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**AIRCRAFT NOISE DEFINITION. PHASE II.
ANALYSIS OF FLYOVER-NOISE DATA FOR THE
DC-8-61 AIRCRAFT**

R. E. DeLapp

Douglas Aircraft Company

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AIRCRAFT NOISE DEFINITION

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ANALYSIS OF FLYOVER-NOISE DATA
FOR THE DC-8-61 AIRCRAFT**

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HJ16-73

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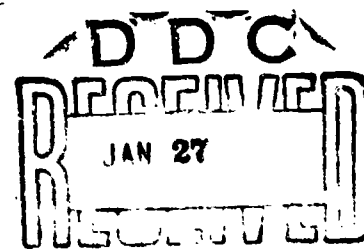
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**AUGUST 1974
FINAL REPORT**

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16. Abstract Phase II of the "Aircraft Noise Definition" program consisted of a DC-8-61 flight test program with an objective to improve the statistical accuracy of the noise data reported in Phase I of the program and to broaden the data base to include measurements at long distances and at a thrust required for a steep approach. Noise measurements were made during flyovers up to an altitude of 8000 feet, at sideline distances up to 8000 feet and at target thrusts of 15,000, 10,000, 5000, 3200, and 2000 pounds. This document reports the data acquisitions, the analysis procedure, and the results in terms of variations in reference-day EPNL and A-weighted sound level with slant range; overhead to sideline noise level relationship; and data showing lateral noise attenuations. Data accuracy is described in terms of assignable confidence limits. A comparison was made between reference-day noise levels determined for surface weather conditions and by a method that accounts for upper-air variations in the sound-path weather. A method that adjusts for lateral noise attenuation in computing EPNL's for sideline locations was suggested.					
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ABBREVIATIONS AND SYMBOLS

EPNL	Effective perceived noise level
EPNdB	Unit of effective perceived noise level
FAR	Federal Aviation Regulations
PNLTM	Maximum tone-corrected perceived noise level
PNdB	Unit of perceived noise level or tone-corrected perceived noise level
P	Sound pressure
SPL	Sound pressure level, decibels or dB
EP	Engine pressure ratio
rms	Root mean square
N_1	First fan stage rotational speed, rpm
$N_1/\sqrt{\theta} P_{t_1}$	First fan stage referred speed, rpm
θ	Ratio of total temperature at fan stage face to standard sea level reference temperature of 518.7° Rankine
T_R	Net thrust, pounds
T_R/θ_{amb}	Referred net thrust, pounds
θ_{amb}	Ratio of ambient pressure to standard sea level reference pressure of 29.92 inches of mercury
I	Sound intensity
M	Mach number
V_S	Stall speed, knots
V_2	Second segment airspeed, defined by FAA, knots
$^{\circ}F$	Degrees Fahrenheit
RH	Relative humidity, percent
c	Speed of sound, ft/sec
q	Dynamic pressure, lb/ft ²
ρ	Density, slug/ft ³
V_{EAS}	Knots equivalent airspeed
V_{IAS}	Knots indicated airspeed
V_{TAS}	Knots true airspeed
C_D	Coefficient of drag

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C_{DG}	Coefficient of drag for landing gear
C_{D0}	Coefficient of drag at zero lift
C_{Di}	Induced drag coefficient
C_L	Coefficient of lift
W	Gross weight, pounds
P_{T2}	Engine inlet total pressure, psi
P_{T7}	Engine core outlet total pressure, psi
T_{T7}	Engine core outlet total temperature, °F
ADDS	Aircraft digital data system
FDC	Flight data center
CISA	Controlled integrating spectrum analyzer
OCUM	Designation for magnetic tape recording of the binary, fixed-length record of a flyover-noise measurement
4MERGE	Designation for magnetic tape recording of four binary, fixed-length records for each flyover. Includes OCUM tape record and three aircraft performance records.
θ_{CPA}	Closest point of aircraft
θ	Elevation angle of aircraft above ground level

SECTION I

INTRODUCTION

The growth in commercial jet transport operations has brought an increase in aircraft noise great enough to be considered as an environmental problem to the surrounding airport communities. In response to Federal legislation dealing with the community impact of aircraft noise, the Federal Aviation Administration (FAA) is conducting comprehensive studies of the definition of aircraft noise. In support of the study objectives, the Douglas Aircraft Company, McDonnell Douglas Corporation, is engaged in an FAA-sponsored Aircraft Noise Definition Program. The program requires that Douglas provide graphic and computerized acoustic and performance data on selected aircraft that are in current fleet operations. The program objectives are to be developed in three phases: Phase I, Analysis of Existing Data; Phase II, Minimum Data Acquisition Program; and Phase III, Expanded Data Acquisition Test Program Plan. This report is a documentation of the results of flyover-noise testing of a Douglas DC-8-61 aircraft for the Phase II portion of the program.

The results of the Phase I analysis of existing Douglas DC-8, DC-9, and DC-10 aircraft flyover-noise data were reported in Reference 1. Certain techniques used in the analysis of the Phase I data were developed for Phase I, reported in Reference 1, and are therefore, in most instances, referenced rather than repeated.

Under Phase II, flyover-noise levels for specified combinations of aircraft performance and altitude for the DC-8-61 were measured and analyzed for a "minimum data acquisition program" with an objective to improve the existing data base and increase confidence levels in areas found to be deficient in the Phase I study. Also of interest is the variation of noise level with distance to the sideline from the aircraft flight path.

Presented in this report are detailed descriptions of the test conditions, the flyover-noise measurement system, and the data processing and analysis. The results of the data analysis are summarized, the data accuracy is discussed, and the 90-percent limits of confidence determined. In addition,

revisions of the computer program listings for acoustic-data computations, developed and reported in Phase I, are included in the appendixes to this report.

The effects of considering the variations in upper-air temperature and relative humidity on the propagation of the flyover-noise were studied with comparisons made between noise spectra adjusted on the basis of surface weather and a layered weather technique.

A suggested method to be used in the determination of sideline noise levels is also presented.

SECTION 2

TEST DESCRIPTION

Flyover-noise tests were conducted with a Douglas DC-8-61 aircraft at Yuma International Airport, Arizona. The tests consisted of level flights, and simulated take-off and approach flyovers as listed in Table 1, with flight profiles as shown in Figure 1. Microphones, space positioning, meteorological, and associated data recording systems were located as shown in Figure 2.

The tests were conducted during the evening and early morning hours of November 6 - 8, 1973. The time of day for each test run is given in Table 1.

This section describes the test aircraft, site, and data acquisition equipment used during the tests.

2.1 AIRCRAFT CONFIGURATION

The test aircraft was a Douglas DC-8-61 aircraft, Fuselage No. 373, FAA Registration No. N8087U, a commercial transport powered by four Pratt and Whitney JT3D-3B turbofan engines, equipped with production nacelles. The aircraft was leased from United Air Lines for the period of these flyover tests. Figure 3 is a three view of the DC-8-61 aircraft, showing the gross dimensions, location of the engines, the IIS glideslope antenna, and the laser tracking targets used for aircraft space position determination during the flyovers.

The aircraft systems configuration for these tests were pneumatic and hydraulic systems NORMAL, auxiliary power unit OFF, landing lights ON, and the landing gear extended for all runs. The aircraft gross weight and flap and landing gear position for each run are listed in Table C-1 of Appendix C.

TABLE 1
AIRCRAFT NOISE DEFINITION - PHASE II
DC-8-61 FLYOVER-NOISE MEASUREMENTS

RUN	DATE TIME	TARGET THRUST P _N /S	TYPE OF FLYOVER	HEIGHT OVER MICROPHONE (1)	FLIGHT PROFILE (FIG. 1)
1	11-7-73 0203	15000	FULL POWER TAKEOFF	1150	E1
2	0214	15000	FULL POWER TAKEOFF	1200	E2
3	ABORT		LEVEL	-	-
4	NO TRACKING		LEVEL	5080	F1
5	0242	15000	LEVEL	5000	F2
6	0253	15000	LEVEL	8030	F3
7	0303	10000	LEVEL	8080	F4
8	0315	10000	LEVEL	5000	I3
9	0327	10000	LEVEL	8000	H1
10	0340	10000	LEVEL	8000	K1
11	11-7-73 2338	15000	FULL POWER TAKEOFF	1120	E1
12	2348	10000	REDUCED THRUST TO	800	G1
13	2358	10000	REDUCED THRUST TO	900	G2
14	ABORT		REDUCED THRUST TO	-	-
15	11-8-73 0017	10000	REDUCED THRUST TO	900	G3
16	0032	2000	REDUCED THRUST APPR	1320	H1
17	0043	2000	REDUCED THRUST APPR	1400	H2
18	0080	2000	REDUCED THRUST APPR	1320	H3
19	0100	5000	APPROACH	1050	K1
20	0110	5000	APPROACH	1100	K2
21	0118	5000	APPROACH	1100	K3
22	0128	15000	FULL POWER TAKEOFF	580	I1
23	0138	15000	FULL POWER TAKEOFF	600	I2
24	0148	15000	FULL POWER TAKEOFF	2200	I3
25	0158	15000	FULL POWER TAKEOFF	2150	I4
26	0210	5000	LEVEL	2400	J1
27	0220	5000	LEVEL	2470	J2
28	0234	15000	LEVEL	5360	F1
29	0245	10000	LEVEL	5080	F6
30	0255	10000	LEVEL	5000	
31	0308	10000	LEVEL	8000	F8
32	0317	10000	LEVEL	8000	F9
33	0330	5000	LEVEL	5020	J3
34	0340	5000	LEVEL	5000	J4
37	0412	3200	LEVEL	380	M1
38	0420	3200	LEVEL	340	M2

NOTE:

TAKEOFFS -- STARTED FROM LEVEL FLIGHT, SIMULATED AFTER ARRIVAL AT A SELECTED POINT OVER RUNWAY

- a. FULL POWER TAKEOFF (RUNS 1, 2, 5, 6, 11 AND 22-25) -- RATED TAKEOFF ENGINE PRESSURE RATIO MAINTAINED
- b. REDUCED THRUST TAKEOFF (RUNS 12, 13 AND 14) -- POWER ADJUSTED FOR SPECIFIED ROTOR SPEED WITH CLIMBOUT AT PRESCRIBED AIRSPEED

APPROACH POWER -- MAINTAINED UNTIL END OF RUN ARRIVAL AT SELECTED POINT OVER RUNWAY, CONTINUED LEVEL UNTIL CLEAR OF AREA

- a. APPROACH (RUNS 19, 20 AND 21) ROTOR SPEED MAINTAINED TO MINIMIZE FAN NOISE VARIATIONS
- b. REDUCED THRUST APPROACH (RUNS 16, 17 AND 18) -- THRUST ASSOCIATED WITH HIGHER ANGLE GLIDESLOPE

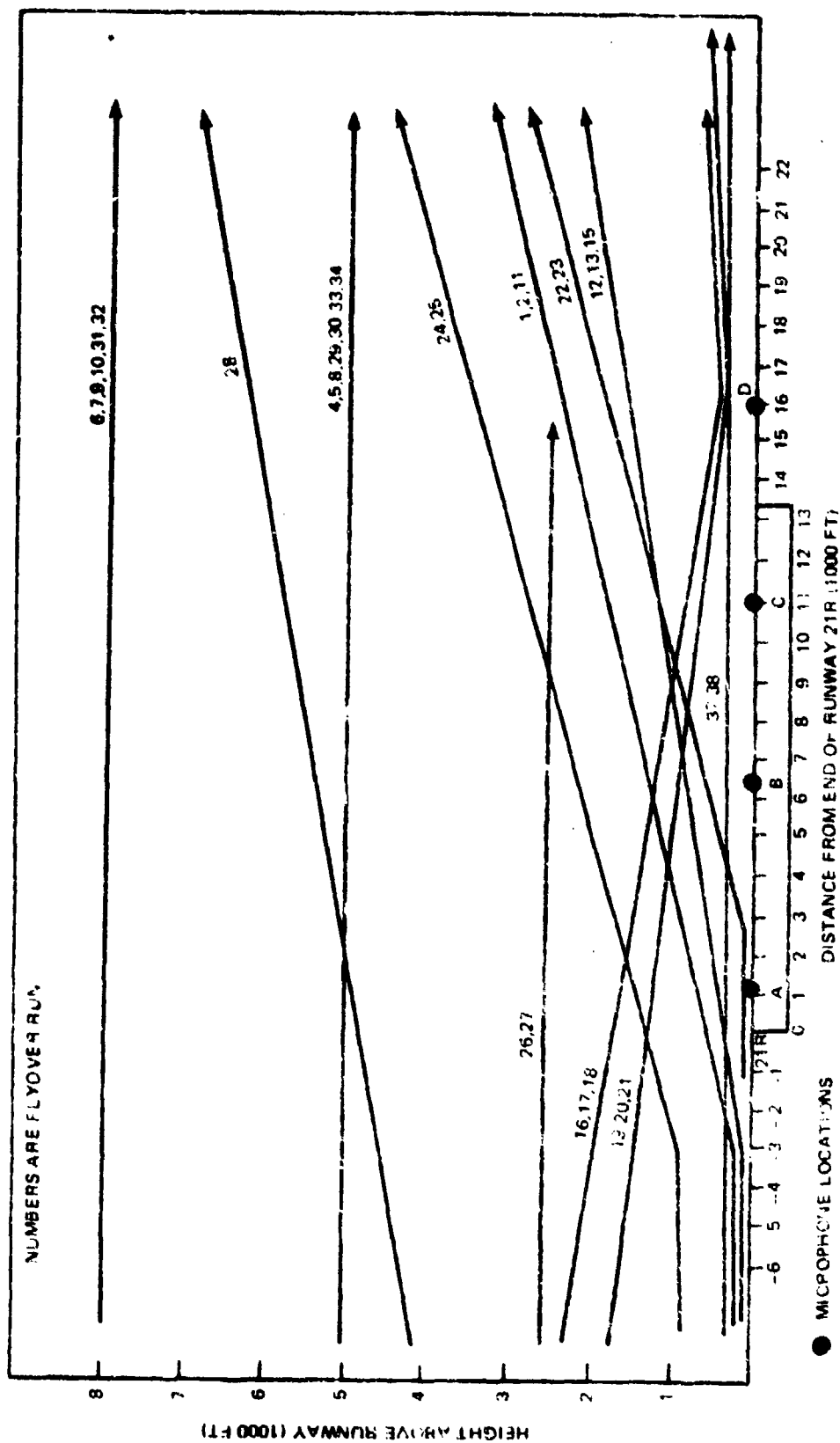


FIGURE 1. AIRCRAFT NOISE DEFINITION - DC-8-61 FLYOVER FLIGHT PROFILES

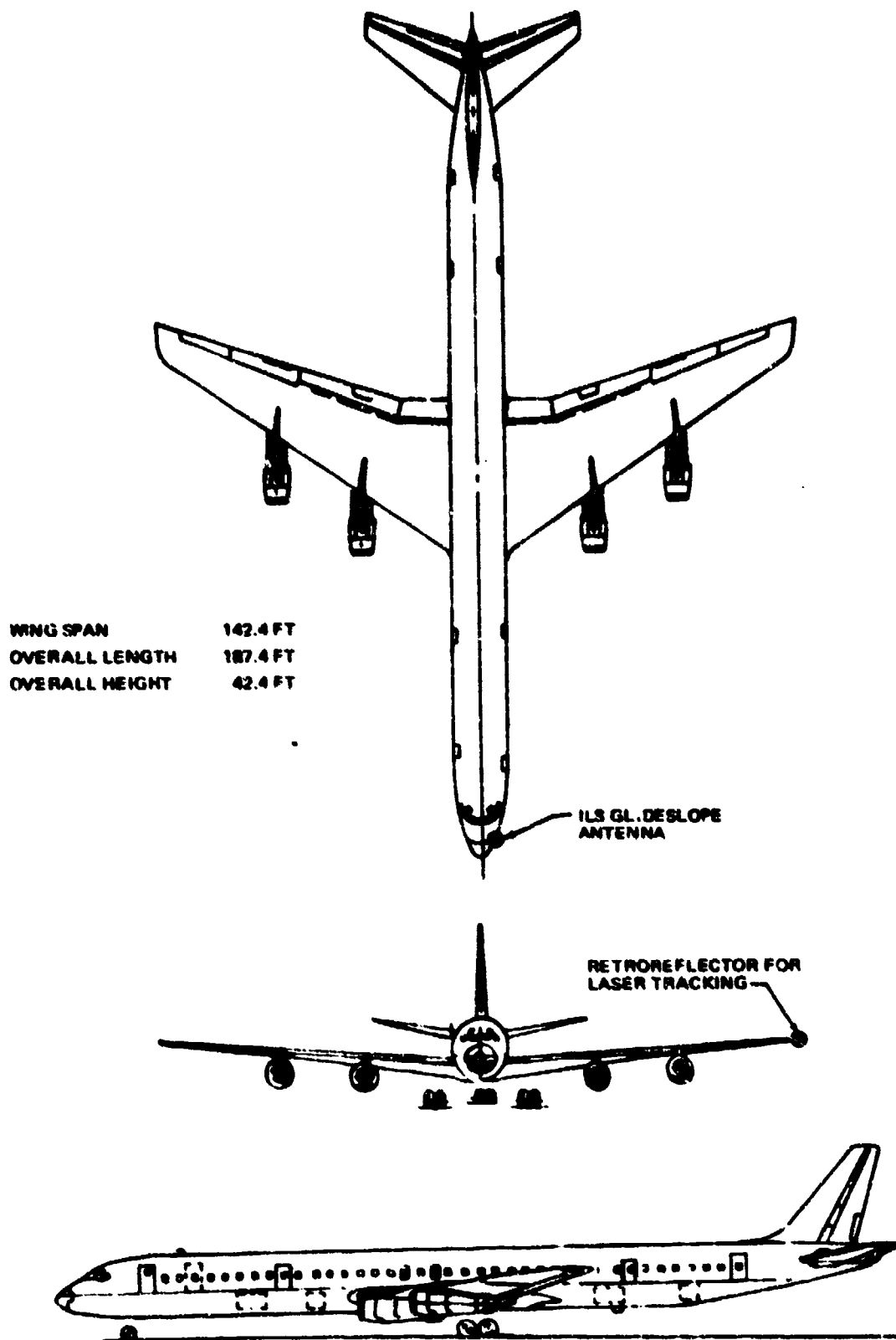


FIGURE 3. THREE VIEW OF DC-8-61

2.2 TEST SITE DESCRIPTION

The flyover-noise tests were conducted at the Yuma International Airport, Yuma, Arizona. The general topography of the test site and the location of the instrumentation systems are shown in Figure 4.

The natural surfaces are sandy soil having various degrees of compaction, with loose compaction predominating. The in situ surfaces adjacent to all test microphones were spaded in a random pattern to assure consistent surface conditions for all microphones, and also eliminate the possibility of excessive surface absorption at any of the measurement locations.

There were no obstructions, for example, trees, buildings, hills, or cliffs at any measurement point which were in violation of the 75-degree half-angle requirements. The terrain was not perfectly flat at all measurement points; however, it was acceptable for the purposes of acoustical measurements.

Climatological data for surface weather conditions at Yuma were compiled by National Weather Corporation for the month of November over a 14-year period. The data sources were (1) U.S. Air Force Revised Uniform Summary of Surface Weather Conditions (1950-1960) and (2) Environmental Science Service Administration climatological data for Yuma, Arizona (1960-1972). A summary of the frequency of occurrence of the surface weather conditions of wind, temperature, and relative humidity that are within FAR Part 36 limits as a function of calendar month is given in Figure B-1 of Appendix B.

A summary of temperature-inversion characteristics as a function of calendar month is given in Figure B-2 of Appendix B.



FIGURE 4. TOPOGRAPHIC MAP OF YUMA FLYOVER TEST SITE

Measured surface temperatures, relative humidities, wind speeds, and wind directions for the periods of the test aircraft flyovers are summarized in Table B-1 and Figure B-3 of Appendix B. Plots of the continuous recordings of the associated upper-air sound-path weather data are given in Figure B-4 of Appendix B.

All surface-weather measured data were within the FAR Part 36 limits of 41 to 86° Fahrenheit temperature; 30- to 90-percent relative humidity; and 0- to 10-knot wind speed.

2.3 FLYOVER-NOISE MEASUREMENT SYSTEM

The Douglas Aircraft Company has designed and developed a variety of special equipment and data instrumentation systems to meet requirements of the various acoustical tests conducted. Over the past 4 years Douglas has designed, developed, implemented (in an incremental fashion), and operated, at high utilization rates, a comprehensive state-of-the-art aircraft-noise measurement system described below. The subsystems used to acquire the required data during aircraft flyover noise testing are grouped into four categories; that is, those for acoustical, meteorological, space-positioning, and airplane operating parameters. These subsystems are shown in Figure 5.

2.3.1 Acoustical Parameters

The flyover-noise data acquisition system is shown in Figures 2, 5, and 6. The control portion of the system is housed in the mobile sound-recording van shown in Figure 5.

Eight of the nine microphones were tripod-mounted with the microphone cartridges 4 feet above the ground and oriented such that the flyover noise impingement on the microphone diaphragm was at approximately grazing incidence throughout the noise recording. The ninth microphone was flush-mounted (Figure 7). All microphones (except the flush-mounted) were fitted with windscreens for all tests. High-frequency preemphasis was utilized during recording of approach and takeoff noise tests. For each noise recording, the gain settings on the signal-conditioning amplifiers were set

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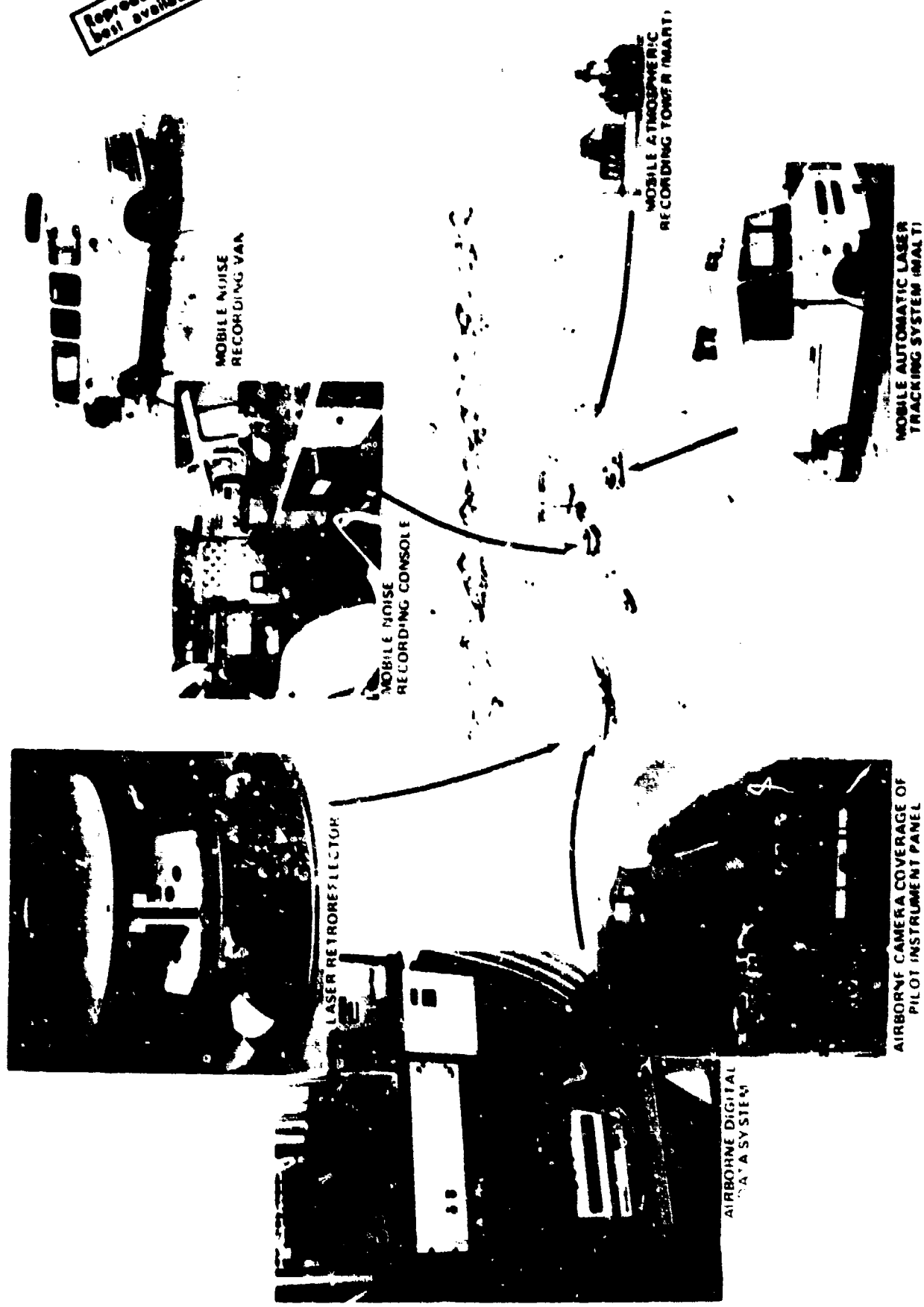


FIGURE 5. AIRPLANE FLYOVER - NOISE MEASUREMENT SYSTEMS

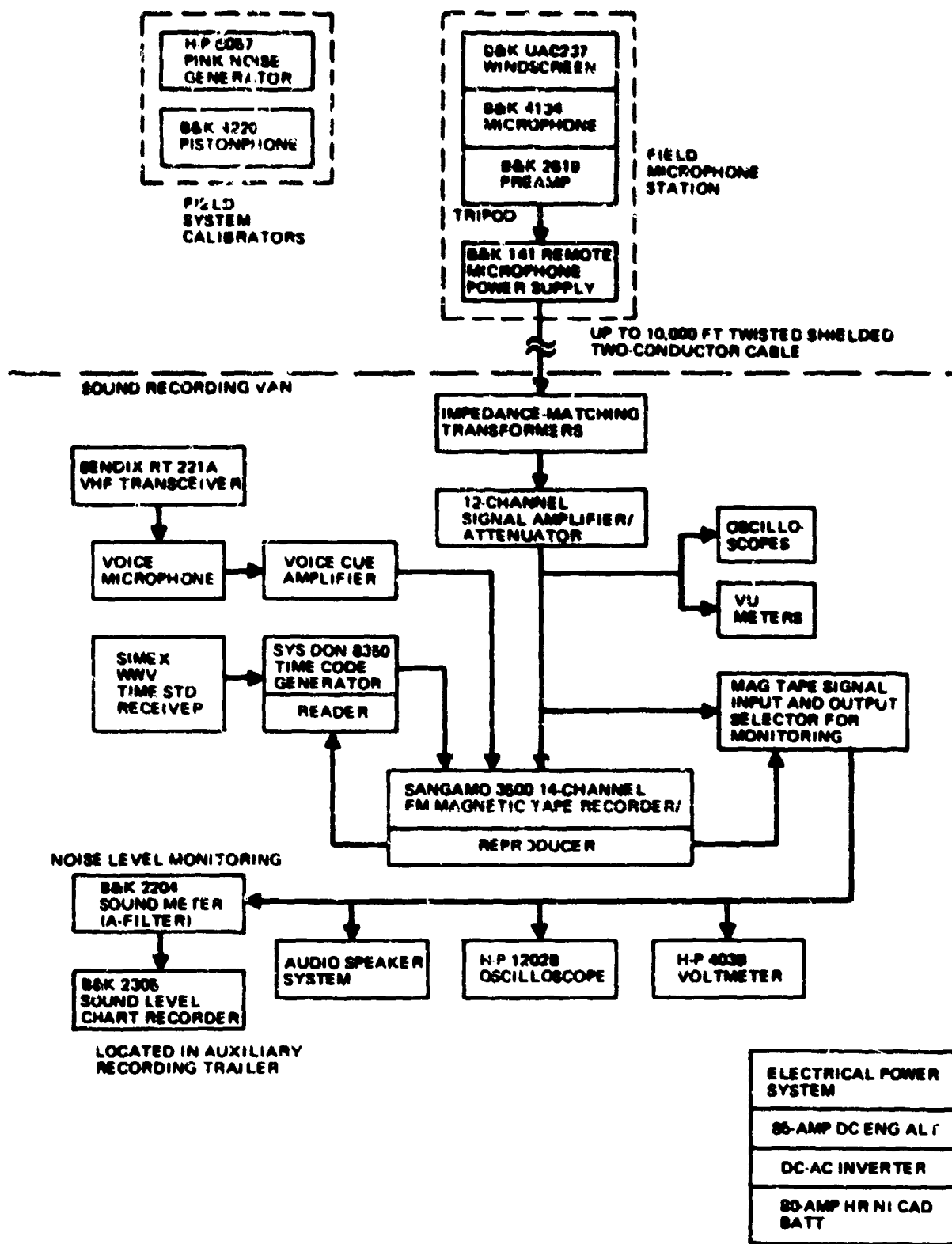


FIGURE 6. FLYOVER NOISE DATA ACQUISITION SYSTEM

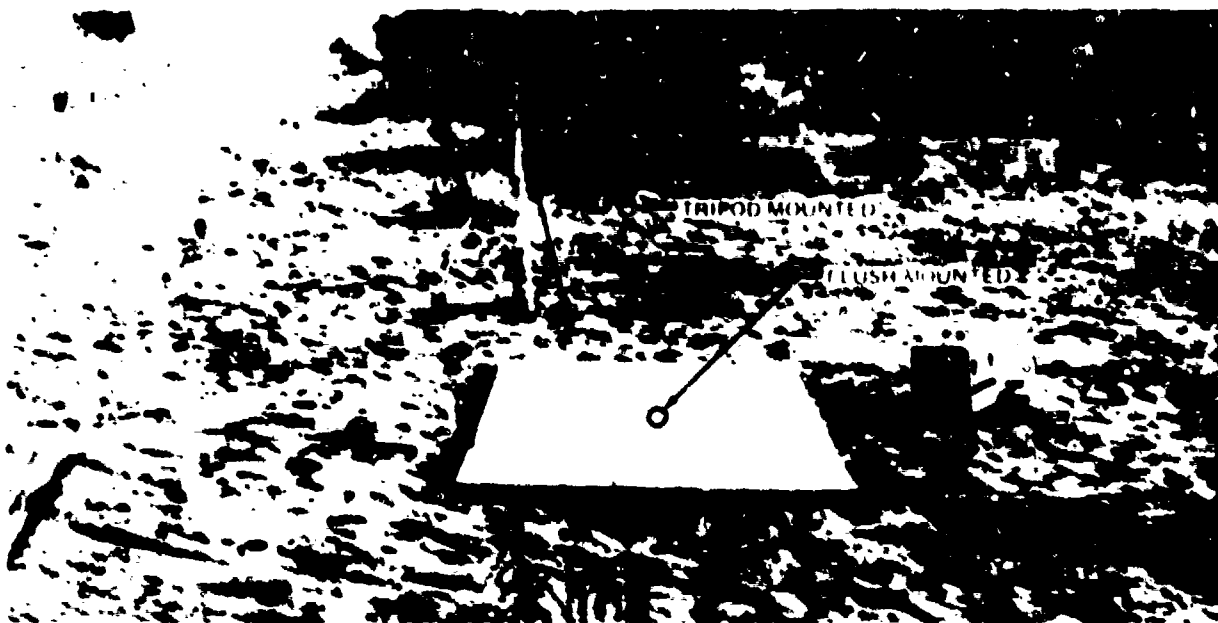


FIGURE 7. MICROPHONE INSTALLATIONS

to obtain optimum signal-to-noise ratios for optimum dynamic recording range on the magnetic tape. The flyover-noise data were recorded on a 14-channel intermediate-band FM recorder operating at 30 inches per second. In addition, the time of day (IRIG-B code) synchronized to the standard time broadcast by radio station WWV (National Bureau of Standards) was recorded on a separate tape channel, along with each flyover-noise recording. A dynamic system calibration with a reference sound pressure level was recorded in the field with a piston-phone that generates a sound pressure level of 124.0 ± 0.2 dB at 250 Hz. Frequency-response calibration signals of the recording system (excluding microphone cartridge) were recorded. The signals consisted of a 90-second recording of broadband "pink" noise generated by a precision pseudo-random noise generator with a noise period of 2.2 seconds.

Immediately before or after each flyover-noise measurement, a recording was made of the ambient noise levels, with the same system gain setting as was used for the flyover recording.

2.3.1.1 Psuedotone Correction - Flyover noise was measured with a flush-mounted microphone located at ground level in close proximity to one of the tripod-mounted noise measurements locations (Figure 7). The primary

objective of measuring flyover noise with this microphone was to establish the presence or absence of low-frequency pseudotones in measured flyover-noise spectra due to ground-reflection phenomena. A discussion of pseudotones and their significance is contained in Appendix D.

2.3.2 Aircraft Operation Parameters

The definition of flyover-noise levels for specific aircraft operation parameters required the monitoring and recording of (1) airplane flight conditions, (2) propulsion-system operation, and (3) airplane systems configuration. The parameters considered necessary to be recorded for the flight-test program are as listed in Table C-1 of Appendix C.

The flight-test aircraft was equipped with an Airborne Digital Data System (ADDS) (Figure 8), cameras focused on the pilot instrument panel and flight engineer panel (cockpit cameras) and other visual cockpit indicators (flight-card recording) (Figure 9). The ADDS uses both analog and digital transducers and includes signal conditioning, analog-to-digital conversion, and multiplexing to record all data on one tape track of a direct wide-band 1-inch recorder. Elapsed time was obtained by recording output signals of a time code generator on the data tape using the IRIG-B code.

Calibrated instruments were used to obtain the aircraft-system data listed in Table C-1.

2.3.3 Meteorological Parameters

Meteorological data, particularly temperature and relative humidity, are required to determine the attenuation of flyover noise due to atmospheric absorption and to correct the measured SPL's to standard or reference-day weather conditions.

2.3.3.1 Surface Weather Conditions - Flyover-noise meteorological equipment includes a 10-meter Mobile Atmospheric Recording Tower (MART) system with temperature, relative-humidity, and wind-velocity recorders, and is trailer-mounted and towed by the acoustics van (see Figure 5). Surface weather-sensing and -recording equipment includes two small portable

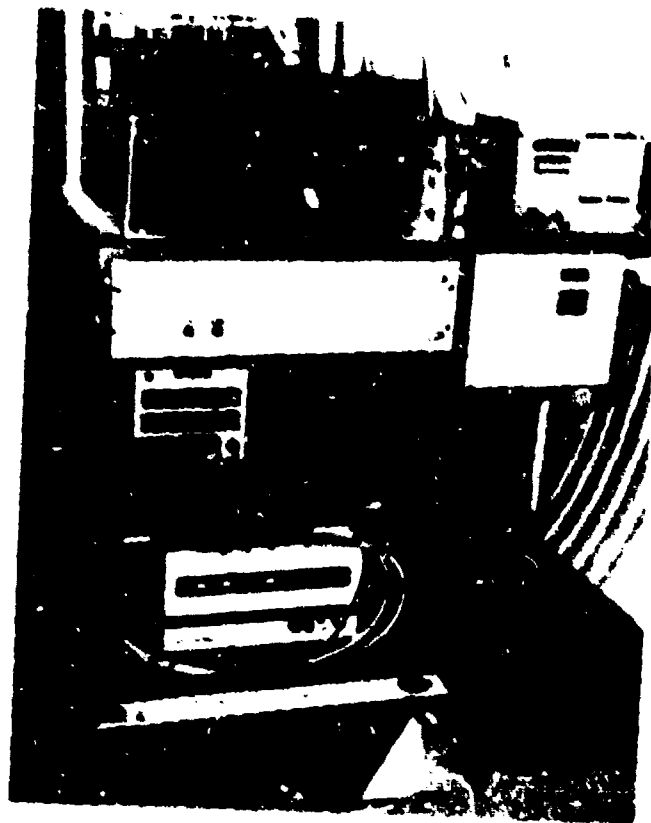


FIGURE 8. AIRCRAFT INSTALLATION OF MINI DIGITAL DATA SYSTEM

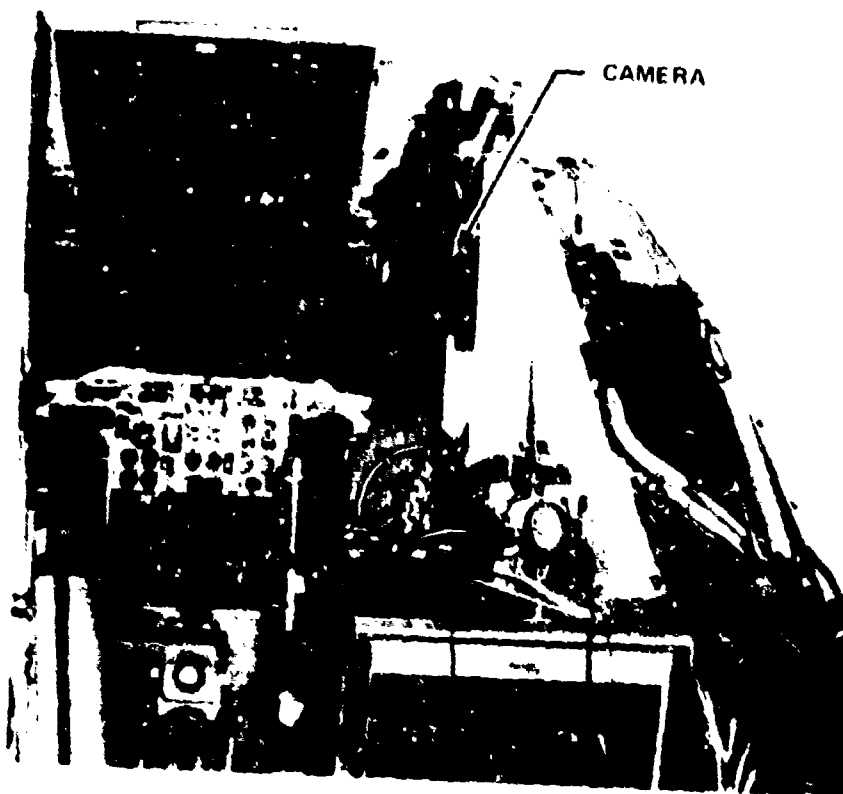


FIGURE 9. CAMERA COVERAGE OF PILOT INSTRUMENT PANEL

weather stations typically located at selected microphone locations for continuously recording the same parameters as above, but near microphone level (5 feet), and two sets of hand-held motor-driven precision psychrometers and wind-speed indicators.

The MART surface measuring system consists of a Beckman-Whitney Model No. 101 wind system producing a strip-chart record of wind speed and wind direction on time-calibrated paper and a Weather-Measure Model H341 temperature and relative-humidity measuring system, which also produces a time-calibrated strip-chart record.

2.3.3.2 Upper Air Sounding - Upper air sounding data were in general taken before, during, and after the flyover-noise tests to define the vertical gradients of temperature, humidity, and wind. The parameters measured were ambient air temperature, wind speed and direction and difference between wet- and dry-bulb temperatures. Data were recorded to the height of the test aircraft for a given series of flyovers (up to about 8000 feet). The minimum accuracies of these measurements were $\pm 0.5^{\circ}\text{F}$ for air temperature and the difference between dry-bulb and wet-bulb temperature, ± 3 knots for wind speed, and ± 10 degrees for wind direction. The sounding data summarized in Appendix B were obtained by the National Weather Corporation. The Figure B-4 plots represent data that was continuously recorded from ground level to the maximum altitude.

2.3.4 Space-Positioning Parameters

Accurate space-positioning data must be available during noise-data processing to define propagation distances for sound-path normalization. The sound-path distance must be precisely synchronized in time with the noise data. A Mobile Automatic Laser Tracking system (MALT) uses an autotrack monopulse optical-radar, with a multipower laser as the ranging beam energy source. MALT, which is self-contained in a small truck (Figure 5) uses a portable power source and can acquire, track, and record the position of a retroreflector-equipped airplane. Tracking range is up to 60,000 feet, with elevation and azimuth coverage of -5 to $+45$ degrees, and ± 120 degrees, respectively. If line of sight permits, microphone locations can also be determined from the MALT van, thereby eliminating the need

for normal surveying. All space-positioning data (and time codes) are recorded on magnetic tape in a digital format for subsequent computer processing.

Target acquisition is initially obtained manually by using a television monitor. Subsequent automatic tracking provides azimuth, elevation, and range data for magnetic-tape recording. The target aircraft retroreflector (Figure 5) reflects a 1060-Angstrom laser beam back to the receiver. The transmitter is a flash-pumped, Q-spoiled Nd:YAG laser that develops 1-MW peak power at a rate of 100 pps. The power of the system is automatically controlled as a function of range to keep the radiated power below the eyesafe level. Position accuracies achieved are ± 1.0 foot for aircraft at a range of 2000 feet and ± 12.0 feet at a range of 30,000 feet from the MALT system.

Data processing is accomplished on either the IBM 360 or Sigma 7 computers by using the original recorded tape as the input data tape. Space position data relative to the runway, or relative to any other desired coordinate system, are provided in selectable tabular or plotted formats. Velocity and acceleration data are derived from position data by standard vector techniques. Orientation and calibration of the MALT system are achieved by tracking surveyed static targets before and after each test. The processed data provide the rotation and translation coefficients necessary to represent the position of the aircraft relative to the desired coordinate system.

SECTION 3

DATA PROCESSING AND ANALYSIS

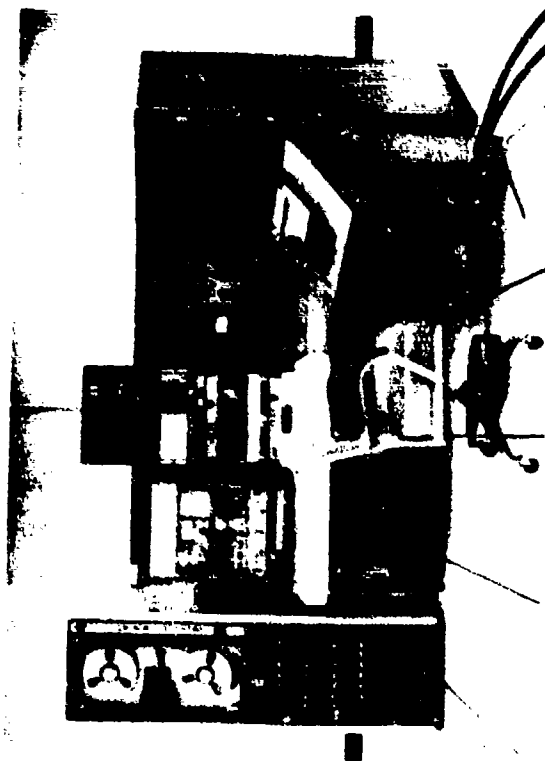
The information acquired for the various flyover-noise measurement parameters is processed by analog and digital data reduction and analyses. The Douglas-developed Flight Data Center (FDC) contains a large-scale digital computing system (XDS Sigma 7) and a variety of input and output devices, including tape drives, line-printers, card-readers, Cathode-Ray Tube visual displays, and hardcopy displays. The FDC which is shown in Figure 10 is the facility where all of the various types of data acquired by the noise-measurement system described in the previous section are integrated to generate the normalized flyover-noise levels discussed. The magnetic tape generated by the FDC is used as an input to a computer program determination of noise levels adjusted to reference conditions of weather and aircraft performance.

3.1 DATA PROCESSING SUBSYSTEMS

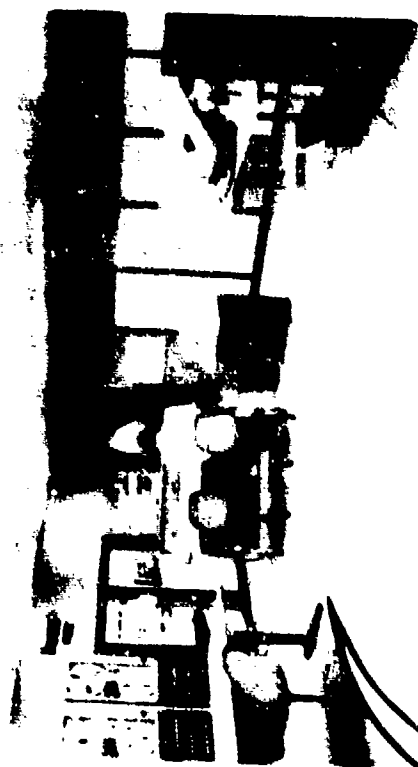
Noise signals on magnetic-tape recordings are reduced to time-series spectra by the Douglas-developed Controlled Integrating Spectrum Analyzer (CISA) shown in Figure 10. Figure 11 is a block diagram of the system, showing the data flow and monitoring points. The system consists primarily of a General Radio (GR) 1921 Real-Time Audio Spectrum Analyzer controlled by a small digital computer. An incremental magnetic tape is generated for further data processing within a large-scale digital computer (XDS Sigma 7). The GR-1921 is a hybrid spectrum analyzer with 24 analog 1/3 octave band filters and a digital detector section employing true integration techniques. This analysis system meets the requirements specified in Paragraph A36.2(d) of FAR Part 36. Table 2 lists some of the basic characteristics of the major components comprising CISA.

Each flyover-noise recording was digitized by using a 0.5-second integration period mode within the GR 1921, to encompass ambient noise and the 10-PNdB down points both prior to and past the point of maximum Tone Corrected Perceived Noise Level (PNLTM). The digitizing time-spans were determined from A-weighted-level histories of the flyover-noise recordings.

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CONTROLLED INTEGRATING SPECTRUM ANALYZER (CISA)



FLIGHT DATA CENTER COMPUTING FACILITIES

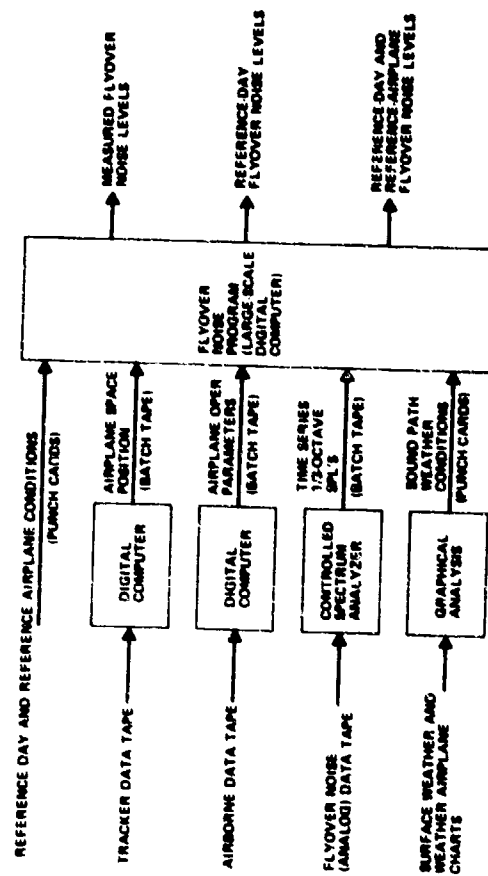


FIGURE 10. FLIGHT DATA CENTER

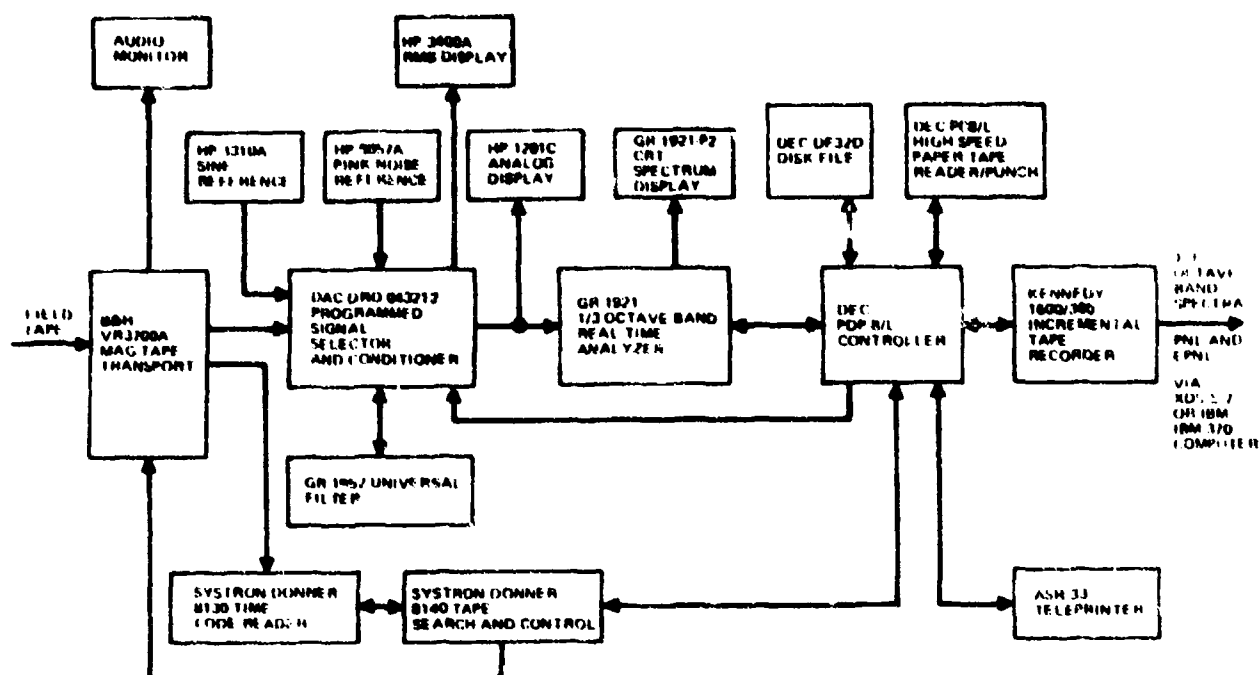


FIGURE 11. CONTROLLED INTEGRATING SPECTRUM ANALYZER (CISA)

TABLE 2
CHARACTERISTICS OF THE CONTROLLED INTEGRATING SPECTRUM ANALYZER (CISA)

I	GENERAL RADIO 1921 REAL TIME AUDIO SPECTRUM ANALYZER	III	KENNEDY MODEL 1600/360 INCREMENTAL TAPE RECORDER
FILTERS	ONE THIRD OCTAVE BAND ANALOG	TAPE DENSITY	800 BPI
CHANNELS	8 PARALLEL	WRITING SPEED	500 CHAR/SEC
FREQUENCY RANGE (MHz)	12.5 Hz TO 10 KHz	TAPE	1/2 INCH COMPACT TAPE
DYNAMIC RANGE	60 DB (DISPLAYED)	TAPE FORMAT	IBM SYSTEM 360 COMPATIBLE 9 TRACK NR
TYPE OF DETECTOR	DIGITAL TRUE INTEGRATION	CONTINUOUS READ CAPABILITY	
BASIC ACCURACY	10.5 DB (+1.0 DB OVER ENTIRE AMPLITUDE RANGE)	IV	SYSTEM DONNER 8130 TIME CODE TRANSLATOR
RESOLUTION	10.25 DB	CODE	MODIFIED BCD
CREST FACTOR CAPACITY	10 DB AT FULL SCALE	CODE OUTPUT	RED OR GREEN MONITOR AND SECOND
DETECTOR CHARACTERISTICS	RMS WITH TRUE LINEAR INTEGRATION	V	BELL & HOWELL VR 1300A FILM DATATAPE
INTEGRATION PERIODS	NOMINAL (SEC) ACTUAL (SEC)	TRACKS	14
	1/8 0.133	SPEED	3.34 IPS TO 120 IPS
	1/4 0.233	TAPE	1 INCH WIDTH
	1/2 0.500	MODE	FM
	1 1.150	BANDWIDTH (Hz)	DC TO 1000 Hz AT 100 IPS IN FM MODE
	2 2.300	VI	PROGRAMMED SIGNAL SELECTION AND CONDITIONER
	4 4.600	ATTENUATION	16.7 DB STEPS
	8 9.199	ACCURACY	10.1 DB STEP
	16 18.398	VII	SYSTEM OUTPUT AND TIMING
	32 36.794	MAGNETIC TAPE OUTPUT FORMAT	BINARY ANALYSIS
DIGITAL OUTPUTS	810 AND BINARY	CONTENTS	BAND NO. LEVEL DBR PLUS IDENTIFICATION
NOMINAL SENSITIVITY	0.1 VOLTS RMS FULL SCALE	24 CHANNEL GR 1921 PPS/L DATA TRANSFER	1.1 MSEC TOTAL TIME PER IDENTIFICATION PERIOD THAT NOISE DATA IS NOT BEING ANALYZED
II	DIGITAL EQUIPMENT CORP. PROGRAMMED DATA PROCESSOR (PDP 8)		
MEMORY SIZE	4096 12 BIT WORDS		
CYCLE TIME	1.6 MICRO SECONDS		
IO FACILITIES	ASH 33 TELETYPE HIGH SPEED PAPER TAPE READER/PUNCH		
PROGRAM LANGUAGE	PASCAL III		

The sound pressure level reference calibration signals, the broadband "pink" random noise, the frequency-response calibration signals, and the ambient noise were digitized for subsequent computer processing. Approximately 10 seconds of ambient noise were analyzed for each flyover-noise recording. To obtain a maximum degree of repeatability, the "pink" noise frequency-response calibration was processed by ensemble averaging within the XDS Sigma 7 of thirty 2.3-second integration-time data samples.

The Douglas-developed FORTRAN computer program (L3SL operating on an XDS Sigma 7 computer) is used to automatically edit and combine the measured 1/3-octave-band levels from the CISA system, the space-positioning data generated by MALT, the airplane-performance data as recorded by the ADDS, and the meteorological data from MART to obtain normalized 1/3-octave and full-octave band SPL's, as well as other flyover-noise measures such as PNL, PNLT, and EPNL (Figure 12). With the exception of the meteorological data, all of the above data are recorded in digital format on magnetic tape, with punched cards as an alternate. The meteorological data are normally input on cards.

To meet the requirements of FAR Part 36, Paragraph A36.2(d) (4), the computer program performs "moving averages" of three 0.5-second scans (obtained from the CISA 0.5-second integration-time samples) to produce sound pressure level values (corresponding to "Slow" on a Sound Level Meter) every 0.5 second.

The computer program corrects any effects that the ambient noise may have on the flyover-noise sound pressure levels and to ensure that erroneous spectral irregularity corrections are not computed when the flyover-noise levels fall below the ambient noise levels. All flyover-noise levels between 5 dB and 10 dB of the ambient noise are corrected for the presence of the ambient noise on an energy basis. The standard acoustical procedure used consists of converting the decibel levels to relative powers, subtracting the ambient power from the flyover-noise power, and then converting back to decibels. All flyover-noise band levels within 5 dB of the ambient-noise

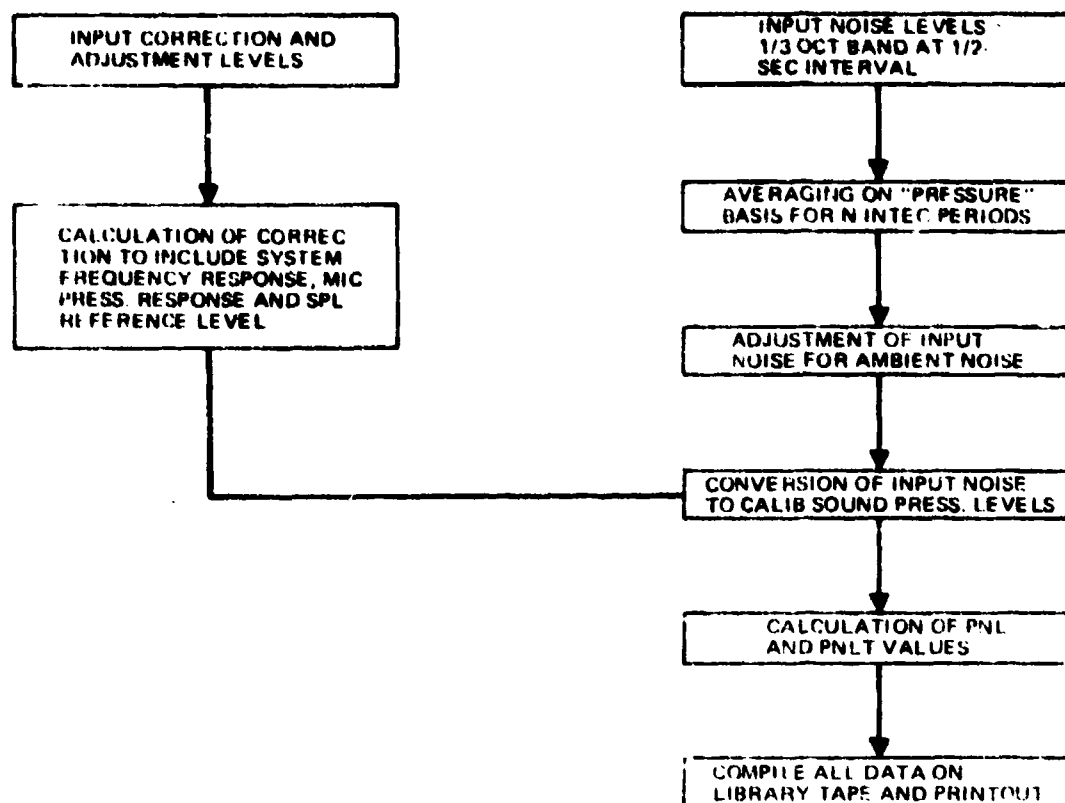


FIGURE 12. BASIC DATA COMPUTING FLOW FOR TEST DAY PNL'S AND PNLT'S (PROGRAM L3SL)

band level are deleted. For the spectra with deleted noise band levels, additions were made to the tone-correction procedure of Appendix B, FAR Part 36. Thus averaged levels (from pre- and post-deleted band levels) are used to prevent calculation of erroneous tone corrections for spectra with deleted-noise band levels.

The computer program automatically accounts for all gain adjustments applied to the data generated by CISA, normalizes the 1/3-octave band levels using reference-level calibration signals of any frequency in the range of interest, adjusts for system frequency response by using recorded broadband-random pink-noise signals, and accounts for the presence of background noise on an energy basis.

Values of PNL and EPNL were derived after the application of FAR Part 36 required procedures. They include data-averaging time, averaging-time mode, duration-time mode, deletion of spurious tone corrections, atmospheric-attenuation corrections (Reference 2), and reference flight profiles and/or reference microphone positions.

The L3SL OCUM* output tape was combined with airplane measured and calculated engine performance data (program C3AC) by using Sigma 7 Computer Program A9NG. The resulting Sigma 7 TMERGE* tape was then input into IBM 370 computing system utility program A9NA.

For engine parameters such as rotor speed (N_1), a short time average (time = closest point of aircraft/200) centered about PNLTM (± 0.5 sec) was obtained. A simple average of the N_1 from each of the engines was computed and used as the N_1 for that flyover. Other parameters on the data tabulations that remain constant during each run, such as flap position, were obtained directly from the tabulations.

For certain incomplete MALT space-positioning data, a manual position technique was used to determine aircraft position and path airspeed data. The technique is discussed in Appendix A.

The output of the data-processing procedure consists of a variety of line printer tabulations, computer-generated plots, and a computer-generated compressed composite magnetic tape that contains the time histories of the test day 1/3-octave band sound pressure levels, time correlated with engine and flight parameters weather, and space position data. This tape is generally the source of data for subsequent engineering analyses.

3.2 AIRCRAFT THRUST CALCULATION

Thrust was obtained from an engine performance program (F2RA02) made up of installed-engine fan and gas-generator characteristics coupled with a thrust calculation procedure based on the Douglas nozzle characteristics. These characteristics were derived from flight tests of the JT3D-3B-powered DC-8-55 and DC-8-61 aircraft during initial certification.

Thrusts for the Phase II test runs were obtained by using the measured in-flight engine pressure ratios (EPR) for the given test-run flight conditions with the F2RA02 engine performance program.

*Douglas designation for binary magnetic tape record

3.3 DATA ANALYSIS, ADJUSTMENT, AND PRESENTATION

3.3.1 Data Analysis

The magnetic tape generated by the digital computing system (XDS Sigma 7) is the source of input data for an IBM 360 computer program (E2QH) used to process the flyover-noise data to determine test and reference-day EPNL's and peak A-weighted sound levels. A flow diagram of this program is given in Figure 13. The line printer output from the E2QH computer program provides test and reference-day (77°F and 70 percent relative humidity), time histories at 0.5 second intervals, aircraft slant range, 1/3-octave band sound pressure levels, perceived noise levels (PNL), tone corrected perceived noise levels (PNLT), A-weighted sound levels, and overall sound pressure levels. The ambient 1/3-octave band and overall sound pressure levels for each measurement are listed. Test and reference-day effective perceived noise levels (EPNL) are also calculated. Representative examples of this presentation are shown in Table C-2 of Appendix C. For final presentation, the EPNL data are adjusted in accordance with FAR Part 36 procedures to reference conditions appropriate for the aircraft, and noted for each set of curves.

Presented in Table E-1 of Appendix E is a summary of the test-and reference-day EPNL and peak A-weighted sound levels, the applicable adjustments to these levels, and the corresponding adjusted values for the flyover-noise levels. Discussed in Appendix E, is the sequential procedure followed in applying each adjustment to derive the flyover-noise levels.

3.3.2 Data Adjustments

The E2QH computer program is based on the specified procedures of FAR Part 36 and is designed to provide flyover-noise levels for aircraft noise certification. To meet the data presentation requirements for the Aircraft Noise Definition Program certain adjustments must be made to the EPNL and A-weighted sound levels provided by the production version of the E2QH computer program. These adjustments were made to account for the presence of psuedotones and to normalize each run to a target aircraft power setting and airspeed. The discussion of psuedotones is presented in Appendix D. For the Phase II data, Table E-1, all tone corrections at

frequencies below 1600 Hz were considered as psuedotones resulting from ground reflection phenomena and not characteristic of the source noise. Therefore, the PNLT values obtained from the (E2QH) computer program analyses were modified, as necessary, so as not to be based on psuedotone corrections. A summary of the psuedotone adjustments is shown in Table D-1 of Appendix D.

Power-setting adjustments are made in both EPNL's and A-weighted levels to normalize each data point to the target thrust of the group. The adjustments applied to the reference-day noise levels are listed in Columns 18 and 20 of Table E-1.

The reference-day EPNL's are adjusted to reference airspeeds appropriate for the power setting. Column 17 of Table E-1 is a tabulation of the corrections determined by the relation

$$\Delta \text{EPNL} = 10 \log_{10} (V_{\text{Test}}/V_{\text{Ref}}).$$

The reference airspeeds (V_{Ref}) are representative of those associated with FAR Part 36 noise certification at the DC-8-61 maximum takeoff and landing gross weights (325, 000 and 240, 000 pounds) and their respective flap settings 15 and 50 degrees. On the basis of reference-day weather conditions, the reference airspeeds used were 180 KTAS for takeoff and 155 KTAS for approach.

4.3.3 Data Presentation

The reference-day, adjusted noise levels, listed in columns 19 and 21 of Table E-1 provide the input data for the noise curve development procedure discussed in Appendix F. The adjusted acoustic data are plotted as noise level variation with distance in groups comprising data of one power setting, and a least-square curve is faired through the data points. For purposes of smoothing and extrapolating the curves, cross plots are made at selected slant ranges to provide the means for plotting all the desired thrust settings.

Power settings for the DC-8 aircraft are identified by referred net thrust (F_N/c_{amb}); approach power settings are also identified by referred tan speed ($N_1/\sqrt{\theta T_2}$), in order to be compatible with the approach performance

charts in Reference 1. Linear interpolation may be used for determining noise levels at intermediate power settings within a set of curves normalized to the same airspeed.

For thrust values between takeoff and approach, appropriate adjustment of the noise curve is required before the interpolation is performed. The difference in terms of EPNL between takeoff and approach airspeeds is 0.6 EPNdB. The transition range for the DC-8 aircraft is between 6000 and 8000 pounds. If, for example, the DC-8-61 is in a takeoff condition at 7500 pounds thrust, the levels along the 5000-pound thrust curve should be decreased by 0.6 EPNdB (corresponding to conversion to 180 KTAS) before interpolation is performed. If the airplane is in approach, the 0.6 EPNdB should be added to the 8000-pound curve before interpolation is performed.

The power setting usually falls within the airspeed range of either takeoff or approach, and the airspeed correction applied to the curve value of EPNL is calculated in a straightforward manner.

SECTION 4

DISCUSSION OF RESULTS

The analysis and resultant noise level information presented in this report are based on the flyover-noise measurement data obtained from the Phase II DC-8-61 aircraft flight test conducted during the period 6-8 November 1973. The analytical methodology and acoustic data computations developed in Phase I of the program were applied to the data. The results of the analysis of the acoustic data are presented as variations with slant range of reference-day (77°F, 70-percent humidity) EPNL and peak A-weighted sound level's, dBA, (maximum A-weighted sound levels during flyover). The data were plotted for several power settings ranging from takeoff thrust to the thrust typical of a high-glide-slope approach. In addition, the effects of elevation angle or sideline distance from the flight path were studied, and levels of lateral noise attenuation were defined. The statistical accuracy of the data used in the EPNL plots was also determined.

4.1 EFFECTIVE PERCEIVED NOISE AND A-WEIGHTED SOUND LEVELS

The results of the analysis of the Phase II flyover-noise measurements are presented in Figures 14 and 15 as EPNL and A-Weighted sound level variations with slant ranges. The preparation of the plots followed the techniques discussed in Section 3 and was identical to that used in the Phase I analysis of existing DC-8-61 flyover-noise data.

Comparison of Figures 14 and 15 with the respective plots of Phase I data (Figures 3 and 4 of Reference 1) shows a general overall lowering of noise levels for a comparable engine thrust and slant range. Plots of the EPNL variations with slant range are compared in Figure 16 for two representative thrust settings. The difference in EPNL's varies between 4 dB at short slant ranges (400 feet) and 6 to 12 dB at large slant ranges (5000 feet). A similar comparison between the A-weighted sound levels would show 2 to 4 dB(A) at short ranges (400 feet) and 5 to 9 dB(A) at large slant ranges (5000 feet).

FLYOVER NOISE LEVELS

DC-8-61

FOUR JT3D-3B ENGINES

TEMP 17° F
REL HUM 70%

NORMALIZED
EFFECTIVE PERCEIVED NOISE LEVEL, EPNL

$F_{N_{1/2}}$ and $N_{1/2}$ V_{ref}

15,000 8695 180

10,000 5716 180

5,000 4400 165

3,200 3870 156

2,000 2905 146

SLANT RANGE AT CPA, FEET

FIGURE 11. EFFECTIVE PERCEIVED NOISE LEVEL VARIATIONS WITH SLANT RANGE

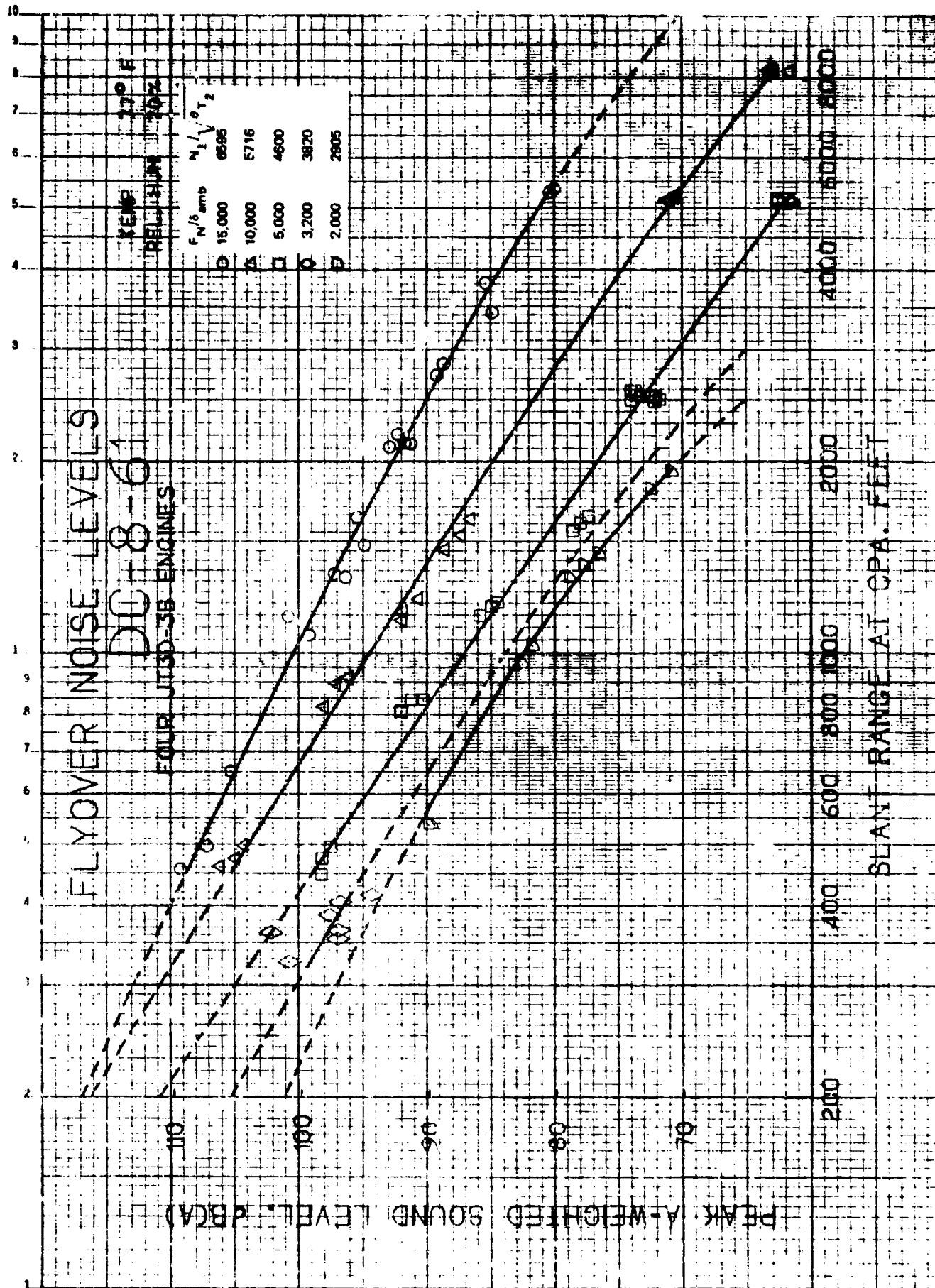


FIGURE 15. PEAK A-WEIGHTED SOUND LEVEL VARIATIONS WITH SLANT RANGE

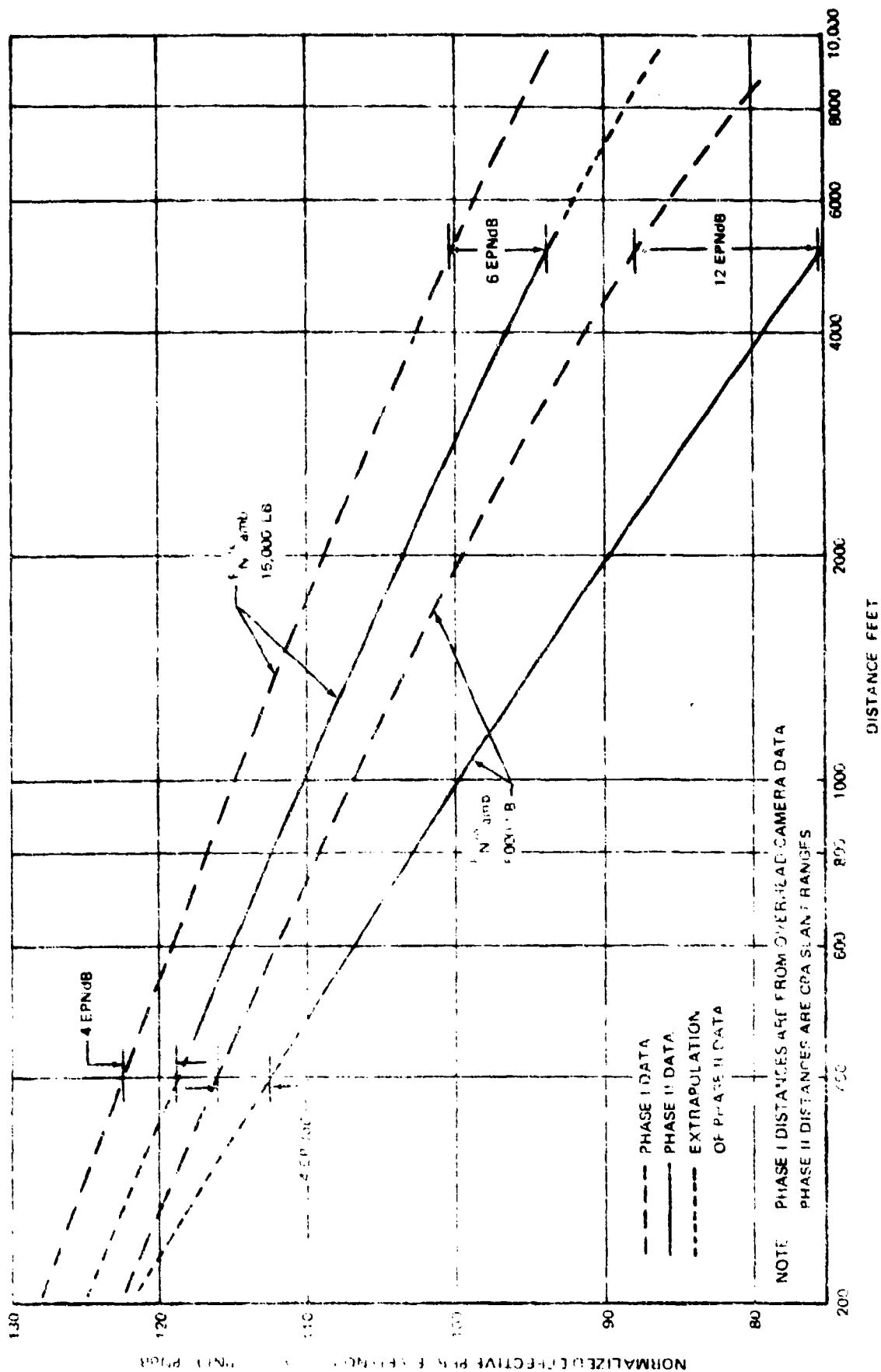


FIGURE 16. COMPARISON OF PHASE I WITH PHASE II NOISE LEVELS

An investigation of these differences was made by reviewing the methods used in data acquisition, processing, and analysis. The investigation identified several factors that could explain the differences in the two sets of data. Quantitative estimates of the effects of three of the factors have been made, but such estimates of the effects of other factors are not available. The discussion that follows indicates the effects of the partial adjustment resulting from the application of the three quantitative estimates.

Different methods were used in determining the flight paths of the airplane. For the Yuma tests, the MALT tracking system (Paragraph 2.3.4) was used, which has a demonstrated accuracy of ± 0.05 -percent. For the Fresno tests, the less accurate photographic method was used. The photographic method has a ± 10 -percent estimated degree of repeatability (within two standard deviations).

The noise measurement and data processing systems for the two tests were not identical, but it is believed that the differences could not have introduced any appreciable variances in the noise data.

There were three differences in the noise analyses. First, the Yuma data were corrected for pseudotones in the low frequency bands of the spectra. No pseudotone corrections were applied to the Fresno data, however. Had corrections been applied, the Fresno data would have been adjusted downward by about 1 EPNdB. Second, the sound-path distances were determined differently. The direct overhead height to the aircraft was taken as the sound-path distance in the Fresno tests. For the Yuma tests, the true sound-path distance (distance between microphone and airplane at the time of PNLTM) was used. A quantitative estimate of the effects of this difference is not available. Third, the aircraft overhead height was taken as the slant range at CPA in plotting the Fresno data. The Yuma data were plotted at the true values of slant range at CPA. The use of the true slant range for the Fresno data would have reduced the noise levels approximately 0 to 0.5 EPNdB. The simplifying assumptions used in the Fresno analyses were appropriate in that program, since the primary objective of the program was the determination of the incremental changes in noise due to nacelle acoustical treatment. Accuracy in the absolute levels of the noise was of lesser importance.

A review of the surface and sound-path weather records obtained during the two tests showed that the surface weather conditions were acoustically similar but that the sound-path weather during the Yuma tests was characterized by generally lower absolute humidities. Differences in the test-day noise spectra tend to reflect the weather variations in that the low-frequency bands of the spectra tended to agree well, but the SPL's in the higher frequency bands for the Yuma data tended to be lower. In conformance with Part 36 procedures, weather corrections have been based only on surface weather.

Although no validated method for adjusting noise for sound-path weather variations is known, an estimate was made of adjustments in the Yuma data that might roughly account for the sound-path weather variations. This estimate and its results are presented in Appendix G, where possible adjustments ranging from +0.3 to +2.9 EPNdB are indicated. The adjustments for the takeoff power average +0.7 EPNdB, for cutback power +1.2 EPNdB, and for approach power +1.8 EPNdB. Corresponding adjustments for the Fresno data are not available.

The three quantitative adjustments mentioned above are compared in Table 3 with the incremental differences. An explanation of the residual differences shown in Table 3 could conceivably be found in the combined effects of the lesser altitude accuracy of the Fresno data and the lack of a consistent and validated method for adjusting both sets of data for sound-path weather variations.

TABLE 3
PARTIAL ACCOUNTING OF DIFFERENCES BETWEEN
PHASE I AND PHASE II

	LOW ALTITUDE/ APPROACH THRUST (400 FT/5,000 LB)	LONG SLANT RANGE/ TAKEOFF THRUST (3000 FT/15,000 LB)
REPORTED EPNdB DIFFERENCE (PHASE I - PHASE II) (FIGURE 16)	+4	+6
PSUF/TONE ADJUSTMENT	1	1
ALTITUDE VS CPA PLOTTING ADJUSTMENT	0	-0.5
LAYERED WEATHER ADJUSTMENT	2	1
ADJUSTED DIFFERENCE (PHASE I - PHASE II)	+1	+3.5

4.2 LATERAL NOISE ATTENUATION

The determination of noise levels from an aircraft flyover directly overhead depends on measurement of a complex set of physical variables. The variations of noise level with distance shown in Figures 14 and 15 are based on measurement of these variables. However, the generation of community noise-impact area contours utilizes not only overhead noise data but also data from the slant-range sideline noise measurements for given aircraft-altitude profiles. Variations of extra ground attenuation (EGA), shielding, and directivity effects as functions of elevation angle (β), must be considered in any accurate definition of noise impact area. As a Phase II study objective, data were measured on either side of the flight path during aircraft flyovers and analyzed in an effort to determine these combined effects on lateral noise attenuation.

Figure 17 is a plot showing the variation of lateral noise attenuation with elevation angle (β) for three power settings. The variation is a function of β and the distance D to the side of the flight path. The data points shown comprise a range of sideline distances from 2500 feet to 8000 feet and slant ranges to approximately 9900 feet.

To normalize the data, differences in noise levels for equal overhead and sideline sound paths were calculated, thus removing effects of attenuation due to atmospheric absorption and spherical divergence. When plotted, the data points collapse to a single curve, rather than the expected spread at any given elevation angle with variations in sideline distance. These data would indicate that the lateral noise attenuation is primarily a function of elevation angle (β); and that the effect of sound path length is negligible. Additional noise-level measurements at sideline distances of 500 to 1500 feet and at low aircraft altitudes (300 feet); as well as large slant-range flyovers at small elevation angles, should help to confirm or revise the observed trend.

4.3 LATERAL PROPAGATION EFFECTS

The possible effects of test-site asymmetry on flyover-noise level measurements are recognized. Other studies (Reference 5) have ascribed

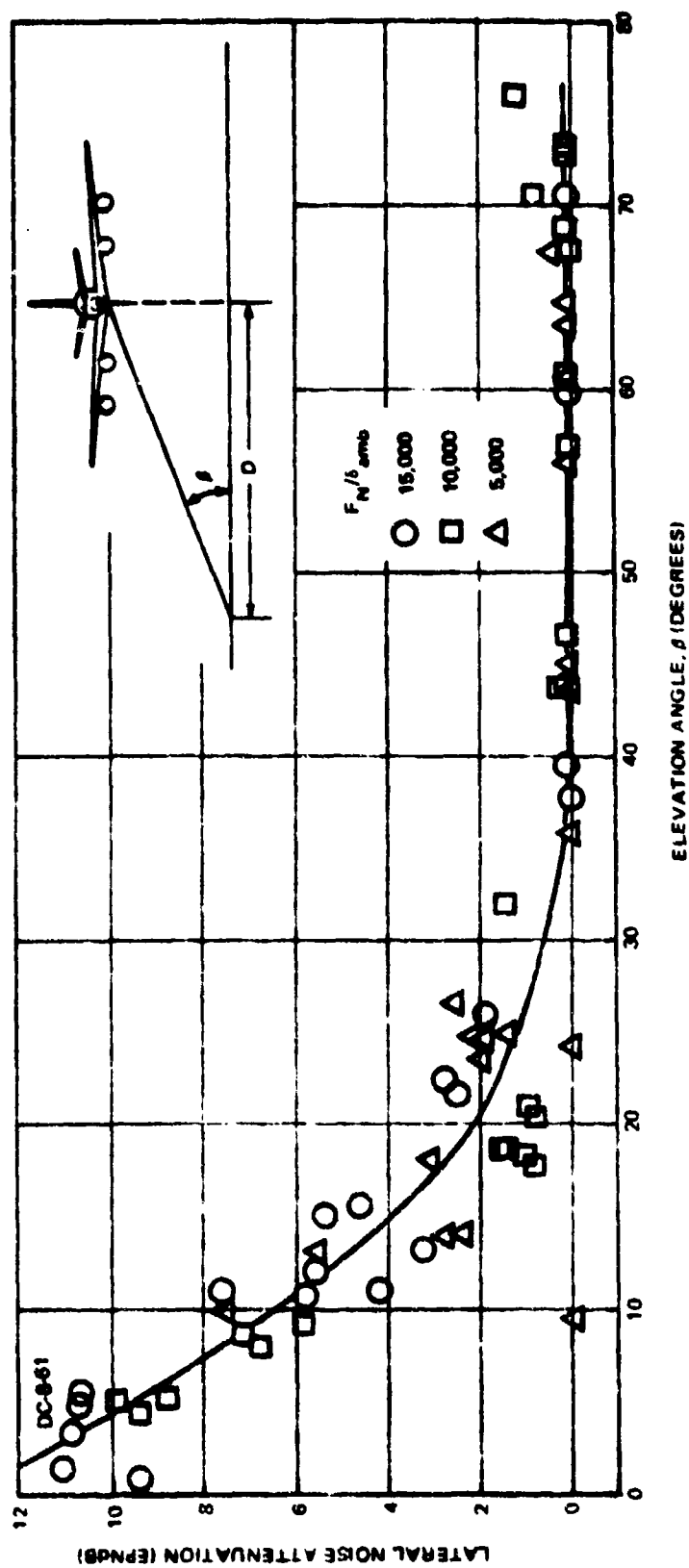


FIGURE 17. VARIATION OF LATERAL NOISE ATTENUATION WITH ELEVATION ANGLE, β

to EGA, anomolous sideline noise levels for small elevation angles (3- to 4-degrees) of the flyover aircraft (400 feet). It was pointed out that elevation differences between sideline measurement locations could be the "explanation" for differences in long-range (6000 feet), symmetrical, sideline noise-level measurements.

In selecting Yuma International Airport as the test site for the Phase II flyover tests, consideration was given to the relatively flat terrain; and although the data from the tests have limitations (single location on NW side), a quantitative evaluation was made of the test site asymmetry.

Figure 18 shows plots of EPNL variations with distance to the sideline of the flight path, at altitudes near 1,000 feet, for thrust settings of 15,000, 10,000, 5,000, and 2,000 pounds. The plots show symmetry for the data available, however, on one side only a single location at 2500 feet was used. Therefore, the symmetry at large sideline distances and low elevation angles could not be determined.

Figure 19 presents similar plots for thrusts of 15,000, 10,000, and 5,000 pounds at altitudes near 5000 feet. The curves are relatively flat compared to those in Figure 18, this demonstrates the effect of the difference in sound path length between overhead and sideline locations. The relative increase in sound path lengths in going from an overhead distance of 1,000 feet to a sideline distance of 8,000 feet is approximately eight times (Figure 18); the relative increase in sound path distance in going from an overhead distance of 5,000 feet to a sideline distance of 8,000 feet is approximately 1.9 times (Figure 19). The difference in attenuation for these distance factors, based on spherical divergence is approximately 12 dB.

Figure 20 shows the noise level variation for overhead and sideline distances for various aircraft flyover altitudes at takeoff thrust. As the flyover altitude is increased, there is a noticeable flattening of the curves, because the centerline noise levels decrease and the sideline noise levels increase with increasing elevation angle (β).

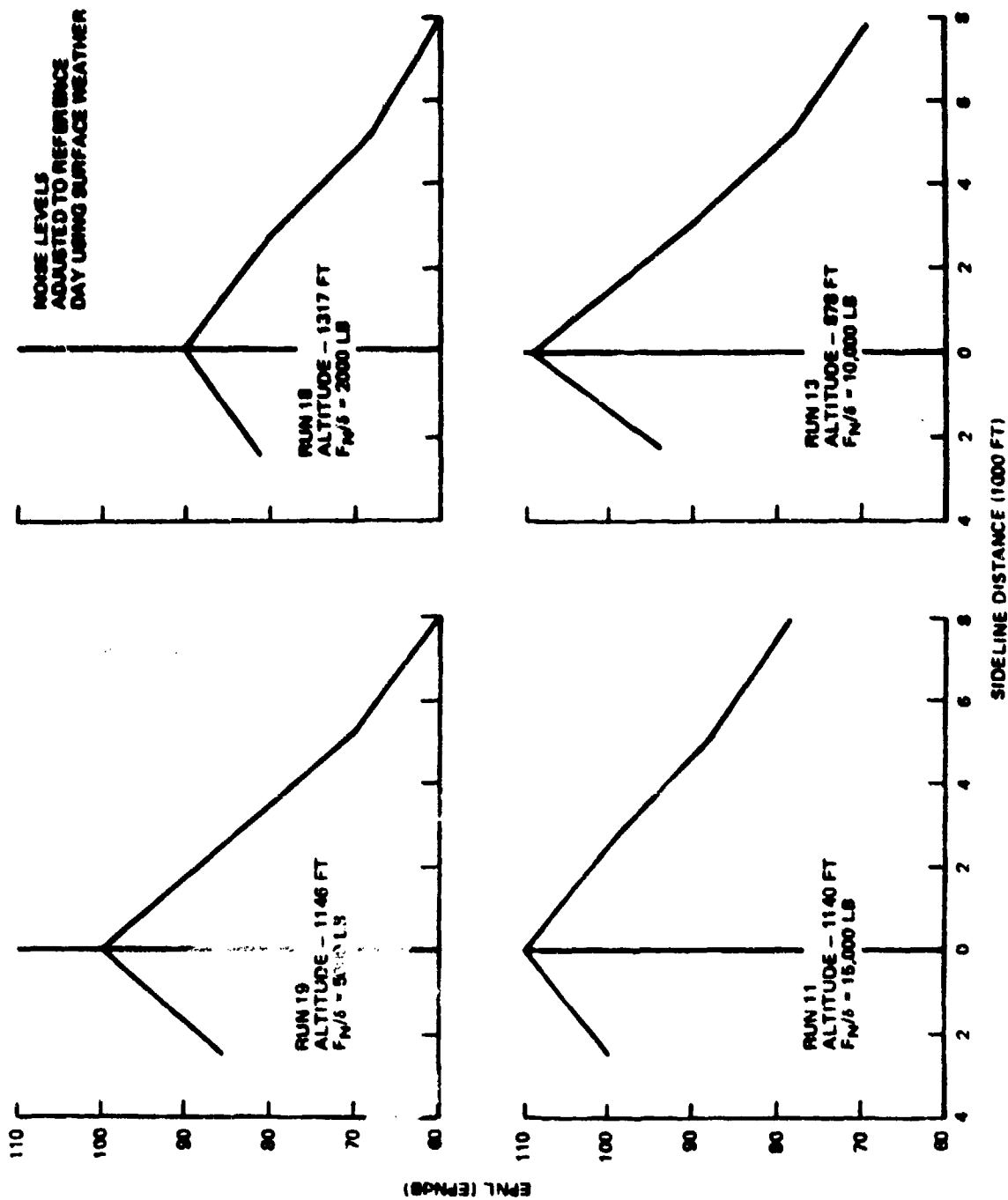


FIGURE 18. VARIATION OF NOISE LEVEL WITH SIDELINE DISTANCE FOR
VARIOUS THRUSTS - AIRCRAFT ALTITUDE NEAR 1000 FT

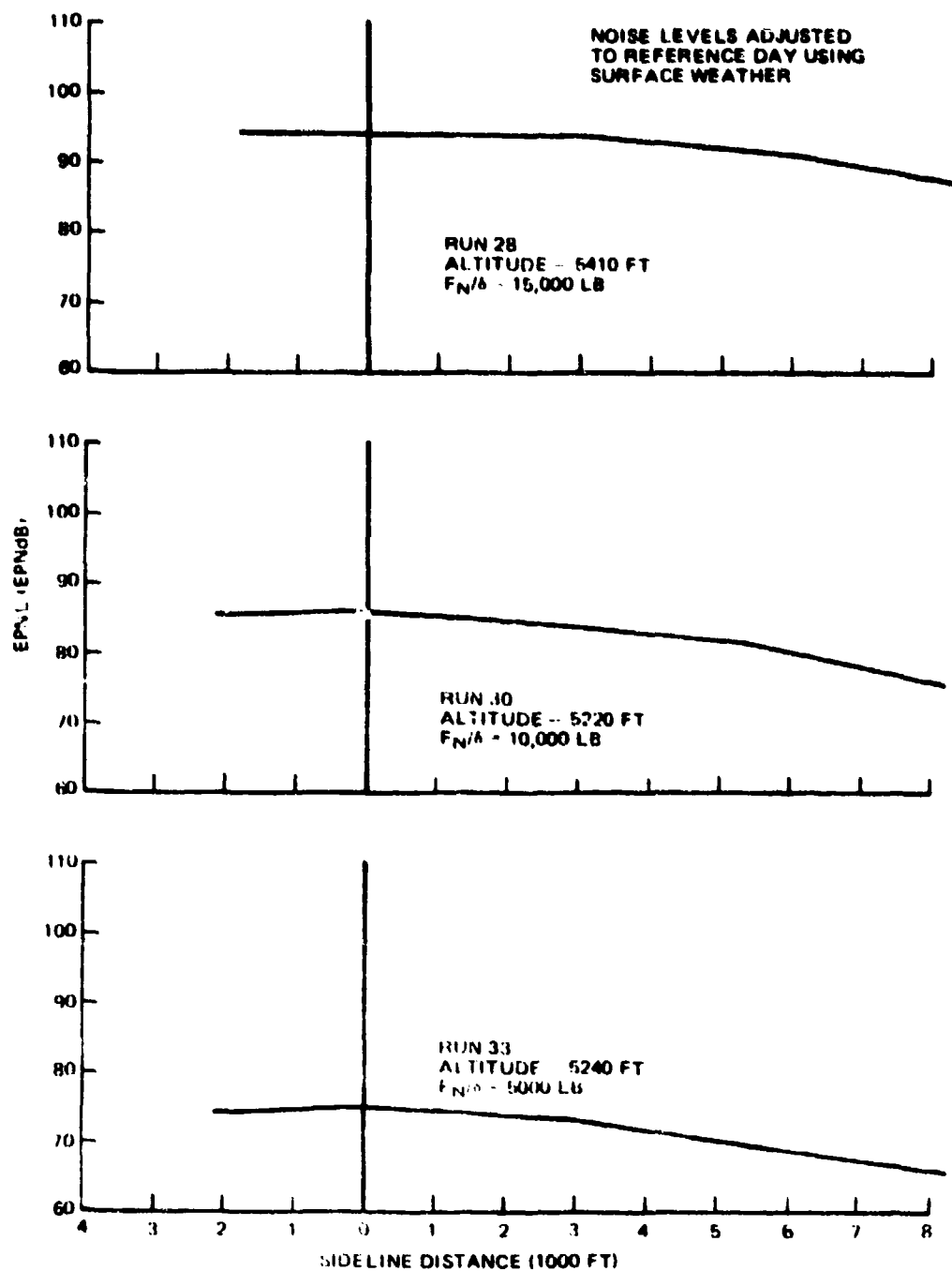


FIGURE 19. VARIATION OF NOISE LEVEL WITH SIDELINE DISTANCE FOR
VARIOUS THRUSTS - AIRCRAFT ALTITUDE NEAR 5000 FT

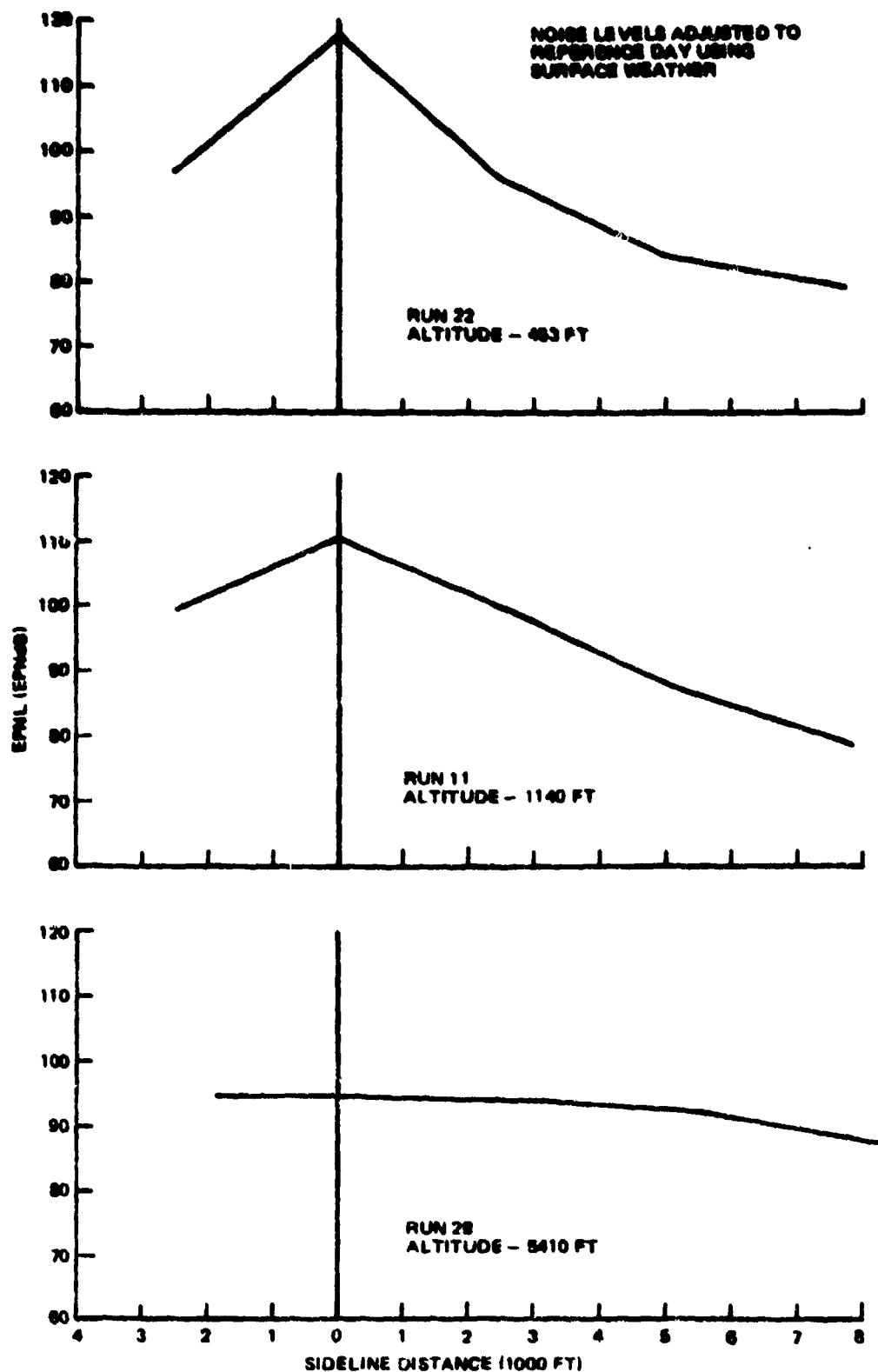


FIGURE 20. VARIATION OF NOISE LEVEL WITH SIDELINE DISTANCE FOR
VARIOUS ALTITUDES AT TAKEOFF THRUST, $F_M/5 = 15,000$ LB

4.4 DATA ACCURACY

The statistical accuracy of the data used in determining the EPNL curves in Figure 14 is tabulated in Table 3 in terms of the 90-percent confidence limits. The noise data used were measured at the centerline microphones, corrected to reference-day conditions and adjusted to the reference airspeed and appropriate target thrust.

The method used in the analysis utilized grouping of the normalized data points by sets in a limited altitude range and adjusting each data point to a common altitude by the technique shown in Figure 21. The sample data point was adjusted from its measured CPA of 1140 feet to the common slant range of 1500 feet along a path parallel to a segment of the 10,000 pound curve from Figure 14. Applying a Δ EPNL of -3.3 EPNdB to the measured 105.5 EPNdB (at the CPA) results in an EPNL of 102.2 DPNdB. Each point is adjusted to 1500 feet in the same manner, and the percent confidence limits of the six data points determined by using the small sample t distribution method as follows (Page 244 of Reference 4):

The small sample confidence limits, μ , for 90 percent is given by

$$\mu = \bar{X} \pm t_{.05} \frac{S}{\sqrt{n}}$$

where $t_{.05}$ is the distribution factor dependent on the number of samples,

$$S = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n-1}},$$

and $\bar{X}$ = average of n samples consisting of $X_1, X_2, \dots, X_n$.

The results shown in Table 3 indicate the 90-percent confidence limits to be better than ± 1.0 EPNdB, except for the low-altitude range (450-650 feet) at 15,000-pounds thrust (± 1.27 EPNdB), and the mid-altitude range at 5,000-pounds thrust (± 2.29 EPNdB). Of these, only the latter data are outside the program objective of equal or better than ± 1.5 EPNdB 90 percent confidence limits.

TABLE 4
CONFIDENCE LIMITS

THRUST, P _N /A (LB)	ALTITUDE RANGE (FEET)	ALTITUDE TO WHICH DATA ARE NORMALIZED, (FEET)	NO. OF DATA POINTS	95 PERCENT CONFIDENCE LIMITS
16,000	400-600	600	3	±1.27
	1000-1042	1000	6	±0.61
	2120-8440	3000	10	±0.54
10,000	400-616	600	6	±0.61
	1130-1630	1000	6	±0.60
	5234-8417	7000	9	±0.35
6,000	446-840	600	6	±0.71
	1147-1046	1000	6	±2.20
	2500-8200	4000	12	±0.74
3,200	323-412	370	6	±0.71
2,000	400-1040	1000	11	±0.70

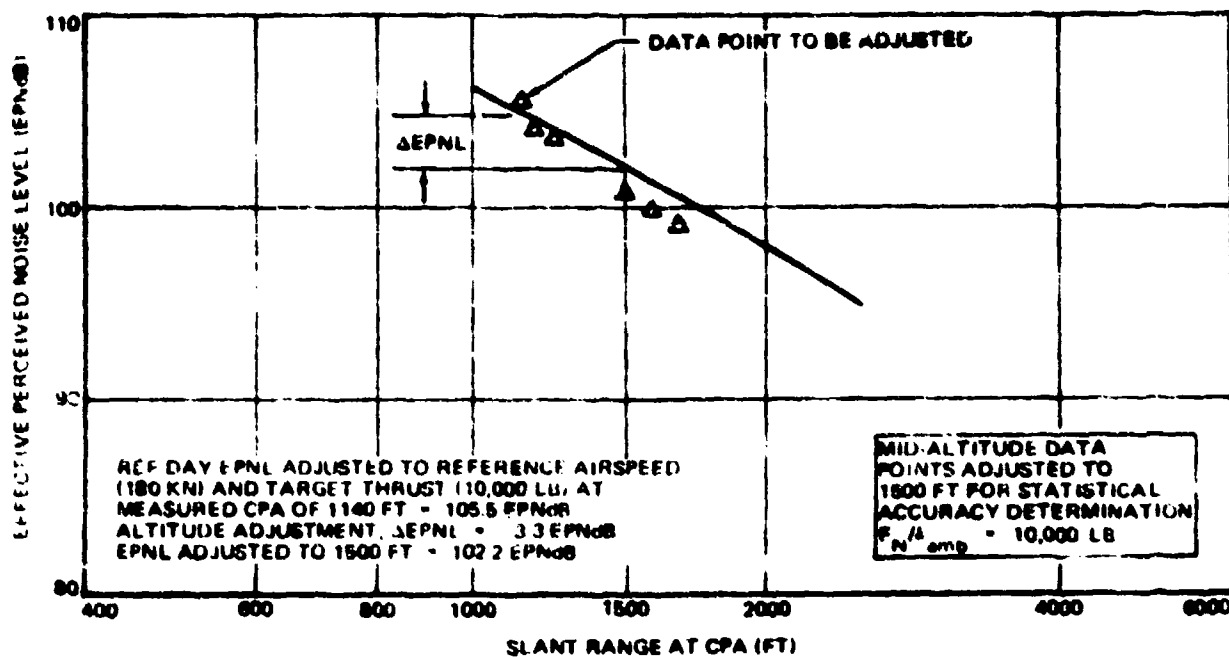


FIGURE 21. DATA POINT ALTITUDE ADJUSTMENT

The three low altitude data points at 15,000-pounds comprise the group giving ± 1.27 EPNdB confidence; although the scatter of these points, as seen in Figure 14, does not appear excessive. Figure 14 also shows the three 5000-pound data points near 1600 feet, which when grouped with the three data points near 1350 feet (all adjusted to 1500 feet) result in the largest confidence interval of ± 2.29 EPNdB. The scatter is evident in the EPNL plotted data but cannot be accounted by variations in airspeed or thrust.

The data for long distance and low thrust (2,000-pounds) showed very favorable results as reflected in the confidence limits.

4.5 LATERAL NOISE ATTENUATION ADJUSTMENT

Although not initially a test objective, a brief study was made into methods of presenting the effects of lateral noise attenuation, including EGA, and the manner in which far sideline distances and low airplane altitudes combine to produce lower-than-expected noise levels. Other studies (References 5 and 6) have suggested a fan plot or "ladder technique" for presenting adjustments to EPNL values to account for EGA effects. Each plot, however, is limited to a specific power setting, thus requiring several plots and considerable interpolation to determine off-design values. As a result a method is suggested as a procedure to compute EPNL's for sideline locations. This method, Figure 22, is based on the relationship

$$EPNL = EPNL_N - 10 \log_{10} \frac{V}{V_{REF}} - LNA$$

where

EPNL = normalized EPNL, EPNdB

V = aircraft velocity

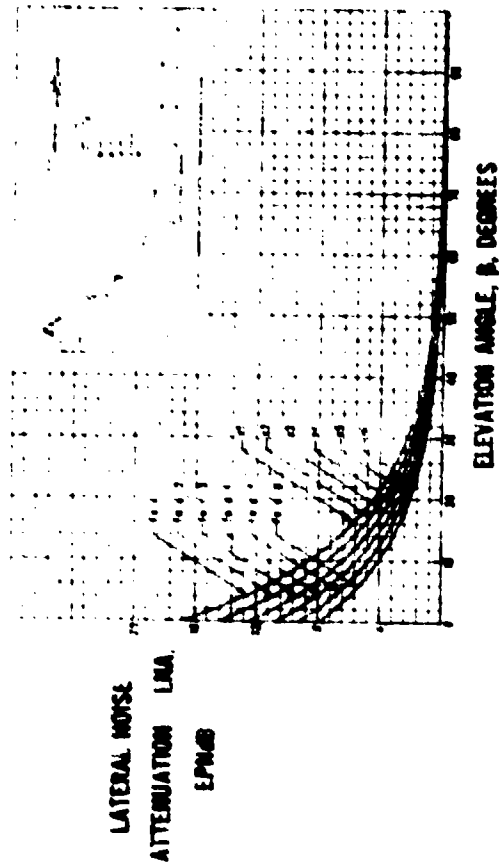
V_{REF} = reference aircraft velocity

LNA = lateral noise attenuation, EPNdB

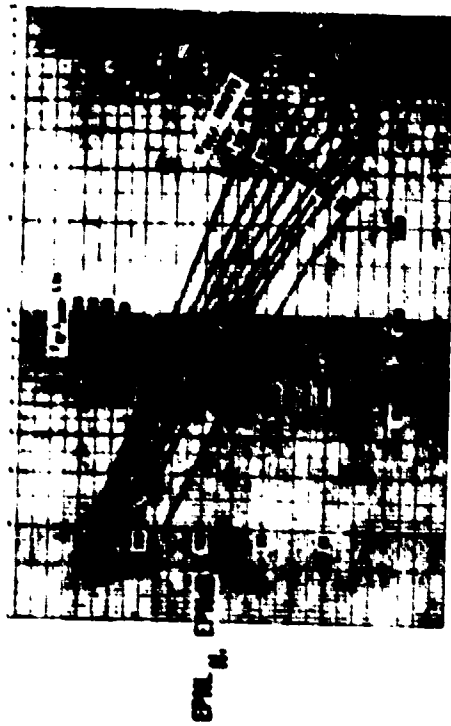
Reproduced from
best available copy.

LATERAL NOISE ATTENUATION AS A FUNCTION OF ELEVATION ANGLE

$$LNA = 10 \log \frac{1}{\sin^2 \theta} = 10 \log \frac{1}{\sin^2 \theta} - \beta$$



NORMALIZED EPNL AS A FUNCTION OF CPA



$$EPNL = EPNL_N - 10 \log \frac{V}{V_{REF}} - LNA$$

NOTE: ALL LEVELS ARE FOR PRESENTATION PURPOSES ONLY!

FIGURE 22. SUGGESTED PROCEDURE TO COMPUTE EFFECTIVE PERCEIVED NOISE LEVELS FOR SIDELINE LOCATIONS

and

$$LNA = ke^{-x} = f(F_N / \delta_{amb} \cdot \beta)$$

Figure 22 is presented as a suggested method with no attempt made to provide quantitative values.

4.6 VERTICAL PROPAGATION EFFECTS

Sound propagating through the atmosphere is subject to uniform spreading losses that follow the inverse square law of spherical divergence and atmospheric absorption (or "excess attenuation"). Reference 2 was issued by the SAE as a recommended practice for determining atmospheric absorption as a function of temperature and humidity and applying adjustments to determine standard-day noise levels. Subsequent to its issuance, ARP 866 was subject to critical evaluation. However, at the present time, it is the accepted method used to meet the requirements for FAR Part 36 aircraft noise certification. Therefore, all noise levels presented in this report are based on the procedures of ARP 866. This required the use of surface weather conditions (temperature and relative humidity measured at 10 meters above the ground) and adjusting the measured data to reference-day values (77°F and 70-percent relative humidity).

It was an objective of this study to investigate what effects variations in temperature and relative humidity along the entire noise propagation path might have on the determination of the reference-day noise levels.

The method followed was to segment the sound path in horizontal strata from the noise source (aircraft) to the measurement location. For each segment, the average weather conditions were determined from the information provided by Figure B-4 of Appendix B. A computer subroutine from the E2QH program (see Paragraph 3.3.1) was used to determine the ARP 866 adjustments in the sound path distance in each segment; the summation of these adjustments was applied to the measured data, and a reference-day noise level spectrum plotted. Shown in Appendix G are tabulations of comparisons between EPNL values determined by the layered-weather and the FAR, Part 36 methods (Table G-1). Also shown in Figure G-1, are representative examples of the 1/3-octave band spectra plots.

The reference-day EPNL values determined by the layered weather method varied from values determined by the FAR, Part 36 method by +0.3 dB (for a low altitude cutback thrust flight) to +2.9 dB (for an intermediate altitude approach thrust flight). Generally, the 1/3-octave band spectra determined by both methods, at time of PNLTM, were quite similar, as shown for Run 11A on Page 151. However, as seen for Run 33B on Page 156, large differences did occur. This anomaly is unexplained and therefore, further research into the effects of sound-path weather variations is needed before this technique can be applied.

SECTION 5

SUMMARY AND CONCLUSIONS

Flyover-noise tests of a Douglas DC-8-61 were conducted at Yuma, Arizona during 6-8 November 1973. Noise data from the flight tests were analyzed and derivations of the normalized EPNL and A-weighted sound level variations with slant range were made. The noise levels for thrust settings from 2000-pound approach thrust to the JT3D-3B takeoff thrust and slant ranges from 200 to 10,000 feet (or minimum noise levels of 80 EPNdB or 65 dBA) were plotted. The data used were from measurements of the overhead-noise levels and did not include any lateral noise attenuation effects.

Comparison of the plotted EPNL and A-weighted sound levels with the respective plots of the data from Phase I indicates values that are lower than previously reported. The EPNL's range from about 4 to 12 EPNdB and the A-weighted sound levels 2 to 9 dBA lower than the values shown in Reference 1, with the larger differences occurring at the longer slant ranges.

From a comparison of the measured overhead and to the sideline noise levels for several power settings a significant relationship between lateral noise attenuation, the flyover elevation angle (β), and the surface distance to the side of the flight path (D) was found to exist. Both the elevation angle and the sideline distance are interrelated in the determination of lateral noise attenuation, but of the two factors, the angle of elevation is the most significant.

No significant asymmetry was noted in the measured test data to a sideline distance of 2500 feet.

The plots of the EPNL variation with distance to the sideline of the flight path exhibit a noticeable flattening with increases in aircraft altitude for a given thrust setting. This is because of the relatively large changes in sound path distance, with altitude increases, for the near centerline locations as opposed to only minor changes in sound path distance to the more distant sideline location, for a comparable increase in altitude.

The statistical accuracy of the data used in determining the plots of EPNL variation with slant range was evaluated in terms of 90-percent confidence limits. The results indicate the confidence limits of EPNL to be less than ± 1.0 EPNdB for most thrusts and altitudes; this was also the case for the DC-8-61 data reported in the Phase I study. For the 5000-pound thrust setting at mid-altitudes, the calculated limits were ± 2.29 EPNdB and for 15,000-pound thrust the limits were ± 1.27 EPNdB. The larger confidence limits calculated for those two thrusts result from variations in the data that are unexplained at this time.

Methods of plotting lateral noise attenuation adjustments were studied and a suggested procedure to compute EPNL's for sideline locations was presented.

Vertical propagation effects were studied and noise level adjustments for sound-path weather variations were estimated. This estimate indicated that a 1 to 2 EPNdB difference might occur for low altitude (less than 2000 feet) flyover noise when weather corrections are made on the basis of sound-path weather rather than surface weather.

The noise levels determined for the DC-8-61 as a result of the Phase II fly-over-noise tests are generally lower than those previously reported in Phase I. A review was made of the methods used in the two tests in data acquisition, processing, and analyses. The review identified three differences in the analytical procedures that contributed to the variances and it identified several other factors, including sound-path weather variations, that might explain the remainder of the difference.

APPENDIX A

EVALUATION OF DATA ACQUISITION

The flyover-noise measurement runs attempted for Phase II of the Aircraft Noise Definition Program are listed in Table 1 of Section 2. The exact space positioning of all microphone locations is shown in Table A-1. Noise data were recorded for all runs. However, only the data listed in Table A-2 were reduced and used in this report.

All Flight 1 ADDS data contain varying degrees of erroneous data for all airplane parameters. Most of the erroneous data is recognizable; however, other necessary operational data are unavailable for Flight 1. Therefore, none of the Flight 1 data were used in the analysis reported in Section 4.

The acoustic data for microphone sideline distances of 5,000 feet or more are severely limited by the levels of ambient and microphone system noise, the system noise consisting of extraneous high-frequency signals. Wherever possible, the extraneous high-frequency content was eliminated, and care was taken to use the lowest possible levels of valid ambient noise for each run.

The following runs had incomplete MALT space-positioning data: Runs 5, 6, 24, 25, and 27 through 34. The deficiencies were eliminated by manual position data input with a point every 2 seconds. The following techniques were used to interpolate for the incomplete MALT space-positioning data:

1. The available tracker altitude data were compared with the corresponding airplane pressure altitude obtained from ADDS data. Aircraft pressure altitude was corrected to correspond with tracker altitude, and the corrected pressure altitude was then used for missing tracker altitude data.
2. A similar technique was used for path speed, where indicated airspeed was adjusted to agree with tracker airspeed. The adjusted airspeed was used for the incomplete path speed data.

TABLE A-1
AIRPLANE FLYOVER NOISE TESTING MICROPHONE LOCATION COORDINATES

MEASUREMENT LOCATION	MICROPHONE LOCATION COORDINATES (FT)*		
	X	Y	Z
A	1208 1/2	221	2
B	6836	221**	-2
B (FLUSH)	6836	221**	-6
C	2460	219	2
D	2802	219	-8
E	6483	2720	-1
F	6483	-228	8
G	7900	-4780	14
H	9600	-7882	15

*RELATIVE TO WEST END OF RUNWAY WITH ALL MICROPHONES (EXCEPT B FLUSH) 4 FEET ABOVE GROUND LEVEL

**EACH MICROPHONE LOCATED APPROXIMATELY 4 FEET IN LINE WITH THIS COORDINATE POINT (SEE FIGURE 8).

TABLE A-2
MATRIX OF FLYOVER NOISE TESTS
7 & 8 NOVEMBER 1973

FLIGHT CONDITION		MICROPHONE LOCATIONS									
		A	B	C	D	E	F	G	H	I	FLUSH
TO CORRECTION	THRUST ENG - 38 TO - 10,000 LB	1	3	10	11	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
		2	3	10	12	5	6	7	8	9	4F
APPR CORRECTION	THRUST ENG - 2,000 LB - 5,000 LB	2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
TO CORRECTION	THRUST/ENG - 38 TO 1	2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
2500 FT LEV FLY THRUST ENG - 5,000 LB	THRUST/ENG - 38 TO 1	2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
5000 FT LEV FLY	THRUST/ENG - 38 TO 1 - 10,000 LB	2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
8000 FT LEV FLY THRUST ENG - 10,000 LB	THRUST/ENG - 38 TO 1	2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
5000 FT LEV FLY THRUST/ENG - 5,000 LB	THRUST/ENG - 38 TO 1	2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
4000 FT LEV FLY THRUST/ENG - 3,200 LB	THRUST/ENG - 38 TO 1	2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F
		2	3	10	12	5	6	7	8	9	4F

NOTES 1 NP - NOT TO BE PROCESSED
2 FOR EACH RUN THE NUMBER BENEATH EACH MIC LOC IS MIC NO AND INDICATES A PROCESSED RECORDING

3. The X-position of the airplane was calculated from the X-component of path speed.
4. Lateral position was obtained by extrapolating available MALT lateral-position data.

The flyover-noise data "drop-out" due to ambient and system noise was anticipated, and the amount of valid data obtained compared to that attempted was high (greater than 90-percent). Consequently, the objective of the test was well satisfied.

APPENDIX B
YUMA, ARIZONA, TEST-SITE WEATHER CONDITIONS

The dry-bulb temperature, relative humidity, and wind speed and direction weather conditions were recorded during the flyover-noise testing at ground level and by upper-air soundings. The latter data were obtained by the National Weather Corporation with the following techniques:

1. Temperature and relative humidity were obtained from continuous recordings from a instrumented light aircraft.
2. Wind speed and direction were obtained from theodolite tracking of weather balloons.

The test day surface and sound-path weather conditions are summarized as follows:

Figure B-1. Summary of Frequency of Occurrence of Surface Weather Conditions within FAR Part 36 Limits.

Figure B-2. Summary of Temperature Inversion Characteristics by Month.

Figure B-3. Plots of Measured Test Day Surface Weather.

Table B-1. Summary of Test Day MART Weather Measurements.

Figure B-4. Plots of Upper-Air Sound-Path Weather Data.

The data from Figure B-4 was used in the layered weather determinations discussed in Section 4.6 and the data presented in Appendix C.

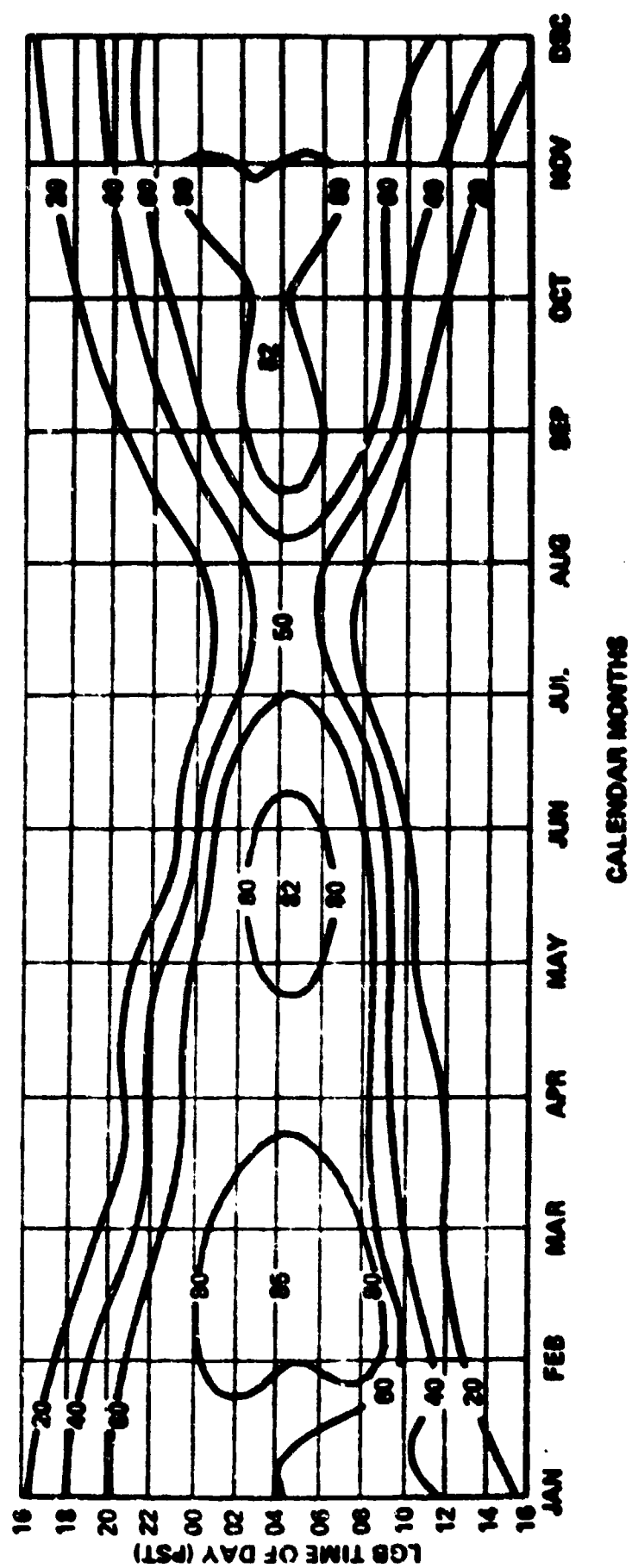
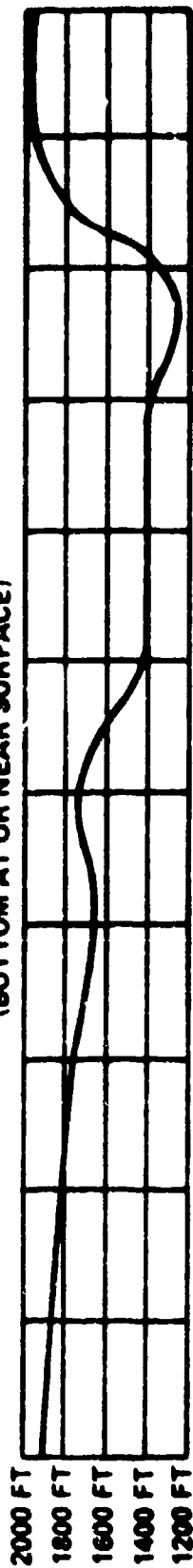


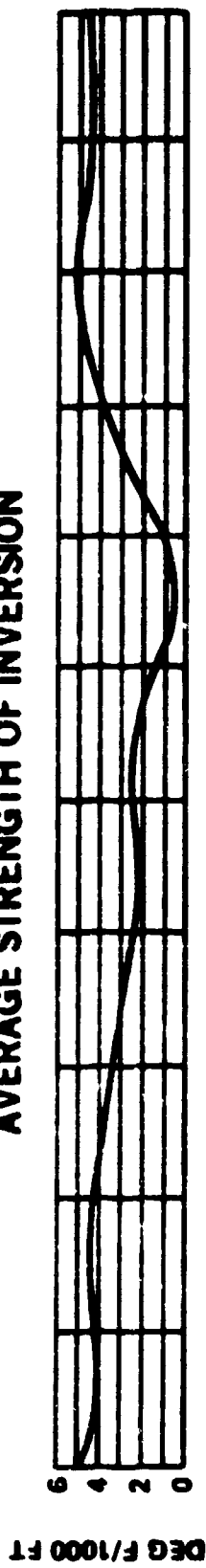
FIGURE B-1. SURFACE WEATHER CONDITIONS WITHIN FAR 38 LIMITS

AVERAGE TOP OF INVERSION

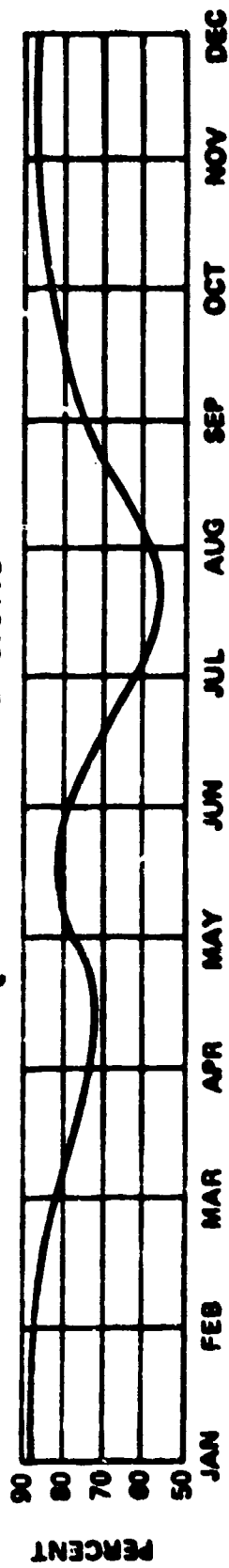
(BOTTOM AT OR NEAR SURFACE)



AVERAGE STRENGTH OF INVERSION



FREQUENCY OF INVERSIONS



CALENDAR MONTHS

FIGURE B-2. TEMPERATURE INVERSION CHARACTERISTICS

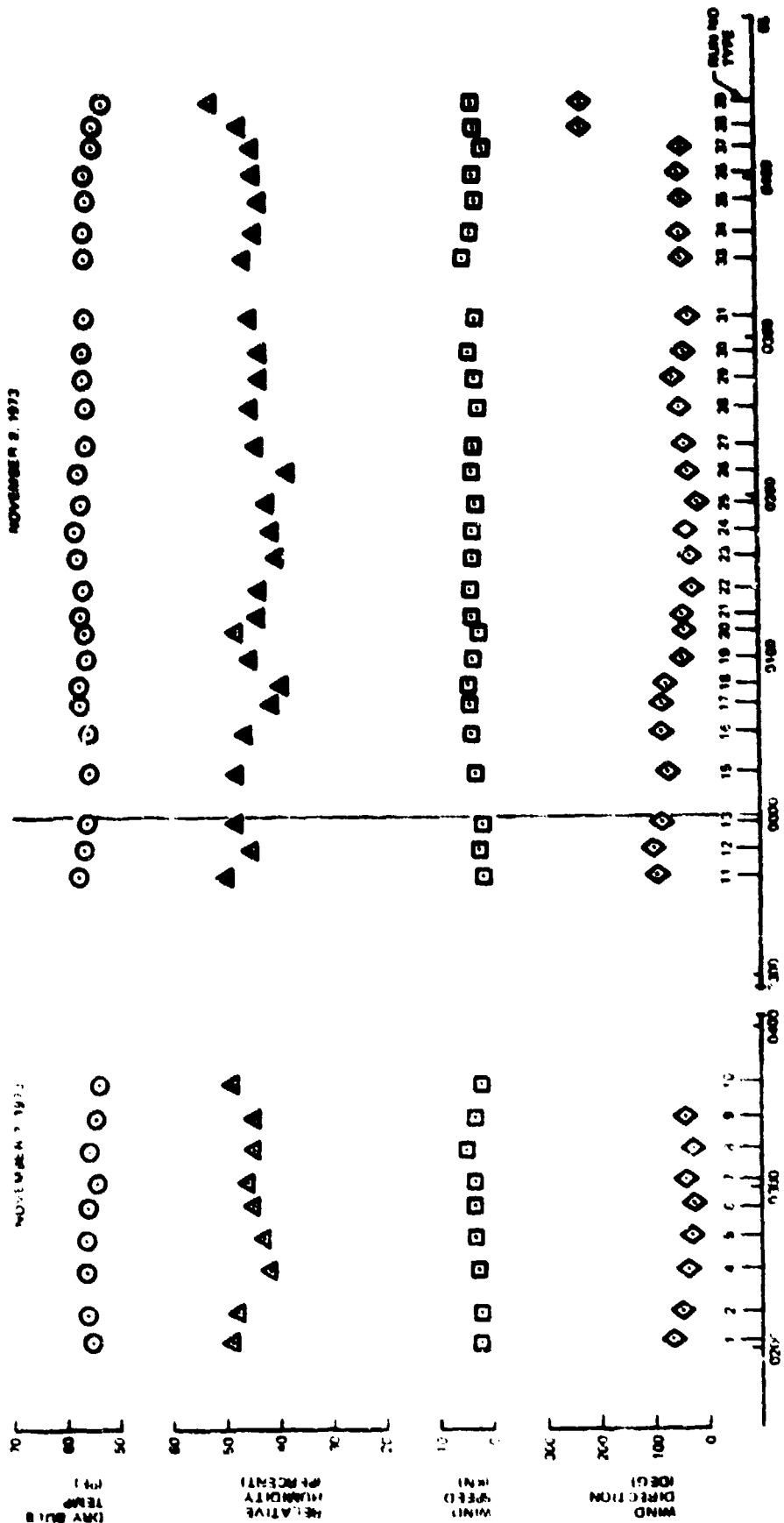


FIGURE B-2. SURFACE WEATHER - DC-8-61 UT30-30/AIRCRAFT DEFINITION

TABLE B-1
MOBILE ATMOSPHERIC RECORDING TOWER WEATHER DATA

TEST TITLE: DC 801 P/Q NOISE DEFINITION: DATE: 11/6/76 73 WEATHER: MODEL: DC 801 REG NO: 100074 KIR NO: 400
(100 METER HEIGHT)

RUN NO	TIME OF DAY	DART			PSYCHROM			WIND		STA PRESS (MM HG)
		D.B. TEMP (°F)	W.B. TEMP (°F)	R.H. (%)	D.B. TEMP (°F)	W.B. TEMP (°F)	R.H. (%)	DIR (DEG)	VEL (MPH)	
CAA	0000	54.5	47.5	48	55.8	51.5		700	2.5 KN	74.810
2	0014	54.5	47.5	48				500	2.5 KN	74.810
4	0030	54.5	46.7	47				600	3.0 KN	74.810
5	0047	54.5	46.7	47				250	3.5 KN	74.810
6	0051	54.0	46.0	45				300	3.5 KN	74.810
7	0101	54.5	46.0	46				420	3.5 KN	74.800
8	0315	54.8	46.8	45				300	5.7 KN	74.800
9	0327	54.8	45.7	45				480	1.5 KN	74.800
10	0340	54.8	44.8	48				800	2.2 KN	74.800
CAA	0700	54.5	47.5	48	55.8	51.5			2.5	74.775
11	0715	54.8	46.5	45				100	2.0 KN	74.775
12	0730	54.8	46.8	48				80	2.5 KN	74.775
13	0745	54.8	46.5	48				75	3.0 KN	74.770
14	0800	54.0	46.7	46				85	3.5 KN	74.770
15	0815	57.2	46.7	47				85	3.5 KN	74.770
16	0830	57.8	46.7	70				75	4.3 KN	74.770
17	0100	56.0	46.7	45				45	3.5 KN	74.776
18	0110	56.8	46.8	48				42	2.2 KN	74.776
19	0115	57.2	46.8	44				45	3.5 KN	74.776
20	0125	56.5	46.7	43				75	3.8 KN	74.776
21	0135	57.8	46.5	40				30	3.5 KN	74.776
22	0145	56.7	46.8	41				35	3.5 KN	74.776
23	0158	57.0	46.7	47				15	2.8 KN	74.776
24	0210	57.5	46.5	38				32	3.5 KN	74.750
25	0220	56.0	47.0	44				40	3.0 KN	74.750
26	0238	56.8	45.8	45				50	2.1 KN	74.750
27	0245	56.5	45.8	47				60	2.5 KN	74.750
28	0255	56.5	46.0	43				38	3.5 KN	74.750
29	0308	56.8	45.8	40				30	2.6 KN	74.750
30	0317	56.7	45.8	41					3.0	
31	0330	56.0	46.7	46				40	4.8 KN	74.750
32	0340	56.0	45.8	44				4	3.5 KN	74.750
33	0352	56.8	45.5	43				43	2.1 KN	74.750
34	0402	56.0	45.8	44				47	3.0 KN	74.750
35	0412	56.8	45.7	46				40	0.8 KN	74.750
36	0423	54.7	45	47				225	1.5 KN	74.750
37	0429	57.8	44.8	52				225	3.0 KN	74.750
CAA	0700	56.8	44.1		56.7	54.5			3.5	

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B.
value of SAE ARP 866 1370 Rev

AIRPLANE MODEL DC-8-61 REG NO. N8087D TEST SITE TONA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 6 NOV. 1973

MEASUREMENT TIMES (PST): 2100 WIND 2035

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

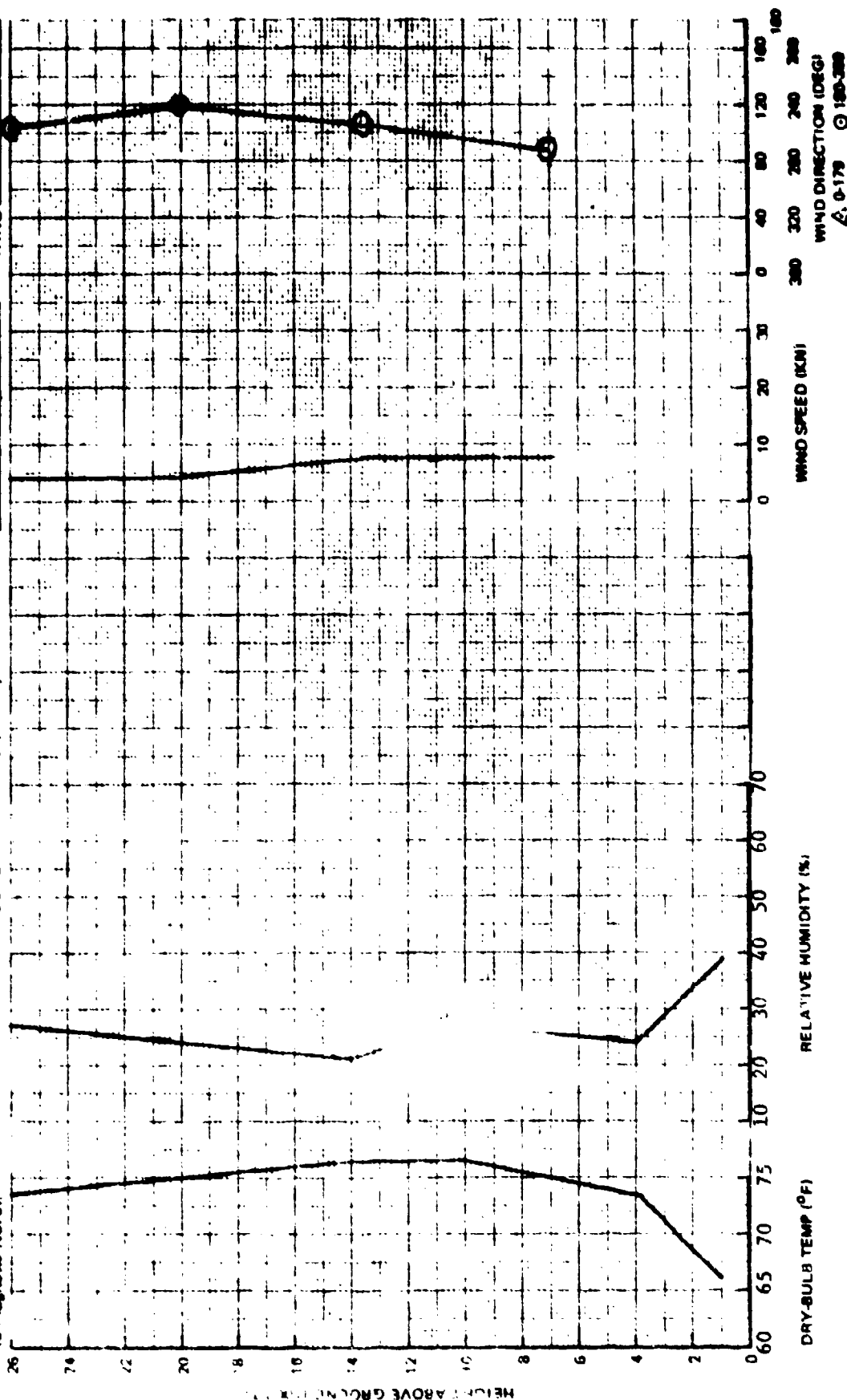


FIGURE B.4. UPPER AIR SOUND PATH WEATHER DATA

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atmospheric coefficient is 1/3 C.B.
value of SAE ARP 866 1970 R.

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. NS087U TEST SITE TUMA, ARIZONA
DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973
MEASUREMENT TIMES (PST): 0145 WIND 0225

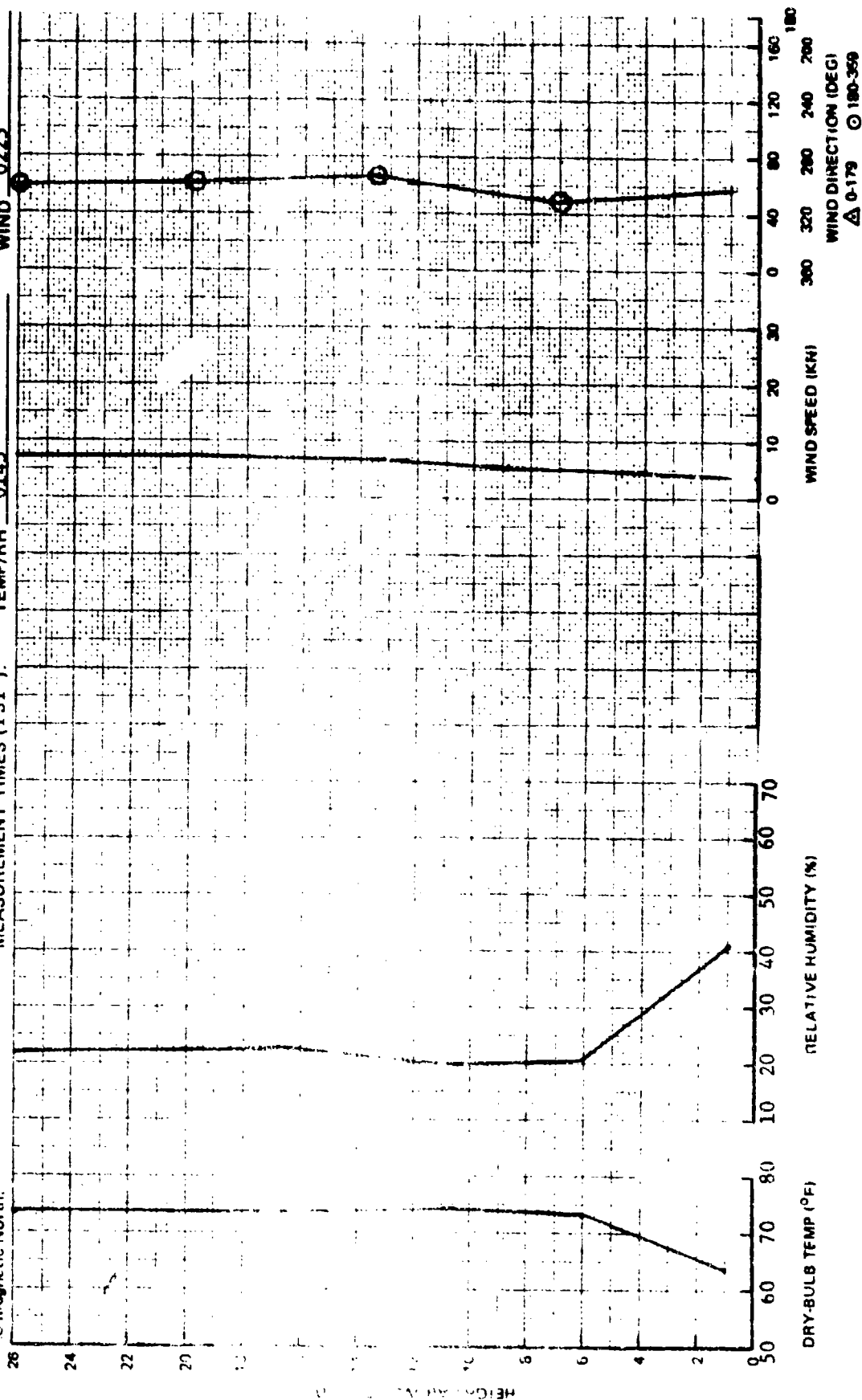


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N80073 TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

WIND DIRECTION (DEG) 0-179 180-359

NOTES: Air obs source is B
value of SAE ARE 08K 14 000

Wind direction is heading from
which wind is blowing, no reference
to magnetic North

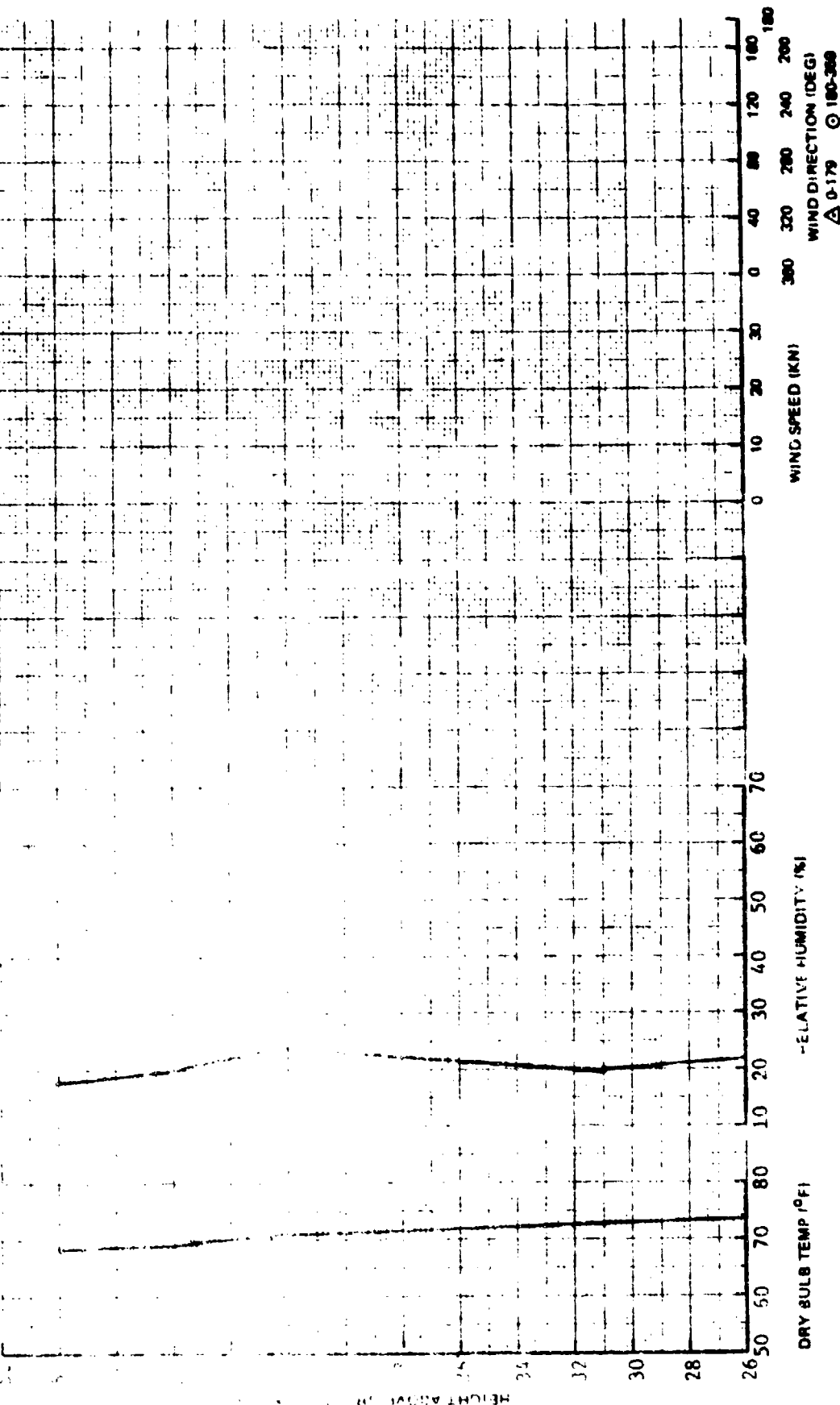


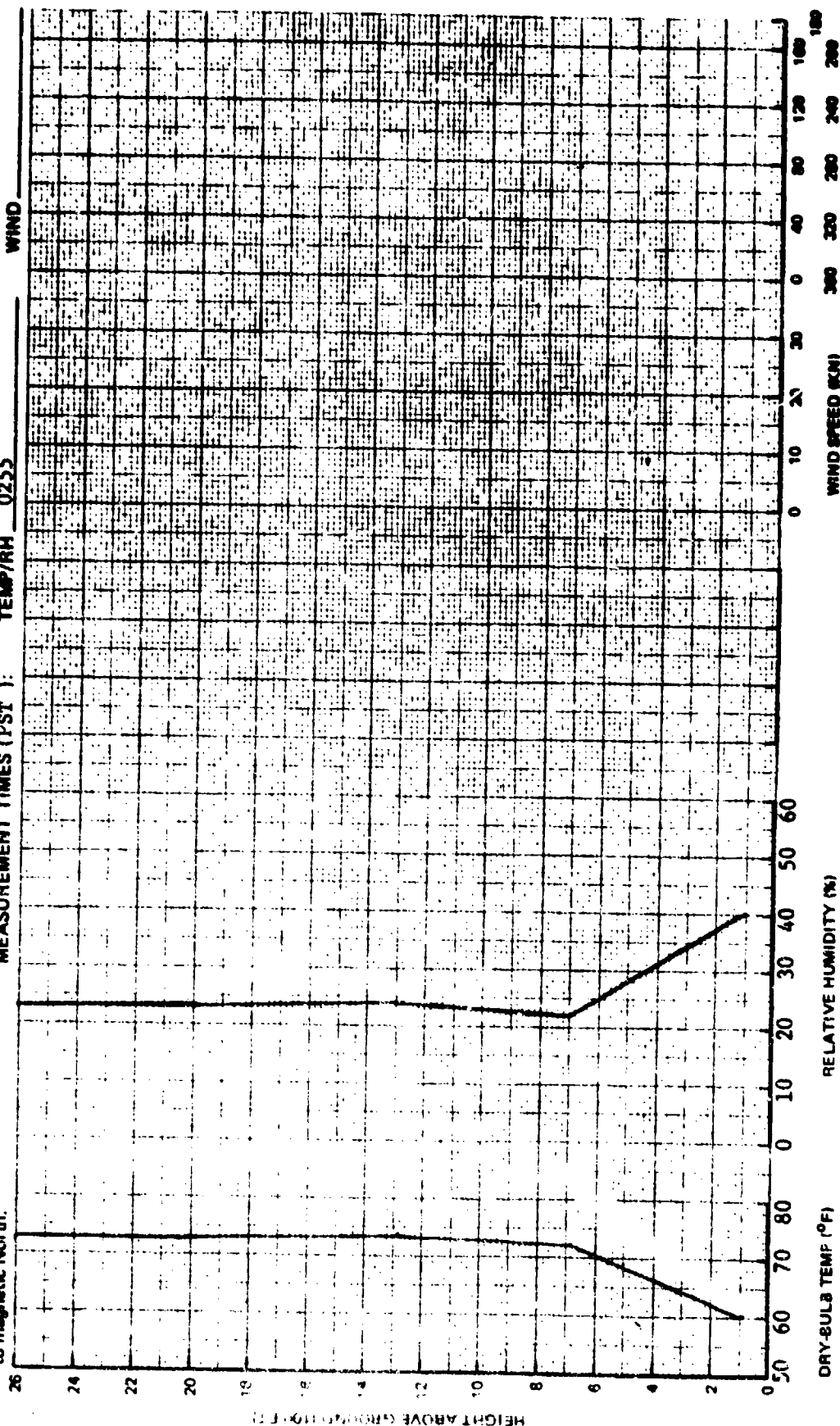
FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B.
value of SAE ARP 866 1970 Rev.

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8037U TEST SITE TUMA, ARIZONA
DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973
MEASUREMENT TIMES (PST): TEMP/RH 0255 WIND



WIND DIRECTION (DEG)
Δ 0-170 ○ 180-360

FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1.3 O.B.
value of SAE ARP 866 1970 Rev.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0255 WIND

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

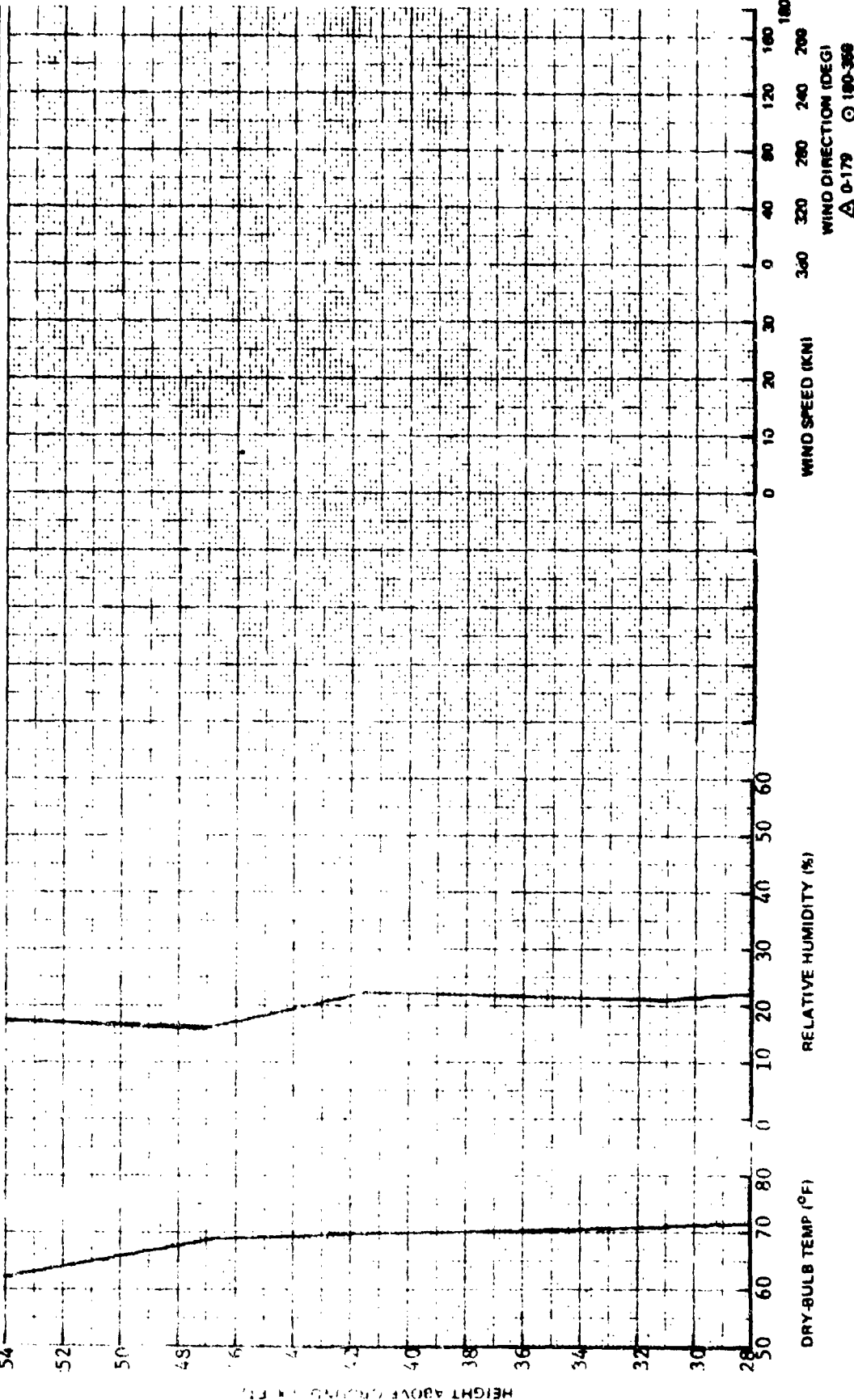


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

MCDONNELL DOUGLAS CORPORATION

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B.
value of SAE ARP 866 197C Rev.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): 0255 WIND

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

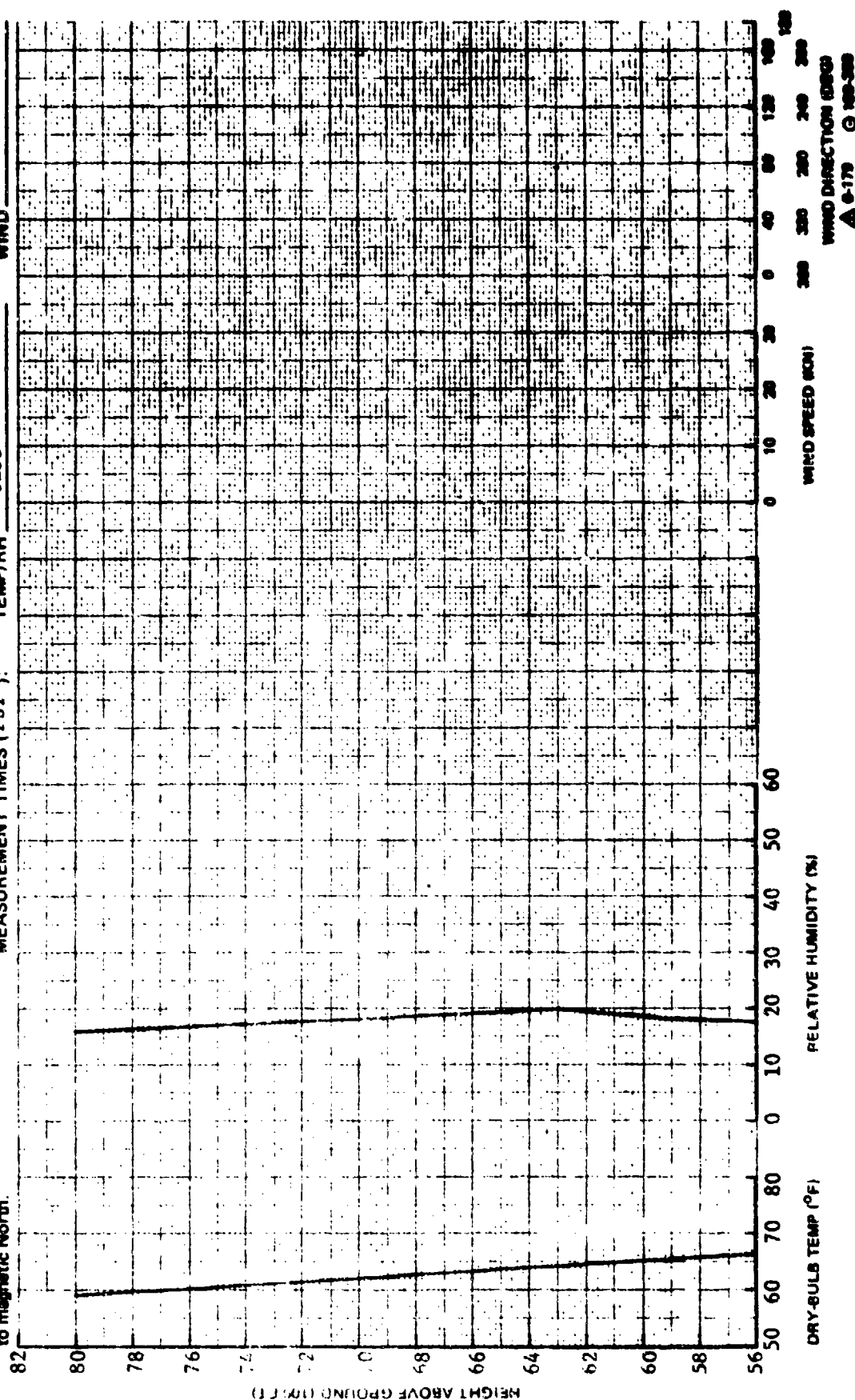


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B.
value of SAE 1HP 866 1970 Rev.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA
DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973
MEASUREMENT TIMES (PST): TEMP/RH 2055 WIND 2040

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

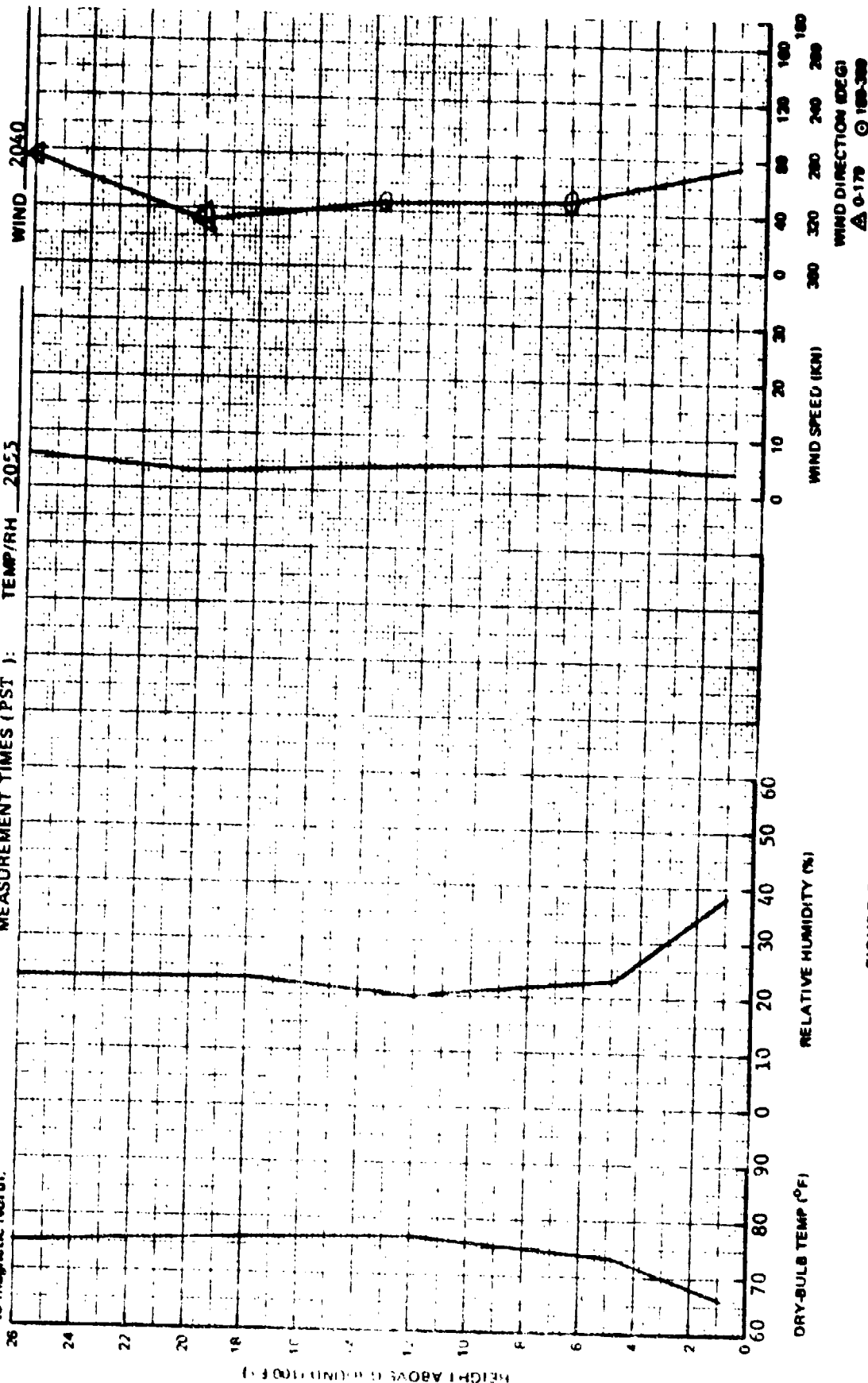


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1.3 C.B.
value of SAE ARP 866 1970 Rev.

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE TUMA, ARIZONA
DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973
MEASUREMENT TIMES (PST): TEMP/RH 2055 WIND 2040

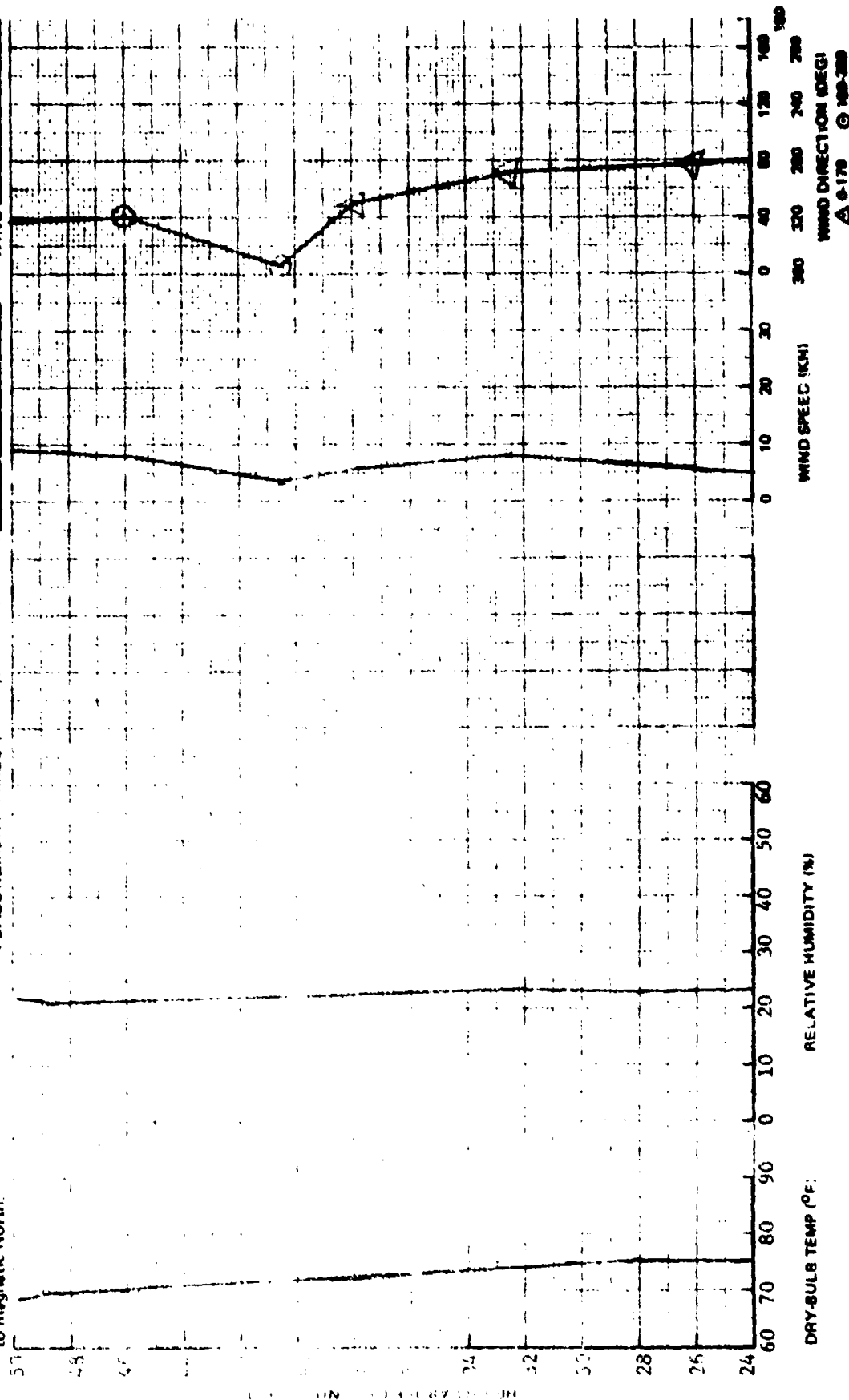


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O B.
value of SAE ARP 806 1970 Rev

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA
DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973
MEASUREMENT TIMES (PST): TEMP/RH 2055 WIND 2040

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

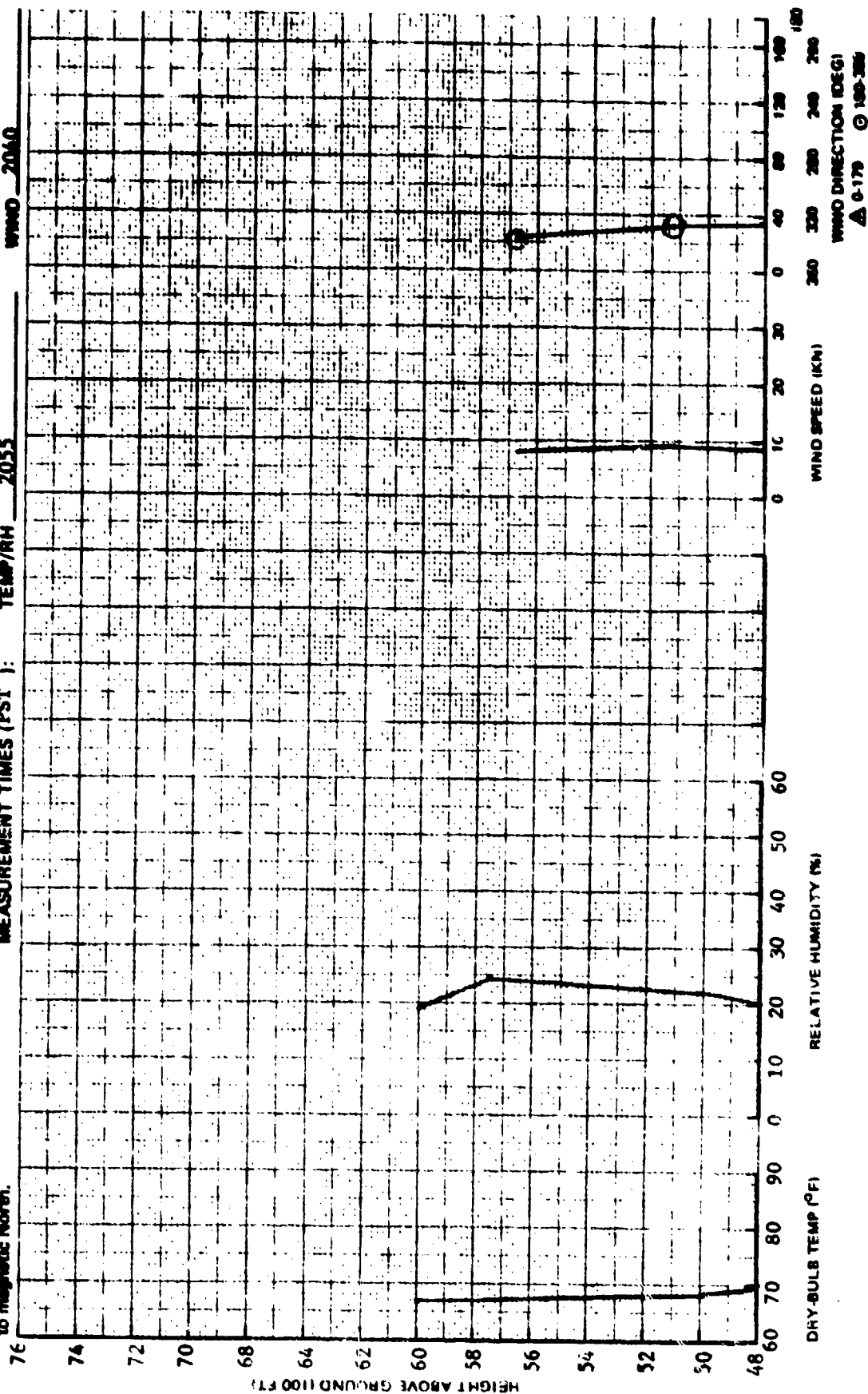


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

MCDONNELL DOUGLAS CORPORATION

NOTES: Atmospheric coefficient of refraction value of 0.000147 is used unless otherwise specified.

Wind direction is based on true which wind is blowing relative to magnetic north.

SOUND-PATH WEATHER DURING FLYOVER NCISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA
 DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973
 MEASUREMENT TIMES (PST) 2320 WIND 2355

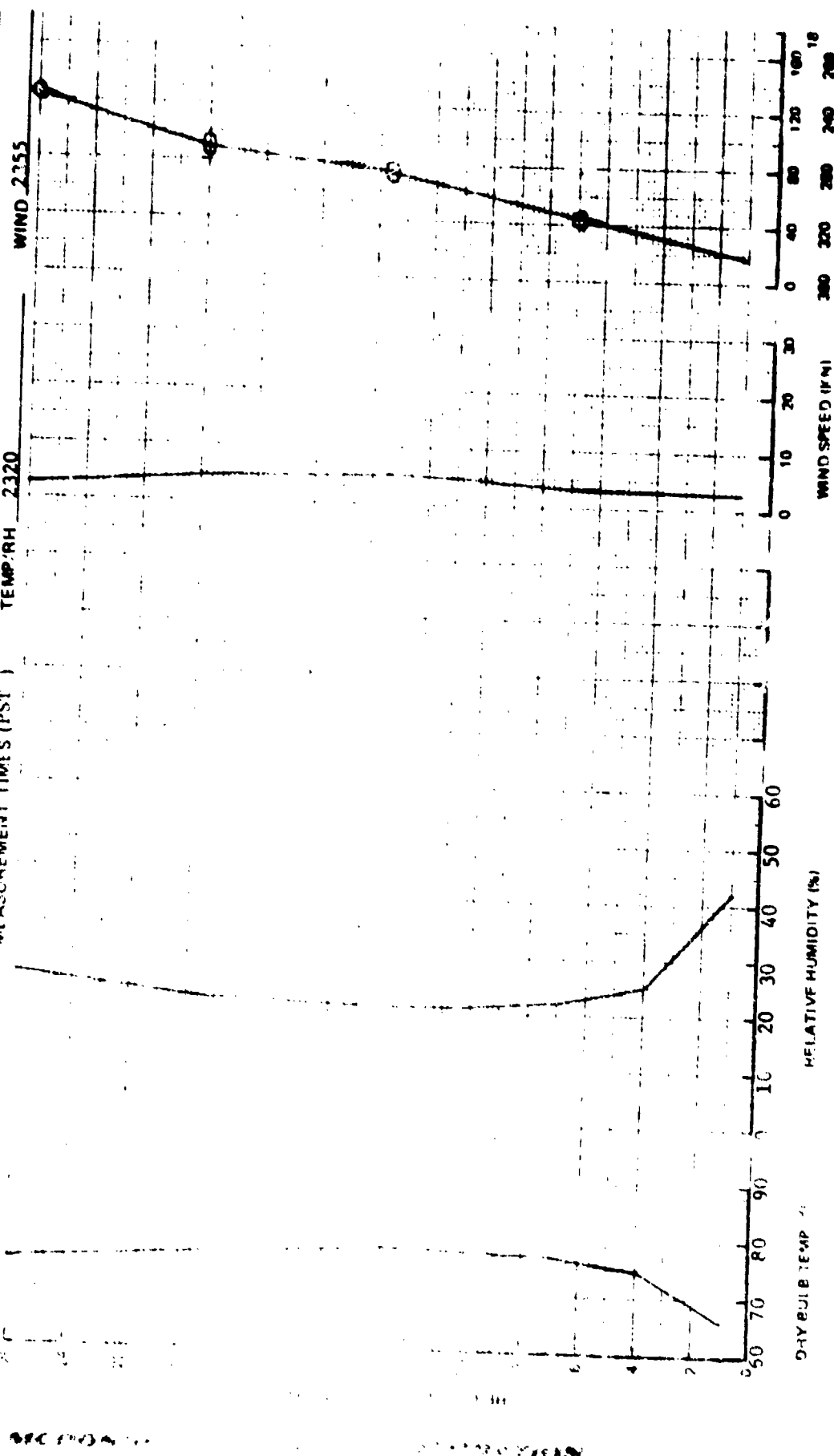


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B.
value of SAE ARP 866 1970 Rev.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE TUWA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): 2320 WIND 2355

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

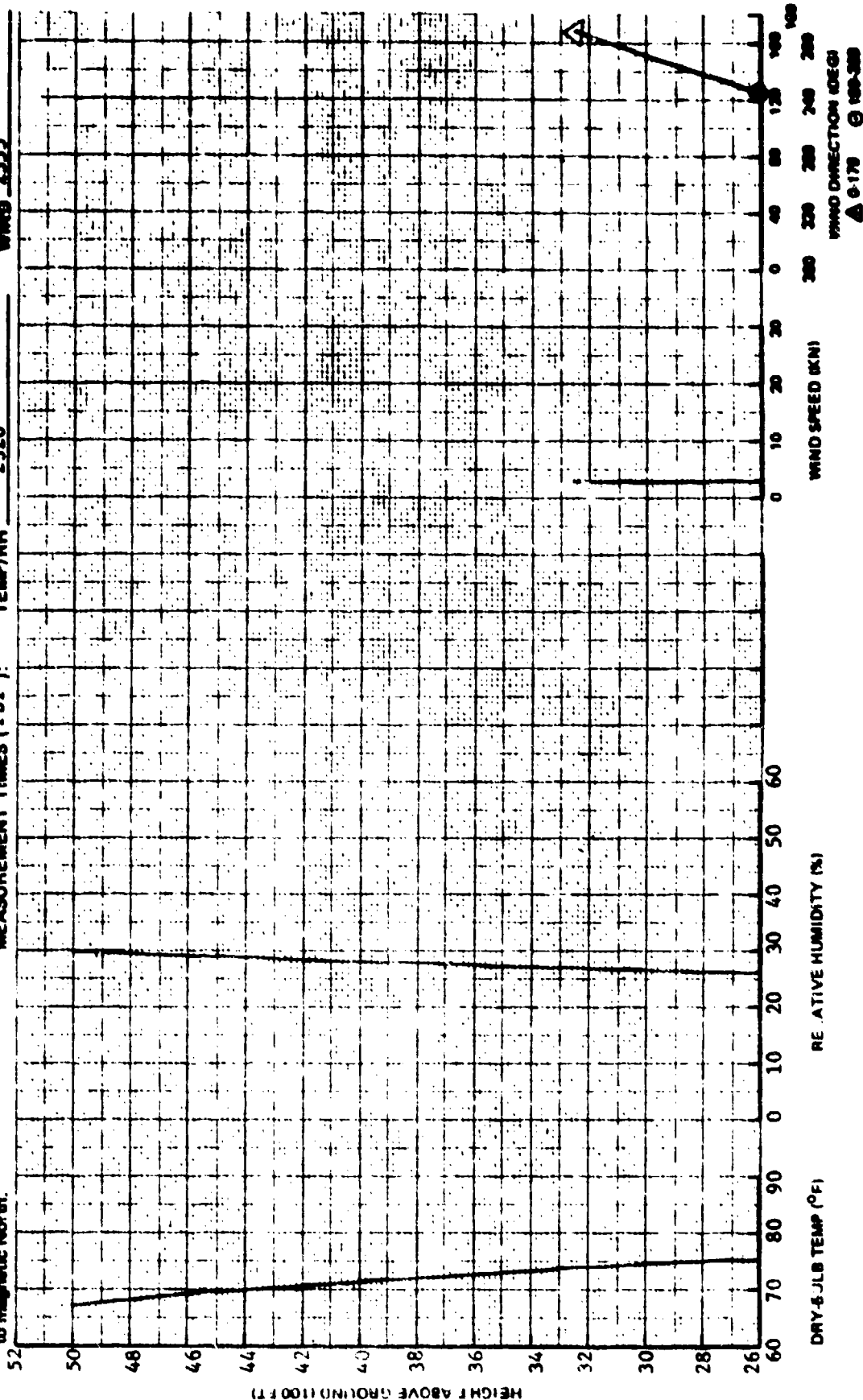


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

MCDONNELL DOUGLAS CORPORATION

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Airplane model is LC-8-01
value of SAE APP 800 1970 Re.

Wind direction is heading from
which wind is blowing, reference
to adjacent 1000 ft.

AIRPLANE MODEL LC-8-01 REG. NO. N8087U TEST SITE TUMA, ARIZONA
DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST) 0640 WIND 0125

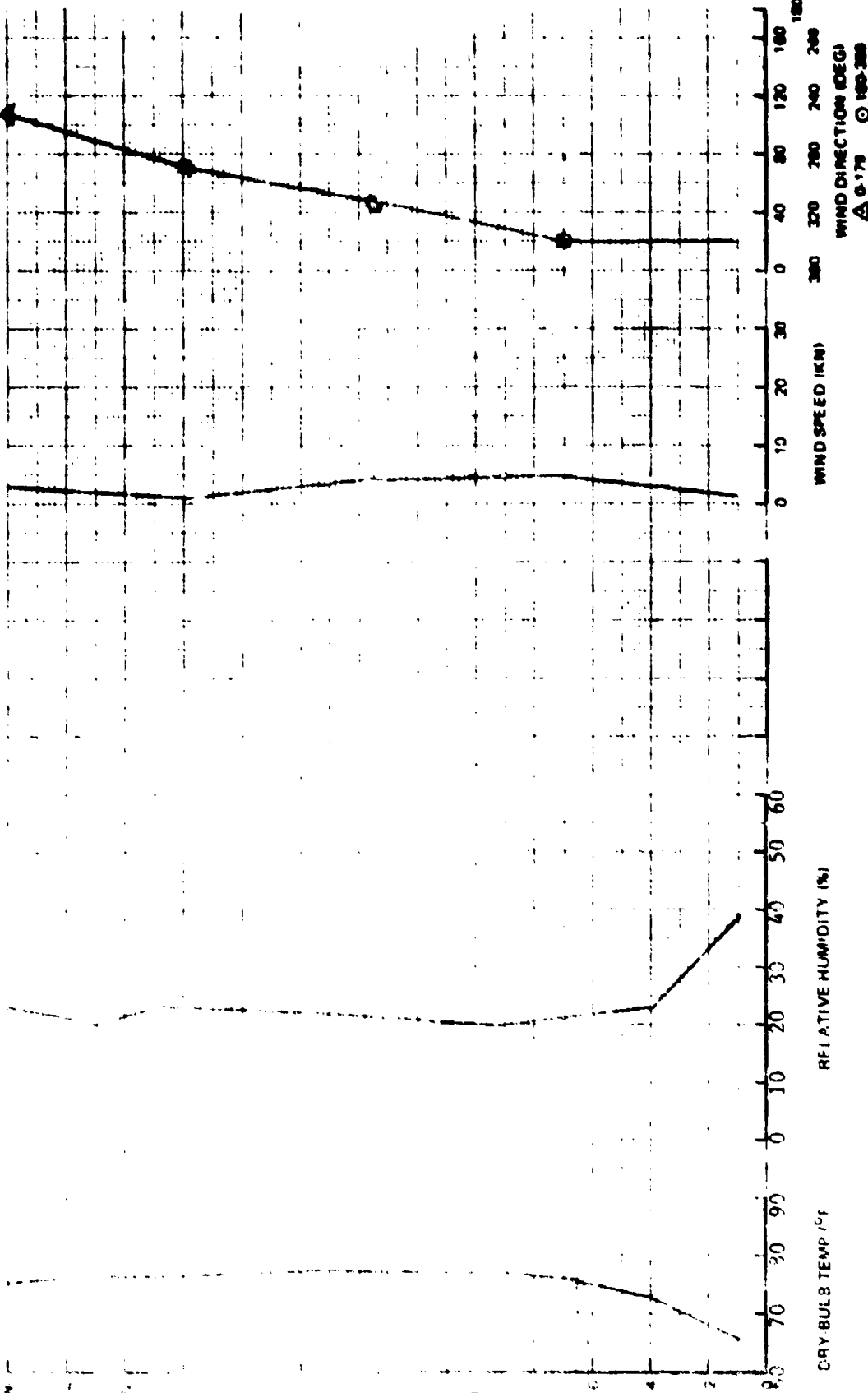


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Air abs coeff is 1/3 O.B.
value of SAE ARP 886 1970 Rev.

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE TUSA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): 0040 0175 WIND

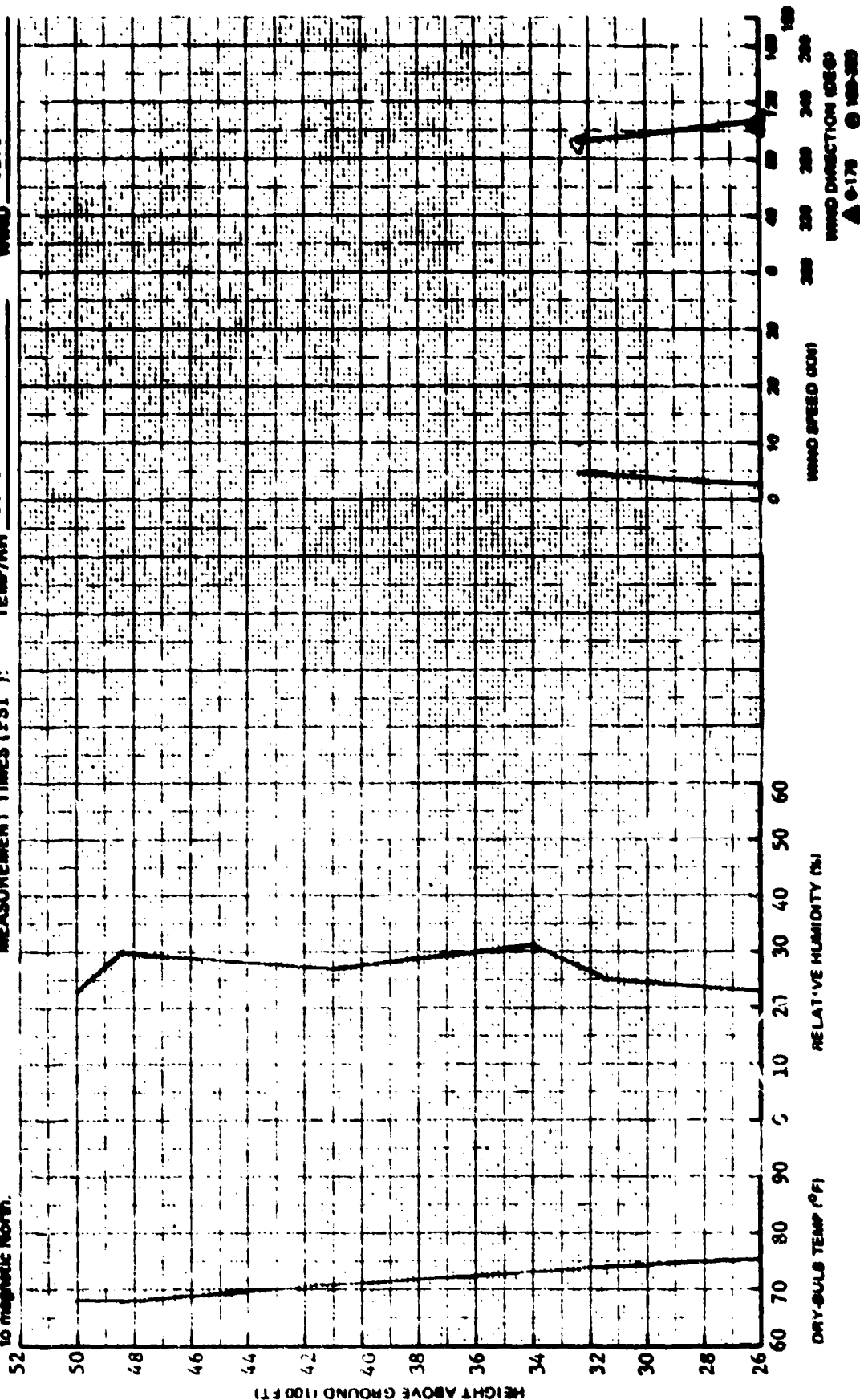


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

MCDONNELL DOUGLAS CORPORATION

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Altitude is 1000 ft.
 Altitude of SAF ARP 866 13/C 1000

Wind direction is heading 170,
 which wind is blowing referenced
 to magnetic North

AIRPLANE MODEL DC-8-61 PEG NO N8087U TEST SITE YUMA, ARIZONA
 DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973
 MEASUREMENT TIMES (ZST): TEMP/RH 0205 WIND 0255

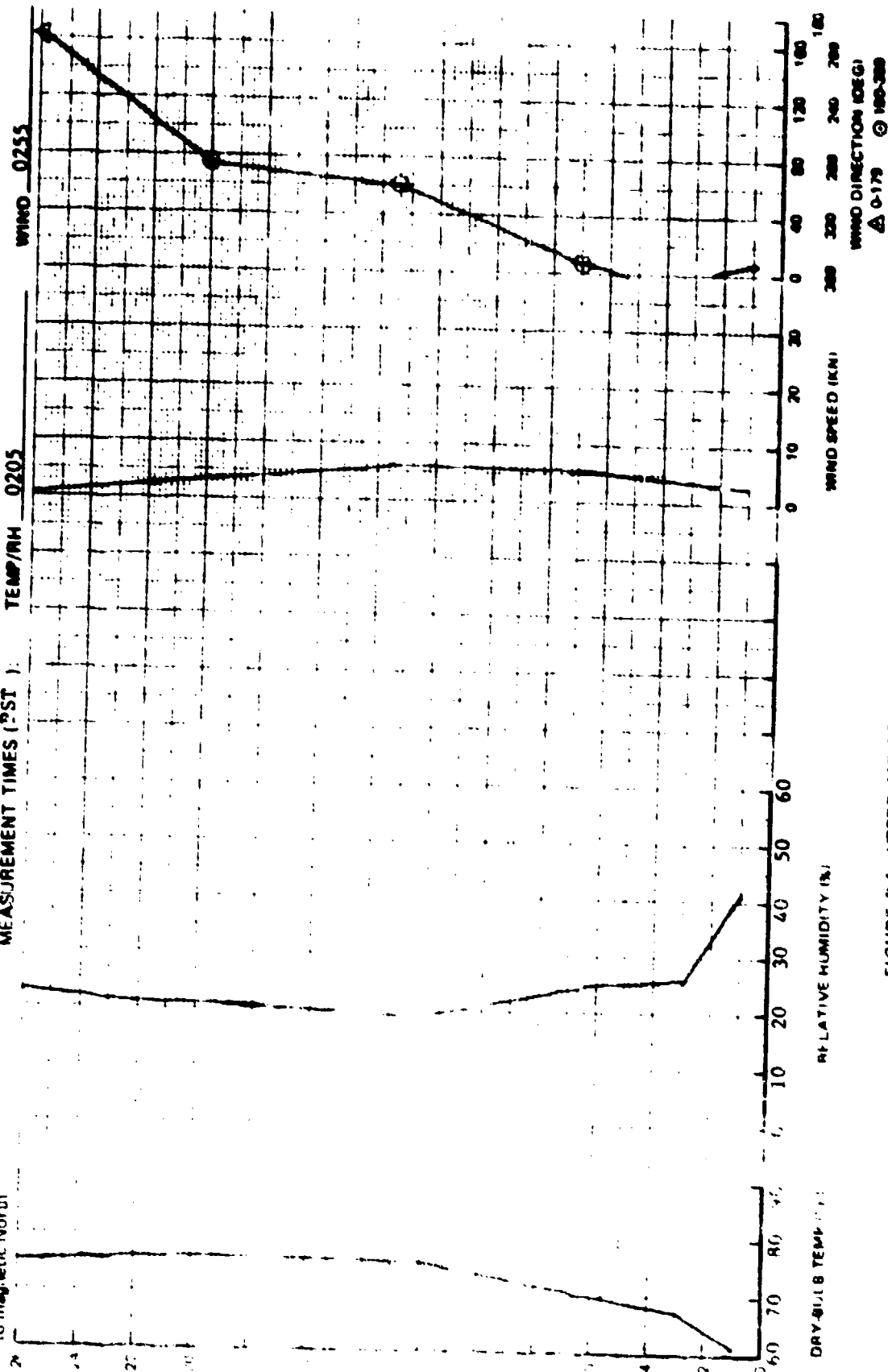


FIGURE B-4 UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Air abs coeff is 1/3 O B
value of SAE ARP 806 1970 Rev.

Wind direction is heading from,
which wind is blowing referenced
to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N9087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/HR 0205 WIND 0255

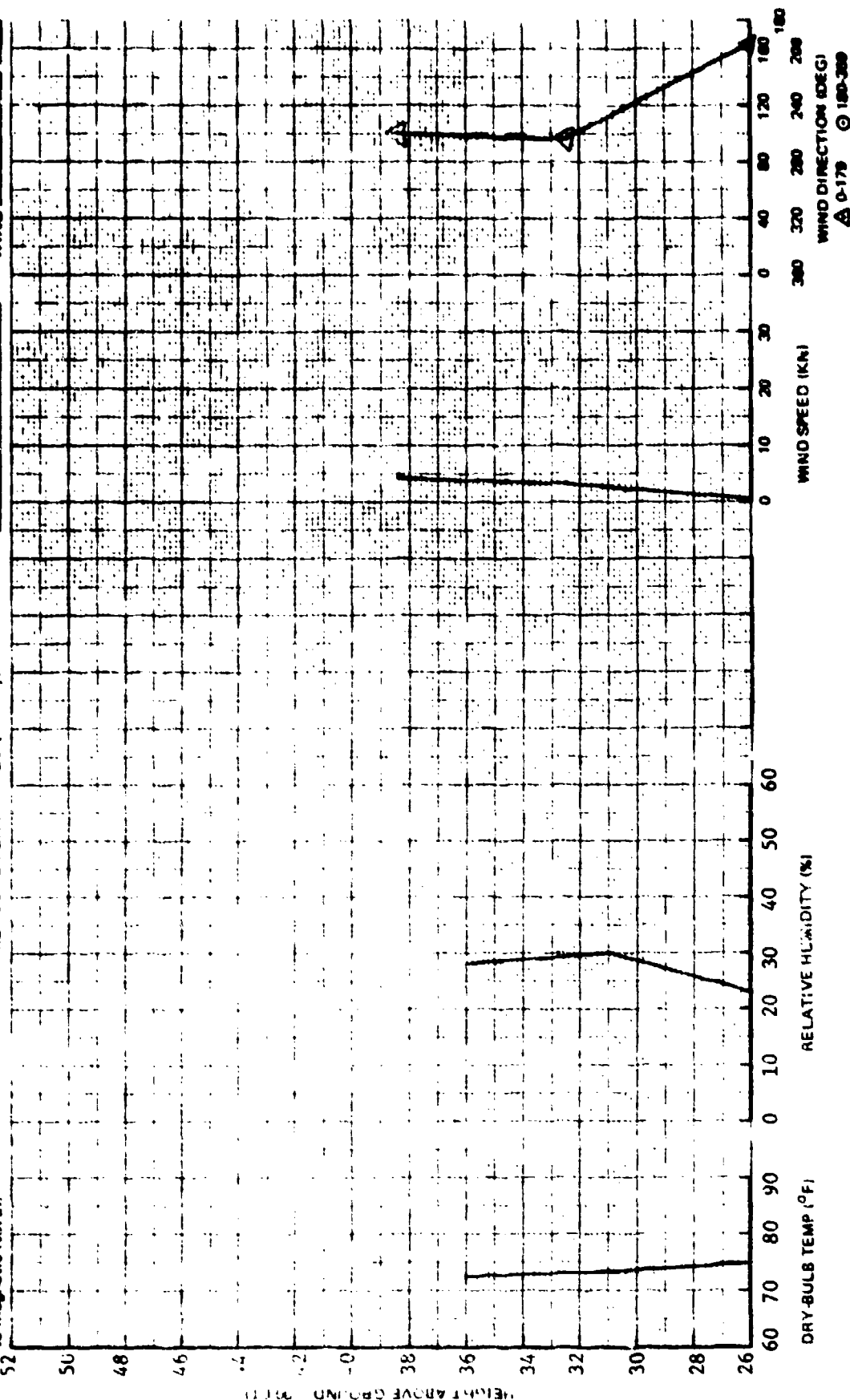


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Air data, eff is 1.008
value is 545 ARP 860 1970 RAY

Wind direction is heading from
which wind is blowing reference
to magnetic field

AIRPLANE N. DEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA
DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973
MEASUREMENT TIMES (PST) TEMP/RH 0315 WIND 0420

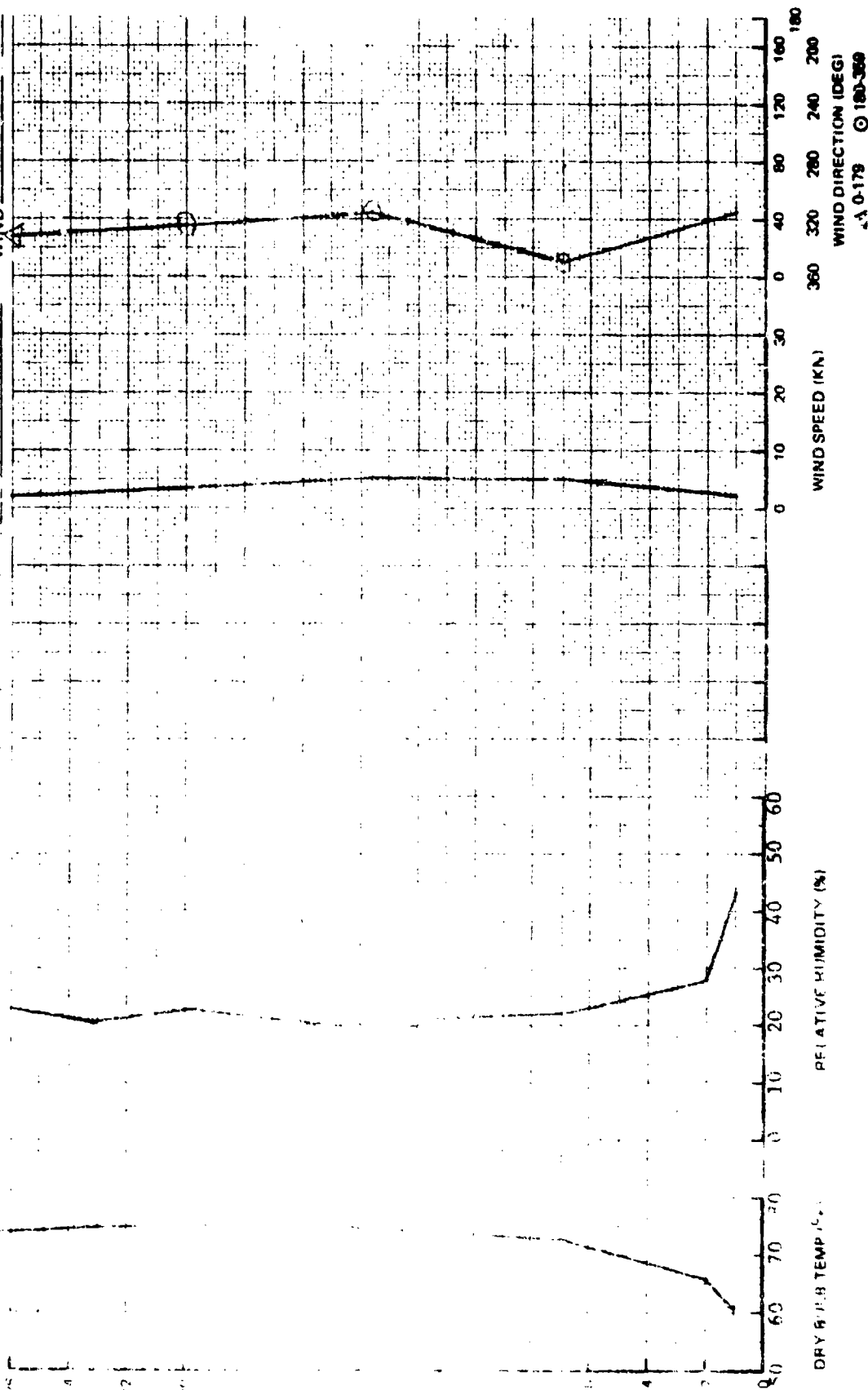


FIGURE B-4 UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1.30 B.
value of SAE ARP 886 1970 Rev.

Wind direction is heading from
which wind is blowing referenced
to magnetic North

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA
DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973
MEASUREMENT TIMES (PST): TEMP/RH 0315 WIND 0420

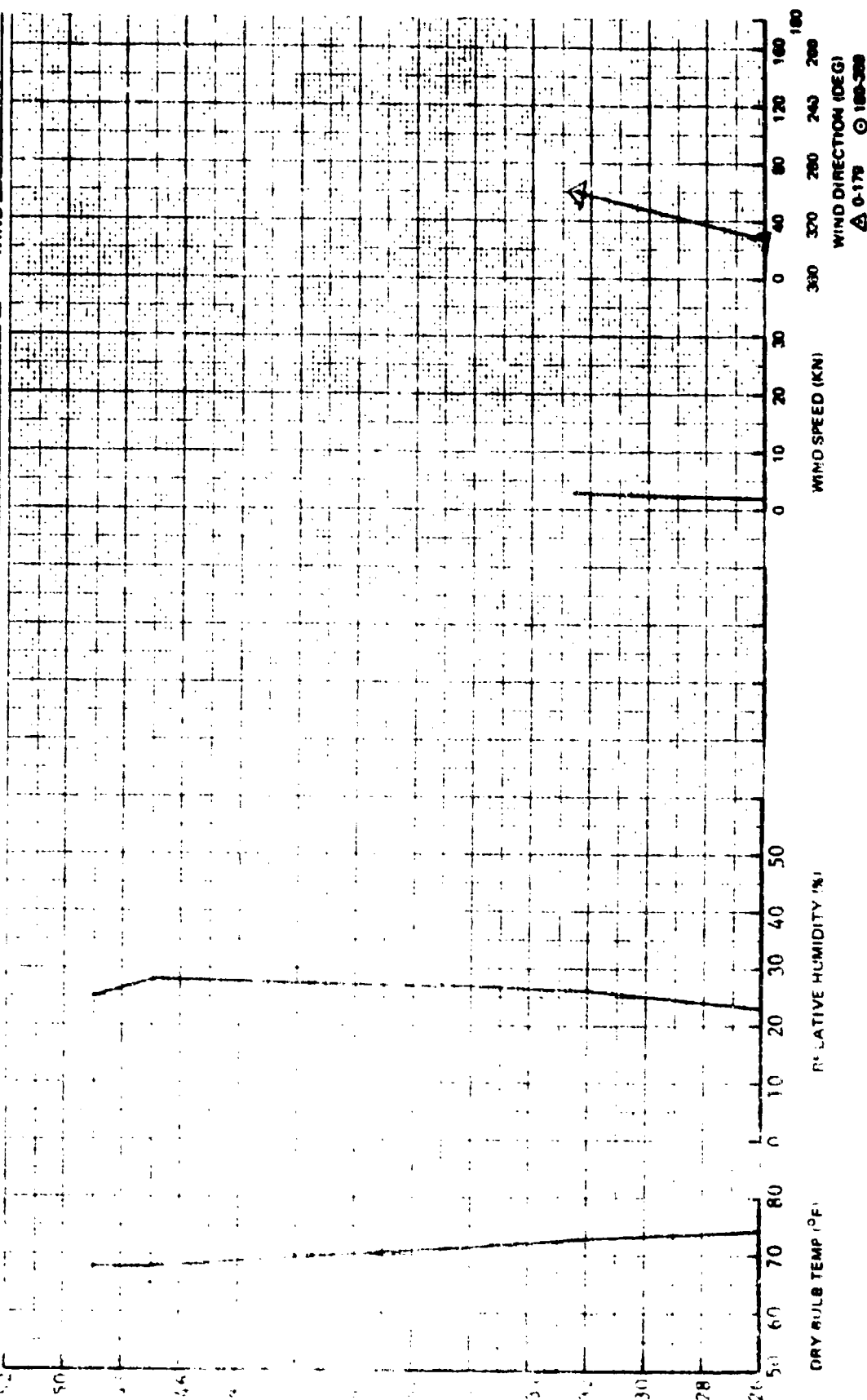


FIGURE B4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA
 DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973
 MEASUREMENT TIMES (PST) 0315 WIND 0420

NOTES: 1. Wind speed is 10-15 kts.
 2. Wind direction is 170-180 deg.

3. The wind is blowing from the
 south-southwest.

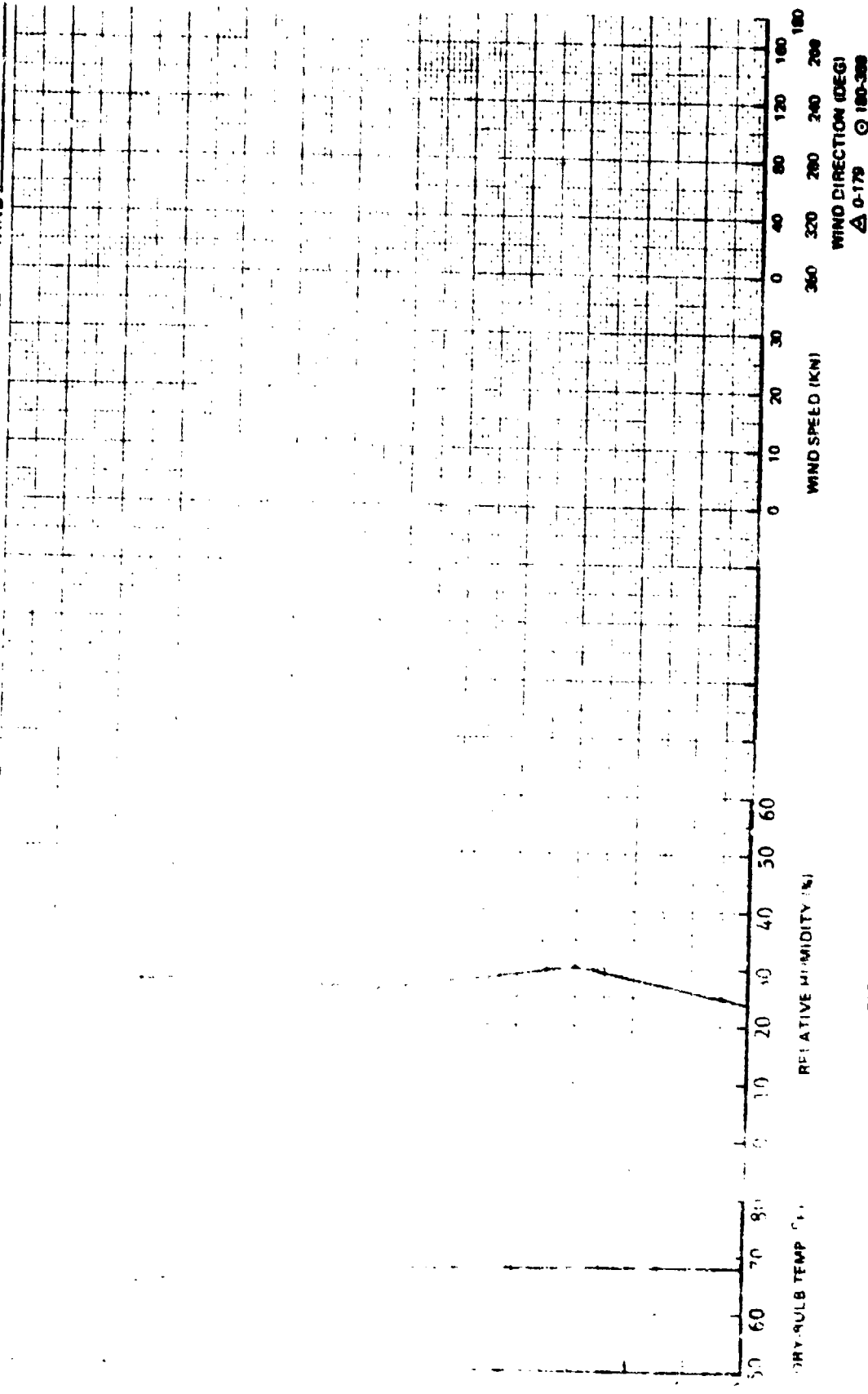


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B.
value of SAE ARP 896 1970 Rev

Wind direction is heading from
which wind is blowing referenced
to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): 0315 WIND 0420

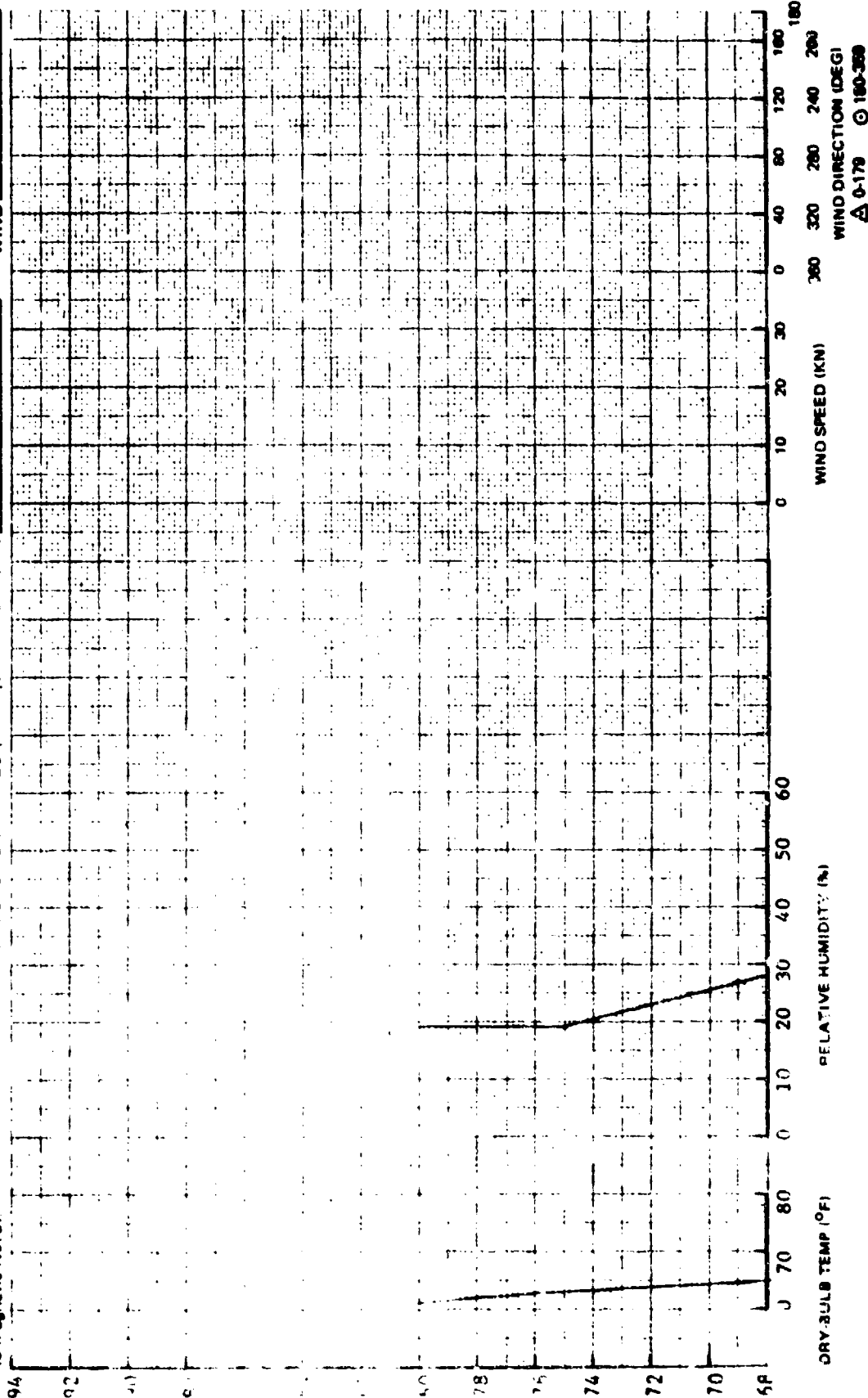


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Altitudes given is 1430 ft
 vs. of SAE ARP 866 1970 Rev.

Wind direction is heading from
 which wind is blowing referenced
 to magnetic North.

AIRPLANE MODEL DC-8-51 REG. NO. N8087J TEST SITE YUMA, ARIZONA
 DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973
 MEASUREMENT TIMES (PST): 0435 WIND

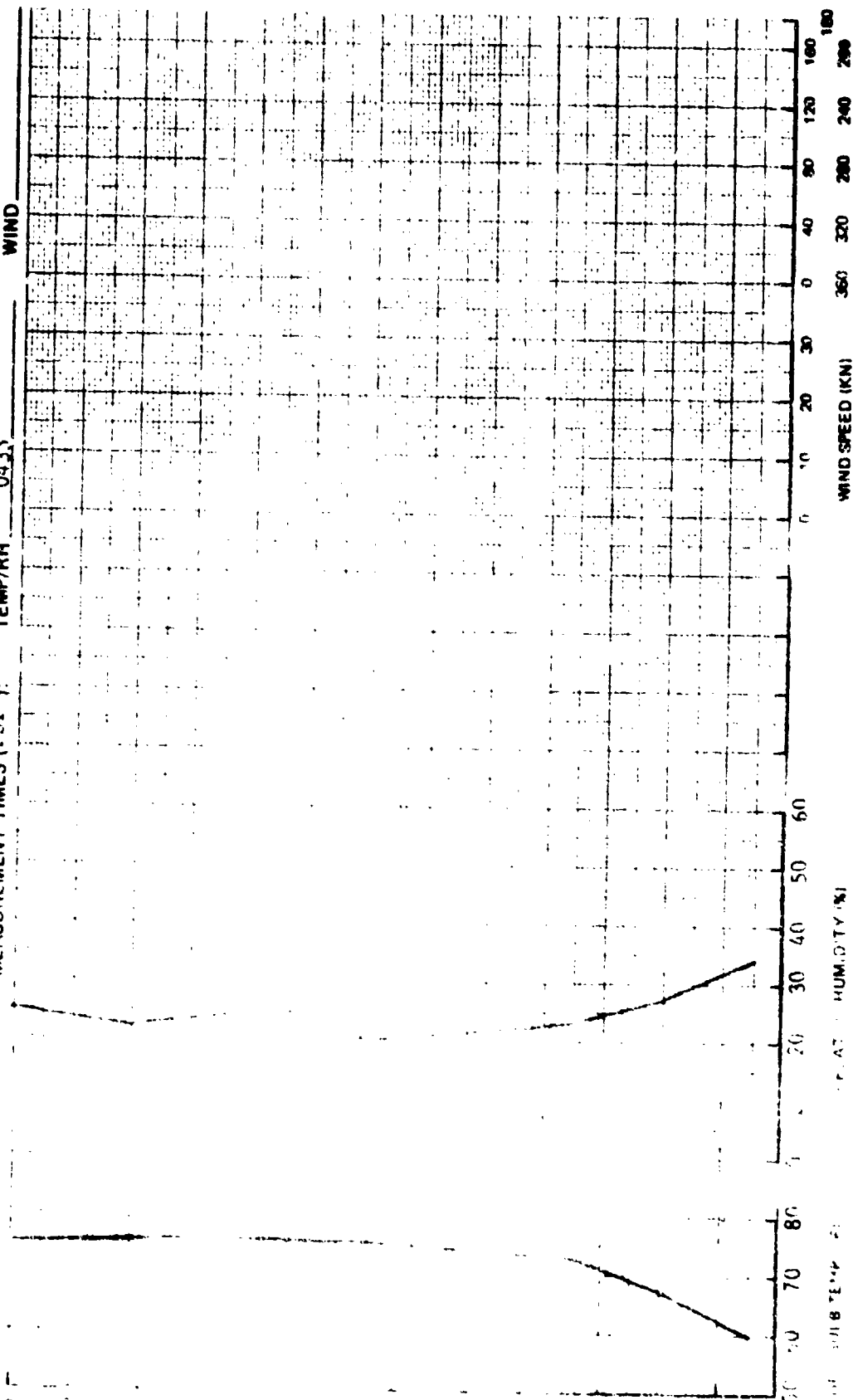


FIGURE B4 UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Altitude used is 3000 ft
value of SAE ARP 866 1970 Rev

Wind direction is heading from
which wind is blowing referenced
to magnetic North

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0435 WIND

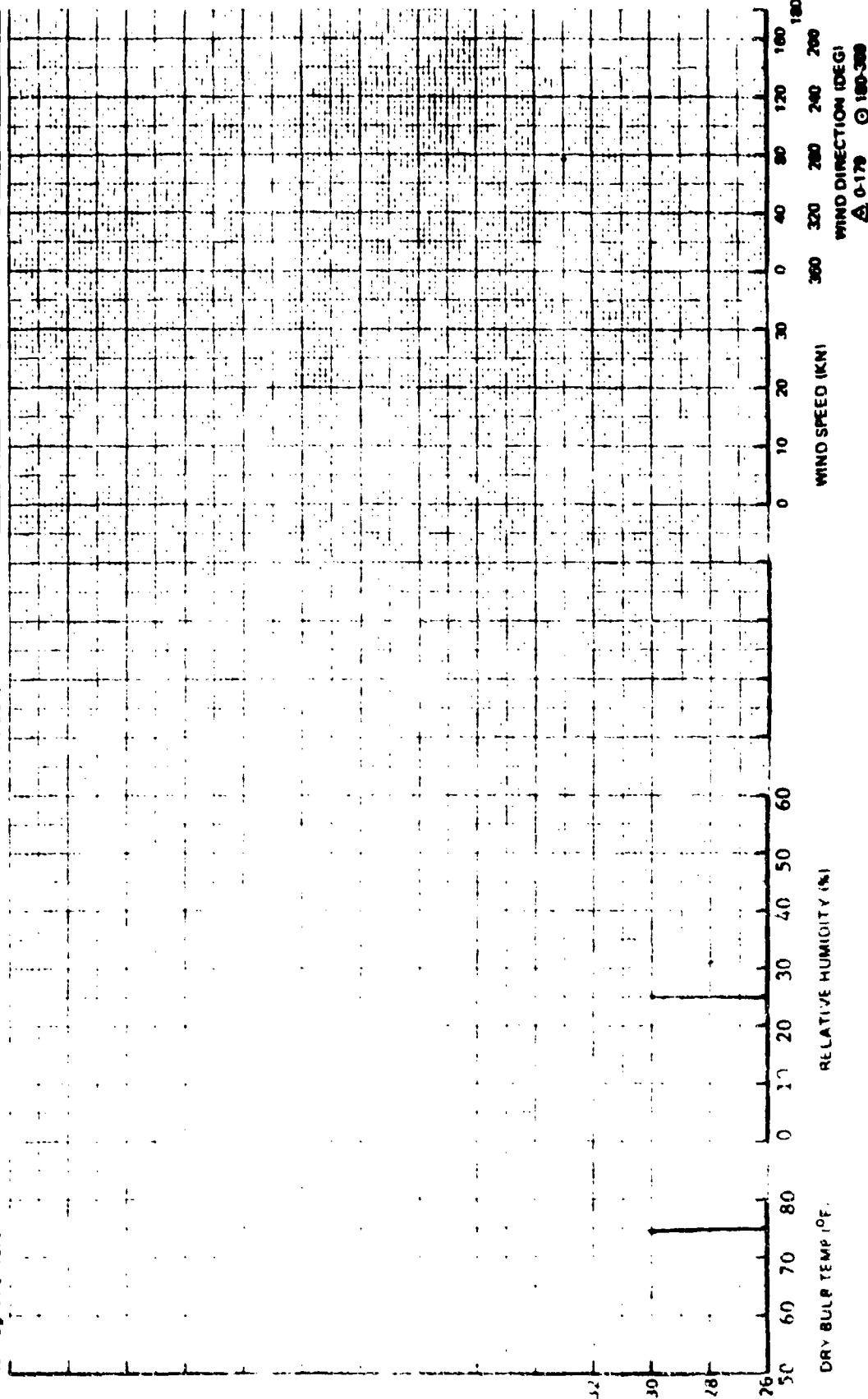


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONCLUDED)

APPENDIX C

SUMMARIES OF ACOUSTIC & AIRCRAFT OPERATION DATA

The printed output data from the computer program analyses of the measured acoustic and aircraft operation parameters are summarized and presented in Tables C-1 and C-2.

Table C-1 is a summary of the measured aircraft operation parameters used in analyzing the flyover-noise data.

Table C-2 presents selected representative computer program flyover-noise analyses of the Phase II flight test. These outputs from the E2QH computer program provide listings of the aircraft, weather, and test site parameters used in each analysis. Also shown are the following:

1. 1/3-octave band SPL's at 0.5-second intervals
2. 1/3-octave band center frequency of tone correction adjustment
3. Time history of overall SPL's at 0.5-second intervals
4. Time history of A-weighted sound levels at 0.5-second intervals
5. Time history of PNL values at 0.5-second intervals
6. Time history of PNLT values at 0.5-second intervals
7. Time history of acoustic range for noise levels at 0.5-second intervals (sound path distance)
8. Time history of optical range for noise levels at 0.5-second intervals (slant range of aircraft at time flyover-noise reached microphone)
9. Plot of time history of PNLT
10. Noise levels at time of PNLTM.

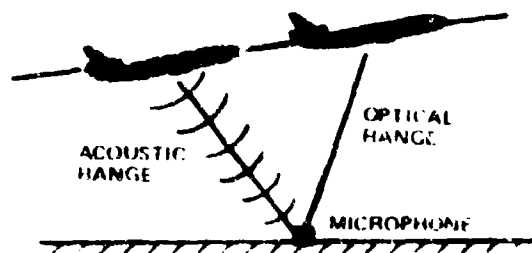


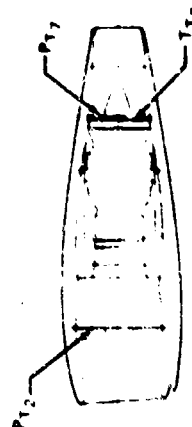
TABLE C.1
AIRPLANE PERFORMANCE SUMMARY

1

MODEL	DC-8-61	FUSELAGE NO.	373	REGISTRATION	AC. NO.	TEST DATE	11-00-75	10570410
FLIGHT NUMBER	2	13	3	2	13	3	2	13
RUN NUMBER	1	1	1	1	1	1	1	1
MICROPHONE LOCATION	2	13	3	2	13	3	2	13
MICROPHONE NUMBER	2	13	3	2	13	3	2	13
GROSS WEIGHT (1000 LBS)	276	273	271	259	255	254	250	247
FLAP ANGLE (DEG)	25.0	17.0	17.0	45.0	35.0	35.0	50.0	50.0
CALCULATED EPR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AIRCRAFT PATH SPEED (KNOTS)	166.2	173.9	175.0	170.5	175.3	178.0	186.7	194.4
AIRCRAFT PATH ALTITUDE (FEET)	1138	819	977	1368	1432	1317	1145	1193
AIRPLANE REFERRED NI	6532	5749	5717	3443	3325	3294	4682	4557
(1) AVE. EXIT PRESSURE (PSIA)	26.133	22.051	21.827	15.354	15.333	15.290	17.804	17.715
(2) AVE. INLET PRESSURE (PSIA)	7.300	4.810	4.333	3.225	3.179	3.173	3.613	3.618
(3) AVE. EXHAUST TEMP (DEG)	522.2	438.217	438.911	332.847	317.92	317.33	361.3	361.9
PULL ATTITUDE (DEG)	-11.24	-0.07	-2.03	0.0	-0.36	1.098	-5.565	-4.425
INBOARD FLAP POS. (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL AIR FLOW (LBS)	27.07	28.11	28.11	27.07	27.07	27.33	28.21	28.11
INBOARD FLAP POS. (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRESSURE ALTITUDE (FEET)	1240.8	139.5	1370.8	1384.5	1445.0	1355.3	1217.3	1244.0
MEASURED AIR SPEED (KNOTS)	177.1	177.0	177.0	161.5	167.3	159.0	177.0	177.0
MEASURED ALTITUDE (FEET)	137.1	27.0	27.0	26.5	26.5	26.4	26.4	26.4
MEASURED GRAVITY (G)	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071
AVE. ENGINE FAN SPEED (RPM)	167.1	167.1	167.1	167.1	167.1	167.1	167.1	167.1
FLIGHT NUMBER	2	13	3	2	13	3	2	13
RUN NUMBER	1	1	1	1	1	1	1	1
MICROPHONE LOCATION	2	13	3	2	13	3	2	13
MICROPHONE NUMBER	2	13	3	2	13	3	2	13
GROSS WEIGHT (1000 LBS)	245	242	240	236	236	236	235	235
FLAP ANGLE (DEG)	50.0	50.0	50.0	26.0	26.0	26.0	45.0	45.0
CALCULATED EPR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AIRCRAFT PATH SPEED (KNOTS)	181.5	174.7	168.5	166.9	166.9	166.2	182.6	182.6
AIRCRAFT PATH ALTITUDE (FEET)	1201	452	444	2103	2459	2467	221.6	221.6
AIRPLANE REFERRED NI	4726	6484	6459	6510	6510	6510	6479	6479
(1) AVE. EXIT PRESSURE (PSIA)	17.849	26.748	26.501	25.218	25.218	25.218	23.107	23.107
(2) AVE. INLET PRESSURE (PSIA)	17.477	7.923	7.574	5.115	5.115	5.115	5.053	5.053
(3) AVE. EXHAUST TEMP (DEG)	363.28	487.37	487.37	358.98	358.98	358.98	358.98	358.98
PULL ATTITUDE (DEG)	-5.16	10.07	11.32	11.29	11.29	11.29	11.29	11.29
INBOARD FLAP POS. (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL AIR FLOW (LBS)	27.79	27.79	27.79	27.79	27.79	27.79	27.79	27.79
INBOARD FLAP POS. (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRESSURE ALTITUDE (FEET)	1282.3	428.0	428.0	2402.8	2402.8	2402.8	2402.8	2402.8
MEASURED AIR SPEED (KNOTS)	177.2	169.0	169.0	169.0	169.0	169.0	177.2	177.2
MEASURED ALTITUDE (FEET)	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
MEASURED GRAVITY (G)	1.071	1.071	1.071	1.071	1.071	1.071	1.071	1.071
AVE. ENGINE FAN SPEED (RPM)	167.1	167.1	167.1	167.1	167.1	167.1	167.1	167.1

AIRPLANE PERFORMANCE SUMMARY (CONCLUDED)

MODEL	FUSELAGE NO.	REGISTRATION NO.	TEST DATE	TEST NO.
DC-9-41	373	N8087U	11-08-73	1123061U

[illegible]
$$\frac{P_1}{P_2} = \frac{P_1}{P_2} \quad \text{ENGINE PRESSURE RATIO}$$

NOTE FLIGHT NUMBER 1 - NOVEMBER 6, 1973
FLIGHT NUMBER 2 - NOVEMBER 7, 1973

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES

FAR PART 36 FLYOVER NOISE LEVELS

DATA IDENTIFICATION INFORMATION

DATA IDENTIFICATION 12-17-73 DATA PROCESSED 04/08/75 1110C400 PAGE 1

MODEL DC-8-61 REG. NO. N4087U
EC-8-61 FLYOVER NOISE DEFINITION

MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS

PLANE/NOISELLE CONFIGURATION -- PCMA JT30-38 ENGINES WITH PRODUCTION NOISELLES

TYPE OF FLIGHT -- TAKE OFF CLER FLYOVER DATA CLASS --
WEATHER TYPE -- FLYOVER FLY PATH, 4 FEET ABOVE SANDY DIRT POWER
REFERENCE AT 12000 FT. V = 221.0, Z = 2.0 FEET FROM WEST-MOST END OF RUNWAY
REFERENCE PLANE IN LOCATION 1 2 120-2.0, V = 0.7 Z = 0.0 FEET

WEATHER DATA
REL. HUM. = 50.0 PCT
WIND SPEED = 0.3 KM/H
WIND DIR = 95.0 DEG
STA. PRESS = 29.80 IN HG
RY. THETA = 1.0220

AIRPLANE AND ENGINE DATA
AVG. NMT = 6513. RPM
AVG. SPEED = 210. DEG
FLAP POS. = 25.0 DEG
PATH ANG. = 7.2 DEG
PITCH ANG. = 11.4 DEG
GR. WEIGHT = 276100. LB

AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF 23-35-41.3
OTHER REFERENCE DATA IS FOR TIME OF PNLM OF 23-35-43.5
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION 23-35-41.1

AIRPLANE SURFACE WEATHER CONDITIONS TEMP = 77.0 F & REL. HUM. = 70.0 PCT

DESCRIPTION OF ACOUSTICAL DATA PROCESSING

ANALYSIS TYPE / RESOLUTION CR1211CISAI / 0.25 CP ATMOSPHERIC ATTENUATION SAE ARP866 (REV)
CLOCK RATE 2 PPS WITH AUTO-START SOUND PRESSURE LEVEL
CLOCK RATE 1000 PPS WITH DATA 0.0002 MICRORBAR)
ANALYSIS TIME 1.500 SECONDS DATA TYPES 1/3 OCTAVE, OVERALL, A-WTD,
PAL, PALT, CEPNL

RUN 11A

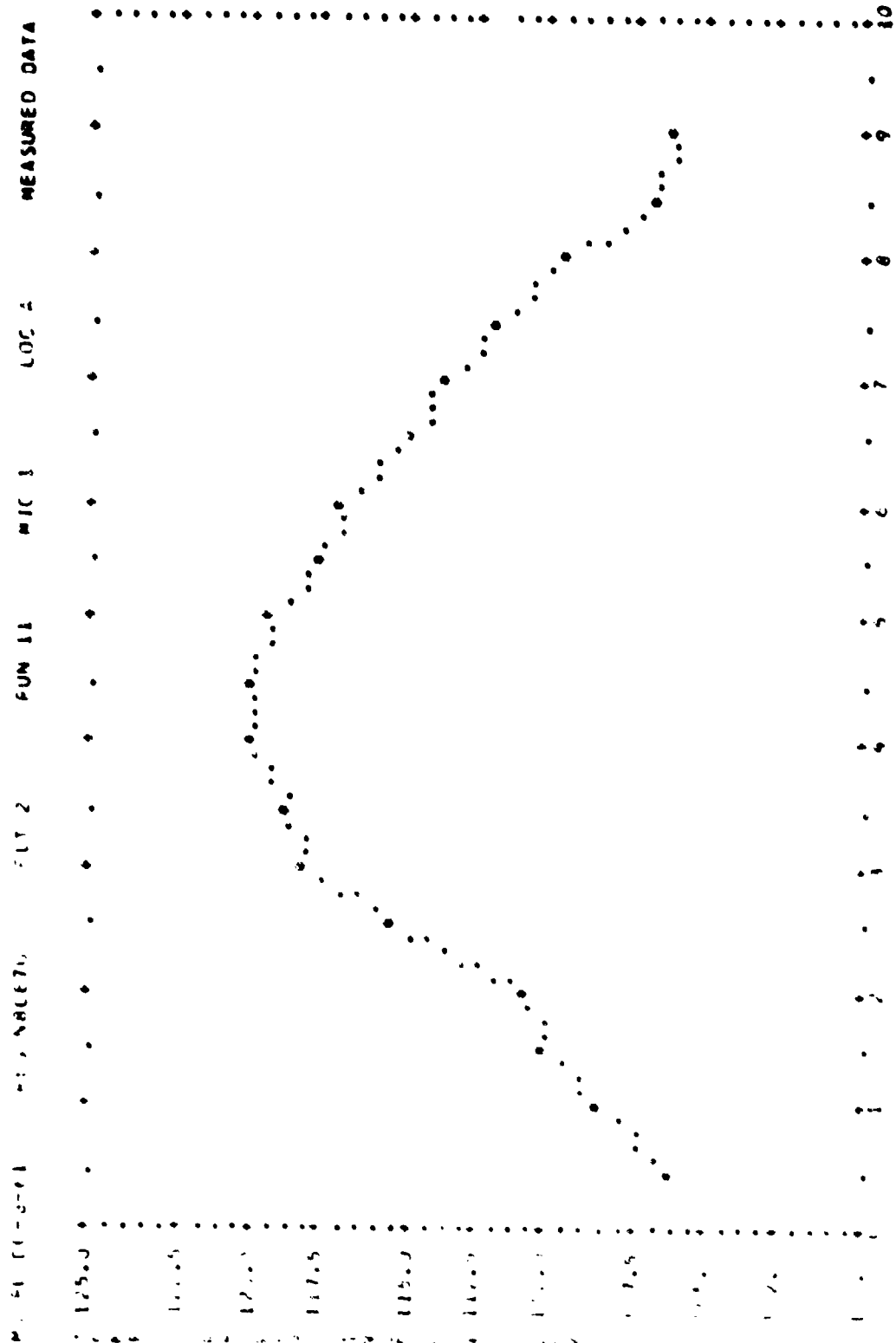
TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL START TIME	SPL HISTORY 23 35 59.000	MODEL REG. ABC87U	CC-8-61 RUN 11	FLY 2 RUN 11	MIC 1 LCC A	TEST DATE 11-07-73					1100-09 PAGE 2
						3.0	3.5	4.0	4.5	5.0	
162.1-18.0	340	0.0	3.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.5
162.1-18.0	57.9	83.1	84.2	85.1	86.5	87.3	88.4	89.3	90.4	91.5	95.7
162.1-18.0	60.4	83.5	84.6	85.9	87.7	89.1	90.4	91.5	92.6	93.7	97.4
162.1-18.0	62.9	83.9	84.6	86.9	87.7	89.1	90.4	91.5	92.6	93.7	97.4
162.1-18.0	61.9	84.6	84.7	84.9	83.9	85.0	86.1	87.2	88.3	89.4	93.5
162.1-18.0	60.2	83.2	82.9	83.3	81.8	82.6	83.7	84.8	85.9	87.0	91.1
162.1-18.0	62.9	83.2	83.3	83.3	81.8	82.6	83.7	84.8	85.9	87.0	91.1
162.1-18.0	56.3	84.1	83.3	81.8	80.1	81.1	82.2	83.3	84.4	85.5	89.6
162.1-18.0	56.1	84.1	83.3	81.8	80.1	81.1	82.2	83.3	84.4	85.5	89.6
162.1-18.0	54.0	84.4	83.3	81.8	80.1	81.1	82.2	83.3	84.4	85.5	89.6
162.1-18.0	53.2	82.3	81.7	80.8	79.9	80.9	82.0	83.1	84.2	85.3	89.4
162.1-18.0	50.4	81.9	81.3	80.4	79.4	80.4	81.5	82.6	83.7	84.8	88.9
162.1-18.0	54.2	84.2	83.3	81.8	80.1	81.1	82.2	83.3	84.4	85.5	89.6
162.1-18.0	51.2	83.0	82.0	81.0	80.1	81.1	82.2	83.3	84.4	85.5	89.6
162.1-18.0	49.7	81.3	80.3	79.4	78.4	79.4	80.5	81.6	82.7	83.8	87.9
162.1-18.0	44.3	78.8	77.8	76.9	75.9	76.9	78.0	79.1	80.2	81.3	85.4
162.1-18.0	47.0	76.3	75.3	74.4	73.4	74.4	75.5	76.6	77.7	78.8	82.9
162.1-18.0	45.9	75.6	74.6	73.7	72.7	73.7	74.8	75.9	77.0	78.1	82.2
162.1-18.0	40.5	70.4	69.4	68.5	67.5	68.5	69.6	70.7	71.8	72.9	77.0
162.1-18.0	38.5	68.4	67.4	66.5	65.5	66.5	67.6	68.7	69.8	70.9	75.0
162.1-18.0	35.7	65.6	64.6	63.7	62.7	63.7	64.8	65.9	67.0	68.1	72.2
162.1-18.0	33.1	63.0	62.0	61.0	60.0	61.0	62.1	63.2	64.3	65.4	69.5
162.1-18.0	31.2	61.1	60.1	59.1	58.1	59.1	60.2	61.3	62.4	63.5	67.6
162.1-18.0	28.4	58.3	57.3	56.3	55.3	56.3	57.4	58.5	59.6	60.7	64.8
162.1-18.0	26.5	56.4	55.4	54.4	53.4	54.4	55.5	56.6	57.7	58.8	62.9
162.1-18.0	24.6	54.5	53.5	52.5	51.5	52.5	53.6	54.7	55.8	56.9	61.0
162.1-18.0	22.7	52.6	51.6	50.6	49.6	50.6	51.7	52.8	53.9	55.0	59.1
162.1-18.0	20.8	50.7	49.7	48.7	47.7	48.7	49.8	50.9	52.0	53.1	57.2
162.1-18.0	18.9	48.8	47.8	46.8	45.8	46.8	47.9	49.0	50.1	51.2	55.3
162.1-18.0	17.0	46.9	45.9	44.9	43.9	44.9	46.0	47.1	48.2	49.3	53.4
162.1-18.0	15.1	45.0	44.0	43.0	42.0	43.0	44.1	45.2	46.3	47.4	51.5
162.1-18.0	13.2	43.1	42.1	41.1	40.1	41.1	42.2	43.3	44.4	45.5	49.6
162.1-18.0	11.3	41.2	40.2	39.2	38.2	39.2	40.3	41.4	42.5	43.6	47.7
162.1-18.0	9.4	39.3	38.3	37.3	36.3	37.3	38.4	39.5	40.6	41.7	45.8
162.1-18.0	7.5	37.4	36.4	35.4	34.4	35.4	36.5	37.6	38.7	39.8	43.9
162.1-18.0	5.6	35.5	34.5	33.5	32.5	33.5	34.6	35.7	36.8	37.9	42.0
162.1-18.0	3.7	33.6	32.6	31.6	30.6	31.6	32.7	33.8	34.9	36.0	40.1
162.1-18.0	1.8	31.7	30.7	29.7	28.7	29.7	30.8	31.9	33.0	34.1	38.2
162.1-18.0	0.0	29.8	28.8	27.8	26.8	27.8	28.9	30.0	31.1	32.2	36.3
162.1-18.0	0.0	27.9	26.9	25.9	24.9	25.9	27.0	28.1	29.2	30.3	34.4
162.1-18.0	0.0	26.0	25.0	24.0	23.0	24.0	25.1	26.2	27.3	28.4	32.5
162.1-18.0	0.0	24.1	23.1	22.1	21.1	22.1	23.2	24.3	25.4	26.5	30.6
162.1-18.0	0.0	22.2	21.2	20.2	19.2	20.2	21.3	22.4	23.5	24.6	28.7
162.1-18.0	0.0	20.3	19.3	18.3	17.3	18.3	19.4	20.5	21.6	22.7	26.8
162.1-18.0	0.0	18.4	17.4	16.4	15.4	16.4	17.5	18.6	19.7	20.8	24.9
162.1-18.0	0.0	16.5	15.5	14.5	13.5	14.5	15.6	16.7	17.8	18.9	23.0
162.1-18.0	0.0	14.6	13.6	12.6	11.6	12.6	13.7	14.8	15.9	17.0	21.1
162.1-18.0	0.0	12.7	11.7	10.7	9.7	10.7	11.8	12.9	14.0	15.1	19.2
162.1-18.0	0.0	10.8	9.8	8.8	7.8	8.8	9.9	11.0	12.1	13.2	17.3
162.1-18.0	0.0	8.9	7.9	6.9	5.9	6.9	8.0	9.1	10.2	11.3	15.4
162.1-18.0	0.0	7.0	6.0	5.0	4.0	5.0	6.1	7.2	8.3	9.4	13.5
162.1-18.0	0.0	5.1	4.1	3.1	2.1	3.1	4.2	5.3	6.4	7.5	11.6
162.1-18.0	0.0	3.2	2.2	1.2	0.2	1.2	2.3	3.4	4.5	5.6	9.7
162.1-18.0	0.0	1.3	0.3	0.3	0.3	0.3	1.4	2.5	3.6	4.7	7.8
162.1-18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.1	3.2	5.9
162.1-18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.1	4.0
162.1-18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.1	2.1
162.1-18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.1	0.2

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURE	FLY HISTORY	WHEEL COUNTS	FLY 2	LOC 1	TEST DATE	11-07-73	11103408
START TIME	23 35 39.000	085. 18.000	PLN 11	LOC 2			PAGE 3
162.18	6.5	7.5	8.0	8.5	9.0		
SC	47.2	57.6	57.3	55.4	53.3		
PO	57.3	57.0	56.3	55.0	54.0		
	54.1	53.6	51.8	41.4	51.4		
183	55.9	54.2	47.3	46.7	44.2		
185	104.1	54.7	55.7	49.5	43.6		
	107.1	135.6	102.6	96.5	83.6		
200	124.7	104.6	101.6	94.7	85.5		
215	59.1	100.1	55.4	57.8	55.7		
	96.6	54.4	52.0	50.5	50.0		
230	57.5	54.3	54.0	49.7	46.3		
	53.1	50.5	48.3	42.5	40.3		
250	50.2	47.6	42.9	40.4	39.0		
	47.3	44.3	42.1	37.0	34.9		
260	44.3	42.2	37.0	33.6	31.1		
275	41.3	38.7	35.2	29.1	26.7		
	38.3	35.0	32.2	28.2	25.1		
290	34.3	31.5	27.9	24.6	22.2		
300	34.3	30.3	26.7	23.3	20.5		
315	29.5	26.0	22.1	19.8	17.5		
330	27.7	22.9	19.1	16.8	14.6		
345	24.8	19.1	15.4	13.5	11.4		
360	21.8	16.0	12.4	10.4	8.5		
375	18.8	13.0	9.4	7.4	5.5		
390	15.8	10.0	6.4	4.4	2.5		
405	12.8	7.0	3.4	1.4	0.5		
420	9.8	4.0	0.4	0.4	0.5		
435	6.8	1.0	0.4	0.4	0.5		
450	3.8	0.0	0.4	0.4	0.5		
465	0.8	0.0	0.4	0.4	0.5		
480	0.8	0.0	0.4	0.4	0.5		
495	0.8	0.0	0.4	0.4	0.5		
510	0.8	0.0	0.4	0.4	0.5		
525	0.8	0.0	0.4	0.4	0.5		
540	0.8	0.0	0.4	0.4	0.5		
555	0.8	0.0	0.4	0.4	0.5		
570	0.8	0.0	0.4	0.4	0.5		
585	0.8	0.0	0.4	0.4	0.5		
600	0.8	0.0	0.4	0.4	0.5		
615	0.8	0.0	0.4	0.4	0.5		
630	0.8	0.0	0.4	0.4	0.5		
645	0.8	0.0	0.4	0.4	0.5		
660	0.8	0.0	0.4	0.4	0.5		
675	0.8	0.0	0.4	0.4	0.5		
690	0.8	0.0	0.4	0.4	0.5		
705	0.8	0.0	0.4	0.4	0.5		
720	0.8	0.0	0.4	0.4	0.5		
735	0.8	0.0	0.4	0.4	0.5		
750	0.8	0.0	0.4	0.4	0.5		
765	0.8	0.0	0.4	0.4	0.5		
780	0.8	0.0	0.4	0.4	0.5		
795	0.8	0.0	0.4	0.4	0.5		
810	0.8	0.0	0.4	0.4	0.5		
825	0.8	0.0	0.4	0.4	0.5		
840	0.8	0.0	0.4	0.4	0.5		
855	0.8	0.0	0.4	0.4	0.5		
870	0.8	0.0	0.4	0.4	0.5		
885	0.8	0.0	0.4	0.4	0.5		
900	0.8	0.0	0.4	0.4	0.5		
915	0.8	0.0	0.4	0.4	0.5		
930	0.8	0.0	0.4	0.4	0.5		
945	0.8	0.0	0.4	0.4	0.5		
960	0.8	0.0	0.4	0.4	0.5		
975	0.8	0.0	0.4	0.4	0.5		
990	0.8	0.0	0.4	0.4	0.5		
1005	0.8	0.0	0.4	0.4	0.5		
1020	0.8	0.0	0.4	0.4	0.5		
1035	0.8	0.0	0.4	0.4	0.5		
1050	0.8	0.0	0.4	0.4	0.5		
1065	0.8	0.0	0.4	0.4	0.5		
1080	0.8	0.0	0.4	0.4	0.5		
1095	0.8	0.0	0.4	0.4	0.5		
1110	0.8	0.0	0.4	0.4	0.5		
1125	0.8	0.0	0.4	0.4	0.5		
1140	0.8	0.0	0.4	0.4	0.5		
1155	0.8	0.0	0.4	0.4	0.5		
1170	0.8	0.0	0.4	0.4	0.5		
1185	0.8	0.0	0.4	0.4	0.5		
1200	0.8	0.0	0.4	0.4	0.5		
1215	0.8	0.0	0.4	0.4	0.5		
1230	0.8	0.0	0.4	0.4	0.5		
1245	0.8	0.0	0.4	0.4	0.5		
1260	0.8	0.0	0.4	0.4	0.5		
1275	0.8	0.0	0.4	0.4	0.5		
1290	0.8	0.0	0.4	0.4	0.5		
1305	0.8	0.0	0.4	0.4	0.5		
1320	0.8	0.0	0.4	0.4	0.5		
1335	0.8	0.0	0.4	0.4	0.5		
1350	0.8	0.0	0.4	0.4	0.5		
1365	0.8	0.0	0.4	0.4	0.5		
1380	0.8	0.0	0.4	0.4	0.5		
1395	0.8	0.0	0.4	0.4	0.5		
1410	0.8	0.0	0.4	0.4	0.5		
1425	0.8	0.0	0.4	0.4	0.5		
1440	0.8	0.0	0.4	0.4	0.5		
1455	0.8	0.0	0.4	0.4	0.5		
1470	0.8	0.0	0.4	0.4	0.5		
1485	0.8	0.0	0.4	0.4	0.5		
1500	0.8	0.0	0.4	0.4	0.5		
1515	0.8	0.0	0.4	0.4	0.5		
1530	0.8	0.0	0.4	0.4	0.5		
1545	0.8	0.0	0.4	0.4	0.5		
1560	0.8	0.0	0.4	0.4	0.5		
1575	0.8	0.0	0.4	0.4	0.5		
1590	0.8	0.0	0.4	0.4	0.5		
1605	0.8	0.0	0.4	0.4	0.5		
1620	0.8	0.0	0.4	0.4	0.5		
1635	0.8	0.0	0.4	0.4	0.5		
1650	0.8	0.0	0.4	0.4	0.5		
1665	0.8	0.0	0.4	0.4	0.5		
1680	0.8	0.0	0.4	0.4	0.5		
1695	0.8	0.0	0.4	0.4	0.5		
1710	0.8	0.0	0.4	0.4	0.5		
1725	0.8	0.0	0.4	0.4	0.5		
1740	0.8	0.0	0.4	0.4	0.5		
1755	0.8	0.0	0.4	0.4	0.5		
1770	0.8	0.0	0.4	0.4	0.5		
1785	0.8	0.0	0.4	0.4	0.5		
1800	0.8	0.0	0.4	0.4	0.5		
1815	0.8	0.0	0.4	0.4	0.5		
1830	0.8	0.0	0.4	0.4	0.5		
1845	0.8	0.0	0.4	0.4	0.5		
1860	0.8	0.0	0.4	0.4	0.5		
1875	0.8	0.0	0.4	0.4	0.5		
1890	0.8	0.0	0.4	0.4	0.5		
1905	0.8	0.0	0.4	0.4	0.5		
1920	0.8	0.0	0.4	0.4	0.5		
1935	0.8	0.0	0.4	0.4	0.5		
1950	0.8	0.0	0.4	0.4	0.5		
1965	0.8	0.0	0.4	0.4	0.5		
1980	0.8	0.0	0.4	0.4	0.5		
1995	0.8	0.0	0.4	0.4	0.5		
2010	0.8	0.0	0.4	0.4	0.5		
2025	0.8	0.0	0.4	0.4	0.5		
2040	0.8	0.0	0.4	0.4	0.5		
2055	0.8	0.0	0.4	0.4	0.5		
2070	0.8	0.0	0.4	0.4	0.5		
2085	0.8	0.0	0.4	0.4	0.5		
2100	0.8	0.0	0.4	0.4	0.5		
2115	0.8	0.0	0.4	0.4	0.5		
2130	0.8	0.0	0.4	0.4	0.5		
2145	0.8	0.0	0.4	0.4	0.5		
2160	0.8	0.0	0.4	0.4	0.5		
2175	0.8	0.0	0.4	0.4	0.5		
2190	0.8	0.0	0.4	0.4	0.5		
2205	0.8	0.0	0.4	0.4	0.5		
2220	0.8	0.0	0.4	0.4	0.5		
2235	0.8	0.0	0.4	0.4	0.5		
2250	0.8	0.0	0.4	0.4	0.5		
2265	0.8	0.0	0.4	0.4	0.5		
2280	0.8	0.0	0.4	0.4	0.5		
2295	0.8	0.0	0.4	0.4	0.5		
2310	0.8	0.0	0.4	0.4	0.5		
2325	0.8	0.0	0.4	0.4	0.5		
2340	0.8	0.0	0.4	0.4	0.5		
2355	0.8	0.0	0.4	0.4	0.5		
2370	0.8	0.0	0.4	0.4	0.5		
2385	0.8	0.0	0.4	0.4	0.5		
2400	0.8	0.0	0.4	0.4	0.5		
2415	0.8	0.0	0.4	0.4	0.5		
2430	0.8	0.0	0.4	0.4	0.5		
2445	0.8	0.0	0.4	0.4	0.5		
2460	0.8	0.0	0.4	0.4	0.5		
2475	0.8	0.0	0.4	0.4	0.5		
2490	0.8	0.0	0.4	0.4	0.5		
2505	0.8	0.0	0.4	0.4	0.5		
2520	0.8	0.0	0.4	0.4	0.5		
2535	0.8	0.0	0.4	0.4	0.5		
2550	0.8	0.0	0.4	0.4	0.5		
2565	0.8	0.0	0.4	0.4	0.5		
2580	0.8	0.0	0.4	0.4	0.5		
2595	0.8	0.0	0.4	0.4	0.5		
2610	0.8	0.0	0.4	0.4	0.5		
2625	0.8	0.0	0.4	0.4	0.5		
2640	0.8	0.0	0.4	0.4	0.5		
2655	0.8	0.0	0.4	0.4	0.5		
2670	0.8	0.0	0.4	0.4	0.5		
2685	0.8	0.0	0.4	0.4	0.5		
2700	0.8	0.0	0.4	0.4	0.5		
2715	0.8	0.0	0.4	0.4	0.5		
2730	0.8	0.0	0.4	0.4	0.5		
2745	0.8	0.0	0.4	0.4	0.5		
2760	0.8	0.0	0.4	0.4	0.5		
2775	0.8	0.0	0.4	0.4	0.5		
2790	0.8	0.0	0.4	0.4	0.5		
2805	0.8	0.0	0.4	0.4	0.5		
2820	0.8	0.0	0.4	0.4	0.5		
2835	0.8	0.0	0.4	0.4	0.5		
2850	0.8	0.0	0.4	0.4	0.5		
2865	0.8	0.0	0.4	0.4	0.5		
2880	0.8	0.0	0.4	0.4	0.5		
2895	0.8	0.0	0.4	0.4	0.5		
2910</							

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES CONTINUED



11100405

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

FORM PART 36 FLYOVER NOISE LEVELS

DATA IDENTIFICATION INFLAMMATIC

DATE DIGITIZED 12-17-73 DATA PROCESSED 04/00/75 11100408 PAGE 1

MODEL DC-8-B1 REG. NO. N80070
DC-8-B1 FLYOVER NOISE DEFINITION

MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS
ENGINE/NADEL CONFIGURATION -- 2 ENG JT3D-35 ENGINES WITH PRODUCTION NACELLES

TYPE 16 FLYOVER -- TAKEOFF CLIMB FLYOVER
MEASURED AT X = 12000 FT. PATH, 4 DATA CLASS -- FM/DT = 10000 LBS
REFERENCE RECORDING LOCATION X = 221.0 FT. 2-0 FEET ABOVE SANDY CLIFF
REFERENCE RECORDING LOCATION X = 12000.0, Y = 0.0, Z = 0.0 FEET FROM WEST-MOST END OF RUNWAY

FLYOVER DATA
FLYER NO. 373 AIRPLANE AND ENGINE DATA
FLIGHT 12 AVG. NMT = 5750 RPM
FLYER TYPE 12 AVG. EPR = N/A
FLYER ALT. 12 A/P HEADING = 210. DEG
FLYER DIR. 12 FLAP PCC = 11.0 DEG
FLYER DEV. = 443.3 FT FLAP PCC = 11.0 DEG
FLYER ENG. = 122.9 FT PITCH ANG. = 4.5 DEG
FLYER SPD. = 460.1 KNOT CR. WEIGHT = 10.0 DEG
FLYER WGT. = 174.5 KNOT CR. WEIGHT = 273300. LBS

WEATHER DATA
TEMP. = 57.0 F
REL. HUM. = 45.4 PCT
WIND SPEED = 5.4 GA/PS
WIND DIR. = 2. DEG
STA. PRESS. = 100.0 DEG
PT. THERM. = 29.80 IN HG

AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF 23-46-41.3
OTHER PERFORMANCE DATA IS FOR TIME OF PNLTH OF 23-46-42.2
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION 23-46-41.1

REFERENCE SURFACE WEATHER CONDITIONS TEMP = 77.0 F & REL. HUM. = 70.0 PCT

DESCRIPTION OF ACOUSTICAL DATA PROCESSING

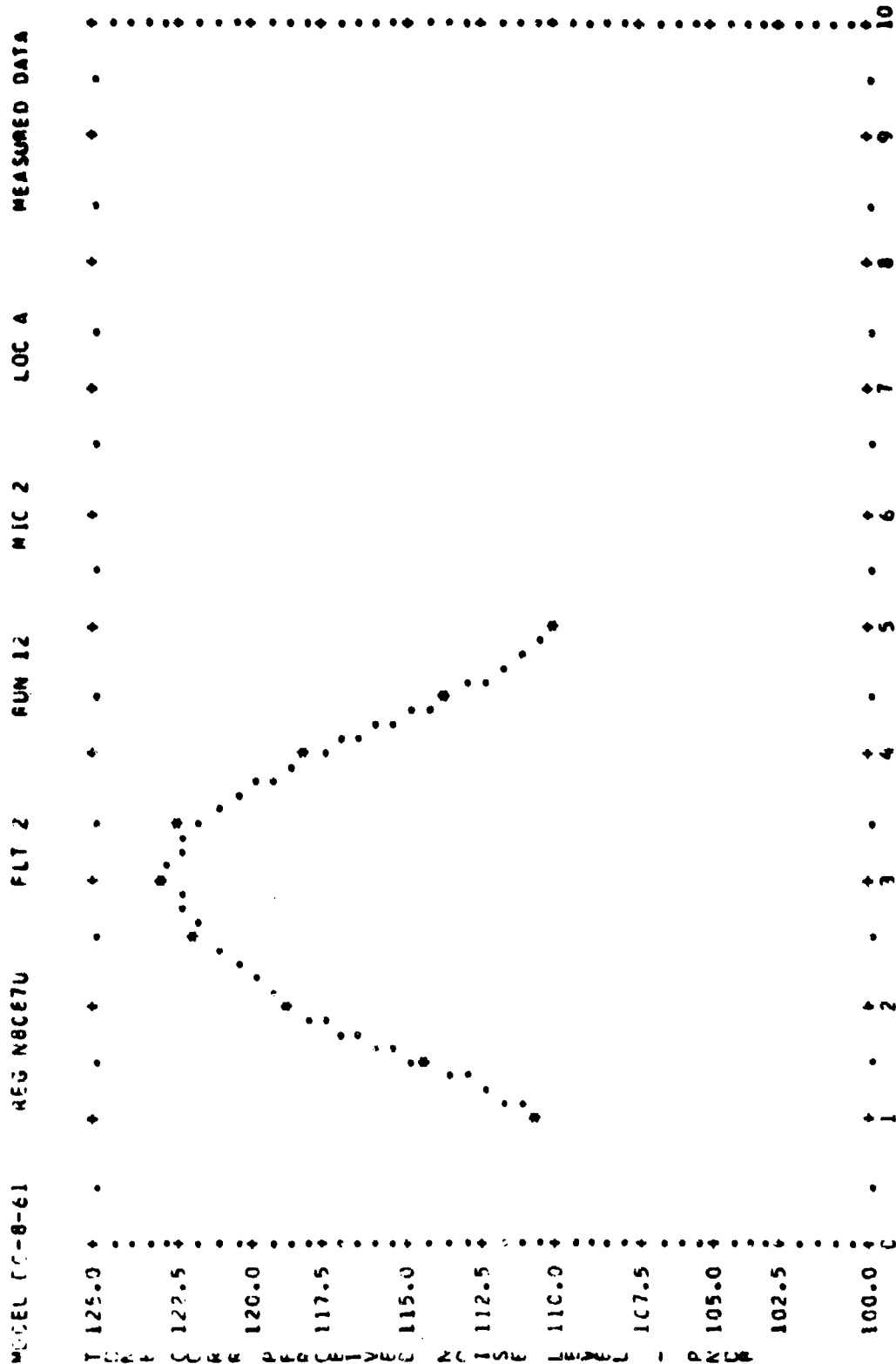
ANALYZER TYPE / RESOLUTION 661921 (CISA) / 0.25 LP
CISA MODEL 1 PASS WITH AUTO-START
SAMPLE INTERVAL FOR BASIC DATA = .500 SECONDS
AVERAGING TIME = 1.500 SECONDS
ATTENUATION SAC ARP866 (REV1)
SOUND PRESSURE LEVEL
ICB REL. 0.0002 MICRORBAR
1/3 OCTAVE, OVERALL, A-WTD,
PAL, PNLTH & EPNL

RUN 12A

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY	MODEL	FLY 1	FLY 2	MIC 1	MIC 2	TEST DATE	11-07-73	11-09-73
STATION	REC.	REC.	REC.	REC.	REC.			
1/3 C.P.	AMB	0.0	0.5	1.0	1.5	2.0	2.5	3.0
GMF (1-2)	SPL	79.1	82.0	82.0	82.0	82.0	82.0	82.0
50	63.3	81.9	82.0	82.0	82.0	82.0	82.0	82.0
63	65.5	80.7	82.0	82.0	82.0	82.0	82.0	82.0
80	64.0	81.2	82.0	82.0	82.0	82.0	82.0	82.0
(2) — 120	65.3	82.0	82.0	82.0	82.0	82.0	82.0	82.0
200	60.2	80.4	82.0	82.0	82.0	82.0	82.0	82.0
250	57.4	84.4	82.0	82.0	82.0	82.0	82.0	82.0
315	55.5	84.5	82.0	82.0	82.0	82.0	82.0	82.0
400	55.9	81.7	82.0	82.0	82.0	82.0	82.0	82.0
500	56.2	79.9	82.0	82.0	82.0	82.0	82.0	82.0
630	55.5	80.8	82.0	82.0	82.0	82.0	82.0	82.0
1000	55.3	81.1	82.0	82.0	82.0	82.0	82.0	82.0
1250	54.4	79.9	82.0	82.0	82.0	82.0	82.0	82.0
1600	53.1	75.9	82.0	82.0	82.0	82.0	82.0	82.0
2000	51.8	83.7	82.0	82.0	82.0	82.0	82.0	82.0
2500	48.8	81.4	82.0	82.0	82.0	82.0	82.0	82.0
3150	47.2	72.3	82.0	82.0	82.0	82.0	82.0	82.0
4000	45.3	71.1	82.0	82.0	82.0	82.0	82.0	82.0
5000	43.7	64.7	82.0	82.0	82.0	82.0	82.0	82.0
6300	40.9	47.0	82.0	82.0	82.0	82.0	82.0	82.0
8000	38.6		82.0	82.0	82.0	82.0	82.0	82.0
(3) — 10000	73.0	93.9	95.8	97.8	99.0	100.0	100.0	100.0
(4) — 10000	64.4	91.1	95.4	97.4	98.6	99.6	99.6	99.6
(5) — 10000	76.6	103.6	106.1	108.2	110.5	112.5	112.5	112.5
(6) — 10000	76.6	104.5	107.8	111.0	114.2	117.4	117.4	117.4
(7) — 10000	110.5	110.5	110.5	110.5	110.5	110.5	110.5	110.5
(8) — 10000	184.6	184.6	184.6	184.6	184.6	184.6	184.6	184.6

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)



(9)

11100408

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

FAR PART 36 FLYOVER NOISE LEVELS
DATA IDENTIFICATION INFORMATION
DATA DIGITIZED 1-2-74 DATA PROCESSED 04/08/75 11120408 PAGE 1

MODEL DC-8-61 REG. AC. N8087U
DC-8-61 FLYOVER NOISE DEFINITION
MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS
ENGINE/MACELLE CONFIGURATION -- P6WA JT3D-38 ENGINES WITH PRODUCTION NACELLES

TYPE OF FLYOVER -- APPR. CORR. FLYOVER
MEASUREMENT TYPE -- BENEATH FLT. PATH, 4 DATA CLASS -- FN/PLT = 5000 LBS
RECORDING AT X = -2802.0, Y = 219.0, Z = -5.0 FEET ABOVE SANDY DIRT
REFERENCE RECORDING LOCATION X = -2802.0, Y = 0.0, Z = 0.0 FEET
WEATHER DATA
TEMP. = 50.2 F
HUM. = 47.1 PCT
WIND SPEED = 3.4 CM/M3
WIND DIR. = 45. DEG
ST. PRESS. = 29.80 IN HG
RT. THETA = 1.0228

AIRPLANE AND ENGINE DATA
FLUG. NO. 373 AIRPLANE NO. 4692. RPM
FLIGHT 19 AVG. APP. = N/A
HEIGHT = 426.5 FT FLAP POS. = 310.0 DEG
LAT. DEV. = -126.7 FT PATH ANG. = -1.1 DEG
SLANT. PRG. = 445.0 FT PITCH ANG. = -1.1 DEG
PATH SPD. = 188.4 KN GR. WEIGHT = 249800. LB
AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF 0-58-56.8
OTHER PERFORMANCE DATA IS FOR TIME OF ENLTM OF 0-58-56.5
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION C-58-56.8
REFERENCE SURFACE WEATHER CONDITIONS TEMP = 77.0 F & REL. HUM. = 70.0 PCT

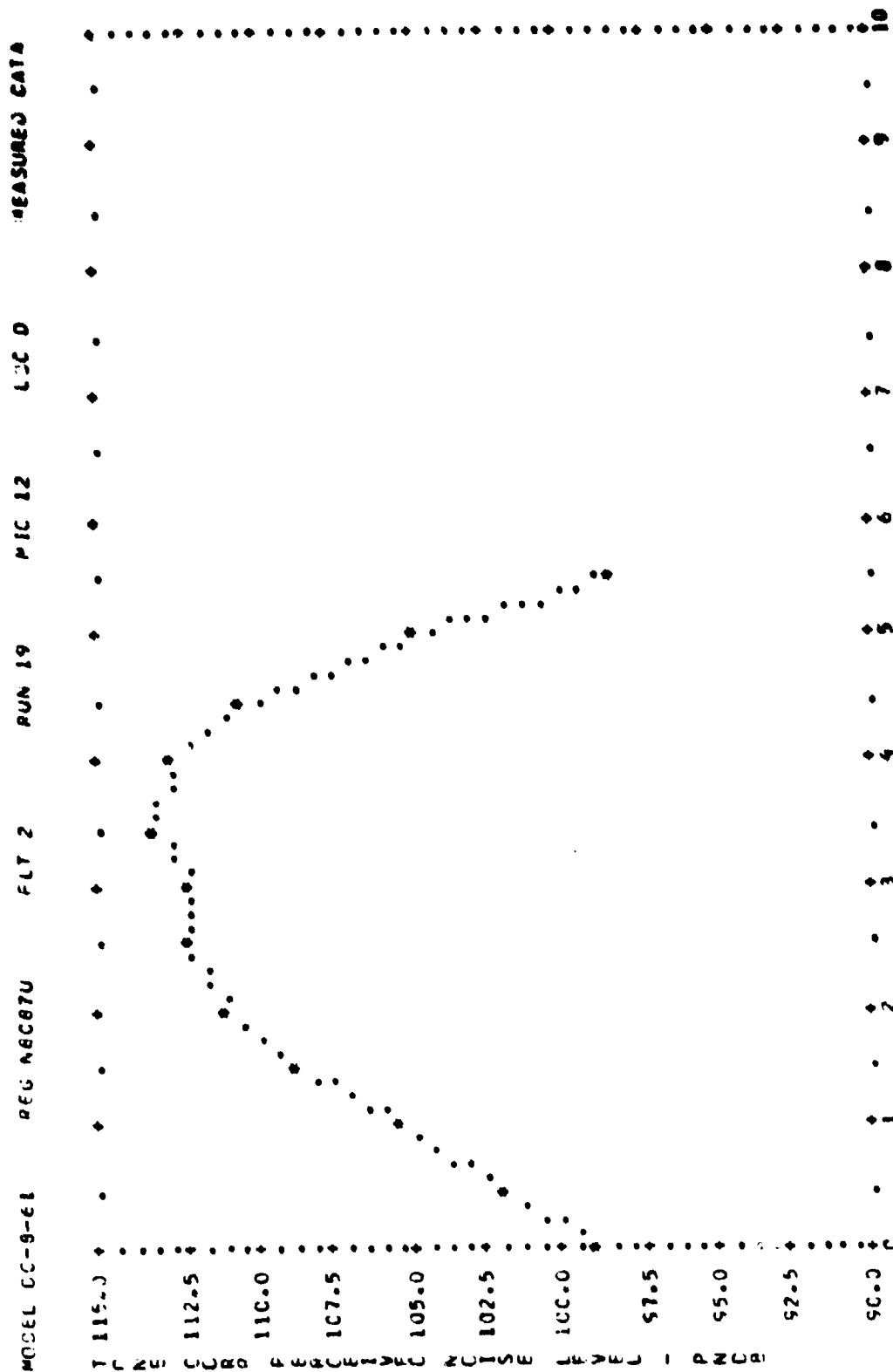
ANALYZER TYPE / RESOLUTION CH1921(CISA) / 0.25 DB
CISA MODE 1 PASS WITH AUTO-START
SAMPLE INTERVAL FOR BASIC DATA = .500 SECONDS
AVERAGING TIME = 1.500 SECONDS
DESCRIPTION OF ACOUSTICAL DATA PROCESSING
ATMOSPHERIC ATTENUATION SAE ARP806(10EVI)
BASIC UNIT SOUND PRESSURE LEVEL
DATA TYPES (CISA REL. U-GOOD MICROBAR)
1/3 OCTAVE, OVERALL, A-BTD.
PWL, PNL, & EPNL

RUN 190

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)(10)									
MEASURED SPL START TIME	HISTORY 0 50 55.0CC	MODEL REG. A8087U	CC-8-61 AUN 19	FLT 2 AUN 19	MIC 12 LCC D	TEST DATE 11-09-73			
						3.5	4.0	4.5	5.0
100	AMP	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5
125	83.3	72.5	74.3	76.8	79.0	79.0	77.8	75.8	74.9
160	62.4	73.1	74.0	75.4	74.2	73.3	71.4	73.3	73.5
200	59.8	67.7	67.9	67.1	68.2	74.2	70.5	61.7	61.0
250	57.6	61.4	63.9	70.2	74.3	69.8	63.0	66.2	65.3
300	55.3	69.8	73.3	76.1	80.5	63.8	65.0	65.3	64.8
350	53.2	76.2	78.4	80.4	82.7	62.9	62.4	60.5	62.5
400	50.4	77.8	78.6	77.6	81.9	61.0	63.3	64.2	63.0
450	48.3	75.4	77.2	77.5	79.6	61.0	63.3	64.9	63.9
500	46.8	73.3	73.8	71.6	78.9	60.3	63.0	63.7	62.4
550	45.8	72.7	73.8	71.6	78.9	60.3	61.6	62.7	61.4
600	44.5	72.2	73.8	76.4	78.2	60.2	61.3	61.0	60.6
650	43.4	70.9	74.6	76.8	79.1	60.4	61.4	61.9	60.7
700	42.2	70.9	74.6	76.8	79.1	60.4	61.4	61.9	60.7
750	41.2	69.7	72.0	75.4	75.4	59.1	60.8	62.3	60.7
800	40.3	68.2	70.9	74.4	74.4	58.0	60.0	61.3	59.7
850	39.7	66.2	69.7	72.0	72.0	58.0	60.0	61.3	59.7
900	38.1	64.1	67.6	70.9	70.9	57.2	59.2	60.7	58.9
950	37.1	62.1	65.6	69.1	69.1	56.7	58.7	60.2	58.4
1000	36.2	60.2	63.7	67.2	67.2	56.2	58.2	59.7	57.9
1050	35.2	58.2	61.7	65.2	65.2	55.7	57.7	59.2	56.9
1100	34.2	56.2	59.7	63.2	63.2	55.2	57.2	58.7	55.9
1150	33.2	54.2	57.7	61.2	61.2	54.7	56.7	57.7	54.9
1200	32.2	52.2	55.7	59.2	59.2	54.2	56.2	57.2	53.9
1250	31.2	50.2	53.7	57.2	57.2	53.7	55.7	56.7	52.9
1300	30.2	48.2	51.7	55.2	55.2	53.2	55.2	56.2	51.9
1350	29.2	46.2	49.7	53.2	53.2	52.7	54.7	55.7	50.9
1400	28.2	44.2	47.7	51.2	51.2	52.2	54.2	55.2	49.9
1450	27.2	42.2	45.7	49.2	49.2	51.7	53.7	54.7	48.9
1500	26.2	40.2	43.7	47.2	47.2	51.2	53.2	54.2	47.9
1550	25.2	38.2	41.7	45.2	45.2	50.7	52.7	53.7	46.9
1600	24.2	36.2	39.7	43.2	43.2	50.2	52.2	53.2	45.9
1650	23.2	34.2	37.7	41.2	41.2	49.7	51.7	52.7	44.9
1700	22.2	32.2	35.7	39.2	39.2	49.2	51.2	52.2	43.9
1750	21.2	30.2	33.7	37.2	37.2	48.7	50.7	51.7	42.9
1800	20.2	28.2	31.7	35.2	35.2	48.2	50.2	51.2	41.9
1850	19.2	26.2	29.7	33.2	33.2	47.7	49.7	50.7	40.9
1900	18.2	24.2	27.7	31.2	31.2	47.2	49.2	50.2	39.9
1950	17.2	22.2	25.7	29.2	29.2	46.7	48.7	49.7	38.9
2000	16.2	20.2	23.7	27.2	27.2	46.2	48.2	49.2	37.9
2050	15.2	18.2	21.7	25.2	25.2	45.7	47.7	48.7	36.9
2100	14.2	16.2	19.7	23.2	23.2	45.2	47.2	48.2	35.9
2150	13.2	14.2	17.7	21.2	21.2	44.7	46.7	47.7	34.9
2200	12.2	12.2	15.7	19.2	19.2	44.2	46.2	47.2	33.9
2250	11.2	10.2	13.7	17.2	17.2	43.7	45.7	46.7	32.9
2300	10.2	8.2	11.7	15.2	15.2	43.2	45.2	46.2	31.9
2350	9.2	6.2	9.7	13.2	13.2	42.7	44.7	45.7	30.9
2400	8.2	4.2	7.7	11.2	11.2	42.2	44.2	45.2	29.9
2450	7.2	2.2	5.7	9.2	9.2	41.7	43.7	44.7	28.9
2500	6.2	0.2	3.7	7.2	7.2	41.2	43.2	44.2	27.9
2550	5.2	0.2	1.7	5.2	5.2	40.7	42.7	43.7	26.9
2600	4.2	0.2	0.7	3.2	3.2	40.2	42.2	43.2	25.9
2650	3.2	0.2	0.7	1.2	1.2	39.7	41.7	42.7	24.9
2700	2.2	0.2	0.7	0.2	0.2	39.2	41.2	42.2	23.9
2750	1.2	0.2	0.7	0.2	0.2	38.7	40.7	41.7	22.9
2800	0.2	0.2	0.7	0.2	0.2	38.2	40.2	41.2	21.9
2850	0.2	0.2	0.7	0.2	0.2	37.7	39.7	40.7	20.9
2900	0.2	0.2	0.7	0.2	0.2	37.2	39.2	40.2	19.9
2950	0.2	0.2	0.7	0.2	0.2	36.7	38.7	39.7	18.9
3000	0.2	0.2	0.7	0.2	0.2	36.2	38.2	39.2	17.9
3050	0.2	0.2	0.7	0.2	0.2	35.7	37.7	38.7	16.9
3100	0.2	0.2	0.7	0.2	0.2	35.2	37.2	38.2	15.9
3150	0.2	0.2	0.7	0.2	0.2	34.7	36.7	37.7	14.9
3200	0.2	0.2	0.7	0.2	0.2	34.2	36.2	37.2	13.9
3250	0.2	0.2	0.7	0.2	0.2	33.7	35.7	36.7	12.9
3300	0.2	0.2	0.7	0.2	0.2	33.2	35.2	36.2	11.9
3350	0.2	0.2	0.7	0.2	0.2	32.7	34.7	35.7	10.9
3400	0.2	0.2	0.7	0.2	0.2	32.2	34.2	35.2	9.9
3450	0.2	0.2	0.7	0.2	0.2	31.7	33.7	34.7	8.9
3500	0.2	0.2	0.7	0.2	0.2	31.2	33.2	34.2	7.9
3550	0.2	0.2	0.7	0.2	0.2	30.7	32.7	33.7	6.9
3600	0.2	0.2	0.7	0.2	0.2	30.2	32.2	33.2	5.9
3650	0.2	0.2	0.7	0.2	0.2	29.7	31.7	32.7	4.9
3700	0.2	0.2	0.7	0.2	0.2	29.2	31.2	32.2	3.9
3750	0.2	0.2	0.7	0.2	0.2	28.7	30.7	31.7	2.9
3800	0.2	0.2	0.7	0.2	0.2	28.2	30.2	31.2	1.9
3850	0.2	0.2	0.7	0.2	0.2	27.7	29.7	30.7	0.9
3900	0.2	0.2	0.7	0.2	0.2	27.2	29.2	30.2	0.9
3950	0.2	0.2	0.7	0.2	0.2	26.7	28.7	29.7	0.9
4000	0.2	0.2	0.7	0.2	0.2	26.2	28.2	29.2	0.9
4050	0.2	0.2	0.7	0.2	0.2	25.7	27.7	28.7	0.9
4100	0.2	0.2	0.7	0.2	0.2	25.2	27.2	28.2	0.9
4150	0.2	0.2	0.7	0.2	0.2	24.7	26.7	27.7	0.9
4200	0.2	0.2	0.7	0.2	0.2	24.2	26.2	27.2	0.9
4250	0.2	0.2	0.7	0.2	0.2	23.7	25.7	26.7	0.9
4300	0.2	0.2	0.7	0.2	0.2	23.2	25.2	26.2	0.9
4350	0.2	0.2	0.7	0.2	0.2	22.7	24.7	25.7	0.9
4400	0.2	0.2	0.7	0.2	0.2	22.2	24.2	25.2	0.9
4450	0.2	0.2	0.7	0.2	0.2	21.7	23.7	24.7	0.9
4500	0.2	0.2	0.7	0.2	0.2	21.2	23.2	24.2	0.9
4550	0.2	0.2	0.7	0.2	0.2	20.7	22.7	23.7	0.9
4600	0.2	0.2	0.7	0.2	0.2	20.2	22.2	23.2	0.9
4650	0.2	0.2	0.7	0.2	0.2	19.7	21.7	22.7	0.9
4700	0.2	0.2	0.7	0.2	0.2	19.2	21.2	22.2	0.9
4750	0.2	0.2	0.7	0.2	0.2	18.7	20.7	21.7	0.9
4800	0.2	0.2	0.7	0.2	0.2	18.2	20.2	21.2	0.9
4850	0.2	0.2	0.7	0.2	0.2	17.7	19.7	20.7	0.9
4900	0.2	0.2	0.7	0.2	0.2	17.2	19.2	20.2	0.9
4950	0.2	0.2	0.7	0.2	0.2	16.7	18.7	19.7	0.9
5000	0.2	0.2	0.7	0.2	0.2	16.2	18.2	19.2	0.9
5050	0.2	0.2	0.7	0.2	0.2	15.7	17.7	18.7	0.9
5100	0.2	0.2	0.7	0.2	0.2	15.2	17.2	18.2	0.9
5150	0.2	0.2	0.7	0.2	0.2	14.7	16.7	17.7	0.9
5200	0.2	0.2	0.7	0.2	0.2	14.2	16.2	17.2	0.9
5250	0.2	0.2	0.7	0.2	0.2	13.7	15.7	16.7	0.9
5300	0.2	0.2	0.7	0.2	0.2	13.2	15.2	16.2	0.9
5350	0.2	0.2	0.7	0.2	0.2	12.7	14.7	15.7	0.9
5400	0.2	0.2	0.7	0.2	0.2	12.2	14.2	15.2	0.9
5450	0.2	0.2	0.7	0.2	0.2	11.7	13.7	14.7	0.9
5500	0.2	0.2	0.7	0.2	0.2	11.2	13.2	14.2	0.9
5550	0.2	0.2	0.7	0.2	0.2	10.7	12.7	13.7	0.9
5600	0.2	0.2	0.7	0.2	0.2	10.2	12.2	13.2	0.9
5650	0.2	0.2	0.7	0.2	0.2	9.7	11.7	12.7	0.9
5700	0.2	0.2	0.7	0.2	0.2	9.2	11.2	12.2	0.9
5750	0.2	0.2	0.7	0.2	0.2	8.7	10.7	11.7	0.9
5800	0.2	0.2	0.7	0.2	0.2	8.2	10.2	11.2	0.9
5850	0.2	0.2	0.7	0.2	0.2	7.7	9.7	10.7	0.9
5900	0.2	0.2	0.7	0.2	0.2	7.2	9.2	10.2	0.9
5950	0.2	0.2	0.7	0.2	0.2	6.7	8.7	9.7	0.9
6000	0.2	0.2	0.7	0.2	0.2	6.2	8.2	9.2	0.9
6050	0.2	0.2	0.7	0.2	0.2	5.7	7.7	8.7	0.9
6100	0.2	0.2	0.7	0.2	0.2	5.2	7.2	8.2	0.9
6150	0.2	0.2	0.7	0.2	0.2	4.7	6.7	7.7	0.9
6200	0.2	0.2	0.7	0.2	0.2	4.2	6.2	7.2	0.9
6250	0.2	0.2	0.7	0.2	0.2	3.7	5.7	6.7	0.9
6300	0.2	0.2	0.7	0.2	0.2	3.2	5.2	6.2	0.9
6350	0.2	0.2	0.7	0.2	0.2	2.7	4.7	5.7	0.9
6400	0.2	0.2	0.7	0.2	0.2	2.2	4.2	5.2	0.9
6450	0.2	0.2	0.7	0.2	0.2	1.7	3.7	4.7	0.9
6500	0.2	0.2	0.7	0.2	0.2	1.2	3.		

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)



(9)

RELATIVE TIME - SECONDS

11120408

ST TIME = C 56 55.0 TFLTM = 0 58 58.5 CP TIME = C 58 56.8

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

FAR PART 36 FLYOVER NCISE LEVELS
DATA IDENTIFICATION INFORMATION
DATA DIGITIZED 1-2-74 DATA PROCESSED 04/30/75 111CC400 PAGE 1

MODEL DC-8-61 REG. NO. NUC87U
DC-8-61 FLYOVER NOISE DEFINITION
MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS
ENGINE/NACELLE CONFIGURATION -- PCWA JT3C-35 ENGINES WITH PRODUCTION NACELLES

TYPE OF FLYOVER -- LEVEL FLIGHT DATA CLASS -- POWER
MEASUREMENT TYPE -- WEATHER FLT PATH, 4 FEET ABOVE SANDY DIRT
RECORDING AT 1 = 6832.0 FT Z = 221.0 FT FROM WEST-NCST END OF RUMBAV
REFERENCE RECORDING LOCATION X = 7034.0 Y = 0. Z = 0.0 FEET

MEASUREMENT INFO
MIC. NUMBER 373 AIRPLANE AND ENGINE DATA AVG. RPM 2475. RPM
LOCATION 26 A/B. HEADING = N/A 210. DEG
FLIGHT 26 FLAP POS. = 45.0 DEG
HEIGHT = 5409.6 FT FLAP POS. = 45.0 DEG
LAT. DEV. = 599.8 FT PATH ANG. = -3.5 DEG
SLMT. HAU. = 5442.7 FT PITCH ANG. = -3.1 DEG
PATH SPD. = 221.8 KM GR. WEIGHT = 224600. LB

AIRPLANE SPACE POSITIONING IS RELATIVE TO PIC FOR TIME AT MIC OF 2-32-17.8
OTHER PERFORMANCE DATA VS FOR TIME OF 2-32-20.5
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION 2-32-16.2
REFERENCE SURFACE WEATHER CONDITIONS TEMP = 77.0 F 6 REL. HUM. = 70.0 PCT

WEATHER DATA
APP. TEMP. = 56.0 F
REL. HUM. = 43.9 PCT
WIND DIR = 5.3 CM/PS
WIND SPD = 2. RM
SEA DIR = 50.75 DEG
SEA PRESS = 29.75 IN HG
AT. THETA = 1.0131

DESCRIPTION OF ACOUSTICAL DATA PROCESSING

ANALYZER TYPE / RESOLUTION GR1521(CISA) / 0.25 CO ATMOSPHERIC ATTENUATION SAE APPROXIMATE
CISA MODE 1 PASS WITH AUTO-START BASIC UNIT SOUND PRESSURE LEVEL
SAMPLE INTERVAL FOR BASIC DATA = .500 SECONDS (CM REL. 0.0002 MICRABAR)
AVERAGING TIME = 1.500 SECONDS DATA TYPES 1/3 CC1V F. OVERALL, A-MTD.
PAL, PAL F & EPMI

RUN 208

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)

MEASURED SPL STAY TIME	HISTORY	PCOEL	CC-8-61	FLY 2	MIC 3	TEST DATE	11-08-73	11-09-73	11-10-73
	2 31 58.000	REG. #00070		RUN 28	LCC F				PAGE 3
1/2 1/2 1/2	6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0								
1/2 1/2 1/2	63.5 65.8 67.1 68.4 69.7 71.0 72.3 73.6 74.9 76.2 77.5 78.8 80.1 81.4								
1/2 1/2 1/2	66.4 68.7 70.0 71.3 72.6 73.9 75.2 76.5 77.8 79.1 80.4 81.7 83.0 84.3								
1/2 1/2 1/2	69.1 71.4 72.7 74.0 75.3 76.6 77.9 79.2 80.5 81.8 83.1 84.4 85.7 87.0								
1/2 1/2 1/2	71.8 74.1 75.4 76.7 78.0 79.3 80.6 81.9 83.2 84.5 85.8 87.1 88.4 89.7								
1/2 1/2 1/2	74.5 76.8 78.1 79.4 80.7 82.0 83.3 84.6 85.9 87.2 88.5 89.8 91.1 92.4								
1/2 1/2 1/2	77.2 79.5 80.8 82.1 83.4 84.7 86.0 87.3 88.6 89.9 91.2 92.5 93.8 95.1								
1/2 1/2 1/2	79.9 82.2 83.5 84.8 86.1 87.4 88.7 90.0 91.3 92.6 93.9 95.2 96.5 97.8								
1/2 1/2 1/2	82.6 84.9 86.2 87.5 88.8 90.1 91.4 92.7 94.0 95.3 96.6 97.9 99.2 100.5								
1/2 1/2 1/2	85.3 87.6 88.9 90.2 91.5 92.8 94.1 95.4 96.7 98.0 99.3 100.6 101.9 103.2								
1/2 1/2 1/2	88.0 90.3 91.6 92.9 94.2 95.5 96.8 98.1 99.4 100.7 102.0 103.3 104.6 105.9								
1/2 1/2 1/2	90.7 93.0 94.3 95.6 96.9 98.2 99.5 100.8 102.1 103.4 104.7 106.0 107.3 108.6								
1/2 1/2 1/2	93.4 95.7 97.0 98.3 99.6 100.9 102.2 103.5 104.8 106.1 107.4 108.7 110.0 111.3								
1/2 1/2 1/2	96.1 98.4 99.7 101.0 102.3 103.6 104.9 106.2 107.5 108.8 110.1 111.4 112.7 114.0								
1/2 1/2 1/2	98.8 101.1 102.4 103.7 105.0 106.3 107.6 108.9 110.2 111.5 112.8 114.1 115.4 116.7								
1/2 1/2 1/2	101.5 103.8 105.1 106.4 107.7 109.0 110.3 111.6 112.9 114.2 115.5 116.8 118.1 119.4								
1/2 1/2 1/2	104.2 106.5 107.8 109.1 110.4 111.7 113.0 114.3 115.6 116.9 118.2 119.5 120.8 122.1								
1/2 1/2 1/2	106.9 109.2 110.5 111.8 113.1 114.4 115.7 117.0 118.3 119.6 120.9 122.2 123.5 124.8								
1/2 1/2 1/2	109.6 111.9 113.2 114.5 115.8 117.1 118.4 119.7 121.0 122.3 123.6 124.9 126.2 127.5								
1/2 1/2 1/2	112.3 114.6 115.9 117.2 118.5 119.8 121.1 122.4 123.7 125.0 126.3 127.6 128.9 130.2								
1/2 1/2 1/2	115.0 117.3 118.6 119.9 121.2 122.5 123.8 125.1 126.4 127.7 129.0 130.3 131.6 132.9								
1/2 1/2 1/2	117.7 120.0 121.3 122.6 123.9 125.2 126.5 127.8 129.1 130.4 131.7 133.0 134.3 135.6								
1/2 1/2 1/2	120.4 122.7 124.0 125.3 126.6 127.9 129.2 130.5 131.8 133.1 134.4 135.7 137.0 138.3								
1/2 1/2 1/2	123.1 125.4 126.7 128.0 129.3 130.6 131.9 133.2 134.5 135.8 137.1 138.4 139.7 141.0								
1/2 1/2 1/2	125.8 128.1 129.4 130.7 132.0 133.3 134.6 135.9 137.2 138.5 139.8 141.1 142.4 143.7								
1/2 1/2 1/2	128.5 130.8 132.1 133.4 134.7 136.0 137.3 138.6 139.9 141.2 142.5 143.8 145.1 146.4								
1/2 1/2 1/2	131.2 133.5 134.8 136.1 137.4 138.7 140.0 141.3 142.6 143.9 145.2 146.5 147.8 149.1								
1/2 1/2 1/2	133.9 136.2 137.5 138.8 140.1 141.4 142.7 144.0 145.3 146.6 147.9 149.2 150.5 151.8								
1/2 1/2 1/2	136.6 138.9 140.2 141.5 142.8 144.1 145.4 146.7 148.0 149.3 150.6 151.9 153.2 154.5								
1/2 1/2 1/2	139.3 141.6 142.9 144.2 145.5 146.8 148.1 149.4 150.7 152.0 153.3 154.6 155.9 157.2								
1/2 1/2 1/2	142.0 144.3 145.6 146.9 148.2 149.5 150.8 152.1 153.4 154.7 156.0 157.3 158.6 159.9								
1/2 1/2 1/2	144.7 147.0 148.3 149.6 150.9 152.2 153.5 154.8 156.1 157.4 158.7 160.0 161.3 162.6								
1/2 1/2 1/2	147.4 149.7 151.0 152.3 153.6 154.9 156.2 157.5 158.8 160.1 161.4 162.7 164.0 165.3								
1/2 1/2 1/2	150.1 152.4 153.7 155.0 156.3 157.6 158.9 160.2 161.5 162.8 164.1 165.4 166.7 168.0								
1/2 1/2 1/2	152.8 155.1 156.4 157.7 159.0 160.3 161.6 162.9 164.2 165.5 166.8 168.1 169.4 170.7								
1/2 1/2 1/2	155.5 157.8 159.1 160.4 161.7 163.0 164.3 165.6 166.9 168.2 169.5 170.8 172.1 173.4								
1/2 1/2 1/2	158.2 160.5 161.8 163.1 164.4 165.7 167.0 168.3 169.6 170.9 172.2 173.5 174.8 176.1								
1/2 1/2 1/2	160.9 163.2 164.5 165.8 167.1 168.4 169.7 171.0 172.3 173.6 174.9 176.2 177.5 178.8								
1/2 1/2 1/2	163.6 165.9 167.2 168.5 169.8 171.1 172.4 173.7 175.0 176.3 177.6 178.9 180.2 181.5								
1/2 1/2 1/2	166.3 168.6 169.9 171.2 172.5 173.8 175.1 176.4 177.7 179.0 180.3 181.6 182.9 184.2								
1/2 1/2 1/2	169.0 171.3 172.6 173.9 175.2 176.5 177.8 179.1 180.4 181.7 183.0 184.3 185.6 186.9								
1/2 1/2 1/2	171.7 174.0 175.3 176.6 177.9 179.2 180.5 181.8 183.1 184.4 185.7 187.0 188.3 189.6								
1/2 1/2 1/2	174.4 176.7 178.0 179.3 180.6 181.9 183.2 184.5 185.8 187.1 188.4 189.7 191.0 192.3								
1/2 1/2 1/2	177.1 179.4 180.7 182.0 183.3 184.6 185.9 187.2 188.5 189.8 191.1 192.4 193.7 195.0								
1/2 1/2 1/2	179.8 182.1 183.4 184.7 186.0 187.3 188.6 189.9 191.2 192.5 193.8 195.1 196.4 197.7								
1/2 1/2 1/2	182.5 184.8 186.1 187.4 188.7 190.0 191.3 192.6 193.9 195.2 196.5 197.8 199.1 200.4								
1/2 1/2 1/2	185.2 187.5 188.8 190.1 191.4 192.7 194.0 195.3 196.6 197.9 199.2 200.5 201.8 203.1								
1/2 1/2 1/2	187.9 190.2 191.5 192.8 194.1 195.4 196.7 198.0 199.3 200.6 201.9 203.2 204.5 205.8								
1/2 1/2 1/2	190.6 192.9 194.2 195.5 196.8 198.1 199.4 200.7 202.0 203.3 204.6 205.9 207.2 208.5								
1/2 1/2 1/2	193.3 195.6 196.9 198.2 199.5 200.8 202.1 203.4 204.7 206.0 207.3 208.6 209.9 211.2								
1/2 1/2 1/2	196.0 198.3 199.6 200.9 202.2 203.5 204.8 206.1 207.4 208.7 210.0 211.3 212.6 213.9								
1/2 1/2 1/2	198.7 201.0 202.3 203.6 204.9 206.2 207.5 208.8 210.1 211.4 212.7 214.0 215.3 216.6								
1/2 1/2 1/2	201.4 203.7 205.0 206.3 207.6 208.9 210.2 211.5 212.8 214.1 215.4 216.7 218.0 219.3								
1/2 1/2 1/2	204.1 206.4 207.7 209.0 210.3 211.6 212.9 214.2 215.5 216.8 218.1 219.4 220.7 222.0								
1/2 1/2 1/2	206.8 209.1 210.4 211.7 213.0 214.3 215.6 216.9 218.2 219.5 220.8 222.1 223.4 224.7								
1/2 1/2 1/2	209.5 211.8 213.1 214.4 215.7 217.0 218.3 219.6 220.9 222.2 223.5 224.8 226.1 227.4								
1/2 1/2 1/2	212.2 214.5 215.8 217.1 218.4 219.7 221.0 222.3 223.6 224.9 226.2 227.5 228.8 230.1								
1/2 1/2 1/2	214.9 217.2 218.5 219.8 221.1 222.4 223.7 225.0 226.3 227.6 228.9 230.2 231.5 232.8								
1/2 1/2 1/2	217.6 219.9 221.2 222.5 223.8 225.1 226.4 227.7 229.0 230.3 231.6 232.9 234.2 235.5								
1/2 1/2 1/2	220.3 222.6 223.9 225.2 226.5 227.8 229.1 230.4 231.7 233.0 234.3 235.6 236.9 238.2								
1/2 1/2 1/2	223.0 225.3 226.6 227.9 229.2 230.5 231.8 233.1 234.4 235.7 237.0 238.3 239.6 240.9								
1/2 1/2 1/2	225.7 228.0 229.3 230.6 231.9 233.2 234.5 235.8 237.1 238.4 239.7 241.0 242.3 243.6								
1/2 1/2 1/2	228.4 230.7 232.0 233.3 234.6 235.9 237.2 238.5 239.8 241.1 242.4 243.7 245.0 246.3								
1/2 1/2 1/2	231.1 233.4 234.7 236.0 237.3 238.6 239.9 241.2 242.5 243.8 245.1 246.4 247.7 249.0								
1/2 1/2 1/2	233.8 236.1 237.4 238.7 240.0 241.3 242.6 243.9 245.2 246.5 247.8 249.1 250.4 251.7								
1/2 1/2 1/2	236.5 238.8 240.1 241.4 242.7 244.0 245.3 246.6 247.9 249.2 250.5 251.8 253.1 254.4								
1/2 1/2 1/2	239.2 241.5 242.8 244.1 245.4 246.7 248.0 249.3 250.6 251.9 253.2 254.5 255.8 257.1								
1/2 1/2 1/2	241.9 244.2 245.5 246.8 248.1 249.4 250.7 252.0 253.3 254.6 255.9 257.2 258.5 259.8								
1/2 1/2 1/2	244.6 246.9 248.2 249.5 250.8 252.1 253.4 254.7 256.0 257.3 258.6 259.9 261.2 262.5								
1/2 1/2 1/2	247.3 249.6 250.9 252.2 253.5 254.8 256.1 257.4 258.7 260.0 261.3 262.6 263.9 265.2								
1/2 1/2 1/2	250.0 252.3 253.6 254.9 256.2 257.5 258.8 260.1 261.4 262.7 264.0 265.3 266.6 267.9								
1/2 1/2 1/2	252.7 255.0 256.3 257.6 258.9 260.2 261.5 262.8 264.1 265.4 266.7 268.0 269.3 270.6								
1/2 1/2 1/2	255.4 257.7 259.0 260.3 261.6 262.9 264.2 265.5 266.8 268.1 269.4 270.7 272.0 273.3								
1/2 1/2 1/2	258.1 260.4 261.7 263.0 264.3 265.6 266.9 268.2 269.5 270.8 272.1 273.4 274.7 276.0								
1/2 1/2 1/2	260.8 263.1 264.4 265.7 267.0 268.3 269.6 270.9 272.2 273.5 274.8 276.1 277.4 278.7								
1/2 1/2 1/2	263.5 265.8 267.1 268.4 269.7 271.0 272.3 273.6 274.9 276.2 277.5 278.8 280.1 281.4								
1/2 1/2 1/2	266.2 268.5 269.8 271.1 272.4 273.7 275.0 276.3 277.6 278.9 280.2 281.5 282.8 284.1								
1/2 1/2 1/2	268.9 271.2 272.5 273.8 275.1 276.4 277.7 279.0 280.3 281.6 282.9 284.2 285.5 286.8								
1/2 1/2 1/2	271.6 273.9 275.2 276.5 277.8 279.1 280.4 281.7 283.0 284.3 285.6 286.9 288.2 289.5								
1/2 1/2 1/2	274.3 276.6 277.9 279.2 280.5 281.8 283.1 284.4 285.7 287.0 288.3 289.6 290.9 292.2								
1/2 1/2 1/2	277.0 279.3 280.6 281.9 283.2 284.5 285.8 287.1 288.4 289.7 291.0 292.3 293.6 294.9								
1/2 1/2 1/2	279.7 282.0 283.3 284.6 285.9 287.2 288.5 289.8 291.1 292.4 293.7 295.0 296.3 297.6								
1/2 1/2 1/2	282.4 284.7 286.0 287.3 288.6 289.9 291.2 292.5 293.8 295.1 296.4 297.7 299.0 300.3								
1/2 1/2 1/2	285.1 287.4 288.7 290.0 291.3 292.6 293.9 295.2 296.5 297.8 299.1 300.4 301.7 303.0								
1/2 1/2 1/2	287.8 290.1 291.4 292.7 294.0 295.3 296.6 297.9 299.2 300.5 301.8 303.1 304.4 305.7								
1/2 1/2 1/2	290.5 292.8 294.1 295.4 296.7 298.0 299.3 300.6 301.9 303.2 304.5 305.8 307.1 308.4								
1/2 1/2 1/2	293.2 295.5 296.8 298.1 299.4 300.7 302.								

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(10)									
MEASURED SPL	HISTORY	MODEL	CC-8-01	FLY 2	WIC 2	TEST DATE 11-08-73			
STATION TIME	2 31 50.000	REV. 10070	ALA 28			23.5	24.0	24.5	25.0
123118	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5
123119	63.4								
123120	62.1	63.5	64.3	64.6	64.1	64.1	64.3	64.6	64.7
123121	71.2	71.1	71.5	71.5	72.0	72.0	72.2	72.2	72.4
123122	73.9	73.8	73.7	73.6	74.1	74.1	74.3	74.3	74.5
123123	76.1	76.0	76.0	76.1	76.3	76.3	76.5	76.5	76.6
123124	77.2	77.1	77.1	77.1	77.3	77.3	77.5	77.5	77.6
123125	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5
123126	76.5	76.5	76.5	76.5	76.5	76.5	76.5	76.5	76.5
123127	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4
123128	69.2	69.2	69.2	69.2	69.2	69.2	69.2	69.2	69.2
123129	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3
123130	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0
123131	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7
123132	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0
123133	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
123134	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123135	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123136	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123137	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123138	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123139	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123140	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123141	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123142	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123143	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123144	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123145	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123146	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123147	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123148	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123149	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123150	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123151	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123152	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123153	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123154	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123155	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123156	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123157	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123158	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123159	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123160	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123161	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123162	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123163	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123164	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123165	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123166	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123167	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123168	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123169	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123170	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123171	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123172	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123173	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123174	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123175	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123176	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123177	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123178	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123179	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123180	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123181	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123182	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123183	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123184	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123185	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123186	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123187	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123188	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123189	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123190	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123191	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123192	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123193	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123194	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123195	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123196	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123197	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123198	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123199	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
123200	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASUREMENT START TIME	SPL 2 31 56.0CC	FLY 2 PUN 20	MODEL REG. ABCDU	CC-4-6: 29.5 25.0	FLY 2 PUN 20	30.5 31.0	31.5 32.0	32.5 33.0	33.5 34.0	TEST DATE 11-30-73	1100-00 PAGE 6
1/2 C.F. C.F. 11.0 100	27.5 28.0	27.5 28.0	27.5 28.0	27.5 28.0	27.5 28.0	27.5 28.0	27.5 28.0	27.5 28.0	27.5 28.0	11-30-73	1100-00
125	62.4 62.5	62.4 62.5	62.4 62.5	62.4 62.5	62.4 62.5	62.4 62.5	62.4 62.5	62.4 62.5	62.4 62.5	11-30-73	1100-00
160	73.1 73.4	73.1 73.4	73.1 73.4	73.1 73.4	73.1 73.4	73.1 73.4	73.1 73.4	73.1 73.4	73.1 73.4	11-30-73	1100-00
200	77.4 77.6	77.4 77.6	77.4 77.6	77.4 77.6	77.4 77.6	77.4 77.6	77.4 77.6	77.4 77.6	77.4 77.6	11-30-73	1100-00
250	71.5 71.6	71.5 71.6	71.5 71.6	71.5 71.6	71.5 71.6	71.5 71.6	71.5 71.6	71.5 71.6	71.5 71.6	11-30-73	1100-00
300	75.4 75.5	75.4 75.5	75.4 75.5	75.4 75.5	75.4 75.5	75.4 75.5	75.4 75.5	75.4 75.5	75.4 75.5	11-30-73	1100-00
350	74.7 74.8	74.7 74.8	74.7 74.8	74.7 74.8	74.7 74.8	74.7 74.8	74.7 74.8	74.7 74.8	74.7 74.8	11-30-73	1100-00
400	71.0 71.1	71.0 71.1	71.0 71.1	71.0 71.1	71.0 71.1	71.0 71.1	71.0 71.1	71.0 71.1	71.0 71.1	11-30-73	1100-00
450	65.7 65.8	65.7 65.8	65.7 65.8	65.7 65.8	65.7 65.8	65.7 65.8	65.7 65.8	65.7 65.8	65.7 65.8	11-30-73	1100-00
500	59.8 59.9	59.8 59.9	59.8 59.9	59.8 59.9	59.8 59.9	59.8 59.9	59.8 59.9	59.8 59.9	59.8 59.9	11-30-73	1100-00
550	57.3 57.4	57.3 57.4	57.3 57.4	57.3 57.4	57.3 57.4	57.3 57.4	57.3 57.4	57.3 57.4	57.3 57.4	11-30-73	1100-00
600	53.3 53.4	53.3 53.4	53.3 53.4	53.3 53.4	53.3 53.4	53.3 53.4	53.3 53.4	53.3 53.4	53.3 53.4	11-30-73	1100-00
650	49.8 49.9	49.8 49.9	49.8 49.9	49.8 49.9	49.8 49.9	49.8 49.9	49.8 49.9	49.8 49.9	49.8 49.9	11-30-73	1100-00
700	46.3 46.4	46.3 46.4	46.3 46.4	46.3 46.4	46.3 46.4	46.3 46.4	46.3 46.4	46.3 46.4	46.3 46.4	11-30-73	1100-00
750	42.8 42.9	42.8 42.9	42.8 42.9	42.8 42.9	42.8 42.9	42.8 42.9	42.8 42.9	42.8 42.9	42.8 42.9	11-30-73	1100-00
800	39.3 39.4	39.3 39.4	39.3 39.4	39.3 39.4	39.3 39.4	39.3 39.4	39.3 39.4	39.3 39.4	39.3 39.4	11-30-73	1100-00
850	35.8 35.9	35.8 35.9	35.8 35.9	35.8 35.9	35.8 35.9	35.8 35.9	35.8 35.9	35.8 35.9	35.8 35.9	11-30-73	1100-00
900	32.3 32.4	32.3 32.4	32.3 32.4	32.3 32.4	32.3 32.4	32.3 32.4	32.3 32.4	32.3 32.4	32.3 32.4	11-30-73	1100-00
950	28.8 28.9	28.8 28.9	28.8 28.9	28.8 28.9	28.8 28.9	28.8 28.9	28.8 28.9	28.8 28.9	28.8 28.9	11-30-73	1100-00
1000	25.3 25.4	25.3 25.4	25.3 25.4	25.3 25.4	25.3 25.4	25.3 25.4	25.3 25.4	25.3 25.4	25.3 25.4	11-30-73	1100-00
1050	21.8 21.9	21.8 21.9	21.8 21.9	21.8 21.9	21.8 21.9	21.8 21.9	21.8 21.9	21.8 21.9	21.8 21.9	11-30-73	1100-00
1100	18.3 18.4	18.3 18.4	18.3 18.4	18.3 18.4	18.3 18.4	18.3 18.4	18.3 18.4	18.3 18.4	18.3 18.4	11-30-73	1100-00
1150	14.8 14.9	14.8 14.9	14.8 14.9	14.8 14.9	14.8 14.9	14.8 14.9	14.8 14.9	14.8 14.9	14.8 14.9	11-30-73	1100-00
1200	11.3 11.4	11.3 11.4	11.3 11.4	11.3 11.4	11.3 11.4	11.3 11.4	11.3 11.4	11.3 11.4	11.3 11.4	11-30-73	1100-00
1250	7.8 7.9	7.8 7.9	7.8 7.9	7.8 7.9	7.8 7.9	7.8 7.9	7.8 7.9	7.8 7.9	7.8 7.9	11-30-73	1100-00
1300	4.3 4.4	4.3 4.4	4.3 4.4	4.3 4.4	4.3 4.4	4.3 4.4	4.3 4.4	4.3 4.4	4.3 4.4	11-30-73	1100-00
1350	0.8 0.9	0.8 0.9	0.8 0.9	0.8 0.9	0.8 0.9	0.8 0.9	0.8 0.9	0.8 0.9	0.8 0.9	11-30-73	1100-00

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

三

[illegible]

TABLE C-2

[illegible]

TABLE C-2

[illegible]

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL	HISTORY	COEL	CC-8-01	FLT	LOC	TEST DATE	11-08-73	11-08-73	PAGE 10
CLAMP TIME	2 31 58.000	REFS.	K0C870	RUN 28	LOC				
1/2 (1.5)	55.5	56.0	56.5	57.0	57.5	58.0	58.5	59.0	60.0
50	72.7	72.6	73.3	72.1	74.0	74.6	75.0	73.6	73.0
65	75.9	74.9	74.2	73.6	74.3	74.2	75.0	74.3	73.5
80	73.4	73.9	74.3	74.7	74.6	74.4	73.5	73.6	74.4
(2) 100	69.7	69.7	70.5	70.3	70.1	69.8	70.1	71.1	72.2
125	92.7	93.2	93.8	94.4	94.0	94.2	94.5	95.8	96.5
150	58.0	68.2	69.3	68.4	68.2	67.4	66.5	65.3	64.1
200	71.5	71.3	72.2	72.7	72.5	71.5	70.4	70.6	70.1
250	67.9	68.2	68.7	69.0	69.4	65.8	69.7	68.6	67.5
315	57.8	57.8	58.4	58.7	59.1	59.4	59.0	56.3	57.7
400	55.4	55.2	55.9	55.1	55.0	53.7	58.4	57.5	56.0
500	52.9	53.5	53.7	53.7	53.8	53.7	53.7	53.3	53.5
600	49.2	48.7	49.6	47.1	46.8	46.1	45.1	42.7	42.3
700									
800									
900									
1000									
(3) 1100	81.4	81.2	81.4	81.3	81.7	81.6	81.5	81.0	80.9
1200	79.5	79.5	79.5	79.5	79.7	79.5	78.9	78.3	77.9
1400	80.8	80.6	80.6	80.6	79.7	79.5	78.9	78.3	77.9
1600	111.2	112.5	113.8	115.2	116.5	117.0	119.2	120.5	121.9
1800	147.3	149.1	151.5	152.2	154.8	156.8	158.5	160.5	162.3
(4) 2000	81.4	81.2	81.4	81.3	81.7	81.6	81.5	81.0	80.9
2200	79.5	79.5	79.5	79.5	79.7	79.5	78.9	78.3	77.9
2400	80.8	80.6	80.6	80.6	79.7	79.5	78.9	78.3	77.9
2600	111.2	112.5	113.8	115.2	116.5	117.0	119.2	120.5	121.9
2800	147.3	149.1	151.5	152.2	154.8	156.8	158.5	160.5	162.3
(5) 3000	81.4	81.2	81.4	81.3	81.7	81.6	81.5	81.0	80.9
3200	79.5	79.5	79.5	79.5	79.7	79.5	78.9	78.3	77.9
3400	80.8	80.6	80.6	80.6	79.7	79.5	78.9	78.3	77.9
3600	111.2	112.5	113.8	115.2	116.5	117.0	119.2	120.5	121.9
3800	147.3	149.1	151.5	152.2	154.8	156.8	158.5	160.5	162.3
(6) 4000	81.4	81.2	81.4	81.3	81.7	81.6	81.5	81.0	80.9
4200	79.5	79.5	79.5	79.5	79.7	79.5	78.9	78.3	77.9
4400	80.8	80.6	80.6	80.6	79.7	79.5	78.9	78.3	77.9
4600	111.2	112.5	113.8	115.2	116.5	117.0	119.2	120.5	121.9
4800	147.3	149.1	151.5	152.2	154.8	156.8	158.5	160.5	162.3
(7) 5000	81.4	81.2	81.4	81.3	81.7	81.6	81.5	81.0	80.9
5200	79.5	79.5	79.5	79.5	79.7	79.5	78.9	78.3	77.9
5400	80.8	80.6	80.6	80.6	79.7	79.5	78.9	78.3	77.9
5600	111.2	112.5	113.8	115.2	116.5	117.0	119.2	120.5	121.9
5800	147.3	149.1	151.5	152.2	154.8	156.8	158.5	160.5	162.3
(8) 6000	81.4	81.2	81.4	81.3	81.7	81.6	81.5	81.0	80.9
6200	79.5	79.5	79.5	79.5	79.7	79.5	78.9	78.3	77.9
6400	80.8	80.6	80.6	80.6	79.7	79.5	78.9	78.3	77.9
6600	111.2	112.5	113.8	115.2	116.5	117.0	119.2	120.5	121.9
6800	147.3	149.1	151.5	152.2	154.8	156.8	158.5	160.5	162.3

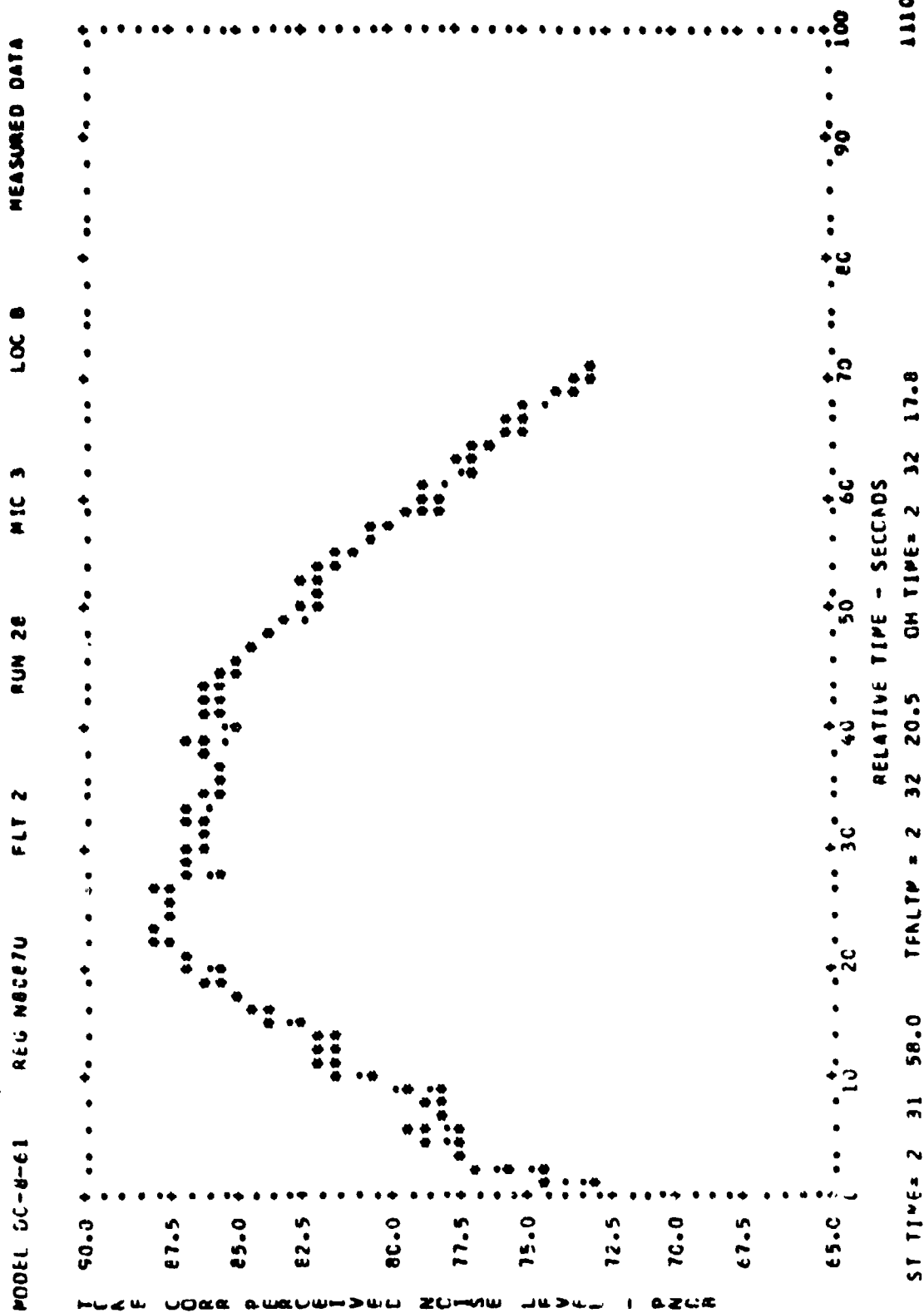
TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL START TIME	HISTORY	MODEL REC.	CC-8-61 ABC87U	FLY 2 RUN 28	(1)		TEST DATE	11-08-73	11-02-08
					MIC 3	LCC 8			
1/2 C.F. 50 63 80	62.5 71.7 73.0	63.5 72.7 73.9	64.0 72.4 73.3	64.5 71.1 71.5	65.5 70.1 74.3	66.0 75.8 74.3	67.0 71.5 72.5	68.0 70.7 73.2	69.0 71.0 73.6
(2) —	72.4 65.6 63.3	70.9 66.0 61.6	70.9 67.0 61.0	70.9 67.0 61.0	70.3 66.7 60.7	70.4 65.3 60.8	70.6 66.0 59.1	71.5 67.3 55.8	71.5 67.3 60.5
250 315	67.8 69.4 66.9	68.1 69.9 66.8	68.2 69.5 66.7	68.8 68.6 67.4	66.2 66.9 66.8	66.0 66.4 66.5	65.8 66.9 66.4	65.2 67.3 65.7	63.4 63.1 65.3
400 500	59.6 53.2	59.2 53.8	55.3 52.6	59.7 52.8	59.5 51.1	55.7 50.3	60.4 50.1	60.3 48.7	58.7 47.1
ECJ 1000 1250 1600 2000 3150 5000 6300 8000 10000	80.2 66.1 77.1 77.1 77.1 77.1 77.1 77.1 77.1	60.7 66.1 77.1 77.1 77.1 77.1 77.1 77.1 77.1	60.7 66.1 77.1 77.1 77.1 77.1 77.1 77.1 77.1	79.5 65.8 70.3 70.3 70.3 70.3 70.3 70.3 70.3	79.6 65.9 70.4 70.4 70.4 70.4 70.4 70.4 70.4	75.5 64.6 73.1 73.1 73.1 73.1 73.1 73.1 73.1	75.3 64.4 73.0 73.0 73.0 73.0 73.0 73.0 73.0	75.7 64.8 73.4 73.4 73.4 73.4 73.4 73.4 73.4	79.3 63.8 73.0 73.0 73.0 73.0 73.0 73.0 73.0
(3) OVERALL	66.1	66.1	66.1	75.5	79.6	75.5	75.3	75.7	79.3
(4) — 4-PM	77.1	77.1	77.1	70.3	75.5	73.1	73.0	73.4	73.0
(5) — 4-PM	77.1	77.1	77.1	70.3	75.5	73.1	73.0	73.4	73.0
(6) — 4-PM	77.1	77.1	77.1	70.3	75.5	73.1	73.0	73.4	73.0
(7) — 4-PM	77.1	77.1	77.1	70.3	75.5	73.1	73.0	73.4	73.0
(8) — 4-PM	77.1	77.1	77.1	70.3	75.5	73.1	73.0	73.4	73.0

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

WFA SUGGESTED START TIME	SPL HISTORY	MODEL REQ. ABC67U	FLY 2 RUN 2H	NIC 3 LCC 8	TEST DATE 11-08-73	1110J408 PAGE 12
173 C.P. (WEFZ)	69.5 70.0 70.5 71.0	70.5 71.0				
50	71.0 71.4 70.0 98.9	70.0 98.9				
60	71.5 71.8 71.6 72.7	71.6 72.7				
80	72.5 72.6 72.8 72.8	72.8 72.8				
(12) --- 100	68.9 69.7 69.5 70.6	69.5 70.6				
125	66.7 66.4 66.0 66.0	66.0 66.0				
160	59.7 58.5 59.2 55.0	59.2 55.0				
200	62.5 62.6 62.9 62.3	62.9 62.3				
250	64.6 65.1 64.5 63.8	64.5 63.8				
315	64.6 64.4 63.9 63.2	63.9 63.2				
400	59.0 58.1 57.8 56.3	57.8 56.3				
500	46.5 46.4 45.6 44.4	45.6 44.4				
630	47.0 45.5 45.6 44.9	45.6 44.9				
800						
1000						
1250						
1600						
2000						
2500						
3150						
4000						
5000						
6300						
8000						
10000						
(3) --- AVERAGE	78.4 78.3 78.3 78.2	78.3 78.2				
(4) --- A-MTC	62.8 62.7 62.4 61.9	62.4 61.9				
(5) --- C-MTC	73.3 73.1 72.9 72.3	72.9 72.3				
(6) --- F-MTC	73.3 73.1 72.8 72.3	72.8 72.3				
(7) --- ACC AVG	14945 15065 15226 15366	15226 15366				
(8) --- CPT PNC	20051 20244 20436 20629	20436 20629				

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)



(9)

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

FAR PART 36 FLYOVER NOISE LEVELS
DATA IDENTIFICATION INFORMATION
DATA CATALOGED 12-17-73 DATA PROCESSED 04/08/75 11100400 PAGE 1

MODEL DC-8-61 REG. NO. N8087U
CC-8-61 FLYOVER NOISE DEFINITION

MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS
ENGINE/PACELLE CONFIGURATION -- PCMA J13C-3B ENGINES WITH PRODUCTION NACELLES

TYPE OF FLYOVER -- LEVEL FLIGHT PATH, 4 FEET ABOVE SANDY DIRT
MEASUREMENT AT X = 2450.0, Y = 219.0, Z = 2.0 FEET FROM WEST-MOST END OF RUNWAY
REFERENCE RECORDING LOCATION X = 2450.0, Y = 0.0, Z = 0.0 FEET

MEASUREMENT INFO
MIC. NUMBER 10
MIC. LOCATION 29
MIC. CHIEF GRIZING
TEST SITE YUMA
TEST DATE 11-08-73
TEST NUMBER 10-4-1
JOB REFEL A4757

AIRPLANE AND ENGINE DATA
FLSE. NO. 373
FLIGHT 29
HEIGHT = 5279.7 FT
LAT. DEVL. = 341.2 FT
SLMT. RAG. = 5290.7 FT
PATH SPD. = 189.6 KN
GR. WEIGHT = 221400. LB

WEATHER DATA
AMB. TEMP. = 50.7 F
REL. HUM. = 43.2 PCT
ABS. HUM. = 5.1 GR/P3
WIND SPEED = 3.0 KN
WIND DIR. = 60. DEG
STA. PRESS = 29.75 IN HG
RT. THETA = 1.0055

AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF 2-44-25.4
OPER PERFORMANCE DATA IS FOR TIME OF PNLTM CF 2-44-25.5
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION 2-44-25.4

REFERENCE SURFACE WEATHER CONDITIONS TEMP = 77.0 F & REL. HUM. = 70.0 PCT

DESCRIPTION OF ACOUSTICAL DATA PROCESSING

ANALYZER TYPE / RESOLUTION CH121(CISA) / 0.25 CB
CISA MODE 1 PASS WITH AUTO START
SAMPLE INTERVAL FOR BASIC DATA = .500 SECONDS
AVERAGING TIME = 1.500 SECONDS
ATMOSPHERIC SOUND PRESSURE LEVEL
DATA TYPES 1/3 OCTAVE, OVERALL, A-WTD,
PAL, PNLT, & EPNL

RUN 29C

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL		HISTORY	MODEL		FLY		MIS		TEST DATE 11-08-73					PAGE	
START TIME	SPL	2 43 59.00C	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
1/2 (12)		4M3						61.9	61.7						
50		48.2													
80		49.3													
120		51.2													
(2)		120													
200		49.6													
250		50.1													
315		49.3													
400		45.9													
500		37.7													
630		35.5													
800		30.2													
1000		27.7													
1200		27.7													
1500		22.1													
2000		18.0													
3150		17.0													
5000		17.7													
8000		17.9													
10000		18.9													
(3) OVERALL															
(4) 1-PAL															
(5) 2-PAL															
(6) 3-PAL															
(7) 4-ACC ENG															
(8) 5-OPT ENG															

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL START TIME	WISDOMY 2 43 55.000	PCDEL REG. NOC87U	FLI 2 PUN 29	MIC 1 LOC 1	TEST DATE 11-00-73	11-00-73
162 (198)	6.5	7.0	8.5	9.0	10.5	11.0
50	60.2	60.8	60.9	60.9	61.7	60.6
60	59.3	59.5	59.9	60.4	61.6	62.4
(2) 100	63.2	61.6	61.6	62.4	62.6	62.6
120	55.2	54.6	54.2	54.8	55.4	55.4
200	55.2	54.6	54.2	54.8	55.4	55.4
315	52.7	52.7	52.7	52.7	52.7	52.7
400	55.2	54.6	54.2	54.8	55.4	55.4
500	46.2	46.7	47.0	48.0	48.4	48.4
630	45.3	44.3	43.9	44.1	44.7	45.7
800	39.3	38.7	38.6	39.2	39.6	40.9
1000						32.2
1250						
1600						
2000						
2500						
3150						
5000						
6300						
8000						
10000						
(4) 10000	87.3	87.3	87.3	87.3	87.3	87.3
(5) 10000	87.3	87.3	87.3	87.3	87.3	87.3
(6) 10000	87.3	87.3	87.3	87.3	87.3	87.3
(7) 10000	87.3	87.3	87.3	87.3	87.3	87.3
(8) 10000	87.3	87.3	87.3	87.3	87.3	87.3

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY		MODEL CC-8-61		FLT 2		VIC 17		TEST DATE 11-08-73		11100408	
START TIME	2 43 59.000	REG. ADJUST	16.0	15.5	16.0	17.0	17.5	18.0	18.5	19.0	PAGE 4
173 C-129	13.5	4.0	14.5	15.0	16.0	16.5	17.0	17.5	18.0	18.5	19.5
SC	62.7	62.0	62.4	61.6	62.5				62.5	63.1	63.3
EC											62.3
(2) — 103	55.8	55.9	62.5	65.1	69.7	67.1	67.9	68.3	55.0	59.2	61.7
163	65.1	65.1	62.5	65.1	69.7	67.1	67.9	68.3	62.0	65.0	69.0
200	67.5	67.7	67.8	67.5	68.0	67.5	69.0	68.3	66.0	67.7	68.4
250	63.8	63.1	63.5	63.0	62.2	61.3	60.5	60.3	60.0	61.5	62.3
315	58.2	59.5	60.3	60.6	61.4	63.9	65.0	66.4	66.0	67.2	67.6
400	61.8	65.0	66.3	67.8	68.5	61.7	61.9	61.8	61.0	63.3	63.8
450	54.3	54.1	54.5	54.4	54.3	55.4	57.1	57.0	57.0	58.0	58.4
800	50.4	51.9	51.3	51.4	51.5	53.4	54.5	54.8	54.5	55.7	55.3
1000	43.8	47.7	45.9	46.4	46.2	48.1	48.1	48.6	48.1	50.0	51.3
1250	37.7	37.8	38.6	38.9	39.1	41.2	42.6	42.8	43.3	44.0	44.3
1600	25.5	25.8	26.5	27.6	28.3	30.0	33.2	33.9	34.5	35.6	36.5
2000											
2500											
3150											
4000											
6000											
10000											
(3) — JVERAL	72.4	72.3	72.5	72.8	72.4	73.1	74.2	74.3	74.5	74.5	75.0
(4) — 1-10	63.0	63.0	63.0	63.0	64.0	64.0	66.0	66.0	66.0	66.0	66.0
(5) — 1-10	72.0	72.0	72.0	72.0	73.0	74.0	74.0	74.0	74.0	74.0	74.0
(6) — 1-10	72.0	72.0	72.0	72.0	73.0	74.0	74.0	74.0	74.0	74.0	74.0
(7) — 1-10	8652	8652	8652	8652	8652	8652	8652	8652	8652	8652	8652
(8) — 1-10	6923	6923	6923	6923	6923	6923	6923	6923	6923	6923	6923

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)		(10)									
WEASURED SPL		MISTOPY		PCEC		FLI 2		MFC 20		TEST DATE 11-08-75	
STATION TIME		2 43 59.000		REC: 800870		RUN 29		LOG 20		1100409	
1/3 C.F.		20.5 21.0 21.5 22.0 22.5 23.0		61.7		23.5 24.0 24.5 25.0 25.5 26.0		26.5 27.0		27.5 28.0	
(MNF 12.7)		20.5 21.0 21.5 22.0 22.5 23.0		61.7		23.5 24.0 24.5 25.0 25.5 26.0		26.5 27.0		27.5 28.0	
100		65.7 67.1 68.5 69.9 71.3 72.7		65.2 66.6 68.0 69.4 70.8 72.2		66.7 68.1 69.5 70.9 72.3 73.7		68.2 69.6 71.0 72.4 73.8 75.2		69.7 71.1 72.5 73.9 75.3 76.7	
125		67.0 68.4 69.8 71.2 72.6 74.0		66.5 67.9 69.3 70.7 72.1 73.5		68.0 69.4 70.8 72.2 73.6 75.0		69.5 70.9 72.3 73.7 75.1 76.5		71.0 72.4 73.8 75.2 76.6 78.0	
200		68.3 69.7 71.1 72.5 73.9 75.3		67.8 69.2 70.6 72.0 73.4 74.8		69.3 70.7 72.1 73.5 74.9 76.3		70.8 72.2 73.6 75.0 76.4 77.8		72.3 73.7 75.1 76.5 77.9 79.3	
315		69.6 71.0 72.4 73.8 75.2 76.6		69.1 70.5 71.9 73.3 74.7 76.1		70.6 72.0 73.4 74.8 76.2 77.6		72.1 73.5 74.9 76.3 77.7 79.1		73.6 75.0 76.4 77.8 79.2 80.6	
400		70.9 72.3 73.7 75.1 76.5 77.9		70.4 71.8 73.2 74.6 76.0 77.4		71.9 73.3 74.7 76.1 77.5 78.9		73.4 74.8 76.2 77.6 79.0 80.4		74.9 76.3 77.7 79.1 80.5 81.9	
500		72.2 73.6 75.0 76.4 77.8 79.2		71.7 73.1 74.5 75.9 77.3 78.7		73.2 74.6 76.0 77.4 78.8 80.2		74.7 76.1 77.5 78.9 80.3 81.7		76.2 77.6 79.0 80.4 81.8 83.2	
630		73.5 74.9 76.3 77.7 79.1 80.5		73.0 74.4 75.8 77.2 78.6 80.0		74.5 75.9 77.3 78.7 80.1 81.5		76.0 77.4 78.8 80.2 81.6 83.0		77.5 78.9 80.3 81.7 83.1 84.5	
800		74.8 76.2 77.6 79.0 80.4 81.8		74.3 75.7 77.1 78.5 79.9 81.3		75.8 77.2 78.6 80.0 81.4 82.8		77.3 78.7 80.1 81.5 82.9 84.3		78.8 80.2 81.6 83.0 84.4 85.8	
1000		76.1 77.5 78.9 80.3 81.7 83.1		75.6 77.0 78.4 79.8 81.2 82.6		77.1 78.5 79.9 81.3 82.7 84.1		78.6 80.0 81.4 82.8 84.2 85.6		80.1 81.5 82.9 84.3 85.7 87.1	
1250		77.4 78.8 80.2 81.6 83.0 84.4		76.9 78.3 79.7 81.1 82.5 83.9		78.4 79.8 81.2 82.6 84.0 85.4		79.9 81.3 82.7 84.1 85.5 86.9		81.4 82.8 84.2 85.6 87.0 88.4	
1600		78.7 80.1 81.5 82.9 84.3 85.7		78.2 79.6 81.0 82.4 83.8 85.2		79.7 81.1 82.5 83.9 85.3 86.7		81.2 82.6 84.0 85.4 86.8 88.2		82.7 84.1 85.5 86.9 88.3 89.7	
2000		80.0 81.4 82.8 84.2 85.6 87.0		79.5 80.9 82.3 83.7 85.1 86.5		81.0 82.4 83.8 85.2 86.6 88.0		82.5 83.9 85.3 86.7 88.1 89.5		84.0 85.4 86.8 88.2 89.6 91.0	
2500		81.3 82.7 84.1 85.5 86.9 88.3		80.8 82.2 83.6 85.0 86.4 87.8		82.3 83.7 85.1 86.5 87.9 89.3		83.8 85.2 86.6 88.0 89.4 90.8		85.3 86.7 88.1 89.5 90.9 92.3	
3150		82.6 84.0 85.4 86.8 88.2 89.6		82.1 83.5 84.9 86.3 87.7 89.1		83.6 85.0 86.4 87.8 89.2 90.6		85.1 86.5 87.9 89.3 90.7 92.1		86.6 88.0 89.4 90.8 92.2 93.6	
4000		83.9 85.3 86.7 88.1 89.5 90.9		83.4 84.8 86.2 87.6 89.0 90.4		84.9 86.3 87.7 89.1 90.5 91.9		86.4 87.8 89.2 90.6 92.0 93.4		87.9 89.3 90.7 92.1 93.5 94.9	
5000		85.2 86.6 88.0 89.4 90.8 92.2		84.7 86.1 87.5 88.9 90.3 91.7		86.2 87.6 89.0 90.4 91.8 93.2		87.7 89.1 90.5 91.9 93.3 94.7		89.2 90.6 92.0 93.4 94.8 96.2	
6300		86.5 87.9 89.3 90.7 92.1 93.5		86.0 87.4 88.8 90.2 91.6 93.0		87.5 88.9 90.3 91.7 93.1 94.5		89.0 90.4 91.8 93.2 94.6 96.0		90.5 91.9 93.3 94.7 96.1 97.5	
8000		87.8 89.2 90.6 92.0 93.4 94.8		87.3 88.7 90.1 91.5 92.9 94.3		88.8 90.2 91.6 93.0 94.4 95.8		90.3 91.7 93.1 94.5 95.9 97.3		91.8 93.2 94.6 96.0 97.4 98.8	
10000		89.1 90.5 91.9 93.3 94.7 96.1		88.6 90.0 91.4 92.8 94.2 95.6		90.1 91.5 92.9 94.3 95.7 97.1		91.6 93.0 94.4 95.8 97.2 98.6		93.1 94.5 95.9 97.3 98.7 100.1	
(3) OVERALL		79.0 79.4 79.8 80.2 80.6 81.0		78.5 78.9 79.3 79.7 80.1 80.5		79.0 79.4 79.8 80.2 80.6 81.0		79.5 79.9 80.3 80.7 81.1 81.5		80.0 80.4 80.8 81.2 81.6 82.0	
(5) PNL		79.4 79.8 80.2 80.6 81.0 81.4		78.9 79.3 79.7 80.1 80.5 80.9		79.4 79.8 80.2 80.6 81.0 81.4		79.9 80.3 80.7 81.1 81.5 81.9		80.4 80.8 81.2 81.6 82.0 82.4	
(6) FALT		79.8 80.2 80.6 81.0 81.4 81.8		79.3 79.7 80.1 80.5 80.9 81.3		79.8 80.2 80.6 81.0 81.4 81.8		80.3 80.7 81.1 81.5 81.9 82.3		80.8 81.2 81.6 82.0 82.4 82.8	
(7) ACC WNG		80.2 80.6 81.0 81.4 81.8 82.2		79.7 80.1 80.5 80.9 81.3 81.7		80.2 80.6 81.0 81.4 81.8 82.2		80.7 81.1 81.5 81.9 82.3 82.7		81.2 81.6 82.0 82.4 82.8 83.2	
(8) CPT PNC		80.6 81.0 81.4 81.8 82.2 82.6		80.1 80.5 80.9 81.3 81.7 82.1		80.6 81.0 81.4 81.8 82.2 82.6		81.1 81.5 81.9 82.3 82.7 83.1		81.6 82.0 82.4 82.8 83.2 83.6	

TABLE C-2

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TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

[illegible]

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASUREMENT START TIME	SPL HISTORY	PCDEL REG.	CC-8-61 A8087U	FLY 2 RUN 29	(1)		TEST DATE 11-08-73	11100400 PAGE 8
					MIC 10 LOC C	LOC C		
1/2 C.P. CME 121	41.5 42.0 42.5 43.0 43.5 44.0	42.5 43.0 43.5 44.0	44.5 45.0 45.5 46.0	46.5 47.0 47.5 48.0	44.5 45.0 45.5 46.0	46.5 47.0 47.5 48.0	46.5 47.0 47.5 48.0	46.5 47.0 47.5 48.0
SC	61.6	61.6	61.6	62.6	62.2 62.5 63.2 64.7	63.8 64.7 65.1 65.8	64.7 65.1 65.8 66.3	64.7 65.1 65.8 66.3
EC	61.6 61.2	60.6	60.6	60.6	60.6	60.6	60.6	60.6
(2) 102	68.8 69.3 69.8 70.3 70.8 71.3	69.3 69.8 70.3 70.8 71.3 71.8	70.3 70.8 71.3 71.8 72.3 72.8	71.3 71.8 72.3 72.8 73.3 73.8	70.8 71.3 71.8 72.3 72.8 73.3	71.3 71.8 72.3 72.8 73.3 73.8	71.3 71.8 72.3 72.8 73.3 73.8	71.3 71.8 72.3 72.8 73.3 73.8
120	69.1 69.6 70.1 70.6 71.1 71.6	69.6 70.1 70.6 71.1 71.6 72.1	70.1 70.6 71.1 71.6 72.1 72.6	71.1 71.6 72.1 72.6 73.1 73.6	70.6 71.1 71.6 72.1 72.6 73.1	71.1 71.6 72.1 72.6 73.1 73.6	71.1 71.6 72.1 72.6 73.1 73.6	71.1 71.6 72.1 72.6 73.1 73.6
250	67.3 67.8 68.3 68.8 69.3 69.8	67.8 68.3 68.8 69.3 69.8 70.3	68.3 68.8 69.3 69.8 70.3 70.8	69.3 69.8 70.3 70.8 71.3 71.8	68.8 69.3 69.8 70.3 70.8 71.3	69.3 69.8 70.3 70.8 71.3 71.8	69.3 69.8 70.3 70.8 71.3 71.8	69.3 69.8 70.3 70.8 71.3 71.8
315	66.6 67.1 67.6 68.1 68.6 69.1	67.1 67.6 68.1 68.6 69.1 69.6	67.6 68.1 68.6 69.1 69.6 70.1	68.1 68.6 69.1 69.6 70.1 70.6	67.6 68.1 68.6 69.1 69.6 70.1	68.1 68.6 69.1 69.6 70.1 70.6	68.1 68.6 69.1 69.6 70.1 70.6	68.1 68.6 69.1 69.6 70.1 70.6
400	63.6 64.1 64.6 65.1 65.6 66.1	64.1 64.6 65.1 65.6 66.1 66.6	64.6 65.1 65.6 66.1 66.6 67.1	65.1 65.6 66.1 66.6 67.1 67.6	64.6 65.1 65.6 66.1 66.6 67.1	65.1 65.6 66.1 66.6 67.1 67.6	65.1 65.6 66.1 66.6 67.1 67.6	65.1 65.6 66.1 66.6 67.1 67.6
500	62.3 62.8 63.3 63.8 64.3 64.8	62.8 63.3 63.8 64.3 64.8 65.3	63.3 63.8 64.3 64.8 65.3 65.8	63.8 64.3 64.8 65.3 65.8 66.3	63.3 63.8 64.3 64.8 65.3 65.8	63.8 64.3 64.8 65.3 65.8 66.3	63.8 64.3 64.8 65.3 65.8 66.3	63.8 64.3 64.8 65.3 65.8 66.3
630	57.6 58.1 58.6 59.1 59.6 60.1	58.1 58.6 59.1 59.6 60.1 60.6	58.6 59.1 59.6 60.1 60.6 61.1	59.1 59.6 60.1 60.6 61.1 61.6	58.6 59.1 59.6 60.1 60.6 61.1	59.1 59.6 60.1 60.6 61.1 61.6	59.1 59.6 60.1 60.6 61.1 61.6	59.1 59.6 60.1 60.6 61.1 61.6
800	52.6 53.1 53.6 54.1 54.6 55.1	53.1 53.6 54.1 54.6 55.1 55.6	53.6 54.1 54.6 55.1 55.6 56.1	54.1 54.6 55.1 55.6 56.1 56.6	53.6 54.1 54.6 55.1 55.6 56.1	54.1 54.6 55.1 55.6 56.1 56.6	54.1 54.6 55.1 55.6 56.1 56.6	54.1 54.6 55.1 55.6 56.1 56.6
1000	46.6 47.1 47.6 48.1 48.6 49.1	47.1 47.6 48.1 48.6 49.1 49.6	47.6 48.1 48.6 49.1 49.6 50.1	48.1 48.6 49.1 49.6 50.1 50.6	47.6 48.1 48.6 49.1 49.6 50.1	48.1 48.6 49.1 49.6 50.1 50.6	48.1 48.6 49.1 49.6 50.1 50.6	48.1 48.6 49.1 49.6 50.1 50.6
1200	36.4 36.9 37.4 37.9 38.4 38.9	36.9 37.4 37.9 38.4 38.9 39.4	37.4 37.9 38.4 38.9 39.4 39.9	37.9 38.4 38.9 39.4 39.9 40.4	37.4 37.9 38.4 38.9 39.4 39.9	37.9 38.4 38.9 39.4 39.9 40.4	37.9 38.4 38.9 39.4 39.9 40.4	37.9 38.4 38.9 39.4 39.9 40.4
1600	26.4 26.9 27.4 27.9 28.4 28.9	26.9 27.4 27.9 28.4 28.9 29.4	27.4 27.9 28.4 28.9 29.4 29.9	27.9 28.4 28.9 29.4 29.9 30.4	27.4 27.9 28.4 28.9 29.4 29.9	27.9 28.4 28.9 29.4 29.9 30.4	27.9 28.4 28.9 29.4 29.9 30.4	27.9 28.4 28.9 29.4 29.9 30.4
2500	16.4 16.9 17.4 17.9 18.4 18.9	16.9 17.4 17.9 18.4 18.9 19.4	17.4 17.9 18.4 18.9 19.4 19.9	17.9 18.4 18.9 19.4 19.9 20.4	17.4 17.9 18.4 18.9 19.4 19.9	17.9 18.4 18.9 19.4 19.9 20.4	17.9 18.4 18.9 19.4 19.9 20.4	17.9 18.4 18.9 19.4 19.9 20.4
3150	11.4 11.9 12.4 12.9 13.4 13.9	11.9 12.4 12.9 13.4 13.9 14.4	12.4 12.9 13.4 13.9 14.4 14.9	12.9 13.4 13.9 14.4 14.9 15.4	12.4 12.9 13.4 13.9 14.4 14.9	12.9 13.4 13.9 14.4 14.9 15.4	12.9 13.4 13.9 14.4 14.9 15.4	12.9 13.4 13.9 14.4 14.9 15.4
4000	6.4 6.9 7.4 7.9 8.4 8.9	6.9 7.4 7.9 8.4 8.9 9.4	7.4 7.9 8.4 8.9 9.4 9.9	7.9 8.4 8.9 9.4 9.9 10.4	7.4 7.9 8.4 8.9 9.4 9.9	7.9 8.4 8.9 9.4 9.9 10.4	7.9 8.4 8.9 9.4 9.9 10.4	7.9 8.4 8.9 9.4 9.9 10.4
5000	1.4 1.9 2.4 2.9 3.4 3.9	1.9 2.4 2.9 3.4 3.9 4.4	2.4 2.9 3.4 3.9 4.4 4.9	2.9 3.4 3.9 4.4 4.9 5.4	2.4 2.9 3.4 3.9 4.4 4.9	2.9 3.4 3.9 4.4 4.9 5.4	2.9 3.4 3.9 4.4 4.9 5.4	2.9 3.4 3.9 4.4 4.9 5.4
6300	0.4 0.9 1.4 1.9 2.4 2.9	0.9 1.4 1.9 2.4 2.9 3.4	1.4 1.9 2.4 2.9 3.4 3.9	1.9 2.4 2.9 3.4 3.9 4.4	1.4 1.9 2.4 2.9 3.4 3.9	1.9 2.4 2.9 3.4 3.9 4.4	1.9 2.4 2.9 3.4 3.9 4.4	1.9 2.4 2.9 3.4 3.9 4.4
8000	0.4 0.9 1.4 1.9 2.4 2.9	0.9 1.4 1.9 2.4 2.9 3.4	1.4 1.9 2.4 2.9 3.4 3.9	1.9 2.4 2.9 3.4 3.9 4.4	0.9 1.4 1.9 2.4 2.9 3.4	1.4 1.9 2.4 2.9 3.4 3.9	1.4 1.9 2.4 2.9 3.4 3.9	1.4 1.9 2.4 2.9 3.4 3.9
10000	0.4 0.9 1.4 1.9 2.4 2.9	0.9 1.4 1.9 2.4 2.9 3.4	1.4 1.9 2.4 2.9 3.4 3.9	1.9 2.4 2.9 3.4 3.9 4.4	0.4 0.9 1.4 1.9 2.4 2.9	0.9 1.4 1.9 2.4 2.9 3.4	0.9 1.4 1.9 2.4 2.9 3.4	0.9 1.4 1.9 2.4 2.9 3.4
(3) OVERALL	78.9 79.4 79.9 80.4 80.9 81.4	79.4 79.9 80.4 80.9 81.4 81.9	79.9 80.4 80.9 81.4 81.9 82.4	80.4 80.9 81.4 81.9 82.4 82.9	79.9 80.4 80.9 81.4 81.9 82.4	80.4 80.9 81.4 81.9 82.4 82.9	80.4 80.9 81.4 81.9 82.4 82.9	80.4 80.9 81.4 81.9 82.4 82.9
(4) A-MTC	69.4 69.9 70.4 70.9 71.4 71.9	69.9 70.4 70.9 71.4 71.9 72.4	70.4 70.9 71.4 71.9 72.4 72.9	70.9 71.4 71.9 72.4 72.9 73.4	69.9 70.4 70.9 71.4 71.9 72.4	70.4 70.9 71.4 71.9 72.4 72.9	70.4 70.9 71.4 71.9 72.4 72.9	70.4 70.9 71.4 71.9 72.4 72.9
(5) PAL	78.9 79.4 79.9 80.4 80.9 81.4	79.4 79.9 80.4 80.9 81.4 81.9	79.9 80.4 80.9 81.4 81.9 82.4	80.4 80.9 81.4 81.9 82.4 82.9	78.9 79.4 79.9 80.4 80.9 81.4	79.4 79.9 80.4 80.9 81.4 81.9	79.4 79.9 80.4 80.9 81.4 81.9	79.4 79.9 80.4 80.9 81.4 81.9
(6) PAL	78.9 79.4 79.9 80.4 80.9 81.4	79.4 79.9 80.4 80.9 81.4 81.9	79.9 80.4 80.9 81.4 81.9 82.4	80.4 80.9 81.4 81.9 82.4 82.9	78.9 79.4 79.9 80.4 80.9 81.4	79.4 79.9 80.4 80.9 81.4 81.9	79.4 79.9 80.4 80.9 81.4 81.9	79.4 79.9 80.4 80.9 81.4 81.9
(7) ECC RNC	60.12 60.17 60.22 60.27 60.32 60.37	60.17 60.22 60.27 60.32 60.37 60.42	60.22 60.27 60.32 60.37 60.42 60.47	60.27 60.32 60.37 60.42 60.47 60.52	60.12 60.17 60.22 60.27 60.32 60.37	60.17 60.22 60.27 60.32 60.37 60.42	60.17 60.22 60.27 60.32 60.37 60.42	60.17 60.22 60.27 60.32 60.37 60.42
(8) CPT RNC	70.06 70.11 70.16 70.21 70.26 70.31	70.11 70.16 70.21 70.26 70.31 70.36	70.16 70.21 70.26 70.31 70.36 70.41	70.21 70.26 70.31 70.36 70.41 70.46	70.06 70.11 70.16 70.21 70.26 70.31	70.11 70.16 70.21 70.26 70.31 70.36	70.11 70.16 70.21 70.26 70.31 70.36	70.11 70.16 70.21 70.26 70.31 70.36

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL START TIME	HISTORY 2 43 59.000	MODEL KDC87U	LC-8-61	FLT 29	MIC 10	TEST DATE	11-J8-75	PAGE	
1/2 (1)	48.5 49.0 49.5 50.0 50.5 51.0 51.5 52.0 52.5	49.5 50.0 50.5 51.0 51.5 52.0 52.5	50.0 50.5 51.0 51.5 52.0 52.5	51.0 51.5 52.0 52.5	52.0 52.5	53.0 53.5 54.0 54.5	55.0	11100408	
59	66.4 67.1 67.6 68.1 68.6 69.1 69.6 70.1 70.6	67.1 67.6 68.1 68.6 69.1 69.6 70.1 70.6	67.6 68.1 68.6 69.1 69.6 70.1 70.6	68.1 68.6 69.1 69.6 70.1 70.6	68.6 69.1 69.6 70.1 70.6	69.1 69.6 70.1 70.6	70.1 70.6 71.1 71.6	71.1 71.6	72.1 72.6
60	65.9 66.4 66.9 67.4 67.9 68.4 68.9 69.4 69.9	66.4 66.9 67.4 67.9 68.4 68.9 69.4 69.9	66.9 67.4 67.9 68.4 68.9 69.4 69.9	67.4 67.9 68.4 68.9 69.4 69.9	67.9 68.4 68.9 69.4 69.9	68.4 68.9 69.4 69.9	68.9 69.4 69.9	69.4 69.9	70.0 70.5
(2) 100	71.5 71.9 72.3 72.7 73.1 73.5 73.9 74.3 74.7	72.3 72.7 73.1 73.5 73.9 74.3 74.7	72.7 73.1 73.5 73.9 74.3 74.7	73.1 73.5 73.9 74.3 74.7	73.5 73.9 74.3 74.7	74.0 74.4 74.8 75.2	74.4 74.8 75.2	74.8 75.2	75.6 76.0
125	69.7 70.1 70.5 70.9 71.3 71.7 72.1 72.5 72.9	70.5 70.9 71.3 71.7 72.1 72.5 72.9	70.9 71.3 71.7 72.1 72.5 72.9	71.3 71.7 72.1 72.5 72.9	71.7 72.1 72.5 72.9	72.2 72.6 73.0 73.4	72.6 73.0 73.4	73.0 73.4	73.8 74.2
150	67.3 67.7 68.1 68.5 68.9 69.3 69.7 70.1 70.5	68.1 68.5 68.9 69.3 69.7 70.1 70.5	68.5 68.9 69.3 69.7 70.1 70.5	68.9 69.3 69.7 70.1 70.5	69.3 69.7 69.7 70.1 70.5	69.8 70.2 70.6 71.0	70.2 70.6 71.0	70.6 71.0	71.4 71.8
200	65.2 65.6 66.0 66.4 66.8 67.2 67.6 68.0 68.4	66.0 66.4 66.8 67.2 67.6 68.0 68.4	66.4 66.8 67.2 67.6 68.0 68.4	66.8 67.2 67.6 68.0 68.4	67.2 67.6 67.6 68.0 68.4	67.7 68.1 68.5 68.9	68.1 68.5 68.9	68.5 68.9	69.3 69.7
250	63.1 63.5 63.9 64.3 64.7 65.1 65.5 65.9 66.3	63.9 64.3 64.7 65.1 65.5 65.9 66.3	64.3 64.7 65.1 65.5 65.9 66.3	64.7 65.1 65.5 65.9 66.3	65.1 65.5 65.5 65.9 66.3	65.6 66.0 66.4 66.8	66.0 66.4 66.8	66.4 66.8	67.2 67.6
300	61.0 61.4 61.8 62.2 62.6 63.0 63.4 63.8 64.2	61.8 62.2 62.6 63.0 63.4 63.8 64.2	62.2 62.6 63.0 63.4 63.8 64.2	62.6 63.0 63.4 63.8 64.2	63.0 63.4 63.4 63.8 64.2	63.5 63.9 64.3 64.7	63.9 64.3 64.7	64.3 64.7	65.1 65.5
350	58.9 59.3 59.7 60.1 60.5 60.9 61.3 61.7 62.1	59.7 60.1 60.5 60.9 61.3 61.7 62.1	60.1 60.5 60.9 61.3 61.7 62.1	60.5 60.9 61.3 61.7 62.1	60.9 61.3 61.3 61.7 62.1	61.4 61.8 62.2 62.6	61.8 62.2 62.6	62.2 62.6	63.0 63.4
400	56.8 57.2 57.6 58.0 58.4 58.8 59.2 59.6 60.0	57.6 58.0 58.4 58.8 59.2 59.6 60.0	58.0 58.4 58.8 59.2 59.6 60.0	58.4 58.8 59.2 59.6 60.0	58.8 59.2 59.2 59.6 60.0	59.3 59.7 60.1 60.5	59.7 60.1 60.5	60.1 60.5	60.9 61.3
500	54.7 55.1 55.5 55.9 56.3 56.7 57.1 57.5 57.9	55.5 55.9 56.3 56.7 57.1 57.5 57.9	55.9 56.3 56.7 57.1 57.5 57.9	56.3 56.7 57.1 57.5 57.9	56.7 57.1 57.1 57.5 57.9	57.2 57.6 58.0 58.4	57.6 58.0 58.4	58.0 58.4	58.8 59.2
600	52.6 53.0 53.4 53.8 54.2 54.6 55.0 55.4 55.8	53.4 53.8 54.2 54.6 55.0 55.4 55.8	53.8 54.2 54.6 55.0 55.4 55.8	54.2 54.6 55.0 55.4 55.8	54.6 55.0 55.0 55.4 55.8	55.1 55.5 55.9 56.3	55.5 55.9 56.3	55.9 56.3	56.7 57.1
800	50.5 50.9 51.3 51.7 52.1 52.5 52.9 53.3 53.7	51.3 51.7 52.1 52.5 52.9 53.3 53.7	51.7 52.1 52.5 52.9 53.3 53.7	52.1 52.5 52.9 53.3 53.7	52.5 52.9 52.9 53.3 53.7	53.0 53.4 53.8 54.2	53.4 53.8 54.2	53.8 54.2	54.6 55.0
1000	48.4 48.8 49.2 49.6 49.9 50.3 50.7 51.1 51.5	49.2 49.6 49.9 50.3 50.7 51.1 51.5	49.6 49.9 50.3 50.7 51.1 51.5	49.9 50.3 50.7 51.1 51.5	50.3 50.7 50.7 51.1 51.5	50.8 51.2 51.6 52.0	51.2 51.6 52.0	51.6 52.0	52.4 52.8
1200	46.3 46.7 47.1 47.5 47.9 48.3 48.7 49.1 49.5	47.1 47.5 47.9 48.3 48.7 49.1 49.5	47.5 47.9 48.3 48.7 49.1 49.5	47.9 48.3 48.7 49.1 49.5	48.3 48.7 48.7 49.1 49.5	48.8 49.2 49.6 50.0	49.2 49.6 50.0	49.6 50.0	50.4 50.8
1600	44.2 44.6 45.0 45.4 45.8 46.2 46.6 47.0 47.4	45.0 45.4 45.8 46.2 46.6 47.0 47.4	45.4 45.8 46.2 46.6 47.0 47.4	45.8 46.2 46.6 47.0 47.4	46.2 46.6 46.6 47.0 47.4	46.7 47.1 47.5 47.9	47.1 47.5 47.9	47.5 47.9	48.3 48.7
2000	42.1 42.5 42.9 43.3 43.7 44.1 44.5 44.9 45.3	42.9 43.3 43.7 44.1 44.5 44.9 45.3	43.3 43.7 44.1 44.5 44.9 45.3	43.7 44.1 44.5 44.9 45.3	44.1 44.5 44.5 44.9 45.3	44.6 45.0 45.4 45.8	45.0 45.4 45.8	45.4 45.8	46.2 46.6
2500	40.0 40.4 40.8 41.2 41.6 42.0 42.4 42.8 43.2	40.8 41.2 41.6 42.0 42.4 42.8 43.2	41.2 41.6 42.0 42.4 42.8 43.2	41.6 42.0 42.4 42.8 43.2	42.0 42.4 42.4 42.8 43.2	42.5 42.9 43.3 43.7	42.9 43.3 43.7	43.3 43.7	44.1 44.5
3100	37.9 38.3 38.7 39.1 39.5 39.9 40.3 40.7 41.1	38.7 39.1 39.5 39.9 40.3 40.7 41.1	39.1 39.5 39.9 40.3 40.7 41.1	39.5 39.9 40.3 40.7 41.1	39.9 40.3 40.3 40.7 41.1	40.4 40.8 41.2 41.6	40.8 41.2 41.6	41.2 41.6	42.0 42.4
4000	35.8 36.2 36.6 37.0 37.4 37.8 38.2 38.6 39.0	36.6 37.0 37.4 37.8 38.2 38.6 39.0	37.0 37.4 37.8 38.2 38.6 39.0	37.4 37.8 38.2 38.6 39.0	37.8 38.2 38.2 38.6 39.0	38.3 38.7 39.1 39.5	38.7 39.1 39.5	39.1 39.5	39.9 40.3
5000	33.7 34.1 34.5 34.9 35.3 35.7 36.1 36.5 36.9	34.5 34.9 35.3 35.7 36.1 36.5 36.9	34.9 35.3 35.7 36.1 36.5 36.9	35.3 35.7 36.1 36.5 36.9	35.7 36.1 36.1 36.5 36.9	36.2 36.6 37.0 37.4	36.6 37.0 37.4	37.0 37.4	37.8 38.2
6300	31.6 32.0 32.4 32.8 33.2 33.6 34.0 34.4 34.8	32.4 32.8 33.2 33.6 34.0 34.4 34.8	32.8 33.2 33.6 34.0 34.4 34.8	33.2 33.6 34.0 34.4 34.8	33.6 34.0 34.0 34.4 34.8	34.1 34.5 34.9 35.3	34.5 34.9 35.3	34.9 35.3	35.7 36.1
8000	29.5 29.9 30.3 30.7 31.1 31.5 31.9 32.3 32.7	30.3 30.7 31.1 31.5 31.9 32.3 32.7	30.7 31.1 31.5 31.9 32.3 32.7	31.1 31.5 31.9 32.3 32.7	31.5 31.9 31.9 32.3 32.7	32.0 32.4 32.8 33.2	32.4 32.8 33.2	32.8 33.2	33.6 34.0
10000	27.4 27.8 28.2 28.6 29.0 29.4 29.8 30.2 30.6	28.2 28.6 29.0 29.4 29.8 30.2 30.6	28.6 29.0 29.4 29.8 30.2 30.6	29.0 29.4 29.8 30.2 30.6	29.4 29.8 29.8 30.2 30.6	30.0 30.4 30.8 31.2	30.4 30.8 31.2	30.8 31.2	31.6 32.0
(3) OVERALL	77.6 77.9 78.2 78.5 78.8 79.1 79.4 79.7 80.0	78.2 78.5 78.8 79.1 79.4 79.7 80.0	78.5 78.8 79.1 79.4 79.7 80.0	78.8 79.1 79.4 79.7 80.0	79.1 79.4 79.4 79.7 80.0	79.6 80.0 80.4 80.8	80.0 80.4 80.8	80.4 80.8	81.2 81.6
(4) A-BNL	98.9 99.2 99.5 99.8 100.1 100.4 100.7 101.0 101.3	99.5 99.8 100.1 100.4 100.7 101.0 101.3	99.8 100.1 100.4 100.7 101.0 101.3	100.1 100.4 100.7 101.0 101.3	100.4 100.7 100.7 101.0 101.3	100.9 101.3 101.7 102.1	101.3 101.7 102.1	101.7 102.1	102.5 102.9
(5) BNL	76.6 76.9 77.2 77.5 77.8 78.1 78.4 78.7 79.0	77.2 77.5 77.8 78.1 78.4 78.7 79.0	77.5 77.8 78.1 78.4 78.7 79.0	77.8 78.1 78.4 78.7 79.0	78.1 78.4 78.4 78.7 79.0	78.6 79.0 79.4 79.8	79.0 79.4 79.8	79.4 79.8	80.2 80.6
(6) FAL	71.3 71.6 71.9 72.2 72.5 72.8 73.1 73.4 73.7	71.9 72.2 72.5 72.8 73.1 73.4 73.7	72.2 72.5 72.8 73.1 73.4 73.7	72.5 72.8 73.1 73.4 73.7	72.8 73.1 73.1 73.4 73.7	73.3 73.7 74.1 74.5	73.7 74.1 74.5	74.1 74.5	74.9 75.3
(7) ACC	82.1 82.4 82.7 83.0 83.3 83.6 83.9 84.2 84.5	82.7 83.0 83.3 83.6 83.9 84.2 84.5	83.0 83.3 83.6 83.9 84.2 84.5	83.3 83.6 83.9 84.2 84.5	83.6 83.9 83.9 84.2 84.5	84.1 84.5 84.9 85.3	84.5 84.9 85.3	84.9 85.3	85.7 86.1
(8) LPT	70.0 70.3 70.6 70.9 71.2 71.5 71.8 72.1 72.4	70.6 70.9 71.2 71.5 71.8 72.1 72.4	70.9 71.2 71.5 71.8 72.1 72.4	71.2 71.5 71.8 72.1 72.4	71.5 71.8 71.8 72.1 72.4	72.0 72.4 72.8 73.2	72.4 72.8 73.2	72.8 73.2	73.6 74.0

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL START TIME	HISTORY 2 43 59.CCC	MCCEL REG.	CC-8-01 K60870	FLT 2 RUN 29	MIC 10 LOC C	TEST DATE 11-30-73			PAGE 10
						60.0	60.5	61.0	
(1)									
1/2 (1) 1/2	55.5	56.0	56.5	57.0	57.5	58.0	58.5	59.0	61.5
50	69.2	68.3	67.0	66.9	66.5	66.9	67.3	67.7	62.0
63	68.7	68.4	67.1	67.1	67.0	67.2	67.6	68.0	65.0
83	64.1	64.1	63.7	64.6	64.5	64.7	64.9	65.3	66.1
(2)									
100	61.8	60.0	58.2	64.7	64.3	64.3	64.4	64.8	59.3
125	67.4	66.2	66.1	68.7	68.1	67.4	66.8	66.3	62.4
160	68.8	68.3	68.8	68.7	68.1	67.4	66.8	66.3	64.8
200	69.3	65.7	69.6	65.1	64.3	64.3	64.9	64.3	66.1
250	64.3	64.8	65.2	65.1	64.3	64.6	64.4	64.3	66.1
315	60.3	59.2	58.2	56.9	56.4	55.4	55.4	54.6	66.1
400	60.6	60.2	60.4	60.7	60.8	60.2	60.4	60.3	66.1
500	53.2	53.1	53.5	53.3	52.9	52.7	53.1	53.0	66.1
600	47.6	47.2	46.2	46.5	46.6	46.6	46.7	46.7	66.1
1000	41.1	40.3	39.5	39.6	39.1	39.0	39.6	39.4	66.1
1250									
1600									
2000									
2500									
3150									
4000									
5000									
6300									
8000									
(3) OVERALL	76.7	76.4	76.0	75.7	75.6	75.8	75.9	75.9	75.9
(4) A-FNC	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0
(5) FNC	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2
(6) FNC	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2
(7) FNC	83.8	83.8	83.8	83.8	83.8	83.8	83.8	83.8	83.8
(8) FNC	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

WEATHERED SPL STAY TIME	HISTORY 2 43 59.000	MODEL REQ. 180870	FLY 29 RUN 29	MIC 29 LOC 29	TEST DATE 11-08-73	11100408 PAGE 11
1/3 12.0	62.5	63.0	63.5	64.0	64.5	65.0
50	68.0	68.5	69.0	69.5	70.0	70.5
63	67.6	68.1	68.6	69.1	69.6	70.1
80	66.5	67.0	67.5	68.0	68.5	69.0
100	68.7	69.2	69.7	70.2	70.7	71.2
125	68.9	69.4	69.9	70.4	70.9	71.4
160	68.5	69.0	69.5	70.0	70.5	71.0
200	68.3	68.8	69.3	69.8	70.3	70.8
250	68.1	68.6	69.1	69.6	70.1	70.6
315	67.9	68.4	68.9	69.4	69.9	70.4
400	67.7	68.2	68.7	69.2	69.7	70.2
500	67.5	68.0	68.5	69.0	69.5	70.0
630	67.3	67.8	68.3	68.8	69.3	69.8
800	67.1	67.6	68.1	68.6	69.1	69.6
1000	66.9	67.4	67.9	68.4	68.9	69.4
1250	66.7	67.2	67.7	68.2	68.7	69.2
1600	66.5	67.0	67.5	68.0	68.5	69.0
2000	66.3	66.8	67.3	67.8	68.3	68.8
2500	66.1	66.6	67.1	67.6	68.1	68.6
3150	65.9	66.4	66.9	67.4	67.9	68.4
4000	65.7	66.2	66.7	67.2	67.7	68.2
5000	65.5	66.0	66.5	67.0	67.5	68.0
6300	65.3	65.8	66.3	66.8	67.3	67.8
8000	65.1	65.6	66.1	66.6	67.1	67.6
10000	64.9	65.4	65.9	66.4	66.9	67.4
(3) OVERALL	74.8	75.3	75.8	76.3	76.8	77.3
(4) 1/3 12.0	61.3	61.8	62.3	62.8	63.3	63.8
(5) 50	67.6	68.1	68.6	69.1	69.6	70.1
(6) 63	67.3	67.8	68.3	68.8	69.3	69.8
(7) 80	66.5	67.0	67.5	68.0	68.5	69.0
(8) 100	68.7	69.2	69.7	70.2	70.7	71.2
(9) 125	68.9	69.4	69.9	70.4	70.9	71.4
(10) 160	68.5	69.0	69.5	70.0	70.5	71.0
(11) 200	68.3	68.8	69.3	69.8	70.3	70.8
(12) 250	68.1	68.6	69.1	69.6	70.1	70.6
(13) 315	67.9	68.4	68.9	69.4	69.9	70.4
(14) 400	67.7	68.2	68.7	69.2	69.7	70.2
(15) 500	67.5	68.0	68.5	69.0	69.5	70.0
(16) 630	67.3	67.8	68.3	68.8	69.3	69.8
(17) 800	67.1	67.6	68.1	68.6	69.1	69.6
(18) 1000	66.9	67.4	67.9	68.4	68.9	69.4
(19) 1250	66.7	67.2	67.7	68.2	68.7	69.2
(20) 1600	66.5	67.0	67.5	68.0	68.5	69.0
(21) 2000	66.3	66.8	67.3	67.8	68.3	68.8
(22) 2500	66.1	66.6	67.1	67.6	68.1	68.6
(23) 3150	65.9	66.4	66.9	67.4	67.9	68.4
(24) 4000	65.7	66.2	66.7	67.2	67.7	68.2
(25) 5000	65.5	66.0	66.5	67.0	67.5	68.0
(26) 6300	65.3	65.8	66.3	66.8	67.3	67.8
(27) 8000	65.1	65.6	66.1	66.6	67.1	67.6
(28) 10000	64.9	65.4	65.9	66.4	66.9	67.4

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL STAFF TIME	HISTORY 2 43 59.000	MODEL REG.	CC-8-61 R0C870	FLY 29 RUN	MIC 10 LOC C	TEST DATE 11-08-73				(1) PAGE 12
						74.0	74.5	75.0	75.5	
1/2 124	69.5	70.0	70.5	71.0	71.5	72.0	72.5	73.0	73.5	74.0
50	68.5	69.0	69.5	70.0	70.5	71.0	71.5	72.0	72.5	73.0
63	67.8	68.4	69.0	69.6	70.2	70.8	71.4	72.0	72.6	73.2
80	68.1	68.6	69.1	69.6	70.1	70.6	71.1	71.6	72.1	72.6
(2) 100	61.1	61.7	62.1	62.4	62.8	63.2	63.6	64.0	64.4	64.8
125	56.5	56.5	56.1	57.4	58.0	58.6	59.2	59.8	60.4	61.0
160	62.4	62.5	61.3	62.0	62.8	63.4	64.0	64.6	65.2	65.8
200	62.9	62.9	63.4	64.1	64.8	65.4	66.0	66.6	67.2	67.8
250	61.8	61.4	61.5	62.1	62.8	63.4	64.0	64.6	65.2	65.8
315	52.8	52.6	52.8	54.2	55.4	56.6	57.8	59.0	60.2	61.4
400	52.6	53.1	53.1	53.3	53.5	53.7	54.0	54.3	54.6	54.9
500	42.9	43.1	43.7	44.3	44.8	45.3	45.8	46.3	46.8	47.3
630	41.4	41.5	41.8	42.1	42.0	41.1	38.3	36.6	34.5	34.3
800										
1000										
1250										
1500										
2000										
3150										
4000										
5000										
6300										
8000										
10000										
(3) OVERALL	74.3	74.7	74.5	74.7	75.1	74.8	74.9	75.4	75.5	75.8
(4) A-WEIGHTED	58.4	58.4	58.5	59.1	59.4	59.6	58.7	58.4	58.5	58.8
(5) FAULT	58.6	58.6	58.8	59.5	60.2	60.0	58.8	58.4	58.5	58.8
(6) FAULT	58.6	58.6	58.8	59.5	60.2	60.0	58.8	58.4	58.5	58.8
(7) 1/2 124	115.78	119.58	119.98	120.37	120.77	121.17	121.57	121.97	122.37	122.77
(8) 1/2 124	115.78	119.58	119.98	120.37	120.77	121.17	121.57	121.97	122.37	122.77

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

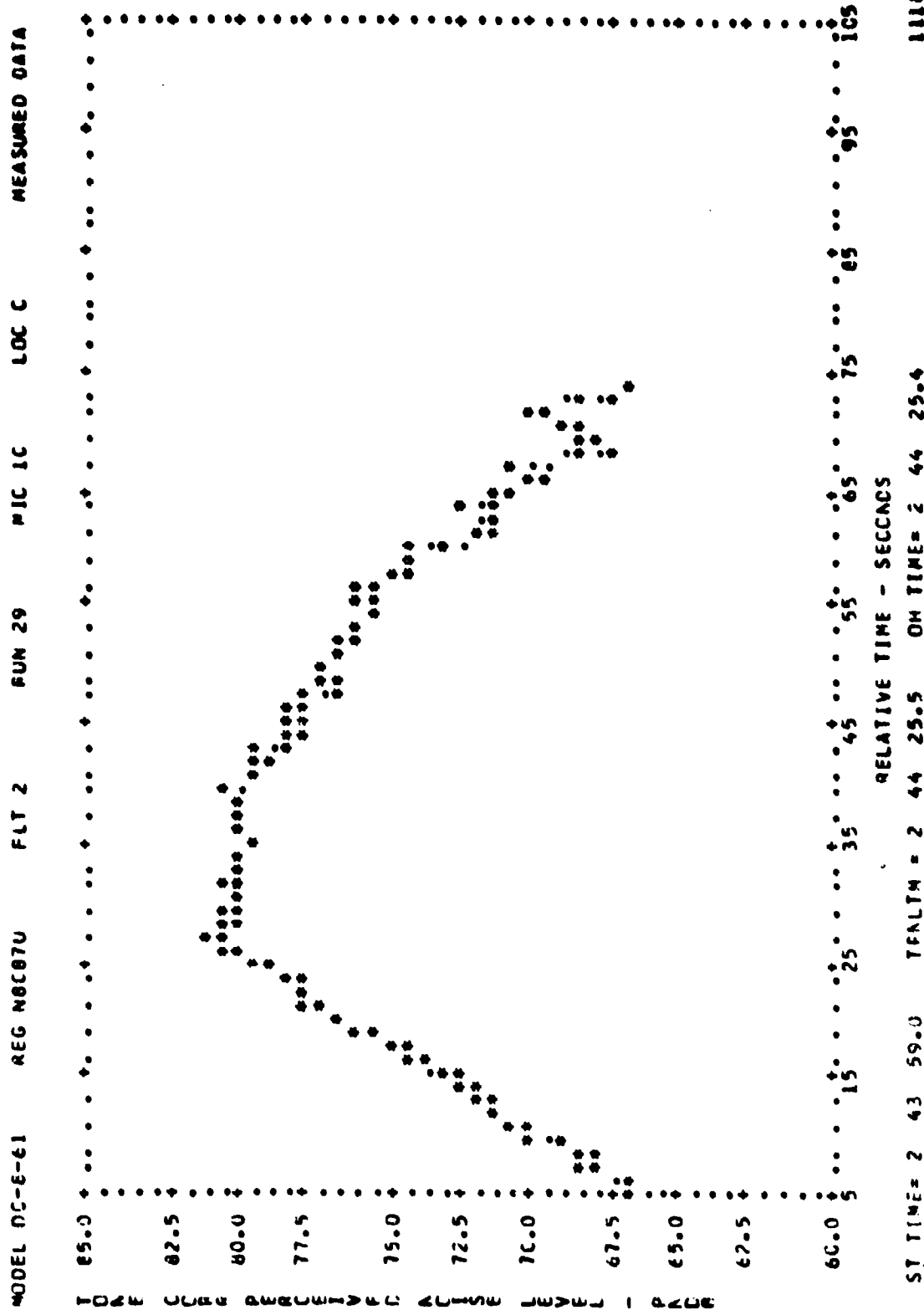
TEST DATE 11-30-73 11100+08
PAGE 13

MIC 1J
LOC C

MEASURED SPL START TIME	HISTORY	MODEL REG. NO.	LOC 8-61	FLY 2 RUN 29
1/3 C.P. 50 50	76.5 77.0 77.5 78.0 78.5 79.0	62.7 63.2 63.7 64.2 64.7 65.2	62.7 63.2 63.7 64.2 64.7 65.2	62.7 63.2 63.7 64.2 64.7 65.2
(2) 125 163	65.1 65.6 66.1 66.6 67.1 67.6	65.1 65.6 66.1 66.6 67.1 67.6	65.1 65.6 66.1 66.6 67.1 67.6	65.1 65.6 66.1 66.6 67.1 67.6
200 250 315	60.6 61.1 61.6 62.1 62.6 63.1	60.6 61.1 61.6 62.1 62.6 63.1	60.6 61.1 61.6 62.1 62.6 63.1	60.6 61.1 61.6 62.1 62.6 63.1
400 500 630	58.9 59.4 59.9 60.4 60.9 61.4	58.9 59.4 59.9 60.4 60.9 61.4	58.9 59.4 59.9 60.4 60.9 61.4	58.9 59.4 59.9 60.4 60.9 61.4
800 1000 1250	53.4 53.9 54.4 54.9 55.4 55.9	53.4 53.9 54.4 54.9 55.4 55.9	53.4 53.9 54.4 54.9 55.4 55.9	53.4 53.9 54.4 54.9 55.4 55.9
1600 2000 2500	46.6 47.1 47.6 48.1 48.6 49.1	46.6 47.1 47.6 48.1 48.6 49.1	46.6 47.1 47.6 48.1 48.6 49.1	46.6 47.1 47.6 48.1 48.6 49.1
3150 4000 5000	39.4 39.9 40.4 40.9 41.4 41.9	39.4 39.9 40.4 40.9 41.4 41.9	39.4 39.9 40.4 40.9 41.4 41.9	39.4 39.9 40.4 40.9 41.4 41.9
6300 8000 10000	35.6 36.1 36.6 37.1 37.6 38.1	35.6 36.1 36.6 37.1 37.6 38.1	35.6 36.1 36.6 37.1 37.6 38.1	35.6 36.1 36.6 37.1 37.6 38.1

(3) OVERALL	71.5 72.0 72.5 73.0 73.5 74.0	71.5 72.0 72.5 73.0 73.5 74.0	71.5 72.0 72.5 73.0 73.5 74.0	71.5 72.0 72.5 73.0 73.5 74.0
(4) 1/3 C.P.	55.0 55.5 56.0 56.5 57.0 57.5	55.0 55.5 56.0 56.5 57.0 57.5	55.0 55.5 56.0 56.5 57.0 57.5	55.0 55.5 56.0 56.5 57.0 57.5
(5) 1/3 C.P.	64.6 65.1 65.6 66.1 66.6 67.1	64.6 65.1 65.6 66.1 66.6 67.1	64.6 65.1 65.6 66.1 66.6 67.1	64.6 65.1 65.6 66.1 66.6 67.1
(6) 1/3 C.P.	13179 13255 13331 13407 13483 13559	13179 13255 13331 13407 13483 13559	13179 13255 13331 13407 13483 13559	13179 13255 13331 13407 13483 13559
(7) 1/3 C.P.	16711 16862 17014 17165 17316 17468	16711 16862 17014 17165 17316 17468	16711 16862 17014 17165 17316 17468	16711 16862 17014 17165 17316 17468

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)



(9)

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

FAR PART 36 FLYOVER NOISE LEVELS
DATA IDENTIFICATION INFORMATION
DATA DIGITIZED 1-2-74 DATA PROCESSED 04/08/75 1110C408 PAGE 1

MODEL DC-8-61 REG. NO. N8087U
DC-8-61 FLYOVER NOISE DEFINITION

MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS

ENGINE/NACELLE CONFIGURATION -- PENA JT3D-3B ENGINES WITH PRODUCTION NACELLES

TYPE OF FLYOVER -- LEVEL FLIGHT DATA CLASS -- FN/DLT = 500C LBS
MEASUREMENT TYPE -- BENEATH FLY PATH, 4 FEET ABOVE SANDY DIRT
RECORDING AT X = 6832.0 Y = 221.0 Z = -2.0 FEET FROM WEST-MOST END OF RUNWAY
REFERENCE RECORDING LOCATION X = 7634.0, Y = .0, Z = .0 FEET
WEATHER DATA
REL. HUM. = 47.1 PCY
ABS. HUM. = 5.4 GM/M³
WIND SPEED = 5.0 DEG
WIND DIR = 40.0 DEG
STA. PRESS = 29.75 IN HG
RT. THETA = 1.0061
WEATHER DATA
TEMP. = 56.2 F
REL. HUM. = 47.1 PCY
ABS. HUM. = 5.4 GM/M³
WIND SPEED = 5.0 DEG
WIND DIR = 40.0 DEG
STA. PRESS = 29.75 IN HG
RT. THETA = 1.0061
WEATHER DATA
TEMP. = 56.2 F
REL. HUM. = 47.1 PCY
ABS. HUM. = 5.4 GM/M³
WIND SPEED = 5.0 DEG
WIND DIR = 40.0 DEG
STA. PRESS = 29.75 IN HG
RT. THETA = 1.0061

AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC CF 3-29-26.8
OTHER PERFORMANCE DATA IS FOR TIME JF PNLTH CF 3-29-26.0
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION 3-29-17.9
REFERENCE SURFACE WEATHER CONDITIONS TEMP = 77.0 F & REL. HUM. = 70.0 PCY

DESCRIPTION OF ACoustICAL DATA PROCESSING

ANALYZE TYPE / RESOLUTION CR1521(CISAI) / 0.25 CB ATMOSPHERIC ATTENUATION SAE ARP886 (REV1)
CISAI MODE 1 PASS WITH AUTO-START BASIC DATA
SAMPLE INTERVAL FOR BASIC DATA = .500 SECONDS
AVERAGING TIME = 1.500 SECONDS
DATA TYPES 1/3 CCIVE, OVERALL, A-W10.
PAL, PNL & EPNL

RUN 33B

TABLE C.2

120

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL START TIME	MISCRY 3 28 56.500	MODEL REG. ABC870	FLY 2 RUN 33	MIC 3 LCC 8	TEST DATE 11-08-73	11-00 11-05 12-00 12-05 13-00	11-00 11-05 12-00 12-05 13-00
1/2 C.F. 50 63 80	6.5 7.0 7.5 8.0 8.5 9.0	54.7 55.2 55.8 56.2 56.7 57.2	54.7 55.0 55.4 55.7 56.0 56.3	54.5 54.8 55.1 55.4 55.7 56.0	56.8 57.1 57.4 57.7 58.0	56.8 57.1 57.4 57.7 58.0	56.8 57.1 57.4 57.7 58.0
(2) — 100 125 160	55.2 55.8 56.2 56.7 57.2 57.7	55.8 56.2 56.7 57.2 57.7 58.2	55.8 56.2 56.7 57.2 57.7 58.2	55.8 56.2 56.7 57.2 57.7 58.2	56.8 57.1 57.4 57.7 58.0	56.8 57.1 57.4 57.7 58.0	56.8 57.1 57.4 57.7 58.0
300 350 400 500 630	48.6 49.3 49.9 50.1 50.5 50.9	48.6 49.3 49.9 50.1 50.5 50.9	48.6 49.3 49.9 50.1 50.5 50.9	48.6 49.3 49.9 50.1 50.5 50.9	48.6 49.3 49.9 50.1 50.5 50.9	48.6 49.3 49.9 50.1 50.5 50.9	48.6 49.3 49.9 50.1 50.5 50.9
800 1000 1250	42.8 43.4 44.2 44.6 45.5 46.2	42.8 43.4 44.2 44.6 45.5 46.2	42.8 43.4 44.2 44.6 45.5 46.2	42.8 43.4 44.2 44.6 45.5 46.2	42.8 43.4 44.2 44.6 45.5 46.2	42.8 43.4 44.2 44.6 45.5 46.2	42.8 43.4 44.2 44.6 45.5 46.2
1600 2000 2500	36.8 37.3 37.7 38.1 38.5 39.0	36.8 37.3 37.7 38.1 38.5 39.0	36.8 37.3 37.7 38.1 38.5 39.0	36.8 37.3 37.7 38.1 38.5 39.0	36.8 37.3 37.7 38.1 38.5 39.0	36.8 37.3 37.7 38.1 38.5 39.0	36.8 37.3 37.7 38.1 38.5 39.0
3150 4000 5000	29.5 30.1 30.5 31.0 31.4 31.8	29.5 30.1 30.5 31.0 31.4 31.8	29.5 30.1 30.5 31.0 31.4 31.8	29.5 30.1 30.5 31.0 31.4 31.8	29.5 30.1 30.5 31.0 31.4 31.8	29.5 30.1 30.5 31.0 31.4 31.8	29.5 30.1 30.5 31.0 31.4 31.8
6300 8000 10000	23.0 23.5 24.0 24.5 25.0 25.5	23.0 23.5 24.0 24.5 25.0 25.5	23.0 23.5 24.0 24.5 25.0 25.5	23.0 23.5 24.0 24.5 25.0 25.5	23.0 23.5 24.0 24.5 25.0 25.5	23.0 23.5 24.0 24.5 25.0 25.5	23.0 23.5 24.0 24.5 25.0 25.5
(3) — OVERALL (4) — A-WEIGHTED (5) — B-WEIGHTED (6) — C-WEIGHTED (7) — D-WEIGHTED (8) — E-WEIGHTED	57.5 58.0 58.5 59.0 59.5 60.0	57.5 58.0 58.5 59.0 59.5 60.0	57.5 58.0 58.5 59.0 59.5 60.0	57.5 58.0 58.5 59.0 59.5 60.0	57.5 58.0 58.5 59.0 59.5 60.0	57.5 58.0 58.5 59.0 59.5 60.0	57.5 58.0 58.5 59.0 59.5 60.0

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)		MEASURED SPL HISTORY	PCDEL CC-8-61	FLT 2	MIC 3	TEST DATE 11-06-73				11100408					
		START TIME 3 28 56.500	REG. ABC87U	RUN 33	LOC 8					PAGE 4					
123 (12)		13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0
(2)		59.0	59.7	59.8	59.9	61.1	62.2	62.3	59.4	59.2	58.9	58.4	55.9	62.3	53.3
		55.7	60.4	60.4	60.6	59.5	55.5	58.8	58.7	58.5	59.2	58.7	55.2	59.1	55.2
		52.8	52.5	51.5	52.1	51.5	52.0	52.2	52.1	52.5	53.1	53.7	54.6	55.1	58.7
		53.8	54.9	55.3	57.1	57.5	58.3	58.6	58.6	55.5	59.4	59.9	60.2	60.9	61.1
		54.0	53.7	53.3	52.8	53.2	53.0	53.4	53.0	52.8	51.8	52.1	53.2	55.0	55.5
		49.9	49.0	48.7	45.1	44.8	50.9	51.4	51.4	51.4	51.8	52.0	53.1	53.3	54.0
		46.7	46.1	46.1	44.2	46.6	47.6	48.5	49.5	46.6	49.1	49.5	50.3	51.2	51.6
		41.5	41.3	42.9	41.2	41.2	42.0	43.4	43.8	43.8	43.9	43.2	44.5	45.4	46.5
		34.5	34.3	35.1	35.3	36.2	37.7	38.9	39.2	35.3	39.3	39.2	35.3	40.0	41.5
		25.4	25.1	29.3	28.9	29.1	29.5	30.5	31.0	31.3	31.8	31.8	32.5	33.1	33.8
		1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
		2150	2150	2150	2150	2150	2150	2150	2150	2150	2150	2150	2150	2150	2150
		4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
		6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
		10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
(3)		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
(4)		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
(5)		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
(6)		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
(7)		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
(8)		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.1	67.3	67.1	67.4	68.0	68.4	68.0
		56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.0	59.3	59.3	59.4	59.9	60.5	61.0
		64.1	64.6	64.6	64.9	65.0	66.1	66.9	66.9	67.3	67.3	67.6	68.1	68.8	69.3
		74.1	74.6	74.6	75.0	75.0	76.1	76.9	76.9	77.3	77.3	77.6	78.1	78.8	79.3
		64.6	65.0	65.0											

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASUREMENT STATION TIME	SPL	HISTORY	MODEL REG.	FLY RUN	MTC LCC	TEST DATE 11-08-73				1102409 PAGE 5
						20.5	21.5	22.5	23.5	
1/2 C.P. C/F (12)	50	20.5	21.5	22.5	23.5	24.5	25.5	26.5	27.5	
63										
80										
(2) — 103		54.3	55.5	56.4	57.0	57.9	58.7	59.5	60.3	61.1
123		61.3	61.5	61.9	62.3	62.7	63.1	63.5	63.9	64.3
160		63.6	63.4	62.9	62.5	62.1	61.7	61.3	60.9	60.5
200		58.7	57.7	57.4	57.0	56.6	56.2	55.8	55.4	55.0
250		59.6	60.3	61.1	61.9	62.7	63.5	64.3	65.1	65.9
315		60.8	60.6	60.0	59.6	59.2	58.8	58.4	58.0	57.6
400		55.2	55.5	56.3	57.1	57.9	58.7	59.5	60.3	61.1
500		54.3	54.8	55.6	56.4	57.2	58.0	58.8	59.6	60.4
600		51.7	51.3	50.9	50.5	50.1	49.7	49.3	48.9	48.5
1200		33.2	33.7	34.4	35.1	35.8	36.5	37.2	37.9	38.6
1600										
2000										
3150										
4000										
5000										
6300										
8000										
(3) — OVERALL		69.1	69.6	70.3	71.0	71.7	72.4	73.1	73.8	74.5
(4) — PNL		69.5	69.4	69.1	68.8	68.5	68.2	67.9	67.6	67.3
(5) — FALT		69.5	69.4	69.1	68.8	68.5	68.2	67.9	67.6	67.3
(6) — ACC		69.5	69.4	69.1	68.8	68.5	68.2	67.9	67.6	67.3
(7) — CPT		69.5	69.4	69.1	68.8	68.5	68.2	67.9	67.6	67.3
(8) — RMG		69.5	69.4	69.1	68.8	68.5	68.2	67.9	67.6	67.3

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

[illegible]

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)													
MEASURED SPL	HISTORY	PCDEL	CC-8-61	FLT 3	MJC 3	TEST DATE 11-26-73				PAGE			
START TIME	3 20	50.500	REG. NOC87U	36.0	37.0	37.5	38.0	38.5	39.0	39.5	40.0	40.5	41.0
1/2 C.F.													
52.7													
100	59.5	58.7	57.4	56.6	56.7	56.9	57.1	56.4	57.2	57.1	57.1	56.4	55.9
125	63.5	62.9	62.5	62.2	62.4	62.3	62.3	62.3	61.9	61.4	60.4	60.2	60.4
150	63.8	64.0	63.4	63.5	64.5	64.5	65.0	65.0	64.1	63.6	63.5	63.1	63.6
200	58.8	57.8	57.4	59.2	59.6	59.5	59.7	57.5	60.9	60.5	61.6	61.8	62.3
250	60.3	59.2	58.6	58.0	57.6	60.0	61.5	60.3	57.9	57.6	58.6	58.5	59.5
315	59.7	58.7	58.2	58.6	59.4	59.5	55.2	54.2	60.9	59.4	59.2	59.2	58.5
400	59.4	58.9	57.3	57.2	58.8	55.4	55.1	55.6	54.2	55.8	52.1	51.9	52.2
500	56.2	55.7	55.4	54.6	54.6	54.5	55.2	54.9	54.9	53.9	52.6	51.9	51.0
630	54.5	54.5	54.7	53.6	53.3	53.0	54.0	54.3	54.3	53.8	52.7	51.9	51.2
800	51.2	50.5	50.7	50.3	51.1	50.2	50.3	50.2	50.2	48.4	48.8	47.0	47.6
1000	48.6	48.1	48.1	48.0	48.5	48.2	48.3	48.1	48.1	48.0	48.0	47.3	47.6
1250	45.8	44.4	44.7	43.5	43.4	42.9	42.8	42.7	42.7	42.2	41.7	41.3	42.8
1500	34.4	33.7	34.8	34.3	32.1	31.1	30.6	31.3	31.3	31.1	30.3	30.0	30.2
1/2 C.F.													
70.1													
100	70.1	69.7	69.6	65.2	69.1	69.3	69.4	65.7	69.4	66.6	66.8	66.4	66.7
125	61.7	61.4	61.4	61.1	60.8	60.5	60.3	60.9	60.8	60.0	59.7	59.3	59.3
150	70.6	65.8	70.3	69.6	69.4	69.1	69.1	69.2	65.5	69.6	68.6	68.0	68.2
200	70.6	65.8	70.0	69.6	69.4	69.2	69.5	69.6	69.6	68.6	68.3	68.0	68.2
250	51.24	55.68	56.15	54.66	57.18	57.74	58.31	58.51	60.18	60.55	61.53	62.24	62.96
315	61.57	62.38	63.22	64.09	64.98	65.89	66.82	67.77	69.75	70.77	71.80	72.85	73.92
(3) - OVERALL													
70.1													
(4) - 1/2 C.F.													
70.1													
(5) - 1/2 C.F.													
70.1													
(6) - 1/2 C.F.													
70.1													
(7) - 1/2 C.F.													
70.1													
(8) - 1/2 C.F.													
70.1													

EMPLOYEE NOISE ANALYSIS SUMMARIES (CONTINUED)

[illegible]

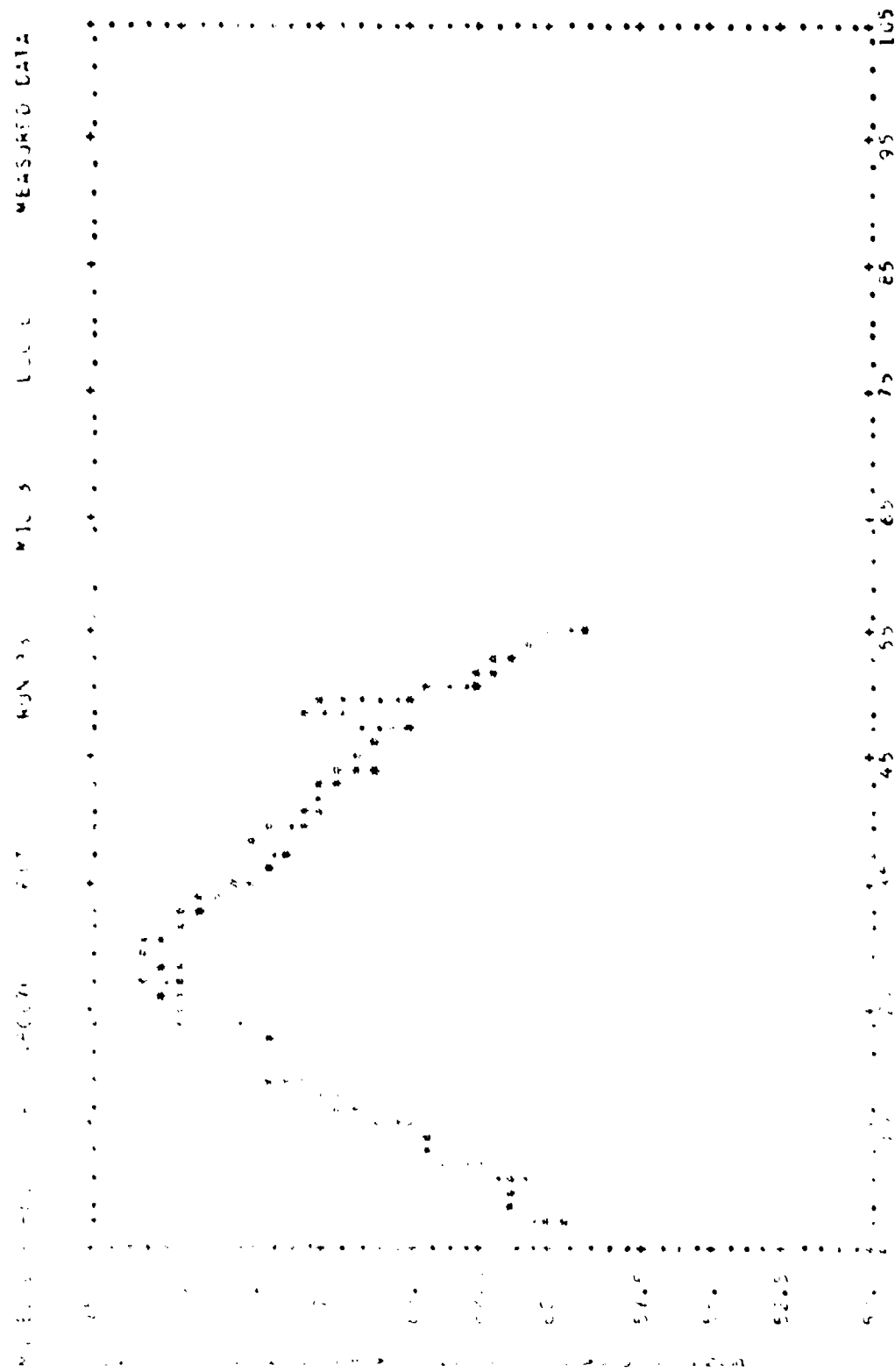
TABLE C.2

(2)

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL START TIME	HISTORY 3 28 56.500	MCDEL REG. N8C87U	EC-8-61 RUN 33	FLY 2 RUN 33	MIC 3 LOC 8	TEST DATE 11-08-73	11100438 PAGE 10
(1) 125	55.5	56.0	57.0	57.5	58.0	59.5	60.0
(2) 125	56.9	54.3	54.7	55.5	56.7	59.1	59.5
(3) 125	56.8	56.8	57.7	58.3	59.1	59.5	59.5
(4) 125	53.5	54.4	55.1	55.8	55.5	59.9	59.6
(5) 125	56.3	56.5	55.1	54.8	54.2		
(6) 125	56.9*	57.1*	55.8	55.6	55.5	59.5	59.8
(7) 125	52.0	52.7	52.3	50.9	55.2	59.5	59.8
(8) 125	48.9	48.3	48.7	48.5	43.8	44.2	44.4
(9) 125	47.3	47.7	48.3	48.5	43.7	44.1	44.4
(10) 125	36.7	35.5	32.9			32.2	
(11) 125	35.3	35.1					
(12) 125	35.3	35.1					
(13) 125	35.3	35.1					
(14) 125	35.3	35.1					
(15) 125	35.3	35.1					
(16) 125	35.3	35.1					
(17) 125	35.3	35.1					
(18) 125	35.3	35.1					
(19) 125	35.3	35.1					
(20) 125	35.3	35.1					
(21) 125	35.3	35.1					
(22) 125	35.3	35.1					
(23) 125	35.3	35.1					
(24) 125	35.3	35.1					
(25) 125	35.3	35.1					
(26) 125	35.3	35.1					
(27) 125	35.3	35.1					
(28) 125	35.3	35.1					
(29) 125	35.3	35.1					
(30) 125	35.3	35.1					
(31) 125	35.3	35.1					
(32) 125	35.3	35.1					
(33) 125	35.3	35.1					
(34) 125	35.3	35.1					
(35) 125	35.3	35.1					
(36) 125	35.3	35.1					
(37) 125	35.3	35.1					
(38) 125	35.3	35.1					
(39) 125	35.3	35.1					
(40) 125	35.3	35.1					
(41) 125	35.3	35.1					
(42) 125	35.3	35.1					
(43) 125	35.3	35.1					
(44) 125	35.3	35.1					
(45) 125	35.3	35.1					
(46) 125	35.3	35.1					
(47) 125	35.3	35.1					
(48) 125	35.3	35.1					
(49) 125	35.3	35.1					
(50) 125	35.3	35.1					
(51) 125	35.3	35.1					
(52) 125	35.3	35.1					
(53) 125	35.3	35.1					
(54) 125	35.3	35.1					
(55) 125	35.3	35.1					
(56) 125	35.3	35.1					
(57) 125	35.3	35.1					
(58) 125	35.3	35.1					
(59) 125	35.3	35.1					
(60) 125	35.3	35.1					
(61) 125	35.3	35.1					
(62) 125	35.3	35.1					
(63) 125	35.3	35.1					
(64) 125	35.3	35.1					
(65) 125	35.3	35.1					
(66) 125	35.3	35.1					
(67) 125	35.3	35.1					
(68) 125	35.3	35.1					
(69) 125	35.3	35.1					
(70) 125	35.3	35.1					
(71) 125	35.3	35.1					
(72) 125	35.3	35.1					
(73) 125	35.3	35.1					
(74) 125	35.3	35.1					
(75) 125	35.3	35.1					
(76) 125	35.3	35.1					
(77) 125	35.3	35.1					
(78) 125	35.3	35.1					
(79) 125	35.3	35.1					
(80) 125	35.3	35.1					
(81) 125	35.3	35.1					
(82) 125	35.3	35.1					
(83) 125	35.3	35.1					
(84) 125	35.3	35.1					
(85) 125	35.3	35.1					
(86) 125	35.3	35.1					
(87) 125	35.3	35.1					
(88) 125	35.3	35.1					
(89) 125	35.3	35.1					
(90) 125	35.3	35.1					
(91) 125	35.3	35.1					
(92) 125	35.3	35.1					
(93) 125	35.3	35.1					
(94) 125	35.3	35.1					
(95) 125	35.3	35.1					
(96) 125	35.3	35.1					
(97) 125	35.3	35.1					
(98) 125	35.3	35.1					
(99) 125	35.3	35.1					
(100) 125	35.3	35.1					

TABLE C-2
 REMOVED NOISE ANALYSIS SUMMARIES (CONCLUDED)



RELATIVE TIME = SECONDS

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APPENDIX D

GROUND REFLECTION PSEUDOTONES

To obtain "free field" noise spectra from data measured in the presence of a ground plane requires that the measured noise spectra be corrected for the spectral effects of the ground reflection phenomena. In the presence of a surface, the recorded noise spectra of a source will be affected by the interferences between the direct and reflected sound waves; with destructive interference or reinforcement of the signal dependent on the differences in direct and reflected sound path distances.

The theoretical bases for the following are taken from the analyses made by various authors (References 7, 8, and 9).

During a flyover, the geometry of the point source and microphone receiver relative to the ground surface is as shown in Figure D-1.

The source of the sound is assumed to be a point source which produces a stationary and random noise.

In the vicinity of the microphone ground surface irregularities are assumed to be small when compared with the wave length of the sound in the frequency range of interest, such that specular reflection can be assumed and that the concept of an image source can be adopted.

If the ground is considered as a perfect reflector, the ratio, R , of the resulting mean square pressure to the mean square pressure which would have been measured in the "free field" is given by (References 7 and 9):

$$R = 1 + \frac{1}{Z^2} + \frac{2}{Z} C_r$$

where

$$Z = \frac{r'}{r}$$

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In the case of a pure tone, the autocorrelation coefficient, C_T , is given by:

$$C_T = \cos 2\pi \frac{\Delta r}{\lambda}.$$

The reflection index, ΔN , associated with this frequency, expressed in dB, represents the difference between the total sound level (direct plus reflected) and the direct signal alone. It may be expressed as

$$\Delta N = 10 \log_{10} \left[1 + \frac{1}{Z^2} + \frac{2}{Z} \cos 2\pi \frac{\Delta r}{\lambda} \right]$$

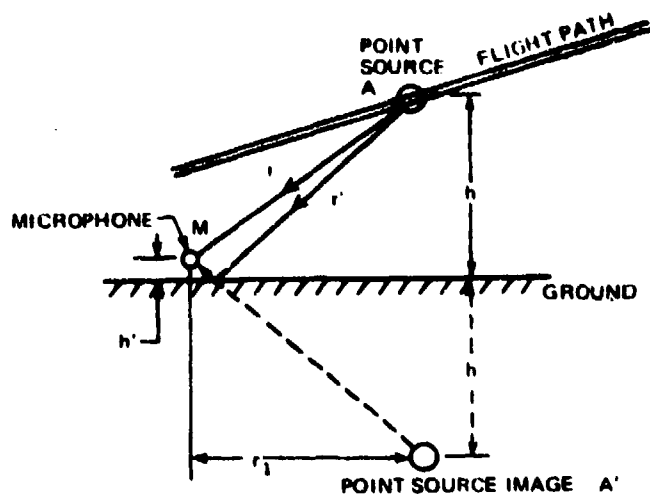
A plot of reflection indices as a function of $\Delta r/\lambda$ for the geometrical parameter $Z = r'/r = 1$ are shown in Figure D-2. A phase difference occurs between the direct and reflected waves because of differences in acoustic path length.

The resulting 1/3-octave band spectrum will contain a series of peaks and nulls with the theoretical form as shown in Figure D-2. The peaks occurring at wave lengths, λ , that are multiples of the sound path differences and the nulls at one-half wave lengths. The first null would occur for the case of the aircraft directly overhead at

$$\frac{\lambda}{2} = 2h'$$

Figure D-3 represents 1/3-octave band spectra plots for a typical test run for microphones located both 4 feet above the ground and flush with the surface. The spectra for the flush microphone was normalized -3 dB to account for pressure doubling. The noise spectra measured with the microphone 4 feet above the ground exhibits nulls and peaks corresponding to the theoretical curve in Figure D-2. Since these nulls and peaks are not associated with the noise source, they are classified as pseudotones.

The flyover-noise analysis computer program (E2QH) provides as an output the designated, by frequency and amplitude, tone corrections that were determined by the procedures specified in Appendix B of FAR, Part 36. However, pseudotones are not associated with the noise source and must



- r LENGTH OF DIRECT SOUND RAY
- r' LENGTH OF REFLECTED SOUND RAY (LENGTH MA')
- r_1 PROJECTION OF DIRECT RAY ON GROUND
- h HEIGHT OF SOURCE ABOVE GROUND
- h' HEIGHT OF MICROPHONE ABOVE GROUND
- $\Delta r = r' - r$ DIFFERENCE BETWEEN REFLECTED AND DIRECT ACOUSTIC PATHS

FIGURE D-1. GEOMETRY OF POINT SOURCE AND MICROPHONE RECEIVER WITH RESPECT TO GROUND SURFACE

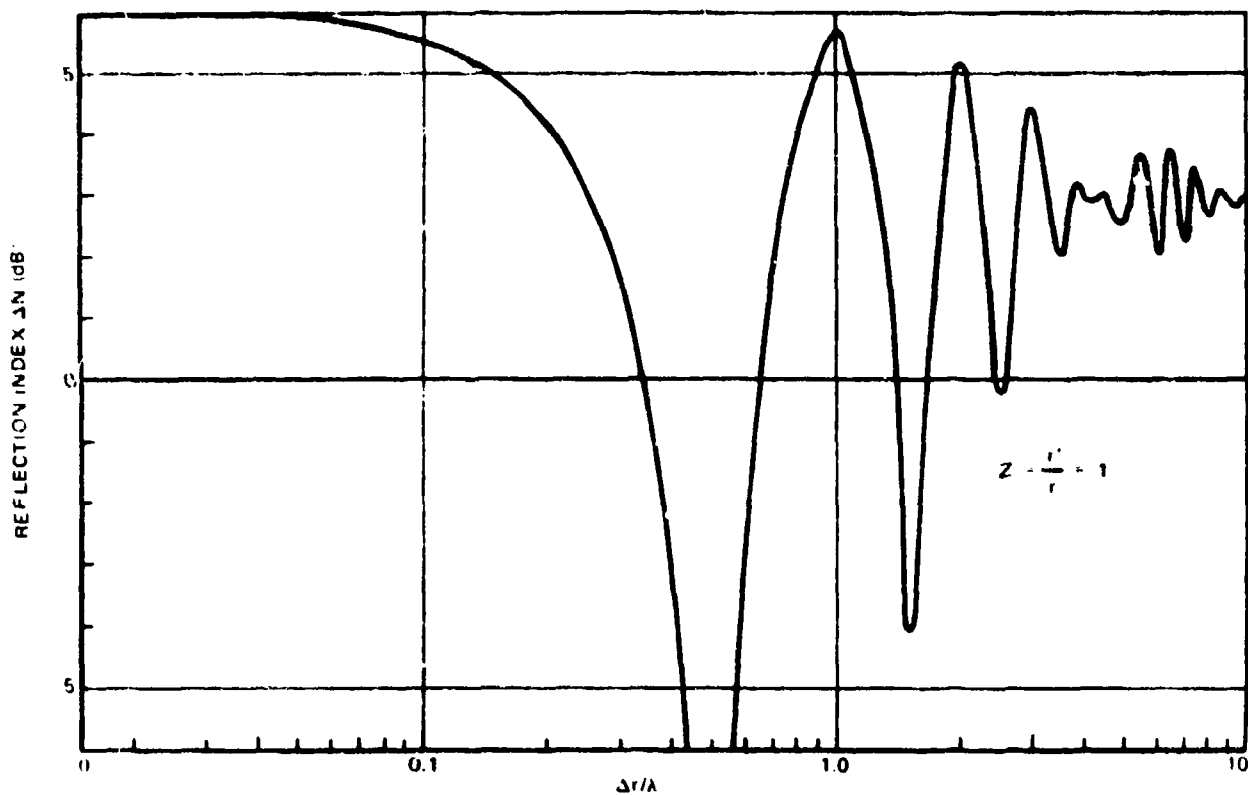


FIGURE D-2. THEORETICAL 1/3 OCTAVE REFLECTION INDEX

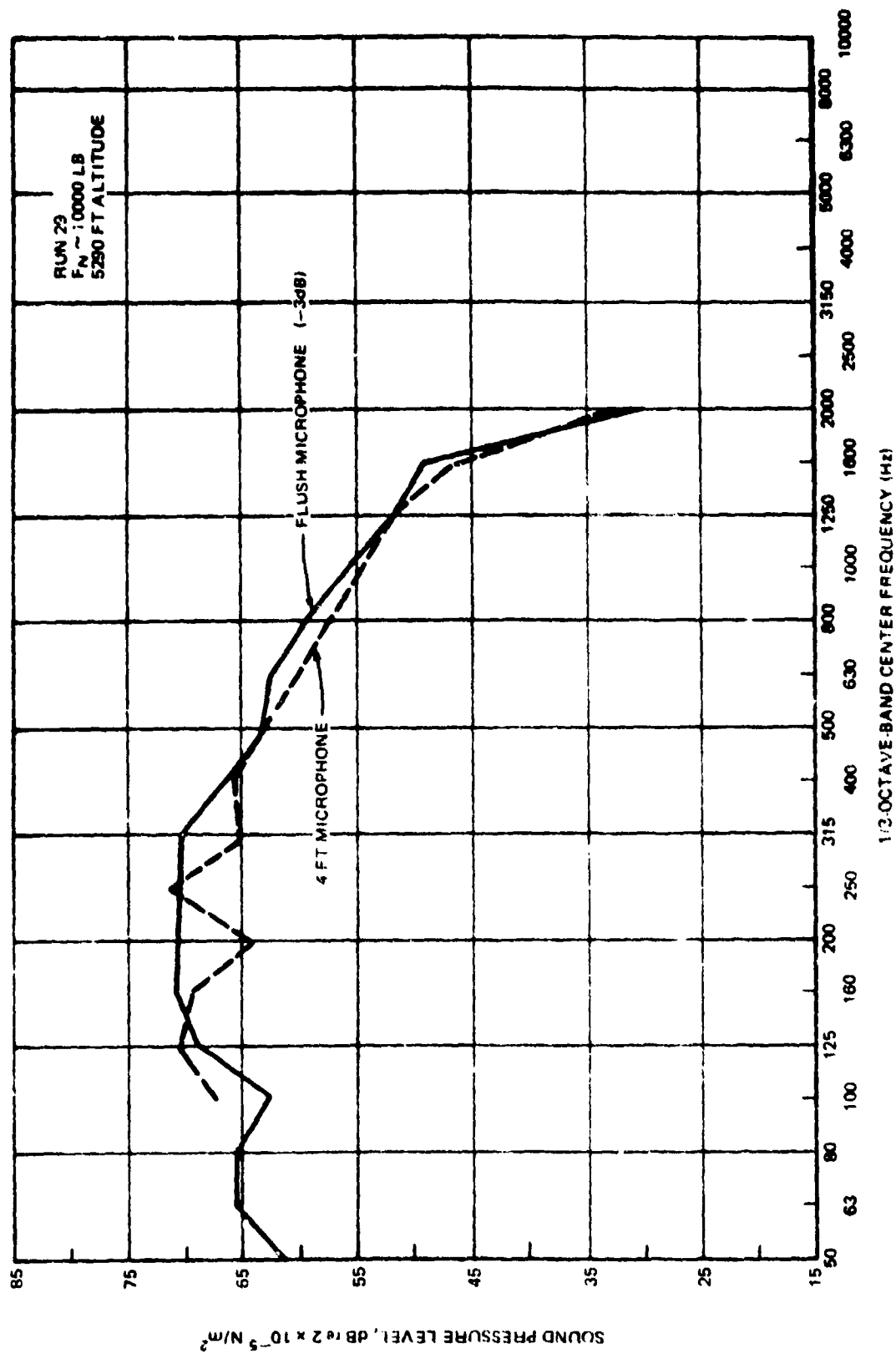


FIGURE D-3. VALIDATION OF PSEUDOTONES

not be applied to the PNL values to obtain PNLT. Table D-1 is a summary of those tone corrections that are considered as pseudotones. Such tone corrections were subsequently removed from the PNLT values shown in Table C-2 of Appendix C.

TABLE D-1
SUMMARY OF PSEUDOTONE ADJUSTMENTS

MEASUREMENT (RUN AND MICROPHONE)	TONE CORRECTION	
	AMPLITUDE - PNLdB	FREQUENCY - Hz
11B	0.5	250
11C	0.9	250
11D	0.9	250
11E	1.6	500
11F	1.7	500
11H	1.0	500
12G	1.2	1000
12G	1.3	1000
15G	1.8	1000
15H	1.1	1250
16F	2.4	500
17E	3.4	500
17F	3.0	500
17F	2.2	500
18F	4.4	500
18F	3.8	500
19F	2.9	500
19G	1.4	500
20F	3.5	500
21E	2.8	500
21F	3.0	500
21G	2.9	500
21H	2.0	500
22C	1.0	250
22D	0.9	315
22F	2.1	800
22F	1.1	1250
23C	0.8	250
23D	0.7	160
23E	2.1	630
23F	1.9	630
23G	1.8	1000
23H	1.0	630
24A	0.5	160
24B	0.7	160
25C	1.1	250
25D	1.1	250
25E	1.1	630
25F	0.7	315
25G	2.0	630
25H	0.7	125

TABLE D-1
SUMMARY OF PSEUDOTONE ADJUSTMENTS (CONTINUED)

MEASUREMENT (RUN AND MICROPHONE)	TONE CORRECTION	
	AMPLITUDE - PNLdB	FREQUENCY - Hz
26A	0.8	260
26F	2.1	800
26H	1.1	1000
27G	2.9	630
27H	0.5	400
28A	0.9	260
28B	0.7	260
28D	0.8	260
28E	0.8	260
28F	0.7	315
28G	1.5	800
28H	1.6	630
29B	0.7	160
29C	1.2	260
29D	1.1	260
29E	1.3	1600
29G	2.5	1260
29F	1.9	630
30C	1.0	260
30D	1.0	260
30E	1.2	1600
30G	0.6	400
31C	1.0	260
31D	0.7	126
32A	0.8	315
32C	1.1	260
32F	1.0	260
32H	0.7	160
33B	1.1	260
33C	1.3	260
33D	1.1	260
33E	1.2	260
33F	1.1	160
33H	1.1	630
34B	0.9	260
34C	1.1	260
34D	1.4	260
34E	0.6	260
34G	0.9	400
34H	1.0	630
38E	1.8	1000

NOTES

- (1) DETERMINED BY PROCEDURES SPECIFIED IN APPENDIX B, OF FAR, PART 36.
- (2) ALL FREQUENCIES REPRESENT THE CENTER FREQUENCY OF THE 1/3-OCTAVE BAND IN WHICH THE TONE OCCURRED.

APPENDIX E
SUMMARY OF DATA ANALYSIS

The data resulting from the processing and analysis of the flyover-noise measurements are summarized in Table E-1. For the microphone locations not listed, data analyses were not performed because of unacceptable recorded noise or aircraft operational performance measurements. This included all of the first night's data (Runs 1-10).

Table E-1 is a listing of the measured data, the applied corrections and adjustments, and the resultant reference-day noise levels for all the analyzed Phase II flyover data.

The columns, as numbered, contain the following information:

1. TARGET THRUST, $F_N/\delta_{amb}(1000 \text{ lb})$
2. RUN NUMBER
3. MICROPHONE LOCATION
4. LATERAL DEVIATION, FT - Distance perpendicular to and measured from the ground projection of the flight path to the microphone location.
5. AIRCRAFT HEIGHT, FT
6. SLANT RANGE, FT - From measurement location to closest point of aircraft (CPA)
7. MEASURED EPNL - Data analyzed as measured (including only measurement system corrections)
8. REFERENCE WEATHER EPNL - Adjusted to reference-day conditions (77°F and 70-percent relative humidity)
9. TONE CORRECTION (MEASURED) - Determined by FAR, Part 36, Appendix B

10. TONE CORRECTION FREQUENCY - Center frequency of 1/3-octave band containing tone
11. MEASURED EPNL MINUS TONE CORRECTION - EPNL with tone correction removed if due to a pure tone
12. REF. WEA. EPNL MINUS TONE CORRECTION - EPNL with tone correction removed if due to a pure tone
13. MEASURED dBA - A-weighted sound level including only measurement system corrections
14. REFERENCE WEATHER, dBA - Measured dBA adjusted to reference-day conditions (77°F and 70-percent relative humidity)
15. TRUE AIRSPEED, KNOTS - Measured airspeed
16. ACTUAL THRUST, F_N/δ_{amb} lb
17. AIRSPEED CORRECTION (EPNdB) - EPNL adjustment to reference airspeed
18. THRUST CORRECTION (EPNdB) - EPNL adjustment to target thrust
19. EPNL (ADJUSTED) - (8) or (12) + (17) and (18)
20. THRUST CORRECTION (dBA) - A-weighted sound level adjustment to target thrust
21. dBA (ADJUSTED) - (14) + (20)
22. PNLTM (MEASURED)
23. DURATION CORRECTION (MEASURED) - (22) - (7)

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TABLE E-1
SUMMARY OF FLYOVER
NOISE ANALYSIS (CONTINUED)

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TABLE E-1

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TABLE E-1

INFORMATION ON THE CHINESE NATIONAL SECURITY

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TABLE E-1
SUMMARY OF FLYOVER
NOISE ANALYSIS (CONTINUED)

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TABLE E-1
SUMMARY OF FLYOVER
NOISE ANALYSIS (CONTINUED)

NOISE 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INSTRUCTIONS TO THE CLERK, NO. 1330000, 3001.

APPENDIX F

PROCEDURE FOR NOISE CURVE DEVELOPMENT

Determination of a mean curve fit to a set of experimental noise-level data has long been a problem in establishing the relationship between noise level and distance from a source. Numerous techniques, such as least-square curve fit to a polynomial of a desired degree or simple use of a ship's curve, have been used.

In this program, the dependence of noise level on distance from the source is based on a least-square curve fit using an expression accounting for the decrease in noise level with distance according to a logarithmic decay term (spherical divergence attenuation) and a term for atmospheric losses having a linear coefficient (atmospheric attenuation). Thus it can be expressed as

$$L_o - a \log (X/X_o) - b [(X - X_o)/1000] = L,$$

where

L_o = noise level at reference distance, EPNdB or dB

a = coefficient of logarithmic decay term for given noise-level quantity

X = distance between source and receiver, feet

X_o = reference distance of 250 feet

b = coefficient of linear decay term for given noise-level quantity,
EPNdB/1000 feet or dB/1000 feet

L = noise level at distance X , EPNdB or dB

(A variable coefficient was included for the logarithmic term because there was not an a priori reason for the EPNL or the A-weighted level to decay exactly as the inverse-square law. The value of the coefficient should be approximately 29.)

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It is necessary to find L_0 , a , and b such that a curve through the data points minimizes the error. There are, in general, N data points, and the form of the equation, for a general data point at X_i , Y_i , becomes

$$L_0 + a \log (X_i/X_0) - b [(X_i - X_0)/1000] = L_i$$

To simplify,

$$\text{let } \log (X_i/X_0) = W_i$$

$$\text{and } (X_i - X_0)/1000 = Z_i$$

which gives

$$L_0 + a W_i - b Z_i = L_i$$

For the DC-8-61 airplane in this study, the coefficients, (L_0 , a , and b) were determined by the use of a regression method and the noise level as a function of distance for each power setting generated. Because of insufficient data points in the basic Phase II study, some of the noise curves were in conflict in relation to the noise data for the other power settings. When this happened, curves were readjusted by using (noise versus power setting at a desired altitude) cross plots.

In addition, curve definition outside the measured data points required extrapolation. Such extrapolations are shown as dashed lines in Figures 14 and 15.

APPENDIX G

SOUND PATH EXCESS ATTENUATION BY LAYERED WEATHER METHOD

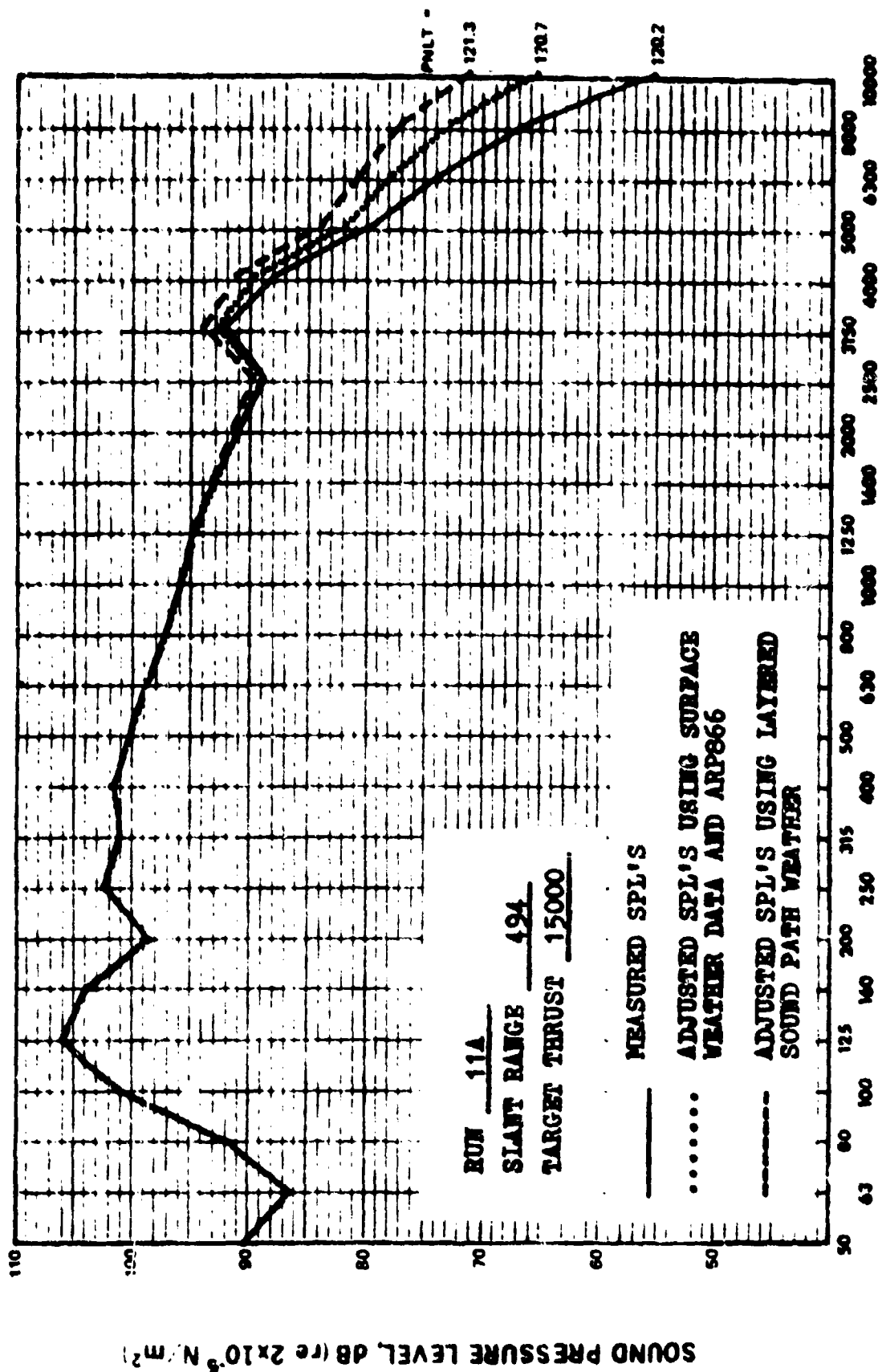
The determination of the reference-day noise levels presented in this report are the result of atmospheric attenuation adjustments based on ground level measured weather conditions at the time of the specific flyover-noise measurement. Table G-1 contains a summary of the measured and reference-weather PNLT and EPNL values for selected flyover-noise measurements. All data are for locations directly beneath the flight path, thus eliminating any lateral noise attenuation.

The effects that any variations in upper-air weather might have on the determination of reference-day noise levels were investigated. For each of the measurements listed in Table G-1 the sound path was divided into a series of segments or layers. The average weather conditions for each layer were found from the upper-air weather data presented in Figure B-4. By use of a subroutine from the E2QH flyover-noise analysis computer program the ARP 866 atmospheric absorption adjustments for each layer were determined, summed, and then applied to the measured data to obtain PNLT and EPNL (listed in Table G-1), and 1/3-octave-band sound pressure levels (shown in Figure G-1).

Comparisons between the measured data, and the data based on surface weather and the layered weather methods of determining reference-day noise levels are presented in Table G-1 and Figure G-1.

TABLE G-1
SUMMARY OF NOISE LEVELS DETERMINED
BY SURFACE-WEATHER AND LAYERED-
WEATHER METHODS

RUN		MIC	TYPE OF FLYOVER	FNLC	SLANT RANGE	VTRUE	PNLT MEASURED	PNLT REF WEATHER	PNLT LAYERED	EPNL REF WEATHER	EPNL LAYERED	EPNL LAYERED - EPNL REF WEATHER	UPPER AIR PROFILE (TABLE B)
TARGET THRUST 15,000 LB	11	A	TAKEOFF	14205	494	168.8	120.2	120.7	121.3	115.6	116.3	+0.7	1
		B	TAKEOFF	14261	1140	186.2	111.5	111.5	112.2	109.8	110.5	+0.7	1
		C	TAKEOFF	14330	1642	171.6	106.5	106.4	107.0	106.4	107.1	+0.7	1
	22	B	TAKEOFF	13985	453	174.7	122.6	123.5	124.2	117.7	118.5	+0.8	2
		C	TAKEOFF	14079	1066	173.5	111.1	111.3	111.8	109.3	109.9	+0.6	2
	23	B	TAKEOFF	14062	646	168.5	117.5	118.7	119.4	114.2	115.0	+0.8	2
		C	TAKEOFF	14169	1329	166.8	109.2	108.4	108.9	108.0	108.5	+0.5	2
	24	A	TAKEOFF	14147	1479	170.5	106.5	106.5	106.0	105.6	106.2	+0.6	2
		B	TAKEOFF	14428	2207	170.8	102.2	102.1	102.7	103.5	104.1	+0.6	2
TARGET THRUST 10,000 LB	25	A	TAKEOFF	14228	1316	167.3	107.4	108.0	108.4	107.4	107.9	+0.5	2
		B	TAKEOFF	14251	2118	166.9	103.0	102.9	103.4	103.3	103.9	+0.6	2
	28	C	LEVEL	13533	5382	227.7	86.6	86.0	86.8	88.8	89.7	+0.9	2
	12	A	TAKEOFF	9533	460	174.5	123.0	124.0	124.2	116.5	116.8	+0.3	1
		B	TAKEOFF	9683	821	173.9	114.2	115.6	116.6	110.4	111.4	+1.0	1
		C	TAKEOFF	9613	1130	170.0	107.4	108.9	110.4	105.7	107.2	+1.5	1
	13	A	TAKEOFF	9354	473	176.9	121.7	122.0	122.5	114.6	115.1	+0.5	1
		B	TAKEOFF	9475	890	175.0	113.5	114.6	116.2	108.9	110.6	+1.7	1
		C	TAKEOFF	9510	1162	172.8	107.0	108.1	110.1	104.3	106.3	+2.0	1
TARGET THRUST 5,000 LB	15	A	TAKEOFF	9524	497	180.5	121.5	122.3	123.0	114.5	115.3	+0.8	3
		B	TAKEOFF	9561	913	179.9	113.0	113.8	115.7	108.3	110.2	+1.9	3
		C	TAKEOFF	9528	1214	178.3	106.4	107.5	109.9	103.6	106.0	+2.4	3
	30	A	LEVEL	9254	5246	188.3	78.3	77.7	78.5	82.3	83.1	+0.8	2
		B	LEVEL	9279	5234	189.6	79.6	79.0	80.1	82.5	83.4	+0.9	2
	32	C	LEVEL	9350	8395	181.9	73.5	72.6	73.3	77.8	78.5	+0.7	4
	19	A	APPROACH	4794	1563	183.3	93.2	94.0	96.5	90.5	93.1	+2.6	3
		B	APPROACH	4714	1147	186.7	101.8	102.8	105.1	97.8	100.1	+2.3	3
		C	APPROACH	4686	805	186.4	108.4	109.1	110.6	103.0	104.6	+1.6	3
TARGET THRUST 5,000 LB	20	A	APPROACH	4724	1607	178.1	88.1	89.2	91.5	87.2	90.1	+2.9	3
		B	APPROACH	4646	1180	184.4	100.3	101.5	103.6	96.9	99.3	+2.4	3
		C	APPROACH	4655	840	184.8	106.0	108.6	110.3	102.8	104.6	+1.8	3
	21	A	APPROACH	5057	1646	171.8	91.2	92.0	94.8	89.7	92.5	+2.8	3
		B	APPROACH	4905	1201	181.6	99.6	101.1	103.5	97.8	100.2	+2.4	3
		C	APPROACH	4859	841	185.0	106.6	107.6	109.0	102.5	104.0	+1.5	3
	26	A	LEVEL	5112	2543	154.8	82.8	83.0	83.9	83.5	84.4	+0.9	2
		C	LEVEL	5036	2600	152.9	86.8	87.3	89.7	86.2	88.7	+2.5	2
	27	A	LEVEL	4710	2519	154.5	84.6	84.4	85.3	83.4	84.3	+0.9	2
TARGET THRUST 5,000 LB		B	LEVEL	4741	2520	155.2	86.0	85.7	87.2	84.7	86.2	+1.5	2
		C	LEVEL	4821	2504	155.9	85.5	85.3	86.2	85.1	86.0	+0.9	2
	33	B	LEVEL	5093	4938	180.5	73.8	72.8	75.4	74.4	77.0	+2.6	4
		C	LEVEL	5091	5256	180.1	73.5	72.9	73.6	75.8	76.6	+0.8	4
	34	C	LEVEL	5033	5214	176.9	73.2	72.6	73.4	75.9	76.7	+0.8	4



1/3 OCTAVE-BAND CENTER FREQUENCY, Hz

FIGURE G-1. COMPARISON OF METHODS FOR ADJUSTING MEASURED SPL TO REFERENCE WEATHER CONDITIONS

SOUND PRESSURE LEVEL, dB (re 2×10^{-5} N/m²)

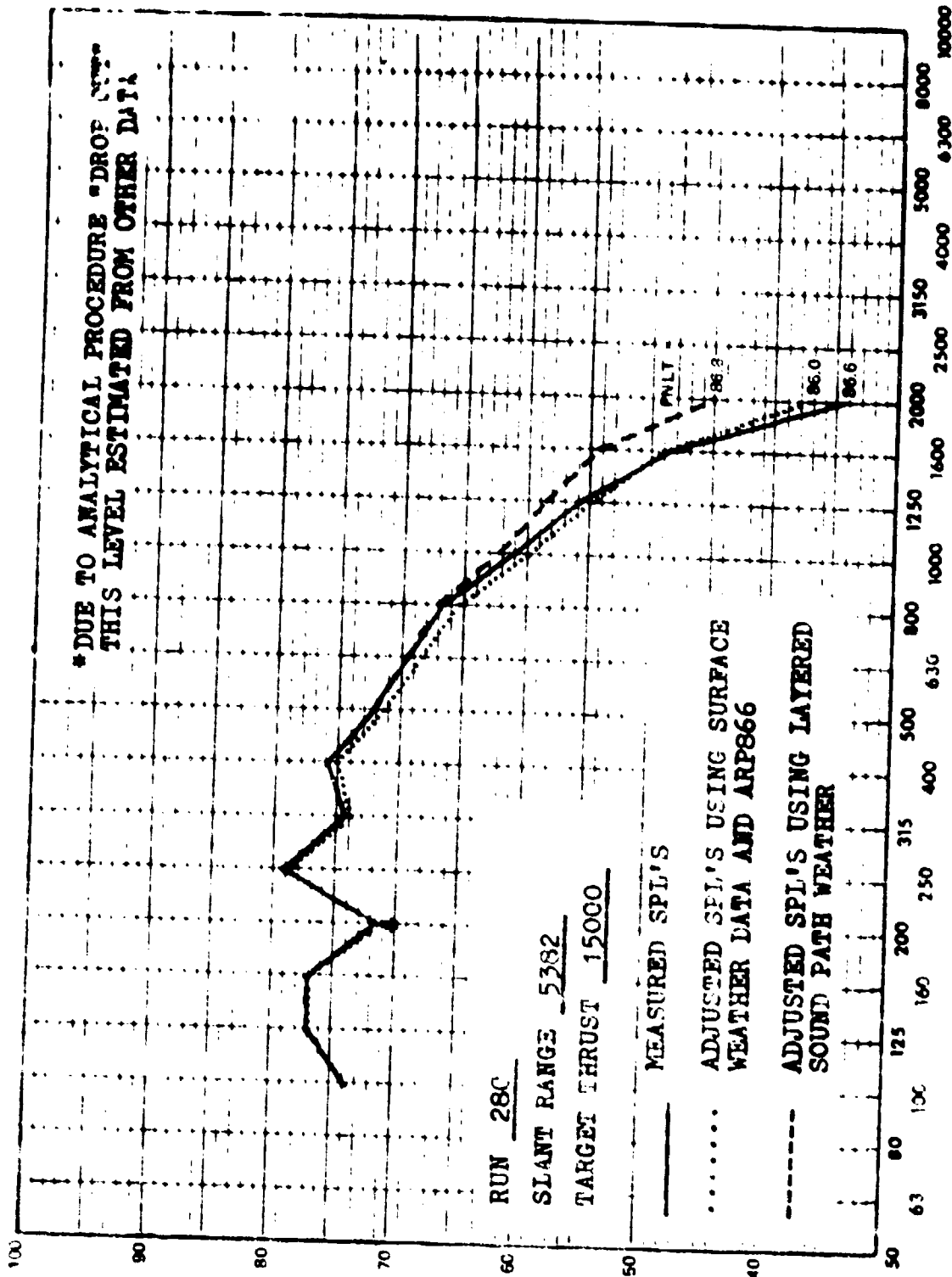
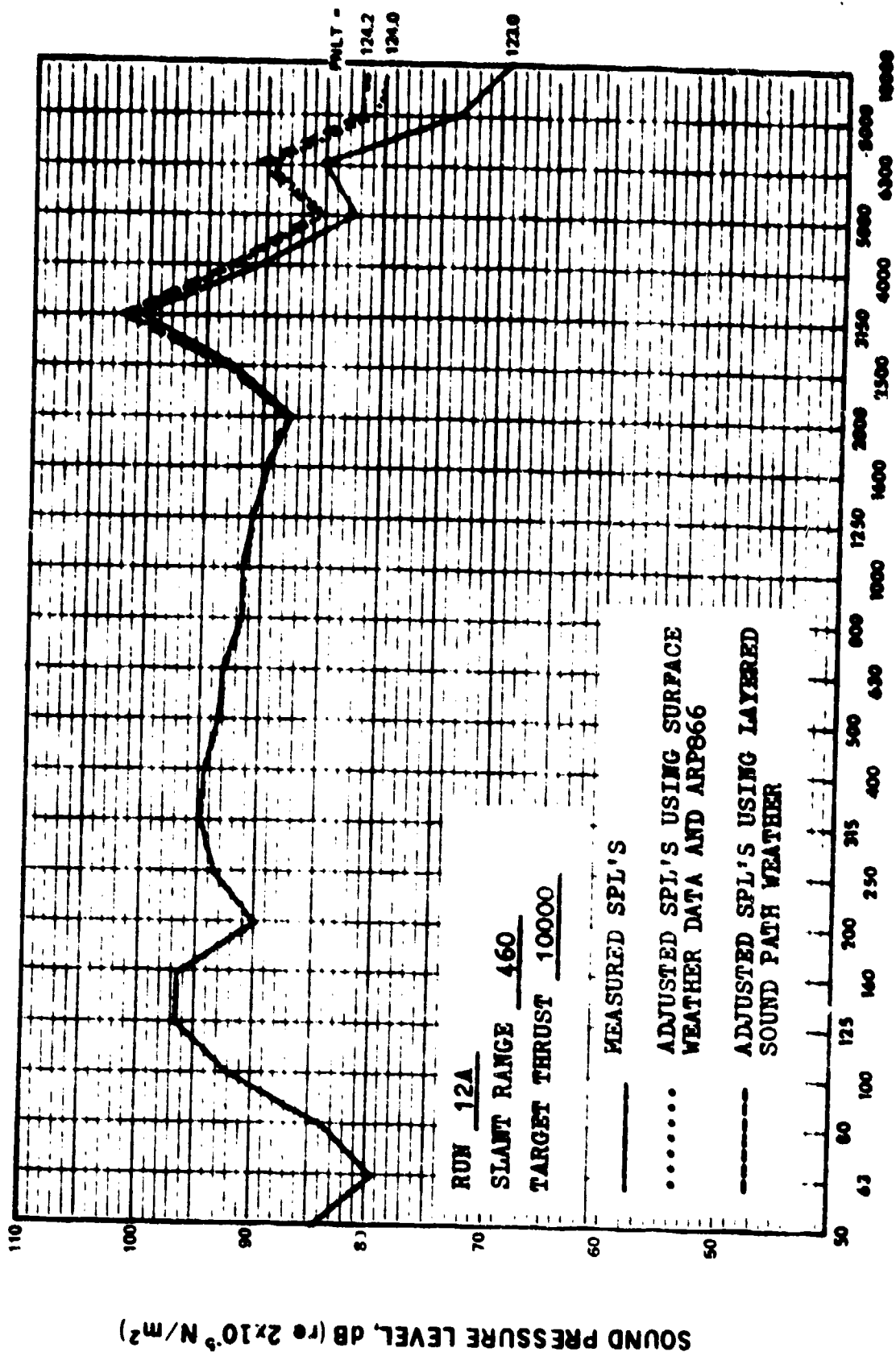
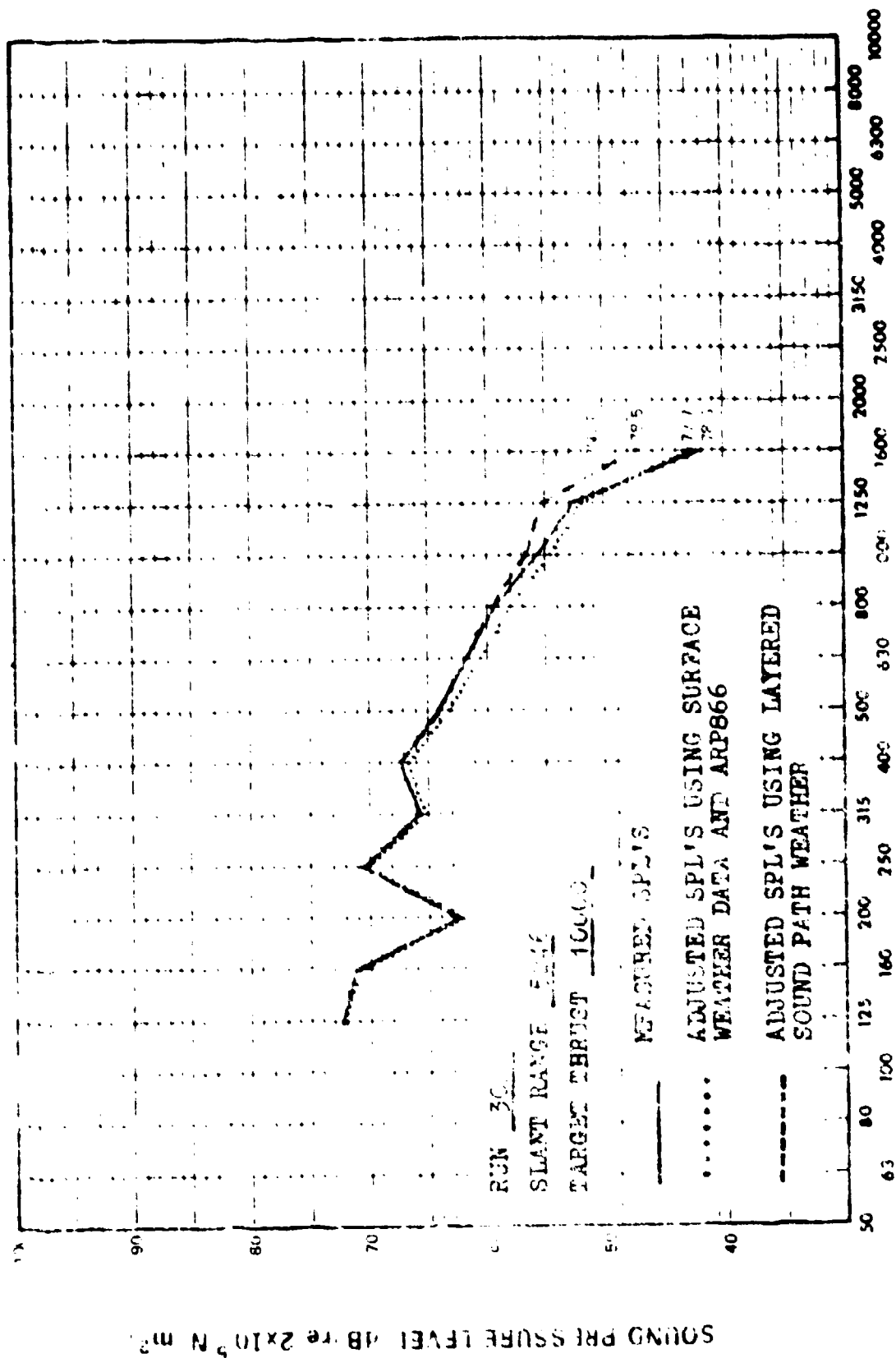


FIGURE 11 COMPARISON OF METHODS FOR ADJUSTING MEASURED SPL'S TO REFERENCE WEATHER CONDITIONS (CONTINUED)



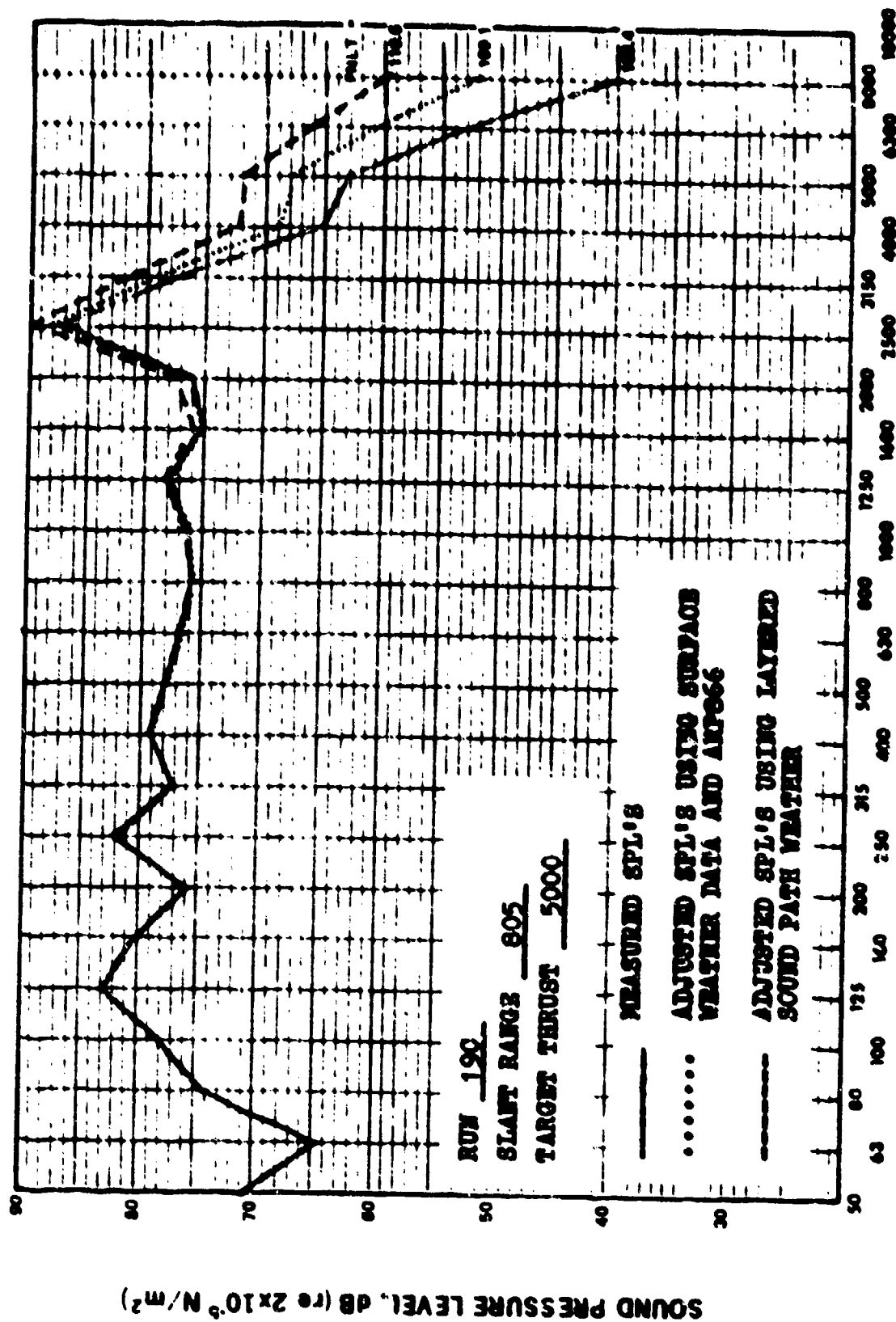
1/3 OCTAVE-BAND CENTER FREQUENCY, Hz

FIGURE G-1. COMPARISON OF METHODS FOR ADJUSTING MEASURED SPL'S TO REFERENCE WEATHER CONDITIONS (CONTINUED)



1/3 OCTAVE-BAND CENTER FREQUENCY, Hz

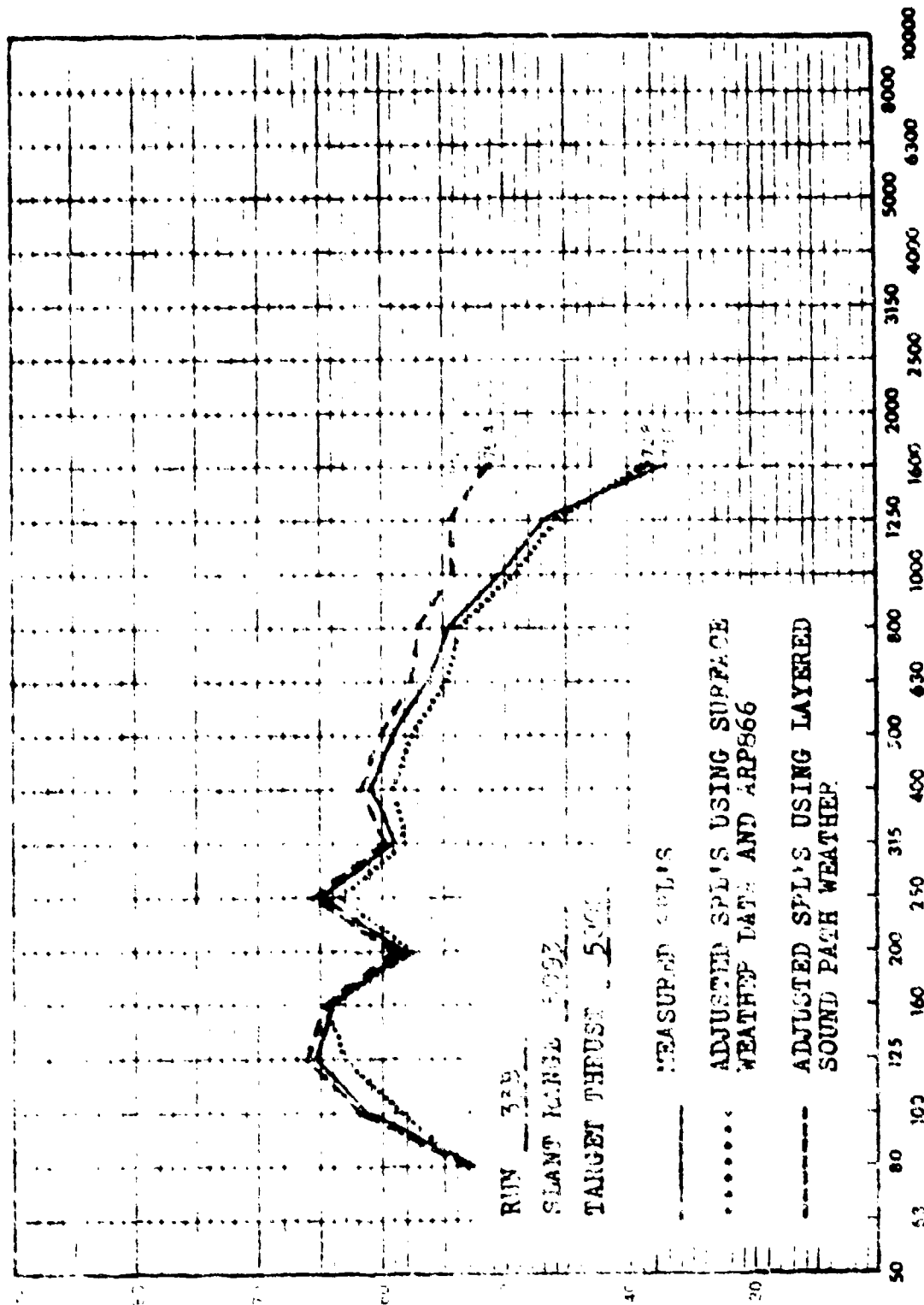
FIGURE 6-1 COMPARISON OF METHODS FOR ADJUSTING MEASURED SPL'S TO REFERENCE WEATHER CONDITIONS (CONTINUED)



1 3 OCTAVE-BAND CENTER FREQUENCY Hz

FIGURE G-1. COMPARISON OF METHODS FOR ADJUSTING MEASURED SPL TO REFERENCE WEATHER CONDITIONS (CONTINUED)

SOUND PRESSURE LEVEL $dB re 2 \times 10^{-9} N/m^2$



1.3 OCTAVE-BAND CENTER FREQUENCY, Hz

FIGURE 1.3 COMPARISON OF METHODS FOR ADJUSTING MEASURED SPL'S TO REFERENCE WEATHER CONDITIONS (CONCLUDED)

APPENDIX H

COMPUTER PROGRAM, D3AA, FOR DETERMINING FLYOVER NOISE LEVELS

This program was developed in compliance with FAA Contract No. DOT-FA73WA-3161.

The purpose of this program is to calculate EPNL and A-weighted sound level values for a specific aircraft at a desired power setting and altitude.

The FAA noise definition digital computer program is written in Fortran IV language for use on a IBM 360/370 computer system.

The program has a built-in data bank to define EPNL and A-weighted sound level curves for six aircraft, namely DC-8-61, DC-8-63, DC-9-30 with JT8D-7 engines, DC-9-30 with JT8D-9 engines, DC-10-1C, and DC-10-40.

No library routines are required for program operation because of a built-in linear interpolation routine.

The inputs required to calculate EPNL and A-weighted sound levels are: model (see program listing for code numbers), power setting, F_N/δ for DC-8 and DC-9, or $N_1/\sqrt{\theta} T_2$ for DC-10; and altitude in feet. Any number of cases can be input and calculated without a sentinel in the data cards to terminate program execution.

The program will check each data input to verify that the desired power setting and altitude are within the range of the defined curves for the applicable model. If either of the values is outside of the range, a message to that effect will be printed along with the model, engine, and input power setting and altitude.

Output is on a 11 x 17 page but can be modified to any format desired. A sample of the output format is shown on Table H-1 of this appendix. Note that EPNL values are representative of fixed aircraft velocities. Determination of the EPNL for other velocities can be made by the formula $10 \log V/V_{REF}$.

A flow chart, Figure H-1, input format loading sheet and program listing are attached to this appendix.

The only change to the computer listing, over that provided under Phase I, was the curve slope values for the DC-8-61.

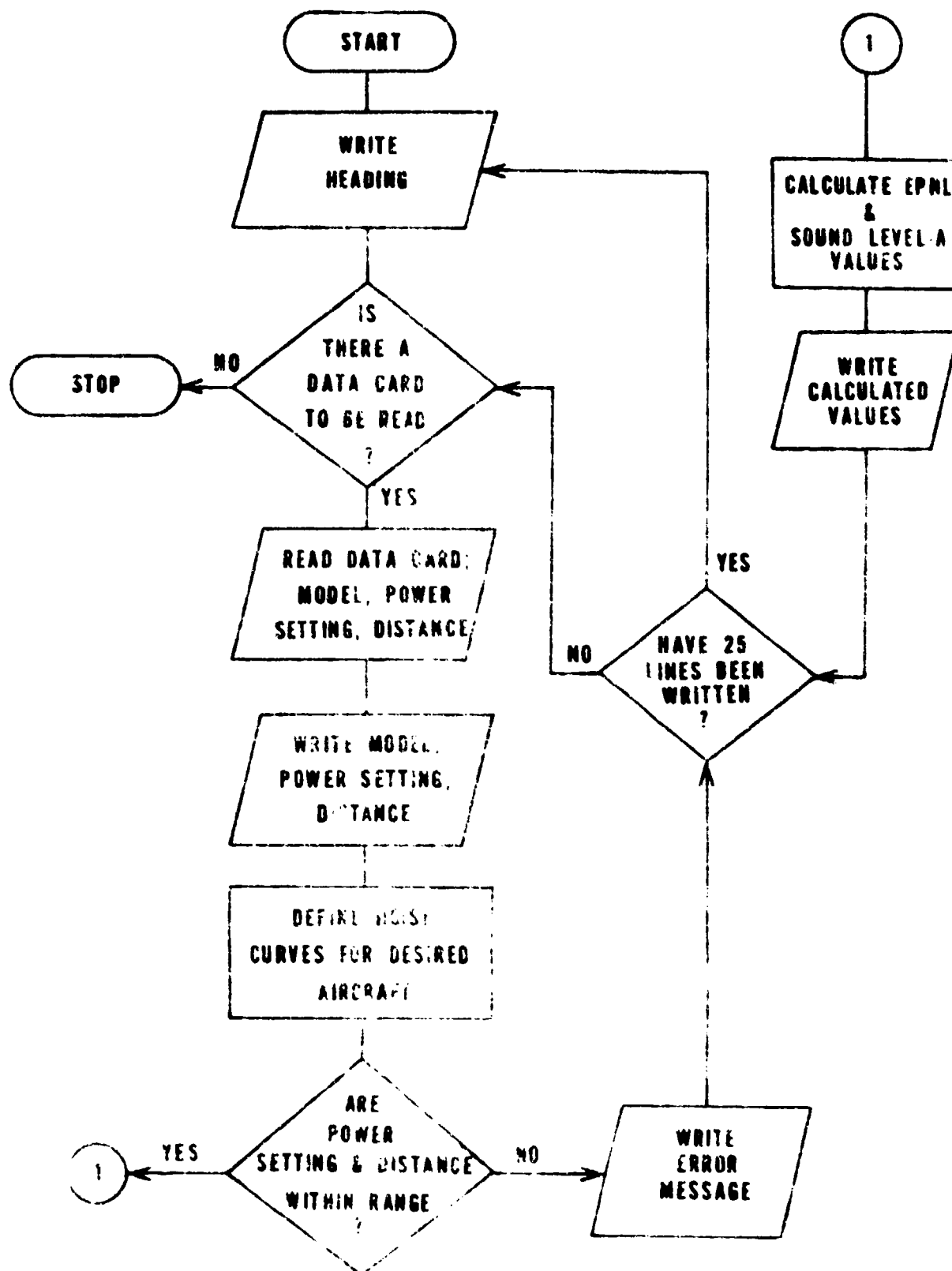


FIGURE H-1 FLOWCHART FOR COMPUTER PROGRAM D3AA

TABLE H-1
SAMPLE OUTPUT FROM D3AA
COMPUTER PROGRAM

MODEL	ENGINE	POWER SETTING	AIRCRAFT ALTITUDE	AIRCRAFT VELOCITY	EPNL, FPM/10	SOUND LEVEL-A
DC-8-61	JT3D-3B	4000.0 LBS	1000.0 FT.	145 KNOTS	90.5	85.1
DC-8-61	JT3D-3B	5000.0 LBS	1000.0 FT.	155 KNOTS	99.5	87.0
DC-8-61	JT3D-3B	6000.0 LBS	1000.0 FT.	155 KNOTS	104.7	88.5
DC-8-61	JT3D-3B	8000.0 LBS	1000.0 FT.	180 KNOTS	104.0	91.9
DC-8-61	JT3D-3B	10000.0 LBS	1000.0 FT.	180 KNOTS	106.2	94.5
DC-8-61	JT3D-3B	12000.0 LBS	1000.0 FT.	180 KNOTS	107.5	96.5
DC-8-61	JT3D-3B	15000.0 LBS	1000.0 FT.	180 KNOTS	110.1	100.4
DC-8-61	JT3D-3B	16000.0 LBS	1000.0 FT.		DATA NOT AVAILABLE	
DC-8-61	JT3D-3B	14000.0 LBS	1500.0 FT.	180 KNOTS	105.2	94.6

TABLE H-2 D3AA COMPUTER PROGRAM LISTING

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C      FAA NOISE PROGRAM                                00000040
C
C      THE CODE NUMBERS FOR THE 6 AIRCRAFT INCLUDED IN THIS PROGRAM ARE 00000050
C      LISTED BELOW                                         00000060
C      MODEL      ENGINE      CODE NO.                    00000070
C      DC-8-61    JT3D-3B      1                          00000080
C      DC-8-63    JT3D-7        2                          00000090
C      DC-9-30     JT4D-7        3                          00000100
C      DC-9-30     JT4D-9        4                          00000110
C      DC-10-10    CF6-60        5                          00000120
C      DC-10-40    JT9D-70       6                          00000130
C
C      INPUT DATA IS TO INCLUDE AIRCRAFT CODE, RPM OR THRUST, AND ALTITUDE 00000140
C
C      DIMENSION EPNL(24),DBA(24),POWER(8)                00000150
C      10 WRITE (6,100)                                     00000160
C      110 FORMAT (1H1,/,/,51X,'FAA - AIRCRAFT NOISE DEFINITION') 00000170
C      110 WRITE (6,110)                                     00000180
C      110 FORMAT(1H0,51X,'POWER      AIRCRAFT      AIRCRAFT      EPNL,' 00000190
C      110 'SOUND')                                         00000200
C      110 WRITE (6,120)                                     00000210
C      120 FORMAT(1H ,24X,'MODEL',4X,'ENGINE',7X,'SETTING      ALTITUDE 00000220
C      120 'VELOCITY      EPNLB      LEVEL-A')              00000230
C      120 K=0                                              00000240
C      20 K=K+1                                             00000250
C      IF (K.GT.25) GO TO 10                               00000260
C      READ (5,30,END=999) MODEL,THRUST,ALT               00000270
C      30 FORMAT (12,2X,F7.1,2X,F7.1)                     00000280
C      GO TO(1,2,3,4,5,6),MODEL                           00000290
C      1 WRITE (6,201) THRUST,ALT                          00000300
C      201 FORMAT (1H0,23X,'DC-8-61      JT3D-3B',4X,F7.1,1X,'LBS',3X,F7.1, 00000310
C      1 1X,'FT.')      GO TO 500                                           00000320
C      2 WRITE (6,202) THRUST,ALT                          00000330
C      202 FORMAT (1H0,23X,'DC-8-63      JT3D-7 ',4X,F7.1,1X,'LBS',3X,F7.1, 00000340
C      1 1X,'FT.')      GO TO 500                                           00000350
C      3 WRITE (6,203) THRUST,ALT                          00000360
C      203 FORMAT (1H0,23X,'DC-9-30      JT8D-7 ',4X,F7.1,1X,'LBS',3X,F7.1, 00000370
C      1 1X,'FT.')      GO TO 500                                           00000380
C      4 WRITE (6,204) THRUST,ALT                          00000390
C      204 FORMAT (1H0,23X,'DC-9-30      JT8D-9 ',4X,F7.1,1X,'LBS',3X,F7.1, 00000400
C      1 1X,'FT.')      GO TO 500                                           00000410
C      5 WRITE (6,205) THRUST,ALT                          00000420
C      205 FORMAT (1H0,23X,'DC-10-10    CF6-60 ',4X,F7.1,1X,'RPM',3X,F7.1, 00000430
C      1 1X,'FT.')      GO TO 500                                           00000440

```

TABLE H-2
D3AA COMPUTER PROGRAM LISTING (CONTINUED)

6 WRITE (6,206) THRUST,ALT 206 FORMAT (140,23X,'DC-10-40',4X,PT,1,1X,PT,1, 1X,PT,1) 500 CONTINUE INDEX=0 GO TO (11,12,13,14,15,16),INDEX 11 CALL JT3038 (ALT,THRUST,EPNL,DHA,POWER,NCURVE) TOVEL = 180. APPVEL = 155. IF (THRUST.GT.6000.) GO TO 900 VTRUE = APPVEL GO TO 803 800 VTRUE = TOVEL 801 IF (THRUST.GT.6000..AND.THRUST.LT.8000.) GO TO 802 GO TO 803 802 CTRUE = 155. + ((THRUST-6000.)/(8000.-6000.))*(180.-155.) INDEX=1 803 CONTINUE GO TO 501 12 CALL JT3037 (ALT,THRUST,EPNL,DHA,POWER,NCURVE) TOVEL = 190. APPVEL = 155. IF (THRUST.GT.6000.) GO TO 405 VTRUE = APPVEL GO TO 808 805 VTRUE = TOVEL 806 IF (THRUST.GT.6000..AND.THRUST.LT.8000.) GO TO 807 GO TO 808 807 CTRUE = 155. + ((THRUST-6000.)/(8000.-6000.))*(190.-155.) INDEX=1 808 CONTINUE GO TO 501 13 CALL JT3037 (ALT,THRUST,EPNL,DHA,POWER,NCURVE) TOVEL = 170. APPVEL = 140. IF (THRUST.GT.6000.) GO TO 910 VTRUE = APPVEL GO TO 813 810 VTRUE = TOVEL 811 IF (THRUST.GT.6000..AND.THRUST.LT.8000.) GO TO 812 GO TO 813 812 CTRUE = 140. + ((THRUST-6000.)/(8000.-6000.))*(170.-140.) INDEX=1 813 CONTINUE GO TO 501 14 CALL JT3039 (ALT,THRUST,EPNL,DHA,POWER,NCURVE) TOVEL = 165. APPVEL = 140. IF (THRUST.GT.6000.) GO TO 915 VTRUE = APPVEL GO TO 819 815 VTRUE = TOVEL 816 IF (THRUST.GT.6000..AND.THRUST.LT.8000.) GO TO 817 GO TO 818	00000550 00000560 00000570 00000580 00000590 00000600 00000610 00000620 00000630 00000640 00000650 00000660 00000670 00000680 00000690 00000700 00000710 00000720 00000730 00000740 00000750 00000760 00000770 00000780 00000790 00000800 00000810 00000820 00000830 00000840 00000850 00000860 00000870 00000880 00000890 00000900 00000910 00000920 00000930 00000940 00000950 00000960 00000970 00000980 00000990 00001000 00001010 00001020 00001030 00001040 00001050 00001060 00001070 00001080
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TABLE H-2
DSAA COMPUTER PROGRAM LISTING (CONTINUED)

817	CTHUST = 140. + ((THPUST-6000.)/(8000.-6000.))*((165.-140.))	00001090
	INDEX=1	00001100
818	CONTINUE	00001110
	GO TO 801	00001120
15	CALL CPM60 (ALT,THPUST,EPNL,DBA,POWER,NCURVE)	00001130
	TOVEL = 180.	00001140
	APPVEL = 150.	00001150
	IF (THPUST.GT.2600.) GO TO 820	00001160
	VTRUE = APPVEL	00001170
	GO TO 823	00001180
820	VTRUE = TOVEL	00001190
821	IF (THPUST.GT.2600..AND.THPUST.LT.3000.) GO TO 822	00001200
	GO TO 823	00001210
822	CTHUST = 150. + ((THPUST-2600.)/(3000.-2600.))*((180.-150.))	00001220
	INDEX=1	00001230
823	CONTINUE	00001240
	GO TO 801	00001250
16	CALL IT9020 (ALT,THPUST,EPNL,DBA,POWER,NCURVE)	00001260
	TOVEL = 200.	00001270
	APPVEL = 160.	00001280
	IF (THPUST.GT.2600.) GO TO 830	00001290
	VTRUE = APPVEL	00001300
	GO TO 833	00001310
830	VTRUE = TOVEL	00001320
831	IF (THPUST.GT.2600..AND.THPUST.LT.3000.) GO TO 832	00001330
	GO TO 833	00001340
832	CTHUST = 160. + ((THPUST-2600.)/(3000.-2600.))*((200.-160.))	00001350
	INDEX=1	00001360
833	CONTINUE	00001370
501	IF (ALT.GT.10000..OR. ALT.LT.200) GO TO 150	00001380
	IF (THPUST.GT.POWER(NCURVE)..OR. THPUST.LT. POWER(1)) GO TO 150	00001390
	ITRUE = VTRUE	00001400
	I = 0	00001410
	J = 0	00001420
510	I = I + 1	00001430
	J = J + 1	00001440
	IF (THPUST.GE. POWER(I) .AND. THPUST.LE. POWER(J)) GO TO 520	00001450
	GO TO 510	00001460
520	LC3 = I*3	00001470
	LC2 = LC3-1	00001480
	LC1 = LC2-1	00001490
	MC3 = J*3	00001500
	MC2 = MC3-1	00001510
	MC1 = MC2-1	00001520
	BTEPNL = EPNL(LC1) - EPNL(LC2) * ALOG10(ALT/250) - EPNL(LC3) * ((ALT-250)/1000)	00001530
	HTEPNL = EPNL(MC1) - EPNL(MC2) * ALOG10(ALT/250) - EPNL(MC3) * ((ALT-250)/1000)	00001540
	DELTA = (HITEPNL - BTEPNL) / (POWER(J) - POWER(I))	00001550
	REPNL = ((THPUST - POWER(I)) * DELTA + BTEPNL)	00001560
	DBA = DBA(LC1) - DBA(LC2) * ALOG10(ALT/250) - DBA(LC3) * ((ALT-250)/1000)	00001570
	1)	00001580
	HDBA = DBA(MC1) - DBA(MC2) * ALOG10(ALT/250) - DBA(MC3) * ((ALT-250)/1000)	00001590
	1)	00001600
	1)	00001610
	1)	00001620

TABLE H-2
D3AA COMPUTER PROGRAM LISTING (CONTINUED)

```

      UFLTA = (HIDBA-KYDBA)/(POWER(J)-PII4E1(I))
      RDBA = ((THRUST-POWER(I))*UFLTA)+STDBA
      IF (REPML.LT.WJ.O.OR.RDBA.LT.6X.O) GO TO 150
      GO TO 360
360  IF (INDEX.GT.O) GO TO 900
      GO TO 380
900  REPML = REPML + (10.*ALOG10(CTHRE / TOVEL))
      GO TO 380
150  WRITE (6,160)
160  FCIMAT (14,90X,'DATA NOT AVAILABLE')
      GO TO 20
380  WRITE (6,370) (TRUE,REPML,RDBA
370  FORMAT(1H,77X,13,' KNOTS',4X,F5.1,7X,F5.1)
      GO TO 20
999  STOP
      END
      SUBROUTINE JT3D3B(ALT,THRUST,EPNL,DBA,POWER,NCURVE)
      DIMENSION EPN(24),DB(24),POWE(8)
      DIMENSION EPNL(24),DBA(24),POWER(8)
      DC-B-61
      DATA EPN/10R.7966174,20.0633769,9.5053520,115.5630477,28.8556442,
      A1.5386065,118.9502338,31.4775435,.6043491,120.6885435,30.8918718,
      B.5767736,121.6137966,28.2848444,.7602853,122.2878188,25.8156411,
      C.7911068,122.6400607,23.5714405,.7274164,123.0408562,20.844218,
      D.4705445/
      DATA DB/96.812297,19.2195439,6.5240358,104.6993912,29.1028822,
      A2.3283154,107.4235931,33.1497144,.3968691,109.1974384,33.4569446,
      R.2500433,111.640136,32.1910586,.4170348,113.1178610,30.1838381,
      C.5358798,113.9489992,27.4632281,.6619359,114.5832014,22.6187261,
      D.8112748/
      NCURVE = R
      DATA POWE /2000.,4000.,5000.,6000.,8000.,10000.,12000.,15000./
      I=0
      K=NCURVE *3
      DO 1 I=1,K
      EPNL(I) = EPN(I)
      DBA(I) = DB(I)
      DO2 I=1,NCURVE
      POWER(I) = POWE(I)
      RETURN
      END
      SUBROUTINE JT3D7 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
      DC-B-63
      DIMENSION EPN(24),DB(24),POWE(8)
      DIMENSION EPNL(24),DBA(24),POWER(8)
      DATA EPN /116.2015384,17.4508311,1.9636556,117.6406613,19.4305009,00007080
      X,1.354868
      1,118.9385383,20.3626042,.999087,120.6706822,21.3187886,.668031,
      2122.3411726,21.0191591,.5290593,122.8409945,20.3791149,.4087281,
      3123.1084992,18.7584281,.3620374/
      DATA DB /107.777249,23.5651919,3.817515,108.7592478,23.22105,
      13.3474734,109.2998101,22.7791267,3.1209339,110.6663154,22.6494376,00002140
      22.7512298,112.7314942,25.7643804,1.1567584,113.7496859,25.0492932,00002150
      3.8168379,114.0636897,22.0789925,.1358417/

```

TABLE (4-2)
DSAA COMPUTER PROGRAM LISTING (CONTINUED)

```

DATA PWRK /4000.,5000.,6000.,8000.,10000.,12000.,15000./
NCURVE = 7
I=0
K=NCURVE*3
DO I I=1,K
  EPNL(I) = EPNL(I)
1 DBA(I) = DBA(I)
  DO2 I=1,NCURVE
2 POWER(I) = POWER(I)
RETURN
END
SUBROUTINE JTRD7(ALT,THRUST,EPNL,DBA,POWER,NCURVE)
C DC-9-30 JTRD-7
  DIMENSION EPN (24),DB (24),POWER (4)
  DIMENSION EPNL(24),DBA(24),POWER(4)
  DATA EPN /107.7365805,15.2117029,5.7243163,104.1677931,16.0758876,10002320
1.4.7582817,110.6403505,15.5547735,4.2378371,113.3739774,17.8990752,00002130
2.2.331482,115.2246557,18.6871147,1.3994396,119.1519035,19.7181709,10002340
3 1.2033763/
  DATA DB /99.9974476,24.2954308,1.3585693,100.8723899,23.719776,10002360
1.4371943,101.8010088,23.176648,71.80562,104.5139605,22.6427426,10002370
2.3634632,107.9663487,22.1785275,12.12538,112.2530262,22.5769483,00002380
3.1293639/
  DATA PWRK /4000.,5000.,6000.,8000.,10000.,12000./
  NCURVE = 6
  I=0
  K=NCURVE*3
  DO I I=1,K
    EPNL(I) = EPNL(I)
1 DBA(I) = DBA(I)
  DO2 I=1,NCURVE
2 POWER(I) = POWER(I)
RETURN
END
SUBROUTINE JTRD9 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
C DC-9-30 JTRD-9
  DIMENSION EPN (24),DB (24),POWER (4)
  DIMENSION EPNL(24),DBA(24),POWER(4)
  DATA EPN /106.7747823,24.5815386,1.0597625,108.8771964,23.6312537,10002550
11.3264455,110.712401,22.9096420,1.0687718,111.6593222,21.1363096,10002560
21.2635920,112.3478173,19.0271536,1.1580915,115.3569484,17.1262407,10002570
31.1574715,119.0321371,15.8746614,1.9620398/
  DATA DB /99.4191154,29.7874452,1.2538370,100.4687835,23.8797379,10002590
11.1191558,101.0924615,23.6165928,1.8425644,102.0018597,23.3752032,00002600
2.5561709,104.7864589,21.7075180,1.5062093,104.5016426,21.6258370,10002610
3.4327588,112.2530262,22.5769483,1.1243639/
  DATA PWRK /2000.,4000.,5000.,6000.,8000.,10000.,12500./
  NCURVE = 7
  I=0
  K=NCURVE*3
  DO I I=1,K
    EPNL(I) = EPNL(I)
1 DBA(I) = DBA(I)
  DO2 I=1,NCURVE
2 POWER(I) = POWER(I)
RETURN
END

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TABLE M-3
DSAA COMPUTER PROGRAM LISTING (CONCLUDED)

	2 POWER(I) = PWE(I)	00002710
	RETURN	00002720
	END	00002730
	SUBROUTINE CP660 (ALT, THRUST, EPN, DBA, POWER, NCURVE)	00002740
C	DC-10-10 CP6-6	00002750
	DIMENSION EPN (24), DB (24), PWE (8)	00002760
	DIMENSION EPNL (24), DBA (24), POWER (4)	00002770
	DATA EPN /103.7261218, 18.9664005, 4.0681013, 107.2929061, 18.0954453, 00002780	00002780
	1.7.1267029, 104.7162039, 18.1525332, 2.4748923, 111.6343991, 18.5025163, 00002790	00002790
	2.1.6544951, 112.4263759, 18.1826906, .9614804/	00002800
	DATA DB /98.6445832, 21.1404174, 4.2478261, 100.1441998, 24.1333453, 00002810	00002810
	12.2367288, 101.2016676, 24.9796477, 2.1745128, 103.3396495, 24.5274631, 00002820	00002820
	21.5627324, 105.7384054, 24.4428879, .7198043/	00002830
	DATA POWER /220., 240., 260., 300., 3420./	00002840
	NCURVE = 5	00002850
	I=0	00002860
	K=NCURVE + 1	00002870
	DO 1 I=1,K	00002880
	EPNL(I) = EPN(I)	00002890
	1 DBA(I) = DB(I)	00002900
	DO 2 I=1,NCURVE	00002910
	2 POWER(I) = PWE(I)	00002920
	RETURN	00002930
	END	00002940
	SUBROUTINE JT6020 (ALT, THRUST, EPNL, DBA, POWER, NCURVE)	00002950
C	DC-10-40 JT90-20	00002960
	DIMENSION EPN (24), DB (24), PWE (8)	00002970
	DIMENSION EPNL (24), DBA (24), POWER (8)	00002980
	DATA EPN /106.5545563, 19.6210165, 2.3004363, 108.7844025, 19.2529155, 00002990	00002990
	1.2.0595723, 109.8254798, 19.0605674, 1.7993489, 111.0344371, 19.2848473, 00003000	00003000
	2.1.2752513, 113.5667650, 18.7740645, .7925667/	00003010
	DATA DB /95.3165871, 20.7570902, .7784318, 93.1349274, 19.958301, 00003020	00003020
	1.7604243, 94.5772533, 19.8299584, .7168077, 101.9740471, 20.6277486, 00003030	00003030
	2.4757521, 103.965049, 19.9326951, .3373154/	00003040
	DATA POWER /220., 240., 260., 300., 340./	00003050
	NCURVE = 5	00003060
	I=0	00003070
	K=NCURVE + 3	00003080
	DO 1 I=1,K	00003090
	EPNL(I) = EPN(I)	00003100
	1 DBA(I) = DB(I)	00003110
	DO 2 I=1,NCURVE	00003120
	2 POWER(I) = PWE(I)	00003130
	RETURN	00003140
	END	00003150

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