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MAR 79 R A LEE
AMRL-TR-75-50-VOL-136

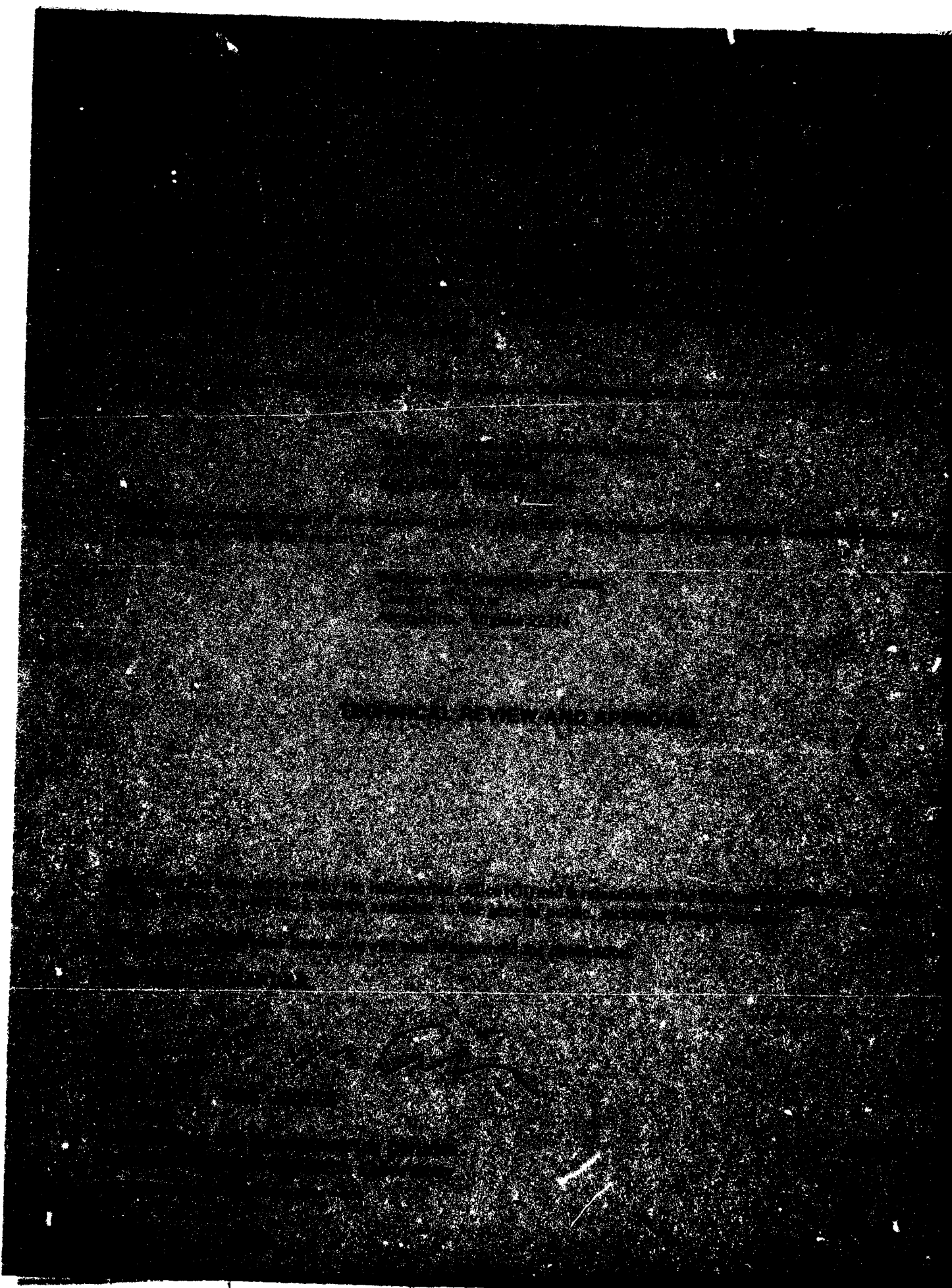
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The AF32A-13 noise suppressor is made by the Industrial Acoustics Corporation for acoustical suppression of the F-111A aircraft. This report provides measured and extrapolated data defining the bioacoustic environments produced by this aircraft operating in the AF32A-13 noise suppressor for five power conditions. Far-field data measured at 19 locations are normalized to standard meteorological conditions and extrapolated from 75-8000 meters			

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to derive sets of equal-value contours for seven acoustic measures as functions of angle and distance from the source. (Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application", AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under Project/Task 723107, Technology to Define and Assess Environmental Quality of Noise From Air Force Operations.

The author gratefully acknowledges Mr. John Cole and Mr. Robert Powell for their assistance in preparing this report, Mr. Jerry Speakmen for his assistance in acquiring the raw data, Mr. Keith Kettler, Mr. Henry Mohlman and Mr. Fred Lampley of the University of Dayton for assistance in the mechanics of data processing, and Mrs. Peggy Massie for assistance in typing this report.

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INTRODUCTION

The F-111A aircraft is a long-range, fighter-bomber aircraft powered by two Pratt and Whitney TF30-P-3 engines. This aircraft is manufactured by General Dynamics and is used to effectively deliver a full spectrum of tactical weapons against enemy targets in any weather, day or night. The AF32A-13 noise suppressor is made by Industrial Acoustics Corporation to provide noise level reduction for all F-111 aircraft during ground runup operations.

This volume provides measured and extrapolated data defining bioacoustic environments produced by this aircraft in this suppressor system during ground runup operations. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with ground runups of the F-111A aircraft operating in the AF32A-13 noise suppressor.

This volume is one of a series published by the Aerospace Medical Research Laboratory (AMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type noise data in the handbook describe the noise produced during *ground operations of aircraft*, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Volume 2 provides a method and data for adjusting the handbook's far-field noise data, which are for standard meteorological conditions (15°C temperature, 70% rel humidity, 0.760 meters Hg barometric pressure), to derive comparable data for other meteorological conditions. *Refer to Volumes 1 and 2* (references 1 and 2) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published and is available upon request from AMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of each updated index.

Direct any questions concerning the technical data in this report and other handbook volumes to: AMRL/BBE, Wright-Patterson AFB, OH 45433; AUTOVON 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

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1. Cole, John., *USAF Bioenvironmental Noise Data Handbook Volume 1: Organization, Content and Application*, AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.
 2. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 2: Procedure to Evaluate Effects of Non-standard Meteorological Conditions on Far-Field Noise*, AMRL-TR-75-50 (2), AMRL, WPAFB, OH, 1975.

FAR-FIELD NOISE

MEASUREMENTS

AMRL acquired the far-field data during a 1- 2-hour test period, thus keeping similar meteorological conditions. Figure 1 shows the ground runup pad, ground cover, aircraft orientation and the 19 microphone measurement sites on a semicircle. The center of the 100 meter radius semicircle used in surveying the AF32A-13 suppressor was on the ground directly below the center of the exhaust stack.

Table 1 provides cockpit readouts of engine characteristics (% RPM, fuel flow, etc.) for each power setting used in the far-field tests. Also listed in this table are the surface meteorological conditions during data acquisition.

All microphone measurement sites are in the acoustic far-field of their source where the sound wave-fronts spherically diverge and the noise source may be regarded as a point source.

A portable microphone/tape-recorder system was used to sequentially record the noise at each far-field location. The microphone was attached to a hand held pole, pointed at the source (0° angle of incidence) and vertically scanned from 0.5 to 3 meters for a period of 5-10 seconds during data acquisition at each microphone location. These samples were then time-integrated to derive a root-mean-square sound pressure level. Vertical scanning and time-integrating together reduce anomalies frequently present in data acquired by a fixed height microphone.

RESULTS

Table 2 lists the overall and 1/3 octave band SPL measured at the far-field locations under meteorological conditions at the time of the test. Data in all other figures and tables are based on these levels. These data were normalized to 100 meters distance and standard meteorological conditions (15°C temperature, 70% relative humidity, 0.760 meter Hg barometric pressure) and used to derive the graphic data in Figure 3 which provides a compact summary of the far-field noise characteristics of the F-111A aircraft operating in the AF32A-13 noise suppressor in a standard format.

Estimates of the noise levels for intermediate power settings (e.g., 90% RPM) and/or different number of engines operating (e.g., single engine) can be determined as explained in Volume 1 of this handbook.

Figures 3 through 9 are sets of equal noise contours describing seven different measures of noise as a function of angle and distance from the source for standard day meteorology. They are respectively, overall sound pressure level, C-weighted sound level, A-weighted sound level, perceived noise level, speech interference level, permissible exposure times for personnel and octave band sound pressure levels.

Data excessively influenced by spurious background electronic noise were eliminated from all figures and tables.

Test personnel performed noise surveys during quiet periods when the background noise was minimal, e.g., early in the morning when no other aircraft or engine test stands were operating. Data eliminated because they were near the background/electronic noise were generally not significant because the levels were so low.

Volume 2 of the handbook describes the influence of meteorology on far-field noise environments, and provides, if required, the factors necessary to adjust the handbook's standard meteorological day data.

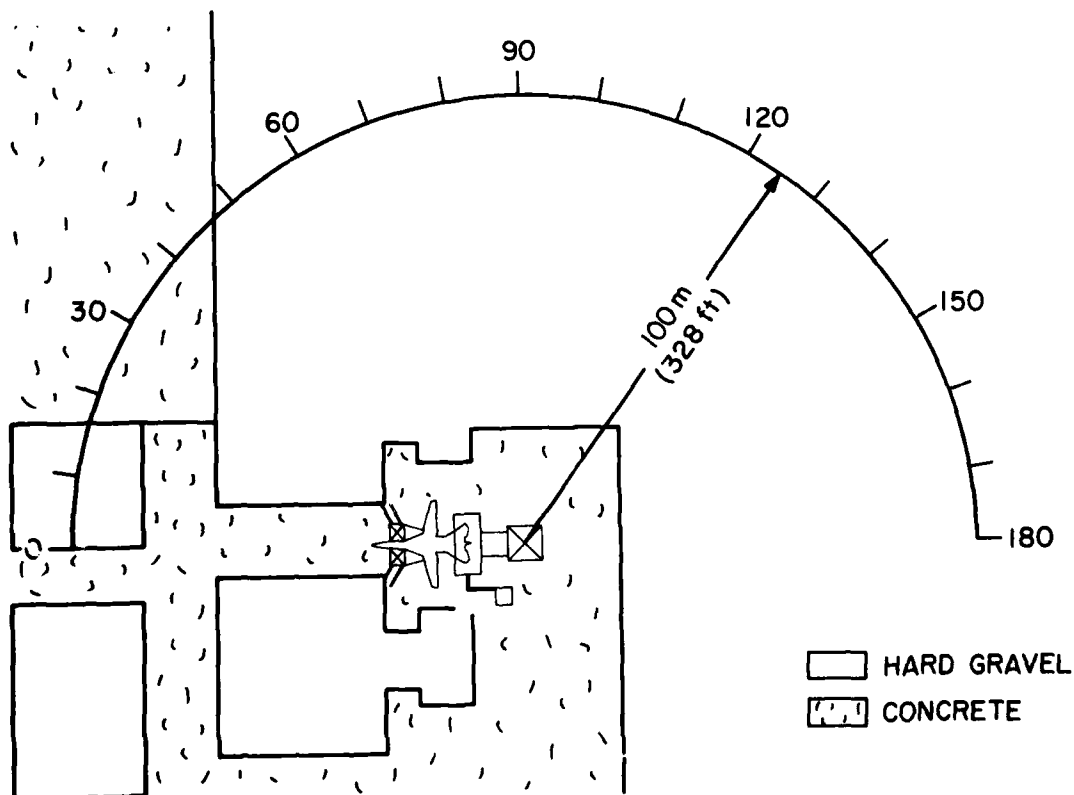


Figure 1. Far-Field Measurement Locations at Nellis AFB, NV

TABLE 1
TEST CONDITIONS
FOR FAR-FIELD NOISE MEASUREMENTS

F-111A Aircraft in The AF32A-13 Noise Suppressor, Ground Runup
Nellis AFB NV Tail #67035

Aircraft Engine Operation

Idle	One Engine 66.9 % RPM 558 C, Turbine Inlet Temperature 900 LBS/HR, Fuel Flow
75% RPM	One Engine 75 % RPM 726 C, TIT 1500 LBS/HR, FF
Military Power	One Engine 96.5 % RPM 1086 C, TIT 5900 LBS/HR, FF
Zone 3 Afterburner	One Engine 96.4 % RPM 1094 C, TIT 20,200 LBS/HR, FF
Zone 5 Afterburner	One Engine 96.1 % RPM 1104 C TIT 33,800 LBS/HR, FF

Meteorology

Temperature	24 C
Bar Pressure	.713 M Hg
Rel Humidity	31 %
Wind — Speed	Calm
— Direction	Calm

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)																			
1/3 OCTAVE BAND																			
DISTANCE = 100 METERS																			
NOISE SOURCE/SUBJECT:																			
F-111A AIRCRAFT IN THE																			
AF32A-13 SUPPRESSOR																			
ENGINE TF30-P-3																			
FAR FIELD NOISE																			
OPERATION:																			
IDLE POWER 66.9% RPM																			
SINGLE ENGINE																			
GROUND RUNUP (SUPPRESSED)																			
TEMP = 24 C																			
BAR PRESS = .713 M HG																			
REL HUMID = 31 %																			
METEOROLOGY:																			
PAGE 2																			
IDENTIFICATION:																			
OMEGA 1.4																			
TEST 77-779-081																			
RUN 01																			
27 SEP 78																			
PAGE 2																			
ANGLE (DEGREES)																			
FREQ (HZ)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
25	67<	67<	68<	70<	68<	62<	58<	56<	57<	56<	63<	60<	59<	58<	57<	59<	60<	61<	61<
31.5	63<	62<	63<	66<	63<	62<	60<	56<	57<	56<	58<	58<	58<	58<	57<	57<	60<	60<	60<
40	61<	61<	63<	66<	61<	63<	60<	56<	57<	56<	58<	58<	58<	58<	57<	57<	60<	60<	60<
50	64<	63<	64<	69	64<	63<	62<	61<	60<	60<	58<	58<	58<	58<	57<	57<	60<	60<	60<
63	70<	69<	72	73	69<	64<	66<	64<	64<	63<	67<	64<	64<	63<	64<	64<	64<	63<	62<
80	74<	72<	72<	71<	73<	69<	69<	66<	66<	65<	67<	64<	64<	63<	64<	64<	64<	63<	62<
100	74<	71<	71<	73<	71<	71<	68<	67<	66<	69<	69<	67<	67<	68<	68<	69<	70<	70<	70<
125	72	71	72	72	69	68	67<	65<	67<	66<	68<	64<	64<	65<	67<	67<	66<	66<	66<
160	76	74	72	73	70	72	68	64<	65<	67<	68	63<	65<	65<	65<	67<	68	68	69
200	69	67	68	71	66	69	67	66	64	68	67	68	69	61<	62<	64	67	69	71
250	70	70	70	72	68	69	69	69	67	69	67	65<	65<	65<	65<	66<	68	71	73
315	70	70	68	69	62<	63<	65	62<	63<	67	63<	62<	62<	61<	61<	64<	65	66	67
400	68	67	63	66	59<	61<	62	61<	62	60<	59<	60<	58<	59<	62	63	63	63	63
500	70	67	64	64	63	64	67	63	64	62	63	64	61	61	66	62	63	63	64
630	63	58	61	62	61	61	64	60	62	60	62	62	59	59	63	59	59	58	58
800	60	58	59	62	58	59	56<	56	56<	59	57	58	58<	56<	52<	55<	55<	55<	55<
1000	57	56<	59	62	56<	57	57<	56<	55<	56<	59	59	55<	55<	52<	55<	54<	53<	53<
1250	57<	56<	58	61	56<	55<	55<	55<	54<	56<	57<	56<	54<	52<	49<	55<	53<	51<	49<
1600	66<	62<	66<	64<	62<	59<	59<	59<	59<	59<	58<	58<	58<	58<	58<	58<	58<	58<	58<
2000	76	73<	76	74	73<	70<	69<	67<	64<	65<	64<	67<	65<	66<	66<	66<	66<	66<	66<
2500	65	61<	67	65	64	61<	63	62	60<	61<	60<	61<	59<	58<	58<	58<	58<	58<	58<
3150	64	62	66	64	63	61<	59<	59<	59<	59<	59<	58<	58<	57<	52<	56<	56<	56<	56<
4000	69	67	72	70	70	67	66	66	65	64	64	65	62<	61<	56<	61<	56<	56<	56<
5000	62	60	66	63	62	61	61	61	63	62	63	62	59	55	49<	51	48<	44<	40<
6300	60	60	64	62	61	61	60	62	62	61	62	62	58	53	46	48	45	42<	38<
8000	59	60	62	59	59	58	58	59	57	59	59	57	52	49	41	43	39	36<	32<
10000	57	57	55	51	50	51	52	56	52	52	54	50	43	42	31<	34<	31<	27<	27<
OVERALL	84	82	83	83	81	79	79	77	76	77	78	77	76	76	76	78	77	77	78

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)																	IDENTIFICATION:
1/3 OCTAVE BAND																	OMEGA 1.4
DISTANCE = 100 METERS																	TEST 77-779-001
NOISE SOURCE/SUBJECT:																	RUN 02
(OPERATIONS:																	
(ENGINE RUNUP 75% RPM																	TEMP = 24 C
(SINGLE ENGINE																	BAR PRESS = .713 M HG
(GROUND RUNUP (SUPPRESSED)																	27 SEP 78
(FAR FIELD NOISE																	REL HUMID = 31 %
(																	PAGE 2
FREQ	ANGLE (DEGREES)																
(HZ)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160 170 180
25	71<	70<	67<	69<	68<	68<	68<	67<	66<	64<	63<	63<	62<	62<	62<	62<	66< 67< 68<
31.5	68<	66<	64<	63<	65<	66<	66<	65<	65<	64<	63<	62<	61<	60<	61<	62<	62< 62< 63<
40	70	65<	63<	64<	63<	67	66<	65<	64<	63<	62<	61<	60<	61<	62<	62<	63< 64< 64<
50	70	68	66<	66<	65<	68	67<	66<	65<	64<	63<	62<	61<	60<	61<	62<	64< 65< 66<
63	72	72	72	72	69<	69<	68<	67<	67<	66<	65<	64<	63<	64<	64<	65<	65< 65< 65<
80	74<	73<	73<	73<	73<	72<	71<	70<	69<	68<	67<	66<	65<	64<	64<	65<	65< 65< 65<
100	77	73<	71<	71<	70<	73<	72<	71<	70<	69<	68<	67<	66<	65<	64<	64<	67< 67< 66<
125	76	74	72	72	71	72	71	70	69	67<	66<	65<	64<	64<	64<	64<	64< 63< 63<
160	78	77	72	71	71	72	71	69	67<	66<	64<	63<	62<	64<	64<	64<	64< 64< 63<
200	73	74	68	68	69	69	68	68	67	67	66	65	64	65	65	66	66< 66< 66<
250	74	76	70	70	69	68	68	67	67	67	66	64	63	65	66	67	67< 68< 69<
315	73	75	68	67	65	66	66	65	65	64	63	62	61	62	62	62	62< 62< 62<
400	73	74	65	65	64	66	65	64	63	62	61	61	61	61	61	60<	60< 60< 60<
500	74	72	64	63	64	65	64	63	62	61	61	61	61	61	61	61	60 59 59<
630	70	69	65	68	64	65	65	65	65	65	65	62	61	60	58	57	56< 55< 53<
800	70	69	63	63	63	62	61	61	60	59	59	58	57	56	54	53	52< 50< 48<
1000	69	68	62	60	61	60	59	59	59	58	58	57	56	54	53	52	51< 49<
1250	67	69	60	59	59	59	59	58	57<	57<	57<	56<	55<	53<	53<	51<	49<
1600	66<	69<	61<	62<	59<	66<	65<	64<	63<	63<	62<	61<	60	58	57	56	55< 52<
2000	74	75	72<	73	69<	66<	65<	64<	63<	65	64	63	62	60	57<	55<	52<
2500	69	72	72	70	69	69	68	67	66	65	64	63	62	61	58	55	52<
3150	64	66	66	64	65	63	62	62	61	60	59	59	58	56	53	50	46< 43<
4000	68	68	68	68	67	64	64	63	63	62	62	61	61	59	56	53	49 46 43<
5000	63	66	66	65	65	63	63	62	61	61	61	61	61	59	56	53	40 37< 34<
6300	61	64	63	63	62	61	61	61	60	59	59	58	57	54	50	46	43 40 37<
8000	60	62	62	61	61	61	60	60	59	59	59	58	57	54	50	46	43 40 37<
10000	58	59	58	57	57	57	56	55	55	54	53	52	43	40	37	35	32< 29< 26<
OVERALL	86	86	82	82	81	82	81	80	79	78	77	76	76	76	75	75	76 76 76

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)		IDENTIFICATION:																	
2	1/3 OCTAVE BAND	) OMEGA 1.4																	
	DISTANCE = 100 METERS	) TEST 77-779-001																	
NOISE SOURCE/SUBJECT:		) METEOROLOGY:																	
F-111A AIRCRAFT IN THE		) TEMP = 24 C																	
AF32A-13 SUPPRESSOR		) BAR PRESS = .713 M HG																	
ENGINE TF30-P-3		) REL HUMID = 31 %																	
FAR FIELD NOISE		) PAGE 2																	
FREQ (HZ)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
25	83	82	81	81	81	81	80	80	79	78	77	77	78	79	80	82	83	82	82
31.5	77	77	78	78	78	77	77	77	76	76	76	75	75	75	76	76	77	77	77
40	75	75	75	74	74	74	74	74	74	73	72	73	73	75	75	76	76	76	76
50	74	74	75	75	74	74	74	74	74	72	70	72	73	73	74	75	75	76	77
63	75	75	75	75	75	75	75	74	74	73	72	72	73	73	73	73	73	73	73
80	76	76	77	79	80	80	80	80	80	77	74	75	76	76	76	76	76	74	73
100	77	78	79	79	79	79	78	78	78	77	77	77	77	76	76	75	75	76	76
125	77	78	78	78	78	77	76	76	75	74	73	73	73	73	73	73	73	72	70
160	79	80	81	81	82	81	80	79	77	74	71	72	73	73	73	73	74	71	68
200	83	82	81	84	86	85	84	83	83	80	77	78	79	78	77	76	75	74	73
250	80	82	83	83	83	82	81	81	80	79	77	78	78	77	76	75	74	73	72
315	81	82	82	81	81	80	79	79	78	77	76	75	75	74	73	72	72	70	68
400	79	80	81	80	80	79	78	78	77	76	75	75	74	74	73	72	72	70	69
500	77	78	79	79	80	79	79	78	77	75	73	74	75	74	73	73	72	71	70
630	79	80	80	80	80	79	79	78	78	75	72	74	75	75	74	73	72	69	67
800	81	82	82	82	82	81	80	79	78	75	72	72	72	72	71	70	69	67	65
1000	77	78	80	80	81	79	78	76	75	73	71	70	70	68	67	66	65	63	61
1250	75	76	78	77	77	76	74	73	72	71	70	68	66	66	65	65	65	63	60
1600	73	75	76	76	76	75	74	73	71	71	70	68	67	66	66	65	65	64	62
2000	76	77	78	77	77	76	76	75	74	74	73	72	71	70	70	69	68	68	66
2500	77	77	78	77	77	76	74	73	72	71	69	69	66	66	67	67	67	64	62
3150	72	73	75	74	74	73	72	71	70	70	71	69	66	66	67	66	65	65	65
4000	73	74	75	75	75	74	73	72	71	72	72	70	68	67	67	66	65	65	65
5000	71	72	73	72	72	71	70	69	69	69	67	67	66	64	63	61	59	57	55
6300	68	70	71	70	70	69	68	67	68	68	69	67	65	62	59	56	53	51	50
8000	68	68	69	68	68	67	66	65	64	64	65	62	60	56	53	50	47	45	43
10000	65	65	65	65	65	63	62	60	59	58	58	56	53	50	46	42	39	37	34
OVERALL	92	92	93	93	93	93	92	91	91	89	87	88	88	88	88	88	88	87	87
< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.																			

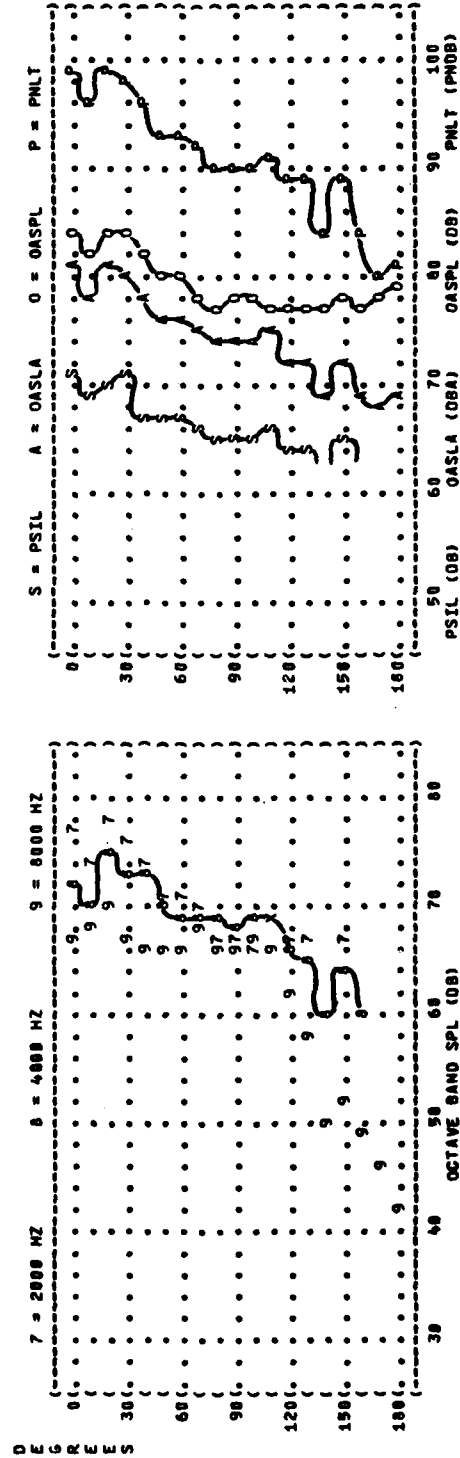
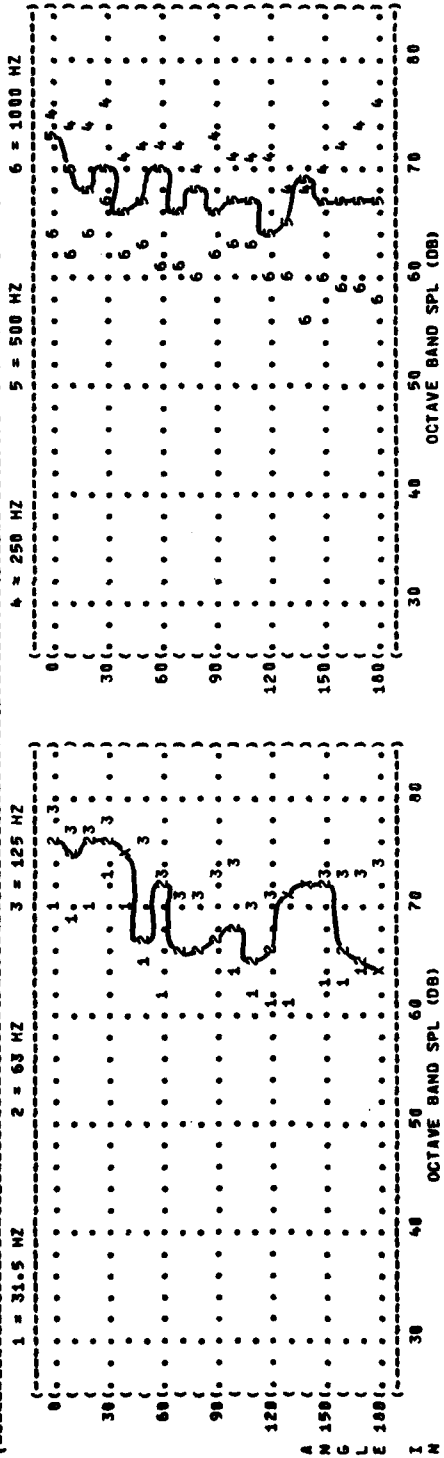
< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)																	
1/3 OCTAVE BAND																	
DISTANCE = 100 METERS																	
NOISE SOURCE/SUBJECT: (OPERATION:) METEOROLOGY:) IDENTIFICATION:																	
F-111A AIRCRAFT IN THE (ZONE 3 AFTERBURNER POWER) TEMP = 24 C) OMEGA 1.4																	
AF32A-13 SUPPRESSOR (SINGLE ENGINE) BAR PRESS = .713 M HG) TEST 77-779-001																	
ENGINE TF30-P-3 (GROUND RUNUP (SUPPRESSED)) REL HUMID = 31 %) RUN 04																	
FAR FIELD NOISE ()) PAGE 2																	
FREQ (HZ)																	
ANGLE (DEGREES)																	
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180																	
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50	80	81	82	81	80	80	79	76	74	74	75	75	75	77	79	79	77
63	80	80	80	79	78	76	76	75	75	76	76	76	76	77	79	78	82
80	81	83	85	85	85	81	80	78	77	77	77	78	78	80	82	78	86
100	81	82	84	83	82	82	80	78	79	80	80	79	78	80	83	79	86
125	79	80	81	81	81	81	76	76	76	77	78	77	76	77	81	75	83
160	80	81	82	82	81	80	76	75	74	73	72	73	74	75	78	81	74
200	80	81	82	83	84	82	80	78	77	77	77	76	76	77	79	74	82
250	81	84	86	85	84	81	82	81	80	79	78	77	76	75	78	80	81
315	84	84	84	83	82	82	84	81	79	77	75	75	75	75	76	72	77
400	82	82	83	83	83	85	84	83	81	79	76	76	76	75	75	73	75
500	80	81	82	83	84	84	83	81	80	78	76	76	76	76	75	72	77
630	83	83	84	84	84	82	83	81	78	77	75	75	74	74	74	72	69
800	84	85	85	85	85	83	82	80	78	77	75	74	73	73	72	71	67
1000	81	82	84	84	84	82	82	79	77	76	74	73	72	70	69	69	65
1250	80	81	83	82	82	82	81	79	77	75	74	72	71	70	69	70	64
1600	78	79	80	80	79	80	81	79	76	74	72	71	70	69	69	69	61
2000	80	81	81	81	80	80	79	77	75	73	71	70	69	69	70	75	59
2500	79	79	80	79	79	78	79	77	75	73	72	71	70	69	68	68	56
3150	75	76	77	76	76	76	74	72	70	69	68	67	66	65	64	64	56
4000	75	76	77	76	76	76	75	73	71	71	69	68	67	66	66	66	54
5000	73	74	74	74	73	72	72	71	69	69	67	65	63	61	60	58	54
6300	70	70	71	71	70	71	70	69	68	68	65	63	60	58	56	54	53
8000	68	69	70	69	69	69	65	65	65	65	62	58	55	52	50	48	52
10000	66	66	66	66	66	66	60	60	59	58	54	51	47	43	41	40	39
OVERALL	95	96	97	97	97	96	95	93	92	91	91	90	90	90	91	93	93
< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.																	

[illegible]

DISTANCE = 100 METERS

USE SOURCE/SUBJECT: (OPERATION:
F-111A AIRCRAFT IN THE (IDLE POWER 66-9% RPM
AF32H-13 SUPPRESSOR (SINGLE ENGINE
ENGINE TF38-P-3 (GROUND RUNUP (SUPPRESSED)
FAR FIELD NOISE (



42635

FIGURE 1 NORMALIZED FARFIELD NOISE LEVELS

2 DISTANCE = 100 METERS

NOISE SOURCE/SUBJECT: F-111A AIRCRAFT IN THE AF32A-13 SUPPRESSOR ENGINE TF30-P-3 FAR FIELD NOISE

OPERATION: ENGINE RUNUP 75X RPM SINGLE ENGINE GROUND RUNUP (SUPPRESSED)

METEOROLOGY: TEMP = 15 C BAR PRESS = .760 M HG REL HUMID = 70 %

IDENTIFICATION: OMEGA 1.4 TEST 77-779-001 RUN 02 27 SEP 78 PAGE 6

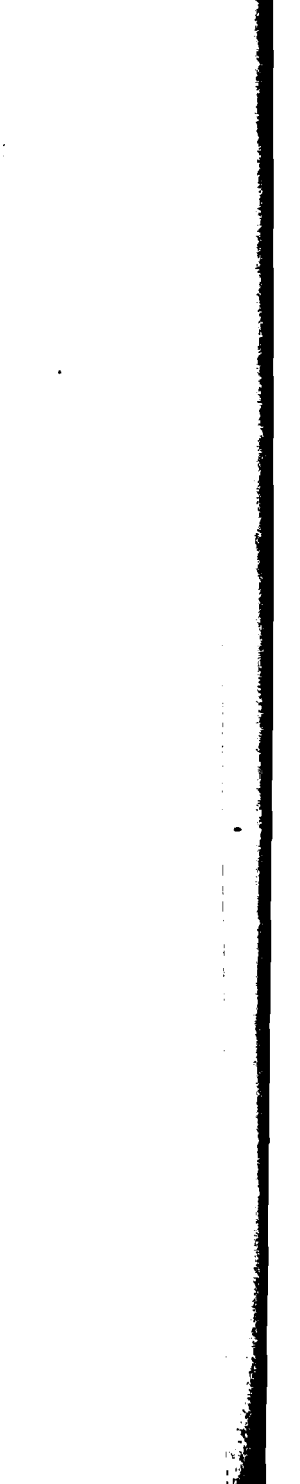
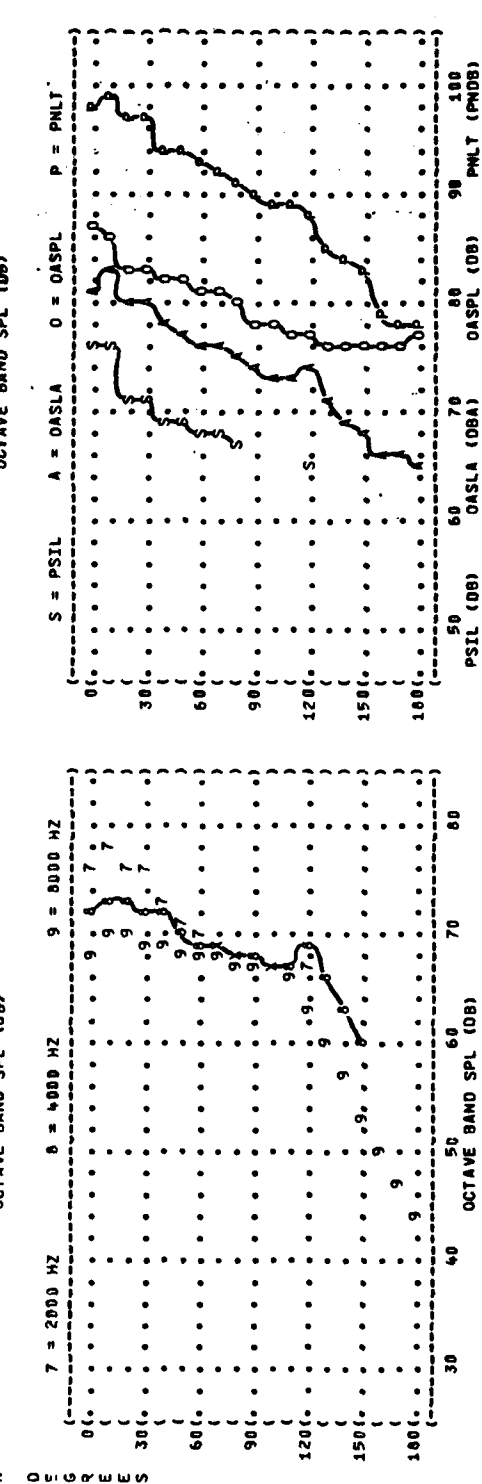


FIGURE: NORMALIZED FARFIELD NOISE LEVELS

2 DISTANCE = 100 METERS

IDENTIFICATION:

OMEGA 1.4

TEST 77-779-001

RUN 03

27 SEP 70

PAGE 6

NOISE SOURCE/SUBJECT:

F-111A AIRCRAFT IN THE

AF32A-13 SUPPRESSOR

ENGINE TF39-P-3

FAR FIELD NOISE

OPERATION:

MILITARY POWER 96.5% RPH

SINGLE ENGINE

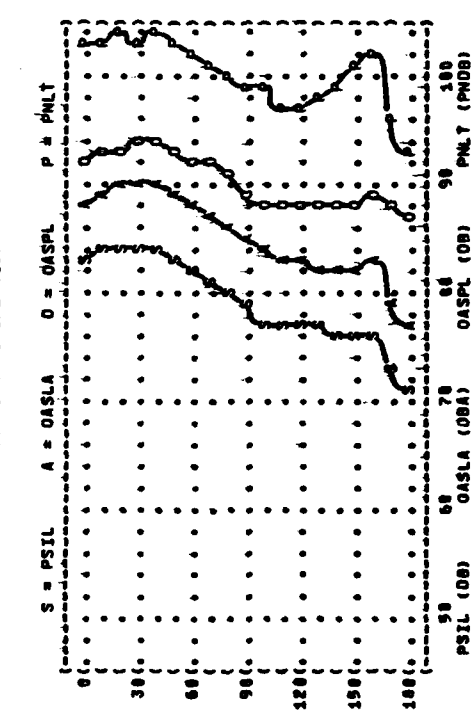
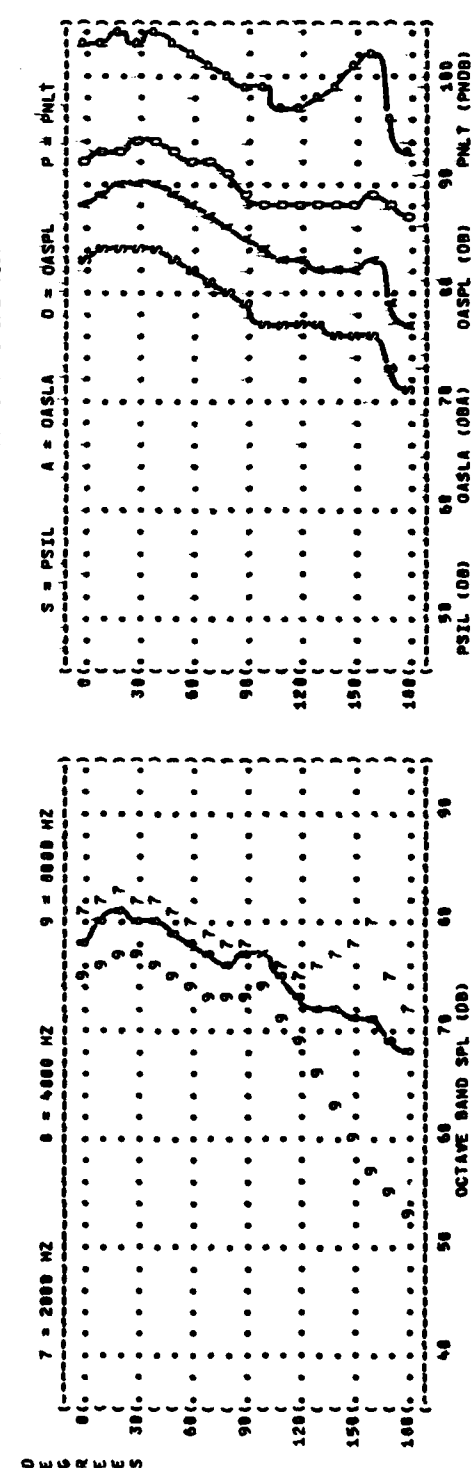
GROUND RUNUP (SUPPRESSED)

METEOROLOGY:

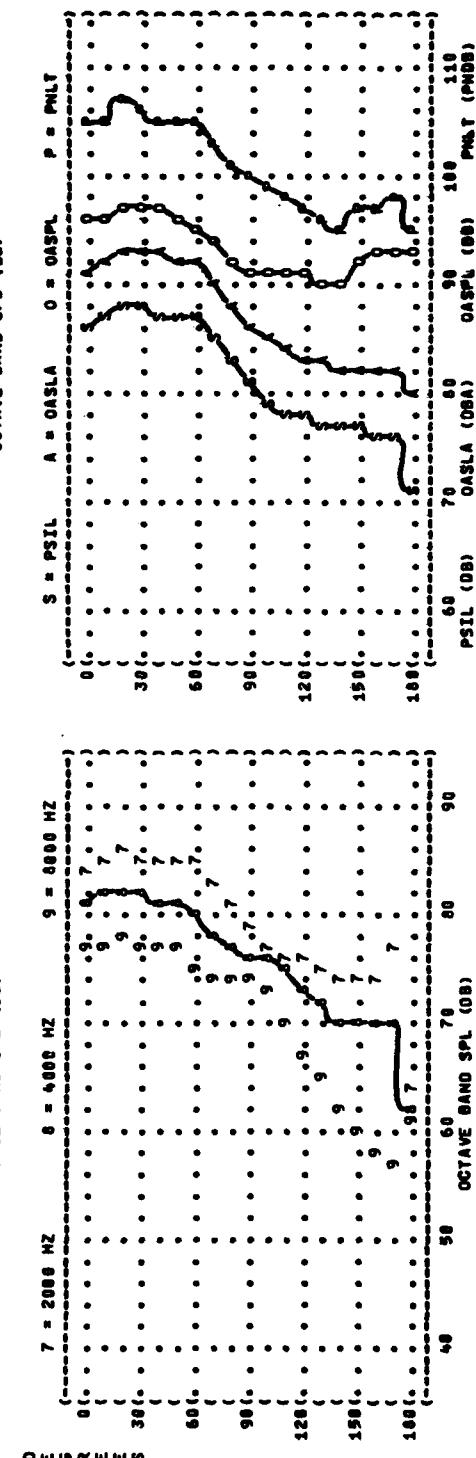
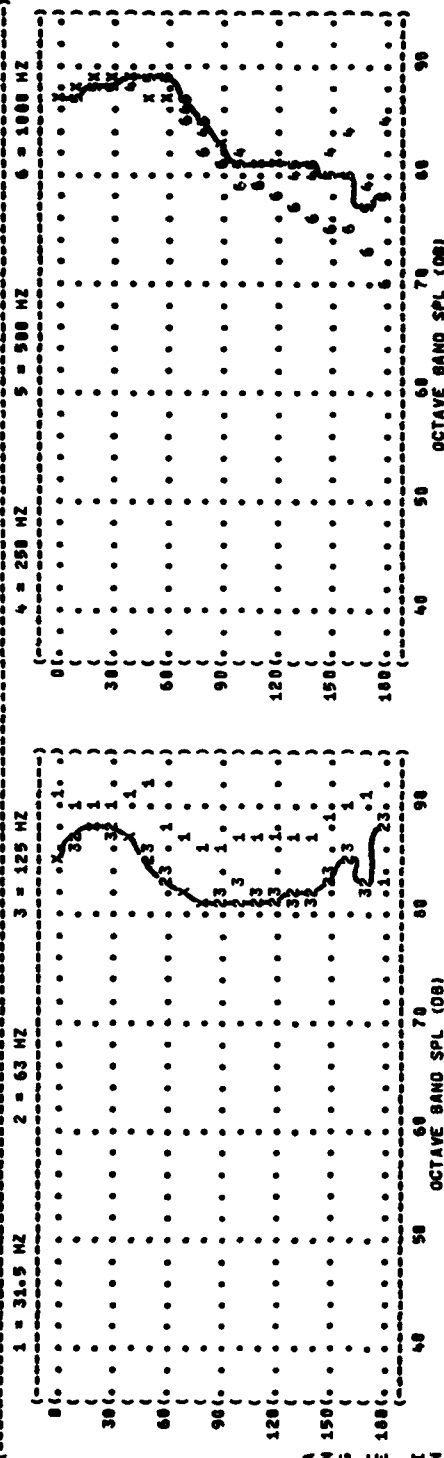
TEMP = 15 C

BAR PRESS = 768 M HG

REL HUMID = 76 %



(FIGURE 1 NORMALIZED FARFIELD NOISE LEVELS)
 (2 DISTANCE = 100 METERS)
 (NOISE SOURCE/SUBJECT)
 (F-111A AIRCRAFT IN THE)
 (AF32A-13 SUPPRESSOR)
 (ENGINE TF38-P-3)
 (FAR FIELD NOISE)
 (OPERATION)
 (ZONE 3 AFTERBURNER POWER)
 (SINGLE ENGINE)
 (GROUND RUNUP (SUPPRESSED))
 (METEOROLOGY)
 (TEMP = 15 C)
 (BAR PRESS = .760 H HG)
 (REL HUMID = 78 %)
 (PAGE 6)
 (IDENTIFICATION)
 (OMEGA 1.4)
 (TEST 77-779-881)
 (RUN 84)
 (27 SEP 76)
 ()



(2
DISTANCE = 100 METERS

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) OMEGA 1.4)

(2
DISTANCE = 100 METERS
) OMEGA 1.4

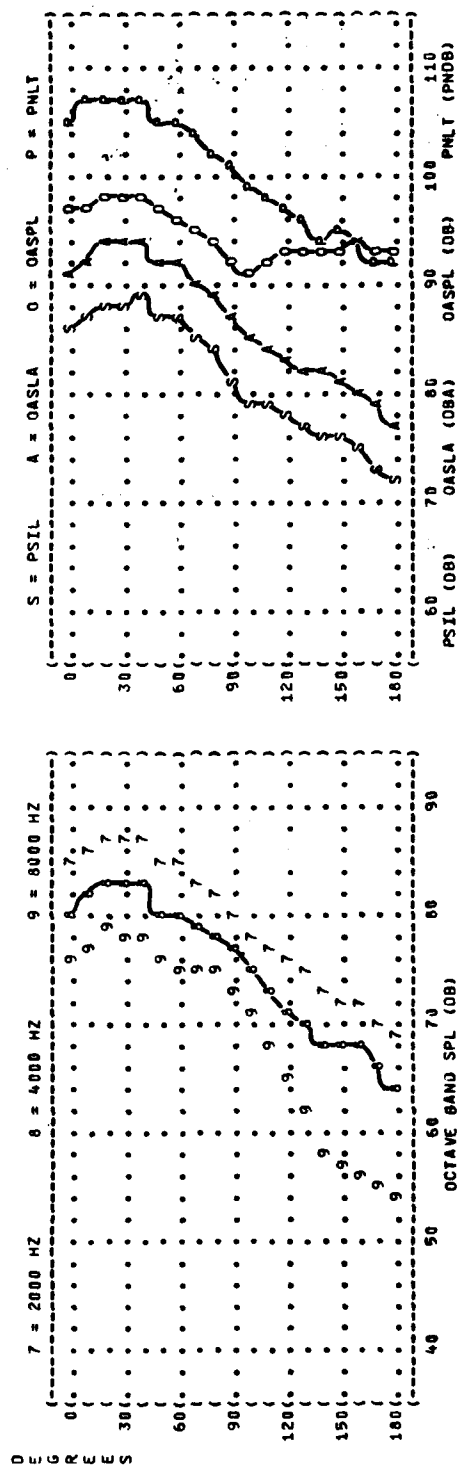
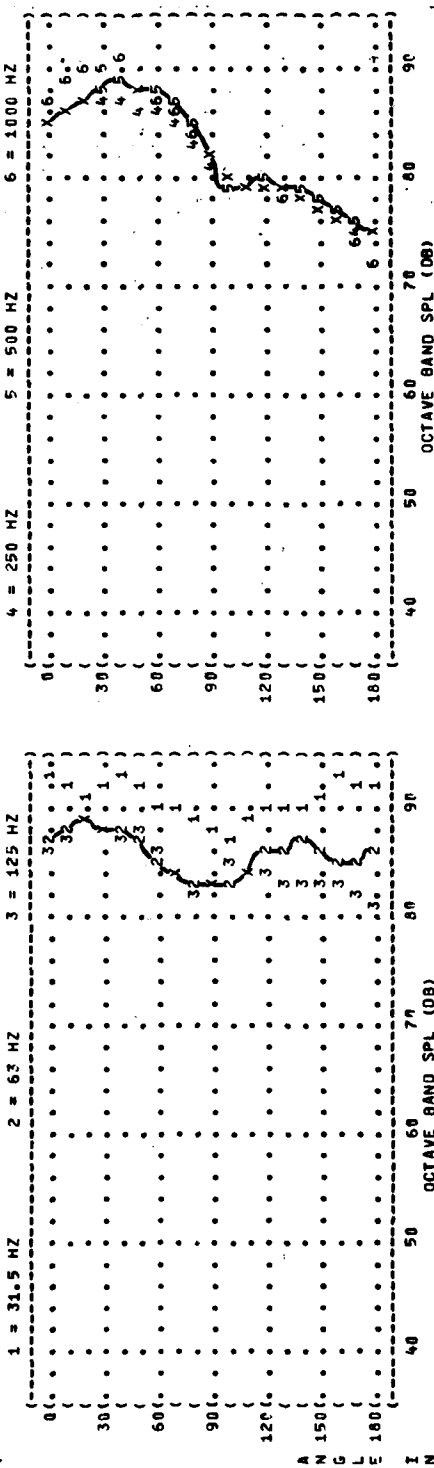
[illegible]

() WISE SOURCE/SUBJECT:
 () F-111A AIRCRAFT IN THE
 () OPERATION:
 () ZONE 5 AFTERBURNER POWER
 () TEMP = 15 C
 () TEMP = 750 M

(	AF32A-13	SUPPRESSOR	(	SINGLE ENGINE	(	BAR PRESS = 0.760 H MG	)	27 SEP 78
(	ENGINE TF30-P-3		(	GROUND RUNUP (SUPPRESSED)	(	REL HUMID = 70 %	)	

(FAR FIELD NOISE ())

1 = 31.5 HZ 2 = 63 HZ 3 = 125 HZ 4 = 250 HZ 5 = 500 HZ 6 = 1000 HZ



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( ( FIGURE: OVERALL SOUND PRESSURE LEVEL (OASPL) ) IDENTIFICATION: )
( ( EQUAL LEVEL CONTOURS (DB) ) ) )
( ( 3 ) OMEGA 1.4 )
( ( NOISE SOURCE/SUBJECT: ) METEOROLOGY: ) TEST 77-779-001 )
( ( F-111A AIRCRAFT IN THE ) TEMP = 15 C ) RUN 01 )
( ( AF32A-13 SUPPRESSOR ) BAR PRESS = .760 M HG ) )
( ( ENGINE TF30-P-3 ) REL HUMID = 70 % ) )
( ( FAR FIELD NOISE ) PAGE 13 )

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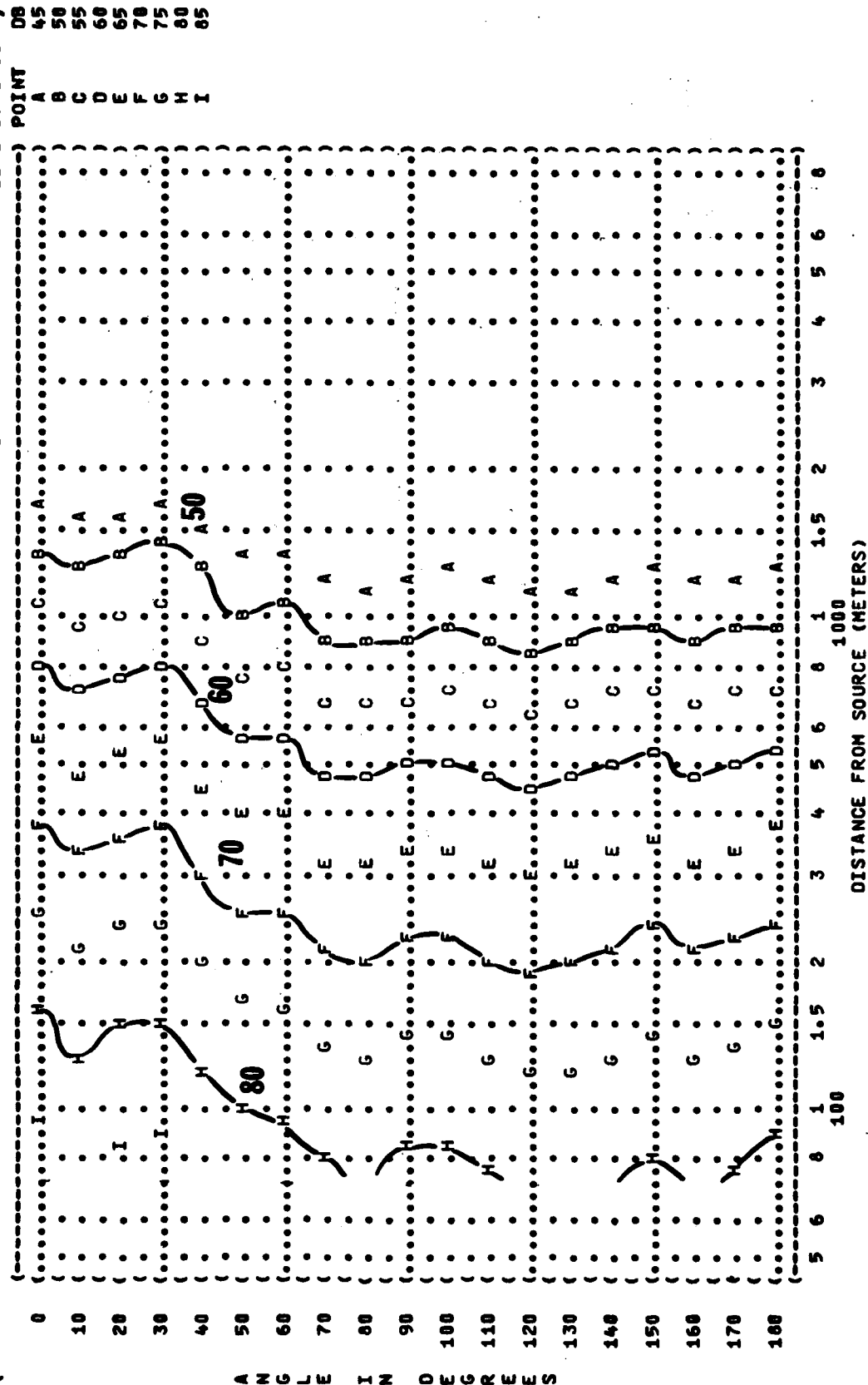


FIGURE 3 OVERALL SOUND PRESSURE LEVEL {OASPL} EQUAL LEVEL CONTOURS (DB)

METEOROLOGY: = 15 C
 TEMP = .760 Hg
 BAR PRESS = 70 %
 REL HUMID



FIGURE 1: OVERALL SOUND PRESSURE LEVEL (OASPL) EQUAL LEVEL CONTOURS (DB)

IDENTIFICATION:

OMEGA 1.4

TEST 77-779-001

RUN 04

•

27 SEP 7

0 METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

OPERATIONS

ZONE 3 AFTERBURNER POWER

SINGLE ENGINE

() GROUND RUNUP (SUPPRESSED)

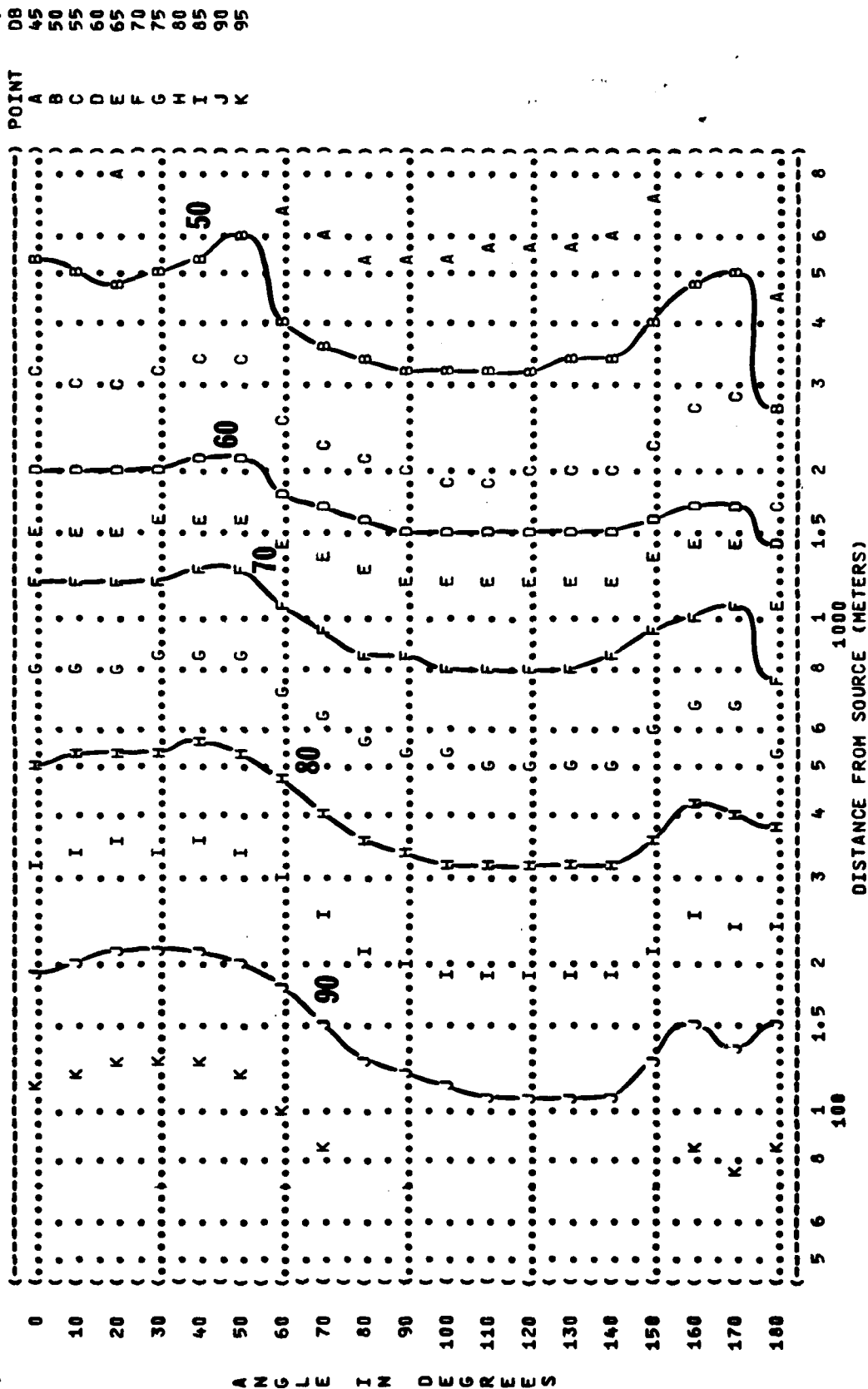
NOISE SOURCE/SUBJECT:

F-111A AIRCRAFT IN THE

AF32A-13 SUPPRESSOR

ENGINE TF30-P-3

FAR FIELD NOISE



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(-----)
( FIGURE: OVERALL SOUND PRESSURE LEVEL {OASPL} ) IDENTIFICATION: )
( EQUAL LEVEL CONTOURS (DB) ) )
( 3 ) OMEGA 1.4 )
( ) TEST 77-779-001 )
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: ) RUN 05 )
( F-111A AIRCRAFT IN THE ) TEMP = 15 C ) )
( AF32A-13 SUPPRESSOR ) BAR PRESS = .760 M HG ) )
( ENGINE TF30-P-3 ) REL HUMID = 70 % ) )
( FAR FIELD NOISE ) PAGE 13 )
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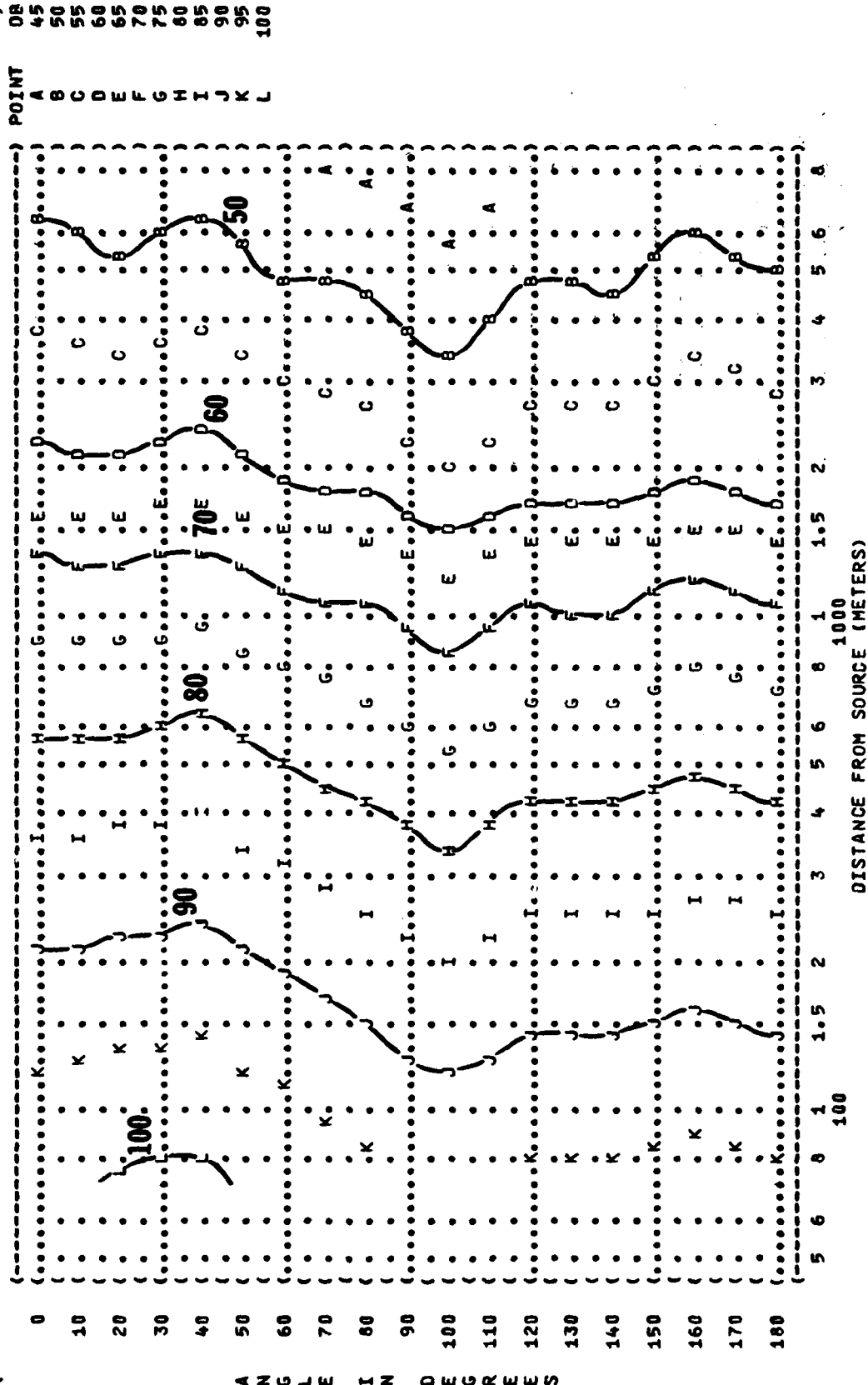
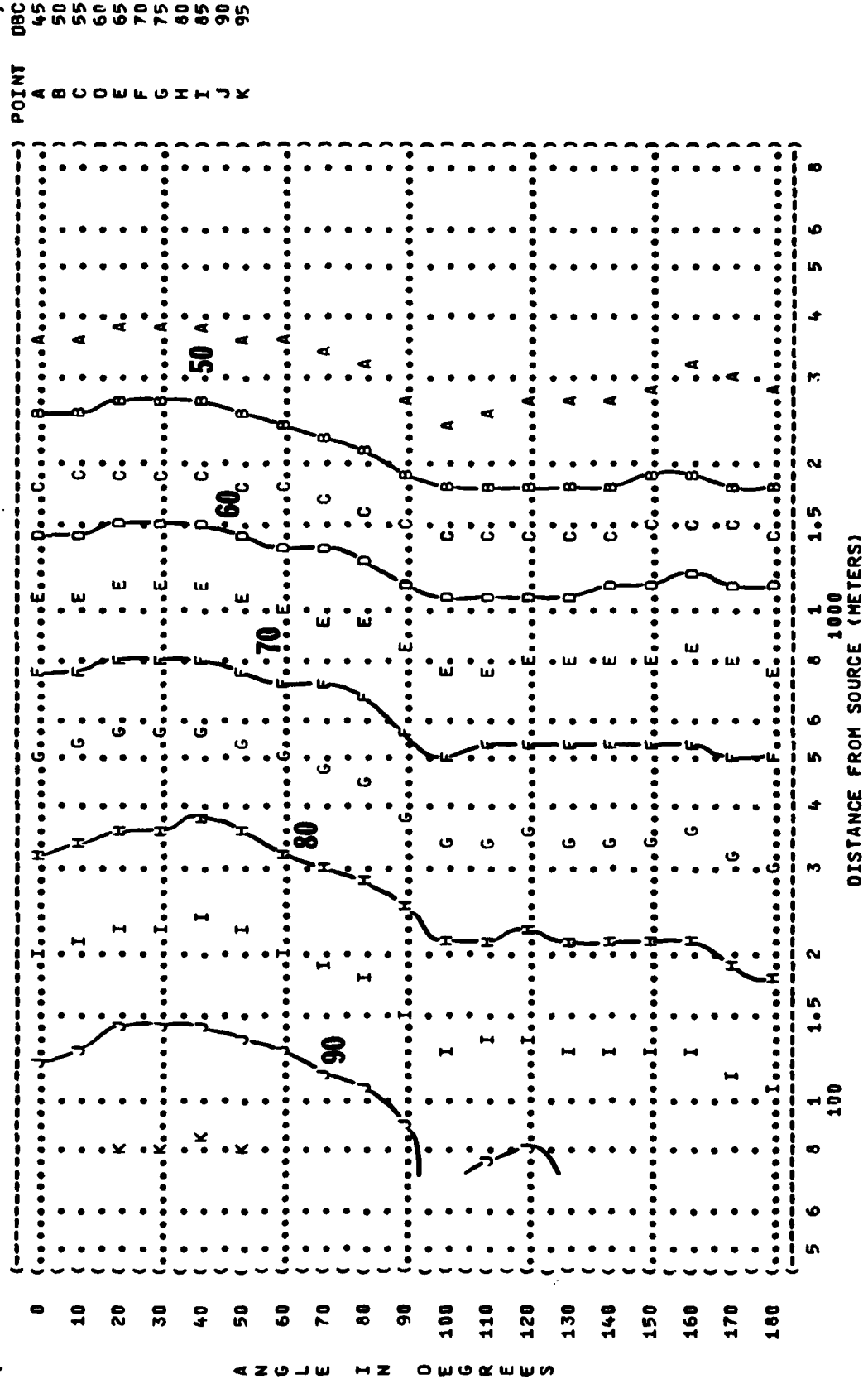


FIGURE: C-WEIGHTED OVERALL SOUND LEVEL (OASLC)
 4
 IDENTIFICATION:
 OMEGA 1.4
 TEST 77-779-001
 RUN 03
 27 SEP 78
 PAGE 14

NOISE SOURCE/SUBJECT: (OPERATION:) METEOROLOGY:
 F-111A AIRCRAFT IN THE (MILITARY POWER 96.5% RPM) TEMP = 15 C
 AF32A-13 SUPPRESSOR (SINGLE ENGINE) BAR PRESS = .760 M HG
 ENGINE TF30-P-3 (GROUND RUNUP (SUPPRESSED)) REL HUMID = 70 %
 FAR FIELD NOISE ()



[illegible]

1000

100

ANGLE IN DEGREES

**FIGURE: C-WEIGHTED OVERALL SOUND LEVEL {OASLC}
EQUAL LEVEL CONTOURS (DBC)**

OPERATION:

ZONE 5 AFTERBURNER POWER

SINGLE ENGINE

TEMP = 15 C

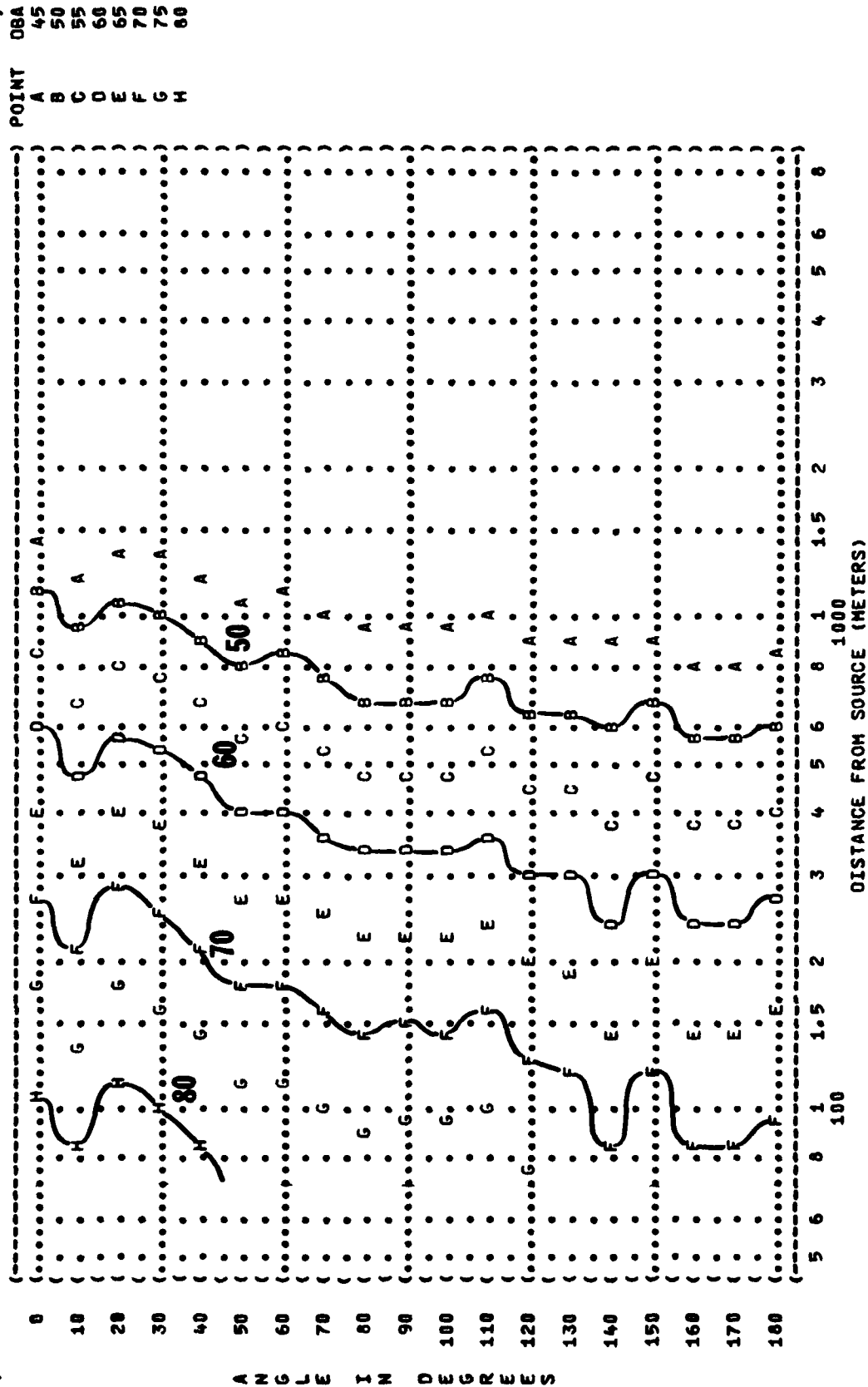
127 SEP 78

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) PAGE 14



(FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (OASLA)
 (5 EQUAL LEVEL CONTOURS (DBA)
 () IDENTIFICATION:
 () OMEGA 1.4
 () TEST 77-779-001
 () RUN 01
 (NOISE SOURCE/SUBJECT:) METEOROLOGY:
 (F-111A AIRCRAFT IN THE) IDLE POWER 66.9% RPM) TEMP = 15 C
 (AF32A-13 SUPPRESSOR) SINGLE ENGINE) BAR PRESS = .760 M HG
 (ENGINE TF30-P-3) GROUND RUNUP (SUPPRESSED)) REL HUMID = 70 %
 (FAR FIELD NOISE)) PAGE 15



EQUAL LEVEL CONTOURS (DBA)

2

OMEGA 1.4

TEST 77-779-001

TEST 77-770
RUN 02

NOISE SOURCE/SUBJECT: (OPERATION:

F-111A AIRCRAFT IN THE (ENGINE RUNUP 75% RPM

AF32A-13 SUPPRESSOR (SINGLE ENGINE

ENGINE TF30-P-3 (GROUND RUNUP (SUPPRESSED))

FAR FIELD NOISE

) METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

INT

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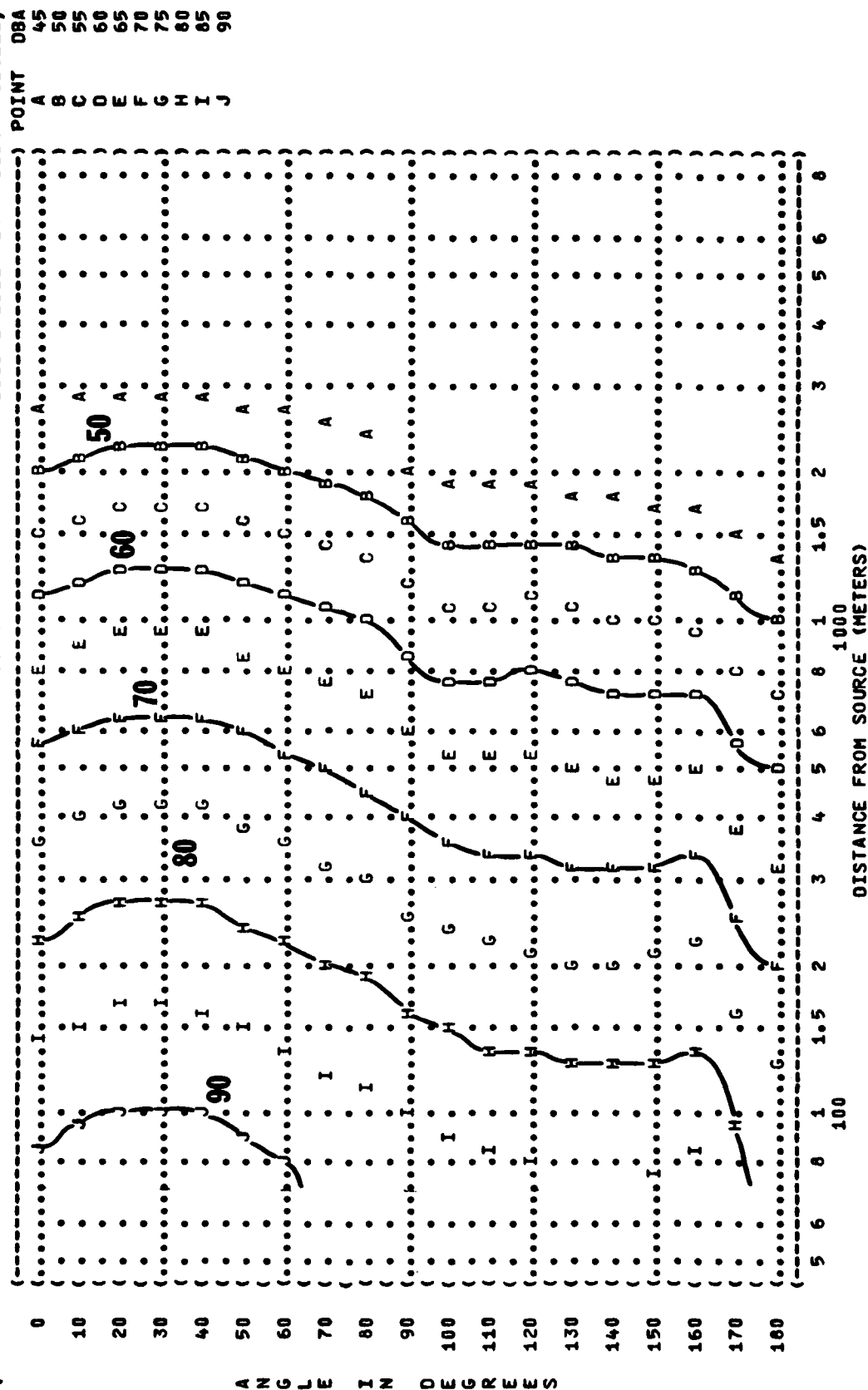
EQUAL LEVEL CONTOURS (DBA)

NOISE SOURCE/SUBJECT:
F-111A AIRCRAFT IN 1
AF32A-13 SUPPRESS
ENGINE TF30-P-3
FAR FIELD NOISE

(C) OPERATION:
(C) MILITARY
(C) SINGLE EN
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METEOROLOGY: =
TEMP =
BAR PRESS =
REL HUMID =

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IDENTIFICATION:
OMEGA 1.4
TEST 77-779-003
RUN 03
27 SEP 78
PAGE 15
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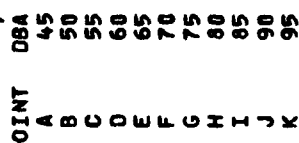


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IDENTIFICATION:
OMEGA 1.4
TEST 77-779-001
RUN 04
27 SEP 70
PAGE 15

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) RUN 04)
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) 27 SEP 78)
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) PAGE 15)



IDENTIFICATION:

OMEGA 4 6

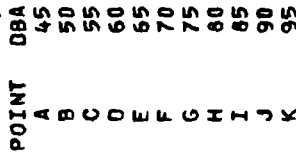
OPERATION:

**ZONE 5 AFTERBURNER POWER
SINGLE ENGINE**

GROUND RUNUP (SUPPRESSED)

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-----) POINT



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FIGURE: PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT)
 6
 IDENTIFICATION:
 OMEGA 1.4
 TEST 77-779-001
 RUN 02
 27 SEP 78
 PAGE 16

NOISE SOURCE/SUBJECT: OPERATION: METEOROLOGY:
 F-111A AIRCRAFT IN THE ENGINE RUNUP 75% RPM TEMP = 15 C
 AF32A-13 SUPPRESSOR SINGLE ENGINE BAR PRESS = .760 M HG
 ENGINE TF30-P-3 GROUND RUNUP (SUPPRESSED) REL HUMID = 70 %
 FAR FIELD NOISE

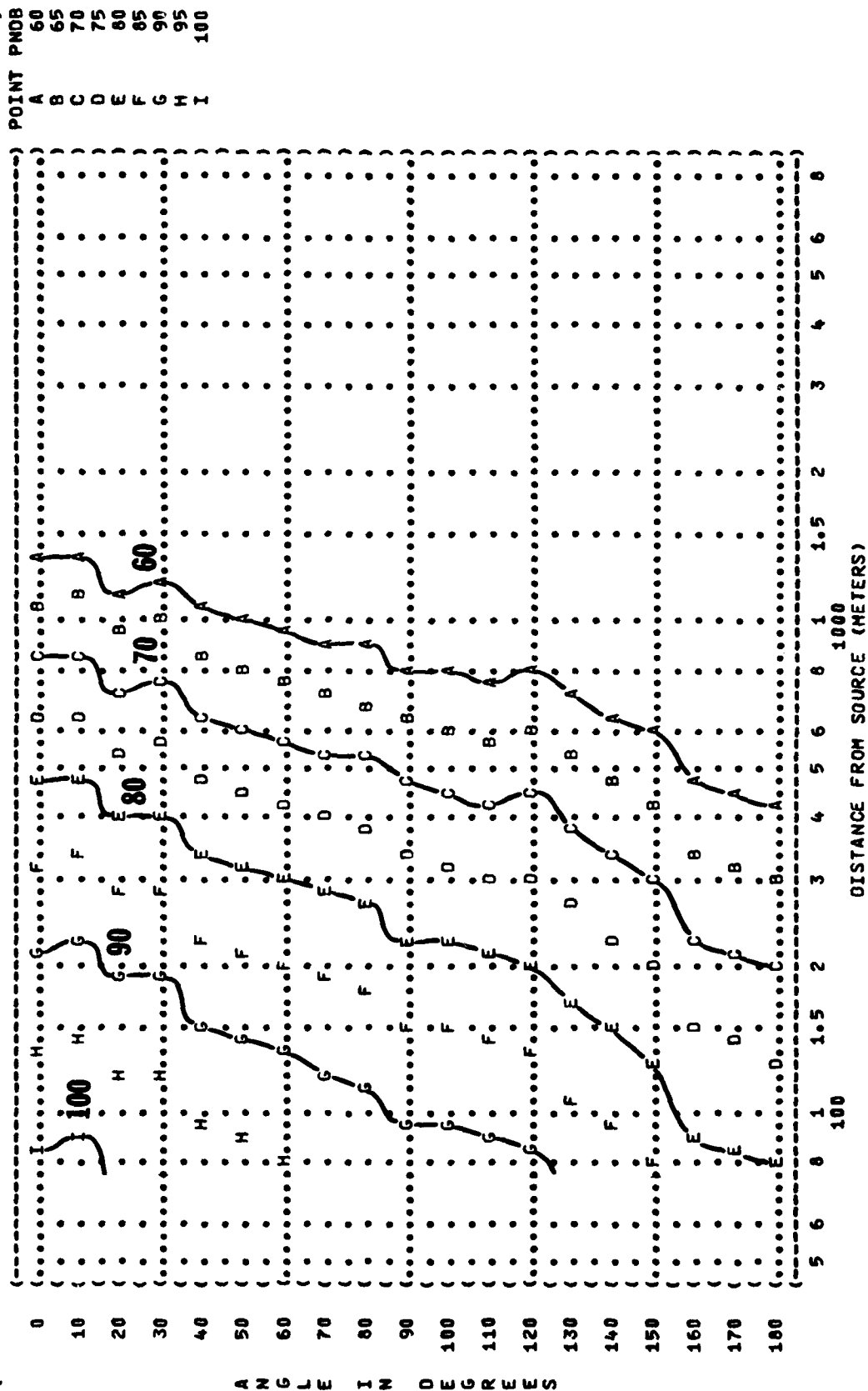


**FIGURE 1: PERCEIVED NOISE LEVEL, TONE CORRECTED {PNLT}
EQUAL LEVEL CONTOURS (PND8)**

NOISE SOURCE/SUBJECT:

F-111A AIRCRAFT IN THE

AF32A-13 SUPPRESSOR

ENGINE TF30-P-3

FAR FIELD NOISE

OPERATIONS:

MILITARY POWER 96.5% RPM

SINGLE ENGINE

GROUND RUNUP

METEOROLOGY:

TEMP

BAR PRESS = .760 M HG

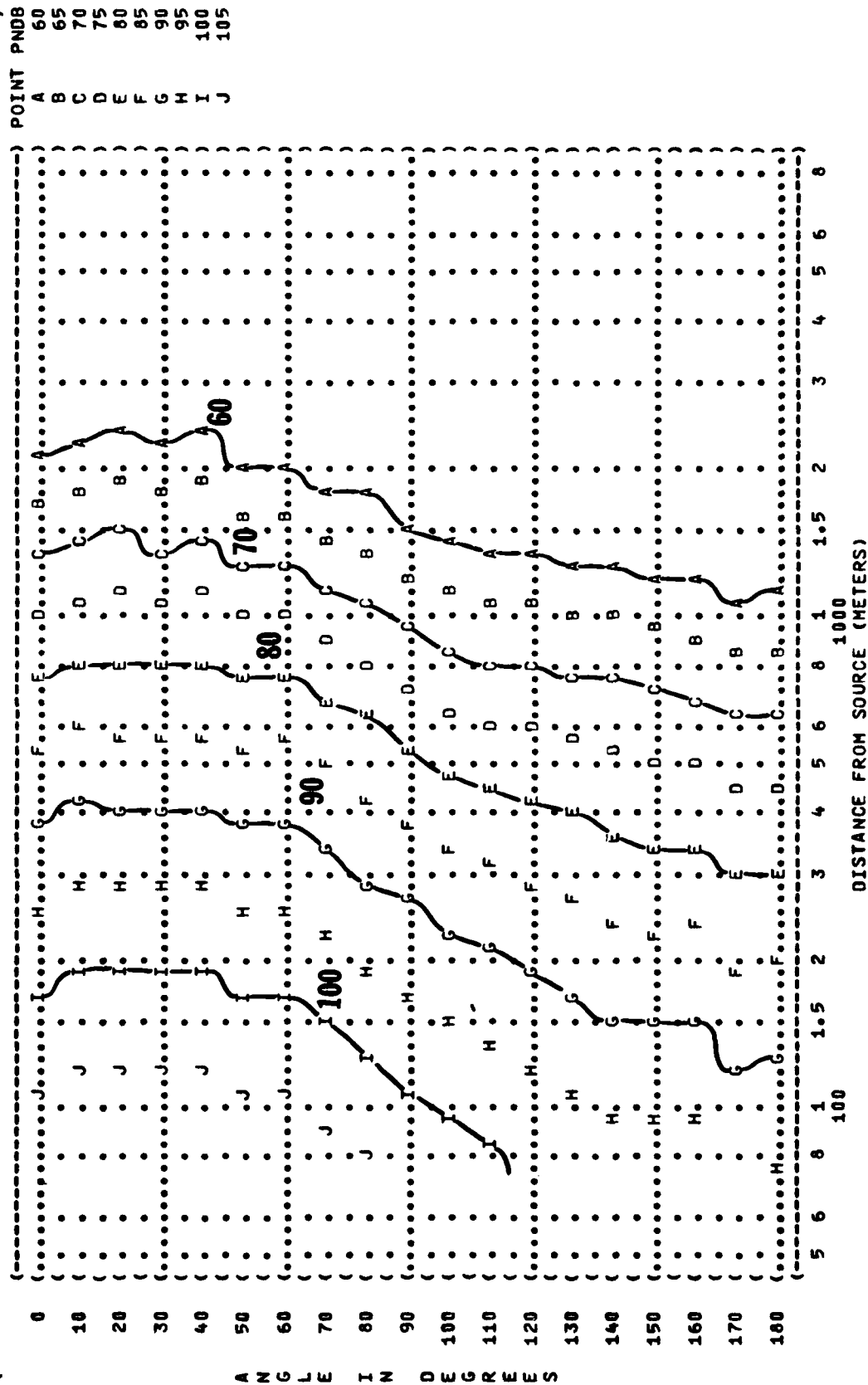
REL HUMID = 70 %

Figure 1 is a graph showing the dependence of the point PnDB on the parameter θ . The x-axis is labeled θ and ranges from 0 to 40. The y-axis is labeled POINT PnDB and ranges from 60 to 105. The graph consists of a grid of points labeled A through J. A solid line connects the points, showing a general upward trend with some fluctuations. The line starts at point A ($\theta=0$, PnDB=60) and ends at point J ($\theta=40$, PnDB=105).

420 JW HZ OWORWWW

DISTANCE FROM SOURCE (METERS)


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(-----)
( FIGURE: PERCEIVED NOISE LEVEL, TONE CORRECTED {PNLT} )
(      6      EQUAL LEVEL CONTOURS (PNDB) )
(-----)
( NOISE SOURCE/SUBJECT: )
( F-111A AIRCRAFT IN THE )
( AF32A-13 SUPPRESSOR )
( ENGINE YF30-P-3 )
( FAR FIELD NOISE )
( OPERATION: )
( ZONE 5 AFTERBURNER POWER )
( SINGLE ENGINE )
( GROUND RUNUP (SUPPRESSED) )
( METEOROLOGY: )
( TEMP = 15 C )
( BAR PRESS = .760 M HG )
( REL HUMID = 70 % )
( IDENTIFICATION: )
( OMEGA 1.4 )
( TEST 77-779-001 )
( RUN 05 )
( PAGE 16 )
(-----)
```



(FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL)
 (7
 (EQUAL LEVEL CONTOURS (DB)
 () IDENTIFICATION:
 () OMEGA 1.4
 () TEST 77-779-001
 () RUN 01
 () METEOROLOGY:
 () TEMP = 15 C
 () BAR PRESS = .760 M HG
 () REL HUMID = 70 %
 () 27 SEP 78
 () PAGE 17
 ()
 (NOISE SOURCE/SUBJECT:
 () OPERATION:
 () F-111A AIRCRAFT IN THE
 () SINGLE ENGINE
 () AF32A-13 SUPPRESSOR
 () GROUND RUNUP (SUPPRESSED)
 () ENGINE TF30-P-3
 () FAR FIELD NOISE
 ()



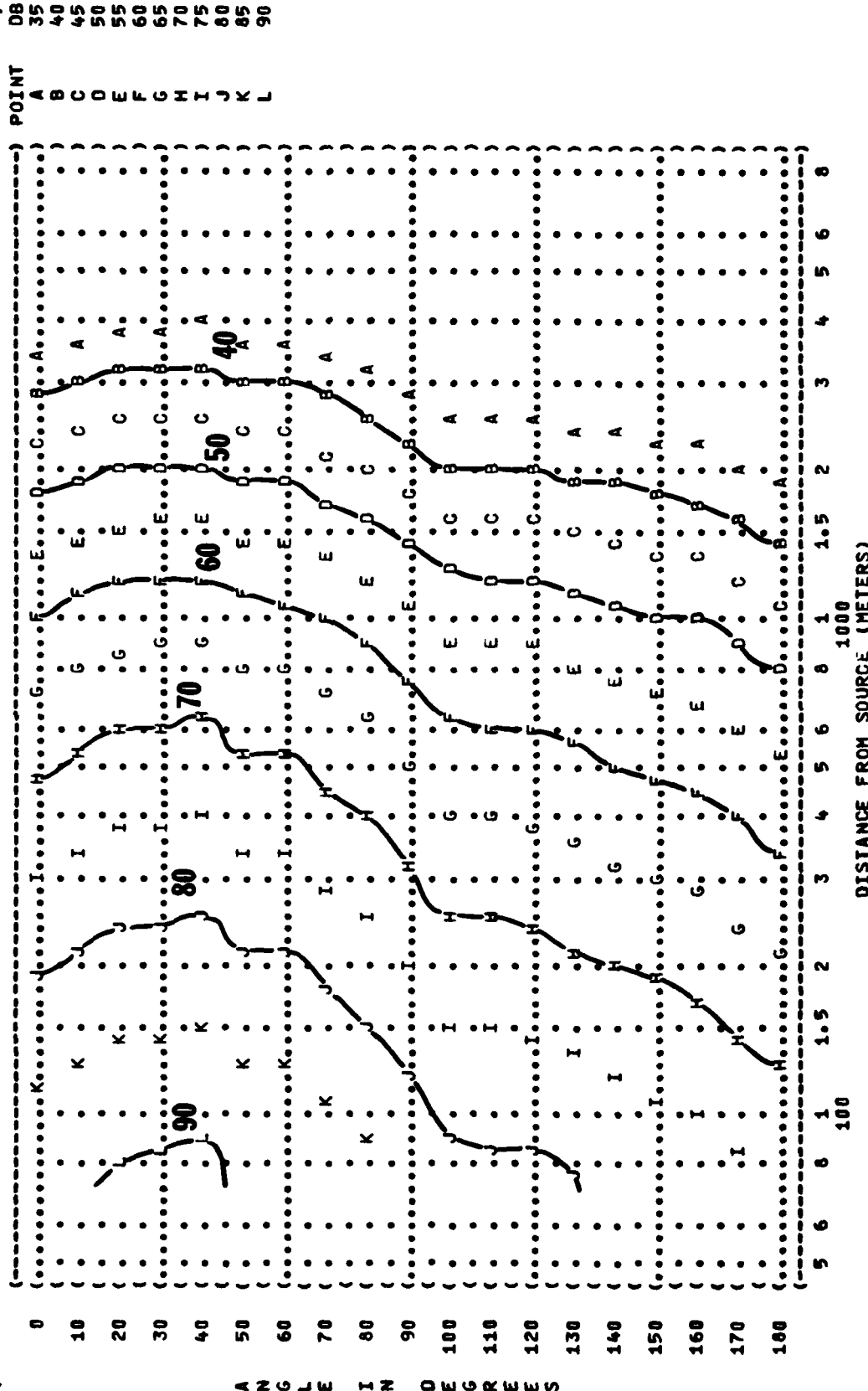
() POINT DB
 () A 35
 () B 40
 () C 45
 () D 50
 () E 55
 () F 60
 () G 65
 () H 70


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(-----)
(  FIGURE:  PREFERRED SPEECH INTERFERENCE LEVEL {PSIL} )
(  7 )
(  EQUAL LEVEL CONTOURS  (DB) )
(-----)
(  NOISE SOURCE/SUBJECT: )
(  F-111A AIRCRAFT IN THE )
(  AF32A-13  SUPPRESSOR )
(  ENGINE TF30-P-3 )
(  FAR FIELD NOISE )
(-----)
(  OPERATION: )
(  MILITARY POWER 96.5% RPM )
(  SINGLE ENGINE )
(  GROUND RUNUP (SUPPRESSED) )
(-----)
(  METEOROLOGY: )
(  TEMP = 15 C )
(  BAR PRESS = .760 M HG )
(  REL HUMID = 70 % )
(-----)
(  IDENTIFICATION: )
(  )
(  OMEGA 1.4 )
(  TEST 77-779-001 )
(  RUN 03 )
(  27 SEP 78 )
(  PAGE 17 )
(-----)

```


(FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL))
 (7 EQUAL LEVEL CONTOURS (DB))
 () IDENTIFICATION:)
 () OMEGA 1.4)
 () TEST 77-779-001)
 () RUN 05)
 (NOISE SOURCE/SUBJECT:)
 (F-111A AIRCRAFT IN THE)
 () ZONE 5 AFTERBURNER POWER)
 () TEMP = 15 C)
 (AF32A-13 SUPPRESSOR)
 () SINGLE ENGINE)
 () BAR PRESS = .760 M HG)
 () ENGINE TF30-P-3)
 () GROUND RUNUP (SUPPRESSED))
 () REL HUMID = 70 %)
 () FAR FIELD NOISE)
 () PAGE 17)




```
(-----)
( FIGURE: MAXIMUM PERMISSIBLE TIME {T} FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) ) IDENTIFICATION: )
(      8 EQUAL TIME CONTOURS (MINUTES) ) )
( ) ) OMEGA 1.4 )
( ) ) TEST 77-779-001 )
( ) ) RUN 01 )
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: )
( F-111A AIRCRAFT IN THE ) IDLE POWER 66.9% RPM = 15 C )
( AF32A-13 SUPPRESSOR ) SINGLE ENGINE ) BAR PRESS = .760 M HG )
( ENGINE TF38-P-3 ) GROUND RUNUP (SUPPRESSED) ) REL HUMID = 70 % )
( FAR FIELD NOISE ) ) PAGE 8 )
(-----)
```

0<	(	)
10<	(	)
20<	(	)
30<	(	)
40<	(	)
50<	(	)
60<	(	)
70<	(	)
80<	(	)
90<	(	)
100<	(	)
110<	(	)
120<	(	)
130<	(	)
140<	(	)
150<	(	)
160<	(	)
170<	(	)
180<	(	)

PERSONNEL MAY BE EXPOSED UP TO 960 MINUTES PER DAY
AT ALL DISTANCES FROM SOURCE EQUAL TO OR GREATER THAN 75 METERS
FOR ALL ANGLES EVALUATED (INDICATED BY < AT LEFT)
UNDER THE FOLLOWING EAR PROTECTION CONDITIONS:

- MINIMUM QPL EAR MUFFS
- AMERICAN OPTICAL 1700 EAR MUFFS
- V-51R EAR PLUGS
- COMFIT TRIPLE FLANGE EAR PLUGS
- H-133 GROUND COMMUNICATION UNIT

	5	6	8	1	1.5	2	3	4	5	6	8	1	1.5	2	3	4	5	6	8		
											100										
											1000										
	DISTANCE FROM SOURCE (METERS)																				


```
(-----)
(( FIGURE: MAXIMUM PERMISSIBLE TIME {T} FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) ) IDENTIFICATION: )
((      8 EQUAL TIME CONTOURS (MINUTES) ) )
((-----)
(( NOISE SOURCE/SUBJECT: ) OPERATION: ) METEOROLOGY: )
(( F-111A AIRCRAFT IN THE ) MILITARY POWER 96.5% RPM ) TEMP = 15 C )
(( AF32A-13 SUPPRESSOR ) SINGLE ENGINE ) BAR PRESS = .760 M HG )
(( ENGINE TF30-P-3 ) GROUND RUNUP (SUPPRESSED) ) REL HUMID = 70 % )
(( FAR FIELD NOISE ) ) ) PAGE 8 )
(-----)
```

0<
10<
20<
30<
40<
50<
60<
70<
80<
90<
100<
110<
120<
130<
140<
150<
160<
170<
180<

PERSONNEL MAY BE EXPOSED UP TO 960 MINUTES PER DAY
AT ALL DISTANCES FROM SOURCE EQUAL TO OR GREATER THAN 75 METERS
FOR ALL ANGLES EVALUATED (INDICATED BY < AT LEFT)

UNDER THE FOLLOWING EAR PROTECTION CONDITIONS:

MINIMUM QPL EAR HUFFS

AMERICAN OPTICAL 1700 EAR MUFFS

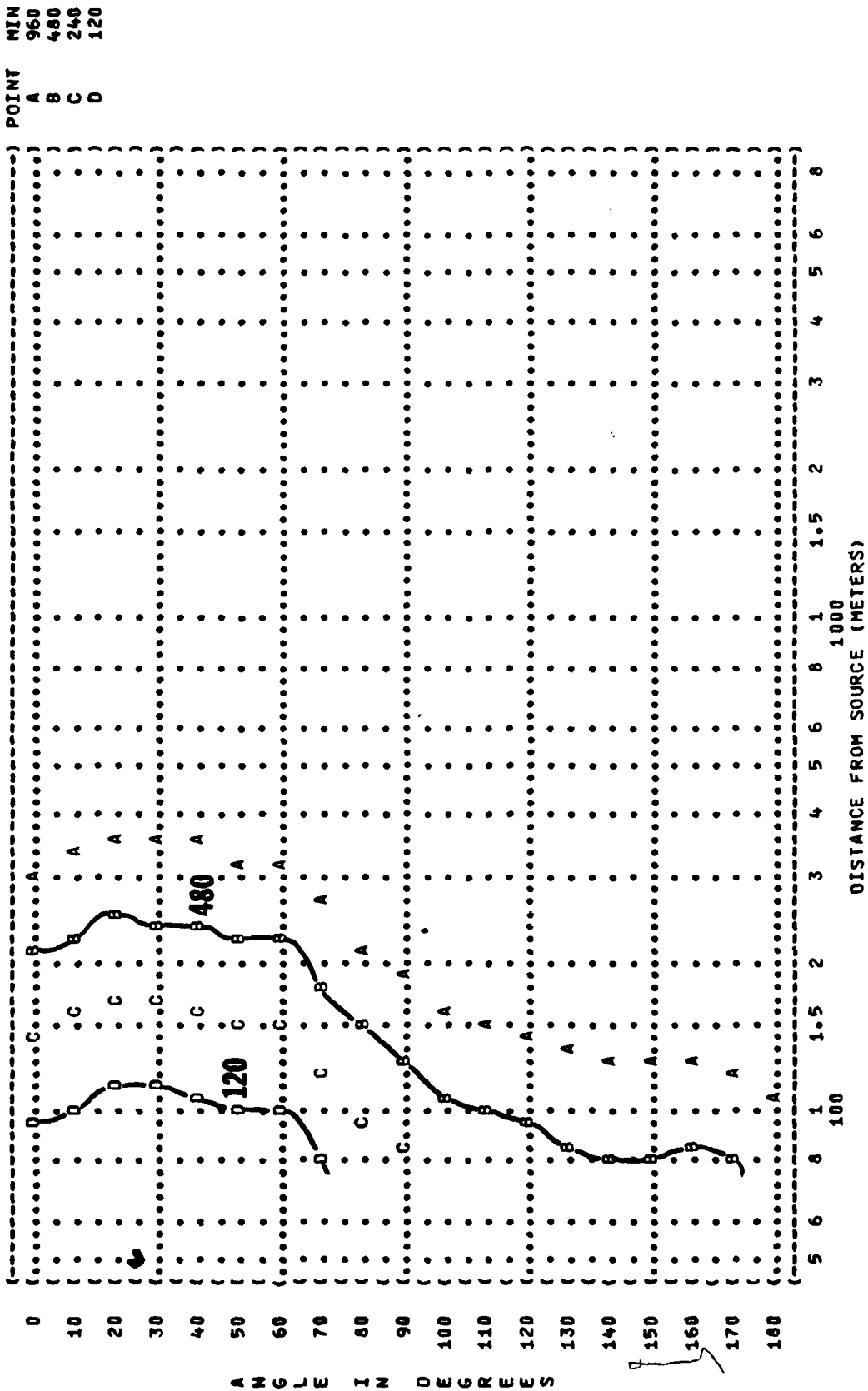
V-51R EAR PLUGS

COMFIT TRIPLE FLANGE EAR PLUGS

H-133 GROUND COMMUNICATION UNIT

DISTANCE FROM SOURCE (METERS)	
100	1000
5 6 8	1 1.5 2 3 4 5 6 8

(FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)) IDENTIFICATION:)
 (8 EQUAL TIME CONTOURS (MINUTES)))
 (NO PROTECTION))
 () OMEGA 1.4)
 () TEST 77-779-001)
 () RUN 04)
 (NOISE SOURCE/SUBJECT:) OPERATION:) METEOROLOGY:)
 (F-111A AIRCRAFT IN THE) ZONE 3 AFTERBURNER POWER) TEMP = 15 C)
 (AF32A-13 SUPPRESSOR) SINGLE ENGINE) BAR PRESS = .760 M HG)
 (ENGINE TF30-P-3) GROUND RUNUP (SUPPRESSED)) REL HUMID = 70 %)
 (FAR FIELD NOISE)) PAGE 7)



```

(-----)
( ( FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) ) IDENTIFICATION: )
( ( 8 ) ) )
( ( EQUAL TIME CONTOURS (MINUTES) ) ) )
(-----)
( ( NOISE SOURCE/SUBJECT: ) OPERATION: ) METEOROLOGY: )
( ( F-111A AIRCRAFT IN THE ) ZONE 3 AFTERBURNER POWER ) TEMP = 15 C )
( ( AF32A-13 SUPPRESSOR ) SINGLE ENGINE ) BAR PRESS = .760 M HG )
( ( ENGINE TF30-P-3 ) GROUND RUNUP (SUPPRESSED) ) REL HUMID = 70 % )
( ( FAR FIELD NOISE ) ) )
(-----)
( ( OMEGA 1.4 ) )
( ( TEST 77-779-001 ) )
( ( RUN 04 ) )
(-----)
( ( PAGE 8 ) )
(-----)

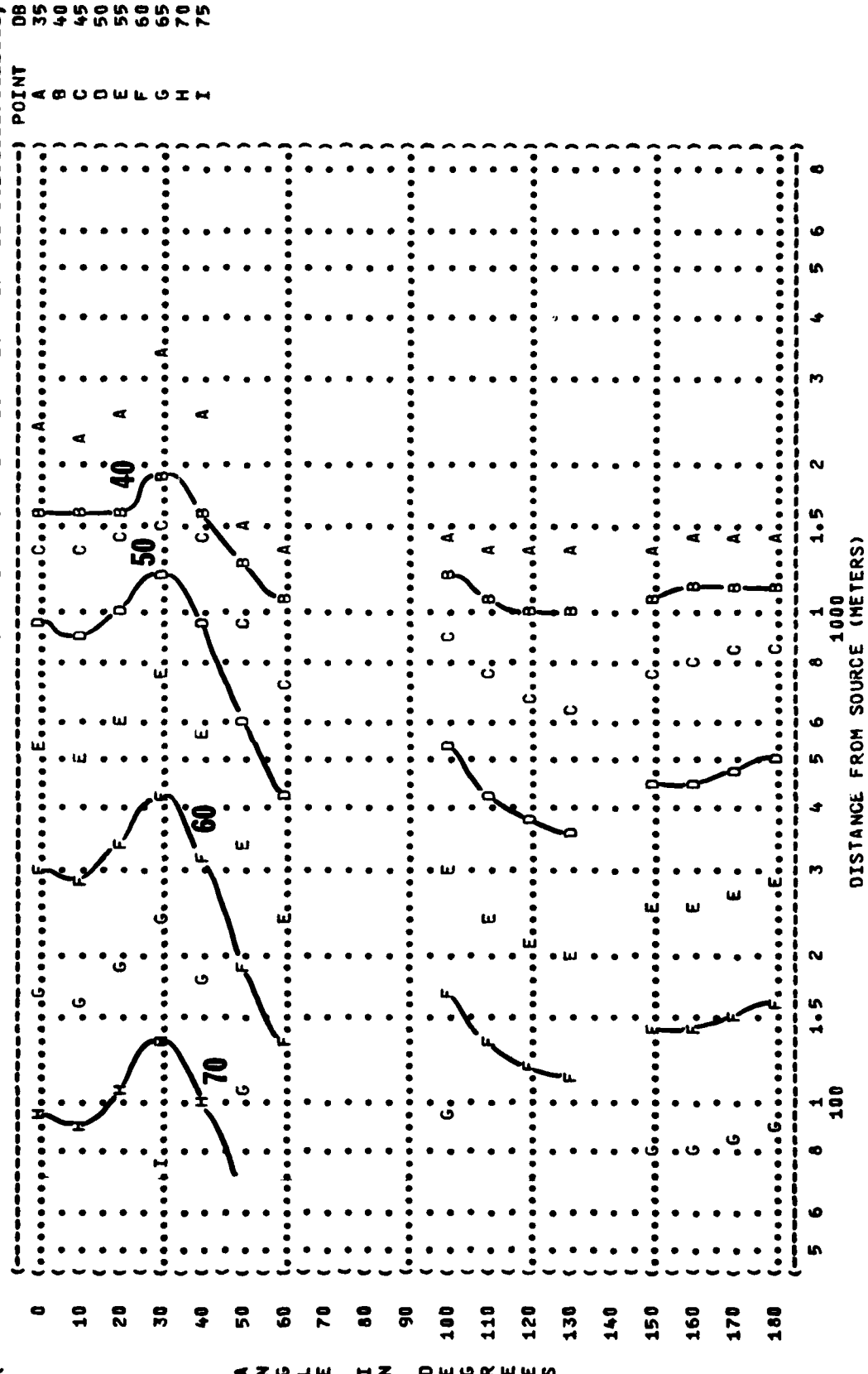
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(-----)
( ( FIGURE: SOUND PRESSEUPE LEVEL {SPL} ) IDENTIFICATION: )
( ( 9 EQUAL LEVEL CONTOURS (DB) ) )
( ( 31.5 HZ OCTAVE BAND ) )
(-----)
( ( NOISE SOURCE/SUBJECT: ) METEOROLOGY: )
( ( F-111A AIRCRAFT IN THE ) TEMP = 15 C )
( ( AF32A-13 SUPPRESSOR ) BAR PRESS = .760 M HG )
( ( ENGINE TF30-P-3 ) REL HUMID = 70 % )
( ( FAR FIELD NOISE ) )
(-----)

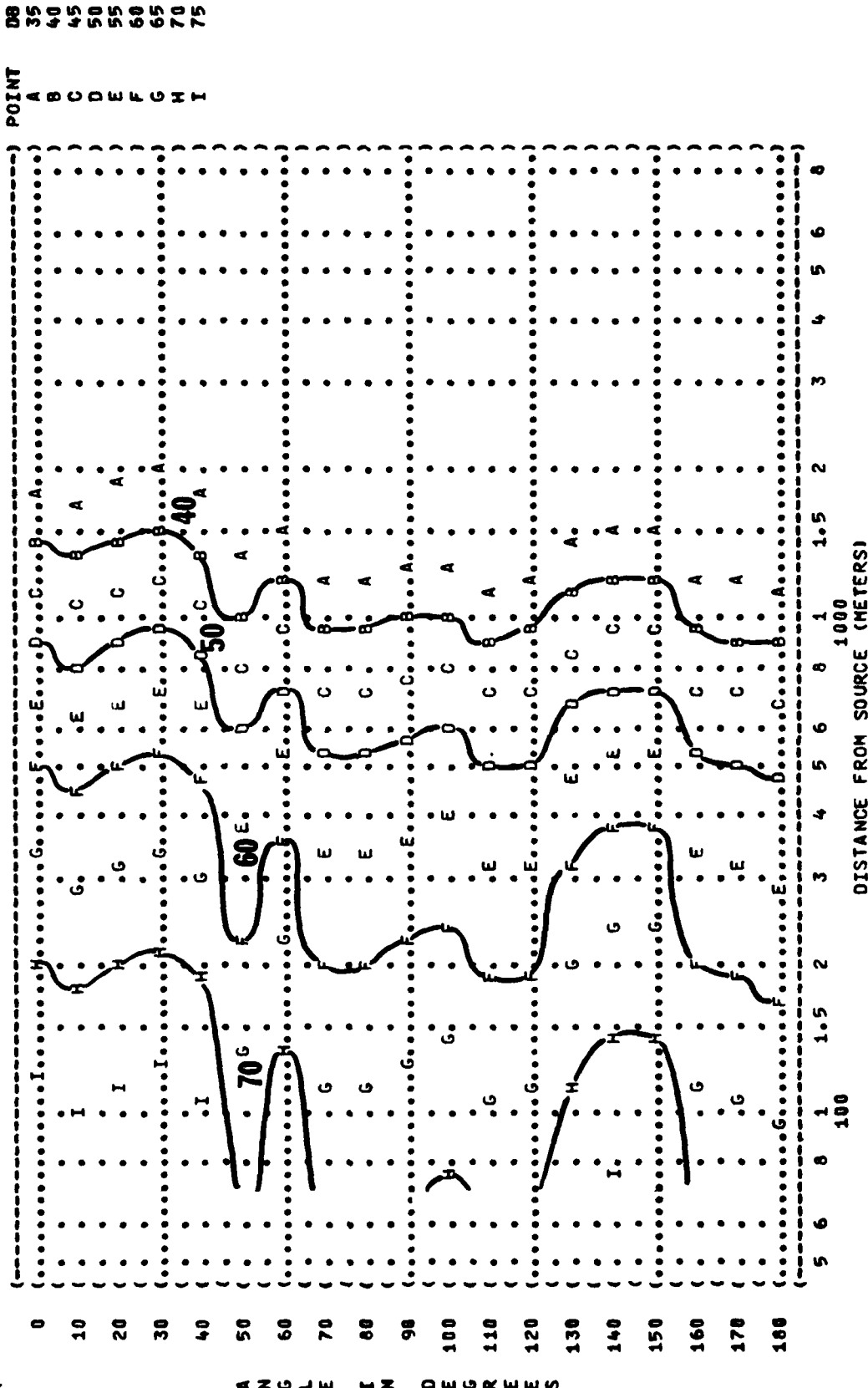
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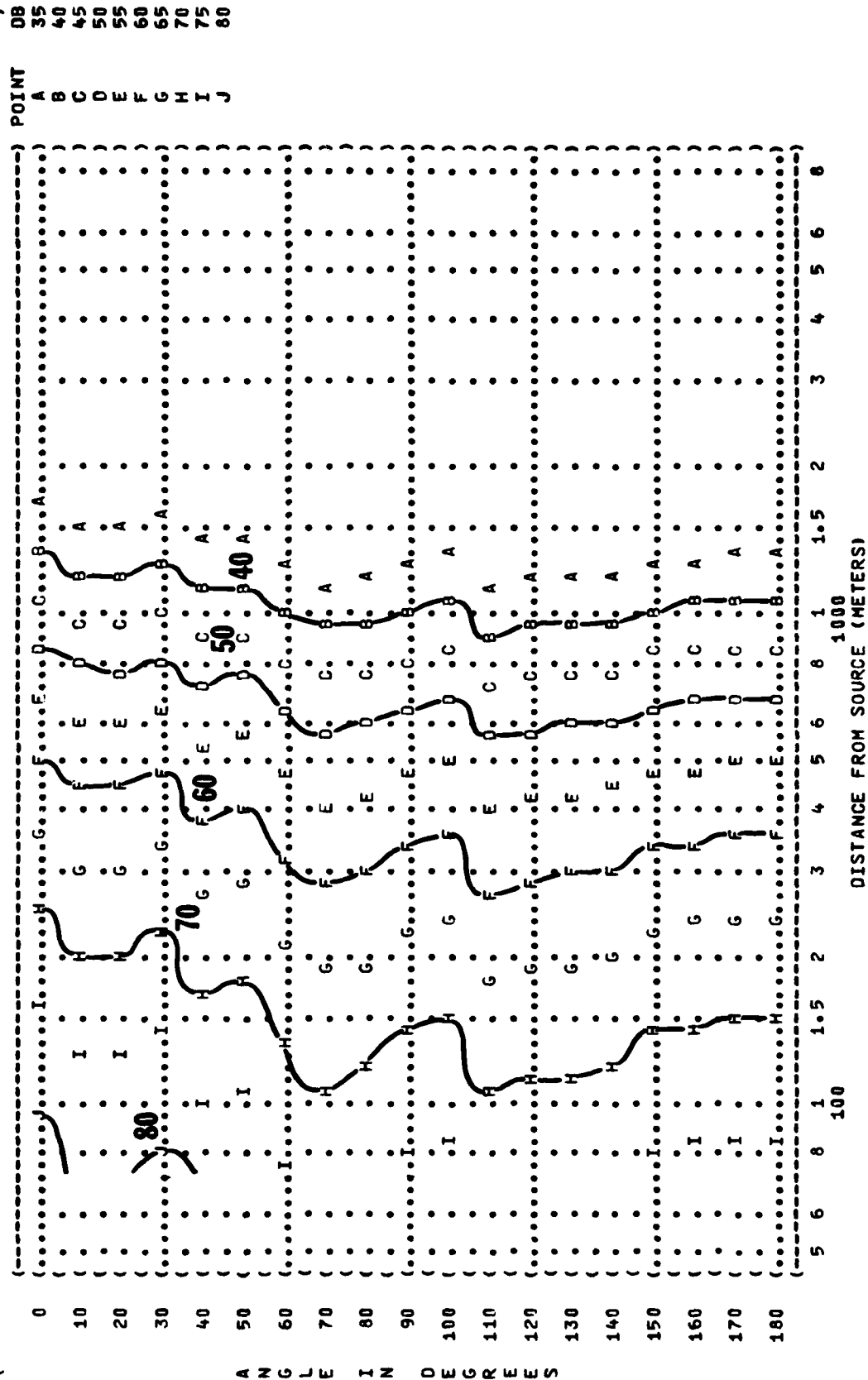
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( ( FIGURE; SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION; )
( ( EQUAL LEVEL CONTOURS (DB) ) )
( ( 9 ) OMEGA 1.4 )
( ( 63 HZ OCTAVE BAND ) TEST 77-779-001 )
( ( NOISE SOURCE/SUBJECT; ) METEOROLOGY; )
( ( F-111A AIRCRAFT IN THE ) IDLE POWER 66.9% RPM = 15 C )
( ( AF32A-13 SUPPRESSOR ) SINGLE ENGINE ) BAR PRESS = .760 M HG )
( ( ENGINE TF30-P-3 ) GROUND RUNUP (SUPPRESSED) ) REL HUMID = 70 % )
( ( FAR FIELD NOISE ) ) PAGE 19 )

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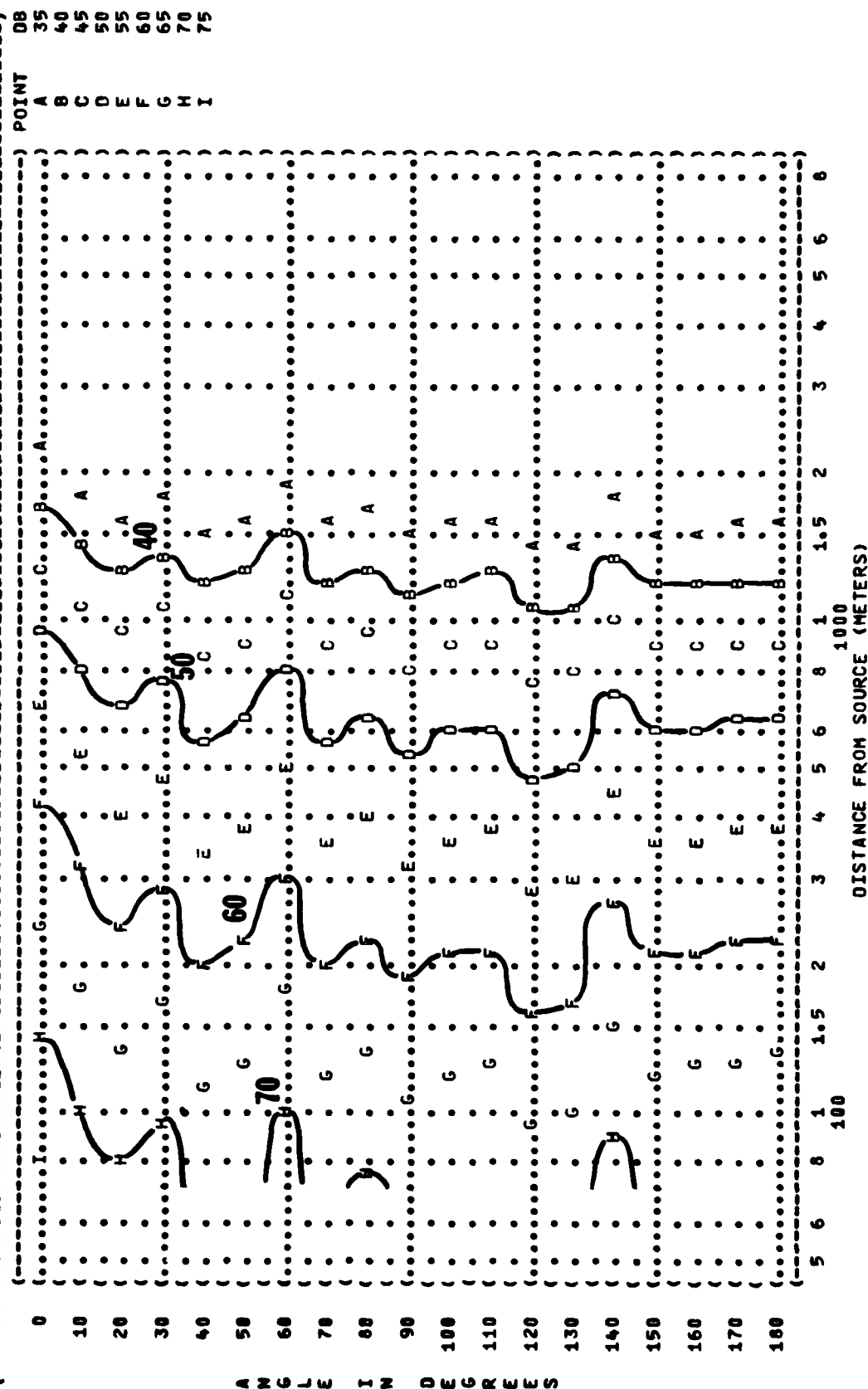
(FIGURE: SOUND PRESSURE LEVEL (SPL))
 (9 EQUAL LEVEL CONTOURS (DB))
 (125 HZ OCTAVE BAND)
 (NOISE SOURCE/SUBJECT:)
 (F-111A AIRCRAFT IN THE)
 (AF32A-13 SUPPRESSOR)
 (ENGINE TF30-P-3)
 (FAR FIELD NOISE)
 (OPERATION:)
 (IDLE POWER 66.9% RPM)
 (SINGLE ENGINE)
 (GROUND RUNUP (SUPPRESSED))
 ()
 (METEOROLOGY:)
 (TEMP = 15 C)
 (BAR PRESS = .760 M HG)
 (REL HUMID = 70 %)
 ()
 (IDENTIFICATION:)
 ()
 (OMEGA 1.4)
 (TEST 77-779-001)
 (RUN 01)
 (27 SEP 78)
 (PAGE 20)



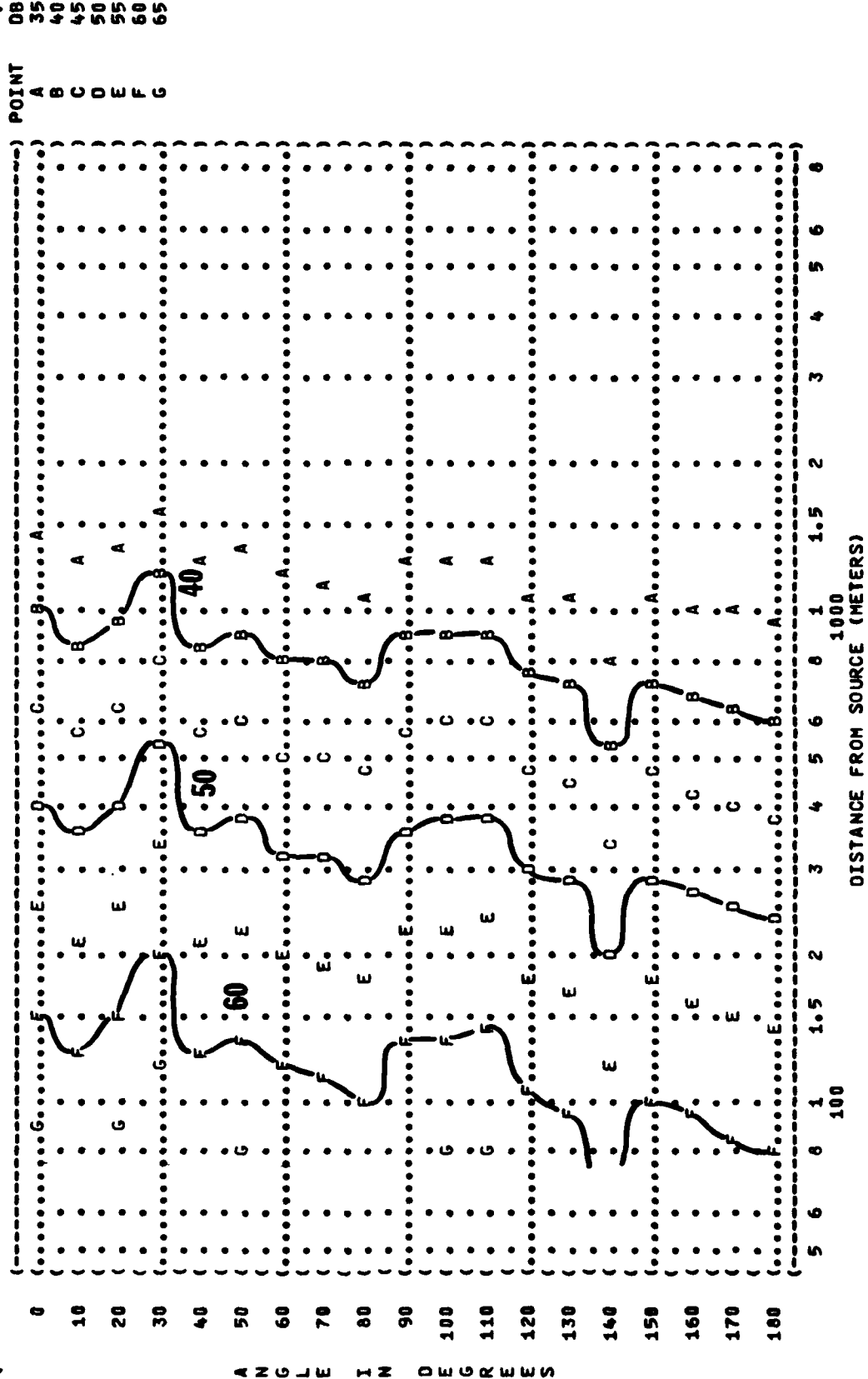

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(-----)
( ( FIGURE: SOUND PRESSURE LEVEL (SPL) ) IDENTIFICATION: )
( ( EQUAL LEVEL CONTOURS (DB) ) )
( ( 9 ) )
( ( 500 HZ OCTAVE BAND ) )
(-----)
( ( NOISE SOURCE/SUBJECT: ) )
( ( F-111A AIRCRAFT IN THE ) )
( ( AF32A-13 SUPPRESSOR ) )
( ( ENGINE TF30-P-3 ) )
( ( FAR FIELD NOISE ) )
(-----)
( ( OPERATION: ) METEOROLOGY: )
( ( IDLE POWER 66.9% RPM ) TEMP = 15 C )
( ( SINGLE ENGINE ) BAR PRESS = .760 M HG )
( ( GROUND RUNUP (SUPPRESSED) ) REL HUMID = 70 % )
( ( ) )
(-----)
( ( PAGE 22 ) )
(-----)

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(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (9 EQUAL LEVEL CONTOURS (DB)
 (1000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION: (METEOROLOGY: (IDENTIFICATION: ()
 (F-111A AIRCRAFT IN THE (IDLE POWER 66.9% RPM (TEMP = 15 C (OMEGA 1.4
 (AF32A-13 SUPPRESSOR (SINGLE ENGINE (BAR PRESS = .760 M HG (TEST 77-779-081
 (ENGINE TF30-P-3 (GROUND RUNUP (SUPPRESSED) (REL HUMID = 70 % (RUN 01
 (FAR FIELD NOISE ((((PAGE 23 ()

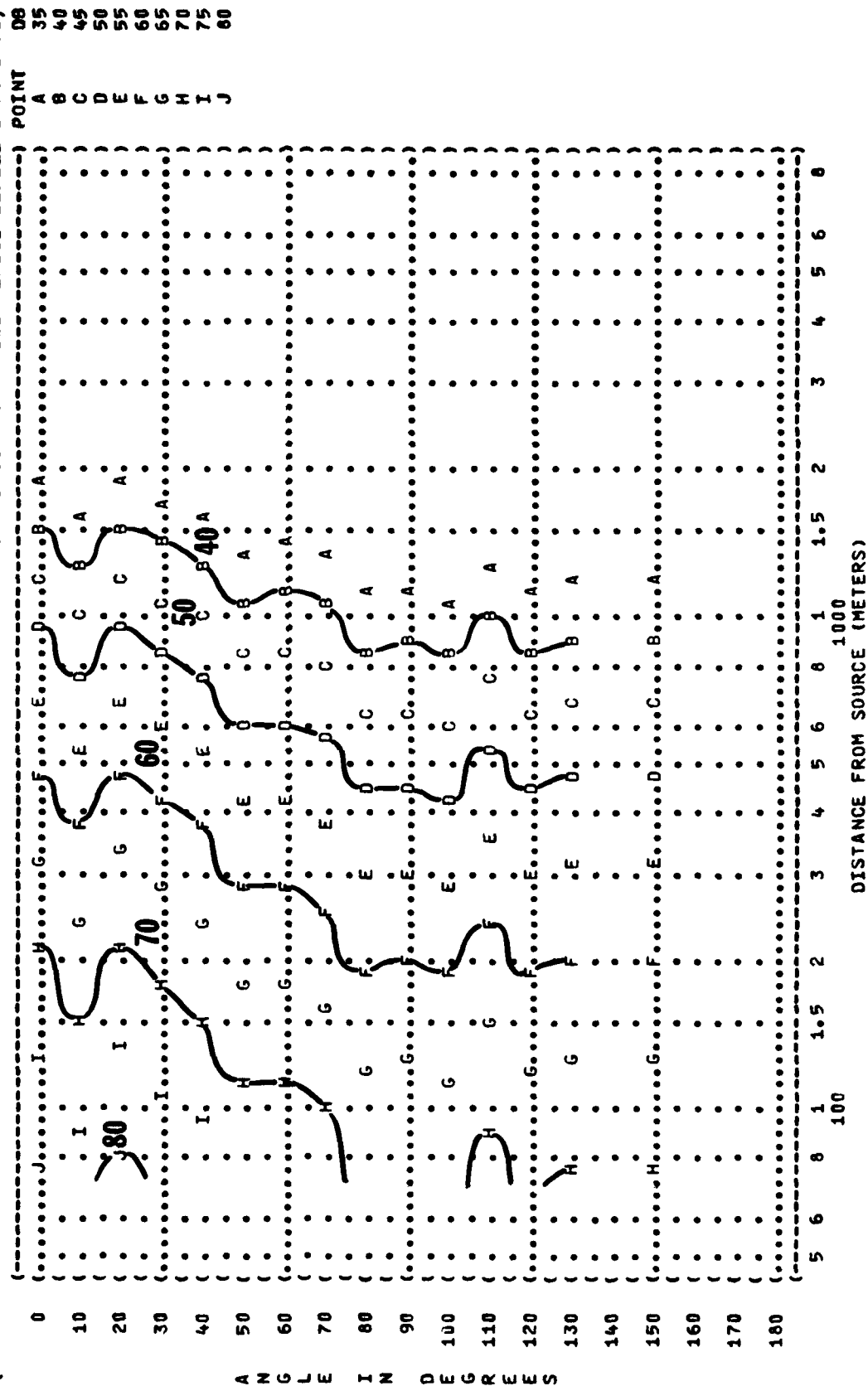


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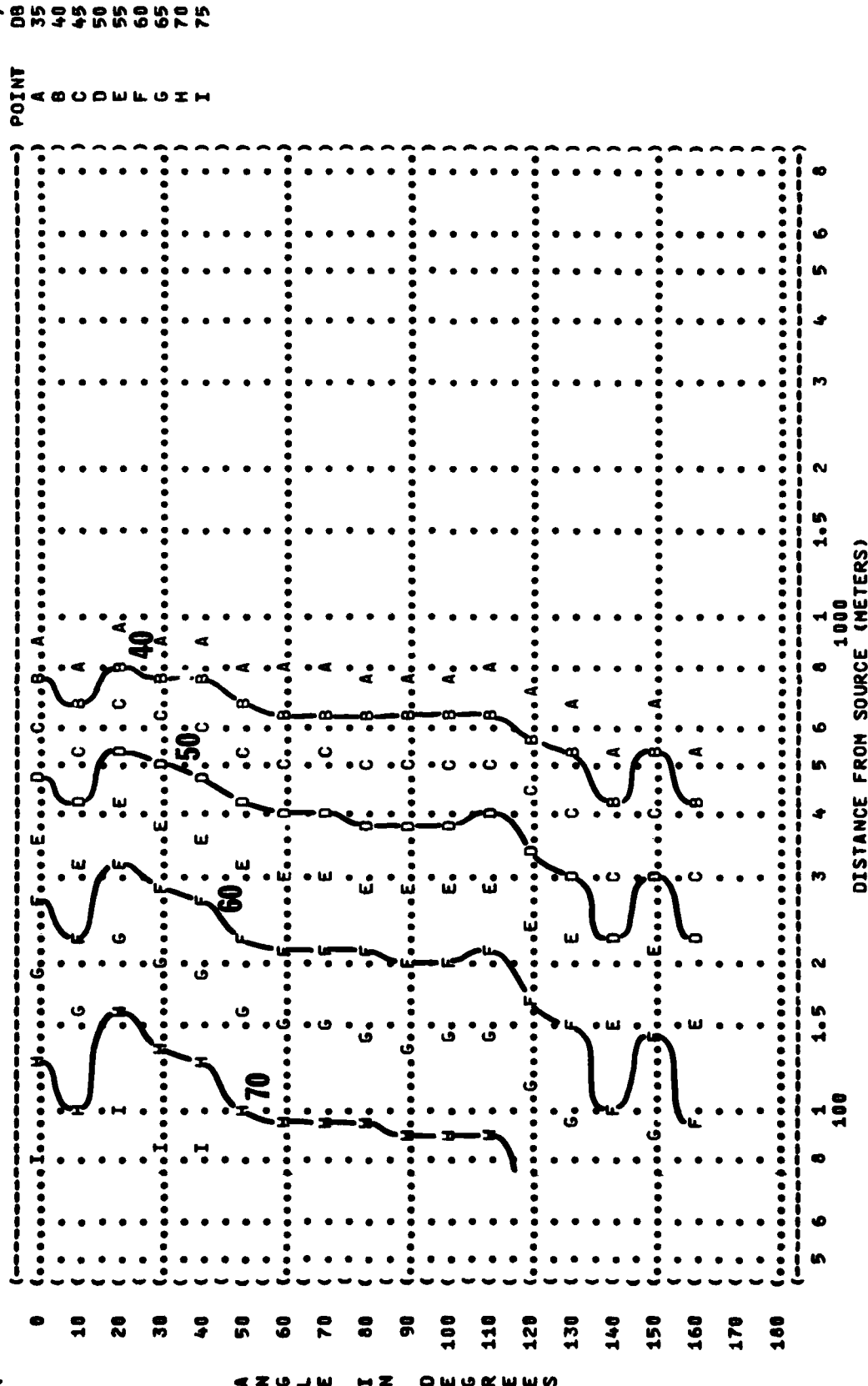
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(-----)
( ( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( ( EQUAL LEVEL CONTOURS (DB) ) )
( ( 9 ) )
( ( 2000 HZ OCTAVE BAND ) )
(-----)
( ( NOISE SOURCE/SUBJECT: ) )
( ( F-111A AIRCRAFT IN THE ) )
( ( AF32A-13 SUPPRESSOR ) )
( ( ENGINE TF30-P-3 ) )
( ( FAR FIELD NOISE ) )
(-----)
( ( OPERATION: ) )
( ( IDLE POWER 66.9% RPM ) )
( ( SINGLE ENGINE ) )
( ( GROUND RUNUP (SUPPRESSED) ) )
(-----)
( ( METEOROLOGY: ) )
( ( TEMP = 15 C ) )
( ( BAR PRESS = .760 M HG ) )
( ( REL HUMID = 70 % ) )
(-----)
( ( OMEGA 1.4 ) )
( ( TEST 77-779-001 ) )
( ( RUN 01 ) )
( ( PAGE 24 ) )
(-----)

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(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (9 EQUAL LEVEL CONTOURS (DB)
 (4000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (F-111A AIRCRAFT IN THE (IDLE POWER 66.9% RPM
 (AF32A-13 SUPPRESSOR (SINGLE ENGINE
 (ENGINE TF30-P-3 (GROUND RUNUP (SUPPRESSED)
 (FAR FIELD NOISE (



(FIGURE: SOUND PRESSURE LEVEL (SPL))
 (9 EQUAL LEVEL CONTOURS (DB))
 (8000 HZ OCTAVE BAND)
 (NOISE SOURCE/SUBJECT:)
 (F-111A AIRCRAFT IN THE)
 (AF32A-13 SUPPRESSOR)
 (ENGINE TF30-P-3)
 (FAR FIELD NOISE)
 (OPERATIONS:)
 (IDLE POWER 66.9% RPM)
 (SINGLE ENGINE)
 (GROUND RUNUP (SUPPRESSED))
 (METEOROLOGY:)
 (TEMP = 15 C)
 (BAR PRESS = .760 H MG)
 (REL HUMID = 70 %)
 (IDENTIFICATION:)
 (OMEGA 1.4)
 (TEST 77-779-001)
 (RUN 01)
 (27 SEP 78)
 (PAGE 26)

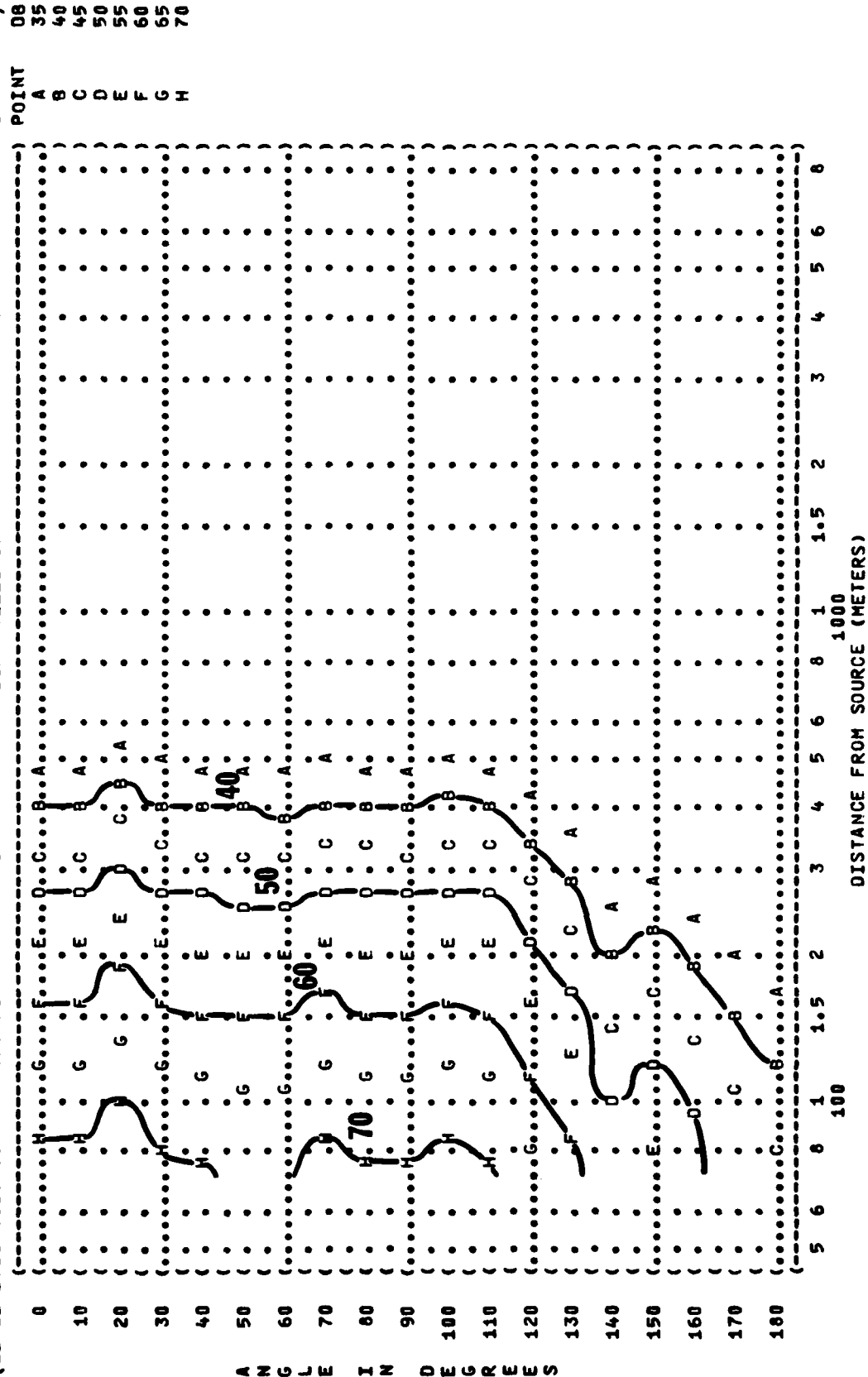


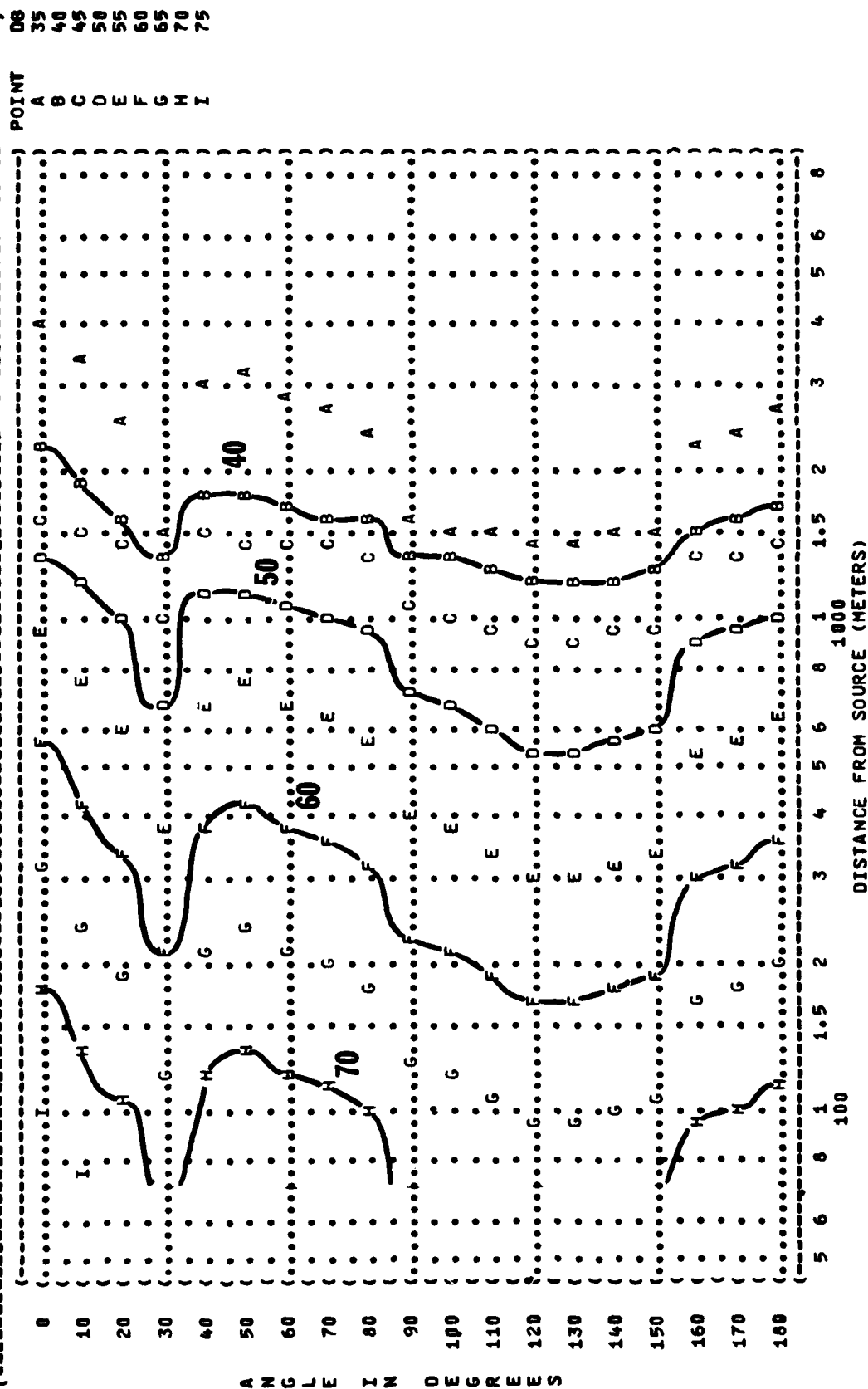
FIGURE 9: SOUND PRESSURE LEVEL (SPL) EQUAL LEVEL CONTOURS (DB) 31.5 HZ OCTAVE BAND

NOISE SOURCE/SUBJECT: (OPERATION:
F-111A AIRCRAFT IN THE (ENGINE R
AF32A-13 SUPPRESSOR (SINGLE E
ENGINE TF30-P-3 (GROUND R
FAR FIELD NOISE (

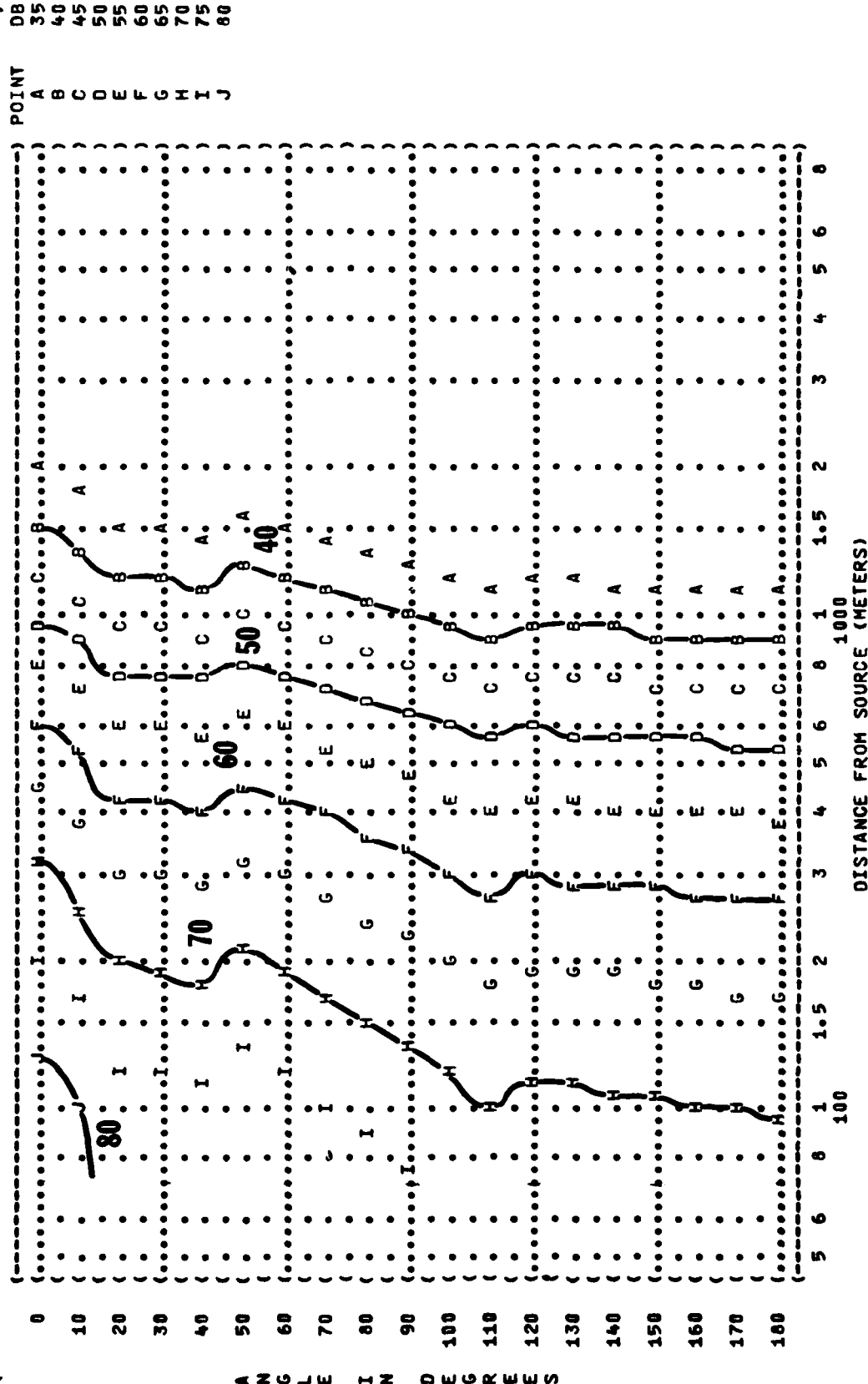
NOISE SOURCE/SUBJECT: F-111A AIRCRAFT IN THE AF32A-13 SUPPRESSOR ENGINE TF30-P-3

) METEOROLOGY:
) TEMP
) BAR PRESS
) REL HUMID

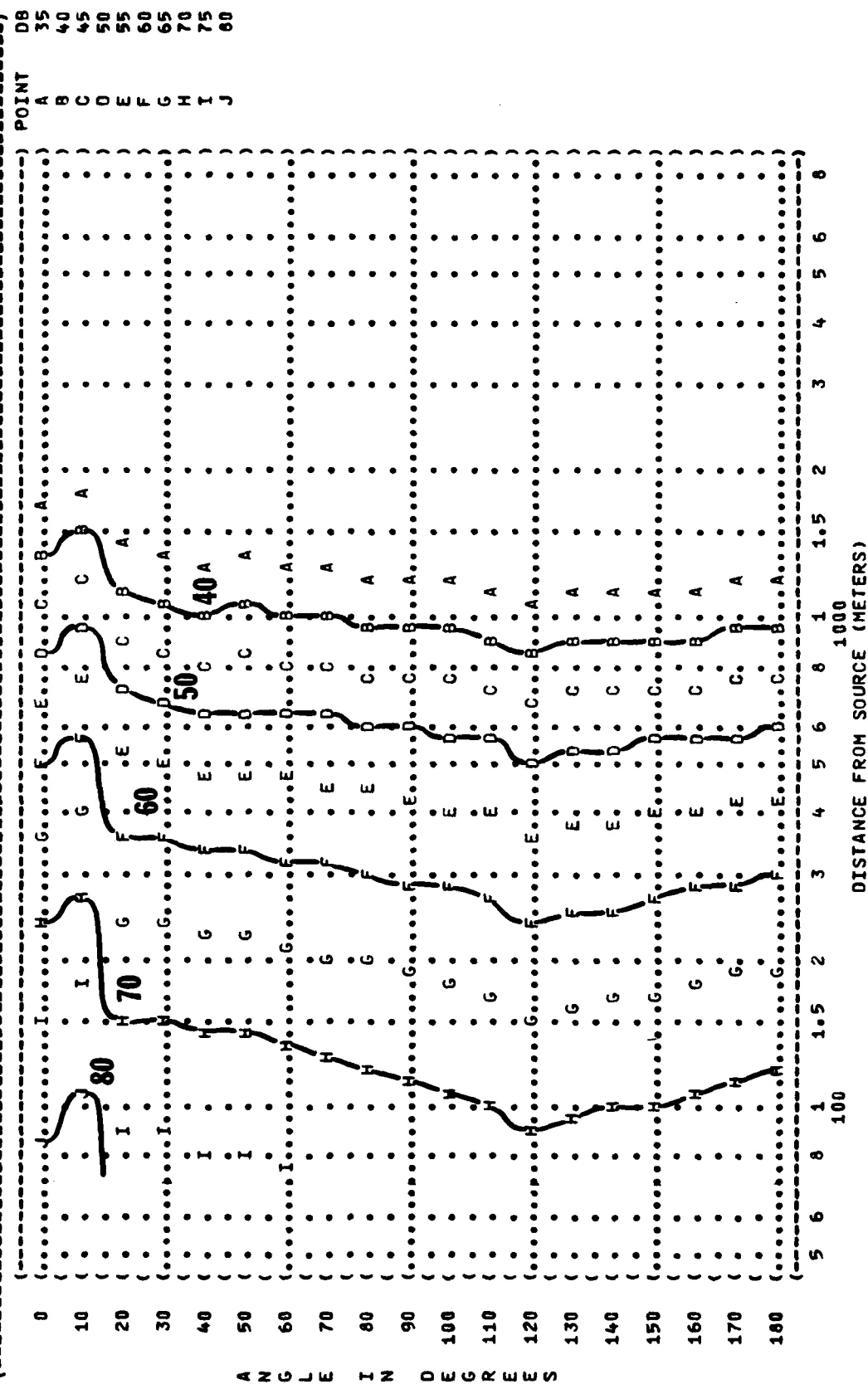
OMEGA 1.4
TEST 77-779
RUN 02



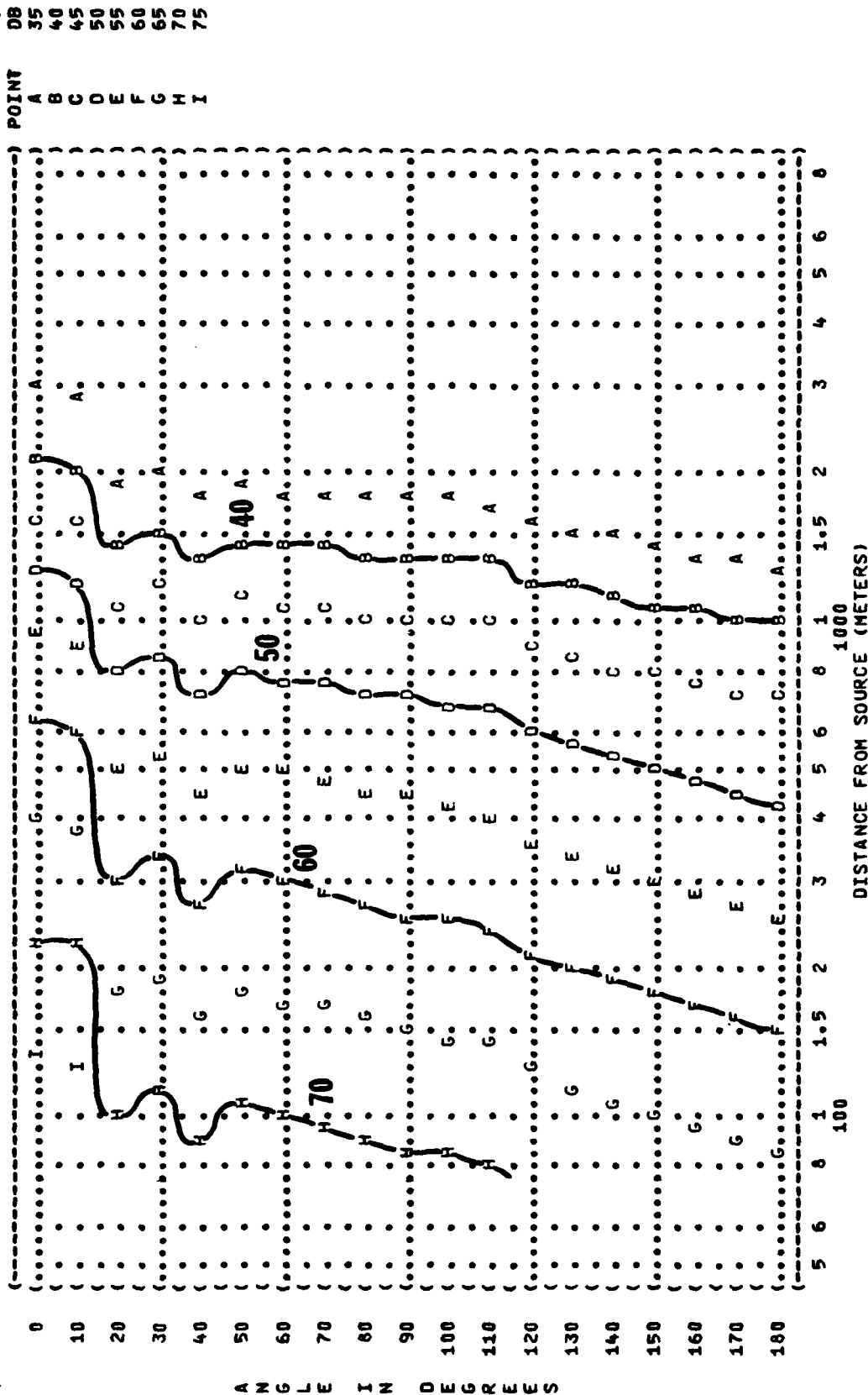
(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (9 EQUAL LEVEL CONTOURS (DB)
 (125 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT:
 (F-111A AIRCRAFT IN THE
 (AF32A-13 SUPPRESSOR
 (ENGINE TF30-P-3
 (FAR FIELD NOISE
 (OPERATION:
 (ENGINE RUNUP 75% RPM
 (SINGLE ENGINE
 (GROUND RUNUP (SUPPRESSED)
 (METEOROLOGY:
 (TEMP = 15 C
 (BAR PRESS = .760 M HG
 (REL HUMID = 70 %
 (IDENTIFICATION:
 (OMEGA 1.4
 (TEST 77-779-001
 (RUN 02
 (27 SEP 78
 (PAGE 20



```
(-----)
( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( EQUAL LEVEL CONTOURS (DB) ) )
( 9 ) OMEGA 1.4 )
( 250 HZ OCTAVE BAND ) TEST 77-779-001 )
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: )
( F-111A AIRCRAFT IN THE ) TEMP = 15 C )
( AF32A-13 SUPPRESSOR ) ENGINE RUNUP 75% RPM )
( ENGINE TF30-P-3 ) SINGLE ENGINE ) BAR PRESS = .760 M HG )
( FAR FIELD NOISE ) GROUND RUNUP (SUPPRESSED) ) REL HUMID = 70 % )
( ) ) PAGE 21 )
(-----)
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(FIGURE: SOUND PRESSURE LEVEL (SPL))
 (9 EQUAL LEVEL CONTOURS (DB))
 (500 HZ OCTAVE BAND)
 (NOISE SOURCE/SUBJECT:)
 (F-111A AIRCRAFT IN THE)
 (AF32A-13 SUPPRESSOR)
 (ENGINE TF30-P-3)
 (FAR FIELD NOISE)
 (OPERATION:)
 (ENGINE RUNUP 75% RPM)
 (SINGLE ENGINE)
 (GROUND RUNUP (SUPPRESSED))
 (METEOROLOGY:)
 (TEMP = 15 C)
 (BAR PRESS = .760 M HG)
 (REL HUMID = 70 %)
 (IDENTIFICATION:)
 (OMEGA 1.4)
 (TEST 77-779-001)
 (RUN 02)
 (27 SEP 78)
 (PAGE 22)



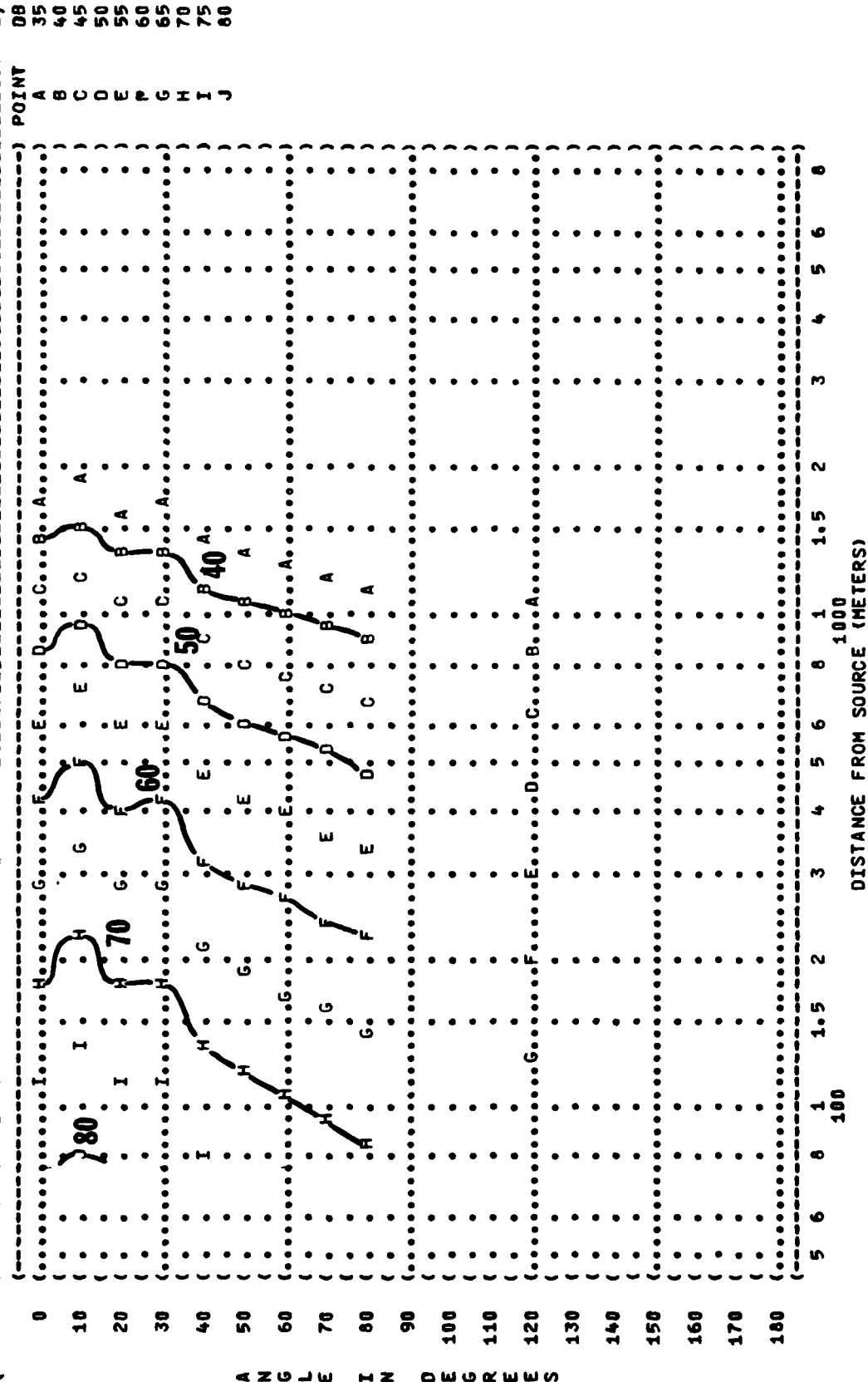
A N G L E I N D E G R E E S

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(-----)
( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( 9 EQUAL LEVEL CONTOURS (DB) ) )
( 1000 HZ OCTAVE BAND ) OMEGA 1.4 )
(-----)
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: )
( F-111A AIRCRAFT IN THE ) ENGINE RUNUP 75% RPM ) TEMP = 15 C )
( AF32A-13 SUPPRESSOR ) SINGLE ENGINE ) BAR PRESS = .760 M HG )
( ENGINE TF30-P-3 ) GROUND RUNUP (SUPPRESSED) ) REL HUMID = 70 % )
( FAR FIELD NOISE ) ) PAGE 23 )
(-----)
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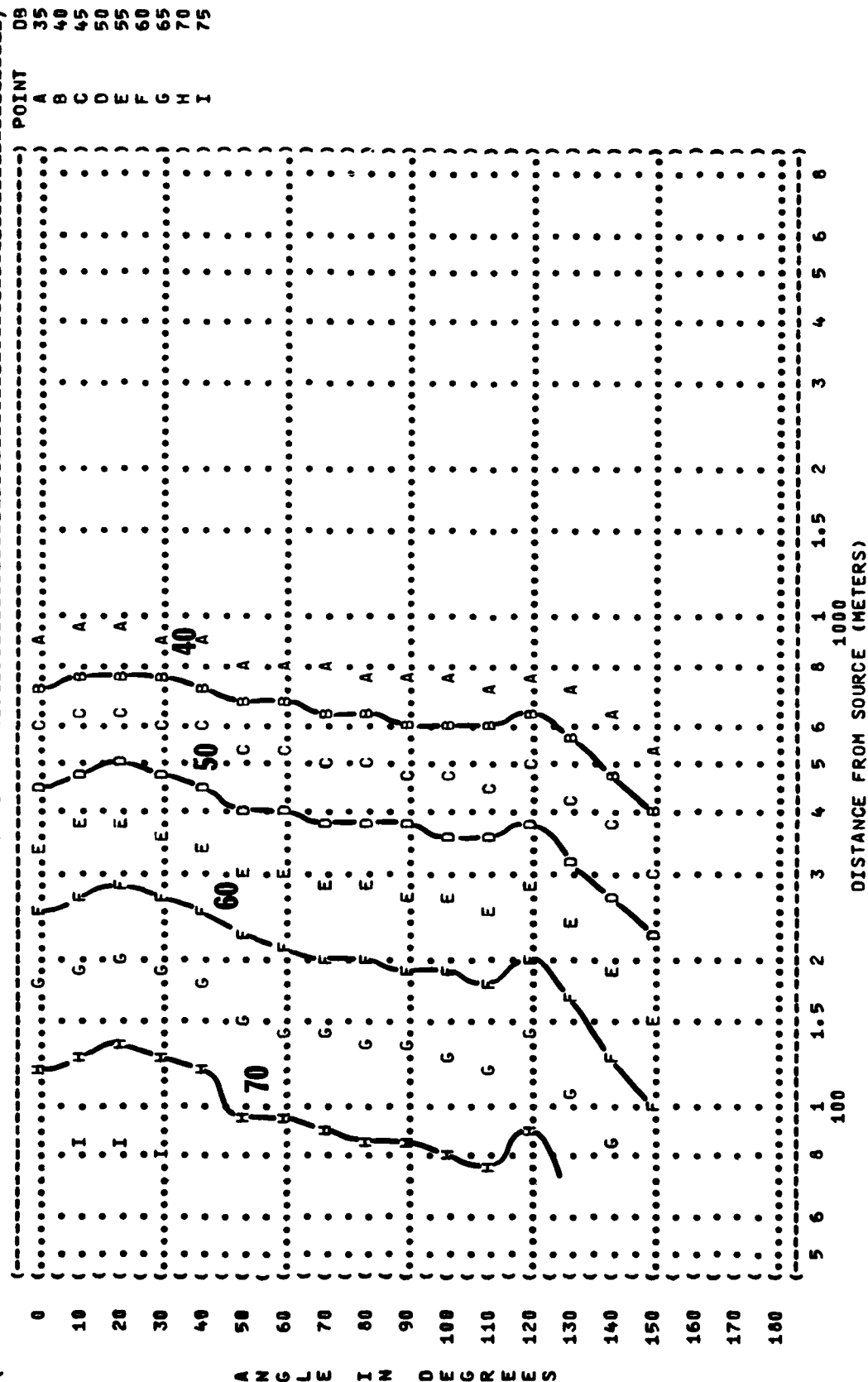


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(		) IDENTIFICATION:	
(	FIGURE: SOUND PRESSURE LEVEL (SPL)		
(	EQUAL LEVEL CONTOURS (DB)		
(	9		
(	2000 HZ OCTAVE BAND		
(			
(	NOISE SOURCE/SUBJECT:	METEOROLOGY:	
(	F-111A AIRCRAFT IN THE	TEMP = 15 C	
(	AF32A-13 SUPPRESSOR	BAR PRESS = .760 M HG	
(	ENGINE TF30-P-3	REL HUMID = 70 %	
(	FAR FIELD NOISE	PAGE 24	



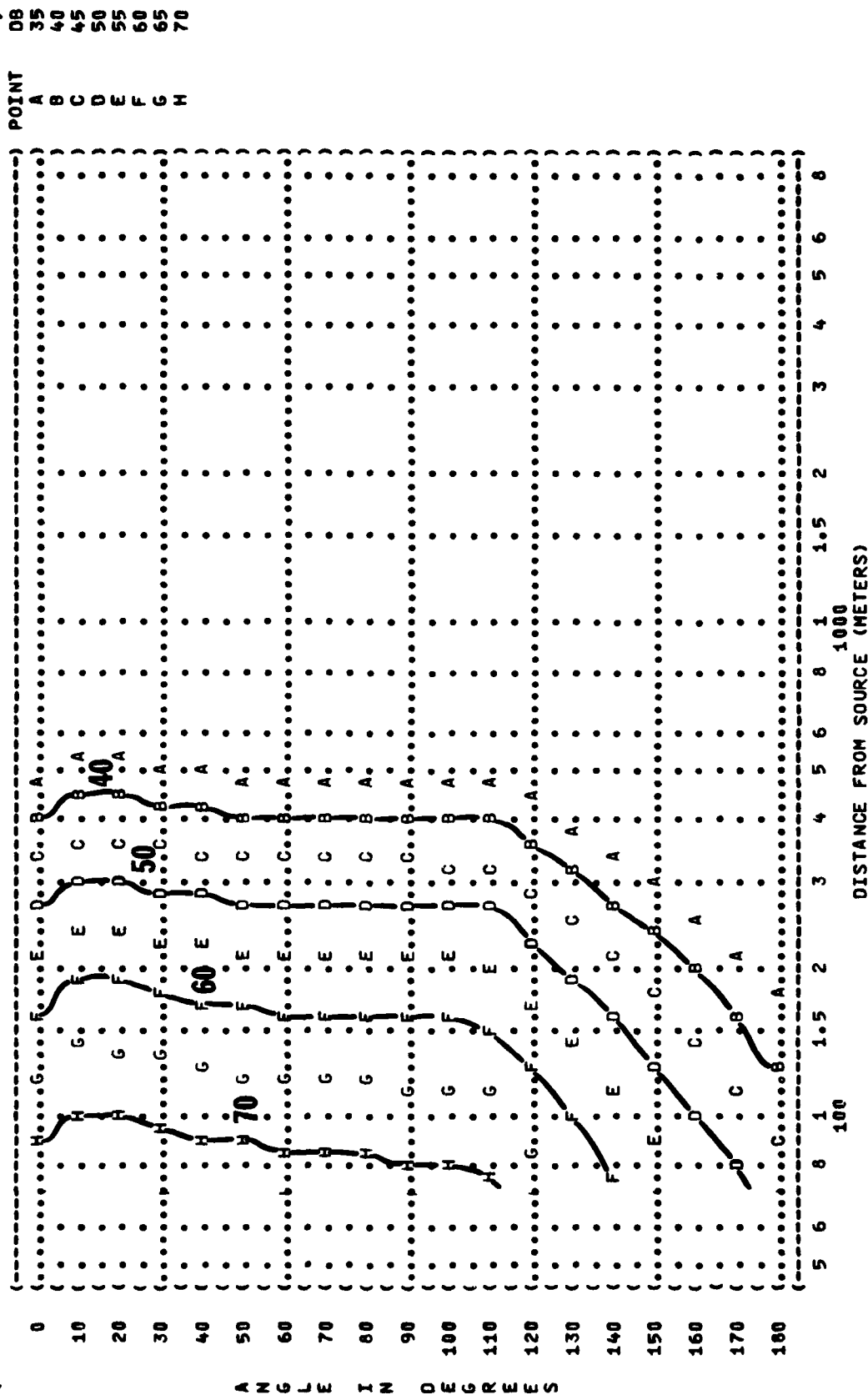
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( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( 9 EQUAL LEVEL CONTOURS (DB) ) )
( 4000 HZ OCTAVE BAND ) OMEGA 1.4 )
( NOISE SOURCE/SUBJECT: ) TEST 77-779-001 )
( F-111A AIRCRAFT IN THE ) OPERATION: ) METEOROLOGY: )
( AF32A-13 SUPPRESSOR ) ( ENGINE RUNUP 75% RPM ) TEMP = 15 C )
( ENGINE TF30-P-3 ) ( SINGLE ENGINE ) BAR PRESS = .760 M HG )
( FAR FIELD NOISE ) ( GROUND RUNUP (SUPPRESSED) ) REL HUMID = 70 % )
( ) ) )
( ) ) PAGE 25 )
(-----)
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(-----)
( ( FIGURE: SOUND PRESSURE LEVEL (SPL) ) IDENTIFICATION: )
( ( EQUAL LEVEL CONTOURS (DB) ) )
( ( 9 ) )
( ( 8000 HZ OCTAVE BAND ) )
(-----)
( ( NOISE SOURCE/SUBJECT: ) )
( ( F-111A AIRCRAFT IN THE ) )
( ( AF32A-13 SUPPRESSOR ) )
( ( ENGINE TF30-P-3 ) )
( ( FAR FIELD NOISE ) )
(-----)
( ( OPERATION: ) )
( ( ENGINE RUNUP 75% RPM ) )
( ( SINGLE ENGINE ) )
( ( GROUND RUNUP (SUPPRESSED) ) )
(-----)
( ( METEOROLOGY: ) )
( ( TEMP = 15 C ) )
( ( BAR PRESS = .760 M HG ) )
( ( REL HUMID = 70 % ) )
(-----)
( ( PAGE 26 ) )
(-----)

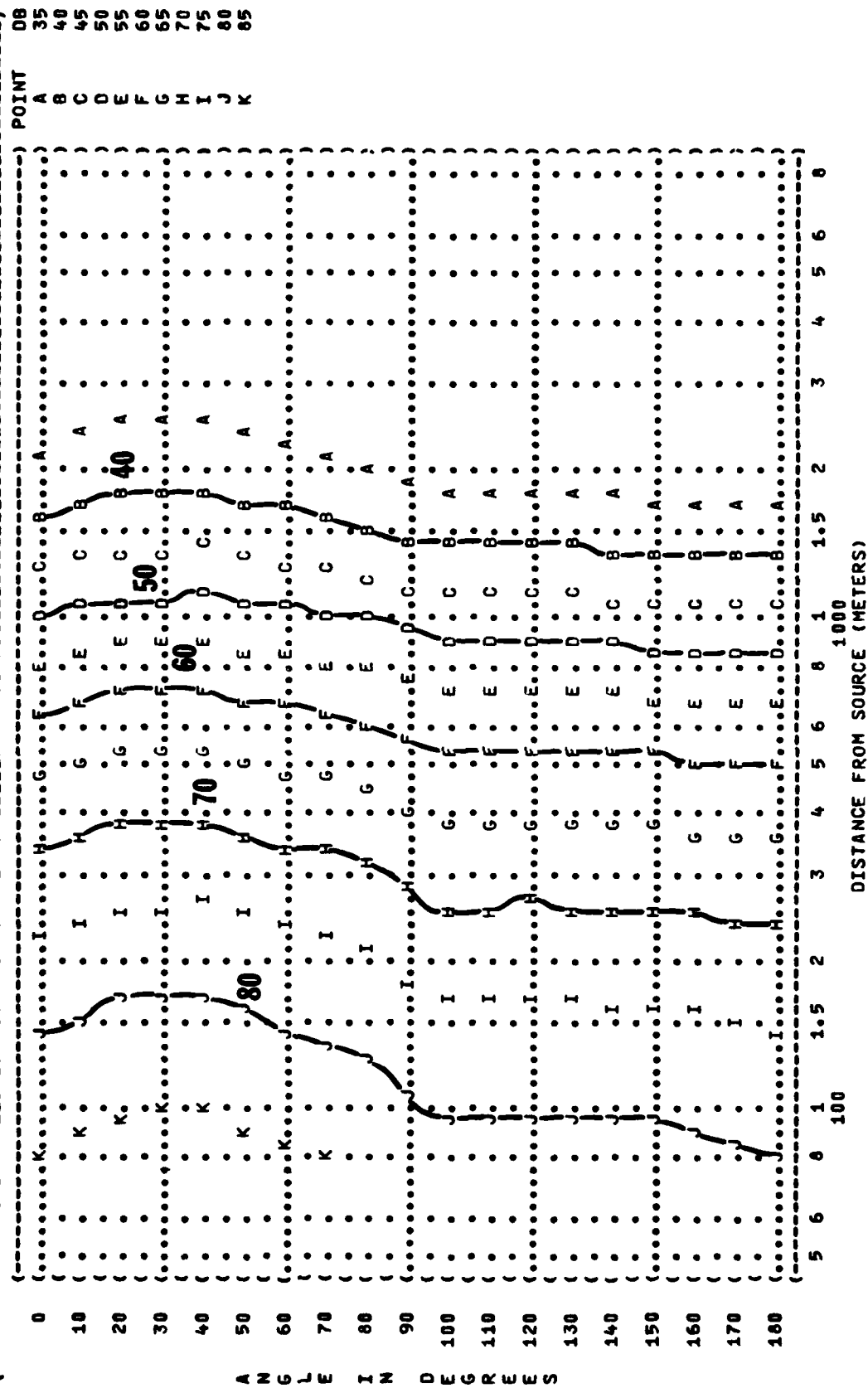
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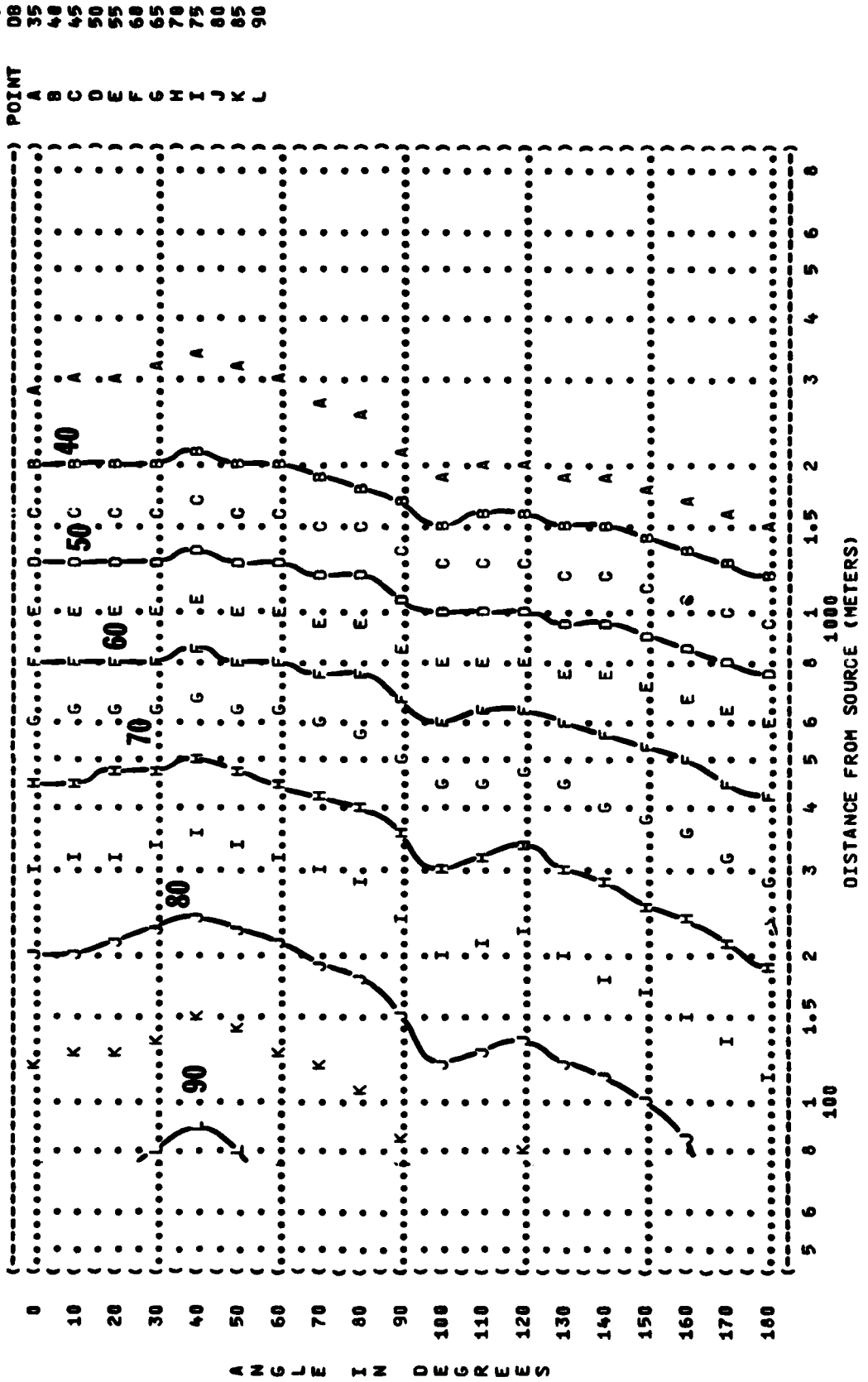


71

(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (EQUAL LEVEL CONTOURS (DB)
 (9 125 HZ OCTAVE BAND
 (IDENTIFICATION:
 (OMEGA 1.4
 (TEST 77-779-001
 (RUN 83
 (NOISE SOURCE/SUBJECT:
 (OPERATION:
 (F-111A AIRCRAFT IN THE
 (MILITARY POWER 96.5% RPM
 (TEMP = 15 C
 (AF32A-13 SUPPRESSOR
 (SINGLE ENGINE
 (BAR PRESS = .760 M HG
 (ENGINE TF30-P-3
 (GROUND RUNUP (SUPPRESSED)
 (REL HUMID = 70 %
 (FAR FIELD NOISE
 (PAGE 20

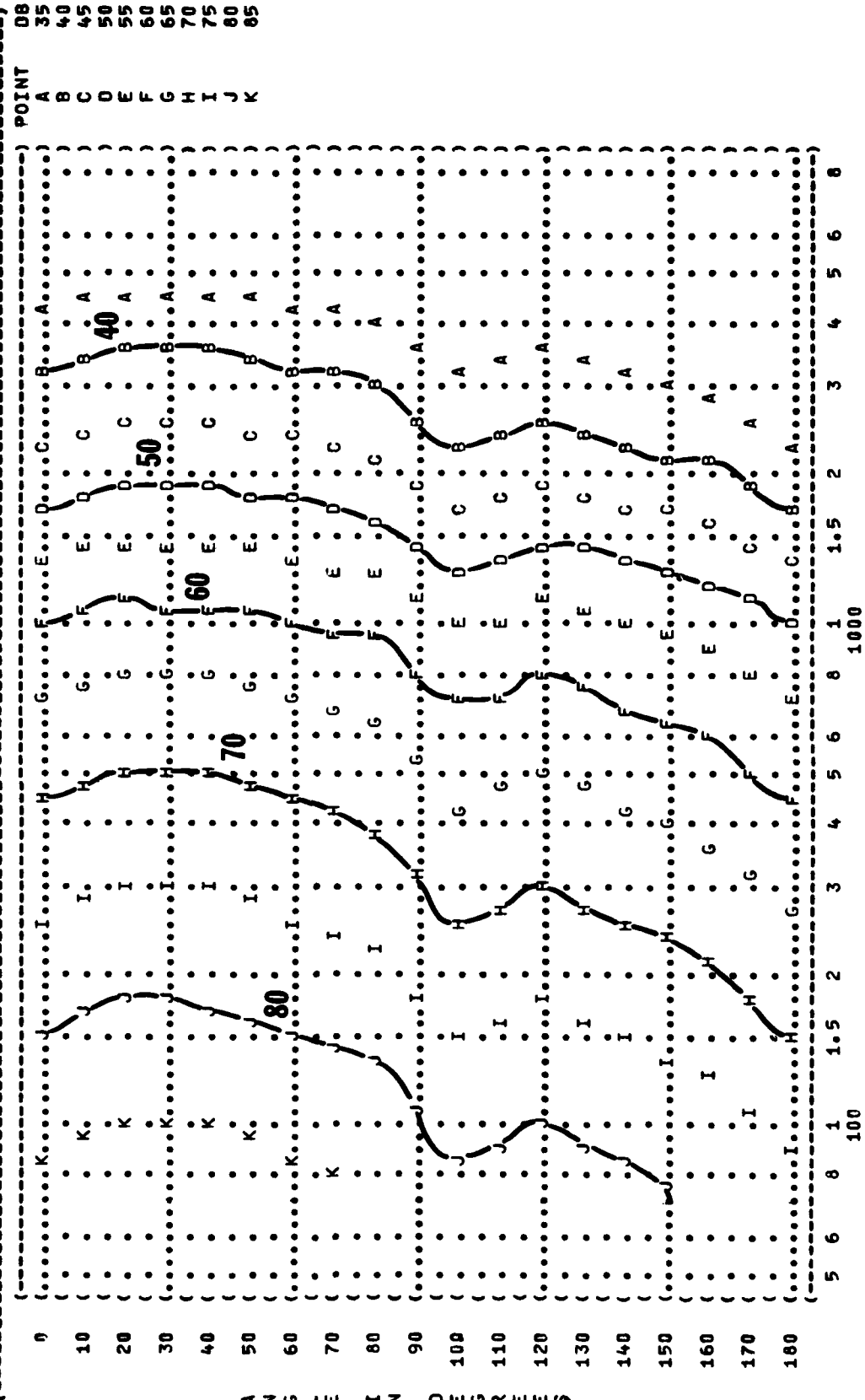


() FIGURE: SOUND PRESSURE LEVEL (SPL)
 () 9 EQUAL LEVEL CONTOURS (DB)
 () 250 HZ OCTAVE BAND
 () NOISE SOURCE/SUBJECT: () OPERATION:
 () F-111A AIRCRAFT IN THE () MILITARY POWER 96.5% RPM
 () AF32A-13 SUPPRESSOR () SINGLE ENGINE
 () ENGINE TF30-P-3 () GROUND RUNUP (SUPPRESSED)
 () FAR FIELD NOISE ()
 () METEOROLOGY:
 () TEMP = 15 C
 () BAR PRESS = .760 M HG
 () REL HUMID = 70 %
 () IDENTIFICATION:
 () OMEGA 1.4
 () TEST 77-779-001
 () RUN 03
 () 27 SEP 78
 () PAGE 21



A N G L E I N D E G R E E S

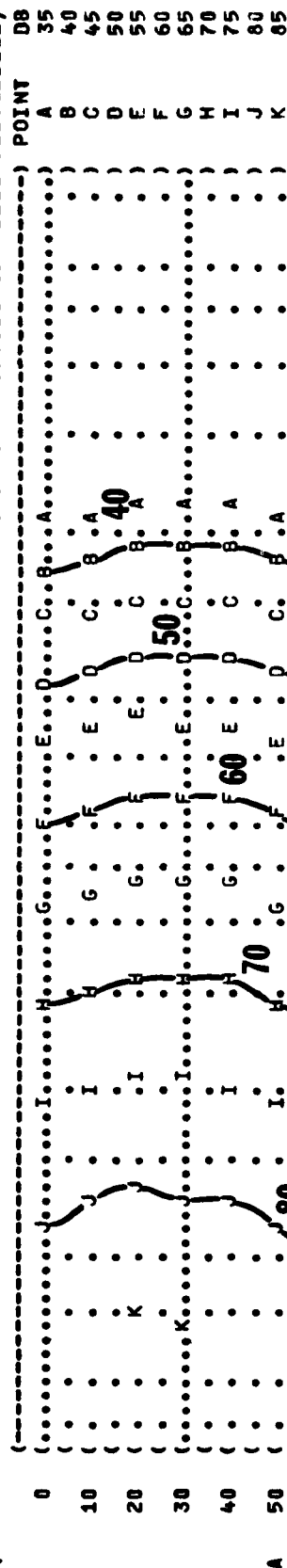
(FIGURE: SOUND PRESSURE LEVEL (SPL)) IDENTIFICATION:)
 (9 EQUAL LEVEL CONTOURS (DB)))
 (500 HZ OCTAVE BAND))
 (NOISE SOURCE/SUBJECT:) METEOROLOGY:)
 (F-111A AIRCRAFT IN THE) OPERATION:)
 (AF32A-13 SUPPRESSOR) (MILITARY POWER 96.5% RPM) TEMP = 15 C)
 (ENGINE TF30-P-3) (SINGLE ENGINE) BAR PRESS = .760 M HG)
 (FAR FIELD NOISE) (GROUND RUNUP (SUPPRESSED)) REL HUMID = 70 %)
 () () PAGE 22)
 () () TEST 77-779-001)
 () () RUN 03)



(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (9 EQUAL LEVEL CONTOURS (DB)
 (2000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (F-111A AIRCRAFT IN THE (MILITARY POWER 96.5% RPM
 (AF32A-13 SUPPRESSOR (SINGLE ENGINE
 (ENGINE TF30-P-3 (GROUND RUNUP (SUPPRESSED)
 (FAR FIELD NOISE (

) IDENTIFICATION:
) OMEGA 1.4
) TEST 77-779-001
) RUN 03
) 27 SEP 78
) PAGE 24

) METEOROLOGY:
) TEMP = 15 C
) BAR PRESS = .760 M HG
) REL HUMID = 70 %

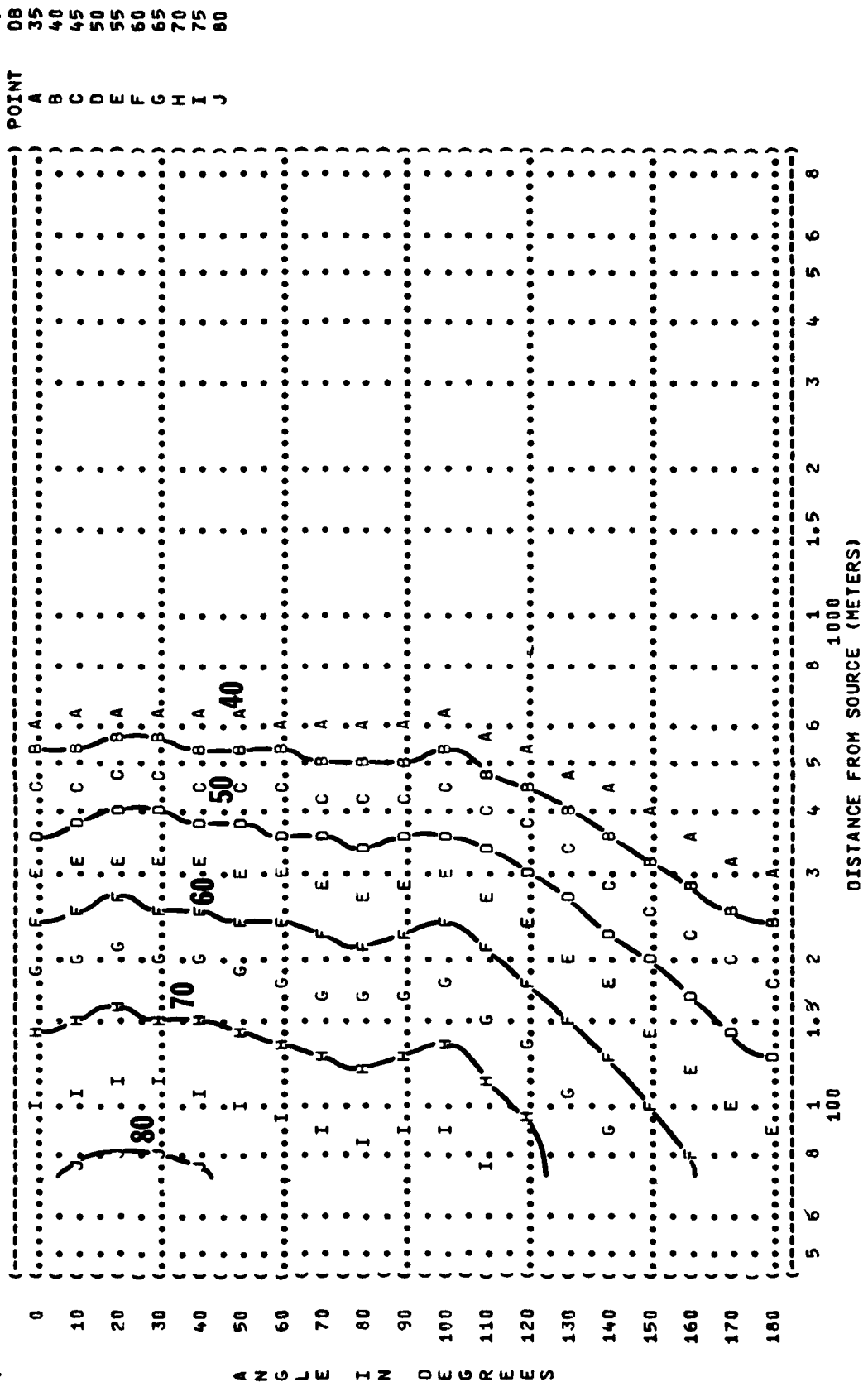


A N G L E I N D E G R E E S

DISTANCE FROM SOURCE (METERS)

[illegible]

(FIGURE: SOUND PRESSURE LEVEL (SPL))
 (9 EQUAL LEVEL CONTOURS (DB))
 (8000 HZ OCTAVE BAND)
 (NOISE SOURCE/SUBJECT:)
 (F-111A AIRCRAFT IN THE)
 (AF32A-13 SUPPRESSOR)
 (ENGINE TF30-P-3)
 (FAR FIELD NOISE)
 (OPERATION:)
 (MILITARY POWER 96.5% RPM)
 (SINGLE ENGINE)
 (GROUND RUNUP (SUPPRESSED))
 (METEOROLOGY:)
 (TEMP = 15 C)
 (BAR PRESS = .760 H MG)
 (REL HUMID = 70 %)
 (IDENTIFICATION:)
 (OMEGA 1.4)
 (TEST 77-779-001)
 (RUN 03)
 (27 SEP 78)
 (PAGE 26)



A N G
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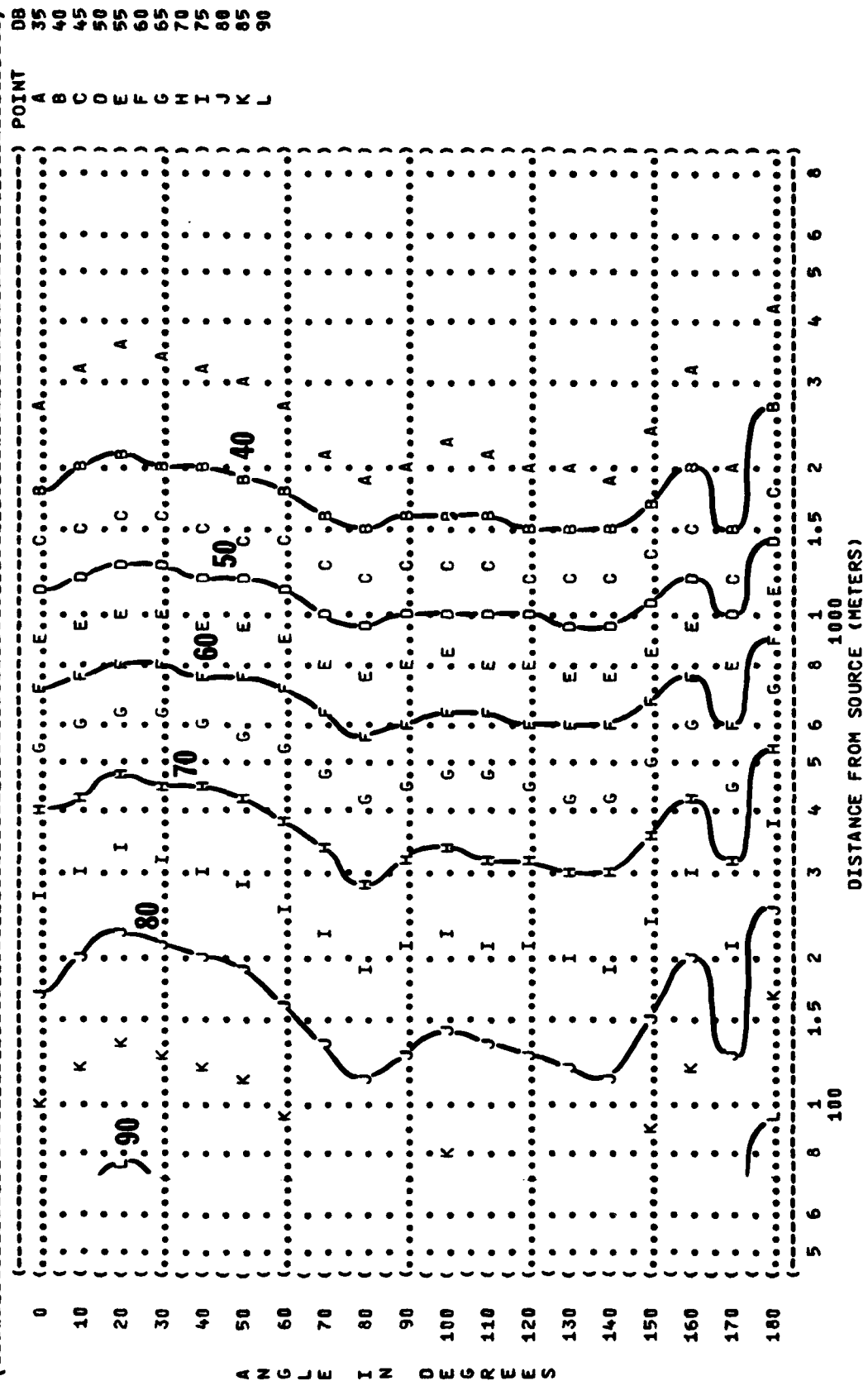
IDENTIFICATION:
OMEGA 1.4
TEST 77-779-001

METEOROLOGY:
TEMP
BAR PRESS
REL HUMID

RUN 04
27 SEP 78
PAGE 18

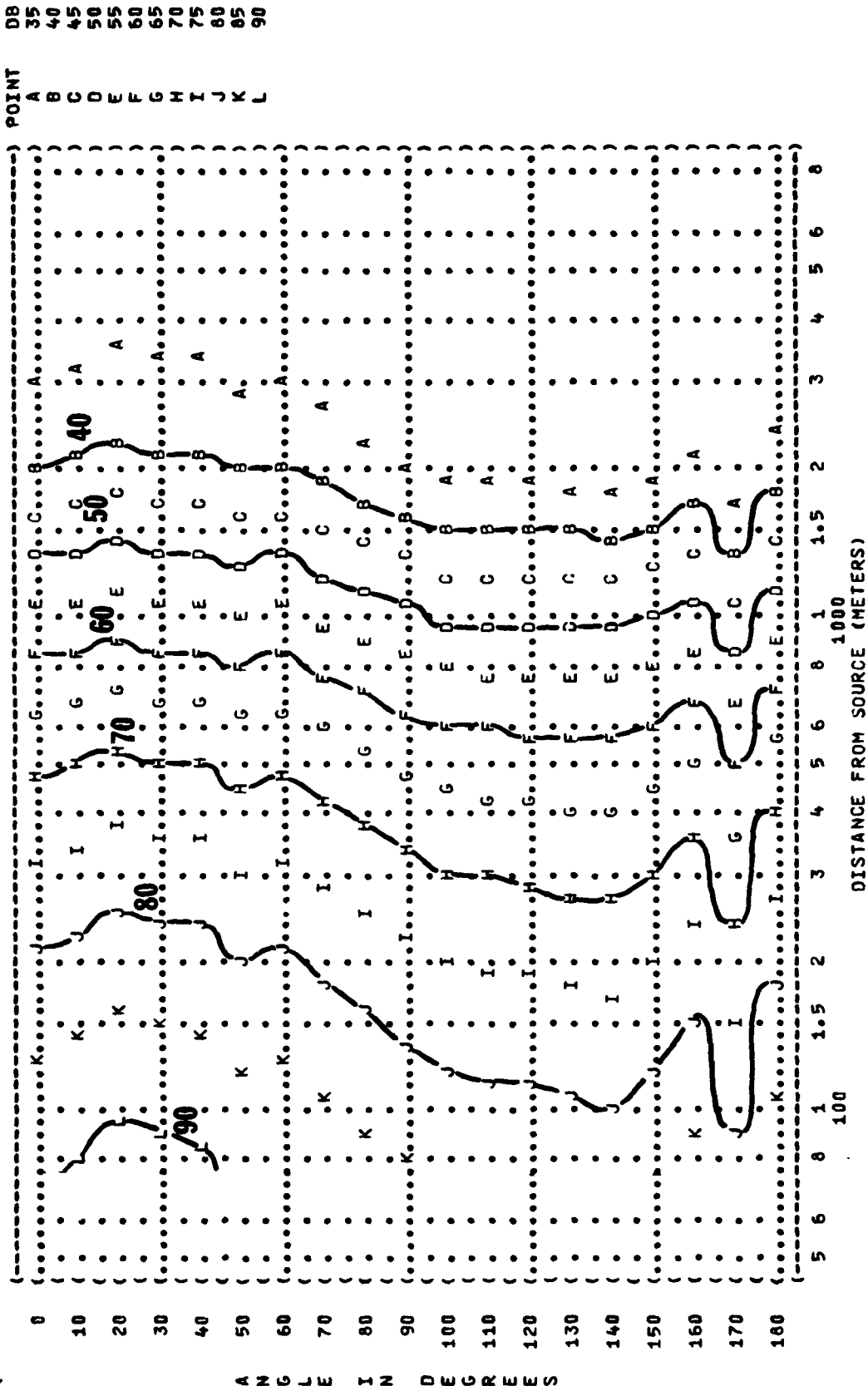


(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (9 EQUAL LEVEL CONTOURS (DB)
 (125 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT:
 (F-111A AIRCRAFT IN THE
 (AF32A-13 SUPPRESSOR
 (ENGINE TF30-P-3
 (FAR FIELD NOISE
 (OPERATION:
 (ZONE 3 AFTERBURNER POWER
 (SINGLE ENGINE
 (GROUND RUNUP (SUPPRESSED)
 (METEOROLOGY:
 (TEMP = 15 C
 (BAR PRESS = .760 M HG
 (REL HUMID = 70 %
 (IDENTIFICATION:
 (OMEGA 1.4
 (TEST 77-779-001
 (RUN 04
 (27 SEP 78
 (PAGE 20



A N G L E I N D E G R E E S

(FIGURE: SOUND PRESSURE LEVEL (SPL))
 (9 EQUAL LEVEL CONTOURS (DB))
 (250 HZ OCTAVE BAND)
 (NOISE SOURCE/SUBJECT:)
 (F-111A AIRCRAFT IN THE)
 (AF32A-13 SUPPRESSOR)
 (ENGINE TF30-P-3)
 (FAR FIELD NOISE)
 (OPERATION:)
 (ZONE 3 AFTERBURNER POWER)
 (SINGLE ENGINE)
 (GROUND RUNUP (SUPPRESSED))
 (METEOROLOGY:)
 (TEMP = 15 C)
 (BAR PRESS = .760 M HG)
 (REL HUMID = 70 %)
 (IDENTIFICATION:)
 (OMEGA 1.4)
 (TEST 77-779-001)
 (RUN 04)
 (27 SEP 78)
 (PAGE 21)



IDENTIFICATIONS

METEOROLOGY:

0 RUN 04

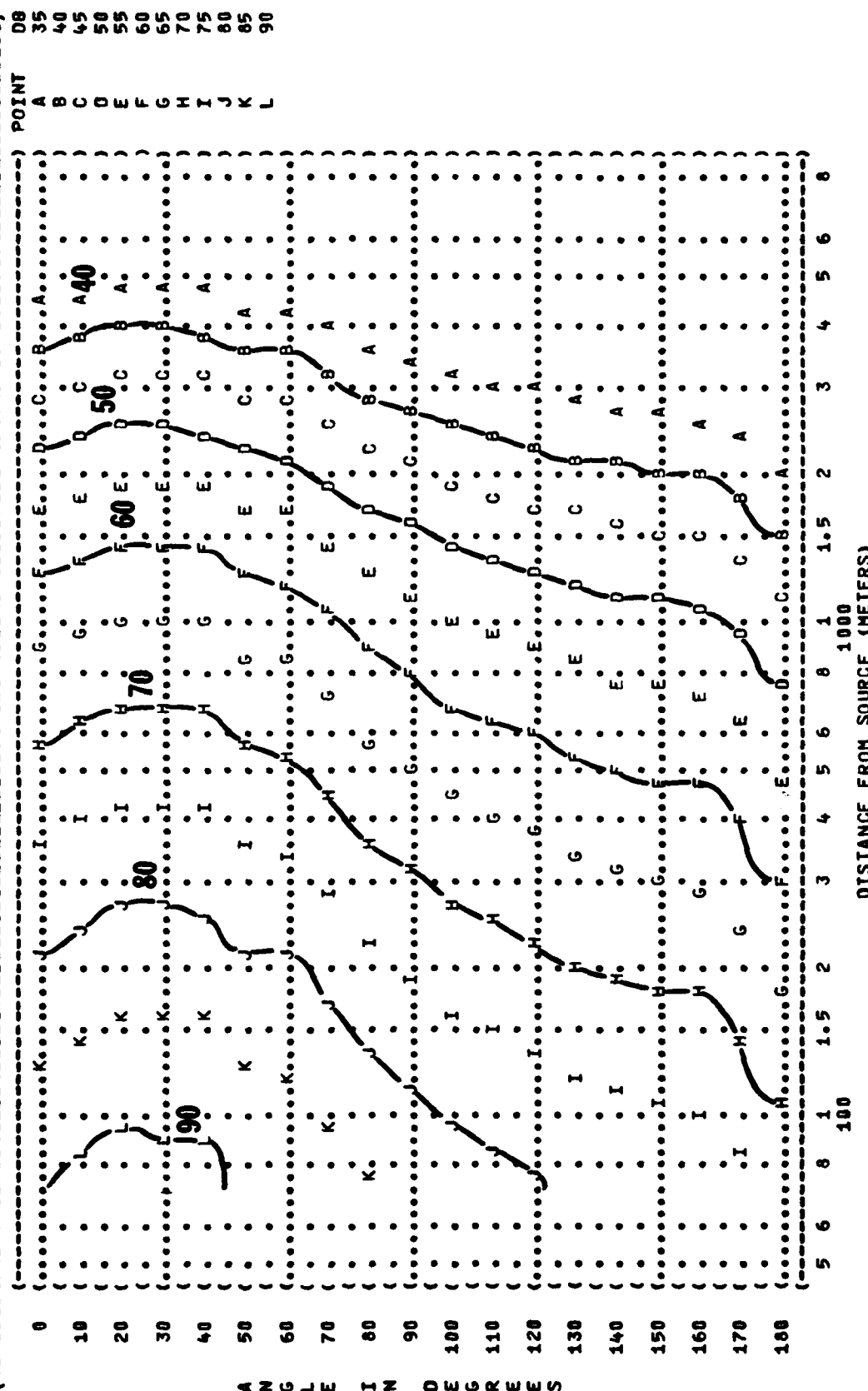
TEMP = 15 C
BAR PRESS = .760 M HG
REL HUMID = 70 %

POINT

ANGLE IN DEGREES

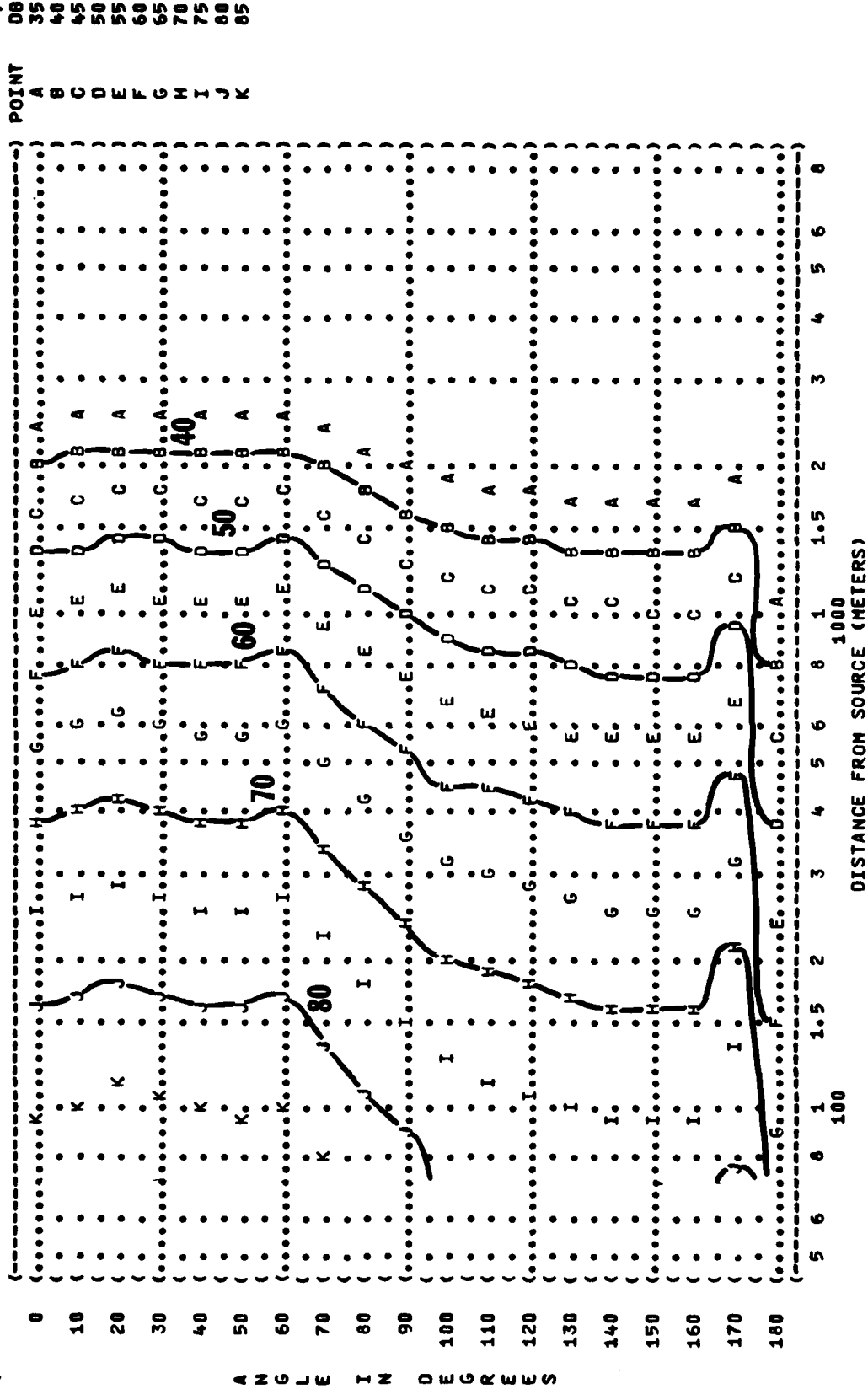
DISTANCE FROM SOURCE (METERS)

(FIGURE: SOUND PRESSURE LEVEL (SPL))
 (9 EQUAL LEVEL CONTOURS (DB))
 (1000 HZ OCTAVE BAND)
 (NOISE SOURCE/SUBJECT:)
 (F-111A AIRCRAFT IN THE)
 (AF32A-13 SUPPRESSOR)
 (ENGINE TF30-P-3)
 (FAR FIELD NOISE)
 (OPERATION:)
 (ZONE 3 AFTERBURNER POWER)
 (SINGLE ENGINE)
 (GROUND RUNUP (SUPPRESSED))
 ()
 (METEOROLOGY:)
 (TEMP = 15 C)
 (BAR PRESS = .760 M HG)
 (REL HUMID = 70 %)
 ()
 (IDENTIFICATION:)
 ()
 (OMEGA 1.4)
 (TEST 77-779-001)
 (RUN 04)
 (27 SEP 78)
 ()
 (PAGE 23)
 ()



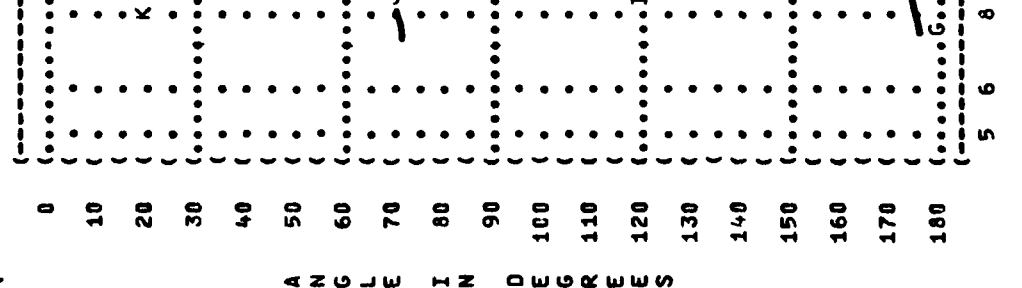
A N G L E I N D E G R E E S

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 (9 EQUAL LEVEL CONTOURS (DB)
 (2000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT:
 (F-111A AIRCRAFT IN THE
 (AF32A-13 SUPPRESSOR
 (ENGINE TF30-P-3
 (FAR FIELD NOISE
 (OPERATION:
 (ZONE 3 AFTERBURNER POWER
 (SINGLE ENGINE
 (GROUND RUNUP (SUPPRESSED)
 (METEOROLOGY:
 (TEMP = 15 C
 (BAR PRESS = .760 H HG
 (REL HUMID = 70 %
 (IDENTIFICATION:
 (OMEGA 1.4
 (TEST 77-779-001
 (RUN 04
 (27 SEP 78
 (PAGE 24



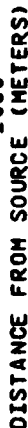
((FIGURE: SOUND PRESSURE LEVEL
((EQUAL LEV
((9
((4000 HZ (

((NOISE SOURCE/SUBJECT
((F-111A AIRCRAFT
((AF32A-13 SUPPL
((ENGINE TF30-P-33
((FAR FIELD NOISE



1

DB	POINT
35	A
40	B
45	C
50	D
55	E
60	F
65	G
70	H
75	I
80	J

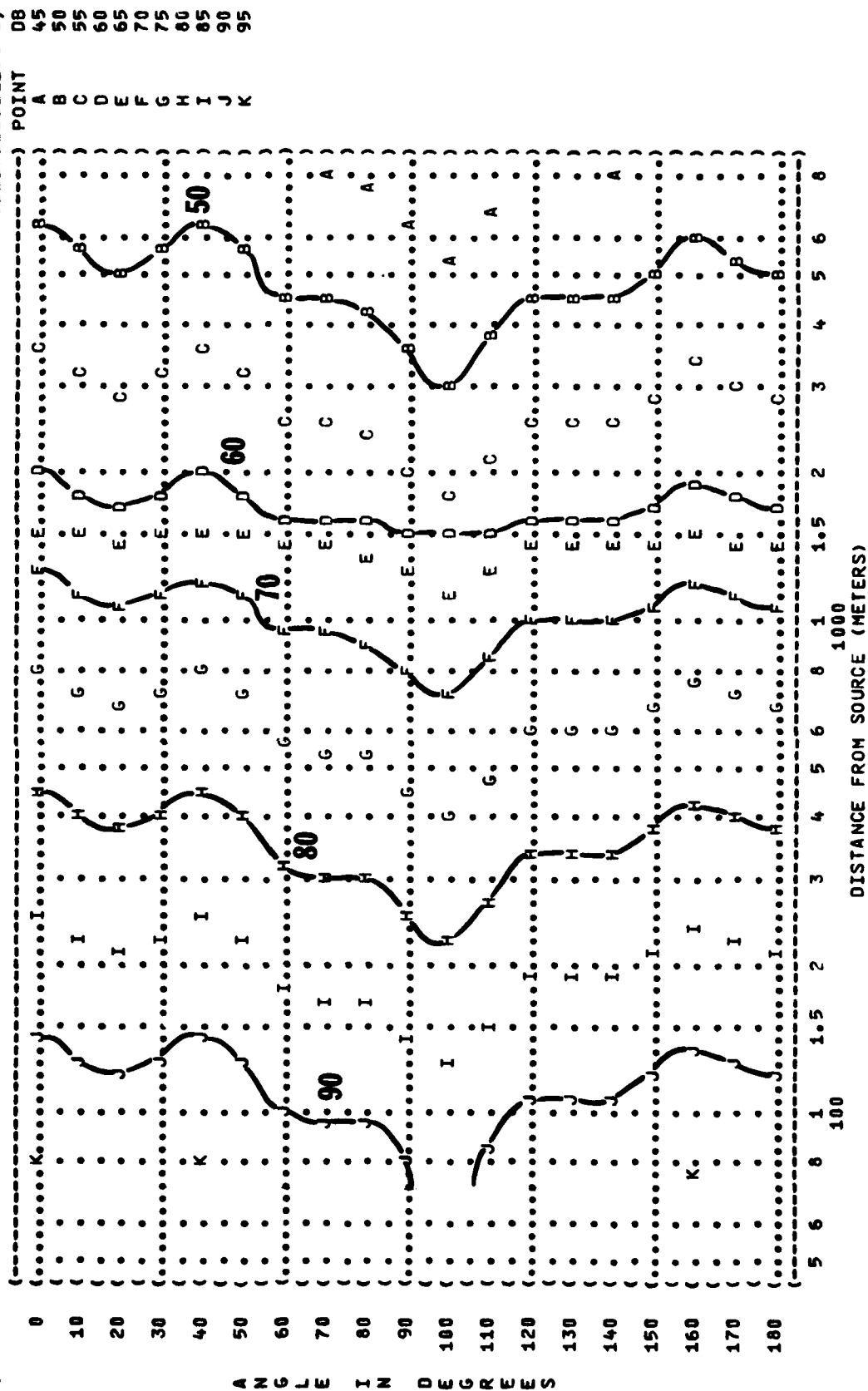


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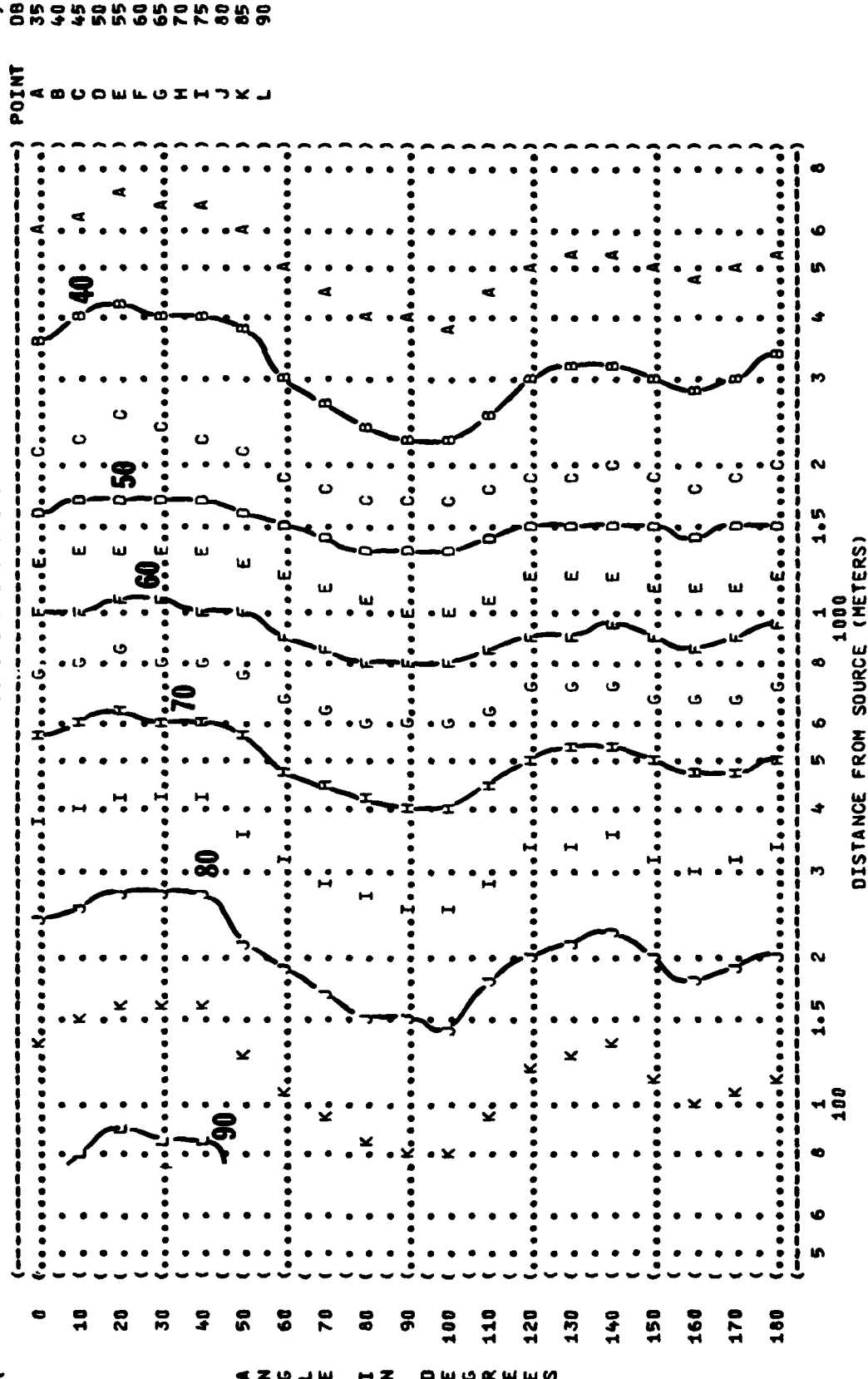
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(-----)
( ( FIGURE: SOUND PRESSURE LEVEL {SPL} ) )
( ( EQUAL LEVEL CONTOURS (DB) ) )
( ( 9 ) )
( ( 31.5 HZ OCTAVE BAND ) )
(-----)
( ( NOISE SOURCE/SUBJECT: ) )
( ( F-111A AIRCRAFT IN THE ) )
( ( AF32A-13 SUPPRESSOR ) )
( ( ENGINE TF30-P-3 ) )
( ( FAR FIELD NOISE ) )
(-----)
( ( OPERATION: ) )
( ( ZONE 5 AFTERBURNER POWER ) )
( ( SINGLE ENGINE ) )
( ( GROUND RUNUP (SUPPRESSED) ) )
( ( ) )
(-----)
( ( METEOROLOGY: ) )
( ( TEMP = 15 C ) )
( ( BAR PRESS = .760 M HG ) )
( ( REL HUMID = 70 % ) )
( ( ) )
(-----)
( ( IDENTIFICATION: ) )
( ( ) )
( ( OMEGA 1.4 ) )
( ( TEST 77-779-001 ) )
( ( RUN 05 ) )
( ( ) )
( ( 27 SEP 78 ) )
( ( ) )
( ( PAGE 18 ) )
(-----)

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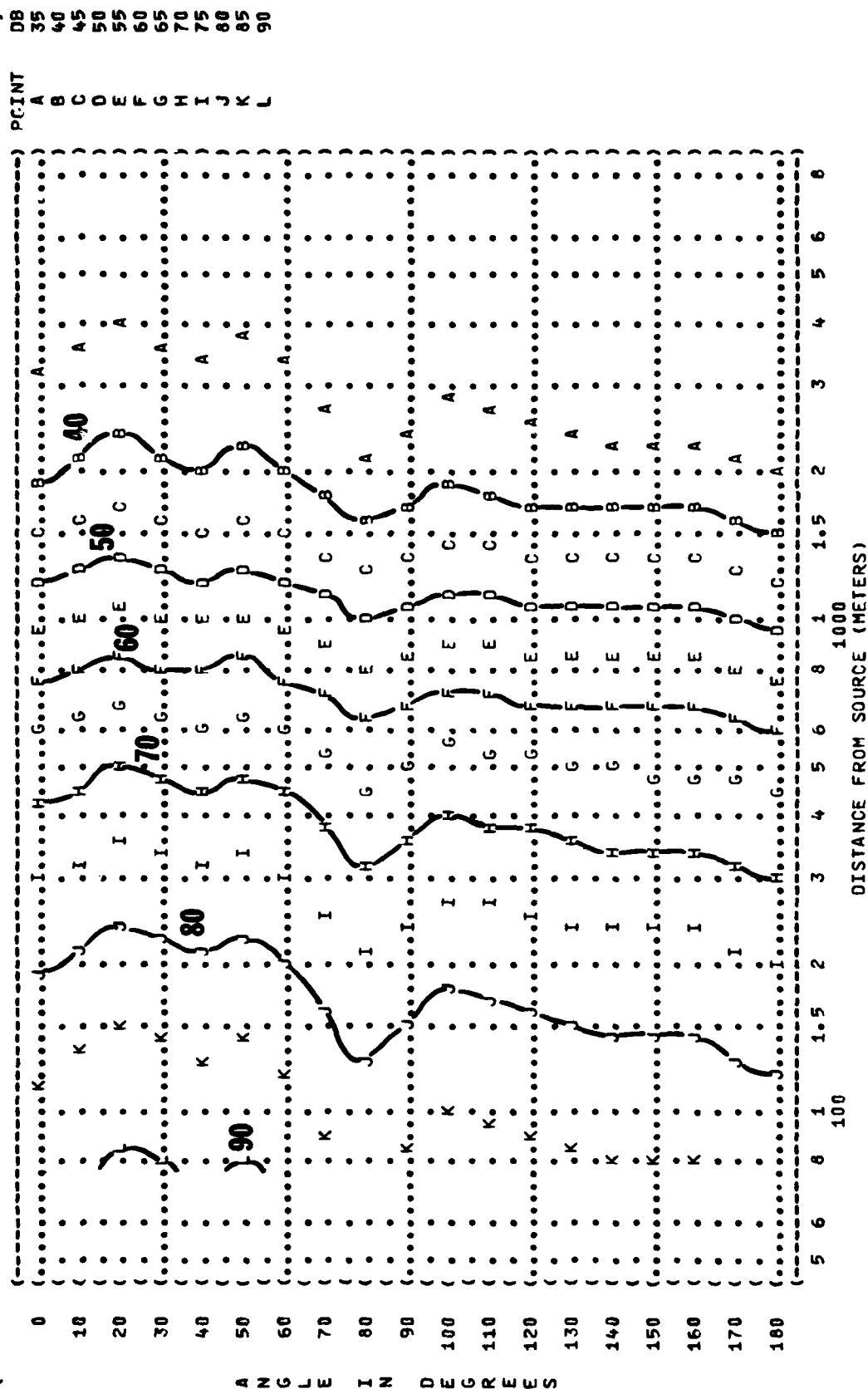
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(      9 EQUAL LEVEL CONTOURS (DB) ) )
(      63 HZ OCTAVE BAND ) OMEGA 1.4 )
( NOISE SOURCE/SUBJECT: ) TEST 77-779-001 )
( F-111A AIRCRAFT IN THE ) METEOROLOGY: ) RUN 05 )
( AF32A-13 SUPPRESSOR ) TEMP = 15 C )
( ENGINE TF30-P-3 ) BAR PRESS = .760 M HG ) 27 SEP 78 )
( FAR FIELD NOISE ) REL HUMID = 70 % ) PAGE 19 )
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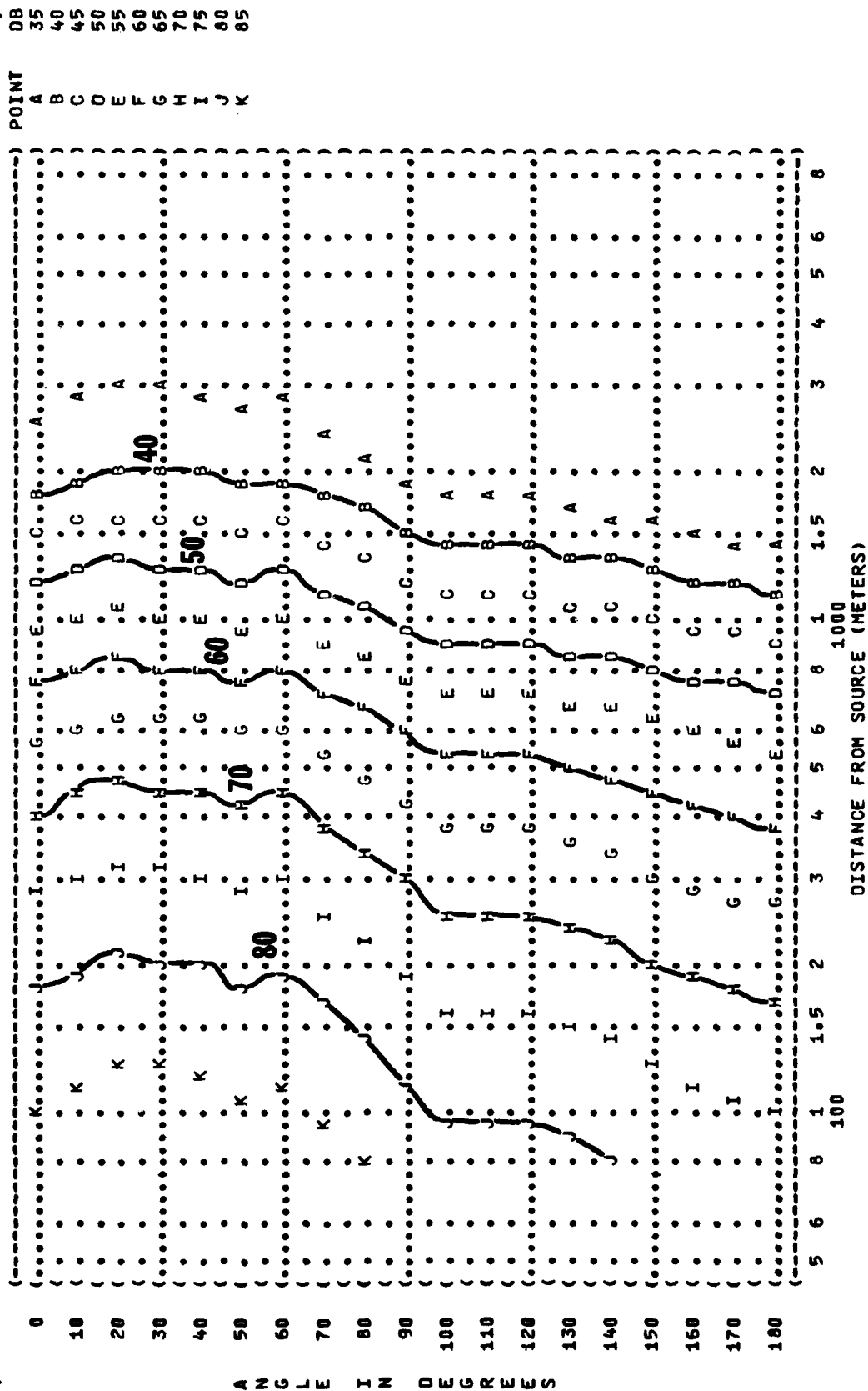
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(-----)
( ( FIGURE: SOUND PRESSURE LEVEL (SPL) ) IDENTIFICATION: )
( ( EQUAL LEVEL CONTOURS (DB) ) )
( ( 9 ) )
( ( 125 HZ OCTAVE BAND ) )
(-----)
( ( NOISE SOURCE/SUBJECT: ) METEOROLOGY: )
( ( F-111A AIRCRAFT IN THE ) TEMP = 15 C )
( ( AF32A-13 SUPPRESSOR ) BAR PRESS = .760 M HG )
( ( ENGINE TF30-P-3 ) REL HUMID = 70 % )
( ( FAR FIELD NOISE ) )
(-----)
( ( OPERATION: ) )
( ( ZONE 5 AFTERBURNER POWER ) )
( ( SINGLE ENGINE ) )
( ( GROUND RUNUP (SUPPRESSED) ) )
( ( ) )
(-----)
( ( PAGE 20 ) )
(-----)

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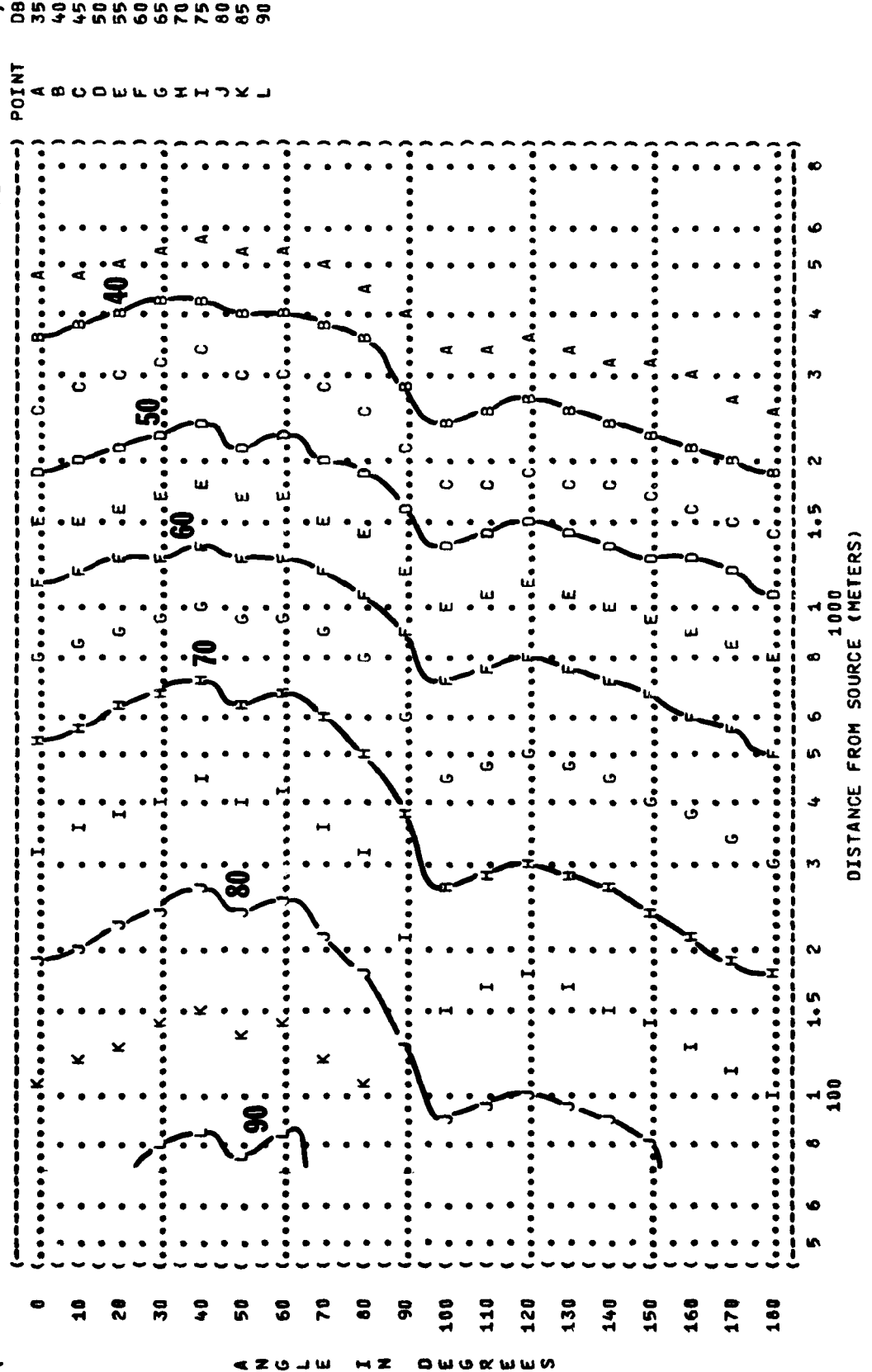
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 (9 EQUAL LEVEL CONTOURS (DB)
 (250 HZ OCTAVE BAND
 (IDENTIFICATION:
 ()
 () OMEGA 1.4
 () TEST 77-779-001
 () RUN 05
 ()
 (NOISE SOURCE/SUBJECT:
 (F-111A AIRCRAFT IN THE) METEOROLOGY:
 () ZONE 5 AFTERBURNER POWER) TEMP = 15 C
 () SINGLE ENGINE) BAR PRESS = .760 M HG
 () GROUND RUNUP (SUPPRESSED)) REL HUMID = 70 %
 () FAR FIELD NOISE)
 () PAGE 21



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(-----)
( ( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( ( 9 EQUAL LEVEL CONTOURS (DB) ) )
( ( 500 HZ OCTAVE BAND ) )
(-----)
( ( NOISE SOURCE/SUBJECT: ) )
( ( F-111A AIRCRAFT IN THE ) )
( ( AF32A-13 SUPPRESSOR ) )
( ( ENGINE TF30-P-3 ) )
( ( FAR FIELD NOISE ) )
(-----)
( ( OPERATION: ) METEOROLOGY: )
( ( ZONE 5 AFTERBURNER POWER ) TEMP = 15 C )
( ( SINGLE ENGINE ) BAR PRESS = .760 M HG )
( ( GROUND RUNUP (SUPPRESSED) ) REL HUMID = 70 % )
( ( ) )
(-----)
( ( PAGE 22 ) )
(-----)

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AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB OH F/S 1/2
USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK, VOLUME 136, F-111A A--ETC(U)
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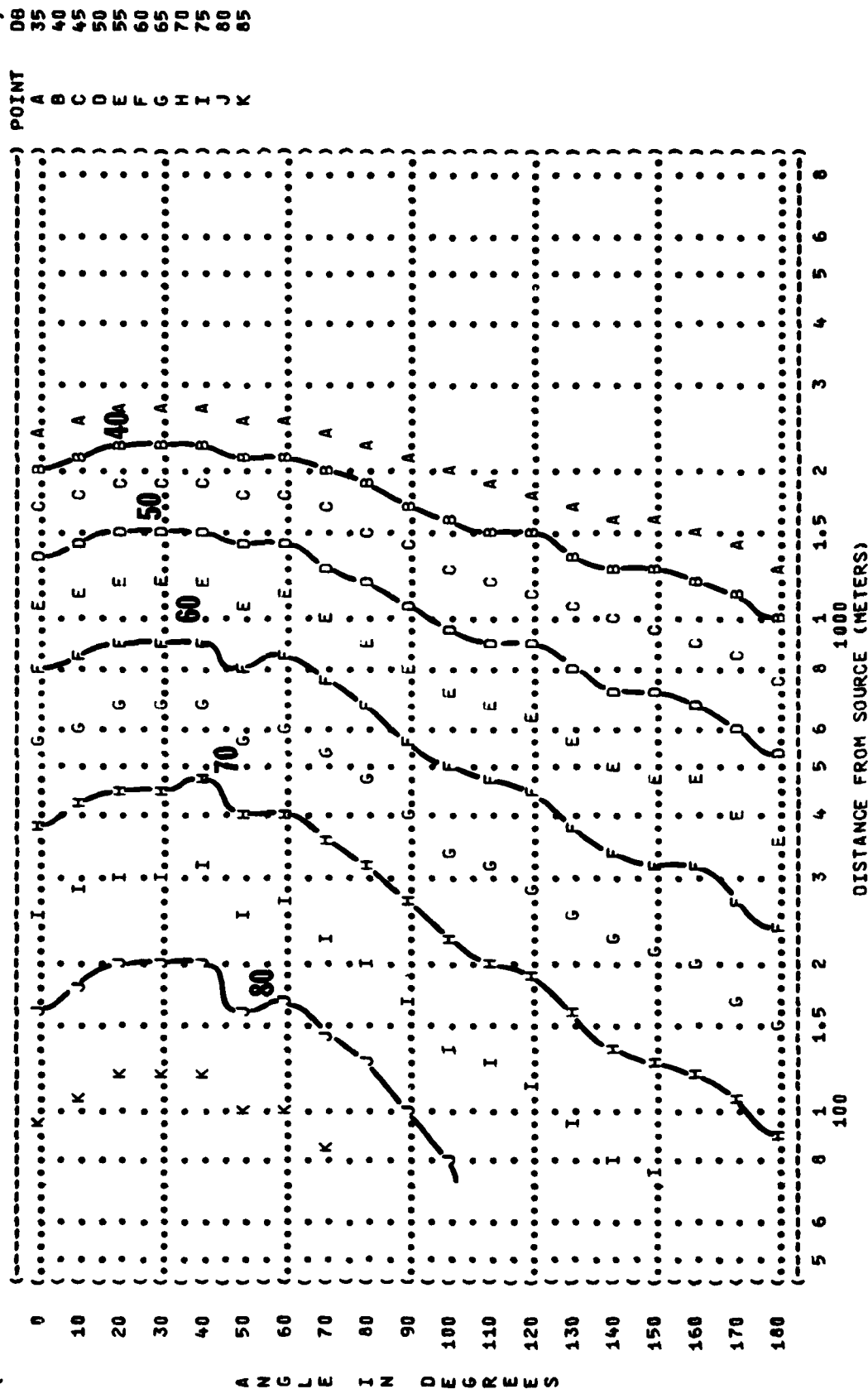
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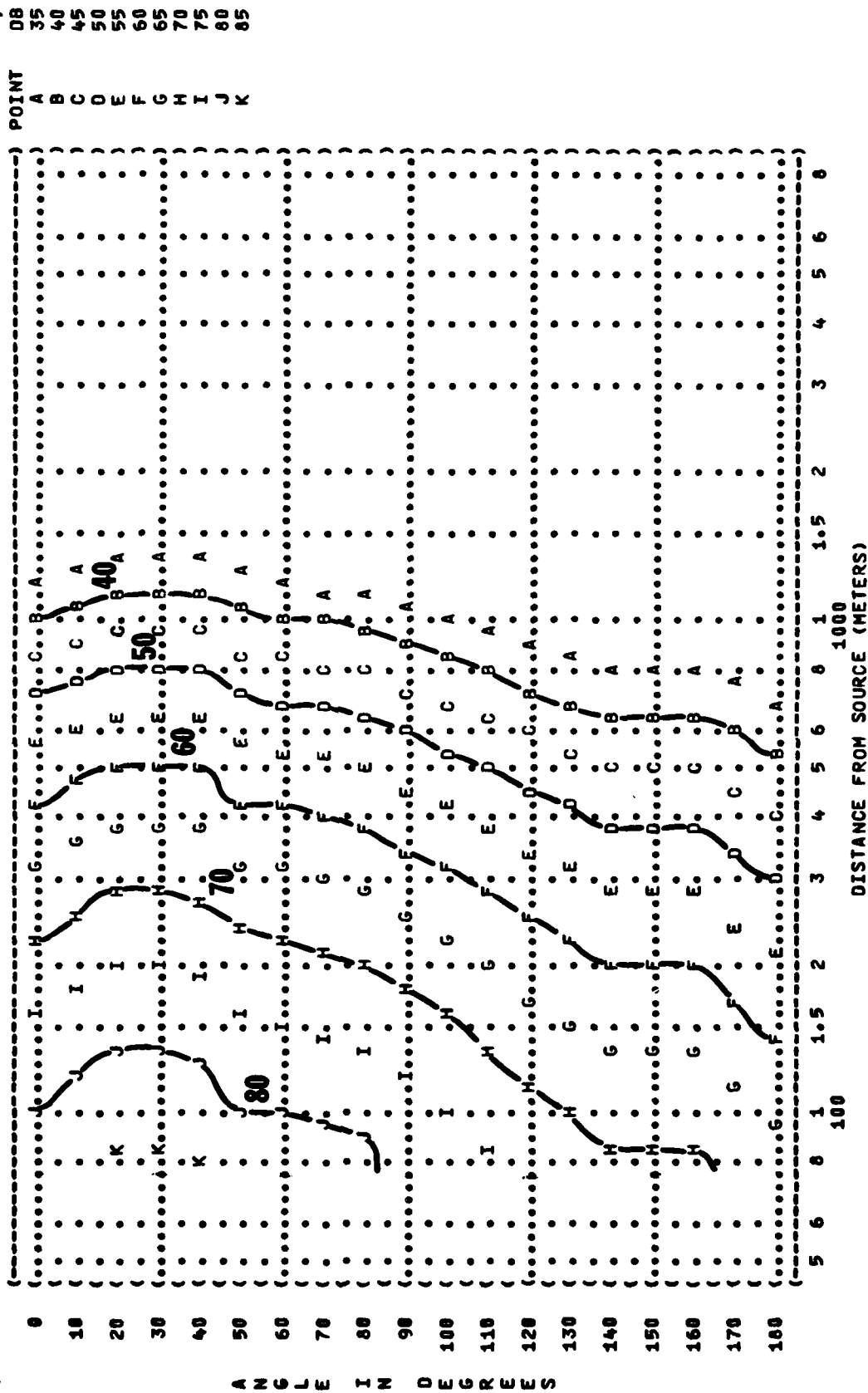
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(-----)
( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( 9 EQUAL LEVEL CONTOURS (DB) ) )
( 2000 HZ OCTAVE BAND ) OMEGA 1.4 )
( ) TEST 77-779-001 )
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: )
( F-111A AIRCRAFT IN THE ) OPERATION: ) TEMP = 15 C )
( AF32A-13 SUPPRESSOR ) ( ZONE 5 AFTERBURNER POWER ) BAR PRESS = .760 M HG )
( ENGINE TF30-P-3 ) ( SINGLE ENGINE ) REL HUMID = 70 % )
( FAR FIELD NOISE ) ( GROUND RUNUP (SUPPRESSED) ) )
( ) PAGE 24 )
(-----)
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420 LE IN DEGREE

(FIGURE: SOUND PRESSURE LEVEL (SPL)
 (9 EQUAL LEVEL CONTOURS (DB)
 (4000 HZ OCTAVE BAND
 (NOISE SOURCE/SUBJECT: (OPERATION:
 (F-111A AIRCRAFT IN THE (ZONE 5 AFTERBURNER POWER) TEMP = 15 C
 (AF32A-13 SUPPRESSOR (SINGLE ENGINE) BAR PRESS = .760 M HG
 (ENGINE TF30-P-3 (GROUND RUNUP (SUPPRESSED)) REL HUMID = 70 %
 (FAR FIELD NOISE ((PAGE 25)



A N G L E I N D E G R E E S

