	71.3	71.0	70.6	69.3	67.5
250.0	72.2	72.7	71.0	70.8	70.8	70.9
315.2	73.9	74.4	73.9	74.4	74.2	73.8
400.0	77.6	77.4	77.0	76.1	76.0	75.4
500.0	79.9	79.7	79.8	79.3	78.7	78.6
630.0	82.6	82.7	81.8	81.8	81.0	81.6
800.0	85.4	84.9	84.0	82.8	82.0	82.2
1000.0	88.1	86.8	84.9	84.0	83.1	82.4
1250.0	90.1	88.4	87.2	86.4	85.4	84.6
1600.0	91.4	89.3	88.2	87.3	86.5	86.2
2000.0	92.4	90.8	89.6	88.7	87.5	87.1
2500.0	92.7	91.4	90.2	89.6	88.5	87.9
3150.0	93.8	92.4	91.1	90.4	89.3	88.7
4000.0	94.1	92.9	91.6	90.7	89.9	88.9
5000.0	93.9	93.1	92.0	90.7	90.1	89.2
6300.0	94.0	94.1	92.3	91.3	90.6	89.8
8000.0	94.1	94.6	91.4	90.9	90.1	89.0
10000.0	94.4	94.0	92.0	90.4	90.1	88.8
12500.0	94.4	92.9	91.6	90.2	89.8	88.5
16000.0	92.8	92.4	90.2	89.3	88.9	87.7
20000.0	90.9	92.4	89.9	88.6	88.1	87.1
25000.0	90.9	91.0	89.3	87.9	87.6	86.8
31500.0	90.2	91.1	88.8	87.2	87.1	86.5
40000.0	88.9	90.8	86.3	87.2	86.2	86.6
OVERALL SPL	105.0	104.5	102.7	101.7	101.0	100.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO	MICRO	MICRO	MICRO
CENTER	PHONE	PHONE	PHONE	PHONE
FREQ.	NO. ANGLE	NO. ANGLE	NO. ANGLE	NO. ANGLE
HZ	16 127.5	17 135.0	18 142.5	19 150.0

200.0	66.5	66.6	68.3	69.6
250.0	69.9	70.4	70.7	71.0
315.2	72.3	71.4	71.5	72.7
400.0	74.3	73.7	73.6	74.6
500.0	77.9	76.7	76.5	75.5
630.0	82.2	81.0	79.0	76.4
800.0	81.5	80.9	80.1	78.6
1000.0	82.0	81.0	80.8	80.1
1250.0	83.7	83.4	82.7	81.0
1600.0	84.9	84.1	83.6	82.5
2000.0	86.4	85.8	84.9	83.3
2500.0	86.9	86.2	85.5	84.1
3150.0	88.0	87.2	86.5	84.8
4000.0	88.7	87.7	87.0	85.3
5000.0	88.7	87.4	86.9	85.2
6300.0	89.5	87.7	87.2	85.8
8000.0	89.0	88.1	86.6	85.3
10000.0	89.0	87.6	86.2	84.7
12500.0	88.4	87.5	85.8	83.9
16000.0	87.7	86.7	85.0	82.4
20000.0	87.0	85.6	83.9	81.0
25000.0	86.3	84.7	83.1	79.6
31500.0	85.5	84.0	82.4	78.4
40000.0	85.0	83.9	81.7	77.3

OVERALL				
SPL	99.8	98.7	97.6	95.8

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 12.00 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 681.00 DEG.F, CHAMBER TEMPERATURE = 91.00 DEG.F
RELATIVE HUMIDITY = 30.0 PERCENT
GAMMA = 1.370

RUN NUMBER 48

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.845$
TEMPERATURE RATIO $TR = 2.071$
MACH NUMBER $MJ = 0.986$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 1.755$
JET DENSITY RATIO $\rho J/\rho_0 = 0.570$
JET VELOCITY RATIO $VJ/A_0 = 1.306$
JET VELOCITY $VJ = 1503.2$ FPS

$TR/TJ = 1.180$
 $DR/D_0 = 0.891$
 $DR/DJ = 1.564$
MASS FLOW = 1.363 POUNDS PER SECOND
THRUST = 62.68 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	91.0	89.3	84.6	82.6	80.9	78.4
250.0	93.9	92.8	91.0	87.2	84.9	81.2
315.2	98.3	95.5	95.7	91.0	87.1	84.8
400.0	100.1	100.4	98.0	95.0	91.7	88.6
500.0	103.4	102.4	101.4	97.7	94.3	91.0
630.0	102.6	105.0	104.8	101.3	98.2	94.2
800.0	107.0	108.4	107.7	104.2	101.2	97.5
1000.0	105.6	108.9	109.9	107.3	104.3	100.4
1250.0	107.6	110.2	112.1	110.2	107.4	103.0
1600.0	107.9	111.0	112.6	111.4	108.9	105.0
2000.0	108.8	111.9	113.1	112.4	110.1	106.3
2500.0	108.8	112.4	113.5	112.2	109.8	106.2
3150.0	108.6	112.3	113.2	111.3	108.8	106.4
4000.0	108.2	111.7	112.2	109.9	108.2	106.4
5000.0	105.9	109.4	109.7	107.7	106.7	105.9
6300.0	104.1	107.5	107.4	106.0	105.6	105.5
8000.0	101.6	105.1	105.1	104.3	104.2	104.5
10000.0	99.4	102.9	103.0	103.0	103.1	104.1
12500.0	96.9	100.5	101.0	101.5	102.1	103.2
16000.0	94.6	98.3	99.1	100.3	101.0	102.3
20000.0	91.4	95.6	97.0	98.5	99.3	101.2
25000.0	89.0	93.8	95.3	97.0	97.9	100.3
31500.0	86.4	91.8	92.9	94.7	95.8	98.8
40000.0	84.8	91.0	90.9	93.2	93.6	97.5
OVERALL SPL	118.2	121.2	122.0	120.4	118.5	116.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	75.8	76.1	75.6	74.6	74.4	74.2
250.0	78.6	77.8	77.4	76.4	76.8	75.9
315.2	82.0	80.1	79.5	79.2	78.5	77.8
400.0	85.4	82.1	82.3	81.2	81.4	80.1
500.0	87.3	84.3	83.6	82.3	82.3	80.8
630.0	90.4	87.0	86.3	85.4	85.0	84.1
800.0	93.5	90.1	88.7	87.4	87.0	86.8
1000.0	95.7	92.0	90.5	89.7	88.4	87.9
1250.0	98.1	94.5	92.7	91.8	90.6	90.2
1600.0	100.4	96.1	94.3	93.0	92.1	91.2
2000.0	101.8	97.7	95.9	94.4	93.4	92.6
2500.0	102.4	98.7	96.8	95.6	94.5	93.5
3150.0	103.3	99.7	97.8	96.6	95.5	94.5
4000.0	104.0	100.8	98.9	97.4	96.2	95.3
5000.0	104.2	101.0	98.7	97.7	96.5	95.7
6300.0	104.2	101.5	99.1	98.3	96.8	96.3
8000.0	103.8	101.2	99.0	98.0	96.6	96.3
10000.0	103.5	101.3	98.9	98.2	96.6	96.5
12500.0	102.9	100.8	98.8	97.9	96.3	96.2
16000.0	102.2	100.7	98.9	97.6	96.3	96.0
20000.0	101.1	99.7	98.1	96.7	95.3	94.9
25000.0	100.0	99.0	97.7	96.1	94.7	94.1
31500.0	98.2	97.6	96.4	94.5	93.4	92.6
40000.0	96.6	96.8	95.2	93.2	92.8	91.4
OVERALL SPL	114.4	111.8	109.8	108.7	107.4	106.8

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 11.84 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 645.00 DEG.F, CHAMBER TEMPERATURE = 54.00 DEG.F
RELATIVE HUMIDITY = 65.0 PERCENT
GAMMA = 1.370

RUN NUMBER 149

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_R = 1.846$
TEMPERATURE RATIO $T_R = 2.150$
MACH NUMBER $M_J = 0.986$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 1.822$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.549$
JET VELOCITY RATIO $V_J/A_0 = 1.331$
JET VELOCITY $V_J = 1479.6$ FPS

$T_R/T_J = 1.180$
 $D_R/D_0 = 0.859$
 $D_R/D_J = 1.564$
MASS FLOW = 1.338 POUNDS PER SECOND
THRUST = 62.72 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

100

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	58.5	58.8	60.5	61.0
250.0	62.5	62.3	62.7	62.7
315.2	65.4	64.2	63.3	64.5
400.0	67.2	66.2	65.5	66.0
500.0	71.4	70.5	69.4	67.8
630.0	75.4	74.4	71.7	67.8
800.0	74.9	73.9	73.1	70.8
1000.0	75.4	73.7	73.5	72.1
1250.0	76.6	76.3	76.1	73.4
1600.0	77.7	77.2	76.7	75.3
2000.0	79.0	78.8	78.0	75.9
2500.0	80.0	79.5	78.7	77.1
3150.0	80.8	80.4	79.5	77.9
4000.0	81.8	81.1	80.3	78.3
5000.0	82.1	80.9	80.4	78.8
6300.0	82.7	81.9	81.0	79.6
8000.0	82.6	82.0	80.9	79.5
10000.0	82.3	81.5	80.3	78.8
12500.0	82.1	81.3	80.0	78.2
16000.0	81.5	80.4	79.0	76.6
20000.0	80.7	79.5	77.9	75.0
25000.0	80.0	78.6	77.0	73.6
31500.0	79.3	77.9	76.3	72.3
40000.0	78.8	77.7	75.5	71.4
OVERALL SPL	93.1	92.3	91.2	89.3

Note: All sound pressure levels printed on this page are 10 dB lower than the actual levels. To obtain correct levels, add 10 dB to all sound pressure levels printed above.

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.53 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 761.00 DEG.F, CHAMBER TEMPERATURE = 80.00 DEG.F
RELATIVE HUMIDITY = 52.0 PERCENT
GAMMA = 1.365

RUN NUMBER 28

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.037$
TEMPERATURE RATIO $TR = 2.261$
MACH NUMBER $MJ = 0.232$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 2.239$
JET DENSITY RATIO $DJ/D_0 = 0.447$
JET VELOCITY RATIO $VJ/A_0 = 0.348$
JET VELOCITY $VJ = 396.2$ FPS

$TR/TJ = 1.010$
 $DR/D_0 = 0.459$
 $DR/DJ = 1.027$
MASS FLOW = 0.284 POUNDS PER SECOND
THRUST = 3.48 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	59.0	57.3	56.0	54.6	54.9	52.7
250.0	60.8	60.2	60.5	58.5	57.7	55.5
315.2	64.7	63.3	64.2	61.5	61.8	59.0
400.0	66.6	66.9	64.6	63.3	63.7	61.0
500.0	67.9	66.0	65.4	63.9	63.9	62.2
630.0	64.3	65.5	66.3	64.3	64.2	62.4
800.0	66.4	66.7	65.8	64.6	64.7	62.8
1000.0	63.8	64.7	65.5	64.3	64.6	63.2
1250.0	62.6	64.8	65.3	64.4	64.8	63.0
1600.0	59.4	62.2	63.6	63.0	63.7	62.5
2000.0	57.0	60.3	62.2	62.3	63.2	62.0
2500.0	54.8	58.0	60.1	60.6	61.9	61.2
3150.0	52.0	55.5	58.0	59.4	60.5	60.4
4000.0	53.0	54.4	56.2	58.1	59.8	59.4
5000.0	52.7	53.8	54.7	56.2	58.7	58.9
6300.0	51.9	52.1	53.0	55.0	57.6	57.8
8000.0	51.6	50.6	51.7	53.6	56.1	56.5
10000.0	52.0	48.7	50.3	52.8	55.5	55.9
12500.0	49.8	49.1	50.2	52.0	54.9	55.3
16000.0	48.3	48.9	49.3	51.3	54.4	54.6
20000.0	46.9	48.4	48.9	50.8	53.7	53.8
25000.0	47.6	49.2	49.0	50.2	53.3	53.4
31500.0	49.6	51.5	49.6	50.5	53.8	53.3
40000.0	52.2	54.3	51.4	52.5	56.7	53.6
OVERALL SPL	74.8	75.1	75.2	74.2	74.9	73.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	53.0	53.6	51.5	52.9	54.0	53.2
250.0	54.8	54.2	52.9	52.6	54.1	52.8
315.2	57.8	57.5	56.2	55.9	56.1	55.5
400.0	60.2	58.9	57.6	57.2	56.7	55.8
500.0	60.6	59.7	58.6	58.0	58.6	56.6
630.0	61.4	60.2	59.5	58.8	58.9	57.6
800.0	62.0	60.8	60.4	59.4	59.7	58.4
1000.0	62.4	61.2	60.7	59.8	59.9	58.5
1250.0	62.1	61.6	60.9	60.1	60.6	59.2
1600.0	61.9	60.9	60.5	59.6	60.0	58.6
2000.0	61.4	60.8	60.2	59.5	59.9	58.7
2500.0	60.6	59.9	59.9	58.7	59.4	58.2
3150.0	59.9	59.5	59.1	58.4	59.2	57.9
4000.0	59.1	58.8	58.7	57.7	58.6	57.3
5000.0	58.5	58.3	57.9	57.3	58.4	57.3
6300.0	57.8	57.7	57.3	56.9	58.1	57.0
8000.0	57.1	57.0	56.8	56.2	57.6	56.3
10000.0	56.7	56.6	56.2	56.3	57.2	56.1
12500.0	56.3	56.2	56.0	55.5	57.2	56.1
16000.0	55.9	56.0	56.0	55.1	57.3	55.8
20000.0	55.5	55.4	55.6	54.5	56.8	54.9
25000.0	55.4	55.0	55.4	53.9	56.5	54.2
31500.0	55.5	54.4	54.8	53.5	56.0	53.5
40000.0	56.9	54.4	54.7	53.5	56.2	53.4
OVERALL SPL	73.0	72.3	71.8	71.1	71.9	70.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.52 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 715.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.365

RUN NUMBER 218

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.037$
TEMPERATURE RATIO $TR = 2.260$
MACH NUMBER $MJ = 0.230$
JET STATIC TEMPERATURE RATIO $TJ/TO = 2.238$
JET DENSITY RATIO $DJ/DO = 0.447$
JET VELOCITY RATIO $VJ/AO = 0.344$
JET VELOCITY $VJ = 385.1$ FPS

$TR/TJ = 1.010$
 $DR/DO = 0.459$
 $DR/DJ = 1.027$
MASS FLOW = 0.282 POUNDS PER SECOND
THRUST = 3.42 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	54.2	56.4	57.2	54.9	53.5	54.7
250.0	57.2	58.8	58.2	55.6	55.8	56.0
315.2	60.6	60.2	59.6	58.7	59.0	58.6
400.0	61.7	60.3	60.4	58.8	59.3	59.0
500.0	60.3	58.6	59.0	58.7	58.4	57.4
630.0	61.4	60.1	59.4	58.9	58.9	58.6
800.0	62.2	61.2	60.7	60.1	59.9	59.4
1000.0	61.7	60.3	59.8	59.7	59.2	58.6
1250.0	61.3	60.1	60.0	59.5	58.7	58.3
1600.0	60.5	59.8	59.4	58.8	58.6	57.7
2000.0	60.0	59.4	59.5	58.7	58.4	58.1
2500.0	59.2	58.7	58.5	58.2	58.0	57.4
3150.0	58.8	58.0	58.0	57.9	57.7	57.2
4000.0	58.1	57.5	57.7	57.5	57.5	56.6
5000.0	57.1	56.9	57.6	57.0	57.4	56.5
6300.0	56.8	57.7	57.4	57.4	57.6	56.6
8000.0	56.9	57.3	55.9	56.4	56.7	55.9
10000.0	57.2	56.9	55.6	55.8	56.1	55.4
12500.0	57.4	55.6	55.9	55.5	55.8	55.0
16000.0	56.6	55.9	55.0	55.2	55.6	54.6
20000.0	55.0	55.9	55.4	54.9	55.1	54.3
25000.0	55.0	54.5	54.8	54.4	54.5	53.9
31500.0	55.1	54.6	54.5	54.1	54.1	53.7
40000.0	54.0	54.0	54.3	54.6	53.4	54.5
OVERALL SPL	72.8	72.1	71.9	71.3	71.2	70.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO		MICRO	
CENTER	PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE
HZ	16	127.5	17	135.0
			18	142.5
			19	150.0
200.0	55.2		57.3	54.7
250.0	56.7		54.8	56.1
315.2	59.3		57.9	57.4
400.0	58.5		58.1	57.4
500.0	57.9		57.4	57.1
630.0	58.7		57.7	56.9
800.0	59.6		58.6	57.5
1000.0	58.8		58.3	56.5
1250.0	58.3		57.1	55.2
1600.0	57.7		56.1	54.9
2000.0	57.7		56.3	54.4
2500.0	57.5		56.0	54.1
3150.0	57.3		55.8	53.8
4000.0	56.9		55.5	53.6
5000.0	56.8		54.8	52.7
6300.0	56.6		54.5	52.2
8000.0	56.0		53.9	51.0
10000.0	55.2		52.9	50.1
12500.0	54.6		52.1	49.0
16000.0	54.4		51.1	48.4
20000.0	54.1		49.9	47.5
25000.0	52.5		48.3	45.3
31500.0	51.7		47.0	43.8
40000.0	51.0		46.8	43.2
OVERALL				
SPL	70.7		69.4	68.0
				67.3

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.70 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 765.00 DEG.F, CHAMBER TEMPERATURE = 99.00 DEG.F
RELATIVE HUMIDITY = 26.0 PERCENT
GAMMA = 1.365

RUN NUMBER 49

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.049$
TEMPERATURE RATIO $TR = 2.191$
MACH NUMBER $MJ = 0.266$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 2.163$
JET DENSITY RATIO $DJ/D0 = 0.462$
JET VELOCITY RATIO $VJ/A0 = 0.392$
JET VELOCITY $VJ = 454.1$ FPS

$TR/TJ = 1.013$
 $DR/D0 = 0.479$
 $DR/DJ = 1.036$
MASS FLOW = 0.332 POUNDS PER SECOND
THRUST = 4.57 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	61.4		60.5		58.8	
250.0	64.1		64.3		63.4	
315.2	67.4		66.4		66.1	
400.0	69.4		69.9		67.0	
500.0	71.7		70.0		69.0	
630.0	69.0		69.6		69.9	
800.0	70.8		71.3		70.2	
1000.0	67.8		69.0		69.8	
1250.0	66.4		68.2		69.0	
1600.0	63.2		65.8		67.2	
2000.0	61.2		64.1		66.0	
2500.0	58.2		61.4		64.0	
3150.0	55.3		59.2		61.8	
4000.0	56.2		58.3		60.1	
5000.0	55.3		57.2		58.1	
6300.0	54.9		55.4		56.3	
8000.0	54.9		54.2		55.4	
10000.0	54.4		52.3		54.6	
12500.0	53.6		52.8		53.4	
16000.0	51.6		52.1		52.7	
20000.0	48.7		50.2		51.5	
25000.0	48.1		50.2		51.0	
31500.0	48.3		51.0		50.2	
40000.0	50.2		53.1		50.7	
					51.3	
OVERALL						
SPL	78.5		78.8		78.7	
					77.7	
					78.3	
						77.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 7 ANGLE 60.0	NO. 8 ANGLE 67.5	NO. 9 ANGLE 75.0	NO. 10 ANGLE 82.5	NO. 11 ANGLE 90.0	NO. 12 ANGLE 97.5
200.0	55.0	55.0	54.4	53.6	54.1	55.0
250.0	57.6	56.5	55.9	55.8	55.8	55.0
315.2	59.9	58.2	57.4	58.2	56.9	57.8
400.0	62.5	60.7	59.5	59.8	58.4	58.0
500.0	63.7	62.3	61.0	60.8	60.0	59.8
630.0	64.6	63.3	62.3	61.8	61.4	61.0
800.0	65.7	64.5	63.3	62.9	62.3	62.0
1000.0	65.9	64.7	64.1	63.5	62.4	62.2
1250.0	66.1	64.9	64.5	64.1	63.0	63.0
1600.0	66.2	65.0	64.3	64.0	63.0	62.7
2000.0	65.5	64.9	64.2	64.0	62.8	62.7
2500.0	64.7	64.3	63.4	63.7	62.3	62.2
3150.0	64.1	63.7	62.8	63.4	62.1	62.1
4000.0	63.5	63.2	62.5	62.7	61.4	61.6
5000.0	62.9	62.7	61.9	62.4	61.1	61.3
6300.0	62.1	61.9	60.9	61.8	60.5	61.1
8000.0	61.6	61.6	60.7	61.2	60.3	60.7
10000.0	61.2	61.0	60.1	60.9	59.9	60.2
12500.0	60.7	60.5	59.7	60.5	59.4	60.2
16000.0	60.2	60.2	59.8	60.2	59.3	59.7
20000.0	59.2	59.2	58.9	59.2	58.3	58.4
25000.0	58.6	58.3	58.5	58.3	57.5	57.4
31500.0	57.2	56.8	57.0	56.6	55.9	55.6
40000.0	57.4	56.0	55.9	55.4	55.6	54.4
OVERALL SPL	76.7	75.9	75.2	75.2	74.2	74.2

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.69 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 722.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.365

RUN NUMBER 219

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.049$
TEMPERATURE RATIO $TR = 2.273$
MACH NUMBER $MJ = 0.265$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 2.244$
JET DENSITY RATIO $DJ/D0 = 0.446$
JET VELOCITY RATIO $VJ/A0 = 0.397$
JET VELOCITY $VJ = 443.2$ FPS

$TR/TJ = 1.013$
 $DR/D0 = 0.461$
 $DR/DJ = 1.035$
MASS FLOW = 0.323 POUNDS PER SECOND
THRUST = 4.52 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE	
	10	82.5	11	90.0	12	97.5	13	105.0	14	112.5	15	120.0
200.0	54.9		57.5		58.3		56.8		55.7		55.7	
250.0	59.0		59.2		59.8		57.4		57.6		56.9	
315.2	61.4		61.4		61.3		60.1		60.8		60.4	
400.0	63.2		62.3		62.3		61.2		61.7		60.9	
500.0	63.4		63.0		62.6		62.1		61.2		60.7	
630.0	64.8		63.8		63.2		62.6		62.5		61.9	
800.0	65.6		65.0		64.3		63.1		63.1		62.4	
1000.0	65.2		64.6		64.2		63.6		62.4		62.6	
1250.0	65.2		64.6		64.3		63.8		63.2		62.6	
1600.0	64.8		64.4		64.0		63.4		62.6		62.3	
2000.0	64.1		64.4		63.9		63.5		62.5		62.3	
2500.0	63.5		63.8		63.0		63.2		62.5		62.0	
3150.0	62.9		63.1		62.7		62.6		62.2		61.6	
4000.0	62.5		62.7		62.4		62.5		61.7		60.9	
5000.0	61.8		62.1		62.3		61.7		61.6		60.8	
6300.0	61.5		62.3		61.8		61.8		61.5		60.8	
8000.0	61.2		62.3		60.5		60.9		60.7		60.2	
10000.0	61.5		61.9		60.1		60.2		60.1		59.5	
12500.0	61.7		60.5		60.2		60.1		59.9		59.5	
16000.0	60.6		60.6		59.2		59.8		59.6		59.0	
20000.0	59.7		60.8		59.5		59.6		59.1		58.9	
25000.0	60.4		59.6		59.3		59.5		58.8		58.9	
31500.0	60.8		60.0		59.4		59.4		58.8		59.3	
40000.0	60.8		60.0		59.4		60.0		58.3		60.5	
OVERALL SPL	76.5		76.3		75.8		75.4		74.9		74.5	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 16 127.5	MICRO PHONE NO. ANGLE 17 135.0	MICRO PHONE NO. ANGLE 18 142.5	MICRO PHONE NO. ANGLE 19 150.0
200.0	56.5	57.6	56.4	56.7
250.0	58.7	57.7	57.0	58.1
315.2	60.1	59.8	58.2	58.8
400.0	60.8	60.1	59.9	59.8
500.0	61.2	60.2	60.1	59.7
630.0	62.5	61.0	60.1	59.5
800.0	62.8	61.9	61.0	60.2
1000.0	62.8	61.7	60.1	59.7
1250.0	62.2	61.3	59.6	58.5
1600.0	62.1	60.4	59.3	57.6
2000.0	61.9	61.2	59.5	57.0
2500.0	61.6	60.8	58.8	56.5
3150.0	61.4	60.3	58.6	56.2
4000.0	61.2	60.1	58.5	55.3
5000.0	61.0	59.1	57.8	54.7
6300.0	60.8	58.9	57.0	55.0
8000.0	60.1	58.4	56.0	53.3
10000.0	59.5	57.1	54.9	52.1
12500.0	58.9	56.5	53.7	51.4
16000.0	58.7	55.8	52.8	50.3
20000.0	58.2	54.8	51.9	49.2
25000.0	57.4	53.7	50.5	46.8
31500.0	56.9	52.6	49.2	45.3
40000.0	56.4	52.2	48.0	45.3
OVERALL SPL	74.4	73.0	71.6	70.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.09 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 773.00 DEG.F, CHAMBER TEMPERATURE = 98.00 DEG.F
RELATIVE HUMIDITY = 26.0 PERCENT
GAMMA = 1.363

RUN NUMBER 50

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_r = 1.077$
TEMPERATURE RATIO $T_r = 2.210$
MACH NUMBER $M_J = 0.331$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 2.167$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.462$
JET VELOCITY RATIO $V_J/A_0 = 0.487$
JET VELOCITY $V_J = 564.2$ FPS

$T_r/T_J = 1.020$
 $\rho_r/\rho_0 = 0.487$
 $\rho_r/\rho_J = 1.056$
MASS FLOW = 0.412 POUNDS PER SECOND
THRUST = 7.06 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	66.6	66.7	63.6	62.2	61.9	60.1
250.0	69.3	70.1	68.6	66.9	65.6	63.3
315.2	71.9	72.0	71.0	68.7	67.6	66.2
400.0	74.2	76.3	72.8	71.0	70.4	68.7
500.0	77.6	76.3	75.0	72.3	71.7	70.3
630.0	75.4	76.9	76.9	74.6	73.7	71.6
800.0	77.8	78.6	77.0	75.0	74.9	73.1
1000.0	74.7	76.8	76.8	75.0	75.3	74.0
1250.0	73.2	76.1	76.8	75.3	75.6	74.0
1600.0	70.5	73.8	75.0	74.2	74.9	74.2
2000.0	68.1	72.0	73.8	73.2	74.6	73.6
2500.0	65.5	69.6	71.8	71.5	73.4	73.0
3150.0	62.8	67.2	69.5	70.4	72.4	72.3
4000.0	62.9	66.2	67.7	68.8	71.8	71.1
5000.0	61.3	65.0	65.6	66.6	70.4	70.4
6300.0	60.5	62.3	63.5	65.0	68.8	69.1
8000.0	60.5	61.6	62.4	63.8	67.5	68.1
10000.0	60.0	59.3	61.2	62.3	66.4	67.1
12500.0	60.0	59.4	60.0	61.2	65.3	66.3
16000.0	57.8	58.6	58.8	60.1	64.3	65.4
20000.0	55.1	56.7	57.4	58.6	62.9	64.2
25000.0	54.8	56.6	56.4	57.4	61.9	63.6
31500.0	55.4	57.1	54.7	55.7	60.3	62.3
40000.0	58.4	59.2	54.2	55.0	59.4	61.4
OVERALL SPL	84.6	86.0	85.6	84.2	85.0	84.1

1/3 OCTAVE SOUND PRESSURE LEVEL CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	58.1	57.5	57.2	58.6	57.6	58.4
250.0	61.6	60.2	58.7	60.0	59.2	59.0
315.2	63.6	61.6	60.8	61.5	61.0	60.8
400.0	66.4	64.2	63.5	62.8	62.7	62.1
500.0	68.4	66.8	65.9	64.9	64.2	63.7
630.0	70.1	68.2	67.2	66.9	66.1	65.4
800.0	71.4	69.6	68.5	67.9	67.5	66.7
1000.0	72.1	70.3	69.0	68.6	68.3	67.3
1250.0	72.3	71.2	70.0	69.5	69.0	68.3
1600.0	72.6	71.0	70.1	69.5	68.9	68.2
2000.0	72.4	71.2	70.3	69.6	69.2	68.4
2500.0	71.8	70.8	69.7	69.3	68.1	68.2
3150.0	71.3	70.2	69.6	69.2	69.0	68.4
4000.0	70.5	70.0	69.3	68.7	68.1	67.9
5000.0	70.1	69.3	68.5	68.5	67.7	67.6
6300.0	69.2	68.4	67.5	67.8	67.0	67.0
8000.0	68.4	67.9	67.2	67.1	66.7	66.7
10000.0	67.8	67.1	66.4	66.6	66.1	66.4
12500.0	67.1	66.3	66.0	66.2	65.5	66.2
16000.0	66.3	65.7	65.8	65.5	65.1	65.7
20000.0	65.3	64.5	64.8	64.5	63.9	64.4
25000.0	64.4	63.6	64.2	63.7	63.3	63.4
31500.0	62.6	61.9	62.9	62.0	61.8	61.6
40000.0	61.6	61.0	61.7	60.6	61.2	60.2
OVERALL SPL	83.0	81.8	81.0	80.6	80.1	79.8

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.09 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 743.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.363

RUN NUMBER 220

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.077
TEMPERATURE RATIO TR = 2.313
MACH NUMBER MJ = 0.331
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.268
JET DENSITY RATIO DJ/D0 = 0.441
JET VELOCITY RATIO VJ/A0 = 0.499
JET VELOCITY VJ = 557.7 FPS

TR/TJ = 1.020
DR/D0 = 0.465
DR/DJ = 1.056
MASS FLOW = 0.403 POUNDS PER SECOND
THRUST = 7.07 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	57.8	60.6	60.4	59.0	59.4	57.7
250.0	60.2	61.0	60.4	60.3	60.7	60.5
315.2	62.5	63.5	63.5	63.2	63.5	62.7
400.0	65.0	65.1	64.6	64.0	65.5	64.2
500.0	67.2	66.2	65.9	65.3	65.9	64.2
630.0	68.7	67.9	67.5	66.9	66.9	66.3
800.0	70.4	69.6	68.6	68.4	67.9	67.6
1000.0	71.0	69.9	68.6	69.0	68.2	67.3
1250.0	71.4	70.3	69.8	69.6	69.6	68.0
1600.0	71.4	70.6	69.7	69.4	69.7	68.3
2000.0	71.0	70.8	69.9	69.6	69.5	68.5
2500.0	70.6	70.1	69.5	69.6	69.6	68.4
3150.0	70.6	69.8	69.2	69.0	69.0	68.0
4000.0	69.7	69.5	68.9	68.6	68.6	67.3
5000.0	68.7	69.0	68.4	67.8	68.3	66.7
6300.0	68.2	68.9	68.2	67.7	68.6	67.1
8000.0	67.7	68.5	66.4	66.9	67.2	65.7
10000.0	67.8	68.0	65.9	66.4	67.1	65.3
12500.0	67.7	66.5	66.0	65.9	66.5	64.5
16000.0	66.3	66.3	64.8	65.3	66.0	64.0
20000.0	64.8	66.5	65.1	64.9	65.4	63.6
25000.0	65.4	65.1	64.8	64.5	65.0	63.5
31500.0	65.9	65.5	64.8	64.5	65.1	63.5
40000.0	65.3	65.8	64.7	65.1	64.8	63.9
OVERALL SPL	82.2	81.8	81.0	80.8	81.0	79.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	58.2	59.8	58.4	59.0
250.0	59.8	60.3	60.1	60.1
315.2	62.1	61.9	62.2	62.8
400.0	63.9	63.2	63.9	63.4
500.0	64.8	63.9	63.6	63.5
630.0	66.1	65.3	64.7	64.4
800.0	66.6	65.8	66.1	65.0
1000.0	67.4	66.6	65.4	64.6
1250.0	67.8	66.4	65.6	64.1
1600.0	67.7	66.0	64.5	63.6
2000.0	68.1	66.3	65.1	63.5
2500.0	67.8	66.4	64.9	62.8
3150.0	67.7	66.6	64.6	62.4
4000.0	67.0	66.0	64.5	61.6
5000.0	66.5	65.1	63.7	61.1
6300.0	66.5	65.0	63.0	60.7
8000.0	65.7	64.2	61.8	59.6
10000.0	65.2	63.2	60.9	59.0
12500.0	64.2	62.4	59.8	57.7
16000.0	63.6	61.6	59.1	56.4
20000.0	62.9	60.4	58.1	55.4
25000.0	62.2	59.6	57.2	53.9
31500.0	62.0	59.1	56.6	52.8
40000.0	61.7	58.8	55.8	51.9
OVERALL SPL	79.3	78.0	76.8	75.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.60 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 783.00 DEG.F, CHAMBER TEMPERATURE = 98.00 DEG.F
RELATIVE HUMIDITY = 26.0 PERCENT
GAMMA = 1.362

RUN NUMBER 51

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.113
TEMPERATURE RATIO TR = 2.228
MACH NUMBER MJ = 0.399
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.165
JET DENSITY RATIO DJ/D0 = 0.462
JET VELOCITY RATIO VJ/A0 = 0.587
JET VELOCITY VJ = 679.5 FPS

TR/TJ = 1.029
DR/D0 = 0.499
DR/DJ = 1.082
MASS FLOW = 0.496 POUNDS PER SECOND
THRUST = 10.25 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	69.6	69.6	67.8	65.4	64.7	63.0
250.0	73.5	73.5	73.1	70.2	70.0	67.0
315.2	76.4	76.0	76.0	72.8	71.7	70.3
400.0	78.9	80.4	77.6	75.5	74.7	72.8
500.0	81.8	80.6	80.1	77.8	77.0	74.7
630.0	80.2	82.1	82.1	80.1	79.2	76.6
800.0	83.4	84.3	83.5	81.5	80.4	78.2
1000.0	80.8	83.0	83.9	82.2	81.0	79.8
1250.0	78.9	82.6	83.5	82.1	81.9	80.3
1600.0	76.3	80.3	81.4	81.2	81.4	80.2
2000.0	74.5	78.8	80.3	80.5	81.1	80.1
2500.0	71.9	76.3	78.2	78.8	80.2	79.8
3150.0	69.6	74.9	76.1	77.5	79.4	79.0
4000.0	68.7	73.6	74.8	76.2	78.7	78.1
5000.0	67.1	72.4	72.5	74.2	77.1	77.2
6300.0	65.9	70.8	70.5	72.5	75.7	76.0
8000.0	65.5	69.5	69.0	71.0	74.2	74.7
10000.0	65.1	67.8	67.6	69.5	72.8	73.5
12500.0	64.9	67.7	65.8	68.1	71.6	72.4
16000.0	63.8	67.5	64.4	66.8	70.4	71.5
20000.0	61.8	65.9	62.4	65.0	68.5	70.1
25000.0	61.5	66.0	61.3	63.5	67.4	69.4
31500.0	62.0	66.1	59.1	61.1	65.5	67.9
40000.0	64.8	67.9	57.6	59.7	64.5	67.3
OVERALL SPL	89.8	91.6	91.8	90.8	91.1	90.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	61.5	60.7	59.6	59.8	60.2	60.8
250.0	64.6	64.0	62.2	61.8	62.1	62.5
315.2	66.6	65.2	64.6	64.2	63.8	64.2
400.0	70.1	67.7	66.6	66.0	66.1	65.6
500.0	71.6	70.5	68.8	68.0	68.3	67.5
630.0	74.0	72.4	71.0	70.3	70.0	69.6
800.0	75.6	74.3	72.7	71.9	71.4	71.0
1000.0	76.7	75.4	74.0	73.1	72.7	71.6
1250.0	77.4	76.4	75.3	74.3	73.9	73.2
1600.0	78.1	76.9	75.5	74.6	74.2	73.1
2000.0	78.1	77.1	75.9	75.2	74.6	73.6
2500.0	78.1	76.9	75.5	74.8	74.6	73.5
3150.0	78.0	76.7	75.5	75.1	74.8	74.0
4000.0	77.5	76.7	75.3	74.4	74.4	73.7
5000.0	77.2	76.2	74.6	74.1	74.1	73.6
6300.0	76.3	75.4	73.7	73.5	73.5	72.9
8000.0	75.6	74.8	73.3	72.7	73.0	72.7
10000.0	74.8	73.9	72.4	72.8	72.6	72.7
12500.0	74.0	73.2	71.6	71.1	71.3	71.5
16000.0	73.2	72.5	71.4	70.4	70.9	71.0
20000.0	72.1	71.2	70.4	69.0	69.5	69.5
25000.0	71.5	70.2	69.7	67.8	68.6	68.4
31500.0	70.2	68.4	68.2	65.7	66.9	66.3
40000.0	69.9	67.3	67.0	64.0	66.1	64.8
OVERALL SPL	88.9	87.7	86.4	85.7	85.6	85.0

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.59 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 760.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.362

RUN NUMBER 221

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.112
TEMPERATURE RATIO TR = 2.346
MACH NUMBER MJ = 0.398
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.281
JET DENSITY RATIO DJ/D0 = 0.438
JET VELOCITY RATIO VJ/A0 = 0.601
JET VELOCITY VJ = 671.6 FPS

TR/TJ = 1.029
DR/D0 = 0.474
DR/DJ = 1.081
MASS FLOW = 0.482 POUNDS PER SECOND
THRUST = 10.20 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	59.2	62.1	61.6	61.4	60.2	59.9
250.0	62.7	63.5	62.4	62.0	63.0	62.8
315.2	65.0	65.7	65.9	66.5	65.3	66.0
400.0	68.0	68.3	67.5	66.9	67.9	67.5
500.0	70.2	69.8	69.7	68.9	66.1	67.9
630.0	73.0	72.4	71.2	70.9	70.2	70.1
800.0	74.7	74.0	72.2	71.9	71.3	71.6
1000.0	75.8	74.0	73.0	72.9	72.5	72.0
1250.0	76.5	74.8	74.8	73.9	73.7	72.7
1600.0	76.3	75.7	74.6	74.1	73.8	73.0
2000.0	76.3	75.9	75.1	74.7	73.7	73.4
2500.0	76.1	75.3	74.6	74.4	73.9	73.4
3150.0	76.1	75.3	74.6	74.4	73.6	73.3
4000.0	75.6	75.0	74.6	74.0	73.4	72.9
5000.0	74.9	74.5	74.4	73.5	72.9	72.5
6300.0	74.5	74.4	73.7	73.4	72.8	72.4
8000.0	73.7	74.2	72.2	72.3	71.8	71.5
10000.0	74.0	73.5	71.5	71.6	71.0	70.8
12500.0	73.3	71.8	71.5	71.1	70.8	70.4
16000.0	71.9	71.3	70.2	70.6	70.2	69.8
20000.0	70.3	71.5	70.3	70.0	69.5	69.3
25000.0	71.0	70.2	70.0	69.7	69.2	68.9
31500.0	71.1	70.8	70.0	69.7	69.2	69.0
40000.0	70.7	71.0	70.1	70.2	68.8	69.5
OVERALL SPL	87.4	86.8	86.0	85.6	85.1	84.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0	60.6		60.9		60.5		59.9		
250.0	64.2		62.4		62.6		62.1		
315.2	65.9		64.3		63.5		63.9		
400.0	67.1		66.3		65.0		66.2		
500.0	68.2		67.3		66.6		66.3		
630.0	70.1		69.6		68.1		66.5		
800.0	70.9		70.3		69.5		68.2		
1000.0	71.4		70.5		69.6		68.5		
1250.0	72.3		71.3		70.0		67.9		
1600.0	72.6		70.9		69.7		68.2		
2000.0	72.8		71.7		70.2		68.2		
2500.0	72.8		71.7		69.9		67.4		
3150.0	73.0		71.6		70.1		67.4		
4000.0	72.9		71.6		70.0		66.9		
5000.0	72.6		70.7		69.1		66.0		
6300.0	72.3		70.5		68.7		65.7		
8000.0	71.3		69.9		67.4		64.7		
10000.0	70.6		68.8		66.2		63.3		
12500.0	70.0		68.2		65.3		62.6		
16000.0	69.3		67.3		64.5		61.3		
20000.0	68.6		66.3		63.4		60.1		
25000.0	67.9		65.6		62.6		58.7		
31500.0	67.6		64.9		61.8		57.5		
40000.0	67.6		64.8		61.0		56.6		
OVERALL									
SPL	84.3		82.9		81.3		79.3		

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.20 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 796.00 DEG.F, CHAMBER TEMPERATURE = 97.00 DEG.F
RELATIVE HUMIDITY = 26.0 PERCENT
GAMMA = 1.362

RUN NUMBER 52

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.155
TEMPERATURE RATIO TR = 2.255
MACH NUMBER MJ = 0.464
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.170
JET DENSITY RATIO DJ/D0 = 0.461
JET VELOCITY RATIO VJ/A0 = 0.684
JET VELOCITY VJ = 791.4 FPS

TR/TJ = 1.039
DR/D0 = 0.512
DR/DJ = 1.112
MASS FLOW = 0.577 POUNDS PER SECOND
THRUST = 13.90 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	74.5	73.3	70.8	68.2	69.3	66.0
250.0	76.8	76.5	76.1	72.2	71.6	69.6
315.2	81.0	79.4	79.7	75.8	75.0	71.7
400.0	83.4	84.2	81.8	78.6	77.2	74.8
500.0	86.8	85.0	84.4	80.7	80.1	76.7
630.0	85.4	86.6	87.2	83.4	81.8	79.0
800.0	88.4	89.3	86.4	85.5	83.8	81.0
1000.0	86.8	88.5	89.0	86.2	84.6	82.2
1250.0	85.4	88.1	89.0	86.7	85.5	83.2
1600.0	81.9	85.5	87.2	85.6	85.4	83.7
2000.0	79.3	83.6	85.7	84.8	85.5	83.7
2500.0	76.4	80.8	83.1	83.1	84.6	83.2
3150.0	73.6	78.7	81.3	81.9	84.1	83.2
4000.0	72.9	77.6	79.6	80.6	83.4	82.4
5000.0	71.2	75.9	77.5	78.6	82.2	81.7
6300.0	69.5	73.9	75.6	76.6	80.6	80.7
8000.0	68.7	72.4	74.0	75.1	79.6	79.8
10000.0	68.0	68.8	72.3	73.4	78.4	78.7
12500.0	67.9	69.6	70.5	72.0	77.3	77.9
16000.0	66.1	68.6	69.1	70.5	76.1	76.7
20000.0	62.8	66.5	67.3	68.6	74.2	75.3
25000.0	61.3	65.6	66.2	67.1	73.2	74.2
31500.0	59.7	65.1	64.2	64.7	71.9	72.8
40000.0	59.8	66.6	63.0	63.3	71.7	72.3
OVERALL SPL	95.0	96.4	96.9	94.9	95.2	93.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	7	60.0	8	67.5	9	75.0
	10	82.5	11	90.0	12	97.5
200.0	63.4		62.9		62.6	
250.0	66.9		65.4		64.7	
315.2	68.4		67.5		67.1	
400.0	71.6		70.1		68.9	
500.0	73.8		72.6		71.5	
630.0	75.7		74.9		73.8	
800.0	77.5		76.9		75.6	
1000.0	78.8		78.5		77.3	
1250.0	80.0		79.8		78.4	
1600.0	80.7		80.4		78.8	
2000.0	80.7		80.8		79.7	
2500.0	80.8		80.8		79.6	
3150.0	81.0		81.0		79.8	
4000.0	80.9		81.0		79.7	
5000.0	80.6		80.6		79.3	
6300.0	79.9		80.1		78.4	
8000.0	79.3		79.5		78.0	
10000.0	78.5		78.7		77.0	
12500.0	77.7		77.9		76.3	
16000.0	76.9		77.2		75.8	
20000.0	75.7		75.7		74.4	
25000.0	75.2		74.6		73.7	
31500.0	73.7		72.7		72.0	
40000.0	73.7		71.8		70.7	
					68.7	
					69.7	
OVERALL						
SPL	91.8		91.7		90.4	
					89.3	
					89.1	
					88.8	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.20 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 780.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.362

RUN NUMBER 222

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.155
TEMPERATURE RATIO TR = 2.385
MACH NUMBER MJ = 0.465
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.295
JET DENSITY RATIO DJ/D0 = 0.436
JET VELOCITY RATIO VJ/A0 = 0.704
JET VELOCITY VJ = 786.8 FPS

TR/TJ = 1.039
DR/D0 = 0.484
DR/DJ = 1.112
MASS FLOW = 0.562 POUNDS PER SECOND
THRUST = 13.92 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10	ANGLE NO. 82.5	MICRO PHONE NO. 11	ANGLE NO. 90.0	MICRO PHONE NO. 12	ANGLE NO. 97.5	MICRO PHONE NO. 13	ANGLE NO. 105.0	MICRO PHONE NO. 14	ANGLE NO. 112.5	MICRO PHONE NO. 15	ANGLE NO. 120.0
200.0	62.0		63.4		64.6		64.2		63.2		61.8	
250.0	65.6		64.7		65.0		64.6		63.9		63.9	
315.2	71.0		69.5		68.3		70.6		69.4		69.9	
400.0	69.9		69.5		69.6		69.0		69.2		69.3	
500.0	72.1		71.4		71.8		71.5		70.8		70.5	
630.0	74.9		73.5		74.1		73.2		72.1		72.5	
800.0	77.0		76.5		75.7		74.8		74.6		74.2	
1000.0	78.6		77.2		76.5		75.8		75.0		74.6	
1250.0	80.1		78.0		78.1		77.4		76.3		76.0	
1600.0	80.1		78.5		78.2		77.8		76.6		76.4	
2000.0	80.7		79.3		79.1		78.2		77.8		76.8	
2500.0	80.1		79.1		78.8		78.2		77.9		77.4	
3150.0	80.5		79.4		79.0		78.4		77.4		77.0	
4000.0	80.1		79.3		78.9		78.5		77.8		77.1	
5000.0	79.8		79.1		78.8		77.7		77.2		76.6	
6300.0	79.2		79.3		78.4		77.6		76.9		76.6	
8000.0	78.4		78.8		76.8		76.7		76.1		75.8	
10000.0	78.5		78.5		76.2		76.2		75.8		75.0	
12500.0	78.3		76.9		76.1		75.9		75.4		74.9	
16000.0	77.1		75.9		74.6		75.0		75.0		74.0	
20000.0	75.3		76.2		74.5		74.4		74.1		73.4	
25000.0	75.4		75.1		73.9		73.9		73.5		72.9	
31500.0	75.8		75.0		73.6		73.8		73.3		72.8	
40000.0	75.9		75.6		73.5		74.7		73.7		73.8	
OVERALL SPL	91.5		90.7		90.0		89.5		88.9		88.4	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	63.9	61.7	64.0	63.7
250.0	65.6	64.6	65.6	64.6
315.2	70.5	66.5	66.8	68.6
400.0	69.6	67.9	68.8	68.4
500.0	70.6	70.1	69.6	68.6
630.0	73.2	72.5	70.6	69.8
800.0	74.4	72.6	71.8	70.2
1000.0	74.8	73.2	72.3	71.2
1250.0	75.8	74.4	73.6	70.8
1600.0	76.1	74.8	72.8	71.7
2000.0	76.9	75.8	73.8	71.4
2500.0	77.2	75.7	73.9	71.7
3150.0	77.2	75.5	74.1	71.5
4000.0	77.5	75.5	74.0	71.1
5000.0	77.1	75.1	73.3	70.0
6300.0	76.8	74.7	72.9	70.0
8000.0	76.0	74.1	71.8	69.2
10000.0	75.6	73.0	70.8	67.9
12500.0	74.7	72.2	69.8	67.0
16000.0	73.9	71.3	69.0	65.8
20000.0	73.4	70.4	67.9	64.9
25000.0	72.8	69.3	66.9	63.5
31500.0	72.3	68.9	66.5	62.4
40000.0	72.8	69.2	66.2	62.1
OVERALL SPL	88.5	86.6	85.0	82.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.93 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 867.00 DEG.F, CHAMBER TEMPERATURE = 96.00 DEG.F
RELATIVE HUMIDITY = 32.0 PERCENT
GAMMA = 1.362

RUN NUMBER 72

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.206
TEMPERATURE RATIO TR = 2.387
MACH NUMBER MJ = 0.531
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.271
JET DENSITY RATIO DJ/D0 = 0.440
JET VELOCITY RATIO VJ/A0 = 0.800
JET VELOCITY VJ = 925.0 FPS

TR/TJ = 1.051
DR/D0 = 0.505
DR/DJ = 1.147
MASS FLOW = 0.645 POUNDS PER SECOND
THRUST = 18.18 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	78.3	77.0	74.6	72.6	71.9	69.3
250.0	80.2	80.3	80.1	76.8	75.2	71.2
315.2	85.0	83.4	83.3	80.4	78.3	74.6
400.0	87.4	87.9	85.5	83.8	81.3	76.8
500.0	90.1	89.2	88.3	86.1	84.1	78.8
630.0	89.4	90.4	90.6	88.7	86.5	81.0
800.0	92.8	93.5	92.5	90.6	89.0	83.6
1000.0	91.3	93.5	94.1	92.4	90.2	84.9
1250.0	91.4	93.7	95.0	93.5	91.0	86.0
1600.0	88.6	91.0	93.1	92.0	91.0	86.6
2000.0	85.3	88.8	91.3	91.0	91.1	87.0
2500.0	81.4	85.9	88.6	88.8	90.5	86.9
3150.0	78.3	83.6	86.5	87.1	89.5	86.6
4000.0	77.0	82.2	85.4	85.8	88.8	86.2
5000.0	74.8	80.2	83.4	84.1	87.7	85.6
6300.0	73.1	78.6	81.2	82.6	86.5	85.0
8000.0	71.5	76.5	79.5	80.6	84.8	83.8
10000.0	70.5	74.6	78.0	79.4	83.7	83.0
12500.0	70.0	73.4	76.7	77.9	82.5	82.0
16000.0	68.1	72.5	75.7	76.2	81.2	81.1
20000.0	64.9	70.4	74.3	74.4	79.4	80.0
25000.0	62.8	69.4	73.6	72.9	78.2	79.3
31500.0	-7.9	68.5	72.2	71.1	76.6	78.3
40000.0	-6.6	68.6	70.9	69.7	75.1	78.0
OVERALL SPL	99.5	101.1	101.9	100.8	100.6	97.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	67.6	66.0	66.1	64.9	64.7	65.0
250.0	69.9	67.6	66.9	66.2	66.7	66.6
315.2	71.6	70.2	69.0	69.4	69.0	70.0
400.0	74.3	73.7	72.3	71.3	71.4	70.5
500.0	76.1	75.8	74.5	73.4	73.0	72.2
630.0	77.7	77.8	76.7	76.1	75.3	74.9
800.0	79.9	80.3	78.8	78.3	77.2	76.5
1000.0	81.9	82.1	80.6	79.3	78.9	78.4
1250.0	83.2	83.7	82.1	81.0	80.4	80.1
1600.0	83.8	84.2	82.9	81.7	80.9	80.6
2000.0	84.5	85.2	83.9	82.7	81.6	81.1
2500.0	84.5	85.6	83.9	82.5	81.9	81.6
3150.0	84.6	85.7	84.0	83.0	82.2	82.2
4000.0	84.8	86.0	84.5	83.4	82.4	82.2
5000.0	84.8	85.8	84.0	83.0	82.3	82.0
6300.0	84.4	85.4	83.4	82.8	81.9	81.8
8000.0	83.6	84.7	82.7	81.8	81.2	81.2
10000.0	83.3	85.2	82.3	82.0	81.4	81.7
12500.0	82.7	83.4	81.7	80.6	80.0	80.5
16000.0	82.1	82.9	81.3	79.9	79.7	79.8
20000.0	81.2	81.6	80.5	78.8	78.7	78.5
25000.0	80.6	80.6	79.9	77.9	78.0	77.6
31500.0	79.6	79.1	78.7	76.5	76.6	76.0
40000.0	79.5	78.2	77.6	75.2	75.9	74.6
OVERALL SPL	95.8	96.6	95.0	93.9	93.2	93.0

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR FRESSURE = 2.88 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 770.00 DEG.F, CHAMBER TEMPERATURE = 54.00 DEG.F
RELATIVE HUMIDITY = 54.0 PERCENT
GAMMA = 1.362

RUN NUMBER 155

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.206
TEMPERATURE RATIO TR = 2.393
MACH NUMBER MJ = 0.531
JET STATIC TEMPERATURE RATIO TJ/TO = 2.277
JET DENSITY RATIO DJ/DO = 0.439
JET VELOCITY RATIO VJ/A0 = 0.801
JET VELOCITY VJ = 890.0 FPS

TR/TJ = 1.051
DR/DO = 0.504
DR/DJ = 1.147
MASS FLOW = 0.644 POUNDS PER SECOND
THRUST = 18.15 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10	ANGLE 82.5	MICRO PHONE NO. 11	ANGLE 90.0	MICRO PHONE NO. 12	ANGLE 97.5	MICRO PHONE NO. 13	ANGLE 105.0	MICRO PHONE NO. 14	ANGLE 112.5	MICRO PHONE NO. 15	ANGLE 120.0
200.0	63.3		65.6		66.1		65.2		64.5		63.5	
250.0	66.8		67.3		66.2		66.3		66.9		67.1	
315.2	69.4		69.6		69.2		69.6		69.8		69.7	
400.0	72.0		71.8		71.3		70.8		71.2		70.9	
500.0	75.5		74.2		74.6		73.6		73.2		72.4	
630.0	77.9		76.8		76.1		75.7		75.6		75.4	
800.0	80.1		79.0		77.7		76.6		76.5		76.7	
1000.0	81.8		79.8		79.0		78.2		77.7		76.8	
1250.0	83.4		81.0		81.0		80.1		79.5		78.8	
1600.0	83.6		81.8		81.2		80.4		80.0		79.3	
2000.0	83.9		82.9		82.0		81.2		80.4		79.9	
2500.0	83.8		82.9		82.0		81.3		80.8		80.1	
3150.0	84.3		83.0		82.3		81.6		81.1		80.3	
4000.0	84.2		83.1		82.6		81.5		81.1		80.2	
5000.0	83.6		82.9		82.6		81.3		81.0		80.2	
6300.0	83.1		83.1		82.1		81.0		80.9		80.1	
8000.0	82.6		82.9		80.5		80.2		80.0		79.3	
10000.0	82.5		82.2		80.3		79.5		79.5		78.6	
12500.0	82.1		80.4		80.1		79.1		79.0		78.0	
16000.0	80.4		80.0		78.5		78.4		78.4		77.4	
20000.0	78.5		80.0		78.3		77.6		77.5		76.6	
25000.0	78.4		78.4		77.8		76.9		77.1		76.2	
31500.0	78.0		78.6		77.5		76.3		76.6		75.9	
40000.0	76.8		78.4		77.1		76.3		75.9		76.2	
OVERALL SPL	95.0		94.2		93.3		92.5		92.2		91.5	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	63.0	63.7	64.3	64.5
250.0	67.4	66.5	66.1	65.5
315.2	69.6	67.6	67.5	67.4
400.0	70.6	69.9	69.8	69.0
500.0	72.6	71.8	70.7	70.1
630.0	75.7	74.5	72.1	71.0
800.0	76.4	75.2	73.9	72.7
1000.0	76.8	75.5	75.0	73.8
1250.0	77.9	76.9	75.8	73.7
1600.0	78.5	77.4	76.2	74.3
2000.0	79.4	78.6	76.8	74.5
2500.0	79.8	78.8	77.0	74.5
3150.0	79.9	79.1	77.2	74.6
4000.0	80.0	79.1	77.5	74.1
5000.0	79.8	78.7	76.9	73.6
6300.0	79.7	78.3	76.6	73.7
8000.0	78.7	77.5	75.4	72.6
10000.0	77.9	76.5	74.5	71.6
12500.0	77.1	75.7	73.5	70.7
16000.0	76.3	74.8	72.7	69.3
20000.0	75.3	73.6	71.5	68.0
25000.0	74.5	72.6	70.7	66.5
31500.0	73.6	72.0	69.9	65.1
40000.0	73.2	71.8	69.2	64.0
OVERALL SPL	90.8	89.7	88.0	85.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 3.76 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 882.00 DEG.F, CHAMBER TEMPERATURE = 94.00 DEG.F
RELATIVE HUMIDITY = 32.0 PERCENT
GAMMA = 1.360

RUN NUMBER 71

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_R = 1.264$
TEMPERATURE RATIO $T_R = 2.422$
MACH NUMBER $M_J = 0.597$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 2.277$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.439$
JET VELOCITY RATIO $V_J/A_0 = 0.900$
JET VELOCITY $V_J = 1038.6$ FPS

$T_R/T_J = 1.064$
 $D_R/D_0 = 0.522$
 $D_R/D_J = 1.188$
MASS FLOW = 0.724 POUNDS PER SECOND
THRUST = 22.94 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	80.6	78.6	77.4	74.7	74.1	70.8
250.0	82.9	83.2	81.9	79.6	77.6	75.3
315.2	88.1	85.8	85.8	82.9	81.0	78.5
400.0	90.3	90.8	88.2	86.1	84.1	82.1
500.0	93.8	92.2	91.2	88.4	87.0	84.5
630.0	92.8	94.0	94.1	91.3	89.6	86.6
800.0	96.5	97.2	96.8	94.2	92.3	89.3
1000.0	95.3	97.8	98.2	96.1	94.4	91.8
1250.0	95.6	98.4	99.4	97.5	96.0	92.8
1600.0	94.1	96.8	98.4	96.9	96.0	93.7
2000.0	91.6	94.9	96.5	96.0	95.6	93.5
2500.0	88.0	91.8	93.7	93.8	95.0	93.6
3150.0	84.4	89.0	91.2	92.1	94.2	93.3
4000.0	82.9	87.1	89.9	90.9	93.7	92.8
5000.0	80.6	84.9	87.6	89.1	92.2	92.0
6300.0	79.2	83.1	85.8	87.7	91.0	90.9
8000.0	77.9	80.9	83.9	86.0	89.4	89.5
10000.0	77.6	79.0	82.6	84.7	88.1	88.5
12500.0	76.9	77.7	80.9	83.3	86.9	87.3
16000.0	75.1	76.6	79.1	81.9	85.6	86.2
20000.0	72.0	74.7	77.3	80.3	83.9	85.0
25000.0	69.9	73.5	76.0	78.9	82.6	83.9
31500.0	68.0	72.3	74.3	76.7	81.0	82.4
40000.0	66.0	71.6	72.4	75.1	79.6	81.2
OVERALL SPL	103.7	105.5	106.3	105.0	105.1	103.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	69.0	68.5	67.9	66.9	67.1	67.7
250.0	72.5	69.7	68.6	68.0	68.3	68.3
315.2	75.4	72.1	71.8	71.0	70.4	70.9
400.0	78.8	75.4	74.4	73.0	72.6	72.6
500.0	80.9	77.5	76.7	75.6	74.4	74.6
630.0	83.3	79.2	78.2	78.3	76.4	76.9
800.0	86.5	82.2	80.8	80.1	78.9	79.0
1000.0	88.3	84.4	83.0	82.1	80.5	80.7
1250.0	89.9	86.0	85.0	83.8	82.5	82.7
1600.0	90.6	87.0	85.7	84.5	82.9	83.2
2000.0	91.4	88.1	87.0	85.7	83.8	84.2
2500.0	91.7	88.4	87.3	86.0	84.5	84.6
3150.0	91.6	88.8	87.5	86.4	85.0	85.0
4000.0	91.4	89.1	88.2	86.7	85.4	85.3
5000.0	91.1	89.1	87.6	86.7	85.3	85.3
6300.0	90.6	88.9	87.2	86.4	85.4	85.2
8000.0	89.6	88.0	86.6	85.6	84.9	84.7
10000.0	89.3	87.7	86.0	85.1	84.6	84.5
12500.0	88.3	87.1	85.4	84.6	84.0	83.9
16000.0	87.4	86.3	85.0	83.7	83.5	83.2
20000.0	86.3	85.1	83.9	82.6	82.6	81.9
25000.0	85.3	84.2	83.3	81.7	82.0	80.8
31500.0	83.5	82.7	82.0	80.3	81.0	79.0
40000.0	81.9	81.8	80.7	79.0	80.6	77.5
OVERALL SPL	102.0	99.6	98.3	97.2	96.2	96.1

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 3.71 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 783.00 DEG.F, CHAMBER TEMPERATURE = 54.00 DEG.F
RELATIVE HUMIDITY = 54.0 PERCENT
GAMMA = 1.360

RUN NUMBER 156

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.265
TEMPERATURE RATIO TR = 2.418
MACH NUMBER MJ = 0.597
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.272
JET DENSITY RATIO DJ/D0 = 0.440
JET VELOCITY RATIO VJ/A0 = 0.900
JET VELOCITY VJ = 1000.5 FPS

TR/TJ = 1.064
DR/D0 = 0.523
DR/DJ = 1.189
MASS FLOW = 0.725 POUNDS PER SECOND
THRUST = 22.99 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE	
	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
	10	82.5	11	90.0	12	97.5	13	105.0	14	112.5	15	120.0
200.0	66.0		67.4		67.7		66.9		66.2		64.2	
250.0	68.4		68.4		68.2		68.1		68.8		68.5	
315.2	71.2		71.3		71.2		71.7		71.8		71.6	
400.0	73.8		74.1		73.6		73.3		73.2		72.8	
500.0	76.8		76.0		76.0		76.0		75.7		74.5	
630.0	79.5		78.9		78.3		77.9		77.4		77.6	
800.0	81.7		81.5		79.8		78.9		78.6		78.3	
1000.0	84.0		82.5		81.0		80.7		79.7		78.9	
1250.0	85.4		83.9		83.2		82.6		81.6		80.7	
1600.0	86.3		84.6		83.6		83.1		82.3		81.6	
2000.0	86.8		85.7		84.6		83.9		82.8		82.5	
2500.0	87.0		86.0		84.8		84.3		83.5		82.9	
3150.0	87.6		86.6		85.4		84.8		83.9		83.2	
4000.0	87.5		86.8		85.7		85.0		84.2		83.3	
5000.0	87.1		86.7		85.7		84.8		84.3		83.2	
6300.0	86.8		87.0		85.5		84.5		84.3		83.2	
8000.0	86.3		87.0		84.2		83.8		83.3		82.4	
10000.0	86.4		86.4		83.8		83.1		82.8		81.7	
12500.0	86.0		84.7		83.6		82.6		82.4		81.1	
16000.0	84.2		84.2		82.1		81.9		81.6		80.6	
20000.0	82.2		84.2		81.9		81.1		80.8		79.9	
25000.0	82.2		82.7		81.3		80.4		80.2		79.5	
31500.0	81.7		82.8		80.8		79.7		79.7		79.3	
40000.0	80.7		82.7		80.4		79.6		79.0		79.4	
OVERALL SPL	98.2		97.8		96.3		95.6		95.1		94.3	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	64.3	64.5	65.4	66.1
250.0	68.7	67.8	67.9	67.1
315.2	70.9	69.9	69.2	68.9
400.0	72.1	71.6	71.4	70.8
500.0	74.6	73.2	72.8	71.9
630.0	77.6	76.8	74.4	72.5
800.0	78.1	77.1	76.2	74.7
1000.0	78.8	77.6	77.5	75.8
1250.0	80.3	79.0	78.5	76.3
1600.0	80.9	79.6	78.5	77.2
2000.0	81.9	80.8	79.7	77.3
2500.0	82.4	81.4	79.8	77.5
3150.0	83.0	81.8	80.0	77.6
4000.0	83.2	82.0	80.4	77.6
5000.0	83.0	81.5	80.2	77.2
6300.0	82.9	81.6	79.9	77.2
8000.0	82.4	80.9	78.9	76.2
10000.0	81.8	80.1	78.0	75.3
12500.0	80.9	79.5	76.9	74.6
16000.0	80.3	78.6	76.1	73.1
20000.0	79.3	77.3	75.0	71.7
25000.0	78.4	76.3	74.1	70.4
31500.0	77.7	75.7	73.4	69.2
40000.0	77.2	75.6	72.7	68.2
OVERALL SPL	93.9	92.5	91.0	88.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 6.60 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 947.00 DEG.F, CHAMBER TEMPERATURE = 97.00 DEG.F
RELATIVE HUMIDITY = 30.0 PERCENT
GAMMA = 1.355

RUN NUMBER 70

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_r = 1.464$
TEMPERATURE RATIO $T_r = 2.526$
MACH NUMBER $M_J = 0.769$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 2.286$
JET DENSITY RATIO $D_J/D_0 = 0.437$
JET VELOCITY RATIO $V_J/A_0 = 1.163$
JET VELOCITY $V_J = 1345.6$ FPS

$T_r/T_J = 1.105$
 $D_r/D_0 = 0.580$
 $D_r/D_J = 1.325$
MASS FLOW = 0.932 POUNDS PER SECOND
THRUST = 38.15 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	85.8	85.6	80.8	78.1	76.6	74.9
250.0	88.6	88.3	87.0	83.4	81.6	78.2
315.2	92.6	91.3	91.0	87.1	84.7	81.6
400.0	95.7	96.4	93.3	90.9	88.0	85.7
500.0	99.4	97.9	96.6	93.1	91.0	87.6
630.0	97.9	99.3	99.8	96.9	94.5	90.8
800.0	101.8	103.0	102.2	99.3	96.9	93.5
1000.0	101.3	103.8	104.3	102.0	99.8	96.1
1250.0	102.3	105.3	106.4	104.4	101.8	98.2
1600.0	102.3	105.5	106.5	104.6	102.9	99.6
2000.0	101.9	105.6	106.6	104.8	103.2	100.1
2500.0	100.8	104.7	105.2	103.2	102.3	100.1
3150.0	98.2	102.3	102.5	100.8	100.8	99.9
4000.0	94.9	99.9	100.2	99.1	100.6	99.6
5000.0	90.9	96.5	97.3	96.9	99.3	99.0
6300.0	88.1	94.0	95.0	95.4	98.1	98.3
8000.0	85.5	91.8	92.6	93.5	96.6	96.9
10000.0	83.3	90.1	90.7	92.2	95.4	96.0
12500.0	81.5	88.3	88.7	90.7	94.2	94.8
16000.0	79.7	87.0	86.7	89.3	93.0	93.8
20000.0	76.5	84.9	84.5	87.6	91.3	92.4
25000.0	74.5	83.4	82.5	86.1	89.8	91.1
31500.0	72.4	81.9	79.7	84.2	87.7	89.3
40000.0	3.4	81.3	76.7	82.4	85.9	88.2
OVERALL SPL	110.9	113.8	114.3	112.5	111.7	109.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	72.1	72.5	73.2	71.8	71.0	71.0
250.0	76.1	74.3	74.1	73.0	73.3	72.7
315.2	77.6	77.1	76.6	76.3	75.0	75.0
400.0	82.4	80.0	79.6	78.1	78.1	76.7
500.0	83.9	82.4	81.0	79.6	79.2	78.7
630.0	87.3	85.4	83.7	82.2	81.8	80.6
800.0	90.1	87.5	85.9	84.2	84.1	82.9
1000.0	92.2	89.6	88.1	86.5	85.5	84.9
1250.0	94.2	91.5	89.9	88.5	87.7	86.9
1600.0	95.8	93.0	91.3	89.5	88.5	87.5
2000.0	97.1	94.4	92.4	91.0	89.7	88.6
2500.0	97.6	95.0	93.1	91.7	90.3	89.6
3150.0	98.0	95.7	93.8	92.0	91.1	90.1
4000.0	98.2	96.4	94.6	92.5	91.6	90.6
5000.0	98.0	96.3	94.3	92.5	91.6	90.7
6300.0	97.8	96.3	94.1	92.7	91.7	91.1
8000.0	96.8	95.7	93.6	92.0	91.2	90.7
10000.0	96.3	95.3	93.1	91.7	91.0	90.7
12500.0	95.5	94.8	92.7	91.1	90.4	90.4
16000.0	94.6	94.4	92.4	90.5	89.9	89.9
20000.0	93.4	93.2	91.6	89.6	89.0	88.8
25000.0	92.1	92.2	91.0	88.6	88.1	87.8
31500.0	90.2	90.7	89.8	87.1	86.9	86.2
40000.0	88.4	89.6	88.4	85.5	85.9	84.7
OVERALL SPL	108.3	106.7	104.8	103.1	102.3	101.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 6.50 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 846.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 48.0 PERCENT
GAMMA = 1.355

RUN NUMBER 157

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.464$
TEMPERATURE RATIO $TR = 2.521$
MACH NUMBER $MJ = 0.769$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 2.282$
JET DENSITY RATIO $DJ/D_0 = 0.438$
JET VELOCITY RATIO $VJ/A_0 = 1.162$
JET VELOCITY $VJ = 1296.6$ FPS

$TR/TJ = 1.105$
 $DR/D_0 = 0.581$
 $DR/DJ = 1.325$
MASS FLOW = 0.933 POUNDS PER SECOND
THRUST = 38.16 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	69.6	71.4	71.9	71.0	69.4	68.5
250.0	72.1	72.8	71.3	71.0	70.8	71.7
315.2	74.4	74.1	74.6	74.8	74.7	74.7
400.0	77.8	77.4	77.0	77.0	76.5	76.7
500.0	80.5	79.7	79.7	79.9	79.0	78.4
630.0	82.8	82.5	82.1	82.1	81.6	81.9
800.0	85.4	85.0	84.3	82.8	82.6	83.2
1000.0	87.8	86.8	84.9	84.5	83.4	83.3
1250.0	89.9	88.3	87.3	86.3	85.7	85.0
1600.0	91.0	89.0	88.0	87.3	86.6	86.0
2000.0	91.9	90.7	89.2	88.4	87.3	86.8
2500.0	92.2	91.2	89.6	88.8	88.1	87.5
3150.0	93.0	91.7	90.5	89.8	88.8	88.2
4000.0	93.4	92.2	90.9	90.0	89.1	88.4
5000.0	93.0	92.3	91.1	90.0	89.4	88.5
6300.0	92.9	92.9	91.3	90.2	89.5	88.9
8000.0	93.0	93.4	90.2	89.9	88.9	88.2
10000.0	93.2	93.0	89.8	89.2	88.5	87.5
12500.0	93.0	91.5	89.9	88.8	88.0	87.1
16000.0	91.5	90.8	88.4	88.0	87.3	86.6
20000.0	89.7	91.1	88.2	87.1	86.5	86.1
25000.0	89.7	90.1	87.8	86.6	86.2	86.0
31500.0	88.9	89.8	87.2	85.9	85.9	85.6
40000.0	87.5	89.6	86.7	85.8	85.0	85.8
OVERALL SPL	104.1	103.6	101.7	100.9	100.1	99.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	67.0	67.8	69.0	70.5
250.0	71.0	71.9	72.0	71.6
315.2	73.6	73.9	73.2	72.6
400.0	75.2	75.3	74.8	74.8
500.0	78.4	77.8	77.0	76.6
630.0	82.2	81.4	79.0	77.0
800.0	82.3	81.6	80.5	78.8
1000.0	82.6	81.8	81.5	80.3
1250.0	84.2	84.2	83.5	81.5
1600.0	85.3	84.8	83.9	82.5
2000.0	86.5	86.4	85.4	83.0
2500.0	87.1	86.7	85.5	83.6
3150.0	87.7	87.4	86.0	84.1
4000.0	88.3	87.6	86.7	84.4
5000.0	88.4	87.3	86.2	84.3
6300.0	88.6	87.4	86.0	84.5
8000.0	88.0	87.1	85.5	84.1
10000.0	87.4	86.3	84.7	83.3
12500.0	86.9	85.8	83.8	82.7
16000.0	86.2	85.1	83.0	81.2
20000.0	85.3	84.0	81.8	79.8
25000.0	84.9	83.2	81.4	78.5
31500.0	84.0	82.4	80.5	77.3
40000.0	83.5	82.1	79.6	76.1
OVERALL SPL	99.1	98.3	96.9	95.1

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 9.07 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 990.00 DEG.F, CHAMBER TEMPERATURE = 98.00 DEG.F
RELATIVE HUMIDITY = 31.0 PERCENT
 $\gamma = 1.353$

RUN NUMBER 69

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_R = 1.638$
TEMPERATURE RATIO $T_R = 2.599$
MACH NUMBER $M_J = 0.882$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 2.285$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.438$
JET VELOCITY RATIO $V_J/A_0 = 1.334$
JET VELOCITY $V_J = 1544.1$ FPS

$T_R/T_J = 1.137$
 $D_R/D_0 = 0.630$
 $D_R/D_J = 1.440$
MASS FLOW = 1.069 POUNDS PER SECOND
THRUST = 50.17 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	88.7	88.7	85.5	81.2	0.0	78.2
250.0	91.9	92.0	90.8	86.6	85.0	81.5
315.2	97.1	94.6	93.6	90.0	87.4	84.2
400.0	99.3	99.4	96.4	93.8	91.8	87.7
500.0	102.2	101.2	99.7	96.5	94.2	91.0
630.0	101.3	103.3	103.2	100.1	97.9	94.2
800.0	105.2	106.6	105.5	103.6	101.5	97.2
1000.0	104.5	107.0	108.0	106.4	103.9	100.0
1250.0	105.9	108.5	109.9	108.5	106.7	102.2
1600.0	106.2	109.0	110.2	109.5	108.3	104.2
2000.0	106.9	110.1	111.2	110.4	109.5	105.4
2500.0	107.1	110.7	111.5	110.2	109.4	105.5
3150.0	106.9	110.5	110.5	108.6	108.1	105.2
4000.0	105.4	109.3	108.7	107.1	107.3	104.8
5000.0	102.6	106.8	105.6	104.4	105.5	104.3
6300.0	100.1	104.6	103.5	102.8	104.3	103.7
8000.0	97.1	102.1	101.0	100.9	102.6	102.4
10000.0	94.5	99.9	99.0	99.3	101.4	101.6
12500.0	92.0	97.7	96.9	97.8	100.4	100.6
16000.0	89.9	95.9	95.0	96.5	99.2	99.6
20000.0	87.4	93.8	93.0	94.7	97.5	98.1
25000.0	85.5	92.1	91.3	93.0	96.0	96.9
31500.0	83.7	90.1	89.1	90.7	94.2	95.2
40000.0	82.0	88.6	87.0	88.8	92.2	93.9
OVERALL SPL	116.1	119.2	119.5	118.2	117.7	115.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	74.8	75.0	74.0	73.8	74.3	74.1
250.0	78.4	77.2	76.3	75.8	76.4	75.7
315.2	80.6	79.4	78.3	78.0	78.2	77.4
400.0	84.9	82.1	81.2	80.3	80.8	79.7
500.0	86.9	84.1	82.6	80.9	81.9	81.6
630.0	90.1	87.1	85.4	84.7	84.0	83.0
800.0	93.1	90.2	88.1	86.9	86.7	85.6
1000.0	95.6	92.3	90.5	88.6	88.0	87.1
1250.0	97.5	94.4	92.5	90.8	89.8	89.5
1600.0	99.4	96.1	93.7	92.2	91.2	90.4
2000.0	100.6	97.7	95.5	93.5	92.6	91.4
2500.0	101.4	98.5	96.6	94.5	93.4	92.5
3150.0	101.9	99.3	97.1	95.3	94.4	93.4
4000.0	102.3	100.1	98.0	96.2	94.9	93.9
5000.0	102.4	100.2	97.9	96.3	95.2	94.2
6300.0	102.4	100.5	98.0	96.7	95.3	94.5
8000.0	101.8	100.0	97.6	96.1	95.0	94.1
10000.0	101.4	99.8	97.3	96.0	95.0	94.3
12500.0	100.6	99.3	96.9	95.7	94.7	93.9
16000.0	99.8	99.1	96.8	95.2	94.5	93.5
20000.0	98.5	98.1	95.9	94.1	93.6	92.4
25000.0	97.3	97.2	95.3	93.1	92.8	91.4
31500.0	95.4	95.7	93.8	91.6	91.6	89.9
40000.0	93.4	94.4	92.4	89.8	90.7	88.3
OVERALL SPL	112.6	110.7	108.5	106.8	106.0	105.0

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 8.93 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 878.00 DEG.F, CHAMBER TEMPERATURE = 57.00 DEG.F
RELATIVE HUMIDITY = 52.0 PERCENT
GAMMA = 1.353

RUN NUMBER 158

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.638
TEMPERATURE RATIO TR = 2.588
MACH NUMBER MJ = 0.882
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.275
JET DENSITY RATIO DJ/D0 = 0.439
JET VELOCITY RATIO VJ/A0 = 1.331
JET VELOCITY VJ = 1483.3 FPS

TR/TJ = 1.137
DR/D0 = 0.633
DR/DJ = 1.440
MASS FLOW = 1.071 POUNDS PER SECOND
THRUST = 50.17 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	72.1	74.1	75.0	73.8	72.7	70.6
250.0	75.2	74.7	74.2	73.0	73.2	73.2
315.2	76.8	76.8	76.7	77.0	76.8	77.2
400.0	80.1	79.8	79.2	79.7	79.2	79.5
500.0	83.6	82.1	81.7	82.0	82.1	81.5
630.0	85.4	84.6	84.5	84.5	84.9	85.0
800.0	87.9	87.6	86.2	85.5	85.8	86.0
1000.0	90.4	89.7	87.3	86.8	86.0	86.0
1250.0	92.8	91.2	89.5	89.2	88.3	87.7
1600.0	94.1	92.1	90.6	89.9	89.3	88.8
2000.0	95.5	93.5	91.9	91.2	90.0	89.7
2500.0	95.5	94.2	92.7	91.9	91.1	90.6
3150.0	96.3	95.0	93.4	93.2	91.8	91.3
4000.0	96.9	95.5	94.1	93.4	92.2	91.5
5000.0	96.7	95.8	94.4	93.5	92.6	91.8
6300.0	96.7	96.4	94.4	93.9	93.0	92.3
8000.0	96.6	96.8	93.3	93.4	92.2	91.6
10000.0	96.8	96.6	92.7	92.9	91.9	91.0
12500.0	96.8	95.3	92.9	92.5	91.7	90.7
16000.0	95.6	94.5	91.2	91.9	91.0	90.2
20000.0	93.7	94.9	90.8	91.1	90.2	89.7
25000.0	93.3	93.5	89.7	90.6	89.7	89.5
31500.0	92.7	93.6	88.8	90.1	89.2	89.4
40000.0	91.8	93.5	87.9	90.2	88.5	89.8
OVERALL SPL	107.7	107.0	104.5	104.3	103.4	102.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO		MICRO	
CENTER	PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE
HZ	16	127.5	17	135.0
	18	142.5	19	150.0
200.0	69.0		68.8	
250.0	73.3		73.3	
315.2	76.1		75.4	
400.0	77.6		76.2	
500.0	80.7		79.7	
630.0	85.5		84.0	
800.0	85.4		84.4	
1000.0	85.4		83.6	
1250.0	86.3		86.2	
1600.0	87.8		87.0	
2000.0	89.4		89.0	
2500.0	89.9		89.1	
3150.0	90.7		89.8	
4000.0	91.3		90.2	
5000.0	91.5		90.2	
6300.0	91.7		90.6	
8000.0	91.4		90.3	
10000.0	90.8		89.7	
12500.0	90.4		89.1	
16000.0	89.9		88.6	
20000.0	89.0		87.6	
25000.0	88.2		86.6	
31500.0	87.5		86.0	
40000.0	86.9		85.9	
			70.8	71.4
			74.2	73.4
			74.7	74.8
			76.5	77.0
			79.6	78.0
			81.4	78.2
			82.9	80.4
			83.8	82.2
			85.8	83.3
			86.5	84.8
			87.8	85.5
			88.1	86.1
			88.7	86.8
			89.4	87.4
			89.1	87.1
			89.3	87.8
			88.4	87.0
			87.8	86.3
			87.0	85.7
			86.2	84.2
			84.9	82.7
			84.2	81.3
			83.4	80.2
			82.6	79.1
OVERALL				
SPL	102.2		101.2	99.7
				97.8

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 11.72 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1030.00 DEG.F, CHAMBER TEMPERATURE = 98.00 DEG.F
RELATIVE HUMIDITY = 31.0 PERCENT
GAMMA = 1.352

RUN NUMBER 68

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.824$
TEMPERATURE RATIO $TR = 2.670$
MACH NUMBER $MJ = 0.981$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 2.283$
JET DENSITY RATIO $DJ/D_0 = 0.438$
JET VELOCITY RATIO $VJ/A_0 = 1.483$
JET VELOCITY $VJ = 1716.7$ FPS

$TR/TJ = 1.169$
 $DR/D_0 = 0.683$
 $DR/DJ = 1.560$
MASS FLOW = 1.189 POUNDS PER SECOND
THRUST = 62.05 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 1 15.0	MICRO PHONE NO. ANGLE 2 22.5	MICRO PHONE NO. ANGLE 3 30.0	MICRO PHONE NO. ANGLE 4 37.5	MICRO PHONE NO. ANGLE 5 45.0	MICRO PHONE NO. ANGLE 6 52.5
200.0	92.1	93.5	87.0	84.2	83.1	10.0
250.0	95.1	96.3	93.5	89.6	87.9	83.6
315.2	99.5	98.5	96.5	93.2	89.9	86.3
400.0	102.2	102.2	100.0	96.8	94.9	90.6
500.0	105.4	104.1	103.2	100.1	97.1	92.5
630.0	104.2	105.9	106.6	103.4	100.8	96.4
800.0	108.4	109.7	109.5	106.5	104.3	100.1
1000.0	107.7	110.1	111.6	109.4	107.8	103.2
1250.0	108.9	111.3	113.6	111.6	110.3	105.4
1600.0	109.2	112.1	114.1	113.2	112.1	107.7
2000.0	109.9	113.4	114.9	114.6	113.5	109.0
2500.0	110.6	114.6	115.9	114.8	114.3	109.7
3150.0	110.7	115.1	116.2	114.9	113.4	109.7
4000.0	110.6	115.4	116.5	114.5	112.9	109.1
5000.0	109.1	113.9	114.7	112.5	111.1	108.6
6300.0	107.2	112.0	112.8	111.0	109.9	108.1
8000.0	104.9	109.8	110.7	109.2	108.4	107.1
10000.0	103.0	108.0	108.8	107.7	107.3	106.3
12500.0	101.1	106.3	106.8	106.1	106.1	105.4
16000.0	99.3	104.5	104.8	104.6	105.0	104.6
20000.0	97.2	102.4	103.1	102.7	103.3	103.2
25000.0	94.9	100.6	101.4	101.0	101.8	101.9
31500.0	92.4	98.6	99.3	98.9	99.9	100.5
40000.0	90.6	97.1	97.2	97.1	97.8	99.1
OVERALL SPL	120.2	123.9	125.0	123.6	122.5	119.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	78.2	77.4	77.3	76.4	75.2	74.1
250.0	81.4	79.9	78.6	78.1	78.1	77.2
315.2	82.7	80.7	80.1	80.1	79.3	78.2
400.0	86.9	84.3	83.5	82.6	82.5	81.2
500.0	89.3	86.1	84.7	83.2	82.8	82.2
630.0	91.4	88.7	87.5	86.7	86.1	84.8
800.0	95.3	91.4	89.9	88.8	88.4	87.8
1000.0	97.5	94.0	91.9	90.9	89.5	89.0
1250.0	100.0	96.2	93.8	92.9	91.4	91.3
1600.0	102.2	98.0	95.7	94.1	93.2	91.9
2000.0	103.7	99.8	97.3	95.6	94.5	93.5
2500.0	104.5	101.1	98.5	96.6	95.6	94.6
3150.0	104.9	101.9	99.1	97.4	96.4	95.6
4000.0	105.5	103.0	100.4	98.3	97.1	96.2
5000.0	105.8	103.5	100.3	98.6	97.4	96.9
6300.0	105.8	104.0	100.6	99.2	97.7	97.4
8000.0	105.2	103.6	100.4	98.7	97.6	97.4
10000.0	104.9	103.6	100.2	98.7	97.5	97.5
12500.0	104.1	103.2	100.1	98.4	97.1	97.3
16000.0	103.3	102.9	100.2	98.0	97.2	97.1
20000.0	102.3	101.9	99.6	97.2	96.3	96.0
25000.0	101.0	100.6	99.0	96.2	95.4	95.1
31500.0	99.2	99.3	97.9	94.8	94.2	93.7
40000.0	97.3	98.1	96.5	93.1	93.4	92.1
OVERALL SPL	115.9	114.0	111.3	109.4	108.3	107.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 11.55 PSI, ATMOSPHERIC PRESSURE = 14.00 PSI
RESERVOIR TEMPERATURE = 918.00 DEG.F, CHAMBER TEMPERATURE = 57.00 DEG.F
RELATIVE HUMIDITY = 52.0 PERCENT
GAMMA = 1.352

RUN NUMBER 159

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.825$
TEMPERATURE RATIO $TR = 2.665$
MACH NUMBER $MJ = 0.982$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 2.279$
JET DENSITY RATIO $DJ/D0 = 0.439$
JET VELOCITY RATIO $VJ/A0 = 1.482$
JET VELOCITY $VJ = 1651.5$ FPS

$TR/T0 = 1.170$
 $DR/D0 = 0.685$
 $DR/DJ = 1.560$
MASS FLOW = 1.190 POUNDS PER SECOND
THRUST = 62.10 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	73.7	76.4	76.9	75.9	74.7	71.5
250.0	76.7	77.3	76.0	74.4	74.6	73.7
315.2	78.3	78.6	78.0	77.8	78.2	78.2
400.0	81.5	80.8	81.0	80.6	81.2	80.6
500.0	84.7	83.8	83.4	84.0	83.6	83.3
630.0	86.7	86.0	86.4	86.5	86.8	86.9
800.0	89.2	88.8	88.7	87.4	87.5	87.8
1000.0	91.3	90.7	89.3	88.2	87.4	87.2
1250.0	94.3	93.2	91.3	90.7	89.8	89.4
1600.0	95.8	93.4	92.6	91.5	91.3	90.3
2000.0	97.4	95.1	94.1	93.0	92.0	91.3
2500.0	97.5	96.1	94.7	93.9	93.2	92.1
3150.0	98.2	97.0	95.6	95.1	93.9	93.2
4000.0	98.9	97.5	96.2	95.5	94.5	93.6
5000.0	99.1	97.8	96.7	95.5	95.0	94.2
6300.0	99.2	98.5	97.0	95.9	95.2	94.6
8000.0	99.0	99.2	96.1	95.5	94.5	94.1
10000.0	99.5	99.2	95.7	95.3	94.3	93.7
12500.0	99.7	98.0	96.1	95.0	94.2	93.2
16000.0	98.8	97.2	94.9	94.4	93.6	92.6
20000.0	97.0	97.5	94.7	93.7	92.6	92.0
25000.0	96.4	96.5	94.1	93.1	92.2	91.6
31500.0	96.0	96.5	94.1	92.5	91.8	91.5
40000.0	95.0	96.4	93.9	92.6	91.1	91.6
OVERALL SPL	110.1	109.3	107.3	106.5	105.6	105.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 16 127.5	MICRO PHONE NO. ANGLE 17 135.0	MICRO PHONE NO. ANGLE 18 142.5	MICRO PHONE NO. ANGLE 19 150.0
200.0	70.9	70.1	72.6	72.6
250.0	74.5	74.7	75.3	75.6
315.2	77.8	76.3	76.4	76.6
400.0	79.6	77.7	77.4	78.4
500.0	83.2	82.0	81.0	80.3
630.0	87.8	86.5	83.6	80.1
800.0	87.7	86.5	85.0	82.0
1000.0	87.4	85.3	85.6	84.0
1250.0	88.2	88.1	87.8	85.4
1600.0	89.5	89.0	88.5	87.1
2000.0	91.0	91.0	89.9	87.6
2500.0	91.6	91.2	90.4	88.6
3150.0	92.6	91.9	91.4	89.6
4000.0	93.1	92.5	92.0	90.2
5000.0	93.4	92.2	92.0	90.3
6300.0	93.8	92.7	92.3	90.9
8000.0	93.5	92.6	91.7	90.4
10000.0	93.2	91.9	91.0	89.6
12500.0	92.7	91.6	90.4	88.7
16000.0	92.2	90.7	89.7	87.1
20000.0	91.4	89.7	88.5	85.5
25000.0	90.7	88.8	87.6	84.0
31500.0	90.0	88.2	86.9	82.8
40000.0	89.5	88.2	86.2	81.9
OVERALL SPL	104.3	103.3	102.5	100.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.41 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1150.00 DEG.F, CHAMBER TEMPERATURE = 102.00 DEG.F
RELATIVE HUMIDITY = 31.0 PERCENT
GAMMA = 1.345

RUN NUMBER 58

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.029$
TEMPERATURE RATIO $TR = 2.865$
MACH NUMBER $MJ = 0.206$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 2.844$
JET DENSITY RATIO $DJ/D_0 = 0.352$
JET VELOCITY RATIO $VJ/A_0 = 0.347$
JET VELOCITY $VJ = 403.6$ FPS

$TR/TJ = 1.007$
 $DR/D_0 = 0.359$
 $DR/DJ = 1.021$
MASS FLOW = 0.224 POUNDS PER SECOND
THRUST = 2.73 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	60.4	59.0	58.3	56.7	57.0	55.5
250.0	63.0	62.7	62.5	60.8	60.3	58.5
315.2	66.7	65.5	66.3	63.5	63.2	61.9
400.0	68.3	69.5	66.8	65.2	65.4	63.8
500.0	70.1	68.6	67.8	66.7	66.2	64.2
630.0	66.4	67.5	68.5	66.8	66.3	64.8
800.0	67.9	69.2	68.6	66.9	67.0	65.7
1000.0	64.8	66.9	67.9	66.7	66.9	66.0
1250.0	62.9	66.2	66.9	65.8	66.4	65.7
1600.0	59.6	63.1	64.9	64.3	65.2	64.8
2000.0	57.0	61.4	63.0	63.1	64.3	63.8
2500.0	54.4	58.8	60.6	61.2	62.7	63.0
3150.0	51.4	56.4	58.5	59.6	61.6	62.3
4000.0	54.2	56.2	57.3	58.1	60.7	61.5
5000.0	53.3	55.0	55.6	55.9	59.3	60.4
6300.0	52.8	53.1	54.1	54.7	58.2	59.8
8000.0	52.0	51.2	52.8	53.5	57.0	58.6
10000.0	52.8	50.8	52.5	52.7	56.6	58.3
12500.0	50.3	49.5	50.9	51.7	56.0	57.8
16000.0	48.5	49.3	50.4	51.4	55.6	57.5
20000.0	46.7	48.3	49.4	50.4	54.5	56.6
25000.0	47.2	49.0	49.1	49.8	54.0	55.8
31500.0	48.5	50.6	48.9	49.5	53.5	54.4
40000.0	50.8	53.5	50.4	51.4	55.0	53.7
OVERALL SPL	76.4	77.1	77.2	76.0	76.5	75.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3												
OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 7 60.0		MICRO PHONE NO. ANGLE 8 67.5		MICRO PHONE NO. ANGLE 9 75.0		MICRO PHONE NO. ANGLE 10 82.5		MICRO PHONE NO. ANGLE 11 90.0		MICRO PHONE NO. ANGLE 12 97.5	
200.0	54.4		54.2		54.3		53.9		55.5		55.5	
250.0	56.9		56.2		55.0		55.0		55.9		54.8	
315.2	59.9		59.3		57.5		57.7		57.7		57.5	
400.0	62.1		60.2		58.7		58.7		58.4		57.0	
500.0	63.1		61.4		60.6		60.0		60.1		58.7	
630.0	63.7		62.1		61.0		61.2		61.0		60.1	
800.0	65.2		63.8		62.7		62.1		62.2		61.0	
1000.0	64.8		63.6		62.8		62.4		62.0		60.9	
1250.0	64.4		63.7		62.3		62.4		62.0		61.4	
1600.0	64.1		63.1		61.7		61.6		61.4		60.7	
2000.0	63.1		62.8		61.2		61.1		61.1		60.4	
2500.0	62.5		62.0		60.5		60.7		60.5		59.8	
3150.0	62.0		61.9		60.0		60.2		60.3		59.9	
4000.0	61.1		61.7		60.1		59.8		59.8		59.8	
5000.0	60.3		61.0		59.1		59.1		59.4		59.5	
6300.0	60.0		60.8		58.8		59.2		59.2		59.4	
8000.0	58.9		60.1		58.4		58.6		58.8		58.8	
10000.0	58.5		59.9		58.2		58.3		58.6		58.9	
12500.0	57.9		59.5		58.1		58.1		58.1		58.7	
16000.0	57.6		59.5		58.4		57.8		58.3		58.8	
20000.0	56.9		58.1		57.6		57.0		57.4		57.7	
25000.0	56.2		57.4		57.2		56.1		56.8		56.8	
31500.0	55.3		55.9		55.7		54.5		55.4		55.0	
40000.0	57.1		54.9		54.7		53.6		55.2		53.8	
OVERALL SPL	75.1		74.7		73.4		73.2		73.3		72.8	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.41 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1035.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.345

RUN NUMBER 223

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.029
TEMPERATURE RATIO TR = 2.875
MACH NUMBER MJ = 0.206
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.854
JET DENSITY RATIO DJ/D0 = 0.350
JET VELOCITY RATIO VJ/A0 = 0.348
JET VELOCITY VJ = 389.5 FPS

TR/TJ = 1.007
DR/D0 = 0.358
DR/DJ = 1.021
MASS FLOW = 0.224 POUNDS PER SECOND
THRUST = 2.74 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10	ANGLE 82.5	MICRO PHONE NO. 11	ANGLE 90.0	MICRO PHONE NO. 12	ANGLE 97.5	MICRO PHONE NO. 13	ANGLE 105.0	MICRO PHONE NO. 14	ANGLE 112.5	MICRO PHONE NO. 15	ANGLE 120.0
200.0	53.8		55.9		57.0		56.6		55.6		56.0	
250.0	58.5		59.3		58.8		56.9		57.6		56.7	
315.2	62.1		61.6		61.5		60.2		60.7		60.9	
400.0	61.8		62.4		60.8		60.1		61.3		60.4	
500.0	61.5		59.9		60.6		59.5		59.6		59.4	
630.0	62.1		61.6		61.0		59.9		60.4		60.2	
800.0	63.4		62.8		61.9		61.0		61.5		61.4	
1000.0	62.6		62.1		61.5		60.4		61.0		60.7	
1250.0	61.4		61.6		61.5		60.1		60.5		59.8	
1600.0	61.2		61.4		60.8		59.4		60.1		59.8	
2000.0	60.3		61.1		60.4		59.3		59.6		59.6	
2500.0	59.6		60.2		59.6		58.8		59.4		59.2	
3150.0	58.8		59.9		59.2		58.8		59.5		59.3	
4000.0	58.3		59.6		59.1		58.6		59.1		58.9	
5000.0	57.6		59.1		59.0		58.5		59.1		58.7	
6300.0	57.7		59.6		58.8		58.4		59.3		58.8	
8000.0	57.8		59.7		57.5		57.9		58.6		58.0	
10000.0	58.3		59.7		57.5		57.5		58.2		57.5	
12500.0	58.6		58.5		57.6		57.5		58.3		57.3	
16000.0	57.7		58.5		56.7		57.4		58.2		57.0	
20000.0	56.9		58.8		57.4		56.9		57.9		56.9	
25000.0	56.0		57.1		56.0		55.8		56.7		56.2	
31500.0	55.9		56.8		55.4		55.1		55.9		55.8	
40000.0	54.6		56.2		54.7		55.4		55.1		56.0	
OVERALL SPL	73.5		73.9		73.2		72.4		73.0		72.6	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	56.3	57.9	55.2	57.9
250.0	58.1	57.0	56.6	56.7
315.2	61.3	60.6	58.3	58.6
400.0	60.4	59.8	59.2	60.5
500.0	59.8	58.6	58.7	58.5
630.0	60.6	59.3	58.5	58.1
800.0	61.4	60.1	59.3	58.6
1000.0	60.5	59.0	57.7	57.8
1250.0	59.3	58.5	56.4	55.6
1600.0	59.0	57.0	55.2	54.7
2000.0	59.2	57.7	54.8	53.5
2500.0	59.2	57.1	54.4	52.9
3150.0	59.1	57.3	53.8	52.6
4000.0	58.7	56.6	53.7	51.8
5000.0	58.6	56.0	53.1	50.8
6300.0	58.5	55.6	52.5	50.4
8000.0	57.9	54.7	51.0	48.9
10000.0	57.4	53.6	50.3	47.3
12500.0	56.9	52.7	49.5	46.2
16000.0	56.8	51.8	49.0	45.3
20000.0	57.0	51.2	50.1	47.6
25000.0	54.8	48.8	45.3	41.3
31500.0	54.0	47.7	43.8	41.0
40000.0	53.5	48.1	43.8	45.2
OVERALL SPL	72.5	70.7	69.0	68.8

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.54 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1183.00 DEG.F, CHAMBER TEMPERATURE = 105.00 DEG.F
RELATIVE HUMIDITY = 27.0 PERCENT
GAMMA = 1.345

RUN NUMBER 59

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.038
TEMPERATURE RATIO TR = 2.908
MACH NUMBER MJ = 0.236
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.880
JET DENSITY RATIO DJ/D0 = 0.347
JET VELOCITY RATIO VJ/A0 = 0.400
JET VELOCITY VJ = 466.6 FPS

TR/TJ = 1.010
DR/D0 = 0.357
DR/DJ = 1.028
MASS FLOW = 0.255 POUNDS PER SECOND
THRUST = 3.59 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	62.2		60.5		60.0	58.7
250.0	64.6		65.4		64.8	62.8
315.2	69.0		67.9		68.2	66.2
400.0	70.6		71.8		69.3	67.8
500.0	73.0		71.5		70.9	69.5
630.0	69.8		70.8		72.1	69.8
800.0	71.2		72.3		71.9	70.1
1000.0	68.5		69.7		71.2	69.8
1250.0	66.5		69.2		70.6	69.6
1600.0	62.8		66.2		68.3	67.6
2000.0	60.5		64.2		66.6	66.8
2500.0	57.9		61.7		63.9	65.0
3150.0	55.0		59.3		61.6	63.1
4000.0	56.4		58.8		59.5	61.5
5000.0	56.1		57.8		57.4	59.6
6300.0	55.2		55.8		55.5	58.0
8000.0	54.9		54.4		54.5	56.9
10000.0	53.9		52.2		53.5	55.9
12500.0	52.6		52.1		52.5	55.2
16000.0	50.8		51.6		51.7	54.6
20000.0	48.2		50.3		50.5	53.5
25000.0	47.5		50.2		49.9	52.8
31500.0	47.8		50.9		49.1	51.3
40000.0	49.4		56.7		50.0	51.8
OVERALL						
SPL	79.3		80.0		80.3	79.1
						80.0
						78.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	56.0	55.6	55.4	55.4	56.2	56.4
250.0	58.4	57.7	57.0	56.1	57.3	56.5
315.2	61.0	60.1	58.9	58.8	59.2	59.0
400.0	63.5	62.1	60.8	60.2	60.1	59.3
500.0	65.4	63.5	62.7	61.9	61.7	61.0
630.0	66.1	64.9	63.9	63.6	62.9	62.2
800.0	67.3	66.3	65.2	64.8	64.5	63.2
1000.0	67.8	66.6	65.7	65.3	64.9	63.6
1250.0	67.4	66.7	65.6	65.0	65.0	63.9
1600.0	66.8	66.2	65.2	64.7	64.4	63.1
2000.0	66.3	65.9	65.0	64.8	64.2	63.2
2500.0	65.4	65.2	63.9	64.3	63.6	62.8
3150.0	64.9	64.7	63.5	64.1	63.6	63.0
4000.0	64.1	64.1	63.1	63.7	62.4	62.5
5000.0	63.3	63.6	62.2	63.3	62.3	62.5
6300.0	62.4	63.0	61.5	62.9	61.9	62.4
8000.0	61.9	62.7	61.4	62.7	61.9	62.0
10000.0	61.3	62.4	60.8	62.4	61.6	61.8
12500.0	60.9	62.0	60.6	62.2	61.4	61.7
16000.0	60.4	61.9	60.5	61.6	61.6	61.6
20000.0	59.3	61.0	59.7	60.3	60.5	60.4
25000.0	58.6	60.1	59.3	59.3	59.8	59.3
31500.0	57.1	58.0	57.7	56.9	58.0	57.0
40000.0	57.1	56.7	56.2	55.0	56.8	55.3
OVERALL SPL	77.7	77.3	76.2	76.3	75.9	75.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.54 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1040.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.345

RUN NUMBER 224

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.038$
TEMPERATURE RATIO $TR = 2.885$
MACH NUMBER $MJ = 0.236$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 2.857$
JET DENSITY RATIO $DJ/D0 = 0.350$
JET VELOCITY RATIO $VJ/A0 = 0.399$
JET VELOCITY $VJ = 446.5$ FPS

$TR/TJ = 1.010$
 $DR/D0 = 0.360$
 $DR/DJ = 1.028$
MASS FLOW = 0.256 POUNDS PER SECOND
THRUST = 3.60 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	55.7	57.3	58.8	58.8	57.8	56.5
250.0	60.2	60.3	60.1	59.5	59.2	59.0
315.2	62.9	63.3	63.5	62.4	62.1	62.9
400.0	63.9	63.7	63.0	63.1	62.4	62.2
500.0	64.6	64.0	63.2	63.3	63.2	62.1
630.0	65.6	64.4	63.8	63.8	63.5	63.2
800.0	66.8	66.3	64.9	65.2	64.6	64.2
1000.0	67.1	65.4	65.1	64.5	64.0	63.9
1250.0	66.4	65.0	64.6	64.1	63.9	63.6
1600.0	65.6	64.7	64.7	63.9	63.8	63.0
2000.0	65.0	64.7	64.4	64.2	63.4	63.0
2500.0	64.4	64.2	63.8	63.7	63.2	62.6
3150.0	63.9	63.3	63.0	63.6	62.9	62.5
4000.0	63.2	62.7	62.8	63.1	62.7	62.0
5000.0	62.1	62.2	62.6	62.6	62.4	61.7
6300.0	61.8	62.6	62.3	62.7	62.8	61.9
8000.0	61.7	62.7	61.0	62.1	62.1	61.0
10000.0	62.1	62.5	61.0	61.7	61.8	60.8
12500.0	62.3	61.4	61.1	61.7	61.8	60.5
16000.0	61.3	61.3	60.4	61.1	61.5	60.1
20000.0	60.1	61.6	60.8	60.8	61.3	60.0
25000.0	60.4	60.6	60.1	60.4	61.0	59.6
31500.0	60.6	60.7	60.0	60.0	60.8	59.3
40000.0	59.4	60.4	59.9	60.1	60.0	59.5
OVERALL SPL	77.3	76.9	76.5	76.5	76.2	75.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0	56.4		58.5		57.6		58.4		
250.0	59.8		58.8		58.9		58.3		
315.2	62.6		61.6		60.1		59.8		
400.0	62.0		61.3		60.9		62.1		
500.0	62.7		61.7		61.6		61.4		
630.0	63.4		63.1		61.0		61.6		
800.0	63.5		63.2		62.0		61.9		
1000.0	63.2		62.5		61.8		60.9		
1250.0	62.8		62.0		61.0		58.8		
1600.0	62.2		61.0		60.1		57.9		
2000.0	62.6		61.3		60.1		57.5		
2500.0	62.5		61.1		59.3		56.6		
3150.0	62.2		60.7		59.0		56.1		
4000.0	61.8		60.3		58.8		55.3		
5000.0	61.6		59.6		58.3		54.5		
6300.0	61.4		59.4		57.5		53.7		
8000.0	60.6		58.5		56.3		52.0		
10000.0	60.1		57.5		55.4		50.6		
12500.0	59.8		56.7		54.6		49.4		
16000.0	59.3		56.0		54.0		48.4		
20000.0	59.3		55.0		53.7		49.0		
25000.0	58.1		53.4		51.4		44.4		
31500.0	57.7		52.5		50.4		43.6		
40000.0	57.4		52.3		49.6		46.1		
OVERALL									
SPL	75.2		73.8		72.6		71.4		

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.85 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1185.00 DEG.F, CHAMBER TEMPERATURE = 110.00 DEG.F
RELATIVE HUMIDITY = 26.0 PERCENT
GAMMA = 1.345

RUN NUMBER 60

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.060
TEMPERATURE RATIO TR = 2.877
MACH NUMBER MJ = 0.295
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.835
JET DENSITY RATIO DJ/D0 = 0.353
JET VELOCITY RATIO VJ/A0 = 0.497
JET VELOCITY VJ = 581.1 FPS

TR/TJ = 1.015
DR/D0 = 0.368
DR/DJ = 1.044
MASS FLOW = 0.321 POUNDS PER SECOND
THRUST = 5.61 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	66.1	65.6	64.3	62.7	62.1	60.4
250.0	68.1	69.5	69.7	67.3	65.5	63.2
315.2	72.6	71.5	72.8	70.2	68.4	67.0
400.0	75.7	76.0	74.1	73.2	71.4	69.3
500.0	77.6	76.5	76.4	75.5	72.8	71.2
630.0	76.2	77.1	78.6	76.2	74.5	72.3
800.0	78.2	78.8	78.3	77.0	75.8	74.3
1000.0	75.0	76.7	77.8	76.9	76.4	74.9
1250.0	73.0	75.9	77.2	76.5	75.8	74.1
1600.0	69.7	72.9	75.0	75.0	75.0	73.7
2000.0	67.7	70.8	73.3	74.1	74.2	73.2
2500.0	65.6	68.5	70.8	72.2	73.0	72.5
3150.0	62.6	66.4	69.0	70.8	72.0	72.1
4000.0	62.6	65.3	67.4	68.9	71.1	70.9
5000.0	62.0	64.1	65.5	66.9	69.6	70.1
6300.0	59.5	62.0	63.5	65.0	68.2	68.9
8000.0	58.9	60.6	62.4	63.5	66.7	67.9
10000.0	57.3	58.3	60.1	61.1	65.6	67.0
12500.0	55.3	58.2	60.2	61.0	64.8	66.2
16000.0	52.6	57.4	59.1	59.9	63.7	65.5
20000.0	51.0	56.1	57.7	58.3	62.4	64.5
25000.0	50.5	56.0	56.7	57.3	61.3	63.8
31500.0	50.7	56.1	54.8	55.3	59.5	62.0
40000.0	52.5	57.8	53.8	54.3	58.5	60.8
OVERALL SPL	84.9	85.8	86.5	85.7	85.2	84.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	59.7	58.8	57.6	57.2	59.2	59.8
250.0	62.1	60.3	59.5	58.3	60.3	59.9
315.2	65.0	63.9	62.0	61.9	61.9	62.0
400.0	68.2	66.1	64.6	63.1	64.1	62.5
500.0	70.1	68.3	66.6	65.4	65.8	65.4
630.0	71.6	69.9	67.9	67.3	67.4	66.4
800.0	73.0	71.0	69.9	69.3	69.0	68.2
1000.0	73.1	71.9	70.6	69.8	69.8	69.0
1250.0	73.3	72.2	70.8	69.9	70.5	68.7
1600.0	73.4	72.3	70.7	69.4	70.2	68.6
2000.0	72.8	72.0	70.6	69.7	70.1	68.7
2500.0	72.5	71.7	70.0	69.1	69.6	68.3
3150.0	72.2	71.3	69.6	69.0	69.7	68.3
4000.0	71.4	70.7	69.1	68.6	69.0	68.0
5000.0	70.9	70.1	68.4	68.0	68.8	67.9
6300.0	70.1	69.5	67.5	67.3	68.2	67.6
8000.0	69.4	68.8	67.2	66.8	68.0	67.4
10000.0	68.7	68.1	66.6	66.6	67.4	67.5
12500.0	68.1	67.5	66.2	66.2	67.3	67.4
16000.0	67.6	67.0	66.1	65.7	67.2	67.1
20000.0	66.8	65.8	65.2	64.5	66.3	66.2
25000.0	66.1	64.9	64.8	63.7	65.6	65.4
31500.0	64.4	63.3	63.2	61.6	64.3	63.5
40000.0	63.0	62.2	61.8	59.9	64.5	61.8
OVERALL SPL	84.0	82.9	81.5	80.8	81.5	80.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.85 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1050.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.345

RUN NUMBER 225

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.060$
TEMPERATURE RATIO $TR = 2.904$
MACH NUMBER $MJ = 0.295$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 2.861$
JET DENSITY RATIO $DJ/D_0 = 0.350$
JET VELOCITY RATIO $VJ/A_0 = 0.500$
JET VELOCITY $VJ = 558.3$ FPS

$TR/TJ = 1.015$
 $DR/D_0 = 0.365$
 $DR/DJ = 1.044$
MASS FLOW = 0.320 POUNDS PER SECOND
THRUST = 5.62 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	57.8	60.0	61.5	61.5	61.0	60.1
250.0	61.8	61.7	61.6	60.9	61.8	62.1
315.2	64.5	64.4	64.7	64.6	64.9	64.6
400.0	66.3	65.8	66.3	65.2	66.4	65.9
500.0	67.6	67.5	67.9	67.5	67.0	66.7
630.0	69.7	69.3	69.8	68.4	68.0	67.9
800.0	71.0	70.6	70.0	69.4	68.4	68.4
1000.0	71.7	70.6	69.8	69.3	68.5	68.6
1250.0	72.1	70.6	70.7	70.1	69.2	68.6
1600.0	71.3	70.8	70.6	69.7	69.0	68.5
2000.0	71.1	71.1	70.4	69.9	69.1	68.5
2500.0	70.3	70.4	69.8	69.2	68.8	68.4
3150.0	70.2	69.6	69.5	69.3	68.8	68.3
4000.0	69.3	69.4	69.4	68.6	68.4	67.7
5000.0	68.5	68.8	68.6	68.3	68.3	67.3
6300.0	67.8	68.7	68.3	68.2	68.1	67.6
8000.0	67.6	68.5	67.0	67.6	67.4	66.6
10000.0	67.8	68.2	66.9	67.0	66.9	66.3
12500.0	68.0	67.0	66.9	66.8	66.4	65.9
16000.0	67.0	66.9	66.0	66.1	65.9	65.3
20000.0	65.7	67.1	66.2	66.1	65.5	65.1
25000.0	66.2	65.9	65.7	65.9	65.2	64.9
31500.0	66.8	66.4	65.8	66.0	65.0	65.0
40000.0	65.9	66.5	66.0	66.5	64.6	65.5
OVERALL SPL	82.5	82.2	81.9	81.5	81.0	80.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE CENTER FREQ.	MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE		
HZ	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
	16	127.5	17	135.0	18	142.5	19	150.0	
200.0	59.2		59.7		61.6		61.7		
250.0	62.5		61.4		61.6		61.8		
315.2	64.0		63.6		62.6		62.7		
400.0	65.0		64.6		64.6		64.4		
500.0	66.3		65.3		65.4		64.6		
630.0	67.6		66.6		66.6		65.5		
800.0	68.1		67.2		66.4		65.6		
1000.0	68.2		67.3		66.3		65.6		
1250.0	68.3		67.1		66.4		64.4		
1600.0	67.9		66.4		65.5		63.9		
2000.0	68.3		67.0		65.9		63.3		
2500.0	68.4		66.4		65.3		62.8		
3150.0	68.0		66.5		65.0		62.3		
4000.0	67.6		66.3		64.7		61.4		
5000.0	67.1		65.7		63.8		60.5		
6300.0	66.7		65.4		63.2		60.1		
8000.0	66.0		64.4		62.1		58.7		
10000.0	65.4		63.3		60.7		57.1		
12500.0	64.7		62.6		59.7		55.8		
16000.0	64.3		61.7		59.0		54.2		
20000.0	63.7		60.6		58.0		52.9		
25000.0	63.0		59.6		56.7		50.4		
31500.0	62.6		58.7		55.9		49.1		
40000.0	62.5		58.3		54.8		49.2		
OVERALL									
SPL	80.0		78.6		77.5		75.8		

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.24 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1190.00 DEG.F, CHAMBER TEMPERATURE = 106.00 DEG.F
RELATIVE HUMIDITY = 27.0 PERCENT
GAMMA = 1.345

RUN NUMBER 61

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.087
TEMPERATURE RATIO TR = 2.915
MACH NUMBER MJ = 0.354
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.853
JET DENSITY RATIO DJ/D0 = 0.350
JET VELOCITY RATIO VJ/A0 = 0.599
JET VELOCITY VJ = 698.3 FPS

TR/TJ = 1.022
DR/D0 = 0.373
DR/DJ = 1.064
MASS FLOW = 0.384 POUNDS PER SECOND
THRUST = 8.10 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	69.9	70.0	67.3	65.5	65.5	63.3
250.0	71.8	73.6	71.7	69.9	68.8	66.3
315.2	76.3	75.9	75.8	73.3	73.0	69.5
400.0	78.6	79.8	77.1	76.8	75.0	73.0
500.0	81.0	80.8	79.7	78.0	77.4	75.0
630.0	80.2	81.8	81.9	79.9	79.5	76.8
800.0	82.3	83.7	83.1	81.2	80.8	78.8
1000.0	79.9	82.2	82.8	81.7	81.6	79.9
1250.0	78.0	81.5	82.3	81.8	81.8	80.3
1600.0	74.9	78.8	80.3	80.2	81.3	80.2
2000.0	72.2	76.8	78.7	79.2	80.6	79.8
2500.0	69.6	74.5	76.2	77.6	79.4	79.2
3150.0	67.0	72.3	74.3	76.2	77.8	78.6
4000.0	66.2	71.1	72.7	74.6	76.8	77.5
5000.0	65.2	69.9	70.5	72.5	75.1	76.5
6300.0	63.3	68.0	68.3	70.6	73.4	75.2
8000.0	63.2	66.8	66.8	69.3	71.9	73.8
10000.0	62.0	64.7	65.1	67.6	70.6	72.8
12500.0	62.0	64.4	63.3	66.4	69.5	71.7
16000.0	60.5	63.4	61.7	65.2	68.5	70.9
20000.0	58.8	61.8	59.7	63.7	67.0	69.7
25000.0	59.0	61.2	57.9	62.4	65.9	68.9
31500.0	59.9	60.7	55.1	60.3	64.1	67.2
40000.0	63.1	61.7	53.4	58.7	62.8	66.2
OVERALL SPL	88.9	90.8	90.9	90.2	90.7	89.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 7 ANGLE 60.0	NO. 8 ANGLE 67.5	NO. 9 ANGLE 75.0	NO. 10 ANGLE 82.5	NO. 11 ANGLE 90.0	NO. 12 ANGLE 97.5
200.0	61.9	61.0	61.0	60.3	60.8	61.8
250.0	64.0	63.7	62.1	62.2	61.8	62.5
315.2	66.7	65.5	65.2	64.3	63.7	64.6
400.0	70.1	68.3	66.9	66.0	66.0	65.0
500.0	72.2	70.4	69.7	68.6	68.1	67.7
630.0	74.3	72.5	71.5	70.6	70.2	69.9
800.0	76.2	74.3	73.9	72.4	71.7	71.3
1000.0	77.4	75.2	74.7	73.4	72.4	72.1
1250.0	77.8	76.5	75.5	74.2	73.8	73.5
1600.0	78.2	76.5	75.6	74.3	73.8	73.4
2000.0	78.1	76.6	75.8	74.8	74.1	73.7
2500.0	77.5	76.3	75.4	74.3	74.0	73.6
3150.0	77.3	76.3	75.4	74.4	74.1	73.7
4000.0	76.6	76.0	75.1	73.8	73.8	73.1
5000.0	76.2	75.5	74.4	73.3	73.4	72.9
6300.0	75.2	74.8	73.4	72.8	72.6	72.4
8000.0	74.3	74.1	72.9	72.1	72.3	72.0
10000.0	73.6	73.3	72.0	71.6	71.9	71.6
12500.0	72.8	72.6	71.6	71.3	71.1	71.2
16000.0	71.9	72.1	71.4	70.8	71.0	70.9
20000.0	71.0	71.0	70.7	69.8	69.8	69.6
25000.0	70.4	70.0	70.2	69.0	69.0	68.6
31500.0	68.9	68.1	68.7	66.9	67.6	66.3
40000.0	68.3	66.9	67.4	65.0	66.6	64.5
OVERALL SPL	88.5	87.4	86.5	85.5	85.2	84.8

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.23 PSI, ATMOSPHERIC PRESSURE = 14.16 PSI
RESERVOIR TEMPERATURE = 1070.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.345

RUN NUMBER 226

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.087
TEMPERATURE RATIO TR = 2.942
MACH NUMBER MJ = 0.354
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.880
JET DENSITY RATIO DJ/D0 = 0.347
JET VELOCITY RATIO VJ/A0 = 0.600
JET VELOCITY VJ = 670.8 FPS

TR/TJ = 1.022
DR/D0 = 0.369
DR/DJ = 1.064
MASS FLOW = 0.381 POUNDS PER SECOND
THRUST = 8.06 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	58.3	61.8	62.4	61.2	62.2	59.8
250.0	62.8	63.0	62.5	63.2	63.0	62.6
315.2	65.4	65.3	65.8	66.3	66.3	65.5
400.0	67.5	67.8	67.5	67.4	67.1	67.2
500.0	69.6	68.9	69.4	69.0	69.7	68.4
630.0	72.0	71.3	71.2	70.3	70.8	70.1
800.0	73.4	73.2	71.8	71.2	71.6	70.5
1000.0	74.2	73.0	72.4	72.5	71.5	70.2
1250.0	74.4	73.6	73.5	72.9	72.6	71.5
1600.0	74.4	74.3	73.1	73.4	73.2	71.7
2000.0	74.0	74.5	73.9	73.0	72.6	71.7
2500.0	73.7	73.5	73.1	72.6	72.6	71.3
3150.0	73.5	73.3	73.1	72.7	72.2	71.3
4000.0	72.8	72.9	72.5	72.1	72.0	70.8
5000.0	72.0	72.3	72.5	72.0	72.1	70.4
6300.0	71.6	72.5	71.8	71.5	71.8	70.1
8000.0	71.0	72.3	70.5	70.6	70.9	69.6
10000.0	71.4	71.8	70.1	70.1	70.5	69.2
12500.0	71.4	70.5	70.2	70.1	70.2	69.0
16000.0	70.3	70.4	69.2	69.3	69.7	68.3
20000.0	69.2	70.5	69.5	69.1	69.0	68.0
25000.0	69.4	69.1	69.0	68.5	68.5	67.6
31500.0	70.0	69.6	68.9	68.3	68.3	67.9
40000.0	69.6	70.0	69.3	68.6	67.8	68.6
OVERALL SPL	85.4	85.4	84.8	84.4	84.4	83.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	59.6	61.4	62.5	62.9
250.0	64.3	63.8	63.8	64.1
315.2	65.8	65.1	65.7	65.6
400.0	66.2	67.0	67.2	67.4
500.0	67.5	67.5	67.8	67.7
630.0	69.9	69.7	68.7	68.0
800.0	70.8	70.6	69.2	68.7
1000.0	70.7	70.2	69.7	68.7
1250.0	71.2	71.2	69.8	68.6
1600.0	70.6	70.5	69.2	68.1
2000.0	71.4	70.8	69.6	67.6
2500.0	71.5	70.7	68.8	67.0
3150.0	70.8	70.7	69.0	66.6
4000.0	70.5	70.7	68.8	66.2
5000.0	70.2	69.8	68.1	65.3
6300.0	70.0	69.3	67.5	64.8
8000.0	69.0	68.2	66.3	63.6
10000.0	68.6	67.3	64.9	62.5
12500.0	68.0	66.5	64.1	61.3
16000.0	67.4	65.7	63.0	59.9
20000.0	67.3	64.6	61.7	58.4
25000.0	65.9	63.6	60.9	56.7
31500.0	65.4	62.9	60.0	55.5
40000.0	65.3	62.8	59.1	54.6
OVERALL SPL	82.8	82.2	80.9	79.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.71 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1200.00 DEG.F, CHAMBER TEMPERATURE = 106.00 DEG.F
RELATIVE HUMIDITY = 28.0 PERCENT
GAMMA = 1.345

RUN NUMBER 62

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.120
TEMPERATURE RATIO TR = 2.933
MACH NUMBER MJ = 0.414
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.849
JET DENSITY RATIO DJ/D0 = 0.351
JET VELOCITY RATIO VJ/A0 = 0.699
JET VELOCITY VJ = 814.7 FPS

TR/TJ = 1.030
DR/D0 = 0.382
DR/DJ = 1.088
MASS FLOW = 0.449 POUNDS PER SECOND
THRUST = 11.04 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL.

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	74.8	73.8	71.4	68.7	69.0	66.6
250.0	77.1	76.8	76.1	73.5	71.8	69.4
315.2	81.7	80.1	79.8	76.8	75.0	72.6
400.0	83.9	84.1	81.3	79.6	77.8	76.0
500.0	87.4	85.0	84.2	82.0	80.4	77.7
630.0	85.6	86.6	86.7	83.8	82.4	79.6
800.0	88.9	89.6	88.5	86.5	84.4	81.4
1000.0	86.7	88.8	88.9	87.3	85.8	83.0
1250.0	85.4	88.4	88.5	87.2	86.2	83.4
1600.0	81.3	85.2	86.2	86.1	85.8	83.5
2000.0	78.5	83.2	84.4	85.1	85.4	83.6
2500.0	75.5	80.5	81.7	83.3	84.4	83.3
3150.0	72.7	78.3	79.7	81.7	83.4	83.0
4000.0	71.1	76.5	77.9	80.2	82.5	81.9
5000.0	70.0	74.6	76.0	78.1	81.1	81.2
6300.0	68.4	72.5	73.8	76.3	79.6	80.0
8000.0	68.2	70.8	72.5	74.6	78.2	78.9
10000.0	63.0	68.7	70.8	73.0	76.7	77.5
12500.0	66.8	67.8	69.3	71.5	75.5	76.5
16000.0	64.7	67.1	67.7	70.3	74.2	75.5
20000.0	61.0	65.3	65.9	68.7	72.6	74.1
25000.0	59.3	64.7	65.0	67.4	71.5	73.4
31500.0	58.3	64.1	62.7	65.0	70.0	71.8
40000.0	58.7	65.3	60.8	63.4	69.1	71.6
OVERALL SPL	95.2	96.5	96.4	95.4	95.2	93.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	64.6	63.5	63.7	63.4	62.9	63.8
250.0	67.0	66.2	64.2	64.7	64.7	64.4
315.2	70.3	68.7	67.3	67.4	66.7	67.5
400.0	72.5	71.5	69.7	69.0	68.8	67.7
500.0	74.8	73.6	72.3	71.4	70.6	70.4
630.0	76.7	75.8	74.4	73.7	73.2	72.8
800.0	78.9	78.3	76.3	75.5	74.9	74.5
1000.0	80.3	79.6	77.7	77.1	75.8	75.4
1250.0	80.9	80.5	79.2	78.4	77.4	76.9
1600.0	81.5	81.2	79.7	78.6	77.7	77.0
2000.0	81.9	81.4	80.2	79.3	78.3	77.3
2500.0	81.6	81.2	80.1	79.2	78.1	77.3
3150.0	81.5	81.4	80.1	79.4	78.5	77.7
4000.0	80.8	81.0	80.1	78.9	78.1	77.5
5000.0	80.7	80.6	79.5	78.4	77.7	77.4
6300.0	79.8	80.0	78.7	77.7	77.1	76.9
8000.0	79.3	79.2	78.0	77.0	76.7	76.6
10000.0	78.5	78.4	77.1	75.9	76.2	76.2
12500.0	77.9	77.7	76.8	75.6	75.3	75.9
16000.0	77.0	77.2	76.5	74.8	75.0	75.4
20000.0	75.9	75.9	75.3	73.6	73.8	74.1
25000.0	75.4	75.0	74.8	72.7	73.0	73.0
31500.0	74.1	73.4	73.4	70.8	71.2	71.1
40000.0	73.8	72.6	72.2	69.1	70.2	69.5
OVERALL SPL	92.4	92.1	90.9	89.8	89.2	88.8

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.70 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1078.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.345

RUN NUMBER 227

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.120$
TEMPERATURE RATIO $TR = 2.958$
MACH NUMBER $MJ = 0.413$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 2.873$
JET DENSITY RATIO $DJ/D0 = 0.348$
JET VELOCITY RATIO $VJ/A0 = 0.701$
JET VELOCITY $VJ = 783.1$ FPS

$TR/TJ = 1.029$
 $DR/D0 = 0.379$
 $DR/DJ = 1.088$
MASS FLOW = 0.446 POUNDS PER SECOND
THRUST = 11.01 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. Hz	MICRO PHONE NO. 10	ANGLE 82.5	MICRO PHONE NO. 11	ANGLE 90.0	MICRO PHONE NO. 12	ANGLE 97.5	MICRO PHONE NO. 13	ANGLE 105.0	MICRO PHONE NO. 14	ANGLE 112.5	MICRO PHONE NO. 15	ANGLE 120.0
200.0	62.0		64.3		64.5		64.1		65.7		62.5	
250.0	65.6		64.5		65.8		64.7		66.3		65.9	
315.2	67.4		67.2		68.6		68.5		69.0		68.7	
400.0	69.8		69.3		70.7		70.1		70.3		69.2	
500.0	72.9		72.0		72.7		72.4		71.3		70.9	
630.0	75.3		74.6		74.5		74.4		74.0		73.1	
800.0	77.1		76.5		75.6		74.6		75.1		74.5	
1000.0	78.6		77.3		76.2		76.4		75.8		74.5	
1250.0	79.7		78.3		77.6		77.3		77.0		75.9	
1600.0	79.8		78.8		77.5		77.4		77.2		76.1	
2000.0	79.7		79.4		78.2		78.3		77.5		76.4	
2500.0	79.3		78.8		78.1		77.8		77.2		76.2	
3150.0	79.2		78.6		77.6		77.8		77.3		76.2	
4000.0	78.9		78.3		77.7		77.4		76.9		75.7	
5000.0	78.4		78.0		77.6		76.7		76.6		75.5	
6300.0	77.7		77.8		76.8		76.4		76.6		75.2	
8000.0	77.2		77.7		75.6		75.6		75.4		74.5	
10000.0	77.0		77.3		75.3		75.0		75.0		74.3	
12500.0	77.0		75.7		74.9		74.7		74.5		73.5	
16000.0	75.3		75.2		73.5		74.4		74.2		73.1	
20000.0	73.3		75.3		73.9		73.8		73.7		72.6	
25000.0	74.4		74.0		73.4		73.4		73.4		72.4	
31500.0	74.6		74.4		73.5		73.6		73.4		72.5	
40000.0	74.2		74.6		73.7		74.3		73.1		73.3	
OVERALL SPL	90.6		90.1		89.2		89.0		88.7		87.7	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	61.9	63.7	63.8	64.9
250.0	66.4	66.5	65.7	65.8
315.2	68.3	67.9	67.0	67.5
400.0	69.2	70.4	69.0	68.7
500.0	70.8	70.1	70.7	69.4
630.0	73.1	72.6	71.6	70.7
800.0	74.1	74.0	72.6	71.3
1000.0	74.4	74.2	73.8	72.2
1250.0	75.4	74.9	74.2	72.2
1600.0	75.6	74.6	73.5	72.1
2000.0	76.0	75.6	74.0	72.1
2500.0	75.9	75.2	73.9	71.6
3150.0	76.1	75.6	74.0	71.6
4000.0	75.7	75.7	73.7	70.9
5000.0	75.1	74.6	73.1	70.2
6300.0	74.8	74.2	72.7	70.0
8000.0	73.8	73.2	71.3	68.8
10000.0	72.9	72.0	70.1	68.0
12500.0	72.1	71.6	69.1	66.8
16000.0	71.3	70.6	68.2	65.3
20000.0	70.8	69.7	67.1	64.0
25000.0	69.8	68.3	66.4	62.6
31500.0	69.3	68.4	65.8	61.6
40000.0	69.2	68.4	65.2	60.6
OVERALL SPL	87.1	86.6	85.2	83.2

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.26 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1225.00 DEG.F, CHAMBER TEMPERATURE = 104.00 DEG.F
RELATIVE HUMIDITY = 27.0 PERCENT
GAMMA = 1.345

RUN NUMBER 63

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.159
TEMPERATURE RATIO TR = 2.988
MACH NUMBER MJ = 0.473
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.877
JET DENSITY RATIO ρ_J/ρ_0 = 0.348
JET VELOCITY RATIO V_J/A_0^* = 0.802
JET VELOCITY VJ = 933.5 FPS

TR/TJ = 1.039
DR/D0 = 0.388
DR/DJ = 1.116
MASS FLOW = 0.510 POUNDS PER SECOND
THRUST = 14.41 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 1 ANGLE 15.0	NO. 2 ANGLE 22.5	NO. 3 ANGLE 30.0	NO. 4 ANGLE 37.5	NO. 5 ANGLE 45.0	NO. 6 ANGLE 52.5
200.0	77.2	76.4	74.2	72.0	70.7	68.9
250.0	79.6	79.3	79.4	75.9	74.2	72.1
315.2	84.1	82.3	83.1	79.2	77.2	74.3
400.0	86.7	86.9	84.9	82.6	79.9	77.0
500.0	89.8	88.1	87.4	85.5	82.2	79.2
630.0	87.8	89.9	90.3	87.8	84.1	81.3
800.0	91.5	92.8	92.0	90.1	86.2	83.6
1000.0	89.9	92.2	93.6	91.5	87.9	85.5
1250.0	89.7	92.8	94.0	92.0	89.0	86.3
1600.0	86.7	90.2	91.9	90.5	88.9	86.8
2000.0	83.2	87.6	90.2	89.8	88.8	86.6
2500.0	79.7	84.5	87.2	87.6	87.8	86.2
3150.0	76.5	82.0	85.3	86.0	86.9	86.2
4000.0	75.3	80.2	83.7	84.6	86.0	85.5
5000.0	73.6	78.3	81.3	82.5	85.0	84.8
6300.0	71.7	76.1	79.5	80.7	83.7	83.6
8000.0	70.6	74.4	77.7	79.4	82.5	82.6
10000.0	72.7	72.4	75.4	77.6	81.3	81.8
12500.0	69.0	71.0	74.4	76.2	79.9	80.4
16000.0	67.1	70.2	73.2	74.8	78.7	79.5
20000.0	63.5	67.9	71.7	73.2	77.1	78.1
25000.0	61.7	67.0	70.7	72.1	76.2	77.5
31500.0	-8.7	65.9	68.5	70.0	74.4	76.0
40000.0	-7.6	66.6	66.6	68.4	73.7	75.7
OVERALL SPL	98.2	100.1	101.0	99.6	98.2	96.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	66.1	65.3	65.5	65.9	65.2	65.9
250.0	69.4	68.0	66.2	67.2	66.9	66.7
315.2	71.2	69.8	68.8	69.4	68.1	68.9
400.0	73.8	72.7	71.7	71.0	70.4	69.6
500.0	75.7	74.8	74.4	73.5	72.7	72.6
630.0	78.1	77.5	76.5	75.4	74.7	74.7
800.0	80.1	80.2	78.2	77.6	76.5	76.7
1000.0	81.6	81.9	80.4	79.3	78.2	78.1
1250.0	83.0	83.4	81.8	80.6	80.0	79.9
1600.0	83.6	83.7	82.5	81.3	80.2	80.1
2000.0	84.2	84.4	83.1	82.1	80.6	80.5
2500.0	84.1	84.4	83.5	82.0	81.0	80.8
3150.0	84.3	84.8	83.4	82.8	81.4	81.4
4000.0	84.2	84.6	83.4	82.5	81.1	81.0
5000.0	84.0	84.5	83.1	82.3	80.8	80.9
6300.0	83.5	83.7	82.3	81.8	80.4	80.6
8000.0	82.9	83.0	81.8	81.2	80.1	80.2
10000.0	82.9	82.0	81.0	80.8	79.5	79.6
12500.0	81.6	81.4	80.5	80.2	78.9	79.1
16000.0	80.9	80.6	80.1	79.4	78.5	78.5
20000.0	79.7	79.0	79.0	78.3	77.2	77.0
25000.0	79.1	77.9	78.2	77.4	76.6	76.0
31500.0	77.6	75.9	76.7	75.6	75.0	73.8
40000.0	77.4	74.8	75.4	74.2	74.5	72.2
OVERALL SPL	95.2	95.2	94.1	93.3	92.1	92.0

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.23 PSI, ATMOSPHERIC PRESSURE = 14.02 PSI
RESERVOIR TEMPERATURE = 1082.00 DEG.F, CHAMBER TEMPERATURE = 59.00 DEG.F
RELATIVE HUMIDITY = 44.0 PERCENT
GAMMA = 1.345

RUN NUMBER 165

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_r = 1.159$
TEMPERATURE RATIO $T_r = 2.971$
MACH NUMBER $M_J = 0.473$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 2.861$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.350$
JET VELOCITY RATIO $V_J/A_0 = 0.800$
JET VELOCITY $V_J = 893.3$ FPS

$T_r/T_J = 1.039$
 $\rho_r/\rho_0 = 0.390$
 $\rho_r/\rho_J = 1.116$
MASS FLOW = 0.512 POUNDS PER SECOND
THRUST = 14.42 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	65.0	66.3	66.6	66.3	66.1	64.1
250.0	67.0	67.6	66.8	66.8	68.0	68.2
315.2	69.3	70.0	70.0	70.1	70.3	70.8
400.0	71.9	72.1	71.6	71.8	72.0	71.8
500.0	75.2	74.4	74.3	74.3	73.9	73.6
630.0	77.7	76.7	76.2	75.7	75.7	75.5
800.0	79.8	78.8	77.6	76.9	76.9	76.7
1000.0	81.5	79.7	78.6	78.1	78.1	76.9
1250.0	82.6	80.7	80.4	79.7	79.4	78.3
1600.0	82.8	81.2	80.5	79.8	79.9	78.6
2000.0	83.1	81.9	81.0	80.1	80.1	79.1
2500.0	82.5	81.5	80.8	80.1	80.1	79.3
3150.0	83.0	81.7	81.1	80.2	80.1	79.2
4000.0	82.6	81.5	80.9	80.0	80.0	78.9
5000.0	81.8	81.1	80.8	79.5	79.7	78.5
6300.0	81.0	81.0	80.4	79.0	79.6	78.4
8000.0	80.6	81.1	79.0	78.5	78.7	77.5
10000.0	80.6	80.7	78.3	77.9	78.0	76.8
12500.0	80.2	79.1	78.4	77.5	77.7	76.3
16000.0	78.9	78.4	76.9	76.8	77.1	75.7
20000.0	76.9	78.8	77.0	76.1	76.4	75.0
25000.0	77.0	78.0	76.9	75.8	76.2	75.0
31500.0	76.9	78.1	76.5	75.3	75.7	74.7
40000.0	75.8	78.1	76.3	75.4	75.0	75.0
OVERALL SPL	93.8	93.1	92.1	91.3	91.4	90.4

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ.		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE	
HZ		16	127.5	17	135.0	18	142.5	19	150.0
200.0	63.6			64.5		64.9		65.8	
250.0	68.3			67.7		67.2		66.8	
315.2	70.4			69.6		67.7		68.7	
400.0	71.6			70.7		70.4		70.5	
500.0	72.7			72.3		71.6		70.9	
630.0	75.8			74.8		72.5		72.1	
800.0	76.4			75.2		74.1		73.0	
1000.0	77.0			75.8		75.2		74.1	
1250.0	78.1			77.1		75.8		74.1	
1600.0	78.6			77.1		75.6		74.2	
2000.0	79.2			78.0		76.4		74.2	
2500.0	79.3			78.1		76.3		74.0	
3150.0	79.1			78.0		76.4		73.9	
4000.0	79.1			77.6		76.3		73.4	
5000.0	78.8			76.9		75.7		72.5	
6300.0	78.3			76.5		75.2		72.1	
8000.0	77.6			75.9		74.3		71.0	
10000.0	76.9			74.7		73.2		69.9	
12500.0	76.1			74.0		72.0		69.0	
16000.0	75.3			73.1		71.3		67.5	
20000.0	74.5			71.9		69.9		65.9	
25000.0	74.0			71.3		69.5		64.9	
31500.0	73.3			70.5		68.6		63.5	
40000.0	72.8			70.3		67.6		62.2	
OVERALL SPL		90.3		88.8		87.3		85.2	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.92 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1236.00 DEG.F, CHAMBER TEMPERATURE = 105.00 DEG.F
RELATIVE HUMIDITY = 27.0 PERCENT
GAMMA = 1.345

RUN NUMBER 64

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.205$
TEMPERATURE RATIO $TR = 3.002$
MACH NUMBER $MJ = 0.533$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 2.861$
JET DENSITY RATIO $DJ/D0 = 0.349$
JET VELOCITY RATIO $VJ/A0 = 0.902$
JET VELOCITY $VJ = 1051.2$ FPS

$TR/TJ = 1.049$
 $DR/D0 = 0.402$
 $DR/DJ = 1.149$
MASS FLOW = 0.577 POUNDS PER SECOND
THRUST = 18.34 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	79.7		79.3		77.2	
250.0	81.0		81.8		81.6	
315.2	86.7		84.9		85.3	
400.0	88.9		89.6		87.1	
500.0	92.1		90.8		90.1	
630.0	90.5		92.5		92.7	
800.0	94.5		95.7		95.3	
1000.0	93.2		95.5		97.1	
1250.0	93.7		96.7		98.2	
1600.0	92.4		94.8		96.6	
2000.0	89.6		93.0		94.6	
2500.0	85.4		89.6		91.5	
3150.0	81.5		87.0		89.4	
4000.0	79.1		84.9		87.4	
5000.0	76.8		82.6		85.1	
6300.0	74.3		80.5		82.9	
8000.0	72.8		78.9		81.3	
10000.0	70.7		76.8		79.6	
12500.0	70.5		75.5		78.0	
16000.0	68.8		74.5		76.5	
20000.0	65.7		72.7		74.9	
25000.0	74.2		71.4		73.6	
31500.0	62.3		69.6		71.5	
40000.0	-7.6		69.1		69.4	
					71.4	
					74.5	
					78.4	
OVERALL						
SPL	101.7		103.7		104.8	
					103.6	
					103.5	
					102.2	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	68.5	67.0	67.4	67.0	66.7	67.6
250.0	70.5	69.4	69.0	68.7	68.7	68.5
315.2	73.4	72.7	71.0	71.3	70.4	71.0
400.0	75.8	75.0	73.5	73.0	72.9	71.9
500.0	77.8	77.3	76.1	75.0	74.4	74.4
630.0	79.8	79.8	78.2	77.0	76.6	76.3
800.0	82.2	82.1	80.4	79.0	78.7	78.2
1000.0	84.0	83.8	82.7	81.2	80.2	79.9
1250.0	85.7	85.6	84.2	82.9	82.2	81.8
1600.0	86.3	86.4	84.7	83.7	82.8	82.4
2000.0	87.0	87.5	85.9	84.6	83.6	83.2
2500.0	86.9	87.7	86.0	85.0	83.6	83.2
3150.0	87.5	87.8	86.3	85.6	84.2	83.8
4000.0	87.3	87.9	86.6	85.5	84.0	83.7
5000.0	87.3	87.9	86.3	85.6	84.0	83.9
6300.0	86.6	87.2	85.5	85.2	83.8	83.5
8000.0	86.1	86.8	85.0	84.7	83.3	83.0
10000.0	85.4	86.2	84.1	84.2	82.7	82.8
12500.0	84.7	85.5	83.5	83.6	82.1	82.3
16000.0	83.7	84.8	83.0	82.7	81.6	81.5
20000.0	82.5	83.3	81.9	81.4	80.6	80.2
25000.0	81.7	82.2	81.1	80.5	79.8	79.0
31500.0	80.3	80.2	79.4	78.5	78.4	76.9
40000.0	79.8	79.0	77.9	77.1	77.8	75.2
OVERALL SPL	98.0	98.5	96.9	96.2	95.0	94.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.87 PSI, ATMOSPHERIC PRESSURE = 14.02 PSI
RESERVOIR TEMPERATURE = 1100.00 DEG.F, CHAMBER TEMPERATURE = 58.00 DEG.F
RELATIVE HUMIDITY = 48.0 PERCENT
GAMMA = 1.345

RUN NUMBER 166

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.205$
TEMPERATURE RATIO $TR = 3.012$
MACH NUMBER $MJ = 0.533$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 2.871$
JET DENSITY RATIO $DJ/D_0 = 0.348$
JET VELOCITY RATIO $VJ/A_0 = 0.902$
JET VELOCITY $VJ = 1006.8$ FPS

$TR/TJ = 1.049$
 $DR/D_0 = 0.400$
 $DR/DJ = 1.149$
MASS FLOW = 0.575 POUNDS PER SECOND
THRUST = 18.28 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	66.5	68.1	69.0	68.2	66.9	66.1
250.0	69.6	69.0	68.8	68.5	70.1	69.7
315.2	71.4	71.4	71.6	72.1	73.3	72.2
400.0	74.2	73.8	73.8	73.6	74.6	73.5
500.0	77.2	76.5	76.6	76.5	76.6	75.4
630.0	79.5	78.7	78.6	78.2	78.2	78.1
800.0	82.0	81.2	80.2	79.3	79.8	79.3
1000.0	83.7	81.9	81.0	80.8	80.1	79.6
1250.0	85.6	83.3	83.2	82.4	82.1	80.9
1600.0	85.9	84.1	83.4	82.6	82.6	81.5
2000.0	86.4	85.2	84.1	83.6	83.0	82.2
2500.0	86.0	85.0	84.1	83.7	83.4	82.4
3150.0	86.7	85.3	84.4	84.0	83.5	82.3
4000.0	86.4	85.1	84.5	83.9	83.5	82.1
5000.0	85.7	84.7	84.4	83.4	83.3	81.7
6300.0	85.3	85.0	84.0	83.1	83.2	81.7
8000.0	85.0	84.9	82.5	82.5	82.3	80.8
10000.0	84.8	84.4	81.9	81.8	81.8	80.2
12500.0	84.6	82.8	82.0	81.3	81.6	79.6
16000.0	83.4	82.2	80.6	80.8	80.9	79.0
20000.0	81.7	82.5	80.7	80.3	80.3	78.3
25000.0	81.7	81.5	80.5	79.9	80.0	78.2
31500.0	81.5	81.6	80.1	79.2	79.6	78.0
40000.0	80.5	81.6	79.9	79.1	78.7	78.2
OVERALL SPL	97.4	96.4	95.4	94.9	94.7	93.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	65.3	65.9	66.5	68.1
250.0	69.9	69.5	69.3	69.2
315.2	72.2	71.6	70.3	70.4
400.0	73.0	72.3	71.8	72.2
500.0	75.3	74.4	73.8	73.3
630.0	78.1	76.7	74.9	73.7
800.0	78.9	77.5	76.6	74.8
1000.0	79.4	78.2	77.5	76.3
1250.0	80.8	79.8	78.5	76.8
1600.0	81.0	79.9	78.7	77.0
2000.0	81.9	81.0	79.4	77.3
2500.0	82.1	81.2	79.2	77.8
3150.0	82.3	81.3	79.4	77.6
4000.0	82.3	81.3	79.5	77.4
5000.0	82.2	80.7	78.8	76.6
6300.0	81.8	80.4	78.6	76.6
8000.0	81.0	80.0	77.2	75.7
10000.0	80.3	78.8	76.2	74.5
12500.0	79.3	78.0	74.9	73.6
16000.0	78.7	77.1	74.0	72.2
20000.0	77.7	75.9	73.0	70.8
25000.0	77.4	75.4	72.4	69.7
31500.0	76.7	74.7	71.5	68.4
40000.0	76.2	74.4	70.5	67.2
OVERALL SPL	93.3	92.1	90.2	88.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 5.05 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1290.00 DEG.F, CHAMBER TEMPERATURE = 103.00 DEG.F
RELATIVE HUMIDITY = 24.0 PERCENT
GAMMA = 1.340

RUN NUMBER 65

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.355$
TEMPERATURE RATIO $TR = 3.108$
MACH NUMBER $MJ = 0.667$
JET STATIC TEMPERATURE RATIO $TJ/TO = 2.878$
JET DENSITY RATIO $DJ/DO = 0.348$
JET VELOCITY RATIO $VJ/AO = 1.165$
JET VELOCITY $VJ = 1354.8$ FPS

$TR/TJ = 1.080$
 $DR/DO = 0.436$
 $DR/DJ = 1.255$
MASS FLOW = 0.741 POUNDS PER SECOND
THRUST = 30.39 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	83.8		84.2		80.1	78.1
250.0	87.0		87.9		86.1	83.4
315.2	92.2		90.0		90.1	86.8
400.0	94.4		94.8		92.5	89.9
500.0	98.1		96.4		95.6	93.0
630.0	96.2		98.3		98.9	96.0
800.0	100.1		101.6		101.2	98.9
1000.0	99.4		101.9		103.0	101.3
1250.0	100.6		103.2		105.0	103.5
1600.0	101.0		103.6		105.3	103.9
2000.0	101.1		103.9		105.5	104.2
2500.0	100.0		102.7		103.8	102.6
3150.0	97.6		100.1		101.4	100.5
4000.0	93.8		97.2		98.9	98.5
5000.0	90.0		94.2		96.3	96.3
6300.0	87.0		91.2		93.8	94.4
8000.0	84.6		89.3		92.0	92.7
10000.0	82.6		87.0		89.9	91.0
12500.0	80.9		85.3		88.0	89.4
16000.0	79.1		83.9		86.1	87.8
20000.0	75.9		81.6		83.9	85.7
25000.0	73.9		80.2		82.6	84.0
31500.0	71.5		78.3		80.1	81.1
40000.0	2.4		78.0		77.8	79.3
OVERALL						
ALL	109.6		111.9		113.1	111.8
						111.5
						109.4

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	7	60.0	8	67.5	9	75.0
	10	82.5	11	90.0	12	97.5
200.0	72.4		72.3		72.4	
250.0	76.3		74.4		73.0	
315.2	78.9		77.0		75.8	
400.0	82.4		79.8		77.9	
500.0	85.0		81.8		80.0	
630.0	87.4		84.6		82.2	
800.0	90.2		87.0		83.7	
1000.0	92.3		89.6		86.2	
1250.0	94.3		91.8		88.3	
1600.0	95.9		93.0		89.5	
2000.0	96.7		94.2		90.7	
2500.0	97.0		94.8		91.4	
3150.0	97.7		95.6		92.2	
4000.0	97.7		95.8		92.4	
5000.0	97.8		96.1		92.6	
6300.0	97.0		95.8		92.4	
8000.0	96.7		95.5		92.1	
10000.0	95.8		95.1		91.6	
12500.0	95.0		94.5		91.1	
16000.0	93.9		93.8		90.4	
20000.0	92.5		92.4		89.1	
25000.0	91.3		91.3		88.1	
31500.0	89.0		89.2		86.1	
40000.0	87.2		88.0		84.4	
OVERALL						
SPL	107.9		106.3		102.9	
					102.2	
						101.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.98 PSI, ATMOSPHERIC PRESSURE = 14.02 PSI
RESERVOIR TEMPERATURE = 1148.00 DEG.F, CHAMBER TEMPERATURE = 59.00 DEG.F
RELATIVE HUMIDITY = 49.0 PERCENT
GAMMA = 1.340

RUN NUMBER 167

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.355$
TEMPERATURE RATIO $TR = 3.098$
MACH NUMBER $MJ = 0.687$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 2.868$
JET DENSITY RATIO $DJ/D0 = 0.349$
JET VELOCITY RATIO $VJ/A0 = 1.163$
JET VELOCITY $VJ = 1298.8$ FPS

$TR/TJ = 1.080$
 $DR/D0 = 0.437$
 $DR/DJ = 1.255$
MASS FLOW = 0.742 POUNDS PER SECOND
THRUST = 30.40 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	69.5	71.7	75.7	71.4	70.7	69.0
250.0	72.4	72.8	75.4	71.6	72.4	72.2
315.2	74.1	74.4	76.2	75.0	75.7	75.8
400.0	77.5	77.8	78.3	77.4	77.6	77.0
500.0	80.1	79.3	79.8	80.1	79.6	78.8
630.0	82.7	82.1	82.2	82.1	82.1	82.4
800.0	85.6	85.0	83.9	83.5	83.5	83.5
1000.0	87.9	86.7	84.5	84.8	84.2	83.6
1250.0	89.6	87.9	86.5	86.5	85.9	85.2
1600.0	90.7	88.9	87.1	87.1	86.8	86.1
2000.0	91.4	90.5	87.9	88.0	87.3	87.2
2500.0	91.5	91.0	88.5	88.8	88.4	87.7
3150.0	92.0	91.1	88.8	89.4	88.6	88.0
4000.0	92.2	91.5	89.1	89.4	88.8	88.0
5000.0	91.8	91.3	88.9	89.1	88.6	87.9
6300.0	91.2	91.6	89.5	88.7	88.8	88.1
8000.0	91.4	92.0	87.1	88.5	88.1	87.1
10000.0	91.2	91.1	86.8	87.5	87.6	86.2
12500.0	90.9	89.8	85.4	87.2	87.1	85.5
16000.0	89.4	89.0	83.0	86.5	86.6	84.6
20000.0	87.4	89.2	81.9	85.7	85.7	83.7
25000.0	87.2	87.9	80.0	85.1	85.3	83.2
31500.0	86.9	88.1	78.3	84.6	85.1	83.0
40000.0	85.6	87.9	76.4	84.4	84.2	83.1
OVERALL SPL	102.8	102.5	99.2	100.0	99.7	98.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO		MICRO	
CENTER	PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE
HZ	16	127.5	7	35.3
	18	142.5	19	150.0
200.0	68.3	0.0	70.1	71.3
250.0	73.2	0.0	73.1	72.9
315.2	75.9	0.0	74.1	73.6
400.0	76.7	0.0	75.4	76.1
500.0	78.9	0.0	77.6	77.0
630.0	82.9	0.0	79.4	77.4
800.0	83.6	0.0	81.3	79.0
1000.0	84.1	0.0	82.5	80.7
1250.0	84.8	0.0	83.8	81.5
1600.0	86.0	0.0	84.4	82.6
2000.0	85.9	0.0	85.0	82.8
2500.0	87.6	0.0	85.6	83.6
3150.0	87.9	0.0	85.8	83.7
4000.0	88.3	0.0	86.2	83.6
5000.0	88.2	0.0	85.7	83.4
6300.0	88.1	0.0	85.5	83.5
8000.0	87.6	0.0	84.4	82.7
10000.0	86.9	0.0	83.3	81.7
12500.0	86.3	0.0	82.4	80.8
16000.0	85.5	0.0	81.5	79.3
20000.0	84.9	0.0	80.3	78.0
25000.0	84.1	0.0	79.5	76.8
31500.0	83.7	0.0	78.9	75.6
40000.0	83.3	0.0	78.0	74.6
OVERALL				
SPL	99.1	0.0	96.4	94.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 6.87 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1326.00 DEG.F, CHAMBER TEMPERATURE = 110.00 DEG.F
RELATIVE HUMIDITY = 23.0 PERCENT
GAMMA = 1.340

RUN NUMBER 66

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.483
TEMPERATURE RATIO TR = 3.133
MACH NUMBER MJ = 0.787
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.835
JET DENSITY RATIO DJ/D0 = 0.353
JET VELOCITY RATIO VJ/A0 = 1.324
JET VELOCITY VJ = 1550.0 FPS

TR/TJ = 1.105
DR/D0 = 0.473
DR/DJ = 1.342
MASS FLOW = 0.855 POUNDS PER SECOND
THRUST = 39.88 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	87.9	88.2	84.1	80.2	80.1	77.4
250.0	90.1	91.0	89.0	85.4	83.8	80.1
315.2	94.9	93.0	92.8	89.7	87.1	84.2
400.0	97.6	97.5	95.4	92.6	91.3	87.8
500.0	100.7	99.0	97.8	96.3	93.9	90.2
630.0	99.6	100.9	101.6	98.9	97.3	93.2
800.0	103.0	104.9	104.0	102.0	100.1	96.2
1000.0	102.4	105.1	106.2	104.8	102.8	99.2
1250.0	104.1	106.6	108.6	107.4	105.8	101.6
1600.0	104.5	107.1	109.0	108.2	107.2	103.6
2000.0	104.8	108.6	109.7	109.1	108.2	104.8
2500.0	105.4	109.2	109.6	108.6	108.0	104.6
3150.0	105.4	108.9	108.9	107.3	107.0	104.5
4000.0	103.9	107.5	107.3	105.7	105.8	104.1
5000.0	101.0	104.7	104.5	102.9	104.3	103.5
6300.0	97.7	101.9	101.7	100.8	102.5	102.5
8000.0	95.2	99.6	99.6	99.3	101.2	101.5
10000.0	93.0	97.3	97.5	97.4	99.9	100.7
12500.0	91.0	95.6	95.7	95.7	98.5	99.5
16000.0	89.3	93.9	93.9	93.9	96.9	98.2
20000.0	87.1	91.9	91.9	91.8	94.7	96.5
25000.0	85.1	90.4	90.2	90.1	92.9	95.0
31500.0	82.1	87.5	87.5	87.3	90.3	92.8
40000.0	79.9	85.0	84.6	85.1	88.0	91.3
OVERALL SPL	114.4	117.4	118.0	116.8	116.4	114.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	75.3	74.3	74.5	74.2	74.6	74.5
250.0	77.6	76.8	75.6	75.0	75.6	75.5
315.2	80.3	78.2	78.2	78.3	77.6	77.8
400.0	84.1	81.0	80.6	80.2	79.8	78.7
500.0	86.5	83.3	82.5	81.8	81.4	81.0
630.0	89.6	86.4	85.3	84.2	83.8	83.3
800.0	92.7	89.0	87.2	86.3	86.0	85.2
1000.0	95.3	91.5	89.6	88.5	87.8	86.9
1250.0	97.8	93.7	92.0	90.2	89.9	89.0
1600.0	99.5	95.3	93.2	91.7	90.8	89.7
2000.0	100.6	97.0	94.8	93.1	92.1	91.3
2500.0	100.8	97.9	95.6	94.0	92.9	91.9
3150.0	101.7	98.7	96.8	95.0	94.0	93.1
4000.0	101.8	99.5	97.6	95.6	94.6	93.6
5000.0	102.0	99.9	97.7	95.8	95.0	93.9
6300.0	101.4	99.8	97.4	95.8	94.9	94.1
8000.0	101.0	99.9	97.3	95.4	94.8	94.0
10000.0	100.5	99.5	96.8	95.3	94.5	93.9
12500.0	99.7	99.0	96.6	94.7	94.0	93.5
16000.0	98.5	98.4	96.2	93.9	93.5	93.0
20000.0	96.9	96.9	95.2	92.8	92.4	91.4
25000.0	95.4	95.9	94.6	91.8	91.5	90.5
31500.0	93.0	93.6	92.9	89.7	89.6	88.4
40000.0	91.0	92.2	91.4	87.9	88.4	86.6
OVERALL SPL	112.0	110.1	108.0	106.1	105.4	104.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 8.84 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1375.00 DEG.F, CHAMBER TEMPERATURE = 110.00 DEG.F
RELATIVE HUMIDITY = 23.0 PERCENT
GAMMA = 1.340

RUN NUMBER 67

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.622
TEMPERATURE RATIO TR = 3.219
MACH NUMBER MJ = 0.876
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.848
JET DENSITY RATIO DJ/D0 = 0.351
JET VELOCITY RATIO VJ/A0 = 1.479
JET VELOCITY VJ = 1730.4 FPS

TR/TJ = 1.131
DR/D0 = 0.504
DR/DJ = 1.434
MASS FLOW = 0.951 POUNDS PER SECOND
THRUST = 49.48 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10	ANGLE 82.5	MICRO PHONE NO. 11	ANGLE 90.0	MICRO PHONE NO. 12	ANGLE 97.5	MICRO PHONE NO. 13	ANGLE 105.0	MICRO PHONE NO. 14	ANGLE 112.5	MICRO PHONE NO. 15	ANGLE 120.0
200.0	71.5		73.6		75.1		73.9		72.8		71.0	
250.0	74.9		74.7		74.4		73.4		73.3		73.7	
315.2	76.0		76.1		76.3		76.1		76.8		77.2	
400.0	79.4		79.5		78.7		79.0		79.3		79.4	
500.0	82.4		81.5		80.8		81.6		81.6		81.0	
630.0	85.0		84.1		83.7		84.3		84.4		84.9	
800.0	87.4		86.8		86.2		85.5		85.3		85.8	
1000.0	89.8		88.9		87.3		86.5		85.9		86.1	
1250.0	92.2		90.6		88.6		88.7		88.1		87.2	
1600.0	93.5		91.0		89.9		89.5		88.8		88.4	
2000.0	94.4		92.8		91.2		90.7		89.6		89.2	
2500.0	94.9		93.5		91.8		91.4		90.8		90.1	
3150.0	95.5		94.0		92.2		92.1		91.4		90.7	
4000.0	95.9		94.5		92.6		92.4		91.6		90.9	
5000.0	95.7		94.4		92.8		92.3		91.7		91.0	
6300.0	95.6		95.0		92.7		92.5		91.9		91.2	
8000.0	95.5		95.4		91.5		92.1		91.4		90.4	
10000.0	95.7		95.0		90.5		91.5		90.8		89.8	
12500.0	95.6		93.6		90.0		90.8		90.3		89.1	
16000.0	94.2		92.7		87.9		90.2		89.5		88.3	
20000.0	92.5		93.1		86.8		89.4		88.6		87.6	
25000.0	92.0		91.9		85.1		88.8		88.2		87.2	
31500.0	91.7		91.9		83.5		88.3		87.8		86.9	
40000.0	90.6		91.7		81.8		88.1		86.9		86.9	
OVERALL SPL	106.6		105.7		102.7		103.1		102.5		101.8	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 7 ANGLE 35.3	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	70.0	0.0	71.0	72.2
250.0	74.2	0.0	74.3	74.2
315.2	77.2	0.0	75.1	74.7
400.0	77.8	0.0	76.4	77.5
500.0	80.5	0.0	78.9	78.4
630.0	84.8	0.0	80.8	78.5
800.0	85.8	0.0	82.8	80.4
1000.0	85.9	0.0	84.0	82.2
1250.0	86.5	0.0	85.6	83.3
1600.0	87.6	0.0	86.3	84.4
2000.0	89.0	0.0	87.4	85.1
2500.0	89.7	0.0	88.1	85.9
3150.0	89.9	0.0	88.4	86.4
4000.0	90.5	0.0	88.9	86.5
5000.0	90.3	0.0	88.7	86.3
6300.0	90.5	0.0	88.4	86.4
8000.0	90.1	0.0	87.6	85.7
10000.0	89.5	0.0	86.6	84.7
12500.0	88.8	0.0	85.6	83.8
16000.0	88.1	0.0	85.0	82.3
20000.0	87.3	0.0	83.7	80.8
25000.0	86.6	0.0	83.0	79.4
31500.0	86.0	0.0	82.3	78.4
40000.0	85.3	0.0	81.4	77.2
OVERALL SPL	101.3	0.0	99.1	96.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 8.84 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1375.00 DEG.F, CHAMBER TEMPERATURE = 110.00 DEG.F
RELATIVE HUMIDITY = 23.0 PERCENT
GAMMA = 1.340

RUN NUMBER 67

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.622
TEMPERATURE RATIO TR = 3.219
MACH NUMBER MJ = 0.876
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.848
JET DENSITY RATIO DJ/D0 = 0.351
JET VELOCITY RATIO VJ/A0 = 1.479
JET VELOCITY VJ = 1730.4 FPS

TR/TJ = 1.131
DR/D0 = 0.504
DR/DJ = 1.434
MASS FLOW = 0.951 POUNDS PER SECOND
THRUST = 49.48 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	90.2	88.8	86.2	81.8	80.9	79.6
250.0	92.6	91.9	92.2	88.2	85.7	82.0
315.2	97.2	94.8	94.2	90.6	87.6	85.1
400.0	100.2	99.6	97.8	94.5	92.9	89.0
500.0	103.1	101.8	100.0	97.5	95.3	91.6
630.0	101.9	103.3	103.3	100.5	98.9	95.2
800.0	105.6	106.7	106.5	104.1	102.0	98.2
1000.0	104.8	106.7	108.7	107.1	105.1	101.3
1250.0	106.1	108.4	110.1	109.3	107.6	103.6
1600.0	106.8	108.8	110.8	110.4	109.8	105.7
2000.0	107.6	109.8	111.7	111.7	111.3	107.2
2500.0	108.4	111.0	113.2	112.1	111.8	107.9
3150.0	108.9	111.7	113.5	111.9	111.1	107.7
4000.0	108.5	111.7	113.1	111.0	110.2	107.0
5000.0	106.3	109.8	111.0	108.9	108.7	106.3
6300.0	103.9	107.8	108.7	106.7	107.2	105.3
8000.0	101.5	105.7	107.0	105.0	106.0	104.0
10000.0	99.6	102.8	104.0	102.7	104.5	103.0
12500.0	96.9	101.4	103.5	101.3	103.5	102.1
16000.0	94.9	99.4	101.7	99.7	102.0	100.8
20000.0	92.3	97.3	99.9	97.5	100.0	99.2
25000.0	89.9	95.3	98.3	95.4	97.9	97.6
31500.0	87.4	93.1	96.4	93.0	95.5	95.5
40000.0	85.3	91.6	94.5	90.9	93.2	93.9
OVERALL SPL	117.7	120.2	121.8	120.4	120.0	116.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	77.2	75.8	75.4	74.2	75.1	74.2
250.0	80.6	78.1	77.3	76.6	77.4	76.8
315.2	81.6	79.8	79.0	79.0	78.6	77.6
400.0	85.6	83.6	81.8	81.2	81.4	80.1
500.0	87.8	85.5	83.2	81.9	82.3	81.4
630.0	91.1	88.1	86.5	85.4	84.8	83.9
800.0	94.2	90.9	88.6	87.4	87.3	86.8
1000.0	97.0	93.3	91.4	89.5	88.6	88.1
1250.0	99.3	95.4	93.0	91.6	90.4	89.8
1600.0	101.2	97.3	94.7	92.8	92.0	90.8
2000.0	102.6	99.1	96.4	94.2	93.3	92.3
2500.0	103.7	100.6	97.8	95.4	94.6	93.6
3150.0	104.3	101.5	98.5	96.5	95.6	94.6
4000.0	104.6	102.0	99.5	97.2	96.0	95.1
5000.0	104.9	102.6	99.8	97.4	96.4	95.4
6300.0	104.7	102.7	99.6	97.6	96.7	95.8
8000.0	104.3	102.7	99.5	97.5	96.7	95.9
10000.0	103.7	102.2	98.9	97.2	96.4	96.0
12500.0	102.9	101.7	98.5	96.8	95.8	95.3
16000.0	102.0	101.1	98.3	96.1	95.5	94.9
20000.0	100.6	99.6	97.4	95.0	94.4	93.7
25000.0	99.2	98.2	96.6	93.6	93.3	92.4
31500.0	96.8	96.3	95.0	91.7	91.7	90.6
40000.0	94.9	94.7	93.2	89.7	90.6	88.8
OVERALL SPL	114.8	112.7	110.0	107.8	107.0	106.2

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 8.71 PSI, ATMOSPHERIC PRESSURE = 14.02 PSI
RESERVOIR TEMPERATURE = 1225.00 DEG.F, CHAMBER TEMPERATURE = 59.00 DEG.F
RELATIVE HUMIDITY = 49.0 PERCENT
GAMMA = 1.340

RUN NUMBER 169

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.621
TEMPERATURE RATIO TR = 3.247
MACH NUMBER MJ = 0.876
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.872
JET DENSITY RATIO DJ/D0 = 0.348
JET VELOCITY RATIO VJ/A0 = 1.484
JET VELOCITY VJ = 1657.7 FPS

TR/TJ = 1.130
DR/D0 = 0.499
DR/DJ = 1.434
MASS FLOW = 0.946 POUNDS PER SECOND
THRUST = 49.46 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE	
	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
	10	82.5	11	90.0	12	97.5	13	105.0	14	112.5	15	120.0
200.0	73.6		75.5		76.3		75.5		74.7		73.0	
250.0	76.6		76.5		76.1		74.5		74.7		74.8	
315.2	77.8		78.3		77.7		77.9		78.1		78.1	
400.0	81.0		80.7		80.5		80.5		81.4		80.7	
500.0	84.4		83.2		83.5		83.5		83.6		83.0	
630.0	86.5		85.6		86.3		85.9		86.6		86.7	
800.0	88.7		88.6		88.6		87.1		87.2		88.1	
1000.0	91.2		90.5		89.4		88.1		87.4		87.5	
1250.0	93.8		92.6		90.8		90.1		89.6		88.7	
1600.0	95.5		93.2		92.2		91.0		90.0		89.9	
2000.0	96.6		94.7		93.3		92.4		91.7		90.8	
2500.0	97.1		95.9		94.4		93.3		93.0		91.7	
3150.0	97.6		96.3		95.1		94.1		93.3		92.6	
4000.0	98.2		97.0		95.5		94.5		93.9		92.9	
5000.0	98.1		97.1		95.8		94.5		94.0		93.0	
6300.0	98.3		97.7		96.1		94.8		94.3		93.7	
8000.0	98.3		98.2		95.4		94.3		93.8		92.9	
10000.0	98.5		98.1		94.8		93.9		93.4		92.3	
12500.0	98.5		97.0		95.0		93.6		93.1		91.8	
16000.0	97.3		95.8		93.6		92.8		92.3		91.1	
20000.0	95.7		96.3		93.4		92.1		91.5		90.4	
25000.0	95.2		95.5		92.9		91.7		91.1		90.1	
31500.0	94.8		95.3		92.7		91.1		90.8		89.9	
40000.0	93.6		95.1		92.3		90.9		89.9		89.9	
OVERALL SPL	109.2		108.5		106.5		105.4		104.9		104.0	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO		MICRO	
CENTER	PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE
HZ	16	127.5	7	35.3
	18	142.5	19	150.0
200.0	70.9	0.0	72.1	72.8
250.0	75.3	0.0	75.3	76.0
315.2	78.6	0.0	76.8	76.6
400.0	79.6	0.0	78.5	79.4
500.0	82.8	0.0	80.9	80.3
630.0	87.4	0.0	83.2	80.2
800.0	87.8	0.0	84.9	81.5
1000.0	87.7	0.0	85.6	84.1
1250.0	88.2	0.0	87.8	85.0
1600.0	89.3	0.0	88.3	86.3
2000.0	90.7	0.0	89.6	86.8
2500.0	91.4	0.0	90.3	88.0
3150.0	92.1	0.0	90.4	88.6
4000.0	92.6	0.0	91.2	88.9
5000.0	92.7	0.0	90.9	88.8
6300.0	92.8	0.0	90.8	89.0
8000.0	92.7	0.0	90.1	88.5
10000.0	92.1	0.0	89.1	87.4
12500.0	91.5	0.0	88.2	86.5
16000.0	90.9	0.0	87.4	85.0
20000.0	90.1	0.0	86.3	83.4
25000.0	89.5	0.0	85.6	82.1
31500.0	88.8	0.0	84.9	80.3
40000.0	88.1	0.0	84.0	79.5
OVERALL				
SPL	103.6	0.0	101.4	99.2

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.34 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1475.00 DEG.F, CHAMBER TEMPERATURE = 109.00 DEG.F
RELATIVE HUMIDITY = 26.0 PERCENT
GAMMA = 1.330

RUN NUMBER 97

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.024
TEMPERATURE RATIO TR = 3.401
MACH NUMBER MJ = 0.189
JET STATIC TEMPERATURE RATIO TJ/TO = 3.381
JET DENSITY RATIO DJ/DO = 0.296
JET VELOCITY RATIO VJ/A0 = 0.347
JET VELOCITY VJ = 405.9 FPS

TR/TJ = 1.006
DR/DO = 0.301
DR/DJ = 1.018
MASS FLOW = 0.188 POUNDS PER SECOND
THRUST = 2.30 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	62.0		63.9		62.1	63.2
250.0	64.7		67.6		67.3	66.5
315.2	65.9		68.4		67.8	67.4
400.0	68.1		70.7		68.5	69.0
500.0	67.4		68.0		67.6	66.8
630.0	63.5		67.2		66.9	67.0
800.0	64.3		67.3		66.9	66.6
1000.0	62.3		65.6		65.9	67.0
1250.0	61.4		64.1		65.6	65.9
1600.0	59.2		61.4		63.2	63.9
2000.0	57.9		59.5		61.1	62.8
2500.0	56.5		56.8		58.6	60.8
3150.0	55.5		54.8		57.1	59.5
4000.0	55.6		54.5		55.1	57.6
5000.0	56.2		54.5		53.6	55.7
6300.0	56.4		52.8		52.5	55.1
8000.0	57.8		51.6		51.6	53.7
10000.0	58.1		49.4		50.8	53.1
12500.0	59.1		49.3		50.1	51.6
16000.0	59.9		49.4		49.6	51.0
20000.0	60.6		47.0		47.9	48.8
25000.0	62.0		45.5		46.4	46.8
31500.0	63.5		44.9		45.4	44.3
40000.0	66.2		46.3		46.5	44.4
OVERALL						
SPL	76.4		77.4		76.9	77.1
					76.9	77.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	60.7	60.5	60.9	61.0	60.6	60.9
250.0	62.2	62.6	61.3	61.0	61.4	60.8
315.2	60.6	62.6	61.6	62.0	60.9	61.7
400.0	62.7	63.8	63.6	63.6	62.1	62.1
500.0	62.4	62.2	61.0	60.3	60.0	58.4
630.0	62.4	62.2	61.6	60.8	60.2	59.9
800.0	63.0	62.6	62.0	61.5	60.5	60.2
1000.0	63.1	62.7	62.2	61.9	61.3	60.1
1250.0	62.5	62.8	62.2	61.7	60.8	60.5
1600.0	61.8	61.9	61.4	60.8	60.4	59.8
2000.0	61.3	61.8	61.0	60.6	60.1	59.4
2500.0	61.6	61.1	60.5	60.4	59.9	59.6
3150.0	61.8	61.2	60.4	60.1	59.8	59.6
4000.0	61.6	60.8	60.1	59.5	59.3	59.4
5000.0	61.2	59.9	59.2	58.8	58.9	59.1
6300.0	61.7	59.7	58.9	59.0	58.8	58.9
8000.0	61.9	59.4	58.4	59.1	58.8	58.7
10000.0	62.4	58.9	57.9	58.5	58.4	58.7
12500.0	62.9	58.4	57.5	58.2	58.0	58.7
16000.0	63.5	58.0	57.3	57.5	57.7	58.3
20000.0	63.6	56.3	55.8	55.7	55.9	56.8
25000.0	64.9	54.5	54.2	53.4	54.1	55.2
31500.0	65.8	51.6	51.4	50.1	51.2	52.7
40000.0	68.2	49.6	49.0	47.7	49.2	51.2
OVERALL SPL	76.9	74.6	73.9	73.7	73.2	73.1

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.34 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1318.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 59.0 PERCENT
GAMMA = 1.330

RUN NUMBER 228

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.024$
TEMPERATURE RATIO $TR = 3.419$
MACH NUMBER $MJ = 0.189$
JET STATIC TEMPERATURE RATIO $TJ/TO = 3.399$
JET DENSITY RATIO $DJ/DO = 0.294$
JET VELOCITY RATIO $VJ/A0 = 0.349$
JET VELOCITY $VJ = 389.6$ FPS

$TR/TJ = 1.006$
 $DR/DO = 0.299$
 $DR/DJ = 1.018$
MASS FLOW = 0.188 POUNDS PER SECOND
THRUST = 2.30 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10	ANGLE 82.5	MICRO PHONE NO. 11	ANGLE 90.0	MICRO PHONE NO. 12	ANGLE 97.5	MICRO PHONE NO. 13	ANGLE 105.0	MICRO PHONE NO. 14	ANGLE 112.5	MICRO PHONE NO. 15	ANGLE 120.0
200.0	53.3		56.5		57.6		56.8		57.0		55.2	
250.0	58.2		58.2		57.2		57.0		57.5		57.2	
315.2	61.0		61.3		60.7		60.0		60.1		60.2	
400.0	62.6		62.2		61.9		61.7		60.2		60.7	
500.0	61.9		62.3		61.5		61.0		60.2		59.7	
630.0	61.7		61.3		61.0		60.8		61.2		60.1	
800.0	63.2		63.8		62.8		62.0		60.9		60.6	
1000.0	63.6		63.8		63.1		62.4		61.0		60.9	
1250.0	62.4		62.8		62.8		61.7		60.6		59.8	
1600.0	61.0		61.9		61.4		60.1		58.8		58.5	
2000.0	59.7		61.0		60.7		59.7		58.7		58.1	
2500.0	58.8		60.5		59.9		59.6		58.8		58.1	
3150.0	58.0		59.5		59.9		59.7		58.7		58.2	
4000.0	57.7		59.2		59.9		59.2		58.7		57.7	
5000.0	56.8		59.1		59.4		58.9		58.5		57.5	
6300.0	56.9		59.2		59.2		58.8		58.8		57.7	
8000.0	57.2		59.5		58.2		58.4		57.8		56.9	
10000.0	57.9		59.4		58.9		58.4		57.4		56.3	
12500.0	57.7		58.4		58.2		57.7		57.3		56.0	
16000.0	56.6		57.9		57.1		57.2		56.5		55.5	
20000.0	55.4		58.1		57.2		56.4		55.9		54.9	
25000.0	53.7		56.0		55.6		55.2		53.8		53.8	
31500.0	53.4		55.1		54.7		54.1		52.6		52.5	
40000.0	51.4		54.3		53.6		53.9		51.7		52.6	
OVERALL SPL	73.3		74.1		73.7		73.2		72.4		71.9	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	56.7	58.7	57.1	57.9
250.0	57.2	58.0	57.4	57.6
315.2	60.5	60.5	58.4	57.9
400.0	61.2	61.8	60.5	59.5
500.0	61.3	60.8	59.6	58.9
630.0	60.8	60.5	59.4	58.6
800.0	61.3	61.3	59.0	58.7
1000.0	61.6	60.9	59.8	58.1
1250.0	60.1	59.7	57.8	56.0
1600.0	59.0	57.8	55.6	53.7
2000.0	58.6	57.9	54.7	52.2
2500.0	58.2	57.3	54.3	51.4
3150.0	58.2	57.3	53.8	50.5
4000.0	58.1	56.9	53.6	49.6
5000.0	58.0	56.3	52.6	48.1
6300.0	57.8	56.3	52.1	47.3
8000.0	56.9	55.1	50.6	45.2
10000.0	55.8	54.4	49.9	43.2
12500.0	55.7	52.9	47.9	41.5
16000.0	55.2	52.3	47.3	41.9
20000.0	55.1	51.5	48.5	45.9
25000.0	52.6	49.6	43.3	38.2
31500.0	51.1	48.3	41.7	39.4
40000.0	50.2	48.1	42.3	44.7
OVERALL SPL	72.3	71.7	69.6	68.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.46 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1475.00 DEG.F, CHAMBER TEMPERATURE = 112.00 DEG.F
RELATIVE HUMIDITY = 24.0 PERCENT
GAMMA = 1.330

RUN NUMBER 98

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_R = 1.032$
TEMPERATURE RATIO $T_R = 3.383$
MACH NUMBER $M_J = 0.219$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 3.356$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.298$
JET VELOCITY RATIO $V_J/A_0 = 0.402$
JET VELOCITY $V_J = 470.9$ FPS

$T_R/T_J = 1.008$
 $\rho_R/\rho_0 = 0.305$
 $\rho_R/\rho_J = 1.024$
MASS FLOW = 0.219 POUNDS PER SECOND
THRUST = 3.10 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	66.0	64.6	63.9	62.5	61.8	59.5
250.0	68.0	68.9	68.4	65.7	64.8	63.2
315.2	70.8	70.1	71.5	68.6	67.2	62.8
400.0	72.2	73.6	71.9	70.5	68.7	63.9
500.0	72.9	72.0	71.9	70.1	69.2	65.9
630.0	69.0	71.2	71.6	70.5	69.0	66.7
800.0	70.1	71.4	71.0	70.3	69.8	65.6
1000.0	66.7	69.4	70.4	69.8	69.3	67.0
1250.0	65.0	68.1	69.8	69.6	69.2	67.2
1600.0	61.9	65.6	67.2	67.6	68.2	66.3
2000.0	59.3	63.4	65.6	66.1	67.3	66.1
2500.0	55.9	61.0	62.8	64.4	66.4	65.4
3150.0	52.9	58.3	60.8	62.8	65.6	65.5
4000.0	54.1	57.8	58.5	61.0	64.4	64.5
5000.0	53.8	57.9	57.0	59.3	62.9	64.0
6300.0	52.9	56.1	55.7	57.9	62.1	63.6
8000.0	53.5	55.1	55.0	57.0	61.0	64.0
10000.0	52.4	52.1	54.2	56.0	60.0	63.1
12500.0	51.5	51.9	53.1	55.1	59.6	63.1
16000.0	51.3	51.7	53.0	54.5	59.2	63.0
20000.0	48.0	49.8	51.3	52.6	58.1	63.0
25000.0	45.6	48.0	49.7	50.8	57.6	64.2
31500.0	46.3	47.0	47.9	48.0	57.4	65.0
40000.0	49.3	48.2	48.9	46.6	59.6	67.8
OVERALL SPL	79.5	80.5	80.7	79.7	79.7	78.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	7	60.0	8	67.5	9	75.0
	10	82.5	11	90.0	12	97.5
200.0	59.2		60.2		60.3	59.7
250.0	61.0		62.1		59.8	60.8
315.2	62.4		62.2		61.4	61.6
400.0	64.5		65.1		63.8	63.9
500.0	64.9		65.2		63.8	62.7
630.0	65.0		65.2		64.0	63.5
800.0	66.2		65.8		64.9	64.2
1000.0	66.1		66.0		65.0	64.7
1250.0	66.6		66.3		65.6	65.0
1600.0	65.3		65.6		64.7	64.0
2000.0	65.3		65.7		64.6	64.2
2500.0	64.9		65.0		63.7	63.4
3150.0	65.1		64.8		63.7	63.5
4000.0	64.7		64.7		63.3	62.9
5000.0	64.3		63.5		62.5	62.4
6300.0	64.0		63.0		61.8	62.5
8000.0	63.6		62.7		61.5	62.3
10000.0	63.5		62.1		61.0	61.6
12500.0	63.4		62.0		60.8	61.7
16000.0	63.5		61.4		60.6	61.1
20000.0	62.9		60.1		59.4	59.7
25000.0	62.4		58.7		58.1	58.1
31500.0	61.8		55.9		55.6	55.4
40000.0	62.8		53.9		53.0	53.1
						54.0
OVERALL						
SPL	78.0		77.5		76.4	76.2
						75.9
						75.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.45 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1330.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 60.0 PERCENT
GAMMA = 1.330

RUN NUMBER 229

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.032
TEMPERATURE RATIO TR = 3.442
MACH NUMBER MJ = 0.217
JET STATIC TEMPERATURE RATIO TJ/T0 = 3.416
JET DENSITY RATIO DJ/D0 = 0.293
JET VELOCITY RATIO VJ/A0 = 0.401
JET VELOCITY VJ = 448.6 FPS

TR/TJ = 1.008
DR/D0 = 0.300
DR/DJ = 1.024
MASS FLOW = 0.215 POUNDS PER SECOND
THRUST = 3.04 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	56.0	57.7	60.1	59.3	58.7	57.0
250.0	59.2	60.4	59.6	59.7	59.6	59.5
315.2	62.6	62.7	62.8	63.3	62.5	62.4
400.0	65.0	64.5	63.6	63.8	64.2	62.4
500.0	65.6	64.0	64.3	64.0	63.5	62.8
630.0	65.8	64.4	64.4	64.8	64.2	63.5
800.0	67.0	65.8	65.7	64.9	64.7	64.3
1000.0	66.9	65.7	66.0	65.6	65.0	64.6
1250.0	66.4	65.7	65.6	65.5	64.5	63.7
1600.0	65.0	64.5	64.8	64.5	63.9	62.5
2000.0	64.2	63.7	64.3	64.0	63.3	62.5
2500.0	63.2	62.8	63.4	63.5	63.0	62.4
3150.0	62.9	62.4	63.1	63.1	62.5	62.2
4000.0	62.2	62.2	62.8	62.7	62.5	61.8
5000.0	60.9	61.6	62.7	62.2	62.2	61.5
6300.0	61.0	62.2	62.8	62.4	62.2	61.9
8000.0	61.0	62.5	61.5	61.7	61.5	60.8
10000.0	61.5	62.1	61.7	61.2	60.9	61.0
12500.0	61.9	61.0	62.2	61.1	60.7	60.2
16000.0	60.7	60.7	61.0	60.6	60.0	59.6
20000.0	59.3	61.0	61.5	60.2	59.5	59.0
25000.0	59.0	59.3	60.7	59.5	58.4	58.6
31500.0	58.8	59.1	60.1	58.8	57.3	58.2
40000.0	57.2	58.4	59.3	58.4	56.0	58.0
OVERALL SPL	77.0	76.6	76.9	76.6	76.1	75.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. ANGLE	NO. ANGLE	NO. ANGLE	NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	57.3	58.3	58.3	59.6
250.0	60.5	60.1	59.2	59.2
315.2	62.6	61.6	60.2	60.4
400.0	63.0	62.5	63.6	61.8
500.0	63.2	63.0	63.0	61.9
630.0	63.7	63.0	63.0	62.0
800.0	64.2	63.7	62.3	62.4
1000.0	64.3	63.7	62.6	61.8
1250.0	63.6	62.4	61.7	59.7
1600.0	62.1	61.0	60.0	58.2
2000.0	62.1	60.8	59.4	57.1
2500.0	61.7	60.3	58.5	56.3
3150.0	61.3	60.3	58.2	55.5
4000.0	61.5	59.8	57.9	54.1
5000.0	60.9	58.9	56.7	52.5
6300.0	60.8	59.2	56.4	51.8
8000.0	60.1	58.4	54.9	49.7
10000.0	60.2	58.2	54.9	47.8
12500.0	59.4	56.8	52.4	46.4
16000.0	58.7	55.9	51.4	45.3
20000.0	58.3	54.7	51.1	46.7
25000.0	57.2	53.2	48.2	42.3
31500.0	56.0	51.9	46.7	42.1
40000.0	55.2	51.3	45.9	45.1
OVERALL SPL	75.2	74.1	73.0	71.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.71 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1480.00 DEG.F, CHAMBER TEMPERATURE = 114.00 DEG.F
RELATIVE HUMIDITY = 24.0 PERCENT
GAMMA = 1.330

RUN NUMBER 100

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.050$
TEMPERATURE RATIO $TR = 3.380$
MACH NUMBER $MJ = 0.272$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 3.339$
JET DENSITY RATIO $DJ/D0 = 0.299$
JET VELOCITY RATIO $VJ/A0 = 0.496$
JET VELOCITY $VJ = 582.6$ FPS

$TR/TJ = 1.012$
 $DR/D0 = 0.311$
 $DR/DJ = 1.037$
MASS FLOW = 0.272 POUNDS PER SECOND
THRUST = 4.75 POUNDS

SHOCK CELL LENGTH $S = 0.006$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. Hz	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	69.8	69.6	68.2	67.3	66.3	64.9
250.0	71.8	73.1	72.3	70.6	68.8	67.2
315.2	75.7	75.0	75.6	73.4	71.2	70.0
400.0	77.8	78.9	77.1	75.5	74.5	72.5
500.0	79.6	78.6	78.6	76.9	75.6	73.4
630.0	76.8	79.0	79.6	77.6	76.3	74.4
800.0	77.8	-20.0	79.4	77.8	76.6	74.8
1000.0	74.1	76.5	78.9	77.8	77.0	75.7
1250.0	72.7	75.8	77.9	77.2	76.8	76.0
1600.0	69.4	73.2	75.5	75.8	75.4	75.0
2000.0	66.5	70.8	73.4	74.8	75.0	74.6
2500.0	63.2	67.9	71.0	72.9	73.6	73.7
3150.0	60.1	65.4	68.7	71.4	72.3	72.9
4000.0	59.6	64.0	66.2	69.3	71.0	72.1
5000.0	59.2	62.9	64.5	67.3	69.1	70.5
6300.0	57.4	61.6	61.8	64.7	66.6	70.1
8000.0	57.5	60.2	61.3	64.2	66.4	68.5
10000.0	56.0	58.1	60.1	62.9	65.2	67.2
12500.0	54.5	57.4	59.2	62.1	64.5	66.3
16000.0	53.0	57.1	58.2	61.2	63.7	65.5
20000.0	50.9	55.8	56.8	59.6	62.4	64.4
25000.0	48.9	54.5	55.3	58.7	61.7	64.3
31500.0	47.9	52.1	52.8	57.0	59.9	61.5
40000.0	49.6	51.0	51.9	56.7	58.3	62.0
OVERALL SPL	85.9	86.3	87.7	86.8	86.3	85.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 7 ANGLE 60.0	NO. 8 ANGLE 67.5	NO. 9 ANGLE 75.0	NO. 10 ANGLE 82.5	NO. 11 ANGLE 90.0	NO. 12 ANGLE 97.5
200.0	63.6	63.2	62.8	63.6	63.0	63.2
250.0	66.1	64.5	62.9	62.9	63.3	63.2
315.2	67.5	65.6	64.9	65.4	64.2	64.8
400.0	70.5	67.8	67.1	66.4	65.4	65.0
500.0	71.8	69.0	68.7	68.3	67.6	66.5
630.0	73.0	71.2	70.1	69.6	68.6	68.0
800.0	73.8	71.7	70.8	70.2	69.0	68.3
1000.0	74.1	72.2	71.8	70.9	69.7	69.2
1250.0	74.9	72.9	72.2	71.3	70.4	69.9
1600.0	74.3	72.3	71.8	70.7	70.2	69.3
2000.0	73.9	72.4	71.9	70.8	70.3	69.5
2500.0	73.1	71.7	71.2	70.7	69.9	69.2
3150.0	72.7	71.6	71.0	70.6	69.8	69.0
4000.0	72.2	71.6	70.2	69.9	69.1	68.8
5000.0	71.1	70.7	69.7	69.3	68.5	68.5
6300.0	71.0	70.0	69.7	69.6	68.7	68.3
8000.0	69.9	69.6	68.6	69.0	68.0	68.2
10000.0	69.2	68.8	68.0	68.3	67.6	68.0
12500.0	68.6	68.4	67.7	67.9	67.4	68.1
16000.0	68.0	68.2	67.9	67.1	67.2	67.9
20000.0	67.2	67.3	67.1	65.8	66.2	67.1
25000.0	66.4	66.2	66.6	64.7	65.4	66.1
31500.0	64.4	64.1	64.8	62.5	63.5	64.1
40000.0	62.6	62.5	62.7	60.4	62.0	62.1
OVERALL SPL	85.0	83.6	83.0	82.4	81.7	81.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 0.71 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1342.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 60.0 PERCENT
GAMMA = 1.330

RUN NUMBER 230

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.050$
TEMPERATURE RATIO $TR = 3.465$
MACH NUMBER $MJ = 0.272$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 3.424$
JET DENSITY RATIO $DJ/D_0 = 0.292$
JET VELOCITY RATIO $VJ/A_0 = 0.503$
JET VELOCITY $VJ = 562.3$ FPS

$TR/TJ = 1.012$
 $DR/D_0 = 0.303$
 $DR/DJ = 1.037$
MASS FLOW = 0.269 POUNDS PER SECOND
THRUST = 4.76 POUNDS

SHOCK CELL LENGTH 'S' = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	57.7	59.7	61.6	60.7	60.6	59.9
250.0	62.2	63.0	61.6	62.8	62.5	62.7
315.2	65.4	65.0	66.5	65.2	64.7	65.9
400.0	67.7	67.6	67.0	66.5	65.9	66.2
500.0	69.4	68.5	67.2	67.1	66.5	66.7
630.0	70.2	69.0	68.1	68.0	67.5	67.8
800.0	71.6	70.8	69.4	69.0	68.5	68.4
1000.0	72.1	70.9	70.2	69.7	69.0	68.6
1250.0	71.8	70.5	70.0	69.5	69.5	68.3
1600.0	71.2	70.7	69.5	69.0	68.9	67.6
2000.0	70.7	70.4	69.4	69.0	68.8	67.9
2500.0	69.9	69.6	68.6	68.4	68.3	67.4
3150.0	69.3	69.1	68.2	68.5	68.0	67.1
4000.0	68.8	68.3	68.1	67.9	68.1	66.8
5000.0	67.9	67.7	67.9	67.4	68.1	66.4
6300.0	67.8	68.3	67.8	67.7	68.2	67.0
8000.0	67.4	68.4	66.5	66.9	67.4	66.0
10000.0	67.9	68.2	66.7	66.8	66.5	65.9
12500.0	68.1	67.1	66.4	66.5	66.6	65.1
16000.0	66.8	66.5	64.9	65.7	66.1	64.4
20000.0	65.5	67.1	65.3	65.2	65.8	64.3
25000.0	65.9	65.7	64.9	64.5	65.1	64.0
31500.0	66.3	65.9	64.7	64.2	64.7	64.0
40000.0	65.4	65.6	64.4	64.4	64.0	64.1
OVERALL SPL	82.5	82.1	81.2	81.0	80.9	80.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0	60.2		60.4		61.0		61.0		
250.0	63.8		62.5		63.0		62.0		
315.2	65.6		65.0		64.0		63.4		
400.0	66.1		65.7		65.3		64.9		
500.0	66.7		66.0		65.8		64.9		
630.0	68.4		66.6		65.8		65.7		
800.0	68.8		68.0		66.1		65.8		
1000.0	68.7		67.2		66.2		65.6		
1250.0	68.5		67.6		65.0		64.3		
1600.0	67.7		66.1		63.8		63.4		
2000.0	67.7		66.5		64.5		62.4		
2500.0	67.5		66.1		63.7		61.6		
3150.0	67.1		66.1		62.8		61.1		
4000.0	66.8		65.6		63.0		60.0		
5000.0	66.2		64.4		61.7		58.5		
6300.0	66.1		64.6		61.2		57.8		
8000.0	65.3		63.9		59.9		56.0		
10000.0	64.9		63.5		58.9		55.1		
12500.0	64.0		62.0		57.7		53.0		
16000.0	63.4		60.9		56.6		51.7		
20000.0	62.9		59.8		55.7		51.1		
25000.0	62.0		58.6		54.0		49.0		
31500.0	61.6		57.8		52.9		47.9		
40000.0	61.3		57.5		52.2		48.0		
OVERALL									
SPL	79.9		78.6		76.6		75.5		

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.02 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1445.00 DEG.F, CHAMBER TEMPERATURE = 117.00 DEG.F
RELATIVE HUMIDITY = 24.0 PERCENT
GAMMA = 1.330

RUN NUMBER 101

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.072$
TEMPERATURE RATIO $TR = 3.302$
MACH NUMBER $MJ = 0.324$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 3.245$
JET DENSITY RATIO $DJ/D_0 = 0.308$
JET VELOCITY RATIO $VJ/A_0 = 0.584$
JET VELOCITY $VJ = 687.6$ FPS

$TR/TJ = 1.017$
 $DR/D_0 = 0.325$
 $DR/DJ = 1.053$
MASS FLOW = 0.329 POUNDS PER SECOND
THRUST = 6.77 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	73.9	73.3	72.2	71.5	69.8	68.4
250.0	76.5	77.0	77.1	76.1	74.1	71.5
315.2	79.5	79.3	80.4	78.7	76.1	74.3
400.0	82.0	83.1	81.3	80.4	78.4	76.4
500.0	83.8	83.5	82.7	82.2	80.1	77.2
630.0	81.9	84.1	84.5	84.1	82.2	80.0
800.0	84.1	85.8	85.1	84.8	83.5	81.2
1000.0	80.9	83.5	84.9	84.4	82.8	80.8
1250.0	79.2	82.5	84.2	84.2	83.1	81.0
1600.0	75.8	79.3	81.3	82.5	82.0	80.7
2000.0	73.0	77.0	79.4	81.2	81.1	80.4
2500.0	69.6	74.8	77.1	79.5	79.7	79.5
3150.0	66.6	72.1	74.7	77.6	78.2	78.8
4000.0	65.2	70.3	72.0	75.5	76.9	77.7
5000.0	64.0	68.5	69.6	73.2	75.2	75.7
6300.0	60.2	66.8	67.6	71.7	73.2	74.4
8000.0	61.6	65.2	65.5	69.9	72.1	72.6
10000.0	57.6	62.9	64.9	68.3	70.7	71.6
12500.0	58.0	61.2	62.0	67.1	69.6	70.4
16000.0	57.6	60.4	61.5	66.2	68.5	69.3
20000.0	55.6	57.9	60.1	64.6	66.9	68.3
25000.0	53.6	55.7	58.5	63.0	65.7	67.8
31500.0	53.4	54.8	57.2	60.9	63.9	65.9
40000.0	54.9	55.5	57.6	59.3	61.8	65.6
OVERALL SPL	91.0	92.6	93.1	93.1	92.1	90.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	67.1	66.3	67.6	66.4	66.4	66.1
250.0	70.3	69.0	68.1	67.9	67.7	66.5
315.2	72.2	70.2	69.4	69.4	68.3	68.4
400.0	74.7	72.8	71.2	70.2	68.8	68.6
500.0	75.9	73.8	72.6	71.0	70.5	69.4
630.0	78.1	75.6	73.9	73.1	72.5	71.4
800.0	79.1	76.8	75.6	74.3	73.6	72.9
1000.0	79.7	77.6	76.5	75.5	74.4	73.5
1250.0	80.5	78.2	77.2	76.1	75.6	74.4
1600.0	80.0	77.9	77.2	75.9	75.5	74.2
2000.0	79.9	78.3	77.1	76.2	75.4	74.5
2500.0	79.6	77.8	76.7	76.3	75.6	74.5
3150.0	79.0	77.6	76.6	76.1	75.6	74.1
4000.0	78.5	77.4	75.8	75.9	74.8	74.0
5000.0	77.3	76.5	75.0	75.0	74.1	73.5
6300.0	76.1	75.3	73.8	74.4	73.7	73.1
8000.0	75.4	75.7	73.4	74.3	73.3	73.0
10000.0	74.5	74.2	71.9	73.5	72.8	72.6
12500.0	73.8	74.6	71.9	73.2	72.6	72.4
16000.0	73.0	74.3	71.7	72.6	72.4	72.1
20000.0	71.9	73.3	70.7	71.6	71.4	71.2
25000.0	71.2	72.4	69.9	70.4	70.6	70.2
31500.0	69.7	70.8	68.2	68.3	68.9	68.6
40000.0	68.1	69.4	66.3	65.9	67.4	66.8
OVERALL SPL	90.6	89.2	87.8	87.4	86.8	86.0

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.02 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1346.00 DEG.F, CHAMBER TEMPERATURE = 61.00 DEG.F
RELATIVE HUMIDITY = 60.0 PERCENT
GAMMA = 1.330

RUN NUMBER 231

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.072$
TEMPERATURE RATIO $TR = 3.466$
MACH NUMBER $MJ = 0.325$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 3.407$
JET DENSITY RATIO $DJ/D_0 = 0.293$
JET VELOCITY RATIO $VJ/A_0 = 0.599$
JET VELOCITY $VJ = 670.4$ FPS

$TR/TJ = 1.017$
 $DR/D_0 = 0.309$
 $DR/DJ = 1.054$
MASS FLOW = 0.322 POUNDS PER SECOND
THRUST = 6.79 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	60.6	62.1	63.0	63.2	62.3	61.3
250.0	64.0	64.0	63.6	63.8	64.3	64.0
315.2	66.2	66.1	67.0	67.1	66.8	66.4
400.0	68.8	68.3	67.8	68.1	68.1	68.3
500.0	71.0	69.6	69.7	70.0	69.3	68.5
630.0	72.5	71.8	71.6	71.7	70.3	70.8
800.0	74.0	73.0	72.9	71.8	70.9	71.6
1000.0	74.9	73.2	73.2	72.7	71.7	71.3
1250.0	74.8	73.4	74.1	73.6	72.2	72.0
1600.0	74.4	73.6	73.6	73.0	71.9	71.6
2000.0	74.3	73.7	73.7	73.1	72.0	71.7
2500.0	73.6	73.0	73.0	72.6	72.0	71.6
3150.0	73.4	72.7	72.8	72.6	71.5	71.1
4000.0	72.8	72.5	72.8	72.0	71.2	70.7
5000.0	71.6	71.6	72.3	71.3	70.9	70.0
6300.0	71.4	71.9	72.4	71.3	71.2	70.3
8000.0	71.0	71.8	71.0	70.8	70.7	69.4
10000.0	71.5	71.5	70.4	70.3	70.5	69.0
12500.0	71.4	70.0	70.6	69.7	70.2	68.6
16000.0	70.2	69.5	69.3	69.0	69.6	67.9
20000.0	68.9	70.0	69.7	68.5	69.2	67.6
25000.0	68.9	68.7	69.0	68.2	68.5	66.9
31500.0	69.5	69.0	68.9	68.3	68.2	67.1
40000.0	68.8	68.8	68.9	68.9	67.8	67.5
OVERALL SPL	85.6	85.0	85.1	84.6	84.0	83.4

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0		61.0		63.5		62.4		63.1	
250.0		64.1		65.0		64.5		64.5	
315.2		67.6		66.7		66.0		66.1	
400.0		67.3		68.0		68.0		67.6	
500.0		68.1		69.3		68.5		67.7	
630.0		70.1		70.3		69.0		68.9	
800.0		70.8		70.6		69.3		68.6	
1000.0		70.9		71.7		70.1		68.8	
1250.0		71.4		71.7		69.9		68.0	
1600.0		71.2		70.7		69.0		67.0	
2000.0		71.5		71.3		68.8		66.4	
2500.0		71.0		70.7		68.0		65.7	
3150.0		70.7		70.6		67.9		65.3	
4000.0		70.5		70.2		67.2		64.5	
5000.0		69.9		69.2		65.9		63.1	
6300.0		69.6		69.0		65.4		62.7	
8000.0		68.6		68.0		63.7		60.8	
10000.0		68.2		67.0		63.0		60.0	
12500.0		67.3		66.2		61.4		58.0	
16000.0		66.6		64.8		60.4		56.3	
20000.0		66.3		63.5		59.5		55.3	
25000.0		65.1		62.6		58.4		53.7	
31500.0		64.5		62.0		57.5		52.7	
40000.0		64.2		61.9		56.6		52.3	
OVERALL									
SPL		82.7		82.5		80.4		78.9	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.50 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1464.00 DEG.F, CHAMBER TEMPERATURE = 114.00 DEG.F
RELATIVE HUMIDITY = 24.0 PERCENT
GAMMA = 1.330

RUN NUMBER 102

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.105
TEMPERATURE RATIO TR = 3.352
MACH NUMBER MJ = 0.391
JET STATIC TEMPERATURE RATIO TJ/T0 = 3.270
JET DENSITY RATIO DJ/D0 = 0.306
JET VELOCITY RATIO VJ/A0 = 0.707
JET VELOCITY VJ = 829.8 FPS

TR/TJ = 1.025
DR/D0 = 0.330
DR/DJ = 1.078
MASS FLOW = 0.396 POUNDS PER SECOND
THRUST = 9.84 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	77.4	75.8	75.3	73.3	74.1	70.8
250.0	79.3	79.2	80.2	76.9	74.9	73.5
315.2	83.1	82.5	82.6	80.1	78.3	77.0
400.0	85.6	86.4	84.4	82.4	81.9	79.5
500.0	88.1	86.9	86.8	84.7	82.9	81.2
630.0	86.6	88.5	89.3	87.7	85.6	83.4
800.0	89.9	91.0	91.0	89.0	87.4	85.5
1000.0	87.8	89.8	91.4	90.5	88.5	86.3
1250.0	86.2	89.0	90.3	90.0	88.9	86.8
1600.0	82.4	86.0	88.0	88.3	88.3	86.5
2000.0	79.4	83.7	85.7	87.0	87.3	86.3
2500.0	76.0	81.1	83.7	85.2	86.8	86.0
3150.0	72.8	78.4	81.4	83.3	85.6	85.1
4000.0	71.1	76.6	78.9	80.8	84.0	84.3
5000.0	69.2	74.9	76.8	78.7	82.4	82.7
6300.0	67.7	72.9	74.8	77.0	80.5	81.7
8000.0	67.3	71.4	72.7	75.0	78.9	80.1
10000.0	65.9	68.7	70.6	73.1	77.4	78.7
12500.0	64.5	67.9	68.9	71.7	75.5	77.5
16000.0	63.1	67.4	67.7	70.4	74.4	76.6
20000.0	59.9	64.9	65.9	68.3	72.9	75.3
25000.0	57.3	63.3	64.5	67.0	71.5	74.6
31500.0	55.9	58.7	62.6	64.9	69.5	73.0
40000.0	56.5	57.6	57.6	64.4	67.7	72.1
OVERALL SPL	96.2	97.7	98.6	97.9	97.6	96.4

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	71.0	69.9	68.4	68.1	67.6	67.8
250.0	73.9	71.0	69.5	68.9	69.3	68.8
315.2	73.7	72.1	70.5	71.0	70.1	70.4
400.0	77.4	74.3	72.9	72.4	71.5	71.2
500.0	78.6	76.3	74.5	73.6	73.3	72.1
630.0	80.8	78.4	77.3	76.4	75.6	74.6
800.0	82.7	80.7	78.7	78.1	76.9	76.2
1000.0	83.7	82.4	80.2	79.7	78.5	77.4
1250.0	84.8	83.3	81.3	80.5	79.6	78.7
1600.0	84.5	83.1	81.7	80.8	79.9	78.8
2000.0	84.4	83.6	82.3	81.0	80.0	79.0
2500.0	84.0	83.2	82.2	80.8	80.2	79.3
3150.0	83.2	83.1	82.2	80.9	80.4	79.3
4000.0	83.2	82.9	81.3	80.5	80.1	79.1
5000.0	82.0	82.0	80.7	79.9	79.7	78.5
6300.0	80.7	81.5	80.0	79.6	79.4	78.1
8000.0	79.8	81.0	79.4	79.2	78.9	77.7
10000.0	78.8	80.1	79.1	78.4	77.5	77.4
12500.0	77.5	79.5	78.1	77.9	77.7	76.6
16000.0	76.4	79.0	77.9	77.3	77.5	76.3
20000.0	75.0	77.7	77.0	76.3	76.4	74.9
25000.0	73.5	76.9	76.3	75.2	75.6	73.8
31500.0	71.5	75.4	74.8	73.4	73.9	72.1
40000.0	70.0	74.1	73.3	71.3	72.5	70.3
OVERALL SPL	94.6	94.1	92.7	91.9	91.4	90.3

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.40 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1354.00 DEG.F, CHAMBER TEMPERATURE = 61.00 DEG.F
RELATIVE HUMIDITY = 60.0 PERCENT
GAMMA = 1.330

RUN NUMBER 232

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.099
TEMPERATURE RATIO TR = 3.482
MACH NUMBER M-J = 0.378
JET STATIC TEMPERATURE RATIO TJ/T0 = 3.401
JET DENSITY RATIO DJ/D0 = 0.294
JET VELOCITY RATIO VJ/A0 = 0.698
JET VELOCITY VJ = 781.0 FPS

TR/TJ = 1.024
PR/D0 = 0.316
DR/CJ = 1.073
MASS FLOW = 0.376 POUNDS PER SECOND
THRUST = 9.23 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	61.9	64.1	65.5	65.4	63.8	63.2
250.0	64.7	66.1	66.2	65.7	66.6	66.4
315.2	68.1	68.6	68.9	68.7	69.0	69.0
400.0	70.2	70.1	70.7	70.3	69.9	70.3
500.0	72.6	72.7	72.5	72.4	71.8	71.2
630.0	75.3	74.3	73.2	73.9	73.5	73.4
800.0	76.6	76.6	74.6	74.8	74.6	74.3
1000.0	77.9	76.6	76.0	75.8	75.0	74.8
1250.0	78.4	77.4	77.1	76.8	76.1	75.5
1600.0	78.2	77.4	76.8	76.6	75.9	75.4
2000.0	78.3	78.3	77.5	77.2	76.5	75.8
2500.0	78.0	77.8	77.0	77.1	76.3	75.6
3150.0	78.0	77.7	76.7	76.9	76.1	75.5
4000.0	77.4	77.7	76.4	76.6	75.7	74.9
5000.0	76.3	76.6	76.3	75.9	75.5	74.2
6300.0	75.9	76.8	75.9	76.1	75.8	74.4
8000.0	75.6	76.7	74.6	75.0	74.9	73.3
10000.0	76.1	76.1	74.3	74.7	74.5	72.3
12500.0	75.7	74.9	74.3	74.6	74.1	72.2
16000.0	74.2	74.2	72.9	73.8	73.5	71.1
20000.0	72.6	74.6	73.0	73.2	73.0	70.6
25000.0	73.1	73.6	72.7	72.8	72.7	70.2
31500.0	73.6	74.0	72.9	72.6	72.7	70.3
40000.0	73.1	74.2	73.2	73.3	72.4	70.8
OVERALL SPL	89.4	89.3	88.4	88.5	87.9	86.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	62.7	62.8	64.2	64.9
250.0	66.4	65.9	67.1	66.1
315.2	69.0	67.8	68.3	67.1
400.0	69.2	68.9	68.4	68.8
500.0	71.4	71.0	69.6	70.1
630.0	73.3	72.4	70.9	70.7
800.0	73.8	73.5	71.8	71.4
1000.0	74.3	73.3	72.6	71.6
1250.0	74.6	73.8	73.2	71.0
1600.0	74.4	73.6	72.4	70.8
2000.0	75.1	74.0	72.6	70.3
2500.0	75.0	73.6	72.5	69.9
3150.0	75.0	73.9	72.3	69.8
4000.0	74.6	73.8	72.3	69.3
5000.0	73.9	72.6	71.1	68.0
6300.0	73.9	72.4	70.7	67.7
8000.0	72.8	71.3	69.4	66.1
10000.0	72.1	70.1	67.9	64.7
12500.0	71.1	68.9	66.9	63.1
16000.0	70.3	67.7	65.9	61.5
20000.0	69.5	66.5	65.2	61.1
25000.0	68.6	65.1	63.7	59.1
31500.0	68.2	64.4	62.7	58.1
40000.0	68.1	64.5	62.0	58.0
OVERALL SPL	86.3	85.1	83.8	82.0

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.90 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1520.00 DEG.F, CHAMBER TEMPERATURE = 115.00 DEG.F
RELATIVE HUMIDITY = 26.0 PERCENT
GAMMA = 1.330

RUN NUMBER 103

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.134
TEMPERATURE RATIO TR = 3.443
MACH NUMBER MJ = 0.438
JET STATIC TEMPERATURE RATIO TJ/TO = 3.338
JET DENSITY RATIO DJ/DO = 0.300
JET VELOCITY RATIO VJ/A0 = 0.800
JET VELOCITY VJ = 939.9 FPS

TR/TJ = 1.032
DR/DO = 0.329
DR/DJ = 1.099
MASS FLOW = 0.439 POUNDS PER SECOND
THRUST = 12.35 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	79.4	77.4	77.0	75.8	75.0	72.3
250.0	81.9	81.0	81.3	79.5	77.6	74.9
315.2	84.8	83.9	85.0	82.2	80.1	78.1
400.0	87.7	88.6	86.6	85.0	83.3	81.0
500.0	90.1	89.3	89.4	87.9	85.6	82.7
630.0	89.0	90.9	91.4	90.0	88.4	85.0
800.0	93.0	94.1	93.3	92.2	90.3	87.0
1000.0	91.5	93.7	94.4	93.9	91.7	88.8
1250.0	91.2	93.4	95.0	94.3	92.6	89.4
1600.0	88.3	90.7	92.3	92.3	91.7	89.0
2000.0	84.8	88.0	90.1	90.8	91.5	89.0
2500.0	81.4	85.1	87.5	89.1	90.2	88.5
3150.0	78.1	82.5	85.1	87.0	89.0	87.8
4000.0	76.2	80.4	82.9	85.1	87.8	86.9
5000.0	73.8	78.6	81.0	83.1	86.1	85.6
6300.0	71.9	76.3	79.0	81.2	84.4	84.2
8000.0	70.8	74.7	77.2	79.6	82.8	82.7
10000.0	70.0	72.3	75.6	77.8	81.2	81.4
12500.0	67.2	71.2	74.0	76.6	79.9	80.1
16000.0	65.5	70.3	72.9	75.4	78.7	79.1
20000.0	62.1	68.1	71.5	73.8	77.0	77.7
25000.0	-8.8	66.2	70.2	72.2	75.5	76.8
31500.0	-8.7	64.0	68.0	69.9	73.1	75.1
40000.0	-7.6	-7.6	66.1	68.5	70.8	74.0
OVERALL SPL	99.5	101.1	101.9	101.5	101.0	98.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	70.4	68.7	69.5	69.6	68.4	69.5
250.0	72.8	71.0	69.5	70.2	69.7	70.7
315.2	74.8	73.4	71.5	72.2	70.5	71.4
400.0	78.1	75.5	74.4	73.6	73.1	72.2
500.0	80.3	77.5	76.3	75.2	74.7	73.4
630.0	82.4	79.8	78.2	77.5	76.6	76.1
800.0	84.7	81.8	80.5	79.6	78.2	77.9
1000.0	86.2	83.5	81.9	81.4	79.8	79.6
1250.0	87.6	85.3	83.3	82.5	81.3	80.2
1600.0	87.7	85.1	83.6	83.0	81.4	80.6
2000.0	87.9	86.0	84.5	83.8	82.0	81.0
2500.0	87.5	86.0	84.8	83.9	82.3	81.1
3150.0	87.3	86.2	84.9	84.1	82.3	81.3
4000.0	87.0	85.9	84.8	83.8	82.2	81.1
5000.0	85.8	85.4	84.2	83.1	81.6	80.7
6300.0	85.0	84.9	83.7	82.5	80.9	80.6
8000.0	83.9	84.2	82.8	81.9	80.5	80.4
10000.0	82.8	83.2	82.1	80.7	79.6	79.6
12500.0	81.5	82.5	81.5	80.1	78.6	79.4
16000.0	80.5	81.9	81.2	79.5	78.3	78.9
20000.0	79.2	80.6	80.2	78.3	76.8	77.7
25000.0	78.1	79.4	79.3	77.0	75.7	76.4
31500.0	76.3	77.7	77.7	74.9	73.9	74.5
40000.0	74.8	76.5	76.2	72.6	72.6	72.8
OVERALL SPL	97.9	96.7	95.4	94.4	92.9	92.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 1.86 PSI, ATMOSPHERIC PRESSURE = 14.18 PSI
RESERVOIR TEMPERATURE = 1366.00 DEG.F, CHAMBER TEMPERATURE = 61.00 DEG.F
RELATIVE HUMIDITY = 60.0 PERCENT
GAMMA = 1.330

RUN NUMBER 233

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.131
TEMPERATURE RATIO TR = 3.505
MACH NUMBER MJ = 0.434
JET STATIC TEMPERATURE RATIO TJ/TO = 3.399
JET DENSITY RATIO DJ/DO = 0.294
JET VELOCITY RATIO VJ/A0 = 0.800
JET VELOCITY VJ = 894.9 FPS

TR/TJ = 1.031
DR/DO = 0.323
DR/DJ = 1.097
MASS FLOW = 0.431 POUNDS PER SECOND
THRUST = 12.13 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	64.6	66.2	67.8	66.5	68.2	66.8
250.0	67.3	68.3	68.7	67.4	67.8	68.5
315.2	71.5	71.4	72.3	71.7	72.0	72.1
400.0	71.5	72.2	72.5	72.4	72.2	71.9
500.0	74.7	74.2	74.2	74.6	74.2	73.7
630.0	76.7	75.7	76.1	75.9	75.5	75.6
800.0	79.3	78.0	78.2	77.9	77.5	76.9
1000.0	81.0	80.3	79.2	79.4	79.0	78.4
1250.0	82.6	80.8	80.3	80.2	79.6	78.4
1600.0	83.1	81.2	81.6	80.7	80.4	79.4
2000.0	83.4	82.1	81.6	81.5	80.8	79.9
2500.0	82.9	82.4	81.9	81.4	80.8	80.2
3150.0	83.2	82.6	81.9	81.7	80.8	80.2
4000.0	83.2	82.2	81.9	81.5	80.7	79.8
5000.0	82.3	81.4	81.5	80.9	80.0	79.7
6300.0	81.8	81.4	81.6	80.8	80.3	79.5
8000.0	80.8	80.9	80.6	80.1	79.5	78.7
10000.0	81.0	81.0	79.7	79.9	79.8	78.9
12500.0	81.3	80.5	79.6	79.4	79.0	78.3
16000.0	80.4	78.8	78.8	78.6	78.4	77.7
20000.0	79.2	78.9	77.9	78.3	78.0	77.3
25000.0	78.4	78.9	78.2	78.0	77.7	77.3
31500.0	79.3	78.2	78.1	77.8	77.4	77.4
40000.0	80.2	79.7	79.2	78.9	78.4	79.1
OVERALL SPL	94.3	93.5	93.1	92.8	92.3	91.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	66.1	65.5	64.2	65.8
250.0	67.7	66.8	67.6	68.8
315.2	73.1	71.3	71.0	71.7
400.0	72.6	71.0	71.3	70.9
500.0	72.7	72.7	73.0	72.1
630.0	75.6	73.7	73.5	73.4
800.0	77.2	76.1	74.4	74.0
1000.0	77.9	76.4	76.2	75.1
1250.0	78.1	76.7	76.4	75.2
1600.0	78.5	77.7	76.4	75.0
2000.0	79.5	78.0	76.8	75.0
2500.0	79.4	78.4	76.9	75.0
3150.0	79.6	78.7	76.9	74.7
4000.0	79.7	78.4	76.9	74.6
5000.0	79.4	77.6	76.3	73.4
6300.0	79.4	77.3	76.2	73.1
8000.0	78.4	76.5	74.9	72.1
10000.0	77.9	75.3	73.8	70.6
12500.0	77.2	74.2	72.3	69.4
16000.0	76.4	73.0	71.1	67.8
20000.0	76.0	72.1	70.3	66.5
25000.0	75.5	71.2	69.4	65.2
31500.0	75.2	70.5	68.5	63.9
40000.0	75.9	71.2	69.1	64.2
OVERALL SPL	91.0	89.2	88.0	86.2

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.40 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1540.00 DEG.F, CHAMBER TEMPERATURE = 116.00 DEG.F
RELATIVE HUMIDITY = 22.0 PERCENT
GAMMA = 1.330

RUN NUMBER 104

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_R = 1.169$
TEMPERATURE RATIO $T_R = 3.472$
MACH NUMBER $M_J = 0.489$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 3.340$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.299$
JET VELOCITY RATIO $V_J/A_0 = 0.894$
JET VELOCITY $V_J = 1051.4$ FPS

$T_R/T_J = 1.039$
 $\rho_R/\rho_0 = 0.337$
 $\rho_R/\rho_J = 1.124$
MASS FLOW = 0.450 POUNDS PER SECOND
THRUST = 15.41 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	81.7		80.3		80.1	78.0
250.0	83.4		83.6		83.9	82.1
315.2	87.9		86.6		86.3	84.6
400.0	90.1		90.8		88.0	87.2
500.0	93.5		91.6		91.3	89.9
630.0	91.8		93.8		94.3	92.5
800.0	95.1		97.2		96.1	94.8
1000.0	93.8		97.1		98.0	97.0
1250.0	94.4		97.9		98.8	98.3
1600.0	92.5		96.4		97.0	96.8
2000.0	89.6		93.9		94.8	95.5
2500.0	85.4		90.7		91.7	93.4
3150.0	81.5		87.7		89.0	91.3
4000.0	79.1		85.7		86.7	89.1
5000.0	76.5		83.5		84.1	87.0
6300.0	74.1		81.4		81.7	85.2
8000.0	73.0		79.6		79.6	83.3
10000.0	71.6		77.3		77.8	81.1
12500.0	70.3		76.0		75.5	79.7
16000.0	69.0		74.4		74.1	78.2
20000.0	65.5		72.2		72.1	76.4
25000.0	63.0		70.2		70.6	74.9
31500.0	-8.7		67.2		68.5	72.3
40000.0	-7.6		64.7		66.7	70.6
						73.2
						77.3
OVERALL						
SPL	102.4		105.0		105.4	105.1
						104.6
						102.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	72.4	71.4	61.0	71.6	70.8	70.8
250.0	74.8	72.5	71.9	71.8	71.4	71.2
315.2	77.0	74.0	73.2	73.9	72.7	73.2
400.0	80.1	77.0	75.6	75.0	73.8	74.0
500.0	81.8	79.0	78.3	77.0	76.6	76.1
630.0	84.5	81.5	80.7	79.0	78.6	77.8
800.0	87.0	84.2	82.3	81.0	80.5	80.5
1000.0	88.9	85.6	84.7	83.6	82.2	81.5
1250.0	90.5	87.3	86.5	84.8	84.2	83.0
1600.0	90.7	87.5	87.0	85.5	84.2	84.1
2000.0	91.4	88.7	87.9	86.6	85.1	84.3
2500.0	91.2	89.0	88.2	86.9	85.4	84.5
3150.0	91.0	89.0	88.6	87.3	85.8	85.1
4000.0	91.1	89.5	88.4	87.1	85.3	85.2
5000.0	90.4	88.7	87.8	86.5	85.0	84.9
6300.0	89.5	88.2	87.3	86.0	84.4	84.6
8000.0	88.4	87.5	86.7	85.8	83.8	84.2
10000.0	87.1	86.4	85.7	84.5	83.3	83.7
12500.0	85.7	85.7	85.1	83.9	82.7	83.3
16000.0	84.5	84.9	84.6	82.7	82.3	82.6
20000.0	83.0	83.5	83.5	81.5	81.1	81.3
25000.0	81.7	82.4	82.7	80.1	80.0	80.0
31500.0	79.6	80.5	81.0	77.9	78.2	78.1
40000.0	77.8	79.0	79.2	75.8	76.9	76.3
OVERALL SPL	101.4	99.5	98.8	97.4	96.2	95.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 2.36 PSI, ATMOSPHERIC PRESSURE = 14.02 PSI
RESERVOIR TEMPERATURE = 1376.00 DEG.F, CHAMBER TEMPERATURE = 61.00 DEG.F
RELATIVE HUMIDITY = 40.0 PERCENT
GAMMA = 1.330

RUN NUMBER 176

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.168
TEMPERATURE RATIO TR = 3.524
MACH NUMBER MJ = 0.488
JET STATIC TEMPERATURE RATIO TJ/T0 = 3.391
JET DENSITY RATIO DJ/D0 = 0.295
JET VELOCITY RATIO VJ/A0 = 0.899
JET VELOCITY VJ = 1006.2 FPS

TR/TJ = 1.039
DR/D0 = 0.332
DR/DJ = 1.124
MASS FLOW = 0.486 POUNDS PER SECOND
THRUST = 15.37 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 10 ANGLE 82.5	NO. 11 ANGLE 90.0	NO. 12 ANGLE 97.5	NO. 13 ANGLE 105.0	NO. 14 ANGLE 112.5	NO. 15 ANGLE 120.0
200.0	66.8	68.9	69.4	68.4	68.1	66.8
250.0	69.3	69.7	69.3	69.0	69.7	70.0
315.2	70.7	71.4	71.7	72.0	72.7	73.1
400.0	74.2	74.4	73.9	73.9	74.1	74.5
500.0	76.8	76.2	76.5	76.1	76.4	75.7
630.0	79.3	78.6	78.6	78.3	78.1	78.2
800.0	81.8	81.2	80.1	79.3	79.9	79.6
1000.0	83.8	82.3	81.0	80.3	80.4	80.0
1250.0	85.4	83.4	82.7	82.0	81.8	80.9
1600.0	85.4	84.0	83.0	82.3	82.3	81.4
2000.0	85.8	84.7	83.7	82.7	82.7	82.0
2500.0	85.6	84.8	83.9	103.1	83.2	82.1
3150.0	85.7	84.7	83.9	83.2	83.0	82.1
4000.0	85.6	84.8	83.8	82.9	82.7	81.9
5000.0	84.8	84.4	83.6	82.4	82.3	81.5
6300.0	84.3	84.4	83.2	82.2	82.1	81.2
8000.0	83.8	84.6	82.0	81.7	81.2	80.3
10000.0	83.7	84.1	81.2	81.2	80.7	79.5
12500.0	83.4	82.6	81.3	80.9	80.4	78.9
16000.0	82.4	81.8	80.0	80.4	79.9	78.1
20000.0	80.8	82.4	80.2	79.8	79.1	77.5
25000.0	80.6	81.5	80.0	79.6	79.0	77.3
31500.0	80.7	81.7	80.0	79.0	78.7	77.1
40000.0	79.8	81.9	79.8	79.1	78.0	77.3
OVERALL SPL	96.7	96.2	94.9	103.6	94.1	93.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	7	35.3	18	142.5	19	150.0	
200.0	66.1		0.0		67.3		68.4		
250.0	70.2		0.0		69.8		69.8		
315.2	72.7		0.0		70.5		70.2		
400.0	73.6		0.0		72.6		72.4		
500.0	75.6		0.0		74.2		73.0		
630.0	78.1		0.0		75.1		74.3		
800.0	79.2		0.0		76.6		74.8		
1000.0	79.4		0.0		78.1		76.4		
1250.0	80.5		0.0		78.5		76.3		
1600.0	80.9		0.0		78.5		76.4		
2000.0	81.6		0.0		79.1		76.6		
2500.0	81.8		0.0		79.1		76.6		
3150.0	81.7		0.0		79.2		76.6		
4000.0	81.6		0.0		79.4		76.1		
5000.0	81.3		0.0		78.5		75.5		
6300.0	81.0		0.0		77.8		75.3		
8000.0	80.3		0.0		76.4		74.2		
10000.0	79.4		0.0		75.0		73.0		
12500.0	78.5		0.0		73.7		72.3		
16000.0	77.7		0.0		72.7		70.9		
20000.0	77.0		0.0		71.6		69.5		
25000.0	76.5		0.0		71.1		68.5		
31500.0	75.9		0.0		70.2		67.2		
40000.0	75.4		0.0		69.2		66.0		
OVERALL									
SPL	92.8		0.0		89.9		87.8		

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.20 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1605.00 DEG.F, CHAMBER TEMPERATURE = 118.00 DEG.F
RELATIVE HUMIDITY = 22.0 PERCENT
GAMMA = 1.330

RUN NUMBER 105

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.295$
TEMPERATURE RATIO $TR = 3.573$
MACH NUMBER $MJ = 0.634$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 3.350$
JET DENSITY RATIO $DJ/D_0 = 0.298$
JET VELOCITY RATIO $VJ/A_0 = 1.160$
JET VELOCITY $VJ = 1367.6$ FPS

$TR/TJ = 1.066$
 $DR/D_0 = 0.363$
 $DR/DJ = 1.215$
MASS FLOW = 0.634 POUNDS PER SECOND
THRUST = 25.91 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	87.4	86.6	85.1	82.9	81.8	79.4
250.0	89.3	89.8	89.7	86.8	85.2	82.3
315.2	93.7	92.7	92.9	90.3	88.0	85.0
400.0	96.1	96.7	95.4	93.2	91.6	87.5
500.0	99.4	98.4	97.6	96.2	94.2	90.0
630.0	97.9	100.1	100.4	98.9	96.9	93.4
800.0	101.0	103.1	102.6	101.9	99.9	96.0
1000.0	100.3	103.2	105.1	104.2	102.6	98.6
1250.0	101.6	104.5	106.9	106.7	105.1	100.6
1600.0	101.4	104.5	107.0	107.1	105.8	101.6
2000.0	101.2	105.4	107.0	107.1	106.0	102.0
2500.0	100.1	104.6	105.9	105.4	105.2	101.6
3150.0	96.9	101.8	103.1	103.3	103.5	101.2
4000.0	93.0	98.5	99.9	101.1	102.1	100.4
5000.0	89.0	95.2	96.8	98.8	100.0	99.0
6300.0	85.7	92.3	93.9	96.6	98.3	97.8
8000.0	83.0	89.8	91.6	94.8	96.6	96.5
10000.0	80.8	87.3	89.5	92.7	94.7	95.1
12500.0	79.2	85.7	87.6	90.8	93.2	93.5
16000.0	78.0	84.2	85.9	89.0	91.7	91.9
20000.0	75.0	82.1	84.3	86.7	89.5	90.3
25000.0	72.3	80.1	82.7	84.7	87.8	88.9
31500.0	1.3	77.3	80.0	81.9	85.3	86.6
40000.0	2.4	74.8	77.6	79.9	82.9	84.9
OVERALL SPL	110.3	113.3	114.8	114.7	114.0	110.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	76.5	74.7	75.9	74.6	74.4	74.2
250.0	79.4	76.8	75.6	75.6	75.8	74.7
315.2	81.3	79.0	76.8	77.3	76.1	76.8
400.0	85.0	82.0	79.9	79.6	79.3	78.1
500.0	87.3	83.1	81.7	80.4	80.1	79.5
630.0	89.2	86.1	84.4	83.4	83.0	82.0
800.0	92.5	88.6	86.8	85.7	84.7	84.2
1000.0	94.8	90.8	88.8	87.7	86.8	85.8
1250.0	97.2	93.3	91.0	89.7	88.6	87.6
1600.0	97.7	94.4	92.2	90.7	89.6	88.5
2000.0	98.6	95.5	93.3	91.9	90.8	89.5
2500.0	99.0	96.1	94.0	92.6	91.4	90.2
3150.0	99.0	96.7	94.8	93.2	92.4	90.8
4000.0	99.1	97.1	95.0	93.4	92.2	91.1
5000.0	98.4	96.9	94.7	93.1	92.2	91.0
6300.0	97.8	96.7	94.4	93.1	92.0	90.8
8000.0	96.8	96.1	94.0	92.8	91.5	90.6
10000.0	95.8	95.4	93.0	91.9	90.8	90.1
12500.0	94.4	94.5	92.3	91.3	90.2	89.5
16000.0	93.0	93.5	91.7	90.5	89.9	89.2
20000.0	91.4	91.8	90.6	89.1	88.5	87.7
25000.0	89.9	90.5	89.6	87.8	87.3	86.6
31500.0	87.4	88.1	87.7	85.5	85.2	84.6
40000.0	85.2	86.4	85.8	82.9	83.6	82.7
OVERALL SPL	109.0	107.1	105.1	103.7	102.7	101.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 4.07 PSI, ATMOSPHERIC PRESSURE = 14.02 PSI
RESERVOIR TEMPERATURE = 1424.00 DEG.F, CHAMBER TEMPERATURE = 61.00 DEG.F
RELATIVE HUMIDITY = 40.0 PERCENT
GAMMA = 1.330

RUN NUMBER 177

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.290$
TEMPERATURE RATIO $TR = 3.616$
MACH NUMBER $MJ = 0.629$
JET STATIC TEMPERATURE RATIO $TJ/TO = 3.395$
JET DENSITY RATIO $\rho J/\rho O = 0.295$
JET VELOCITY RATIO $VJ/AO = 1.159$
JET VELOCITY $VJ = 1296.7$ FPS

$TR/TJ = 1.065$
 $DR/DO = 0.357$
 $OR/DJ = 1.211$
MASS FLOW = 0.625 POUNDS PER SECOND
THRUST = 25.50 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	69.7	72.4	72.3	72.2	71.3	69.9
250.0	72.4	72.5	71.8	72.1	72.4	73.0
315.2	73.9	74.4	74.2	74.8	75.8	76.8
400.0	76.9	76.8	76.9	77.2	77.6	78.5
500.0	80.0	79.3	79.3	79.7	79.5	79.5
630.0	82.3	81.9	81.8	81.8	81.5	82.4
800.0	85.0	84.6	84.0	83.3	83.2	84.1
1000.0	87.2	86.4	84.6	84.1	83.8	84.2
1250.0	89.2	87.5	86.4	86.2	85.4	85.2
1600.0	90.5	88.3	87.5	86.7	86.5	86.3
2000.0	91.2	89.7	88.4	87.6	87.1	87.1
2500.0	91.1	90.3	88.8	88.1	87.7	87.8
3150.0	91.6	90.6	89.1	88.8	88.0	88.0
4000.0	91.7	90.7	89.5	88.8	88.1	87.9
5000.0	91.1	90.4	89.5	88.3	88.0	87.8
6300.0	90.9	90.7	89.2	88.2	87.9	87.8
8000.0	90.6	91.0	88.1	87.7	87.2	86.9
10000.0	90.7	90.7	87.4	87.0	86.6	85.9
12500.0	90.3	89.2	87.5	86.6	86.3	85.2
16000.0	89.0	88.2	86.1	85.9	85.5	84.4
20000.0	87.2	88.5	86.0	85.2	84.7	83.8
25000.0	87.0	87.6	85.7	84.9	84.4	83.7
31500.0	86.8	87.7	85.4	84.3	84.0	83.3
40000.0	85.7	87.6	85.0	84.2	83.2	83.6
OVERALL SPL	102.4	101.8	100.2	99.5	99.0	98.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 7 ANGLE 35.3	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	0.0	0.0	69.7	71.4
250.0	0.0	0.0	73.6	73.5
315.2	0.0	0.0	74.6	74.1
400.0	0.0	0.0	75.9	76.3
500.0	0.0	0.0	77.8	77.4
630.0	0.0	0.0	79.4	77.9
800.0	0.0	0.0	81.0	78.8
1000.0	0.0	0.0	82.1	80.4
1250.0	0.0	0.0	83.7	81.2
1600.0	0.0	0.0	83.8	82.1
2000.0	0.0	0.0	84.6	82.4
2500.0	0.0	0.0	85.0	82.6
3150.0	0.0	0.0	85.1	82.8
4000.0	0.0	0.0	85.3	82.6
5000.0	0.0	0.0	84.6	82.0
6300.0	0.0	0.0	84.2	81.9
8000.0	0.0	0.0	83.1	81.1
10000.0	0.0	0.0	81.7	79.9
12500.0	0.0	0.0	80.6	79.0
16000.0	0.0	0.0	79.7	77.4
20000.0	0.0	0.0	78.6	76.0
25000.0	0.0	0.0	77.9	75.0
31500.0	0.0	0.0	77.1	73.8
40000.0	0.0	0.0	76.2	72.6
OVERALL SPL	92.8	0.0	95.6	93.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 5.60 PSI, ATMOSPHERIC PRESSURE = 14.22 PSI
RESERVOIR TEMPERATURE = 1600.00 DEG.F, CHAMBER TEMPERATURE = 120.00 DEG.F
RELATIVE HUMIDITY = 18.0 PERCENT
GAMMA = 1.330

RUN NUMBER 106

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.394
TEMPERATURE RATIO TR = 3.552
MACH NUMBER MJ = 0.721
JET STATIC TEMPERATURE RATIO TJ/T0 = 3.271
JET DENSITY RATIO DJ/D0 = 0.306
JET VELOCITY RATIO VJ/A0 = 1.305
JET VELOCITY VJ = 1540.3 FPS

TR/TJ = 1.086
DR/D0 = 0.392
DR/DJ = 1.284
MASS FLOW = 0.730 POUNDS PER SECOND
THRUST = 33.55 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE		MICRO PHONE NO. ANGLE	
	1	15.0	2	22.5	3	30.0	4	37.5	5	45.0	6	52.5
200.0	90.8		89.5		85.5		83.9		83.2		80.1	
250.0	92.8		92.1		91.0		90.2		86.9		83.2	
315.2	96.3		95.0		95.1		92.6		89.2		86.2	
400.0	99.3		99.8		97.5		95.3		93.2		89.5	
500.0	102.1		101.4		100.3		98.4		95.7		91.9	
630.0	100.5		102.7		102.7		101.6		98.7		94.7	
800.0	104.1		106.5		105.8		104.4		102.1		98.2	
1000.0	102.9		106.3		107.7		106.8		104.6		100.9	
1250.0	104.5		107.9		109.8		109.7		107.7		103.4	
1600.0	104.5		108.5		109.5		110.6		108.9		105.0	
2000.0	105.0		110.0		110.3		111.2		110.1		106.1	
2500.0	105.4		0.0		110.4		110.9		109.6		105.8	
3150.0	104.8		109.4		109.4		109.3		108.2		105.4	
4000.0	102.7		107.3		106.7		106.9		106.8		104.6	
5000.0	99.0		103.8		103.6		104.2		104.6		103.3	
6300.0	95.9		101.1		101.2		102.1		103.0		102.5	
8000.0	92.7		98.0		98.6		99.4		101.1		101.0	
10000.0	89.7		95.1		96.6		97.1		99.4		99.6	
12500.0	86.8		92.8		94.9		94.9		97.6		98.1	
16000.0	84.2		90.7		92.6		92.9		95.8		96.4	
20000.0	81.5		88.7		90.3		90.8		93.7		94.5	
25000.0	79.7		86.6		87.8		88.6		91.5		92.5	
31500.0	76.6		83.7		84.9		85.6		88.7		89.8	
40000.0	73.6		81.1		82.0		82.9		85.4		87.4	
OVERALL SPL	114.4		117.5		118.6		118.8		117.7		114.8	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	79.3	77.7	77.7	78.4	76.5	76.9
250.0	80.8	79.0	78.5	78.0	77.0	77.1
315.2	82.6	80.1	80.0	80.2	78.8	78.7
400.0	86.6	84.0	82.1	81.7	81.4	80.4
500.0	89.0	85.5	84.1	83.8	82.6	80.9
630.0	91.0	87.8	86.3	85.8	84.3	83.9
800.0	94.3	90.5	88.7	87.9	87.1	86.0
1000.0	97.0	93.1	91.3	90.0	88.8	87.3
1250.0	99.5	95.6	93.5	91.9	90.4	89.4
1600.0	100.8	96.6	94.9	93.5	91.5	90.4
2000.0	102.0	98.4	96.5	95.2	92.7	91.7
2500.0	102.6	99.0	97.4	96.1	93.5	92.7
3150.0	102.6	99.4	98.1	97.1	94.4	93.0
4000.0	103.5	100.4	98.7	97.5	94.8	93.8
5000.0	102.7	100.2	98.6	97.0	94.8	93.6
6300.0	102.6	100.4	98.7	97.4	94.9	93.8
8000.0	101.4	99.9	98.1	97.0	94.2	93.3
10000.0	100.6	99.1	97.4	96.2	93.5	92.9
12500.0	99.3	98.2	96.8	95.5	92.6	92.1
16000.0	97.4	97.0	95.7	94.2	91.7	91.4
20000.0	95.7	95.7	94.6	92.8	90.5	90.0
25000.0	93.9	94.1	93.3	91.2	89.2	88.7
31500.0	91.2	92.0	91.3	89.1	87.0	86.4
40000.0	89.0	90.2	89.3	86.7	85.3	84.6
OVERALL SPL	112.8	110.3	108.7	107.4	105.0	104.1

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 5.51 PSI, ATMOSPHERIC PRESSURE = 14.02 PSI
RESERVOIR TEMPERATURE = 1458.00 DEG.F, CHAMBER TEMPERATURE = 61.00 DEG.F
RELATIVE HUMIDITY = 40.0 PERCENT
GAMMA = 1.330

RUN NUMBER 178

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.393
TEMPERATURE RATIO TR = 3.681
MACH NUMBER MJ = 0.721
JET STATIC TEMPERATURE RATIO TJ/T0 = 3.391
JET DENSITY RATIO DJ/D0 = 0.295
JET VELOCITY RATIO VJ/A0 = 1.327
JET VELOCITY VJ = 1485.0 FPS

TR/TJ = 1.086
DR/D0 = 0.378
DR/DJ = 1.283
MASS FLOW = 0.717 POUNDS PER SECOND
THRUST = 33.49 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	71.0	73.8	74.6	74.1	72.8	70.7
250.0	73.8	74.5	73.5	72.7	72.9	73.4
315.2	75.2	76.6	76.1	76.8	76.6	77.8
400.0	78.8	79.4	78.9	79.4	79.5	79.0
500.0	82.1	81.4	81.0	81.4	81.0	80.7
630.0	84.2	83.5	83.8	83.7	84.0	84.4
800.0	87.0	86.2	86.2	85.1	85.3	85.8
1000.0	89.0	88.2	86.8	85.8	86.0	85.7
1250.0	91.6	90.1	88.8	88.1	87.6	87.1
1600.0	92.8	90.5	89.8	88.8	88.4	88.1
2000.0	94.0	92.1	91.1	90.0	89.2	89.0
2500.0	93.9	92.8	91.6	90.6	90.3	89.8
3150.0	94.4	93.3	92.0	91.3	90.5	90.2
4000.0	94.7	93.7	92.5	91.4	90.9	90.4
5000.0	94.5	93.4	92.6	91.3	90.8	90.2
6300.0	94.3	94.1	92.6	91.4	90.9	90.6
8000.0	94.2	94.3	91.7	90.9	90.3	89.8
10000.0	94.2	94.2	90.9	90.3	89.8	89.1
12500.0	94.1	92.8	91.2	89.9	89.5	88.4
16000.0	92.9	91.5	89.9	89.2	88.8	87.7
20000.0	91.2	92.2	89.6	88.7	88.1	87.1
25000.0	91.0	91.5	89.3	88.4	88.0	87.0
31500.0	90.6	91.3	89.1	87.9	87.7	86.8
40000.0	89.6	91.4	88.7	87.9	86.8	86.9
OVERALL SPL	105.5	104.9	103.3	102.3	101.8	101.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	7	35.3	18	142.5	19	150.0	
200.0		0.0		0.0		70.4		72.0	
250.0		0.0		0.0		74.1		74.5	
315.2		0.0		0.0		75.6		74.9	
400.0		0.0		0.0		77.0		77.7	
500.0		0.0		0.0		78.7		78.5	
630.0		0.0		0.0		80.3		78.9	
800.0		0.0		0.0		82.3		79.7	
1000.0		0.0		0.0		83.3		81.7	
1250.0		0.0		0.0		85.1		82.9	
1600.0		0.0		0.0		85.6		84.0	
2000.0		0.0		0.0		86.8		84.4	
2500.0		0.0		0.0		87.1		85.3	
3150.0		0.0		0.0		87.4		85.7	
4000.0		0.0		0.0		87.9		85.3	
5000.0		0.0		0.0		87.3		85.1	
6300.0		0.0		0.0		87.2		85.4	
8000.0		0.0		0.0		86.0		84.5	
10000.0		0.0		0.0		84.9		83.5	
12500.0		0.0		0.0		83.8		82.5	
16000.0		0.0		0.0		83.0		81.1	
20000.0		0.0		0.0		81.9		79.7	
25000.0		0.0		0.0		81.3		78.6	
31500.0		0.0		0.0		80.6		77.5	
40000.0		0.0		0.0		79.7		76.4	
OVERALL									
SPL		92.8		0.0		98.0		76.1	

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 7.10 PSI, ATMOSPHERIC PRESSURE = 14.17 PSI
RESERVOIR TEMPERATURE = 1610.00 DEG.F, CHAMBER TEMPERATURE = 108.00 DEG.F
RELATIVE HUMIDITY = 23.0 PERCENT
GAMMA = 1.330

RUN NUMBER 107

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 1.501$
TEMPERATURE RATIO $TR = 3.644$
MACH NUMBER $MJ = 0.802$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 3.295$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.303$
JET VELOCITY RATIO $VJ/A_0 = 1.455$
JET VELOCITY $VJ = 1700.0$ FPS

$TR/TJ = 1.106$
 $DR/D_0 = 0.412$
 $DR/DJ = 1.357$
MASS FLOW = 0.809 POUNDS PER SECOND
THRUST = 41.42 POUNDS

SHOCK CELL LENGTH $S = 0.000$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	92.8	90.9	89.5	88.5	85.2	82.2
250.0	94.6	95.1	93.2	92.5	88.8	84.8
315.2	99.3	96.8	96.7	94.8	90.9	88.4
400.0	101.4	101.2	99.4	97.2	95.2	92.1
500.0	103.6	102.7	102.6	101.0	97.4	94.4
630.0	102.4	104.8	105.3	103.9	101.4	97.8
800.0	105.3	107.7	107.6	106.9	104.1	100.6
1000.0	104.7	107.7	109.0	108.9	107.1	103.7
1250.0	105.6	108.9	111.5	111.6	109.9	106.6
1600.0	105.5	109.5	111.5	112.1	111.4	108.3
2000.0	105.9	110.9	112.2	113.0	112.5	109.4
2500.0	106.5	111.7	113.0	113.3	112.8	110.3
3150.0	106.9	112.5	113.6	113.2	112.3	109.8
4000.0	106.2	111.8	113.0	112.1	110.6	108.7
5000.0	103.1	109.5	111.3	109.9	108.6	107.1
6300.0	100.0	106.8	108.6	107.6	106.8	106.0
8000.0	97.2	104.7	106.0	105.6	105.3	105.2
10000.0	93.3	103.6	103.8	103.4	103.3	103.3
12500.0	91.9	100.0	101.4	101.7	102.2	102.6
16000.0	89.5	98.2	99.5	99.7	100.7	101.0
20000.0	87.0	95.7	97.3	97.2	98.4	99.0
25000.0	84.4	93.6	95.4	95.1	96.5	97.0
31500.0	81.1	91.1	93.1	92.3	94.0	94.9
40000.0	78.5	88.9	91.4	90.4	91.1	92.9
OVERALL SPL	116.2	120.7	122.0	121.8	120.8	118.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	0.0	79.0	79.6	78.6	78.3	78.0
250.0	83.3	81.2	80.1	79.6	79.8	78.5
315.2	84.5	83.0	82.2	81.7	80.4	79.6
400.0	88.3	85.8	84.1	83.4	82.8	81.6
500.0	90.3	88.4	86.0	84.9	84.1	83.6
630.0	93.5	90.6	88.7	87.8	86.6	85.6
800.0	96.5	93.0	91.2	89.9	89.0	87.5
1000.0	99.3	95.8	93.3	91.7	90.7	89.3
1250.0	102.2	98.8	95.5	93.9	92.3	91.4
1600.0	103.6	100.3	96.8	95.4	93.8	92.7
2000.0	105.3	100.9	98.3	96.9	95.2	93.9
2500.0	105.6	102.6	99.6	98.2	96.2	95.0
3150.0	105.9	103.5	100.8	99.0	97.3	96.1
4000.0	106.3	104.3	101.5	99.8	97.8	96.7
5000.0	105.9	104.2	101.6	99.9	97.7	97.0
6300.0	105.3	104.1	101.4	100.0	97.7	97.2
8000.0	105.0	103.7	101.3	100.3	97.7	97.3
10000.0	103.4	103.1	100.7	99.6	98.2	97.5
12500.0	103.0	102.8	100.4	99.5	96.8	97.0
16000.0	101.8	102.1	99.9	98.8	96.4	96.6
20000.0	99.9	100.5	98.8	97.5	95.1	95.3
25000.0	98.4	98.8	97.6	96.2	94.0	94.2
31500.0	96.1	97.0	95.6	94.1	92.2	92.5
40000.0	93.8	95.8	93.6	92.1	90.8	90.9
OVERALL SPL	115.9	114.2	111.7	110.4	108.3	107.8

SUPERSONIC JET EXHAUST NOISE

MACH 1.0 NOZZLE

RESERVOIR PRESSURE = 7.04 PSI, ATMOSPHERIC PRESSURE = 14.02 PSI
RESERVOIR TEMPERATURE = 1472.00 DEG.F, CHAMBER TEMPERATURE = 62.00 DEG.F
RELATIVE HUMIDITY = 38.0 PERCENT
GAMMA = 1.330

RUN NUMBER 179

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 1.502
TEMPERATURE RATIO TR = 3.701
MACH NUMBER MJ = 0.802
JET STATIC TEMPERATURE RATIO TJ/T0 = 3.346
JET DENSITY RATIO DJ/D0 = 0.299
JET VELOCITY RATIO VJ/A0 = 1.468
JET VELOCITY VJ = 1643.7 FPS

TR/TJ = 1.106
DR/D0 = 0.406
DR/DJ = 1.358
MASS FLOW = 0.803 POUNDS PER SECOND
THRUST = 41.50 POUNDS

SHOCK CELL LENGTH S = 0.000 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	72.8	75.3	76.3	75.3	74.4	72.4
250.0	75.9	76.1	75.0	74.4	74.1	74.2
315.2	77.0	77.8	77.4	76.7	77.4	77.7
400.0	79.8	80.2	80.2	80.1	80.7	80.6
500.0	83.3	82.7	82.6	83.1	82.8	82.5
630.0	85.5	85.2	85.5	85.3	85.4	85.7
800.0	87.9	87.8	87.8	86.6	86.7	87.5
1000.0	90.4	90.0	88.8	87.3	86.7	87.4
1250.0	93.2	91.7	90.1	89.6	88.8	88.4
1600.0	94.6	92.3	91.5	90.5	89.8	89.5
2000.0	96.1	93.6	92.7	91.9	90.7	90.5
2500.0	96.3	94.6	93.6	92.8	91.8	91.4
3150.0	96.7	95.2	94.1	93.5	92.3	92.1
4000.0	97.5	95.9	94.9	94.0	92.9	92.6
5000.0	97.1	95.8	94.8	93.8	92.8	92.5
6300.0	97.3	96.5	95.2	94.2	93.2	92.9
8000.0	97.0	96.7	94.2	93.4	92.4	92.1
10000.0	97.4	96.8	93.8	93.2	92.1	91.6
12500.0	97.4	95.3	94.0	92.9	91.8	91.0
16000.0	96.5	94.5	93.0	92.4	91.3	90.3
20000.0	94.7	94.7	92.7	91.7	90.3	89.8
25000.0	94.2	93.6	92.2	91.2	90.0	89.5
31500.0	93.6	93.3	91.8	90.5	89.4	89.1
40000.0	92.4	93.1	91.3	90.1	88.4	89.0
OVERALL SPL	108.2	107.1	105.6	104.8	103.7	103.4

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	7 35.3	18 142.5	19 150.0
200.0	79.3	0.0	71.7	73.2
250.0	74.3	0.0	75.7	76.1
315.2	78.1	0.0	76.9	76.6
400.0	79.2	0.0	77.9	78.9
500.0	81.5	0.0	80.5	79.9
630.0	85.9	0.0	82.1	80.2
800.0	87.1	0.0	83.9	81.2
1000.0	87.1	0.0	85.0	83.4
1250.0	87.3	0.0	86.8	84.7
1600.0	88.7	0.0	87.4	85.5
2000.0	90.2	0.0	88.6	86.3
2500.0	90.4	0.0	89.1	87.4
3150.0	91.2	0.0	89.4	87.9
4000.0	91.8	0.0	90.2	88.0
5000.0	91.5	0.0	89.7	87.8
6300.0	91.8	0.0	89.7	88.0
8000.0	91.0	0.0	88.5	87.0
10000.0	90.6	0.0	87.7	86.2
12500.0	89.9	0.0	86.7	85.4
16000.0	89.4	0.0	86.2	84.2
20000.0	88.3	0.0	84.9	82.6
25000.0	87.7	0.0	84.1	81.5
31500.0	86.8	0.0	83.1	80.1
40000.0	85.9	0.0	82.3	78.9
OVERALL SPL	102.4	0.0	100.2	98.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 29.50 PSI, ATMOSPHERIC PRESSURE = 14.26 PSI
RESERVOIR TEMPERATURE = 69.00 DEG.F, CHAMBER TEMPERATURE = 72.00 DEG.F
RELATIVE HUMIDITY = 78.0 PERCENT
GAMMA = 1.400

RUN NUMBER 73

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 3.069
TEMPERATURE RATIO TR = 0.994
MACH NUMBER MJ = 1.374
JET STATIC TEMPERATURE RATIO T_j/T_0 = 0.722
JET DENSITY RATIO ρ_j/ρ_0 = 1.305
JET VELOCITY RATIO V_j/A_0 = 1.167
JET VELOCITY VJ = 1319.9 FPS

TR/TJ = 1.378
DR/D0 = 3.086
DR/DJ = 2.228
MASS FLOW = 2.961 POUNDS PER SECOND
THRUST = 121.70 POUNDS

SHOCK CELL LENGTH S = 2.073 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	96.3	96.0	87.5	82.6	80.9	78.9
250.0	97.7	97.2	92.5	86.0	84.3	82.1
315.2	101.0	98.6	96.2	89.6	86.5	84.8
400.0	102.7	103.5	98.1	93.3	89.8	87.5
500.0	105.2	104.9	101.4	95.9	92.6	89.6
630.0	106.6	107.5	104.6	98.8	95.4	92.2
800.0	109.8	111.2	107.0	102.1	98.3	94.5
1000.0	109.6	111.0	110.0	104.5	100.7	97.1
1250.0	110.5	113.4	112.1	107.0	102.9	98.6
1600.0	110.8	113.3	112.7	107.3	103.4	99.7
2000.0	110.8	114.0	112.8	108.1	104.8	101.2
2500.0	111.1	113.8	111.8	107.4	104.9	101.5
3150.0	110.4	112.8	110.5	106.5	104.7	101.8
4000.0	109.5	111.2	108.8	105.7	105.2	102.2
5000.0	107.4	108.8	106.3	104.1	104.4	102.3
6300.0	105.6	106.8	104.5	103.1	104.2	102.3
8000.0	103.1	104.6	102.5	101.8	103.5	101.8
10000.0	100.8	102.6	100.9	100.6	102.8	101.5
12500.0	98.4	100.7	99.5	99.5	102.0	100.9
16000.0	96.2	99.0	98.0	98.2	101.0	100.3
20000.0	93.9	97.0	96.5	96.8	99.7	99.3
25000.0	91.8	95.7	95.4	95.5	98.6	98.8
31500.0	90.2	94.4	94.1	94.2	97.7	98.2
40000.0	88.8	93.7	92.9	93.5	96.6	97.9
OVERALL SPL	120.5	122.6	120.8	116.7	115.3	113.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	7	60.0	8	67.5	9	75.0
	10	82.5	11	90.0	12	97.5
200.0	79.0		79.2		80.0	78.3
250.0	81.4		81.2		81.2	80.2
315.2	83.4		83.0		83.1	82.5
400.0	86.5		86.1		85.9	84.5
500.0	87.8		87.4		86.7	85.3
630.0	90.4		89.6		89.0	87.9
800.0	91.9		91.0		90.3	88.8
1000.0	93.7		92.5		92.1	90.5
1250.0	95.3		94.2		93.3	92.3
1600.0	96.9		95.3		94.7	93.2
2000.0	98.1		96.6		95.7	94.0
2500.0	98.7		97.2		96.2	94.6
3150.0	99.4		97.8		96.8	95.5
4000.0	100.0		98.7		97.6	95.8
5000.0	100.4		98.9		97.6	96.3
6300.0	100.6		99.4		97.8	97.0
8000.0	100.5		99.5		98.1	97.0
10000.0	100.6		99.4		98.0	97.0
12500.0	100.4		99.3		98.0	96.9
16000.0	100.2		99.1		98.1	96.6
20000.0	99.6		98.6		97.7	95.9
25000.0	99.1		98.2		97.6	95.5
31500.0	98.3		97.7		97.4	94.9
40000.0	97.6		97.6		96.9	94.2
OVERALL						
SPL	111.6		110.4		109.4	107.9
					108.2	107.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 29.50 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 47.00 DEG.F, CHAMBER TEMPERATURE = 56.00 DEG.F
RELATIVE HUMIDITY = 41.0 PERCENT
GAMMA = 1.400

RUN NUMBER 180

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 3.092$
TEMPERATURE RATIO $TR = 0.983$
MACH NUMBER $MJ = 1.380$
JET STATIC TEMPERATURE RATIO $TJ/TO = 0.712$
JET DENSITY RATIO $DJ/DO = 1.405$
JET VELOCITY RATIO $VJ/AO = 1.164$
JET VELOCITY $VJ = 1295.9$ FPS

$TR/TJ = 1.381$
 $OR/DO = 3.147$
 $DR/DJ = 2.240$
MASS FLOW = 2.994 POUNDS PER SECOND
THRUST = 122.67 POUNDS

SHOCK CELL LENGTH $S = 2.091$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3														
OCTAVE	MICRO		MICRO		MICRO		MICRO		MICRO		MICRO			
CENTER	PHONE		PHONE		PHONE		PHONE		PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	10	82.5	11	90.0	12	97.5	13	105.0	14	112.5	15	120.0		
200.0	73.6		76.1		76.9		76.1		75.3		74.2			
250.0	76.1		77.6		76.7		75.7		75.0		74.1			
315.2	77.2		77.9		77.9		77.6		77.1		76.2			
400.0	80.2		80.7		80.3		80.3		80.5		80.4			
500.0	83.0		82.6		83.4		83.2		83.3		83.4			
630.0	84.9		84.8		85.5		85.8		85.3		85.5			
800.0	87.3		87.4		88.1		87.4		86.6		86.2			
1000.0	89.2		89.8		89.5		88.6		87.9		87.6			
1250.0	91.4		92.0		91.2		90.4		90.1		89.6			
1600.0	92.9		92.8		91.8		91.2		91.0		90.3			
2000.0	94.4		93.9		93.0		92.4		92.0		91.5			
2500.0	95.3		94.4		93.9		93.0		92.7		92.1			
3150.0	95.9		95.1		94.4		94.0		94.0		93.4			
4000.0	96.2		95.8		95.3		95.0		95.6		95.4			
5000.0	96.3		96.7		96.7		96.4		97.2		96.7			
6300.0	97.0		98.1		97.6		97.3		97.8		97.2			
8000.0	97.5		98.6		97.2		96.8		97.4		96.8			
10000.0	97.8		98.6		96.7		96.7		97.4		96.5			
12500.0	98.1		97.8		97.3		96.5		97.4		96.5			
16000.0	97.4		97.5		96.6		96.3		97.1		96.3			
20000.0	96.3		98.0		96.7		96.1		96.6		95.9			
25000.0	96.6		97.7		96.9		96.1		96.4		96.0			
31500.0	96.3		98.2		96.9		95.5		96.0		95.9			
40000.0	95.9		98.3		96.6		95.4		94.8		95.7			
OVERALL														
SPL	108.4		109.1		108.1		107.6		108.0		107.5			

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0	73.1		71.7		72.2		72.4		
250.0	74.1		73.6		74.3		74.4		
315.2	76.2		75.6		75.6		75.5		
400.0	80.1		78.1		77.6		77.7		
500.0	82.2		81.6		80.5		79.0		
630.0	84.8		84.0		82.5		80.2		
800.0	85.0		84.1		83.4		81.7		
1000.0	87.3		85.9		85.3		83.9		
1250.0	89.2		88.6		88.0		86.9		
1600.0	89.8		89.4		89.0		88.5		
2000.0	91.1		90.8		90.8		89.8		
2500.0	91.9		91.8		92.0		91.5		
3150.0	93.4		93.8		94.4		93.9		
4000.0	95.9		96.2		97.1		96.8		
5000.0	96.9		96.8		96.9		97.4		
6300.0	97.2		97.0		96.5		96.5		
8000.0	97.0		96.8		95.7		95.5		
10000.0	96.5		96.0		94.9		94.4		
12500.0	96.4		95.9		94.5		94.0		
16000.0	96.1		95.4		94.1		93.0		
20000.0	95.6		94.6		93.2		91.7		
25000.0	95.3		94.2		93.0		91.0		
31500.0	94.7		93.6		92.3		89.6		
40000.0	94.0		93.3		91.2		88.4		
OVERALL									
SPL	107.2		106.8		106.2		105.6		

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 29.50 PSI, ATMOSPHERIC PRESSURE = 14.26 PSI
RESERVOIR TEMPERATURE = 240.00 DEG.F, CHAMBER TEMPERATURE = 81.00 DEG.F
RELATIVE HUMIDITY = 63.0 PERCENT
GAMMA = 1.398

RUN NUMBER 74

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 3.069$
TEMPERATURE RATIO $TR = 1.294$
MACH NUMBER $MJ = 1.375$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 0.940$
JET DENSITY RATIO $DJ/D_0 = 1.063$
JET VELOCITY RATIO $VJ/A_0 = 1.333$
JET VELOCITY $VJ = 1519.8$ FPS

$TR/TJ = 1.376$
 $DR/D_0 = 2.372$
 $DR/DJ = 2.230$
MASS FLOW = 2.595 POUNDS PER SECOND
THRUST = 121.80 POUNDS

SHOCK CELL LENGTH $S = 2.075$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	97.2	98.0	90.5	86.1	84.6	81.4
250.0	99.0	99.8	95.0	90.2	87.8	83.2
315.2	102.8	101.4	100.1	93.5	90.9	87.0
400.0	105.0	106.1	102.7	98.0	94.6	90.5
500.0	108.8	107.8	106.1	100.9	97.8	92.3
630.0	108.6	110.4	109.8	104.8	101.2	95.7
800.0	111.8	113.5	112.3	108.4	104.4	98.3
1000.0	111.8	114.1	115.0	111.2	107.6	101.6
1250.0	113.0	116.1	117.6	114.3	110.7	103.9
1600.0	113.4	116.5	117.8	115.5	112.1	105.5
2000.0	113.9	117.8	118.5	116.5	113.6	106.8
2500.0	114.5	118.2	118.8	116.7	113.6	107.5
3150.0	114.7	118.5	118.8	116.4	113.0	108.2
4000.0	114.3	118.0	118.5	115.4	112.6	108.4
5000.0	112.6	116.7	116.7	113.3	111.7	108.5
6300.0	111.2	115.4	115.3	112.1	111.0	108.4
8000.0	109.8	113.8	113.6	110.4	110.1	107.8
10000.0	108.8	112.7	112.1	109.4	109.3	107.5
12500.0	107.6	111.7	110.8	108.2	108.5	106.8
16000.0	105.9	110.1	109.1	106.5	107.1	105.9
20000.0	104.0	108.5	107.7	105.3	105.9	105.1
25000.0	102.2	107.0	106.7	104.0	104.8	104.5
31500.0	100.1	105.5	105.3	102.7	103.8	103.8
40000.0	98.8	104.4	104.1	101.9	102.6	103.4
OVERALL SPL	124.3	127.7	128.0	125.3	122.8	118.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	80.2	81.0	80.4	79.2	79.0	78.8
250.0	82.8	81.9	81.3	80.3	81.2	79.5
315.2	84.5	84.2	84.1	83.2	82.9	82.2
400.0	87.4	87.2	86.7	85.4	85.8	84.3
500.0	89.9	88.3	88.1	86.7	85.8	84.8
630.0	92.9	91.7	90.5	90.1	89.3	86.2
800.0	95.2	93.4	92.2	91.0	90.7	90.5
1000.0	97.2	95.3	94.2	92.8	92.0	91.3
1250.0	99.2	96.9	96.1	94.5	93.8	93.8
1600.0	101.0	98.8	97.3	95.9	95.3	94.8
2000.0	102.6	100.3	98.8	97.3	96.5	95.9
2500.0	103.4	101.4	99.5	98.1	97.4	96.9
3150.0	104.5	102.2	100.4	99.2	98.4	97.7
4000.0	105.4	103.3	101.5	99.9	99.1	98.5
5000.0	105.8	103.7	101.7	100.5	99.8	99.4
6300.0	106.2	104.4	102.3	101.3	100.6	100.6
8000.0	106.1	104.4	102.6	101.4	101.0	101.0
10000.0	106.2	104.6	102.6	101.8	101.3	101.7
12500.0	106.1	104.8	103.1	102.0	101.4	102.0
16000.0	105.6	104.7	103.1	101.5	101.4	101.6
20000.0	105.0	104.3	103.1	101.1	101.0	100.9
25000.0	104.6	103.9	103.2	100.9	100.6	100.3
31500.0	103.8	103.4	102.9	100.2	100.0	99.4
40000.0	103.0	103.3	102.4	99.4	99.8	98.6
OVERALL SPL	116.8	115.4	113.9	112.3	111.9	111.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 29.50 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 202.00 DEG.F, CHAMBER TEMPERATURE = 54.00 DEG.F
RELATIVE HUMIDITY = 50.0 PERCENT
GAMMA = 1.398

RUN NUMBER 181

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 3.092
TEMPERATURE RATIO TR = 1.288
MACH NUMBER MJ = 1.380
JET STATIC TEMPERATURE RATIO TJ/TO = 0.934
JET DENSITY RATIO DJ/DO = 1.071
JET VELOCITY RATIO VJ/A0 = 1.334
JET VELOCITY VJ = 1482.2 FPS

TR/TJ = 1.379
OR/DO = 2.401
OR/DJ = 2.242
MASS FLOW = 2.615 POUNDS PER SECOND
THRUST = 122.77 POUNDS

SHOCK CELL LENGTH S = 2.093 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	74.5	77.4	80.8	76.7	76.1	74.6
250.0	78.3	79.2	80.6	77.2	76.1	75.4
315.2	78.9	79.4	80.6	77.8	77.5	77.1
400.0	82.4	82.3	82.6	81.6	81.5	82.4
500.0	85.3	84.6	84.3	85.0	85.0	85.2
630.0	87.3	86.5	87.0	87.1	88.2	87.5
800.0	89.3	89.5	89.0	88.4	88.4	88.1
1000.0	91.6	91.6	90.4	89.9	89.2	89.4
1250.0	94.2	93.8	92.5	92.3	91.7	91.4
1600.0	95.6	94.7	93.3	93.3	92.7	92.4
2000.0	97.4	96.0	94.4	94.4	93.9	93.4
2500.0	98.2	96.7	95.0	95.5	95.0	94.6
3150.0	98.8	97.4	96.1	96.6	96.2	95.8
4000.0	99.3	98.2	96.9	97.7	97.7	97.8
5000.0	99.5	99.1	97.8	98.9	99.4	99.8
6300.0	100.1	100.5	98.8	100.4	100.7	101.0
8000.0	100.6	101.5	98.2	100.2	100.8	100.9
10000.0	101.5	101.7	97.5	100.5	100.5	100.6
12500.0	101.9	101.0	97.5	100.4	100.9	100.5
16000.0	101.1	101.1	95.9	100.1	100.4	99.9
20000.0	100.1	101.3	94.9	99.6	99.7	99.1
25000.0	100.2	100.6	93.3	99.2	99.3	98.7
31500.0	100.1	101.1	92.0	98.8	98.9	98.5
40000.0	99.8	101.4	90.3	98.8	98.0	98.6
OVERALL SPL	111.8	111.9	108.1	110.7	110.8	110.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0		72.5		71.8		72.5		73.6	
250.0		75.0		74.3		75.8		75.6	
315.2		76.4		75.9		76.7		76.7	
400.0		80.7		79.6		78.8		78.5	
500.0		84.9		84.0		82.4		80.7	
630.0		88.2		87.4		85.0		81.5	
800.0		87.4		86.4		85.8		84.0	
1000.0		88.9		87.9		87.0		85.6	
1250.0		90.8		90.6		90.3		88.7	
1600.0		91.7		91.0		91.3		90.6	
2000.0		93.0		92.9		92.6		91.3	
2500.0		94.1		94.1		94.4		93.9	
3150.0		95.6		95.7		96.3		95.5	
4000.0		98.0		98.3		99.6		98.8	
5000.0		99.8		99.7		100.3		100.3	
6300.0		100.8		100.7		100.7		100.6	
8000.0		100.7		100.4		99.9		99.8	
10000.0		100.9		99.6		99.0		98.5	
12500.0		100.1		99.1		98.2		97.6	
16000.0		99.3		98.5		97.6		96.1	
20000.0		98.5		97.4		96.5		94.8	
25000.0		97.8		96.6		95.9		93.6	
31500.0		97.3		96.1		95.3		92.6	
40000.0		96.9		95.9		94.4		91.5	
OVERALL									
SPL		110.3		109.7		109.5		108.8	

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 29.50 PSI, ATMOSPHERIC PRESSURE = 14.26 PSI
RESERVOIR TEMPERATURE = 400.00 DEG.F, CHAMBER TEMPERATURE : 78.00 DEG.F
RELATIVE HUMIDITY = 64.0 PERCENT
 $\gamma = 1.387$

RUN NUMBER 75

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 3.069$
TEMPERATURE RATIO $TR = 1.599$
MACH NUMBER $MJ = 1.378$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.169$
JET DENSITY RATIO $DJ/D0 = 0.855$
JET VELOCITY RATIO $VJ/A0 = 1.490$
JET VELOCITY $VJ = 1693.8$ FPS

$TR/TJ = 1.367$
 $DR/D0 = 1.920$
 $DR/DJ = 2.244$
MASS FLOW = 2.333 POUNDS PER SECOND
THRUST = 122.36 POUNDS

SHOCK CELL LENGTH $S = 2.085$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	1 15.0	2 22.5	3 30.0	4 37.5	5 45.0	6 52.5
200.0	99.0	98.4	93.2	0.0	85.6	83.9
250.0	99.9	100.2	97.6	0.0	89.0	87.5
315.2	104.0	102.2	100.2	0.0	92.9	90.0
400.0	106.9	107.0	103.8	0.0	97.0	93.3
500.0	110.0	109.2	106.7	0.0	100.2	95.8
630.0	108.5	110.8	110.4	0.0	103.1	98.5
800.0	112.3	114.1	113.2	0.0	106.9	102.2
1000.0	111.8	114.4	115.3	0.0	110.2	104.9
1250.0	113.4	116.1	117.7	0.0	113.3	107.7
1600.0	114.0	116.8	118.1	0.0	115.6	110.1
2000.0	114.4	118.1	119.4	0.0	117.5	111.9
2500.0	115.5	118.8	119.9	0.0	118.1	112.7
3150.0	116.2	119.9	120.7	0.0	118.1	113.0
4000.0	116.5	120.1	121.4	0.0	117.7	113.0
5000.0	115.7	119.6	120.5	0.0	116.5	112.9
6300.0	114.6	118.5	119.7	0.0	115.3	112.8
8000.0	113.2	116.9	118.1	0.0	114.4	112.2
10000.0	111.9	115.5	116.7	0.0	113.7	111.9
12500.0	110.7	114.0	115.5	0.0	112.8	111.3
16000.0	108.7	112.5	113.9	0.0	111.6	110.4
20000.0	107.2	111.2	112.9	0.0	110.3	109.9
25000.0	105.7	110.3	111.9	0.0	109.4	109.5
31500.0	104.2	109.4	110.9	0.0	108.5	108.7
40000.0	103.4	109.1	110.1	0.0	107.6	108.6
OVERALL SPL	125.9	129.2	130.3	125.3	127.1	123.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE	MICRO PHONE
FREQ. HZ	NO. 7 ANGLE 60.0	NO. 8 ANGLE 67.5	NO. 9 ANGLE 75.0	NO. 10 ANGLE 82.5	NO. 11 ANGLE 90.0	NO. 12 ANGLE 97.5
200.0	80.6	81.5	81.0	80.1	79.8	79.5
250.0	83.8	82.8	81.4	81.7	81.8	80.7
315.2	86.0	84.5	85.0	85.2	83.1	82.7
400.0	89.5	87.5	87.7	86.8	86.2	85.4
500.0	90.9	89.5	89.0	87.8	86.5	86.5
630.0	94.1	92.8	91.3	90.5	89.9	88.7
800.0	97.0	94.1	93.2	92.4	91.9	91.5
1000.0	99.4	96.6	95.7	93.9	93.1	92.8
1250.0	101.9	98.7	97.4	96.0	95.0	94.9
1600.0	104.0	100.3	98.8	97.2	96.4	96.0
2000.0	106.1	102.1	100.4	98.6	98.0	97.5
2500.0	107.0	102.9	101.4	99.8	99.1	98.4
3150.0	108.2	104.0	102.6	100.8	100.2	99.6
4000.0	109.3	105.7	103.7	101.7	100.9	100.5
5000.0	110.0	106.1	104.1	102.4	101.7	101.5
6300.0	110.5	106.8	104.7	103.0	102.7	102.9
8000.0	110.3	106.9	105.2	103.4	103.3	103.5
10000.0	110.4	107.0	105.3	103.9	103.7	104.2
12500.0	110.2	107.2	105.7	104.2	104.0	104.6
16000.0	109.7	106.9	105.6	103.9	103.9	104.1
20000.0	109.2	106.5	105.5	103.5	103.5	103.2
25000.0	108.5	106.0	105.4	103.2	103.1	102.5
31500.0	107.4	105.4	105.1	102.6	102.4	101.4
40000.0	106.5	105.2	104.4	101.9	102.1	100.5
OVERALL SPL	120.7	117.5	116.2	114.3	114.1	113.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 29.30 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 360.00 DEG.F, CHAMBER TEMPERATURE = 56.00 DEG.F
RELATIVE HUMIDITY = 46.0 PERCENT
GAMMA = 1.387

RUN NUMBER 182

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 3.078$
TEMPERATURE RATIO $TR = 1.589$
MACH NUMBER $MJ = 1.380$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.161$
JET DENSITY RATIO $DJ/D0 = 0.861$
JET VELOCITY RATIO $VJ/A0 = 1.487$
JET VELOCITY $VJ = 1655.8$ FPS

$TR/TJ = 1.368$
 $DR/D0 = 1.937$
 $DR/DJ = 2.249$
MASS FLOW = 2.345 POUNDS PER SECOND
THRUST = 122.74 POUNDS

SHOCK CELL LENGTH $S = 2.092$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	76.1	77.8	78.9	78.5	76.9	75.6
250.0	79.6	79.5	78.8	77.5	76.8	74.9
315.2	79.9	80.1	79.0	78.3	78.2	76.9
400.0	83.0	83.2	82.3	82.1	82.2	82.4
500.0	86.1	85.4	85.4	85.9	85.8	85.8
630.0	88.0	87.9	87.8	88.4	88.8	89.2
800.0	90.1	90.2	89.9	89.2	89.0	89.0
1000.0	92.2	92.3	91.3	90.3	89.4	89.5
1250.0	94.9	94.7	93.1	92.8	91.8	91.7
1600.0	96.7	95.7	94.3	93.8	93.0	92.8
2000.0	98.5	97.1	96.0	95.3	94.0	93.9
2500.0	99.1	98.1	96.6	96.3	95.3	95.0
3150.0	99.9	99.2	97.8	97.6	96.6	96.5
4000.0	100.8	100.1	98.9	98.5	98.0	98.1
5000.0	101.1	100.7	100.2	99.5	100.3	100.3
6300.0	101.6	102.3	102.1	101.0	102.0	102.2
8000.0	102.3	103.7	102.2	101.4	102.3	102.1
10000.0	103.2	104.4	102.1	101.8	102.4	102.3
12500.0	103.9	103.8	102.9	102.0	102.4	101.9
16000.0	103.3	103.5	102.2	101.5	101.7	101.3
20000.0	102.2	103.9	102.1	101.1	100.9	100.6
25000.0	102.5	103.6	102.0	101.0	100.6	100.5
31500.0	102.2	103.7	101.9	100.5	100.1	100.2
40000.0	101.4	103.7	101.6	100.3	99.2	100.0
OVERALL SPL	113.5	114.2	112.7	111.9	112.0	111.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	83.0	71.8	72.6	73.5
250.0	74.8	74.8	75.8	75.9
315.2	77.3	76.6	76.9	78.1
400.0	81.0	79.7	78.8	79.8
500.0	85.5	84.5	82.9	81.7
630.0	89.6	88.9	86.2	81.8
800.0	88.6	88.2	87.2	85.0
1000.0	89.8	88.2	87.4	86.0
1250.0	91.2	90.8	90.4	88.5
1600.0	91.9	91.4	91.5	90.7
2000.0	93.4	93.2	93.0	91.4
2500.0	94.3	94.3	94.5	93.4
3150.0	95.7	96.0	96.1	95.3
4000.0	97.9	98.5	99.6	99.1
5000.0	99.9	100.3	100.7	101.1
6300.0	101.2	101.6	101.4	101.7
8000.0	101.6	102.1	101.2	101.1
10000.0	101.7	101.2	100.3	99.8
12500.0	101.1	100.5	99.3	98.5
16000.0	100.5	99.8	98.7	96.8
20000.0	99.6	98.7	97.5	95.4
25000.0	99.2	98.2	97.2	94.4
31500.0	98.6	97.6	96.4	93.1
40000.0	97.9	97.4	95.4	91.9
OVERALL SPL	111.1	110.8	110.3	109.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 29.00 PSI, ATMOSPHERIC PRESSURE = 14.26 PSI
RESERVOIR TEMPERATURE = 550.00 DEG.F, CHAMBER TEMPERATURE = 81.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.377

RUN NUMBER 76

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 3.034$
TEMPERATURE RATIO $TR = 1.867$
MACH NUMBER $MJ = 1.372$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 1.378$
JET DENSITY RATIO $DJ/D_0 = 0.726$
JET VELOCITY RATIO $VJ/A_0 = 1.611$
JET VELOCITY $VJ = 1836.7$ FPS

$TR/TJ = 1.355$
 $DR/D_0 = 1.625$
 $DR/DJ = 2.239$
MASS FLOW = 2.141 POUNDS PER SECOND
THRUST = 121.41 POUNDS

SHOCK CELL LENGTH $S = 2.068$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	98.8	98.0	93.6	10.0	10.0	82.9
250.0	102.2	101.3	98.7	95.4	92.9	86.9
315.2	105.4	103.1	101.7	98.0	94.8	90.8
400.0	108.1	107.7	104.2	102.2	98.6	94.4
500.0	110.6	109.3	108.3	104.8	101.0	97.0
630.0	110.9	111.8	111.7	108.4	105.0	100.1
800.0	113.1	114.9	114.5	111.5	108.8	103.2
1000.0	113.3	115.3	116.5	114.7	112.1	106.8
1250.0	114.4	116.9	118.8	117.7	115.4	110.1
1600.0	114.8	117.8	119.2	118.6	117.0	112.2
2000.0	116.0	119.2	120.3	120.0	119.3	114.2
2500.0	116.8	120.2	121.1	120.5	119.9	114.8
3150.0	117.3	121.2	122.2	121.6	120.5	115.2
4000.0	117.5	121.5	122.6	122.2	120.6	114.9
5000.0	116.8	120.3	121.6	121.6	120.1	114.7
6300.0	115.3	118.8	119.9	120.3	118.9	114.3
8000.0	113.7	117.1	118.0	118.8	117.4	113.3
10000.0	112.1	115.6	116.4	117.3	116.1	112.8
12500.0	110.8	114.3	115.0	116.1	115.3	112.2
16000.0	109.3	113.1	113.8	114.8	114.0	111.5
20000.0	107.6	111.7	112.8	113.6	112.6	110.9
25000.0	106.2	110.6	111.9	112.6	111.7	110.4
31500.0	104.3	109.6	111.1	111.6	110.8	109.7
40000.0	103.6	109.1	110.8	111.2	109.9	109.5
OVERALL SPL	126.9	130.1	131.2	130.9	129.6	125.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	7	60.0	8	67.5	9	75.0
	10	82.5	11	90.0	12	97.5
200.0	81.9		82.4		81.9	
250.0	85.0		83.3		80.6	
315.2	87.4		86.1		82.3	
400.0	90.5		88.5		85.8	
500.0	92.4		90.1		87.5	
630.0	96.3		93.4		88.4	
800.0	99.3		95.8		91.6	
1000.0	102.0		97.9		93.4	
1250.0	104.7		99.9		95.0	
1600.0	106.9		101.7		97.1	
2000.0	108.7		103.9		98.3	
2500.0	109.9		105.1		99.6	
3150.0	111.1		106.2		101.0	
4000.0	111.7		107.6		101.8	
5000.0	112.5		108.4		102.2	
6300.0	112.6		108.9		103.1	
8000.0	112.2		108.9		104.0	
10000.0	112.1		109.0		104.7	
12500.0	111.9		109.1		105.0	
16000.0	111.2		109.0		105.6	
20000.0	110.6		108.4		105.7	
25000.0	109.8		107.8		106.1	
31500.0	108.8		107.1		106.3	
40000.0	108.1		106.9		106.7	
					106.8	
					105.5	
					105.2	
					104.8	
					103.9	
					103.3	
					103.2	
					101.2	
OVERALL						
SPL	122.8		119.5		117.2	
					115.8	
					115.1	
					114.7	

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 29.10 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 500.00 DEG.F, CHAMBER TEMPERATURE = 55.00 DEG.F
RELATIVE HUMIDITY = 46.0 PERCENT
GAMMA = 1.377

RUN NUMBER 183

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $Pr = 3.064$
TEMPERATURE RATIO $Tr = 1.864$
MACH NUMBER $MJ = 1.380$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.372$
JET DENSITY RATIO $DJ/D0 = 0.729$
JET VELOCITY RATIO $VJ/A0 = 1.616$
JET VELOCITY $VJ = 1797.4$ FPS

$Tr/TJ = 1.359$
 $Dr/D0 = 1.644$
 $Dr/LJ = 2.255$
MASS FLOW = 2.156 POUNDS PER SECOND
THRUST = 122.66 POUNDS

SHOCK CELL LENGTH $S = 2.091$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	77.7	79.5	79.3	79.3	77.8	75.5
250.0	80.3	80.9	79.7	78.0	77.0	75.9
315.2	81.5	81.5	80.3	79.4	79.4	79.6
400.0	85.0	84.7	83.9	83.5	83.6	84.0
500.0	87.9	87.3	86.6	87.1	87.1	87.0
630.0	89.9	89.2	89.5	90.0	90.1	91.0
800.0	92.1	91.9	91.0	90.1	90.8	91.0
1000.0	94.4	94.2	92.4	91.6	91.0	91.2
1250.0	97.2	96.2	94.5	93.8	93.4	93.4
1600.0	98.7	97.6	95.9	95.2	94.7	94.5
2000.0	100.4	98.8	97.6	96.8	96.2	95.6
2500.0	101.3	99.7	98.5	97.9	97.3	96.5
3150.0	102.4	100.8	99.9	99.3	98.6	98.0
4000.0	103.1	101.7	100.8	100.2	100.0	99.7
5000.0	103.5	102.1	102.1	101.5	101.7	102.1
6300.0	104.2	103.6	103.4	103.3	103.2	103.7
8000.0	105.0	104.9	103.7	103.6	103.4	103.5
10000.0	106.0	105.5	103.7	103.7	103.5	103.5
12500.0	106.5	105.1	104.3	103.6	103.5	103.0
16000.0	105.7	104.5	103.5	103.1	102.8	102.3
20000.0	104.5	105.2	103.5	102.4	101.9	101.4
25000.0	104.6	104.6	103.3	102.1	101.6	101.3
31500.0	104.3	104.7	103.1	101.6	101.1	101.0
40000.0	103.4	104.7	102.8	101.4	100.0	101.0
OVERALL SPL	115.9	115.4	114.2	113.6	113.2	113.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0	74.6		73.4		75.2		75.4		
250.0	76.7		76.8		77.7		78.3		
315.2	79.2		78.2		78.6		79.3		
400.0	82.6		81.0		80.1		81.0		
500.0	87.0		86.2		85.2		83.4		
630.0	91.5		90.5		87.8		83.3		
800.0	90.4		89.6		88.6		86.1		
1000.0	91.5		89.3		88.2		87.0		
1250.0	92.6		92.3		92.1		89.5		
1600.0	93.2		93.1		93.0		91.8		
2000.0	94.7		95.1		94.4		92.6		
2500.0	95.9		95.9		95.5		94.4		
3150.0	97.5		97.7		97.4		96.4		
4000.0	99.9		100.7		100.9		100.0		
5000.0	102.2		102.5		101.9		102.1		
6300.0	103.4		103.7		102.4		102.8		
8000.0	103.5		103.8		102.1		101.9		
10000.0	103.3		102.6		101.2		100.4		
12500.0	102.5		102.0		99.9		99.2		
16000.0	101.5		100.8		98.9		97.5		
20000.0	100.7		99.6		97.6		95.9		
25000.0	100.2		98.9		97.2		95.0		
31500.0	99.4		98.2		96.5		93.8		
40000.0	98.8		98.0		95.5		92.6		
OVERALL									
SPL	112.6		112.4		111.1		110.4		

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 28.85 PSI, ATMOSPHERIC PRESSURE = 14.26 PSI
RESERVOIR TEMPERATURE = 840.00 DEG.F, CHAMBER TEMPERATURE = 81.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.361

RUN NUMBER 77

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 3.023$
TEMPERATURE RATIO $TR = 2.403$
MACH NUMBER $MJ = 1.375$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.792$
JET DENSITY RATIO $DJ/D0 = 0.558$
JET VELOCITY RATIO $VJ/A0 = 1.840$
JET VELOCITY $VJ = 2097.8$ FPS

$TR/TJ = 1.341$
 $DR/D0 = 1.258$
 $DR/DJ = 2.254$
MASS FLOW = 1.880 POUNDS PER SECOND
THRUST = 121.78 POUNDS

SHOCK CELL LENGTH $S = 2.075$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	101.0	99.6	93.7	90.2	20.0	10.0
250.0	103.5	102.8	100.4	96.1	93.7	90.9
315.2	108.4	105.8	104.5	100.6	96.6	93.3
400.0	110.7	110.3	107.5	104.0	101.4	96.6
500.0	113.5	112.2	111.0	107.5	104.4	99.3
630.0	112.0	114.3	115.3	111.5	108.6	103.0
800.0	114.9	116.8	117.4	114.7	112.3	107.0
1000.0	114.2	116.6	119.5	117.5	115.0	110.3
1250.0	115.6	118.3	121.0	120.1	118.6	113.4
1600.0	115.6	118.8	121.2	121.0	120.2	116.0
2000.0	116.4	119.9	122.5	122.1	122.4	117.9
2500.0	116.9	120.5	122.8	122.8	122.9	119.2
3150.0	117.0	120.8	123.6	123.9	123.9	119.9
4000.0	116.0	120.5	123.9	124.0	124.4	119.7
5000.0	113.9	118.9	122.3	123.2	124.2	119.5
6300.0	112.0	116.8	120.5	121.8	123.6	118.2
8000.0	109.8	115.0	119.3	120.6	122.4	117.0
10000.0	108.2	113.6	117.7	120.8	122.0	116.1
12500.0	106.7	112.3	117.3	118.7	120.7	115.3
16000.0	104.9	110.8	115.8	117.6	119.9	114.4
20000.0	103.1	109.7	115.0	116.9	118.9	113.7
25000.0	101.4	108.8	114.4	116.2	118.1	113.1
31500.0	99.3	107.6	113.6	115.4	117.6	112.2
40000.0	98.8	107.3	113.1	115.4	117.0	112.0
OVERALL SPL	126.5	129.9	132.8	133.2	133.8	129.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	83.4	84.1	83.2	83.7	81.9	81.0
250.0	86.9	85.4	84.2	84.4	83.9	83.6
315.2	89.0	88.9	87.4	87.0	86.2	85.6
400.0	93.2	91.0	90.1	89.3	89.3	88.0
500.0	95.2	91.8	90.6	90.2	89.2	89.5
630.0	99.2	95.2	93.2	92.9	91.7	90.7
800.0	101.9	97.7	95.9	95.0	94.3	93.7
1000.0	104.8	100.4	97.8	96.8	95.6	94.7
1250.0	107.7	102.6	99.7	98.3	97.4	97.2
1600.0	110.0	104.5	101.0	100.0	99.3	98.0
2000.0	112.0	106.7	103.1	101.2	100.4	99.1
2500.0	113.1	107.7	104.3	102.7	101.5	100.2
3150.0	114.1	109.1	105.7	104.2	102.8	101.6
4000.0	114.6	110.3	107.2	105.2	103.7	102.4
5000.0	115.0	111.3	107.8	105.9	104.5	103.5
6300.0	114.9	111.6	108.3	106.2	105.0	104.3
8000.0	114.6	111.8	108.5	106.2	105.4	104.7
10000.0	114.6	111.8	108.4	106.5	105.8	105.3
12500.0	114.3	111.6	108.7	106.8	106.0	105.5
16000.0	113.5	111.3	108.7	106.6	106.2	105.3
20000.0	112.8	110.8	108.4	106.1	105.7	104.7
25000.0	111.9	110.2	108.2	105.6	105.4	104.0
31500.0	110.9	109.2	107.5	104.8	104.7	103.0
40000.0	110.0	108.8	106.7	103.9	104.3	102.1
OVERALL SPL	125.3	122.1	119.2	117.1	116.4	115.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 28.90 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 774.00 DEG.F, CHAMBER TEMPERATURE = 55.00 DEG.F
RELATIVE HUMIDITY = 50.0 PERCENT
GAMMA = 1.361

RUN NUMBER 184

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_r = 3.050$
TEMPERATURE RATIO $T_r = 2.396$
MACH NUMBER $M_J = 1.381$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 1.783$
JET DENSITY RATIO $\rho_J/\rho_0 = 0.561$
JET VELOCITY RATIO $V_J/A_0 = 1.844$
JET VELOCITY $V_J = 2050.8$ FPS

$T_r/T_J = 1.344$
 $D_r/D_0 = 1.273$
 $D_r/D_J = 2.269$
MASS FLOW = 1.893 POUNDS PER SECOND
THRUST = 122.89 POUNDS

SHOCK CELL LENGTH $S = 2.095$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	80.2	80.8	81.4	82.1	80.6	76.9
250.0	82.2	82.8	81.4	80.2	78.8	77.7
315.2	83.3	83.4	82.2	81.0	81.0	81.3
400.0	86.4	85.9	85.5	85.2	85.3	85.6
500.0	90.4	88.7	88.6	89.2	89.5	89.0
630.0	91.9	90.8	91.0	92.1	92.9	93.4
800.0	93.4	93.4	93.0	92.3	92.7	93.6
1000.0	96.1	95.8	94.2	92.9	92.2	92.8
1250.0	98.9	98.3	95.9	95.5	94.8	94.7
1600.0	100.4	99.2	97.1	96.4	96.3	95.8
2000.0	102.4	100.6	98.8	98.4	97.5	96.9
2500.0	103.2	101.9	99.9	99.5	98.7	98.1
3150.0	104.3	103.1	101.0	101.1	100.1	99.5
4000.0	104.9	104.2	102.1	101.7	101.2	100.6
5000.0	105.6	104.9	102.9	102.5	102.5	102.3
6300.0	106.1	106.0	104.1	104.1	103.9	103.7
8000.0	106.6	107.0	104.0	104.1	104.0	103.4
10000.0	107.6	107.9	103.8	104.4	103.9	103.6
12500.0	108.0	107.4	104.3	104.3	104.1	103.3
16000.0	107.3	106.6	103.3	104.0	103.4	102.6
20000.0	106.0	107.0	102.9	103.3	102.6	102.1
25000.0	106.0	106.7	102.0	103.0	102.2	101.7
31500.0	105.7	106.6	101.1	102.7	102.1	101.8
40000.0	105.0	106.8	100.2	102.8	101.3	101.9
OVERALL SPL	117.6	117.6	114.2	114.6	114.1	113.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 16 127.5	MICRO PHONE NO. ANGLE 17 135.0	MICRO PHONE NO. ANGLE 18 142.5	MICRO PHONE NO. ANGLE 19 150.0
200.0	76.1	75.0	76.3	77.3
250.0	78.0	77.7	79.3	80.2
315.2	81.0	80.3	81.0	82.3
400.0	84.4	82.4	82.5	83.5
500.0	88.9	87.9	87.0	85.4
630.0	93.9	92.4	90.1	85.3
800.0	92.9	92.1	90.7	87.8
1000.0	93.1	91.0	90.2	89.0
1250.0	93.7	93.5	93.4	91.3
1600.0	94.7	94.6	94.6	93.5
2000.0	96.4	97.0	96.4	94.2
2500.0	97.1	97.2	97.3	95.6
3150.0	98.8	98.6	98.8	97.6
4000.0	100.5	100.7	101.3	100.4
5000.0	102.3	102.2	102.5	102.2
6300.0	103.5	103.6	103.1	103.2
8000.0	103.6	103.6	102.6	102.2
10000.0	103.6	102.8	102.0	100.8
12500.0	102.8	102.1	100.8	99.7
16000.0	102.1	101.0	99.9	97.9
20000.0	101.4	100.2	98.8	96.5
25000.0	100.9	99.2	98.1	95.2
31500.0	100.4	98.8	97.8	94.3
40000.0	100.1	98.8	97.1	93.5
OVERALL SPL	113.2	112.7	112.0	110.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 28.20 PSI, ATMOSPHERIC PRESSURE = 14.26 PSI
RESERVOIR TEMPERATURE = 1132.00 DEG.F, CHAMBER TEMPERATURE = 82.00 DEG.F
RELATIVE HUMIDITY = 54.0 PERCENT
GAMMA = 1.344

RUN NUMBER 78

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 2.978
TEMPERATURE RATIO TR = 2.937
MACH NUMBER MJ = 1.369
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.222
JET DENSITY RATIO DJ/D0 = 0.450
JET VELOCITY RATIO VJ/A0 = 2.040
JET VELOCITY VJ = 2327.9 FPS

TR/TJ = 1.322
DR/D0 = 1.014
DR/DJ = 2.252
MASS FLOW = 1.681 POUNDS PER SECOND
THRUST = 120.73 POUNDS

SHOCK CELL LENGTH S = 2.056 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	100.2	99.0	94.7	20.0	20.0	20.0
250.0	102.5	102.5	100.0	95.7	93.4	90.9
315.2	107.7	105.0	104.4	99.6	96.3	93.2
400.0	109.3	109.6	107.2	102.9	101.3	96.4
500.0	112.3	111.8	110.4	106.8	103.4	99.0
630.0	110.9	113.5	114.1	110.1	107.6	103.1
800.0	113.6	116.2	116.6	113.5	111.3	106.3
1000.0	112.7	115.7	118.6	116.5	114.6	110.1
1250.0	113.9	116.7	120.0	119.0	117.8	113.5
1600.0	113.6	116.9	119.9	119.9	120.1	116.0
2000.0	113.6	117.6	120.8	120.7	122.0	118.6
2500.0	113.5	118.2	121.2	121.4	123.0	120.0
3150.0	112.7	117.8	121.6	122.4	123.7	121.4
4000.0	111.3	116.7	121.4	123.0	124.6	121.7
5000.0	109.9	115.3	119.9	122.0	124.7	121.9
6300.0	108.6	113.9	118.4	120.6	124.0	121.4
8000.0	107.2	112.6	117.0	119.4	122.9	120.4
10000.0	106.3	111.3	115.7	118.3	121.7	119.7
12500.0	105.1	110.2	114.7	117.2	121.0	119.1
16000.0	103.8	109.1	113.3	116.1	120.0	118.4
20000.0	102.5	107.7	112.0	115.3	119.0	117.6
25000.0	101.3	106.9	111.0	114.4	118.4	117.3
31500.0	99.6	105.6	109.6	113.4	117.9	116.9
40000.0	99.1	105.5	108.4	113.2	117.4	117.1
OVERALL SPL	124.0	127.7	131.0	131.8	133.9	131.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	84.8	85.2	83.2	82.2	81.8	81.7
250.0	87.2	86.3	83.9	83.5	83.3	83.6
315.2	89.5	87.7	85.7	86.2	86.1	84.8
400.0	92.9	90.6	89.3	88.8	88.4	87.6
500.0	95.3	92.2	89.5	88.4	88.8	88.6
630.0	98.7	95.0	93.3	91.9	91.0	90.4
800.0	101.6	97.6	95.3	94.1	93.5	93.1
1000.0	105.0	100.1	97.4	96.0	95.0	94.5
1250.0	108.0	102.4	99.4	97.8	97.1	96.8
1600.0	110.5	104.5	101.0	99.5	98.6	97.6
2000.0	112.8	106.9	103.0	101.2	99.9	99.4
2500.0	114.2	108.2	104.2	102.1	101.3	100.4
3150.0	115.6	109.6	105.5	103.9	102.4	102.1
4000.0	116.0	110.9	106.9	104.9	103.4	102.9
5000.0	116.6	112.2	107.8	105.8	104.2	104.0
6300.0	116.6	112.9	108.4	106.5	104.8	104.7
8000.0	116.1	113.2	108.7	106.6	105.0	105.0
10000.0	116.0	113.5	108.7	107.5	105.6	105.8
12500.0	115.6	113.5	109.0	107.2	105.9	105.9
16000.0	114.8	113.3	109.1	107.0	106.1	105.8
20000.0	114.0	112.7	109.0	106.6	105.6	105.1
25000.0	113.3	112.1	108.6	106.1	105.0	104.5
31500.0	112.4	111.3	107.9	105.1	104.3	103.4
40000.0	111.6	110.8	107.1	104.1	103.7	102.3
OVERALL SPL	126.6	123.5	119.4	117.3	116.1	115.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 28.60 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 1048.00 DEG.F, CHAMBER TEMPERATURE = 57.00 DEG.F
RELATIVE HUMIDITY = 46.0 PERCENT
GAMMA = 1.344

RUN NUMBER 185

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 3.028
TEMPERATURE RATIO TR = 2.917
MACH NUMBER MJ = 1.381
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.197
JET DENSITY RATIO DJ/D0 = 0.455
JET VELOCITY RATIO VJ/A0 = 2.046
JET VELOCITY VJ = 2280.8 FPS

TR/TJ = 1.328
DR/D0 = 1.038
DR/DJ = 2.281
MASS FLOW = 1.706 POUNDS PER SECOND
THRUST = 122.88 POUNDS

SHOCK CELL LENGTH S = 2.095 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	10.0	82.3	93.1	83.3	81.2	80.0
250.0	83.2	84.1	83.3	82.0	81.3	80.0
315.2	84.0	83.6	82.3	83.4	83.5	84.4
400.0	87.2	86.6	86.2	87.3	87.4	88.0
500.0	90.7	89.2	89.0	91.0	91.4	90.8
630.0	93.3	92.3	92.1	94.1	94.7	95.7
800.0	95.3	94.6	94.4	94.8	95.0	95.9
1000.0	97.1	96.8	95.4	95.4	94.3	94.8
1250.0	100.1	99.6	97.4	97.3	96.8	96.1
1600.0	102.1	100.4	98.8	98.5	98.2	97.6
2000.0	103.9	102.1	100.6	100.3	99.3	98.4
2500.0	105.0	103.2	101.4	101.4	100.8	99.7
3150.0	106.1	104.5	102.8	103.0	101.8	101.0
4000.0	107.0	105.5	103.7	103.7	103.2	101.9
5000.0	107.5	106.0	104.5	104.0	103.9	103.1
6300.0	108.1	107.4	105.4	105.0	104.4	104.2
8000.0	108.7	108.3	105.4	105.1	104.6	104.0
10000.0	109.5	109.2	105.0	105.4	104.6	103.9
12500.0	110.2	108.5	105.9	105.3	104.8	103.6
16000.0	109.7	107.9	105.0	104.9	104.2	103.1
20000.0	108.5	108.4	104.8	104.4	103.4	102.7
25000.0	108.4	108.1	104.2	104.2	103.3	102.6
31500.0	108.0	108.1	103.3	103.6	102.9	102.4
40000.0	107.1	108.0	102.4	103.6	102.0	102.5
OVERALL SPL	119.7	118.9	115.9	115.8	115.1	114.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	77.2	76.6	0.0	79.8
250.0	79.7	79.8	0.0	82.2
315.2	83.8	83.2	0.0	84.3
400.0	86.8	141.0	0.0	85.7
500.0	91.3	90.1	0.0	88.1
630.0	96.7	95.3	0.0	87.4
800.0	96.2	94.9	0.0	89.4
1000.0	95.9	92.8	0.0	91.3
1250.0	95.4	95.0	0.0	93.3
1600.0	96.6	96.7	0.0	95.0
2000.0	98.1	99.3	0.0	96.3
2500.0	99.1	0.0	0.0	97.7
3150.0	100.8	0.0	0.0	99.7
4000.0	101.8	0.0	0.0	101.4
5000.0	102.8	0.0	0.0	102.8
6300.0	103.9	0.0	0.0	103.2
8000.0	104.0	151.2	0.0	102.4
10000.0	103.8	0.0	0.0	101.4
12500.0	103.4	0.0	0.0	100.4
16000.0	102.9	0.0	0.0	98.8
20000.0	102.3	0.0	0.0	97.4
25000.0	101.9	162.6	0.0	96.4
31500.0	101.5	0.0	0.0	95.4
40000.0	101.1	0.0	0.0	94.4
OVERALL SPL	114.1	112.7	112.0	111.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 27.90 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 1410.00 DEG.F, CHAMBER TEMPERATURE = 90.00 DEG.F
RELATIVE HUMIDITY = 18.0 PERCENT
GAMMA = 1.327

RUN NUMBER 111

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 2.965$
TEMPERATURE RATIO $TR = 3.400$
MACH NUMBER $MJ = 1.371$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 2.601$
JET DENSITY RATIO $DJ/D0 = 0.384$
JET VELOCITY RATIO $VJ/A0 = 2.210$
JET VELOCITY $VJ = 2541.0$ FPS

$TR/TJ = 1.307$
 $DR/D0 = 0.872$
 $DR/DJ = 2.268$
MASS FLOW = 1.556 POUNDS PER SECOND
THRUST = 121.07 POUNDS

SHOCK CELL LENGTH $S = 2.062$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	105.1		104.1		100.5	
250.0	107.6		106.9		104.1	
315.2	111.7		110.9		107.5	
400.0	113.8		115.0		111.0	
500.0	115.4		116.5		114.5	
630.0	113.6		118.1		117.6	
800.0	115.6		119.8		120.8	
1000.0	115.0		119.4		123.1	
1250.0	115.2		120.5		125.0	
1600.0	114.9		120.6		124.9	
2000.0	115.0		121.8		125.8	
2500.0	115.0		122.4		126.2	
3150.0	113.9		121.8		126.6	
4000.0	112.7		120.6		126.2	
5000.0	110.2		119.0		124.5	
6300.0	108.4		117.3		123.0	
8000.0	105.7		115.1		121.7	
10000.0	103.9		113.3		120.5	
12500.0	102.4		111.8		119.5	
16000.0	100.7		110.2		118.2	
20000.0	98.9		108.5		117.0	
25000.0	97.0		107.0		116.2	
31500.0	94.8		105.5		114.8	
40000.0	93.2		104.4		114.0	
OVERALL						
SPL	125.7		131.4		135.8	
					137.3	
						137.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3													
OCTAVE	MICRO		MICRO		MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	7	60.0	8	67.5	9	75.0	10	82.5	11	90.0	12	97.5	
200.0	91.2		10.0		89.9		89.0		88.5		87.2		
250.0	93.9		90.5		88.8		89.3		89.5		88.6		
315.2	94.7		91.6		90.9		91.5		90.1		89.0		
400.0	98.7		94.5		93.4		92.8		93.6		92.3		
500.0	101.5		95.0		94.7		94.4		93.0		92.5		
630.0	104.6		99.6		97.7		96.8		95.4		94.4		
800.0	107.7		102.3		100.1		98.7		97.4		97.0		
1000.0	110.9		104.8		102.4		101.0		99.6		98.1		
1250.0	114.9		108.3		104.7		102.5		101.0		100.2		
1600.0	116.7		110.5		106.4		104.2		102.6		101.4		
2000.0	119.8		112.1		108.8		106.1		104.2		103.4		
2500.0	120.9		114.2		110.3		107.5		105.7		104.7		
3150.0	122.5		115.3		112.0		109.0		106.8		105.9		
4000.0	122.9		116.7		113.2		110.2		108.2		107.3		
5000.0	122.4		117.1		113.9		110.6		108.4		107.6		
6300.0	121.9		117.5		114.5		111.3		109.4		108.5		
8000.0	120.7		117.3		114.3		111.3		109.4		108.5		
10000.0	119.8		117.1		114.3		111.2		109.6		108.6		
12500.0	118.6		116.5		114.0		110.9		109.1		108.5		
16000.0	117.3		115.6		113.6		110.2		108.6		107.9		
20000.0	115.9		114.2		112.8		109.4		107.8		107.0		
25000.0	114.8		113.2		112.3		108.4		107.2		106.3		
31500.0	113.7		112.2		111.3		107.1		106.4		105.3		
40000.0	112.8		111.5		110.6		105.9		105.8		104.4		
OVERALL													
SPL	131.7		127.2		124.5		121.3		119.6		118.7		

SUPERSONIC JET EXHAUST NOISE

MACH 1.4 NOZZLE

RESERVOIR PRESSURE = 28.30 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 1360.00 DEG.F, CHAMBER TEMPERATURE = 47.00 DEG.F
RELATIVE HUMIDITY = 40.0 PERCENT
GAMMA = 1.327

RUN NUMBER 186

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 3.007$
TEMPERATURE RATIO $TR = 3.590$
MACH NUMBER $MJ = 1.361$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 2.737$
JET DENSITY RATIO $DJ/D_0 = 0.365$
JET VELOCITY RATIO $VJ/A_0 = 2.284$
JET VELOCITY $VJ = 2521.0$ FPS

$TR/TJ = 1.312$
 $DR/D_0 = 0.838$
 $DR/DJ = 2.293$
MASS FLOW = 1.528 POUNDS PER SECOND
THRUST = 122.87 POUNDS

SHOCK CELL LENGTH $S = 2.094$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	10	82.5	11	90.0	12	97.5
	13	105.0	14	112.5	15	120.0
200.0	10.0		82.5		83.1	
250.0	83.6		84.8		83.9	
315.2	84.2		84.5		83.1	
400.0	87.0		87.0		85.9	
500.0	91.4		90.1		89.9	
630.0	92.8		92.3		92.3	
800.0	95.5		94.8		95.1	
1000.0	97.4		97.3		96.1	
1250.0	100.9		100.1		98.0	
1600.0	102.6		101.4		99.4	
2000.0	104.4		103.0		101.1	
2500.0	105.9		104.1		102.1	
3150.0	106.9		105.2		103.7	
4000.0	107.9		106.5		104.6	
5000.0	108.5		107.4		105.6	
6300.0	109.0		108.6		106.4	
8000.0	109.7		109.6		106.3	
10000.0	110.5		110.8		106.5	
12500.0	111.2		109.7		106.8	
16000.0	110.6		109.3		106.1	
20000.0	109.5		109.9		106.1	
25000.0	109.7		109.8		105.7	
31500.0	109.2		110.1		104.9	
40000.0	108.5		110.1		103.9	
					105.7	
OVERALL						
SPL	120.6		120.3		117.0	
					117.4	
					116.8	
					115.9	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 16 127.5	MICRO PHONE NO. ANGLE 17 135.0	MICRO PHONE NO. ANGLE 18 142.5	MICRO PHONE NO. ANGLE 19 150.0
200.0	78.3	77.0	78.2	79.9
250.0	80.4	81.3	81.6	83.6
315.2	84.1	84.4	84.9	85.7
400.0	87.3	85.9	85.2	87.0
500.0	91.2	91.0	89.9	89.5
630.0	96.4	95.8	93.2	88.9
800.0	97.4	96.6	94.6	90.0
1000.0	96.5	94.8	93.4	92.1
1250.0	95.8	95.6	95.4	93.9
1600.0	97.3	97.2	97.6	95.9
2000.0	99.1	100.0	100.1	96.7
2500.0	99.7	100.7	100.1	98.6
3150.0	101.4	101.3	101.2	101.0
4000.0	102.4	102.6	102.0	102.5
5000.0	103.3	102.9	102.7	104.1
6300.0	104.6	103.9	103.4	104.7
8000.0	105.0	104.3	103.5	104.3
10000.0	105.1	104.0	103.2	103.8
12500.0	104.9	104.2	102.5	102.4
16000.0	104.6	103.6	102.1	100.9
20000.0	104.0	102.8	101.3	99.5
25000.0	103.8	102.5	100.9	98.6
31500.0	103.3	102.1	100.5	97.6
40000.0	103.0	102.2	99.8	96.6
OVERALL SPL	115.3	114.6	113.7	113.4

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 52.50 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 72.00 DEG.F, CHAMBER TEMPERATURE = 74.00 DEG.F
RELATIVE HUMIDITY = 66.0 PERCENT
GAMMA = 1.400

RUN NUMBER 79

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 4.697$
TEMPERATURE RATIO $TR = 0.996$
MACH NUMBER $MJ = 1.667$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 0.640$
JET DENSITY RATIO $DJ/D0 = 1.562$
JET VELOCITY RATIO $VJ/A0 = 1.334$
JET VELOCITY $VJ = 1511.1$ FPS

$TR/TJ = 1.556$
 $DR/D0 = 4.715$
 $DR/DJ = 3.019$
MASS FLOW = 3.814 POUNDS PER SECOND
THRUST = 179.12 POUNDS

SHOCK CELL LENGTH $S = 2.934$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 1 15.0	MICRO PHONE NO. ANGLE 2 22.5	MICRO PHONE NO. ANGLE 3 30.0	MICRO PHONE NO. ANGLE 4 37.5	MICRO PHONE NO. ANGLE 5 45.0	MICRO PHONE NO. ANGLE 6 52.5
200.0	100.3	99.9	90.1	87.5	85.3	82.9
250.0	102.7	102.3	96.5	91.0	87.8	85.9
315.2	106.4	103.6	100.8	94.2	91.0	89.6
400.0	108.5	108.7	102.9	98.2	94.5	92.2
500.0	111.9	109.8	106.4	101.2	96.9	93.3
630.0	112.5	112.3	110.4	104.6	99.8	96.2
800.0	115.5	115.7	112.9	107.8	103.0	98.4
1000.0	115.0	116.8	115.8	110.5	105.5	100.5
1250.0	115.9	118.7	118.4	113.7	108.6	102.1
1600.0	116.8	118.8	119.2	114.8	110.1	103.7
2000.0	117.1	119.6	120.1	116.3	111.5	105.1
2500.0	117.4	119.8	120.1	116.5	111.7	105.8
3150.0	117.6	120.1	120.5	116.3	111.7	106.5
4000.0	117.5	120.0	120.5	115.6	112.4	107.3
5000.0	116.5	119.3	119.3	113.9	111.9	107.8
6300.0	115.3	118.2	118.2	112.5	111.5	107.9
8000.0	113.6	116.3	116.6	111.2	110.8	107.3
10000.0	113.5	112.7	115.2	109.0	110.1	107.2
12500.0	110.3	114.0	113.9	108.8	109.5	106.9
16000.0	108.5	112.8	112.3	107.3	108.1	106.0
20000.0	106.6	111.5	111.2	106.2	106.7	105.2
25000.0	105.1	110.5	110.4	105.2	105.7	104.5
31500.0	103.2	109.4	109.3	103.9	104.4	103.7
40000.0	102.2	109.0	108.5	103.2	103.4	103.4
OVERALL SPL	127.6	129.8	129.9	125.2	122.2	118.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	83.7	84.4	84.1	82.2	82.6	82.1
250.0	85.9	85.3	84.9	83.9	84.1	83.6
315.2	88.8	88.4	87.4	87.4	86.1	85.3
400.0	91.2	90.7	90.1	89.0	88.8	87.7
500.0	93.0	92.7	91.2	89.9	89.2	88.8
630.0	95.4	94.4	93.4	92.1	92.0	91.3
800.0	97.5	95.9	94.7	93.5	93.8	93.4
1000.0	99.0	97.5	96.1	95.2	94.6	93.6
1250.0	100.0	98.9	97.6	96.7	96.4	95.8
1600.0	101.4	100.2	98.9	97.7	97.7	97.0
2000.0	102.6	101.2	100.1	98.8	98.7	97.7
2500.0	103.3	101.8	100.5	99.3	99.0	98.3
3150.0	104.4	102.5	101.1	100.1	99.9	99.3
4000.0	104.9	103.5	102.0	100.6	100.4	100.4
5000.0	105.4	103.8	102.1	101.3	101.1	100.6
6300.0	105.8	104.1	102.5	101.7	101.4	101.0
8000.0	105.7	104.1	102.6	101.3	101.3	101.0
10000.0	106.0	104.1	102.4	101.4	101.7	101.4
12500.0	105.9	104.0	102.7	101.6	101.4	101.1
16000.0	105.1	103.7	102.6	100.9	101.0	100.7
20000.0	104.8	103.1	102.3	100.5	100.6	100.1
25000.0	104.3	102.7	102.0	100.2	100.0	99.2
31500.0	103.4	102.2	102.0	99.4	99.5	98.4
40000.0	102.6	102.1	101.5	98.6	99.4	97.6
OVERALL SPL	116.6	115.1	113.9	112.5	112.5	111.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 53.00 PSI, ATMOSPHERIC PRESSURE = 14.13 PSI
RESERVOIR TEMPERATURE = 50.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 50.0 PERCENT
GAMMA = 1.400

RUN NUMBER 187

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 4.751
TEMPERATURE RATIO TR = 0.981
MACH NUMBER MJ = 1.675
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.628
JET DENSITY RATIO DJ/D0 = 1.591
JET VELOCITY RATIO VJ/A0 = 1.327
JET VELOCITY VJ = 1483.8 FPS

TR/TJ = 1.561
DR/D0 = 4.844
DR/DJ = 3.044
MASS FLOW = 3.868 POUNDS PER SECOND
THRUST = 180.75 POUNDS

SHOCK CELL LENGTH S = 2.955 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	75.8	78.8	80.7	79.6	80.0	78.2
250.0	79.2	80.1	81.3	79.4	79.3	77.8
315.2	80.8	81.4	81.0	81.2	80.4	80.2
400.0	82.3	83.3	83.2	83.0	83.7	84.3
500.0	85.9	85.9	86.1	86.8	87.2	87.1
630.0	87.3	88.1	88.3	89.0	89.5	89.2
800.0	90.0	90.8	91.0	91.0	90.8	90.1
1000.0	92.1	93.0	92.8	92.6	92.3	92.1
1250.0	95.0	95.5	95.2	94.7	94.5	94.5
1600.0	96.6	96.8	95.9	95.7	95.2	95.3
2000.0	98.5	98.1	97.0	96.7	96.6	96.5
2500.0	99.4	98.6	97.8	97.6	97.4	97.3
3150.0	100.4	99.7	98.5	99.4	99.6	99.5
4000.0	101.1	100.9	100.0	100.9	101.1	100.8
5000.0	101.6	101.7	101.0	101.3	101.8	101.5
6300.0	102.1	102.7	101.5	102.6	103.0	102.9
8000.0	102.2	103.4	101.7	102.8	103.0	102.2
10000.0	103.2	104.4	101.2	102.7	102.8	101.7
12500.0	103.8	103.7	100.9	102.5	102.7	101.7
16000.0	103.1	103.2	100.1	102.3	101.9	100.8
20000.0	102.6	103.5	99.1	101.3	100.8	100.0
25000.0	102.7	102.9	97.9	100.7	100.1	99.6
31500.0	101.9	103.1	96.5	100.1	99.6	99.3
40000.0	101.6	103.2	95.1	99.9	98.7	99.4
OVERALL SPL	113.6	114.1	111.4	112.8	112.8	112.3

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16 ANGLE 127.5	MICRO PHONE NO. 17 ANGLE 135.0	MICRO PHONE NO. 18 ANGLE 142.5	MICRO PHONE NO. 19 ANGLE 150.0
200.0	75.4	75.0	74.6	75.3
250.0	78.1	77.5	77.8	77.4
315.2	79.8	79.0	78.7	78.8
400.0	83.1	81.8	81.5	81.0
500.0	86.0	85.5	84.9	83.4
630.0	89.3	88.4	87.0	84.6
800.0	89.8	88.9	88.4	86.9
1000.0	92.3	91.0	90.6	90.1
1250.0	94.1	93.9	94.1	92.7
1600.0	95.0	94.6	94.9	94.1
2000.0	96.1	96.8	97.7	97.4
2500.0	97.1	97.4	97.9	97.6
3150.0	99.6	100.2	100.6	101.0
4000.0	100.9	101.2	101.1	101.4
5000.0	101.9	101.9	101.9	101.7
6300.0	102.6	102.4	101.7	101.5
8000.0	102.1	101.7	100.5	100.3
10000.0	101.6	101.0	99.7	99.5
12500.0	101.0	100.3	98.8	98.1
16000.0	99.8	99.1	97.9	96.5
20000.0	98.9	98.1	96.8	95.1
25000.0	98.2	97.2	96.1	93.9
31500.0	97.6	96.7	95.7	93.1
40000.0	97.2	96.7	94.8	92.2
OVERALL SPL	111.8	111.5	111.0	110.5

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 52.50 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 206.00 DEG.F, CHAMBER TEMPERATURE = 82.00 DEG.F
RELATIVE HUMIDITY = 54.0 PERCENT
GAMMA = 1.399

RUN NUMBER 80

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 4.697
TEMPERATURE RATIO TR = 1.229
MACH NUMBER MJ = 1.667
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.790
JET DENSITY RATIO DJ/D0 = 1.265
JET VELOCITY RATIO VJ/A0 = 1.482
JET VELOCITY VJ = 1691.6 FPS

TR/TJ = 1.555
DR/D0 = 3.823
DR/DJ = 3.022
MASS FLOW = 3.433 POUNDS PER SECOND
THRUST = 179.18 POUNDS

SHOCK CELL LENGTH S = 2.935 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	101.6		100.2		94.2	
250.0	103.8		103.0		98.6	
315.2	108.1		103.7		102.4	
400.0	110.1		110.0		105.6	
500.0	113.4		111.3		108.4	
630.0	112.4		113.7		112.5	
800.0	116.0		117.0		115.0	
1000.0	115.5		117.3		117.7	
1250.0	116.5		119.2		120.1	
1600.0	117.1		119.5		120.8	
2000.0	117.3		120.3		121.7	
2500.0	117.5		120.8		122.1	
3150.0	117.5		121.3		122.7	
4000.0	117.1		120.9		122.9	
5000.0	115.7		120.2		122.2	
6300.0	114.3		118.6		120.6	
8000.0	112.9		117.3		118.9	
10000.0	111.4		116.1		117.6	
12500.0	110.0		114.9		116.7	
16000.0	108.5		113.7		115.6	
20000.0	106.7		112.4		115.1	
25000.0	105.2		111.5		114.4	
31500.0	103.6		110.5		113.4	
40000.0	102.7		110.1		112.8	
OVERALL						
SPL	127.6		130.8		132.1	
					130.6	
					126.2	
					122.7	

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	83.4	84.1	83.7	83.4	82.3	81.0
250.0	86.7	84.5	84.2	83.3	83.4	82.9
315.2	88.7	87.4	86.9	86.4	86.2	85.2
400.0	90.8	90.0	89.7	88.3	88.3	87.5
500.0	92.4	91.5	90.4	89.7	88.8	88.3
630.0	95.4	94.1	93.3	92.6	92.0	91.3
800.0	98.0	95.8	94.9	94.1	94.3	93.8
1000.0	99.8	97.8	96.6	95.8	95.0	94.4
1250.0	101.6	99.5	98.4	97.2	96.6	96.8
1600.0	103.4	100.7	99.7	98.9	98.2	97.6
2000.0	105.1	102.2	100.8	99.9	99.2	98.8
2500.0	106.1	103.0	101.8	100.6	99.9	99.9
3150.0	107.3	104.2	102.7	101.6	100.8	100.7
4000.0	108.3	105.2	103.6	102.3	101.8	101.8
5000.0	109.1	106.0	104.2	103.2	102.9	102.6
6300.0	109.6	106.2	104.5	103.7	102.8	102.5
8000.0	109.7	106.6	104.6	103.4	102.7	102.6
10000.0	109.8	106.6	104.5	103.5	102.7	103.0
12500.0	109.6	106.5	104.6	103.5	102.6	102.6
16000.0	109.1	106.5	104.7	103.0	102.5	102.2
20000.0	108.7	106.0	104.4	102.5	101.9	101.3
25000.0	108.0	105.3	104.2	102.0	101.3	100.6
31500.0	107.1	104.5	103.7	101.1	100.6	99.6
40000.0	106.3	104.2	103.1	100.2	100.3	98.6
OVERALL SPL	120.1	117.2	115.6	114.2	113.6	113.3

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 53.00 PSI, ATMOSPHERIC PRESSURE = 14.13 PSI
RESERVOIR TEMPERATURE = 170.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 44.0 PERCENT
GAMMA = 1.399

RUN NUMBER 188

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 4.751
TEMPERATURE RATIO TR = 1.212
MACH NUMBER MJ = 1.675
JET STATIC TEMPERATURE RATIO TJ/TO = 0.777
JET DENSITY RATIO DJ/DO = 1.287
JET VELOCITY RATIO VJ/A0 = 1.476
JET VELOCITY VJ = 1650.0 FPS

TR/TJ = 1.560
DR/DO = 3.921
DR/DJ = 3.046
MASS FLOW = 3.479 POUNDS PER SECOND
THRUST = 180.81 POUNDS

SHOCK CELL LENGTH S = 2.956 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	10 82.5	11 90.0	12 97.5	13 105.0	14 112.5	15 120.0
200.0	76.8	79.0	79.8	80.2	79.6	78.5
250.0	79.7	81.0	80.6	79.9	78.9	77.9
315.2	80.9	81.5	80.8	80.4	80.2	79.3
400.0	83.5	83.2	82.9	83.5	83.4	83.8
500.0	86.2	86.6	86.5	87.4	87.3	87.4
630.0	88.1	88.5	88.8	90.4	90.1	90.4
800.0	90.3	91.0	91.4	91.6	91.3	90.8
1000.0	92.2	93.2	93.3	93.0	92.6	92.8
1250.0	95.0	96.1	95.8	95.4	94.8	95.0
1600.0	97.0	97.3	96.4	96.0	95.9	95.4
2000.0	99.3	99.1	98.0	97.9	97.1	96.6
2500.0	100.3	99.9	98.8	98.4	98.1	98.3
3150.0	101.5	100.8	99.9	100.6	100.7	101.3
4000.0	102.4	102.1	102.3	103.0	103.2	103.4
5000.0	103.4	103.9	104.2	104.2	104.3	104.3
6300.0	104.7	105.2	105.0	105.1	105.2	105.3
8000.0	105.2	106.1	105.2	105.2	105.3	104.8
10000.0	105.4	106.6	105.5	105.2	105.1	104.8
12500.0	106.2	106.5	105.0	104.8	104.6	103.8
16000.0	105.8	105.8	104.6	104.5	103.9	103.0
20000.0	105.2	105.9	104.3	103.7	102.9	101.9
25000.0	105.6	105.8	104.2	103.3	102.4	101.8
31500.0	104.6	105.7	103.8	102.5	101.7	101.3
40000.0	104.1	105.5	103.4	102.3	100.5	101.3
OVERALL SPL	115.9	116.4	115.3	115.1	114.8	114.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 16	ANGLE 127.5	MICRO PHONE NO. 17	ANGLE 135.0	MICRO PHONE NO. 18	ANGLE 142.5	MICRO PHONE NO. 19	ANGLE 150.0
200.0	76.1		75.3		74.4		75.6	
250.0	77.3		77.6		77.4		78.2	
315.2	79.8		79.0		79.5		79.7	
400.0	83.6		81.3		81.5		81.6	
500.0	87.5		86.3		85.3		83.6	
630.0	90.7		89.6		88.0		84.9	
800.0	90.7		89.9		89.2		87.3	
1000.0	92.9		91.3		90.4		90.1	
1250.0	94.8		94.2		94.5		93.1	
1600.0	95.0		94.9		95.2		94.6	
2000.0	96.6		97.2		98.8		99.1	
2500.0	98.6		99.0		100.4		100.8	
3150.0	101.6		102.2		104.0		104.2	
4000.0	103.8		104.2		104.7		105.1	
5000.0	104.7		104.6		104.7		104.8	
6300.0	105.2		104.8		104.3		104.3	
8000.0	104.8		104.2		103.0		103.0	
10000.0	103.8		103.0		102.0		102.0	
12500.0	103.3		102.3		100.9		100.6	
16000.0	102.1		101.2		100.0		99.0	
20000.0	101.2		99.9		98.7		97.5	
25000.0	100.6		99.4		98.2		96.4	
31500.0	99.8		98.6		97.6		95.3	
40000.0	99.3		98.5		96.7		94.2	
OVERALL SPL	114.1		113.7		113.5		113.3	

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 52.60 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 355.00 DEG.F, CHAMBER TEMPERATURE = 78.00 DEG.F
RELATIVE HUMIDITY = 62.0 PERCENT
GAMMA = 1.392

RUN NUMBER 81

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 4.704
TEMPERATURE RATIO TR = 1.515
MACH NUMBER MJ = 1.670
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.979
JET DENSITY RATIO DJ/D0 = 1.021
JET VELOCITY RATIO VJ/A0 = 1.653
JET VELOCITY VJ = 1879.1 FPS

TR/TJ = 1.547
DR/D0 = 3.105
DR/DJ = 3.042
MASS FLOW = 3.089 POUNDS PER SECOND
THRUST = 179.75 POUNDS

SHOCK CELL LENGTH S = 2.942 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	101.7	102.4	95.9	90.8	90.8	85.6
250.0	104.4	104.6	100.8	96.4	94.4	88.2
315.2	109.4	107.0	104.3	99.4	96.4	92.5
400.0	111.6	111.9	107.2	103.5	100.1	95.4
500.0	114.8	113.6	111.5	107.0	102.8	97.8
630.0	113.9	115.5	114.7	110.4	105.8	100.5
800.0	116.8	118.8	117.7	113.8	109.3	103.7
1000.0	115.8	118.8	119.9	116.8	112.1	106.9
1250.0	117.6	120.2	122.3	120.0	115.8	109.6
1600.0	117.4	120.6	122.6	121.0	117.5	111.9
2000.0	118.2	121.7	123.8	122.8	119.7	113.9
2500.0	118.5	122.5	124.2	123.1	120.6	115.1
3150.0	117.9	122.7	124.8	123.9	121.2	115.8
4000.0	116.3	121.7	124.6	124.2	121.6	116.1
5000.0	114.1	119.7	122.9	123.6	121.1	116.2
6300.0	112.8	118.6	121.5	122.7	120.3	116.1
8000.0	111.3	117.4	120.2	121.4	119.3	115.4
10000.0	110.2	116.2	119.0	120.5	118.5	115.1
12500.0	109.3	115.3	117.9	119.5	117.6	114.8
16000.0	107.7	113.9	116.5	118.3	116.4	114.0
20000.0	106.1	112.6	115.5	117.3	115.1	113.4
25000.0	104.9	111.5	115.0	116.6	114.2	113.0
31500.0	103.2	110.4	114.3	115.8	113.4	112.5
40000.0	102.0	110.0	113.8	115.6	112.6	112.2
OVERALL SPL	127.9	131.7	133.8	133.5	130.8	126.5

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	85.0	84.9	85.0	84.4	83.8	83.0
250.0	87.5	86.2	85.9	84.4	85.6	84.0
315.2	90.1	88.5	88.4	87.8	87.4	86.3
400.0	93.0	90.8	91.2	89.8	90.0	89.1
500.0	94.6	91.8	92.2	91.0	90.6	90.1
630.0	97.5	95.3	94.3	94.1	93.5	92.6
800.0	99.9	97.3	96.3	95.2	95.4	95.0
1000.0	102.4	99.3	98.2	97.0	96.4	95.8
1250.0	104.6	101.0	100.1	98.7	98.4	97.9
1600.0	106.2	102.7	101.0	100.1	99.6	99.3
2000.0	108.0	104.0	102.5	101.0	100.4	100.0
2500.0	109.3	105.0	103.5	102.2	101.7	101.6
3150.0	110.6	106.2	104.7	103.4	103.0	102.5
4000.0	111.7	107.5	106.0	104.3	104.1	104.2
5000.0	112.3	108.3	106.5	105.3	105.3	105.8
6300.0	113.0	109.0	107.0	106.5	106.5	106.9
8000.0	112.9	109.3	107.6	106.8	107.0	107.4
10000.0	113.0	109.6	107.9	107.2	107.5	108.2
12500.0	113.0	109.9	108.3	107.6	107.7	108.3
16000.0	112.4	109.7	108.4	107.3	107.6	107.9
20000.0	112.0	109.2	108.3	106.8	107.2	107.2
25000.0	111.6	108.8	108.2	106.4	106.8	106.5
31500.0	110.7	108.4	108.0	105.7	106.2	105.5
40000.0	110.2	108.3	107.4	104.8	105.9	104.6
OVERALL SPL	123.4	120.1	118.8	117.5	117.7	117.7

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 52.80 PSI, ATMOSPHERIC PRESSURE = 14.13 PSI
RESERVOIR TEMPERATURE = 335.00 DEG.F, CHAMBER TEMPERATURE = 62.00 DEG.F
RELATIVE HUMIDITY = 42.0 PERCENT
GAMMA = 1.392

RUN NUMBER 189

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $P_r = 4.737$
TEMPERATURE RATIO $T_r = 1.523$
MACH NUMBER $M_J = 1.675$
JET STATIC TEMPERATURE RATIO $T_J/T_0 = 0.983$
JET DENSITY RATIO $\rho_J/\rho_0 = 1.017$
JET VELOCITY RATIO $V_J/A_0 = 1.660$
JET VELOCITY $V_J = 1859.2$ FPS

$T_r/T_J = 1.550$
 $\rho_r/\rho_0 = 3.110$
 $\rho_r/\rho_J = 3.057$
MASS FLOW = 3.093 POUNDS PER SECOND
THRUST = 180.74 POUNDS

SHOCK CELL LENGTH $S = 2.955$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	77.7	80.1	81.0	81.6	79.7	79.8
250.0	81.3	81.9	80.8	81.4	79.2	79.0
315.2	82.5	82.6	81.6	81.6	80.2	80.2
400.0	83.6	84.6	83.8	83.8	84.2	84.8
500.0	88.0	88.4	88.1	88.9	89.2	89.0
630.0	89.8	89.8	90.0	91.8	92.2	92.6
800.0	91.8	92.4	92.3	92.4	92.2	92.3
1000.0	93.9	94.5	94.2	94.0	93.4	94.0
1250.0	96.8	97.8	96.9	96.1	95.8	95.5
1600.0	98.6	98.6	97.7	97.0	97.0	96.2
2000.0	100.8	100.3	99.3	98.6	98.3	97.9
2500.0	102.3	101.2	100.1	99.6	99.2	99.0
3150.0	103.5	102.4	101.0	101.2	101.3	101.1
4000.0	104.1	103.6	102.7	102.8	103.7	103.2
5000.0	104.7	105.1	105.1	104.3	105.3	104.7
6300.0	105.8	106.6	106.2	105.7	106.4	106.1
8000.0	106.5	107.6	106.3	106.4	106.6	106.2
10000.0	107.5	108.6	106.2	106.6	106.4	105.8
12500.0	107.9	108.2	106.4	106.2	106.2	105.5
16000.0	107.7	107.6	106.0	105.9	105.5	104.7
20000.0	107.3	107.8	105.8	105.3	104.5	103.9
25000.0	107.5	107.8	105.8	104.8	104.1	103.7
31500.0	106.6	107.8	105.5	104.0	103.5	103.2
40000.0	106.1	107.7	105.0	103.8	102.4	103.2
OVERALL SPL	117.6	118.2	116.6	116.2	116.1	115.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	17	135.0	18	142.5	19	150.0	
200.0		77.2		74.7		76.0		75.8	
250.0		78.3		77.8		78.1		78.5	
315.2		79.8		79.3		80.2		80.1	
400.0		84.0		82.1		82.1		82.5	
500.0		89.2		87.7		87.5		85.6	
630.0		93.2		91.9		90.0		86.2	
800.0		92.4		91.6		90.8		88.0	
1000.0		93.5		92.2		91.5		90.4	
1250.0		96.1		95.2		95.0		93.5	
1600.0		95.5		95.5		96.1		95.4	
2000.0		97.2		97.5		98.6		97.9	
2500.0		98.6		99.1		100.0		100.7	
3150.0		101.3		102.0		102.8		104.2	
4000.0		103.9		104.6		104.6		105.5	
5000.0		105.1		105.1		105.4		105.6	
6300.0		106.1		105.8		105.5		105.3	
8000.0		105.8		105.4		104.6		104.1	
10000.0		105.2		104.3		103.6		102.9	
12500.0		104.6		103.6		102.7		101.9	
16000.0		103.7		102.6		101.5		100.2	
20000.0		102.8		101.4		100.6		98.9	
25000.0		102.3		100.9		100.2		97.9	
31500.0		101.6		100.2		99.5		96.8	
40000.0		101.0		100.2		98.8		95.9	
OVERALL									
SPL		115.1		114.6		114.3		114.0	

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 52.20 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 750.00 DEG.F, CHAMBER TEMPERATURE = 82.00 DEG.F
RELATIVE HUMIDITY = 56.0 PERCENT
GAMMA = 1.370

RUN NUMBER 82

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 4.676$
TEMPERATURE RATIO $TR = 2.232$
MACH NUMBER $MJ = 1.671$
JET STATIC TEMPERATURE RATIO $TJ/TO = 1.472$
JET DENSITY RATIO $DJ/DO = 0.679$
JET VELOCITY RATIO $VJ/AO = 2.028$
JET VELOCITY $VJ = 2313.9$ FPS

$TR/TJ = 1.517$
 $DR/DO = 2.095$
 $DR/DJ = 3.083$
MASS FLOW = 2.522 POUNDS PER SECOND
THRUST = 180.04 POUNDS

SHOCK CELL LENGTH $S = 2.946$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 1 ANGLE 15.0	MICRO PHONE NO. 2 ANGLE 22.5	MICRO PHONE NO. 3 ANGLE 30.0	MICRO PHONE NO. 4 ANGLE 37.5	MICRO PHONE NO. 5 ANGLE 45.0	MICRO PHONE NO. 6 ANGLE 52.5
200.0	103.0	103.8	99.0	93.1	97.8	93.4
250.0	105.9	106.3	104.2	99.2	99.6	95.6
315.2	111.0	108.2	107.0	103.2	100.8	97.4
400.0	113.3	113.4	110.3	106.3	104.6	100.2
500.0	115.6	115.0	113.0	109.6	105.7	101.5
630.0	114.2	116.2	117.0	113.5	108.6	105.0
800.0	116.6	119.3	119.2	117.1	111.9	108.4
1000.0	115.5	118.4	120.8	119.6	114.4	111.0
1250.0	116.7	119.8	122.1	121.8	118.4	114.4
1600.0	116.6	119.8	122.1	123.0	120.4	117.3
2000.0	116.7	120.8	122.9	124.3	122.4	119.8
2500.0	116.5	120.8	123.7	125.0	123.2	121.4
3150.0	115.5	120.3	124.0	125.8	124.2	122.5
4000.0	114.6	119.3	123.2	125.9	125.3	123.3
5000.0	113.8	118.5	122.1	124.8	125.4	123.8
6300.0	113.3	117.7	121.0	123.6	124.3	123.3
8000.0	112.2	116.8	120.1	122.2	122.7	122.1
10000.0	111.0	115.9	118.9	121.0	121.4	121.2
12500.0	109.9	114.9	117.9	120.3	120.1	120.2
16000.0	108.2	113.8	116.5	119.3	118.9	119.0
20000.0	106.5	112.6	115.7	118.8	117.7	118.1
25000.0	105.0	111.8	114.9	118.0	117.0	117.3
31500.0	103.4	110.7	114.0	117.3	116.5	116.9
40000.0	102.3	110.2	113.5	117.2	116.6	116.9
OVERALL SPL	127.3	130.8	133.4	135.0	134.1	132.7

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	87.4	86.4	86.4	85.0	84.4	83.4
250.0	90.7	88.2	86.6	85.5	86.6	84.9
315.2	92.0	89.7	88.9	88.7	88.4	87.5
400.0	95.6	91.8	92.1	91.0	91.0	89.8
500.0	97.5	93.1	92.3	91.5	91.0	90.6
630.0	100.3	95.7	95.0	94.4	93.6	93.1
800.0	103.2	98.2	97.5	96.6	95.6	95.7
1000.0	106.2	100.1	99.6	98.6	97.6	97.0
1250.0	108.9	102.3	101.3	100.1	99.7	99.2
1600.0	111.6	104.2	102.8	102.1	101.3	100.2
2000.0	114.0	106.5	104.7	103.5	102.7	101.9
2500.0	115.7	107.9	106.0	105.0	104.0	103.2
3150.0	117.2	109.4	107.4	106.5	105.3	104.8
4000.0	118.1	110.9	108.8	107.9	106.5	106.0
5000.0	118.9	112.2	109.9	109.1	107.9	107.6
6300.0	119.0	112.9	110.6	109.9	109.2	109.0
8000.0	118.7	113.3	111.2	110.4	109.9	109.8
10000.0	118.5	113.6	111.5	111.0	110.4	110.2
12500.0	118.1	113.7	111.9	111.3	110.7	110.4
16000.0	117.3	113.5	112.1	111.1	110.9	110.2
20000.0	116.7	112.8	111.9	110.8	110.5	109.7
25000.0	116.0	112.2	111.7	110.5	110.0	109.1
31500.0	115.0	111.7	111.3	109.6	109.3	108.2
40000.0	114.3	111.8	110.8	108.8	109.0	107.3
OVERALL SPL	128.9	123.6	122.1	121.1	120.5	119.9

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 52.30 PSI, ATMOSPHERIC PRESSURE = 14.13 PSI
RESERVOIR TEMPERATURE = 705.00 DEG.F, CHAMBER TEMPERATURE = 62.00 DEG.F
RELATIVE HUMIDITY = 42.0 PERCENT
GAMMA = 1.370

RUN NUMBER 190

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 4.701$
TEMPERATURE RATIO $TR = 2.232$
MACH NUMBER $MJ = 1.675$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.469$
JET DENSITY RATIO $DJ/D0 = 0.681$
JET VELOCITY RATIO $VJ/A0 = 2.030$
JET VELOCITY $VJ = 2273.7$ FPS

$TR/TJ = 1.519$
 $DR/D0 = 2.107$
 $DR/DJ = 3.095$
MASS FLOW = 2.530 POUNDS PER SECOND
THRUST = 180.81 POUNDS

SHOCK CELL LENGTH $S = 2.956$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	10.0	81.3	82.8	82.8	80.8	81.4
250.0	82.6	83.6	83.0	82.5	81.3	79.5
315.0	84.1	83.5	82.8	82.2	81.6	82.2
400.0	86.4	85.8	85.0	85.8	85.6	87.5
500.0	90.4	89.2	90.0	90.1	90.6	91.6
630.0	92.1	91.2	92.2	93.2	94.4	95.7
800.0	94.7	94.3	94.3	94.4	94.4	95.6
1000.0	96.2	96.5	95.8	95.0	94.6	95.5
1250.0	99.2	99.4	98.2	98.0	96.7	97.6
1600.0	101.4	100.8	99.6	98.8	98.2	98.5
2000.0	103.6	102.5	101.1	100.8	99.6	99.7
2500.0	105.2	103.5	102.2	101.8	100.7	101.1
3150.0	106.5	104.8	103.5	103.3	102.6	103.1
4000.0	107.5	106.1	104.9	104.6	104.9	105.7
5000.0	108.0	107.0	106.4	105.9	106.9	107.2
6300.0	108.9	109.3	108.0	107.5	107.9	108.5
8000.0	109.7	110.4	108.4	107.8	108.1	108.3
10000.0	110.5	110.9	108.9	108.2	107.9	108.0
12500.0	111.2	110.6	108.9	108.2	108.0	107.5
16000.0	110.9	110.3	108.7	108.1	107.6	107.0
20000.0	110.4	110.8	108.7	107.6	106.9	106.5
25000.0	110.8	110.6	108.9	107.5	106.6	106.5
31500.0	110.1	110.8	108.8	106.9	106.3	106.2
40000.0	109.8	111.0	108.6	107.0	105.4	106.3
OVERALL SPL	120.9	120.8	119.1	118.2	117.9	118.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 16 127.5	MICRO PHONE NO. ANGLE 17 135.0	MICRO PHONE NO. ANGLE 18 142.5	MICRO PHONE NO. ANGLE 19 150.0
200.0	79.4	77.0	77.3	77.8
250.0	79.0	79.4	80.1	80.9
315.2	81.3	81.9	83.5	83.9
400.0	85.9	84.4	85.0	85.9
500.0	91.9	90.7	90.0	88.6
630.0	95.9	95.3	93.2	88.3
800.0	95.4	95.0	93.8	90.2
1000.0	95.6	94.3	92.8	91.7
1250.0	97.4	96.7	96.2	94.5
1600.0	97.8	97.1	97.8	96.8
2000.0	98.8	99.4	99.6	98.4
2500.0	100.2	100.7	101.6	101.1
3150.0	102.5	102.4	103.5	104.1
4000.0	105.2	104.9	105.9	106.5
5000.0	106.6	106.2	106.7	107.2
6300.0	107.4	107.4	107.0	107.1
8000.0	107.5	107.1	106.2	106.2
10000.0	107.1	106.3	105.4	105.0
12500.0	106.6	105.9	104.4	104.0
16000.0	105.9	105.0	103.7	102.6
20000.0	105.2	104.1	102.7	101.3
25000.0	104.9	103.7	102.6	100.5
31500.0	104.4	103.1	102.1	99.6
40000.0	104.0	103.4	101.4	98.7
OVERALL SPL	117.0	116.5	116.0	115.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 51.60 PSI, ATMOSPHERIC PRESSURE = 14.20 PSI
RESERVOIR TEMPERATURE = 1025.00 DEG.F, CHAMBER TEMPERATURE = 82.00 DEG.F
RELATIVE HUMIDITY = 56.0 PERCENT
GAMMA = 1.350

RUN NUMBER 83

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 4.634$
TEMPERATURE RATIO $TR = 2.740$
MACH NUMBER $MJ = 1.670$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 1.841$
JET DENSITY RATIO $DJ/D_0 = 0.543$
JET VELOCITY RATIO $VJ/A_0 = 2.266$
JET VELOCITY $VJ = 2586.2$ FPS

$TR/TJ = 1.488$
 $DR/D_0 = 1.691$
 $DR/DJ = 3.114$
MASS FLOW = 2.254 POUNDS PER SECOND
THRUST = 179.80 POUNDS

SHOCK CELL LENGTH $S = 2.943$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	103.9		105.0		99.8	
250.0	106.7		106.8		103.8	
315.2	112.0		109.9		107.9	
400.0	114.2		114.4		111.6	
500.0	115.8		116.2		114.8	
630.0	114.4		117.4		118.3	
800.0	117.1		119.9		120.4	
1000.0	115.8		119.4		122.4	
1250.0	117.0		120.6		122.8	
1600.0	116.9		120.6		123.0	
2000.0	117.1		121.4		124.3	
2500.0	116.7		121.4		124.6	
3150.0	115.9		120.6		124.2	
4000.0	115.2		120.0		123.4	
5000.0	114.4		119.1		121.9	
6300.0	113.2		118.0		120.6	
8000.0	111.6		116.9		119.0	
10000.0	110.6		115.6		118.1	
12500.0	109.7		114.4		117.1	
16000.0	108.5		113.2		115.8	
20000.0	107.2		111.9		115.1	
25000.0	105.4		110.8		114.5	
31500.0	103.4		109.5		113.7	
40000.0	102.4		109.0		113.2	
OVERALL						
SPL	127.6		131.4		133.9	
					134.7	
					134.2	
						133.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 7 ANGLE 60.0	MICRO PHONE NO. 8 ANGLE 67.5	MICRO PHONE NO. 9 ANGLE 75.0	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5
200.0	90.4	87.4	86.7	86.2	84.8	83.8
250.0	92.9	88.7	87.8	86.9	86.1	85.8
315.2	93.8	90.2	89.8	89.3	88.3	87.7
400.0	96.7	92.5	92.1	91.6	91.0	90.7
500.0	97.3	93.4	92.8	92.2	91.6	91.4
630.0	101.9	96.0	95.8	95.4	94.4	93.7
800.0	104.7	98.4	97.9	97.3	96.7	96.5
1000.0	107.9	100.6	99.9	99.0	98.3	97.5
1250.0	111.0	102.7	102.1	100.9	100.1	99.5
1600.0	113.7	104.8	103.7	102.6	101.9	101.0
2000.0	116.4	107.2	105.6	104.3	103.3	102.6
2500.0	118.2	108.7	107.4	105.5	104.7	103.9
3150.0	119.9	110.2	108.7	107.2	106.6	105.6
4000.0	120.5	111.7	110.1	108.5	107.8	106.8
5000.0	121.1	113.1	111.1	109.7	108.8	108.2
6300.0	121.0	113.6	111.8	110.5	109.9	109.5
8000.0	120.1	113.8	112.3	110.8	110.3	110.1
10000.0	119.9	113.8	112.5	111.2	111.2	111.2
12500.0	119.1	113.8	112.9	111.9	111.1	111.0
16000.0	118.4	113.4	113.0	111.8	111.2	110.9
20000.0	117.6	112.7	112.8	111.3	110.8	110.3
25000.0	116.8	112.2	112.6	111.0	110.5	109.8
31500.0	115.8	111.5	112.1	110.1	109.7	108.8
40000.0	115.1	111.7	111.6	109.2	109.4	108.0
OVERALL SPL	130.6	123.9	123.1	121.6	121.1	120.6

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 51.80 PSI, ATMOSPHERIC PRESSURE = 14.13 PSI
RESERVOIR TEMPERATURE = 972.00 DEG.F, CHAMBER TEMPERATURE = 63.00 DEG.F
RELATIVE HUMIDITY = 43.0 PERCENT
GAMMA = 1.350

RUN NUMBER 191

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 4.666$
TEMPERATURE RATIO $TR = 2.738$
MACH NUMBER $MJ = 1.675$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 1.837$
JET DENSITY RATIO $DJ/D_0 = 0.544$
JET VELOCITY RATIO $VJ/A_0 = 2.270$
JET VELOCITY $VJ = 2544.3$ FPS

$TR/TJ = 1.491$
 $DR/D_0 = 1.704$
 $DR/DJ = 3.130$
MASS FLOW = 2.263 POUNDS PER SECOND
THRUST = 180.78 POUNDS

SHOCK CELL LENGTH $S = 2.956$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	81.3	84.2	85.4	84.4	83.8	81.0
250.0	85.6	86.2	85.5	84.2	83.2	81.0
315.2	86.0	85.7	85.2	83.4	83.7	84.1
400.0	88.6	88.9	88.3	87.9	88.7	88.4
500.0	93.2	92.7	92.4	92.1	92.8	92.4
630.0	94.7	94.5	95.2	96.0	96.7	97.4
800.0	96.9	96.8	97.2	96.4	96.4	96.8
1000.0	98.7	99.0	98.7	97.0	96.0	96.1
1250.0	101.8	102.0	100.9	99.3	98.7	98.1
1600.0	103.8	103.2	102.2	100.8	99.8	99.6
2000.0	106.2	104.8	104.1	102.3	101.6	100.8
2500.0	107.3	106.2	104.8	103.6	103.0	101.9
3150.0	108.5	107.5	106.5	105.6	104.6	104.8
4000.0	109.7	108.9	107.7	107.2	107.1	107.9
5000.0	110.3	109.9	109.1	108.9	108.6	109.6
6300.0	111.3	111.8	110.4	110.1	109.5	110.3
8000.0	112.3	112.9	110.5	110.2	109.8	109.8
10000.0	113.6	113.6	110.7	110.4	109.8	109.2
12500.0	113.7	113.1	111.5	110.3	109.8	109.0
16000.0	113.0	112.6	110.9	110.1	109.2	108.5
20000.0	112.2	113.1	111.0	109.7	108.7	108.2
25000.0	112.6	113.0	111.3	109.7	108.7	108.3
31500.0	111.8	113.0	111.2	109.1	108.3	108.3
40000.0	111.3	113.1	111.0	109.3	107.7	108.5
OVERALL SPL	123.1	123.3	121.5	120.5	119.8	119.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE	MICRO PHONE NO. ANGLE
	16 127.5	17 135.0	18 142.5	19 150.0
200.0	10.0	10.0	10.0	10.0
250.0	10.0	81.6	82.2	83.6
315.2	83.7	83.8	84.9	86.4
400.0	87.2	85.5	86.0	87.6
500.0	91.6	91.4	91.6	89.7
630.0	97.2	96.8	94.1	89.6
800.0	97.0	96.3	94.8	90.9
1000.0	96.5	94.9	93.5	93.1
1250.0	97.9	97.8	97.5	95.6
1600.0	98.8	99.0	99.6	97.8
2000.0	100.3	101.5	102.3	99.1
2500.0	101.6	103.0	103.4	102.6
3150.0	105.1	105.4	105.1	105.6
4000.0	108.6	108.0	107.4	108.8
5000.0	109.6	108.5	107.8	109.1
6300.0	110.0	109.0	108.4	108.9
8000.0	109.6	108.9	107.6	107.6
10000.0	109.2	107.9	106.8	106.4
12500.0	108.5	107.4	106.1	105.3
16000.0	107.9	106.8	105.6	104.0
20000.0	107.3	105.9	104.8	103.0
25000.0	107.1	105.7	104.9	102.2
31500.0	106.6	105.3	104.5	101.5
40000.0	106.4	105.7	104.2	100.8
OVERALL SPL	119.3	118.4	117.6	117.3

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 51.50 PSI, ATMOSPHERIC PRESSURE = 14.21 PSI
RESERVOIR TEMPERATURE = 1285.00 DEG.F, CHAMBER TEMPERATURE = 83.00 DEG.F
RELATIVE HUMIDITY = 14.0 PERCENT
GAMMA = 1.336

RUN NUMBER 112

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 4.624$
TEMPERATURE RATIO $TR = 3.214$
MACH NUMBER $MJ = 1.672$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 2.186$
JET DENSITY RATIO $DJ/D0 = 0.457$
JET VELOCITY RATIO $VJ/A0 = 2.473$
JET VELOCITY $VJ = 2824.4$ FPS

$TR/TJ = 1.470$
 $DR/D0 = 1.439$
 $DR/DJ = 3.146$
MASS FLOW = 2.071 POUNDS PER SECOND
THRUST = 180.24 POUNDS

SHOCK CELL LENGTH $S = 2.949$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 1 15.0	MICRO PHONE NO. ANGLE 2 22.5	MICRO PHONE NO. ANGLE 3 30.0	MICRO PHONE NO. ANGLE 4 37.5	MICRO PHONE NO. ANGLE 5 45.0	MICRO PHONE NO. ANGLE 6 52.5
200.0	107.7	105.5	103.6	101.3	20.0	20.0
250.0	110.2	110.2	109.3	105.7	102.4	20.0
315.2	114.3	113.6	112.6	109.3	104.8	101.5
400.0	115.8	117.2	115.5	112.7	109.2	105.0
500.0	117.5	118.6	119.0	116.0	111.7	107.2
630.0	115.7	120.1	121.9	119.5	116.3	111.6
800.0	117.5	121.4	123.5	122.2	119.5	115.3
1000.0	116.7	120.9	124.2	124.6	122.7	118.8
1250.0	117.6	122.3	125.2	126.2	125.4	122.3
1600.0	117.8	123.0	125.6	126.7	126.8	124.4
2000.0	117.8	124.2	127.0	127.1	128.2	127.0
2500.0	117.4	123.8	127.6	127.4	129.4	128.5
3150.0	116.3	122.7	126.4	127.2	130.3	129.6
4000.0	115.7	122.1	125.3	126.3	130.7	130.4
5000.0	113.8	120.8	124.2	125.0	129.1	130.0
6300.0	112.5	119.1	122.9	124.2	127.6	129.2
8000.0	110.1	117.4	121.2	122.9	126.2	127.7
10000.0	109.7	115.2	121.1	122.9	124.9	126.5
12500.0	107.1	114.8	118.6	120.7	123.9	125.4
16000.0	105.6	113.0	117.0	119.4	122.7	124.2
20000.0	103.6	111.3	115.7	118.2	121.3	122.9
25000.0	101.9	110.0	114.6	117.1	120.4	122.2
31500.0	100.0	108.7	113.5	115.8	119.2	121.5
40000.0	98.1	107.8	112.5	115.1	117.7	121.1
OVERALL SPL	128.2	133.3	136.3	136.9	139.0	139.0

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER	MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE	
FREQ. HZ	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
	7	60.0	8	67.5	9	75.0	10	82.5	11	90.0	12	97.5
200.0	93.4		92.6		91.5		91.3		90.2		88.8	
250.0	95.6		93.5		92.2		92.2		91.0		90.1	
315.2	96.9		94.4		92.9		94.1		91.7		90.8	
400.0	100.7		97.6		96.5		95.3		94.6		94.2	
500.0	103.1		99.8		97.4		96.7		95.0		94.8	
630.0	106.8		102.6		100.9		99.4		97.7		96.8	
800.0	110.3		105.6		103.4		101.4		99.0		98.7	
1000.0	113.5		108.4		105.7		103.6		101.3		100.3	
1250.0	117.0		111.2		108.1		105.7		103.0		102.4	
1600.0	119.3		113.6		109.8		107.5		104.6		104.2	
2000.0	122.2		115.4		112.0		109.3		106.3		105.9	
2500.0	124.5		118.0		113.8		110.7		107.7		107.2	
3150.0	126.3		119.0		115.6		112.5		109.0		108.5	
4000.0	127.4		120.9		117.1		114.0		110.7		110.1	
5000.0	127.5		121.5		118.0		114.7		111.1		110.8	
6300.0	127.3		122.2		119.1		115.8		112.4		112.4	
8000.0	126.5		122.0		119.1		116.0		112.7		112.6	
10000.0	125.9		121.8		119.1		116.1		113.1		113.0	
12500.0	125.0		121.3		119.1		116.1		113.1		113.2	
16000.0	124.0		120.4		118.8		115.4		113.0		112.8	
20000.0	123.0		119.3		118.1		114.5		112.4		112.0	
25000.0	122.3		118.5		117.8		113.6		111.9		111.6	
31500.0	121.2		117.7		117.2		112.4		111.2		110.8	
40000.0	120.6		117.3		116.7		111.3		110.7		110.1	
OVERALL SPL	136.7		131.7		129.2		125.8		123.1		122.9	

SUPERSONIC JET EXHAUST NOISE

MACH 1.7 NOZZLE

RESERVOIR PRESSURE = 51.50 PSI, ATMOSPHERIC PRESSURE = 14.13 PSI
RESERVOIR TEMPERATURE = 1300.00 DEG.F, CHAMBER TEMPERATURE = 66.00 DEG.F
RELATIVE HUMIDITY = 34.0 PERCENT
GAMMA = 1.336

RUN NUMBER 192

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 4.645
TEMPERATURE RATIO TR = 3.346
MACH NUMBER MJ = 1.675
JET STATIC TEMPERATURE RATIO TJ/T0 = 2.274
JET DENSITY RATIO DJ/D0 = 0.440
JET VELOCITY RATIO VJ/A0 = 2.526
JET VELOCITY VJ = 2839.9 FPS

TR/TJ = 1.471
DR/D0 = 1.388
DR/DJ = 3.157
MASS FLOW = 2.034 POUNDS PER SECOND
THRUST = 180.87 POUNDS

SHOCK CELL LENGTH S = 2.957 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	82.9	84.9	86.8	86.4	84.8	82.8
250.0	86.4	87.5	86.5	85.6	83.8	82.5
315.2	87.6	87.9	86.8	85.9	85.8	85.6
400.0	90.1	90.3	90.0	89.2	89.5	90.1
500.0	94.1	93.9	93.6	93.9	93.6	93.6
630.0	96.4	95.8	96.0	96.8	98.1	98.5
800.0	98.9	98.3	98.4	97.8	98.4	99.0
1000.0	100.8	100.4	99.6	98.3	97.5	97.9
1250.0	103.6	103.3	101.4	100.9	100.1	99.5
1600.0	105.8	104.6	103.6	102.3	101.2	101.0
2000.0	107.8	106.0	105.2	104.3	103.3	102.1
2500.0	109.3	107.4	106.2	105.2	104.2	103.4
3150.0	110.6	108.8	108.1	107.3	105.8	105.7
4000.0	112.2	110.6	109.5	109.1	108.2	107.9
5000.0	112.6	111.1	110.6	110.1	110.0	109.1
6300.0	113.7	113.1	113.0	111.8	110.7	110.6
8000.0	114.2	114.1	112.9	111.7	110.7	110.3
10000.0	115.1	114.7	113.0	112.0	110.8	110.3
12500.0	115.8	114.4	112.9	112.1	111.0	110.0
16000.0	115.3	114.2	112.7	112.1	110.9	109.9
20000.0	114.1	114.4	112.4	111.6	110.1	109.4
25000.0	114.0	114.0	112.4	111.6	110.1	109.5
31500.0	112.9	113.9	112.1	110.8	109.6	109.3
40000.0	112.1	113.6	111.5	110.8	108.8	109.4
OVERALL SPL	124.9	124.5	123.1	122.2	121.1	120.6

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3				
OCTAVE	MICRO		MICRO	
CENTER	PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE
HZ	16	127.5	17	135.0
	18	142.5	19	150.0
200.0	10.0		10.0	
250.0	82.5		82.4	
315.2	85.3		85.4	
400.0	89.0		86.8	
500.0	93.4		92.9	
630.0	99.3		97.9	
800.0	99.0		98.2	
1000.0	98.6		96.4	
1250.0	98.8		98.8	
1600.0	100.1		100.3	
2000.0	102.0		103.2	
2500.0	102.6		104.0	
3150.0	105.7		106.0	
4000.0	109.1		109.0	
5000.0	110.2		109.1	
6300.0	110.8		110.2	
8000.0	110.3		109.9	
10000.0	109.9		109.0	
12500.0	109.5		108.6	
16000.0	109.2		108.3	
20000.0	108.4		107.3	
25000.0	108.1		107.0	
31500.0	107.5		106.5	
40000.0	107.2		106.7	
			104.4	
OVERALL				
SPL	120.2		119.6	
			119.0	
				118.5

SUPERSONIC JET EXHAUST NOISE

MACH 2.0 NOZZLE

RESERVOIR PRESSURE = 89.50 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 74.00 DEG.F, CHAMBER TEMPERATURE = 77.00 DEG.F
RELATIVE HUMIDITY = 60.0 PERCENT
GAMMA = 1.400

RUN NUMBER 84

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 7.348$
TEMPERATURE RATIO $TR = 0.994$
MACH NUMBER $MJ = 1.960$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 0.562$
JET DENSITY RATIO $DJ/D0 = 1.778$
JET VELOCITY RATIO $VJ/A0 = 1.470$
JET VELOCITY $VJ = 1669.3$ FPS

$TR/TJ = 1.768$
 $DR/D0 = 7.389$
 $DR/DJ = 4.156$
MASS FLOW = 4.784 POUNDS PER SECOND
THRUST = 247.49 POUNDS

SHOCK CELL LENGTH $S = 3.707$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
					4	37.5
					5	45.0
					6	52.5
200.0	103.3		103.0	96.6	20.0	88.8
250.0	106.6		106.5	101.0	94.3	92.0
315.2	111.4		108.4	104.8	98.2	94.6
400.0	113.2		112.8	108.0	102.7	97.7
500.0	116.5		115.0	111.0	104.4	100.6
630.0	115.9		116.7	114.9	108.2	103.3
800.0	118.7		120.0	117.1	110.9	106.1
1000.0	118.4		120.9	120.1	114.6	109.0
1250.0	119.0		122.1	122.5	117.4	111.8
1600.0	119.0		122.1	122.9	119.0	113.7
2000.0	118.8		122.8	124.0	120.7	115.6
2500.0	118.8		123.3	124.4	121.1	116.4
3150.0	118.2		122.9	125.1	121.6	116.8
4000.0	116.9		121.9	125.1	121.7	117.3
5000.0	115.1		120.3	123.9	120.9	116.7
6300.0	114.2		119.0	122.6	120.6	116.4
8000.0	112.7		117.4	121.2	119.4	115.7
10000.0	109.0		115.7	120.5	119.0	114.2
12500.0	110.0		115.5	119.1	117.3	114.4
16000.0	108.2		114.0	117.8	115.8	113.1
20000.0	106.3		112.6	116.8	114.8	112.1
25000.0	104.8		111.2	116.0	114.1	111.1
31500.0	103.2		110.3	115.3	113.2	110.2
40000.0	102.2		109.8	114.8	113.1	109.4
						109.0
OVERALL						
SPL	129.1		132.6	134.3	131.2	126.9
						123.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	7	60.0	8	67.5	9	75.0
	10	82.5	11	90.0	12	97.5
200.0	86.2		87.3		87.8	86.1
250.0	89.8		88.8		88.3	86.7
315.2	93.5		91.7		90.4	90.3
400.0	95.0		93.4		92.6	92.2
500.0	96.8		94.9		94.1	92.7
630.0	99.3		97.4		96.6	96.0
800.0	101.0		99.0		97.9	97.0
1000.0	102.4		100.7		99.5	98.5
1250.0	103.8		101.8		101.0	100.1
1600.0	104.8		103.2		102.2	101.0
2000.0	106.1		104.2		103.2	102.1
2500.0	106.7		104.8		103.7	102.6
3150.0	108.1		105.9		104.6	103.8
4000.0	108.9		106.7		105.6	104.7
5000.0	109.7		107.3		106.4	105.8
6300.0	110.3		108.1		106.8	106.1
8000.0	110.5		108.1		106.7	105.9
10000.0	110.8		108.1		106.6	106.1
12500.0	110.8		108.0		106.8	106.2
16000.0	110.2		107.8		107.0	105.7
20000.0	109.8		107.2		106.7	105.3
25000.0	109.2		106.8		106.6	104.9
31500.0	108.3		106.2		106.3	104.2
40000.0	107.9		106.2		105.8	103.5
OVERALL						
SPL	121.1		118.8		117.9	116.8
						116.6
						116.4

SUPERSONIC JET EXHAUST NOISE

MACH 2.0 NOZZLE

RESERVOIR PRESSURE = 90.50 PSI, ATMOSPHERIC PRESSURE = 14.24 PSI
RESERVOIR TEMPERATURE = 55.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 50.0 PERCENT
GAMMA = 1.400

RUN NUMBER 193

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 7.355
TEMPERATURE RATIO TR = 0.990
MACH NUMBER MJ = 1.960
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.560
JET DENSITY RATIO DJ/D0 = 1.786
JET VELOCITY RATIO VJ/A0 = 1.467
JET VELOCITY VJ = 1639.7 FPS

TR/TJ = 1.768
DR/D0 = 7.427
DR/DJ = 4.159
MASS FLOW = 4.796 POUNDS PER SECOND
THRUST = 247.67 POUNDS

SHOCK CELL LENGTH S = 3.709 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	78.2	80.3	81.9	81.9	82.3	81.4
250.0	81.2	82.7	82.3	81.7	81.5	80.4
315.2	82.6	83.6	83.0	83.0	83.2	83.0
400.0	84.3	85.4	85.3	85.6	85.4	86.6
500.0	87.8	88.1	88.8	89.2	89.6	89.3
630.0	89.5	90.1	91.0	91.5	92.3	91.9
800.0	91.8	92.8	93.5	93.0	93.7	93.6
1000.0	93.6	95.2	95.7	95.7	95.4	95.6
1250.0	96.5	98.0	98.3	98.1	97.7	97.9
1600.0	98.4	99.5	99.0	98.6	98.4	98.6
2000.0	100.8	101.3	100.5	99.9	100.1	100.1
2500.0	102.1	102.1	101.4	101.0	101.9	102.2
3150.0	103.2	103.3	103.2	103.8	104.7	104.6
4000.0	104.8	105.1	104.8	104.7	105.7	105.4
5000.0	105.6	105.8	105.3	105.0	106.4	105.9
6300.0	106.0	106.5	106.3	106.1	106.8	106.3
8000.0	106.3	107.1	106.2	105.6	106.3	105.5
10000.0	106.9	107.8	105.8	105.0	106.0	104.8
12500.0	107.5	107.5	105.9	105.1	105.7	104.5
16000.0	106.9	106.9	105.4	104.6	104.8	103.9
20000.0	106.4	106.8	104.9	103.8	103.7	103.0
25000.0	106.5	106.4	104.7	103.1	102.9	102.7
31500.0	105.8	106.4	104.4	102.5	102.5	102.4
40000.0	105.2	106.3	104.0	102.5	101.6	102.6
OVERALL SPL	117.2	117.7	116.5	115.9	116.3	115.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 16 127.5	MICRO PHONE NO. ANGLE 7 35.3	MICRO PHONE NO. ANGLE 18 142.5	MICRO PHONE NO. ANGLE 19 150.0
200.0	78.6	0.0	77.2	76.5
250.0	80.6	0.0	80.0	79.5
315.2	82.5	0.0	81.7	81.0
400.0	86.1	0.0	84.3	84.1
500.0	89.6	0.0	87.6	86.6
630.0	92.1	0.0	90.1	88.2
800.0	92.7	0.0	91.6	90.7
1000.0	95.7	0.0	94.5	94.8
1250.0	97.7	0.0	97.2	96.1
1600.0	98.3	0.0	99.5	99.8
2000.0	99.4	0.0	101.7	101.6
2500.0	101.7	0.0	103.2	103.6
3150.0	103.9	0.0	104.1	104.8
4000.0	104.7	0.0	104.7	104.9
5000.0	105.2	0.0	104.3	103.9
6300.0	105.2	0.0	103.9	103.4
8000.0	104.4	0.0	102.6	102.4
10000.0	103.8	0.0	101.7	101.0
12500.0	103.3	0.0	100.8	100.2
16000.0	102.4	0.0	100.0	98.7
20000.0	101.4	0.0	98.9	97.4
25000.0	100.9	0.0	98.4	96.4
31500.0	100.4	0.0	98.0	95.6
40000.0	100.0	0.0	97.4	94.8
OVERALL SPL	114.8	0.0	113.9	113.6

SUPERSONIC JET EXHAUST NOISE

MACH 2.0 NOZZLE

RESERVOIR PRESSURE = 89.50 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 470.00 DEG.F, CHAMBER TEMPERATURE = 80.00 DEG.F
RELATIVE HUMIDITY = 58.0 PERCENT
GAMMA = 1.386

RUN NUMBER 85

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO PR = 7.348
TEMPERATURE RATIO TR = 1.722
MACH NUMBER MJ = 1.962
JET STATIC TEMPERATURE RATIO TJ/T0 = 0.988
JET DENSITY RATIO DJ/D0 = 1.012
JET VELOCITY RATIO VJ/A0 = 1.950
JET VELOCITY VJ = 2221.3 FPS

TR/TJ = 1.743
DR/D0 = 4.266
DR/DJ = 4.216
MASS FLOW = 3.613 POUNDS PER SECOND
THRUST = 248.03 POUNDS

SHOCK CELL LENGTH S = 3.713 INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. ANGLE 1 15.0	MICRO PHONE NO. ANGLE 2 22.5	MICRO PHONE NO. ANGLE 3 30.0	MICRO PHONE NO. ANGLE 4 37.5	MICRO PHONE NO. ANGLE 5 45.0	MICRO PHONE NO. ANGLE 6 52.5
200.0	106.3	104.5	98.7	93.9	98.2	92.8
250.0	109.4	107.9	104.3	99.0	100.4	95.7
315.2	113.6	110.9	108.6	103.2	101.6	97.5
400.0	115.3	115.9	111.8	107.1	103.8	99.4
500.0	118.5	118.0	114.7	110.8	105.5	101.0
630.0	117.1	119.3	118.4	113.9	107.7	104.2
800.0	119.4	122.0	121.5	116.9	111.0	107.4
1000.0	118.5	122.0	123.5	120.3	114.5	110.7
1250.0	119.4	123.0	125.3	123.0	117.4	113.1
1600.0	119.0	122.7	124.8	124.2	119.4	115.7
2000.0	118.8	123.2	125.4	125.3	121.8	118.2
2500.0	117.9	122.6	125.8	125.7	123.0	119.7
3150.0	116.6	121.9	125.4	126.0	124.3	121.1
4000.0	115.4	120.6	124.2	125.9	125.6	122.2
5000.0	114.1	119.6	122.4	124.1	125.7	122.9
6300.0	112.7	118.4	121.0	123.0	124.8	122.7
8000.0	111.0	117.0	119.8	121.6	123.3	121.7
10000.0	109.9	115.8	118.9	120.6	121.9	121.0
12500.0	108.8	114.6	117.8	119.6	121.0	120.3
16000.0	107.4	113.3	116.5	118.5	120.0	119.5
20000.0	105.7	112.0	115.6	117.5	118.7	118.6
25000.0	104.4	110.9	115.0	116.8	117.9	118.0
31500.0	102.7	109.9	114.4	115.9	117.5	117.4
40000.0	101.7	109.5	113.8	115.7	117.6	117.3
OVERALL SPL	129.2	132.8	135.0	135.1	134.3	132.1

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	7	60.0	8	67.5	9	75.0
	10	82.5	11	90.0	12	97.5
200.0	88.7		89.5		90.0	88.4
250.0	90.8		90.5		89.8	88.4
315.2	92.9		93.0		91.0	91.3
400.0	96.0		94.8		93.8	93.7
500.0	97.6		96.3		95.6	93.4
630.0	100.2		99.0		98.3	97.0
800.0	103.1		100.9		100.0	98.5
1000.0	105.2		102.9		101.7	100.1
1250.0	107.2		104.8		103.6	102.0
1600.0	109.5		106.6		104.8	103.4
2000.0	111.2		108.3		106.3	104.6
2500.0	112.8		109.7		107.5	105.7
3150.0	114.3		111.2		108.8	107.3
4000.0	115.3		112.7		110.4	108.5
5000.0	116.4		114.0		111.5	110.0
6300.0	117.2		114.8		112.1	111.2
8000.0	117.2		115.2		112.8	111.8
10000.0	117.6		115.8		113.0	112.3
12500.0	117.3		116.1		113.6	112.7
16000.0	116.7		116.1		113.9	112.6
20000.0	116.2		115.7		113.8	112.2
25000.0	115.6		115.2		113.7	111.7
31500.0	114.8		114.6		113.4	111.0
40000.0	114.2		114.4		112.8	110.1
OVERALL						
SPL	127.5		126.0		123.9	122.4
						121.9
						121.7

SUPERSONIC JET EXHAUST NOISE

MACH 2.0 NOZZLE

RESERVOIR PRESSURE = 90.00 PSI, ATMOSPHERIC PRESSURE = 14.24 PSI
RESERVOIR TEMPERATURE = 430.00 DEG.F, CHAMBER TEMPERATURE = 60.00 DEG.F
RELATIVE HUMIDITY = 50.0 PERCENT
GAMMA = 1.386

RUN NUMBER 194

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 7.320$
TEMPERATURE RATIO $TR = 1.712$
MACH NUMBER $MJ = 1.959$
JET STATIC TEMPERATURE RATIO $TJ/T_0 = 0.983$
JET DENSITY RATIO $DJ/D_0 = 1.017$
JET VELOCITY RATIO $VJ/A_0 = 1.943$
JET VELOCITY $VJ = 2171.5$ FPS

$TR/TJ = 1.741$
 $DR/D_0 = 4.277$
 $DR/DJ = 4.205$
MASS FLOW = 3.618 POUNDS PER SECOND
THRUST = 247.43 POUNDS

SHOCK CELL LENGTH $S = 3.707$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	10.0	0.0	81.6	82.6	82.1	80.8
250.0	82.8	0.0	83.2	82.9	82.6	80.9
315.2	83.3	0.0	83.7	83.0	82.8	81.9
400.0	84.9	0.0	85.2	85.6	85.7	86.6
500.0	88.8	0.0	89.0	90.3	90.4	90.9
630.0	90.4	0.0	91.8	93.5	94.1	94.9
800.0	93.1	0.0	93.7	94.5	94.5	95.0
1000.0	94.5	0.0	95.7	95.9	96.0	96.4
1250.0	97.9	0.0	98.8	98.7	98.8	99.2
1600.0	99.8	0.0	99.8	99.8	99.5	99.3
2000.0	102.1	0.0	101.4	101.5	101.2	100.8
2500.0	103.8	0.0	102.3	102.8	102.8	103.3
3150.0	105.4	0.0	104.1	106.1	107.0	106.6
4000.0	106.8	0.0	106.6	108.6	108.7	108.2
5000.0	108.5	0.0	107.9	109.1	109.6	109.1
6300.0	109.6	0.0	109.0	110.1	110.1	109.8
8000.0	109.6	0.0	109.2	109.9	109.8	108.8
10000.0	110.2	0.0	108.8	109.7	109.3	108.3
12500.0	110.8	0.0	108.6	109.4	109.0	107.8
16000.0	110.5	0.0	108.0	108.8	108.2	107.0
20000.0	110.2	0.0	107.3	108.1	107.2	106.3
25000.0	110.4	0.0	106.8	107.5	106.6	106.0
31500.0	109.7	0.0	106.0	106.9	106.2	106.0
40000.0	109.4	0.0	105.1	107.0	105.4	106.2
OVERALL SPL	120.5	117.7	118.7	119.7	119.4	118.9

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3									
OCTAVE	MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	16	127.5	7	35.3	18	142.5	19	150.0	
200.0	79.9		0.0		77.0		77.0		
250.0	81.8		0.0		80.7		80.2		
315.2	82.8		0.0		83.7		82.8		
400.0	86.1		0.0		85.0		85.5		
500.0	92.0		0.0		90.3		88.6		
630.0	95.8		0.0		92.7		89.0		
800.0	94.8		0.0		93.5		90.8		
1000.0	97.0		0.0		94.7		94.0		
1250.0	99.2		0.0		98.5		97.4		
1600.0	99.4		0.0		99.8		99.4		
2000.0	100.6		0.0		103.9		104.7		
2500.0	103.7		0.0		104.4		105.6		
3150.0	107.0		0.0		107.4		109.0		
4000.0	108.6		0.0		108.6		109.1		
5000.0	109.3		0.0		108.3		108.2		
6300.0	109.3		0.0		107.8		107.6		
8000.0	108.5		0.0		106.5		106.1		
10000.0	107.9		0.0		105.4		104.7		
12500.0	106.9		0.0		104.4		103.8		
16000.0	106.2		0.0		103.7		102.4		
20000.0	105.3		0.0		102.6		101.1		
25000.0	104.7		0.0		102.2		100.2		
31500.0	104.2		0.0		102.0		99.5		
40000.0	104.0		0.0		101.6		98.8		
OVERALL									
SPL	118.4		0.0		117.2		117.2		

SUPERSONIC JET EXHAUST NOISE

MACH 2.0 NOZZLE

RESERVOIR PRESSURE = 88.60 PSI, ATMOSPHERIC PRESSURE = 14.10 PSI
RESERVOIR TEMPERATURE = 855.00 DEG.F, CHAMBER TEMPERATURE = 80.00 DEG.F
RELATIVE HUMIDITY = 56.0 PERCENT
GAMMA = 1.362

RUN NUMBER 86

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 7.284$
TEMPERATURE RATIO $TR = 2.435$
MACH NUMBER $MJ = 1.960$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.437$
JET DENSITY RATIO $DJ/D0 = 0.696$
JET VELOCITY RATIO $VJ/A0 = 2.349$
JET VELOCITY $VJ = 2675.6$ FPS

$TR/TJ = 1.695$
 $DR/D0 = 2.991$
 $DR/DJ = 4.297$
MASS FLOW = 2.993 POUNDS PER SECOND
THRUST = 247.54 POUNDS

SHOCK CELL LENGTH $S = 3.708$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3						
OCTAVE	MICRO		MICRO		MICRO	
CENTER	PHONE		PHONE		PHONE	
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
HZ	1	15.0	2	22.5	3	30.0
	4	37.5	5	45.0	6	52.5
200.0	107.8		106.6		100.8	97.3
250.0	110.1		109.7		106.2	101.7
315.2	115.2		112.8		110.1	105.9
400.0	117.0		117.0		114.4	109.4
500.0	119.0		119.4		117.1	113.1
630.0	117.1		119.9		120.6	116.6
800.0	118.9		122.3		122.6	120.0
1000.0	117.8		121.7		124.1	122.3
1250.0	118.7		122.5		125.0	124.6
1600.0	118.1		122.5		124.9	125.5
2000.0	117.9		122.6		125.8	126.4
2500.0	116.4		122.1		125.2	126.6
3150.0	115.3		120.7		123.9	126.3
4000.0	114.1		119.9		123.3	125.6
5000.0	112.9		118.5		122.2	124.3
6300.0	111.8		117.3		120.8	123.4
8000.0	110.5		116.0		119.6	122.1
10000.0	109.6		115.0		118.4	121.2
12500.0	108.7		114.0		117.4	120.3
16000.0	107.5		112.9		116.3	119.3
20000.0	105.7		111.7		115.3	118.5
25000.0	104.6		110.9		114.8	117.6
31500.0	102.8		109.7		114.0	116.5
40000.0	101.7		109.1		113.6	116.2
OVERALL						
SPL	128.7		132.5		134.9	135.9
					134.4	134.2

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3													
OCTAVE	MICRO		MICRO		MICRO		MICRO		MICRO		MICRO		
CENTER	PHONE		PHONE		PHONE		PHONE		PHONE		PHONE		
FREQ.	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	
HZ	7	60.0	8	67.5	9	75.0	10	82.5	11	90.0	12	97.5	
200.0	91.3		90.6		91.8		89.0		88.7		86.8		
250.0	94.6		91.2		91.0		89.3		89.4		89.3		
315.2	95.4		93.4		93.3		92.0		91.5		90.4		
400.0	98.5		96.5		95.5		94.9		94.1		93.2		
500.0	99.8		97.6		96.8		95.6		93.9		94.4		
630.0	102.6		100.6		99.2		97.9		97.4		96.1		
800.0	105.8		102.6		101.2		100.1		99.4		99.0		
1000.0	108.2		104.8		103.8		101.2		100.5		99.6		
1250.0	110.9		106.9		105.2		103.3		102.8		102.0		
1600.0	113.4		109.0		107.0		104.9		104.0		103.1		
2000.0	116.2		110.8		108.7		106.7		105.6		104.6		
2500.0	118.0		112.6		110.3		108.2		106.8		106.0		
3150.0	119.6		114.5		111.8		109.7		108.3		107.6		
4000.0	120.6		116.4		113.7		111.1		109.7		108.8		
5000.0	121.6		117.9		114.9		112.4		111.3		110.8		
6300.0	121.9		118.8		115.8		113.8		112.8		112.3		
8000.0	121.4		119.2		116.4		114.3		113.3		112.9		
10000.0	121.4		119.4		116.7		115.0		113.8		113.7		
12500.0	120.9		119.4		117.1		115.4		114.2		114.2		
16000.0	120.1		119.2		117.3		115.3		114.4		114.1		
20000.0	119.2		118.3		117.0		114.9		114.0		113.4		
25000.0	118.4		117.5		116.7		114.6		113.7		112.8		
31500.0	117.6		116.7		116.1		113.7		113.1		112.0		
40000.0	117.0		116.5		115.5		112.8		112.8		111.1		
OVERALL													
SPL	131.5		129.1		127.1		125.0		124.0		123.4		

SUPERSONIC JET EXHAUST NOISE

MACH 2.0 NOZZLE

RESERVOIR PRESSURE = 89.50 PSI, ATMOSPHERIC PRESSURE = 14.24 PSI
RESERVOIR TEMPERATURE = 822.00 DEG.F, CHAMBER TEMPERATURE = 62.00 DEG.F
RELATIVE HUMIDITY = 42.0 PERCENT
GAMMA = 1.362

RUN NUMBER 195

MICROPHONES ARE TWELVE FEET FROM THE NOZZLE EXIT PLANE

PRESSURE RATIO $PR = 7.285$
TEMPERATURE RATIO $TR = 2.456$
MACH NUMBER $MJ = 1.960$
JET STATIC TEMPERATURE RATIO $TJ/T0 = 1.449$
JET DENSITY RATIO $DJ/D0 = 0.690$
JET VELOCITY RATIO $VJ/A0 = 2.359$
JET VELOCITY $VJ = 2641.9$ FPS

$TR/TJ = 1.695$
 $DR/D0 = 2.966$
 $DR/DJ = 4.297$
MASS FLOW = 2.981 POUNDS PER SECOND
THRUST = 247.57 POUNDS

SHOCK CELL LENGTH $S = 3.708$ INCHES

1/3 OCTAVE SOUND PRESSURE LEVEL

1/3 OCTAVE CENTER FREQ. HZ	MICRO PHONE NO. 10 ANGLE 82.5	MICRO PHONE NO. 11 ANGLE 90.0	MICRO PHONE NO. 12 ANGLE 97.5	MICRO PHONE NO. 13 ANGLE 105.0	MICRO PHONE NO. 14 ANGLE 112.5	MICRO PHONE NO. 15 ANGLE 120.0
200.0	10.0	0.0	89.4	84.3	83.0	81.7
250.0	84.8	0.0	92.2	85.2	84.1	82.8
315.2	86.1	0.0	88.7	84.5	83.9	82.9
400.0	87.3	0.0	91.3	87.3	87.4	87.8
500.0	91.3	0.0	93.7	92.7	92.8	93.3
630.0	93.7	0.0	96.8	95.7	96.3	97.5
800.0	96.1	0.0	98.4	96.3	96.3	97.8
1000.0	97.2	0.0	98.5	97.4	96.8	97.0
1250.0	100.6	0.0	101.6	100.0	99.4	99.5
1600.0	102.3	0.0	102.4	101.2	100.4	100.4
2000.0	105.0	0.0	104.1	103.0	102.1	101.9
2500.0	106.9	0.0	105.2	104.3	103.5	103.5
3150.0	108.4	0.0	106.9	106.6	106.5	107.3
4000.0	110.1	0.0	109.1	109.2	109.2	109.6
5000.0	110.8	0.0	111.1	110.5	110.2	110.3
6300.0	112.3	0.0	112.2	111.4	111.0	111.0
8000.0	113.0	0.0	112.4	111.7	111.2	110.6
10000.0	113.7	0.0	112.3	111.7	111.1	110.3
12500.0	114.3	0.0	112.6	111.7	111.1	110.1
16000.0	114.1	0.0	112.5	111.4	110.6	109.5
20000.0	113.7	0.0	112.4	111.0	109.9	109.1
25000.0	114.0	0.0	112.6	111.0	109.8	109.2
31500.0	113.1	0.0	112.7	110.5	109.4	109.1
40000.0	112.7	0.0	112.7	110.5	108.6	109.3
OVERALL SPL	123.8	117.7	123.0	121.8	121.1	120.8

1/3 OCTAVE SOUND PRESSURE LEVEL
CONTINUED

1/3								
OCTAVE CENTER FREQ.	MICRO PHONE		MICRO PHONE		MICRO PHONE		MICRO PHONE	
HZ	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE	NO.	ANGLE
	16	127.5	7	35.3	18	142.5	19	150.0
200.0	10.0		0.0		10.0		10.0	
250.0	81.8		0.0		81.5		80.8	
315.2	82.7		0.0		84.4		84.5	
400.0	87.4		0.0		86.1		87.5	
500.0	93.3		0.0		92.1		90.1	
630.0	98.2		0.0		94.6		91.4	
800.0	98.1		0.0		95.9		92.4	
1000.0	97.9		0.0		95.3		94.0	
1250.0	100.1		0.0		98.7		97.7	
1600.0	100.3		0.0		99.8		99.4	
2000.0	101.8		0.0		103.1		103.3	
2500.0	103.7		0.0		105.7		105.6	
3150.0	107.4		0.0		109.0		109.0	
4000.0	109.3		0.0		110.1		109.5	
5000.0	109.9		0.0		110.2		109.3	
6300.0	110.5		0.0		109.7		109.0	
8000.0	110.2		0.0		108.7		108.0	
10000.0	109.7		0.0		107.6		106.7	
12500.0	109.2		0.0		106.8		105.9	
16000.0	108.6		0.0		106.4		104.7	
20000.0	108.1		0.0		105.6		103.7	
25000.0	107.8		0.0		105.6		103.2	
31500.0	107.3		0.0		105.2		102.5	
40000.0	107.2		0.0		104.8		102.0	
OVERALL								
SPL	120.1		0.0		119.2		118.3	