

7



U.S. Department
of Transportation
Federal Aviation
Administration

Report No. FAA-EE-85-7

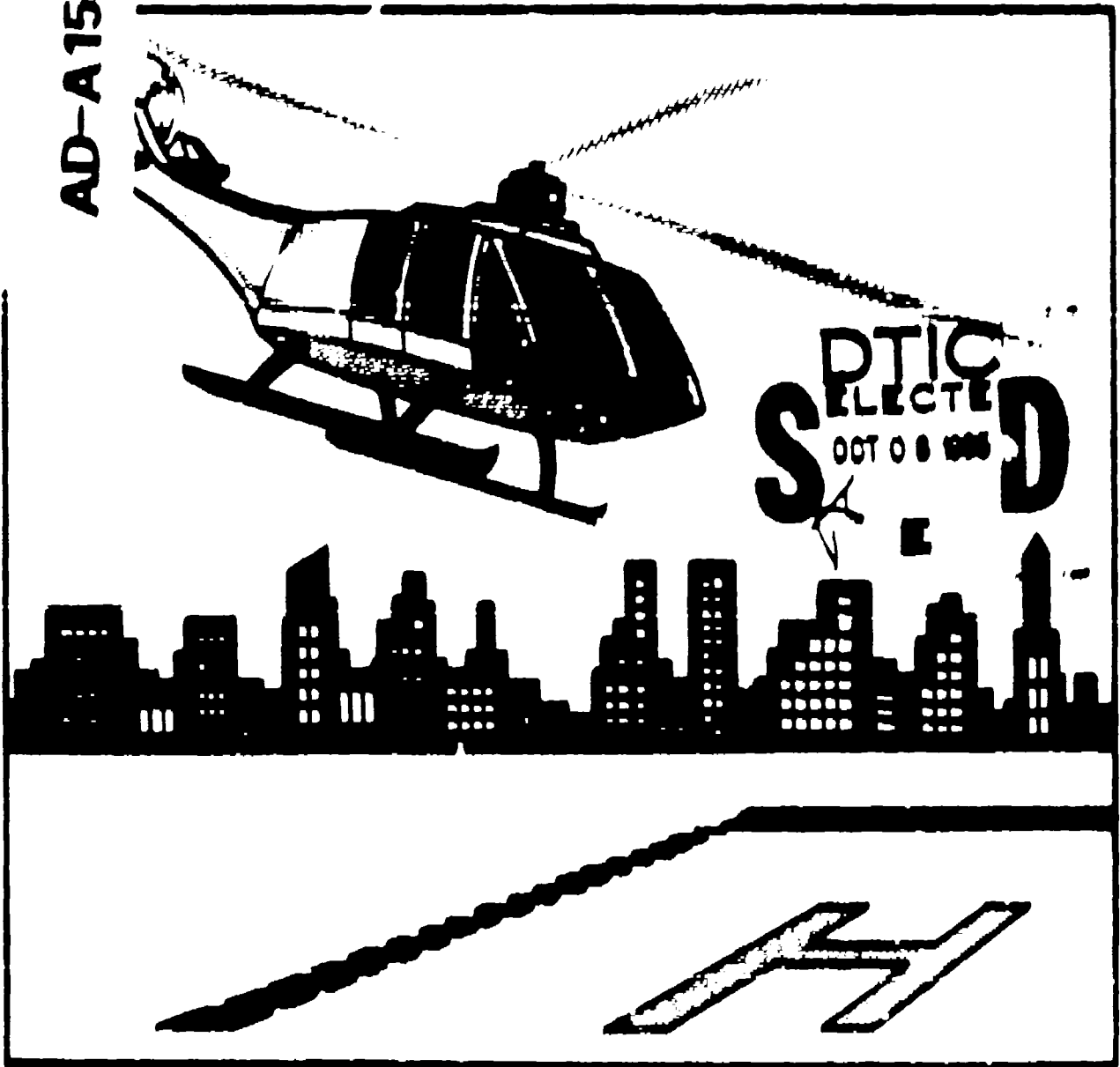
August 1985

FLIGHT OPERATIONS

Noise Tests of Eight Helicopters

Sharon A. Yoshikami

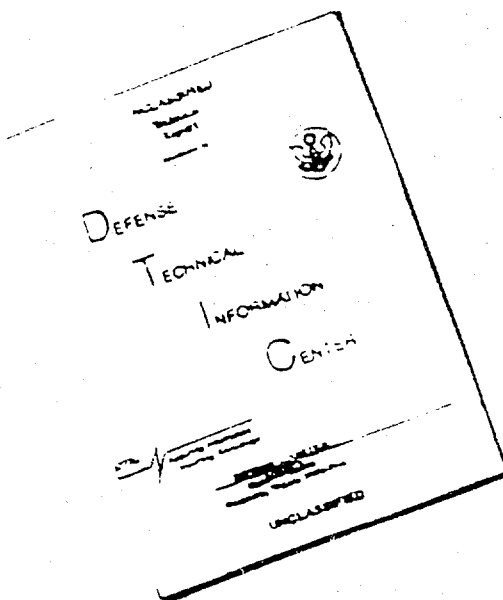
AD-A159 835



WILE FREE COPY

85 10 7 008
24

DISCLAIMER NOTICE



THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

NOTICE

The United States Government does not endorse products or manufacturers. Trade or manufacturers' names are used as necessary in documenting the subject test program.

| | | | | | |
|---|--|--|--|---------------------------------------|-----------|
| 1. Report No. FAA/EE-85-7 | | 2. Government Accession No. AD-4159 8.35 | | 3. Recipient's Catalog No. | |
| 4. Title and Subtitle Flight Operations Noise Tests of Eight Helicopters | | 5. Report Date August 1985 | | 6. Performing Organization Code | |
| | | 7. Author(s) Sharon A. Yoshikami | | 8. Performing Organization Report No. | |
| 9. Performing Organization Name and Address Federal Aviation Administration, Office of Environment and Energy, Noise Abatement Division, Noise Technology Branch (AEE-120), 800 Independence Ave., SW, Washington, DC 20591 | | 10. Work Unit No. (TRAI) | | 11. Contractor or Grant No. | |
| | | 12. Sponsoring Agency Name and Address Federal Aviation Administration, Office of Environment and Energy, Noise Abatement Division, Noise Technology Branch (AEE-120), 800 Independence Ave., SW Washington, DC 20591 | | 13. Type of Report and Period Covered | |
| 13. Supplementary Notes | | 14. Sponsoring Agency Code | | | |
| 16. Abstract This document presents acoustical data and flight path information acquired during the FAA/HAI Helicopter Flight Operations Noise Test Program. "As-measured" noise levels of the Aerospatiale 365N, Agusta 109A, Bell 206L-1 and OH-6A, Hughes 500D, MBB BK117, Robinson R22, and Sikorsky S76 are presented for various enroute and heliport flight operations. These operations include level flyovers at two altitudes, normal takeoffs, normal and constant-gildeslope approaches, various types of noise abatement approaches, level flight turns and hover (ISE and CGE). The acoustical data are accompanied by radar tracking data and cockpit instrument panel information which document the operational procedures flown, and meteorological measurements to permit data corrections for nonstandard atmospheric conditions. This helicopter operational noise data base can be used in enroute and heliport land use planning, heliport environmental studies and planning guidelines, pilot familiarization and training, verification of noise prediction and estimating methods, and lateral attenuation studies. | | | | | |
| 17. Key Words helicopter, noise, heliport, flight operations, noise abatement, directivity approaches | | | 18. Distribution Statement This document is available to the public through the National Technical Information Service, Springfield, VA 22161 | | |
| 19. Security Classification of this report Unclassified | | 20. Security Classification of this page Unclassified | | 21. No. of Pages 28 | 22. Price |

ACKNOWLEDGEMENTS

Appreciation is extended to the following participating organizations:

- DULLES AIR TRAFFIC CONTROL
- DULLES AIRPORT OPERATIONS
- DULLES STRUCTURES AND GROUNDS BRANCH
- DULLES AIRWAYS FACILITIES SECTOR
- NATIONAL WEATHER SERVICE TEST AND EVALUATION DIVISION
- OFFICE OF AIRPORT PLANNING AND PROGRAMMING

MANUFACTURERS:

| | |
|---------------|----------|
| AEROSPATIALE | HUGHES |
| AGUSTA | MBB |
| BELL | ROBINSON |
| BOEING VERTOL | SILORSKY |

OPERATORS:

HORSHAM VALLEY AIRWAYS
 NORTHEAST HELICOPTERS
 OMNI FLIGHT AIRWAYS

Special thanks to Charles R. Cox, industry coordinator, Donna Warren, Loretta Harrison and Steve Albersheim for their extra efforts.

| | |
|--------------------|-------------------------------------|
| Accession For | |
| NTIS GRA&I | <input checked="" type="checkbox"/> |
| DTIC TAB | <input type="checkbox"/> |
| Unannounced | <input type="checkbox"/> |
| Justification | |
| By _____ | |
| Distribution/ | |
| Availability Codes | |
| Dist | Special |
| A-1 | |



TABLE OF CONTENTS

| | <u>PAGE</u> |
|---|-------------|
| LIST OF APPENDICIES..... | iii |
| LIST OF FIGURES..... | iv |
| LIST OF TABLES..... | vii |
| GLOSSARY..... | ix |
| SUMMARY..... | 1 |
| I. INTRODUCTION..... | 3 |
| II. TEST SITE..... | 4 |
| III. TEST HELICOPTERS..... | 6 |
| IV. FLIGHT CONDITIONS..... | 7 |
| V. DATA ACQUISITION SYSTEMS..... | 10 |
| A. Acoustical measurement instrumentation | 12 |
| B. Meteorological measurements | 14 |
| C. Position data | 15 |
| D. Cockpit instrument recording system | 17 |
| E. Ground photo system | 17 |
| VI. TEST DATA COMPARISONS AND TRENDS..... | 19 |
| A. Level flyovers | 19 |
| B. Normal takeoffs | 21 |
| C. Six-degree approach | 22 |
| D. Normal approach | 23 |
| E. Noise abatement approaches..... | 24 |

LIST OF APPENDICES

| | <u>PAGE</u> |
|-------------------------------------|-------------|
| APPENDIX A: SIKORSKY S76 | A-1 |
| APPENDIX B: MBB BK117 | B-95 |
| APPENDIX C: BELL 222A | C-213 |
| APPENDIX D: ROBINSON R22 | D-313 |
| APPENDIX E: AGUSTA 109A | E-381 |
| APPENDIX F: BELL 206L-1 | F-453 |
| APPENDIX G: HUGHES 500D | G-519 |
| APPENDIX H: AEROSPATIALE 365N | H-579 |
| APPENDIX I: BELL 222A | I-647 |

LIST OF FIGURES

| | <u>PAGE</u> |
|---|-------------|
| FIGURE 1: DULLES TEST SITE | 5 |
| FIGURE 2: SCHEMATIC OF TEST FLIGHT TRACKS | 9 |
| FIGURE 3: SCHEMATIC OF GROUND TRACK FOR TURNS..... | 9 |
| FIGURE 4: SCHEMATIC OF MICROPHONE ARRAY FOR HOVER OPERATIONS..... | 10 |
| FIGURE 5: SCHEMATIC OF NOISE TEST AREA AND DATA ACQUISITION SYSTEMS..... | 11 |
| FIGURE 6: SCHEMATIC OF MICROPHONE ARRAY FOR 'BASIC' PROGRAM..... | 12 |
| FIGURE 7: PHOTO OF 4 FEET AND GROUND PLANE MICROPHONES..... | 13 |
| FIGURE 8: METEOROLOGICAL TOWER | 14 |
| FIGURE 9: PILOT WIND BALLOONS AND TRACKER | 16 |
| FIGURE 10: TRACKING RADAR SYSTEM | 16 |
| FIGURE 11: GROUND PHOTOGRAPHER AND ALIGNMENT RIG..... | 18 |

LIST OF TABLES

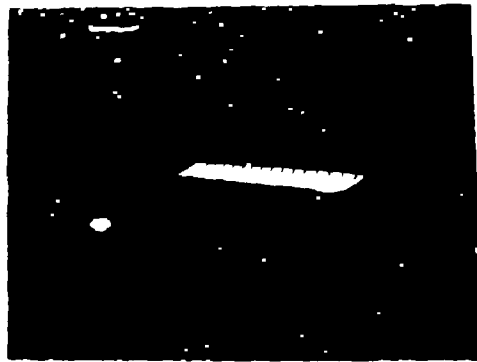
| | <u>PAGE</u> |
|---|-------------|
| TABLE 1: TEST HELICOPTERS AND THEIR BASIC CHARACTERISTICS | 6 |
| TABLE 2: FLIGHT CONDITIONS FOR THE 'BASIC PROGRAM' | 7 |
| TABLE 3: 500 FT. LEVEL FLYOVERS, SEL (ALL 8 HELICOPTERS) | 20 |
| TABLE 4: 1000 FT. LEVEL FLYOVERS, SEL (ALL 8 HELICOPTERS) | 20 |
| TABLE 5: NORMAL TAKEOFF, SEL (ALL 8 HELICOPTERS) | 21 |
| TABLE 6: SIX-DEGREE APPROACH, SEL (ALL 8 HELICOPTERS) | 22 |
| TABLE 7: NORMAL APPROACH, SEL (ALL 8 HELICOPTERS) | 27 |
| TABLE 8: 'BEST' NOISE ABATEMENT APPROACH (ALL 8 HELICOPTERS) | 25 |

GLOSSARY

| | | |
|----------|---|---|
| AGL | - | ABOVE GROUND LEVEL |
| BRC | - | BEST RATE OF CLIMB |
| CLC/CL-C | - | CENTERLINE CENTER |
| CPA | - | CLOSEST POINT OF APPROACH |
| C. I. | - | CONFIDENCE INTERVAL |
| dB | - | DECIBEL |
| dBA | - | A-WEIGHTED SOUND LEVEL |
| FAA | - | FEDERAL AVIATION ADMINISTRATION |
| FPS | - | FEET PER SECOND |
| HAI | - | HELICOPTER ASSOCIATION INTERNATIONAL |
| IAS | - | INDICATED AIRSPEED |
| IGE | - | IN-GROUND-EFFECT (HOVER) |
| KTS | - | KNOTS |
| LEQ | - | EQUIVALENT SOUND LEVEL |
| MET | - | 10-METER METEOROLOGICAL TOWER |
| N | - | SAMPLE SIZE |
| OAT | - | OUTSIDE AIR TEMPERATURE |
| OGE | - | OUT-OF-GROUND-EFFECT (HOVER) |
| SEL | - | SOUND EXPOSURE LEVEL |
| S. D | - | STANDARD DEVIATION |
| SHP | - | SHAFT HORSEPOWER |
| SLM | - | SOUND LEVEL METER |
| VCR | - | CRUISE SPEED FOR BEST RANGE |
| VNE | - | NEVER-EXCEED SPEED |
| VY | - | SPEED FOR BEST RATE OF CLIMB |

SUMMARY

This report presents data acquired during the FAA/HAI Helicopter Flight Operations Noise Test Program. The program emphasized the gathering of an extensive data base of acoustic characteristics and flight path information associated with typical enroute and heliport operations. These operations include level flyovers at two altitudes, normal takeoffs, normal and constant-glide slope approaches, different types of noise abatement approaches, turn and hover. Noise levels and sound directivity of eight test helicopters are presented from ground based microphone located directly beneath the flight path and to large distances to the sidelines of each helicopter. Test results and data trends are summarized and all data are grouped by helicopter type in the appendices. In each appendix, the 'as-measured' A-Weighted sound levels and sound exposure levels are presented in bar charts and tables for quick reference and convenience of the reader. Also included in each appendix are radar tracking data and cockpit instrument panel information which document the operational procedures flown and meteorological measurements to permit data corrections for nonstandard atmospheric conditions.



I. INTRODUCTION

This report presents data from eight helicopters collected during a joint FAA/HAI Flight Operations Noise Test Program. The program was conducted at Washington Dulles International Airport during the summer of 1984. The FAA'S and HAI'S three major objectives were as follows:

- 1) acquire noise data for various helicopter operational procedures with emphasis on sideline noise.
- 2) measure the noise reduction attainable with 'fly neighborly' operating procedures and
- 3) stud. low-angle noise propagation and ground effects.

To achieve these objectives the test was divided into two separate programs. A 'basic program' which was flown by all the test helicopters and the 'extended program' which was flown by only two of the test helicopters. The basic program consisted of approaches, takeoffs, level flyovers, level flight turns and hover. Acoustic data were gathered out to 2000 feet to the sideline. The 'extended program' consisted of level flyovers from 200 to 2000 feet. This program was designed to evaluate low angle noise propagation and ground effects out to sideline distances of 4000 feet over both grass and asphalt concrete ground cover.

In this report, test results for the 'basic program' are presented. The test site, the helicopters tested, the flight conditions and the extensive data acquisition systems are first described. Noise data comparisons and trends are then highlighted. Finally appendices are presented, one for each test helicopter, which include helicopter characteristics, measured noise levels, and radar tracking, meteorological and cockpit video data. These appendices are set up by test helicopter as follows:

APPENDIX A = SIKORSKY S76
APPENDIX B = MBB BK117
APPENDIX C = BELL 222A
APPENDIX D = ROBINSON R22
APPENDIX E = AGUSTA 109A
APPENDIX F = BELL 206L-1
APPENDIX G = HUGHES 500D
APPENDIX H = AEROSPATIALE 365N
APPENDIX I = BELL 222A (REPEAT)

Preceding each appendix is a table of contents to aid the reader in locating the specific data of interest.

II. IESI SITE

The FAA/HAI Flight Operations Noise Test Program was conducted at Washington Dulles International Airport in the vicinity of runway 12/30. This site was selected because of its convenience and it met the following established siting criteria:

- 1) low ambient noise,
- 2) flat terrain (unobstructed to 4000 ft.),
- 3) low prevailing winds (less than 10 kts.) and
- 4) nearby aircraft services (fuel, emergency aid, etc.)

Dulles was located within relatively short flight times for the test helicopters and it was convenient for the majority of test personnel involved.

The test area was located at the approach end of Runway 12. From this point it is unobstructed approximately 2000 feet to the west and approximately 1000 feet to the east. From the center of the runway it is clear 1000 feet to both the north and south. Beyond these distances, the area is bordered to the north, south and west by sparse woods. The terrain is generally flat with a ground cover of short, clipped grass. An aerial photo of the test site is shown in Figure 1.

NOISE MEASUREMENT TEST SITE AT DULLES INTERNATIONAL AIRPORT

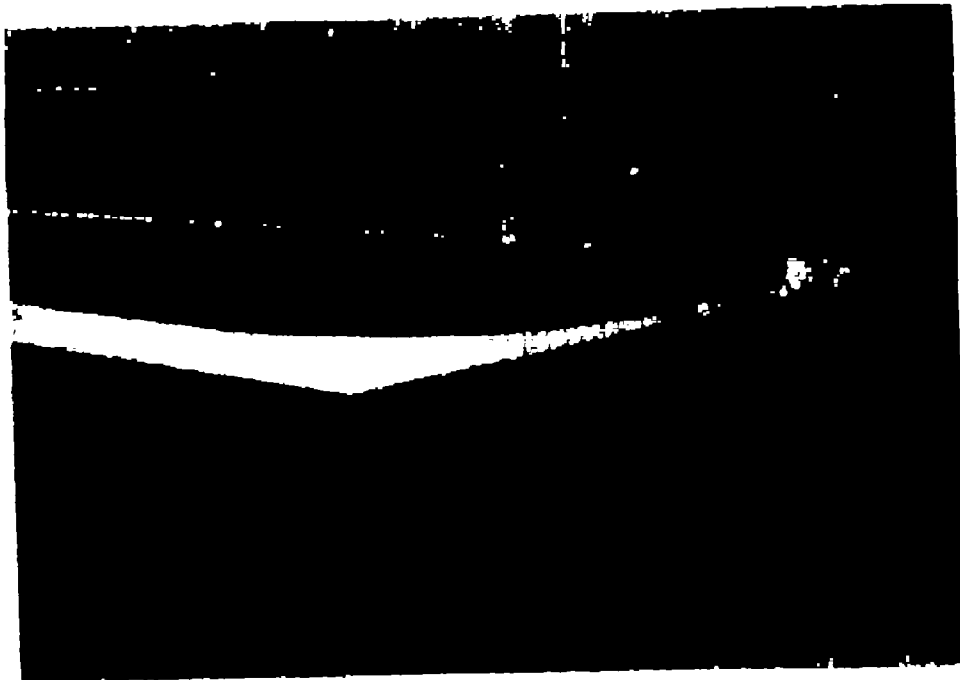


Figure 1

During the thirteen days of noise testing, Runway 12/30 was closed to all commercial and general aviation traffic. All airport traffic was directed to runways 1L/19R and 1R/19L located approximately three miles to the east. Because of the large distance, there was minimal interference. This resulted in an average ambient noise level of 45 dBA during testing.

III. TEST HELICOPTERS

The eight helicopters tested represent a varied mix of design types, sizes and performance capabilities. They vary from a Robinson R22 two seat trainer to the 14-place Sikorsky S76. The test helicopters and some of their basic characteristics are presented in Table 1.

TABLE 1

TEST HELICOPTERS AND THEIR BASIC CHARACTERISTICS

| HELICOPTER | GROSS WT. (LBS) | BLADES MAIN/TAIL | TIPSPEED MAIN/TAIL | VY (KTS) | VCR (KTS) | BRL (FPM) |
|------------|--------------------|---------------------|-----------------------|-------------|--------------|--------------|
| R22 | 1300 | 2/2 | 699/623 | 55 | 83 | 1000 |
| 500D | 3000 | 5/4 | 680/519 | 65 | 118 | 1900 |
| 206L-1 | 4050 | 2/2 | 763/722 | 57 | 100 | 1520 |
| 109A | 5730 | 4/2 | 727/703 | 60 | 145 | 1640 |
| BK117 | 6283 | 4/2 | 725/714 | 65 | 126 | 2145 |
| 222A | 7850 | 2/2 | 724/641 | 65 | 133 | 1550 |
| 365N | 8818 | 4/13 | 717/727 | 75 | 135 | 1460 |
| S76 | 10,300 | 4/4 | 675/674 | 74 | 146 | 1730 |

- (1) Cruise speed for best range defined by each manufacturer
- (2) Tipspeed at 100% rpm except for the R22 and 500D which were tested at 104% and 103%, respectively

IV. FLIGHT CONDITIONS

The 'basic program' consisted of level flyovers, takeoffs, three types of approaches and two optional test conditions - level flight turns and hover. A list of flight conditions for the 'basic program' is shown in Table 2.

TABLE 2
FLIGHT CONDITIONS FOR 'BASIC PROGRAM'

| OPERATION | ALTITUDE (FT. AGL) | IAS (KTS) | NO. OF PASSES |
|---------------------|-----------------------|--------------|------------------|
| 6 DEG APPROACH | 400 | Vy | 6 |
| NORMAL APPROACH (1) | --- | --- | 6 |
| NORMAL TAKEOFF (1) | --- | --- | 6 |
| NOISE ABATEMENT | --- | --- | 6 |
| NOISE ABATEMENT (1) | --- | --- | 6 |
| APPROACH (1) | --- | --- | 6 |
| LEVEL FLIGHT | 500 | Vcr | 6 |
| LEVEL FLIGHT | 1000 | Vcr | 6 |
| <u>OPTIONAL</u> | | | |
| 15 DEGREE TURN (2) | 500 | 65 | 6 |
| 30 DEGREE TURN (2) | 500 | 65 | 6 |
| HOVER IGE | 5 | 0 | 8 headings |
| HOVER OGE | 2 rotor diameters | 0 | 8 headings |

(1) DEFINED BY MANUFACTURER OR OPERATOR

(2) COORDINATED TURNS (BALL CENTERED) AT STABILIZED BANK ANGLE

Descriptions of the normal approach, normal takeoff and one or more noise abatement procedures were supplied to the FAA prior to the test

by each respective manufacturer or operator. Only noise abatement procedures that would be operationally practicable and comfortable to passengers, as judged by each pilot, were evaluated.

All the approaches and takeoffs were conducted into and out of a landing/takeoff area located approximately 4000 feet from the centerline (CLC) microphone position. Figure 2 is a schematic diagram which depicts the takeoff, approach and level flyover flight paths in relation to the landing/takeoff area and microphone array. The pilots were instructed to proceed into and out of the landing/takeoff point as if it were an operational heliport, and to perform all operations in a normal way for the prevailing conditions at the test site. To aid the pilot during the fixed glideslope approaches, a theodolite and operator were located at the landing area. The theodolite operator communicated course guidance information to the pilot via the aircraft radio.

Level flight turns were evaluated using the S76, BK117 and the 222A. These turns were performed at bank angles of 15 and 30 degrees and at an altitude of 500 feet and a constant airspeed of 65 knots. The pilots followed ground markers outlining the turn radius corresponding to the two bank angles. The midpoint of each turn's radius was located at the CLC microphone position. A schematic of the ground track is shown in Figure 3.

Hover data for in-ground-effect (IGE) and out-of-ground-effect (OGE) conditions were also measured for the helicopters not already in the FAA's data base. These were the R22, 109A and the BK117.

SCHEMATIC OF TEST FLIGHT TRACKS

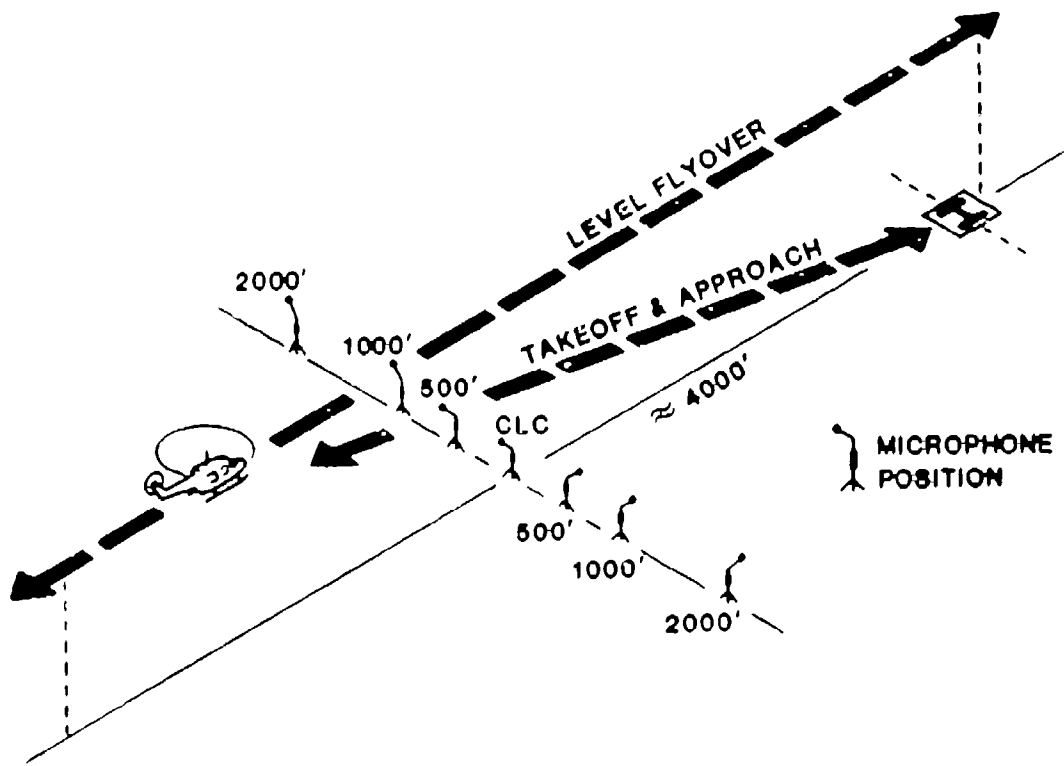


Figure 2

SCHEMATIC OF GROUND TRACK FOR TURNS

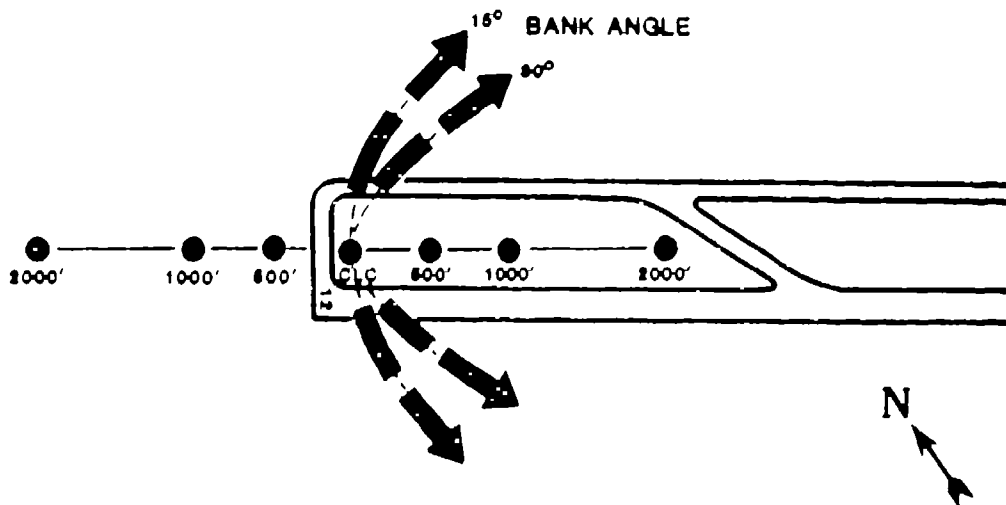


Figure 3

These tests were performed with the hovering helicopter and the microphone array, located first on grass, and then relocated on the runway. A schematic of the microphone array in relation to the hover point is shown in Figure 4.

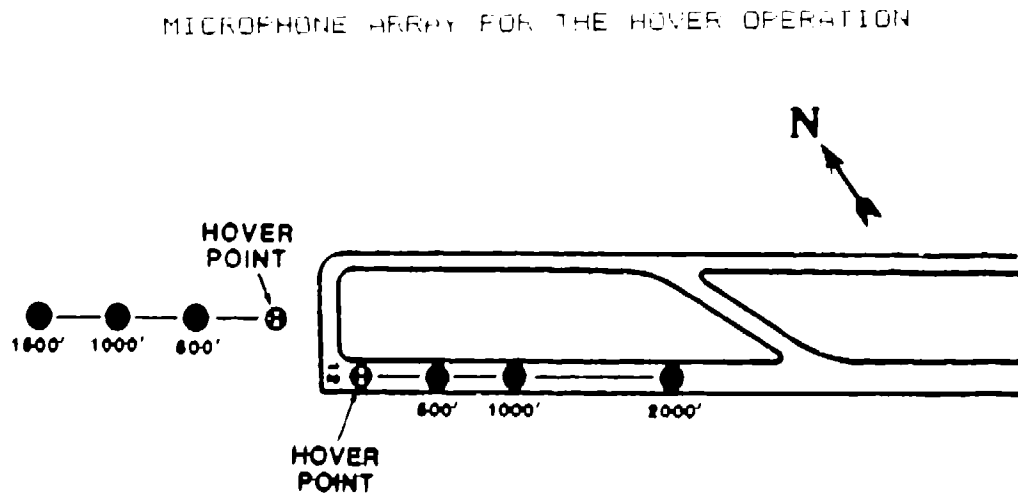


Figure 4

V. DATA ACQUISITION SYSTEMS

Acoustic data, meteorological measurements, helicopter position data and cockpit instrument recordings were acquired using extensive ground and helicopter based data acquisition systems. Each of these systems is discussed in the following subsections. Figure 5 depicts the relative location of the ground based data acquisition systems in relation to the approach end of Runway 12, the flight path, and the landing/takeoff point.

NOISE TEST AREA AND DATA ACQUISITION SYSTEM

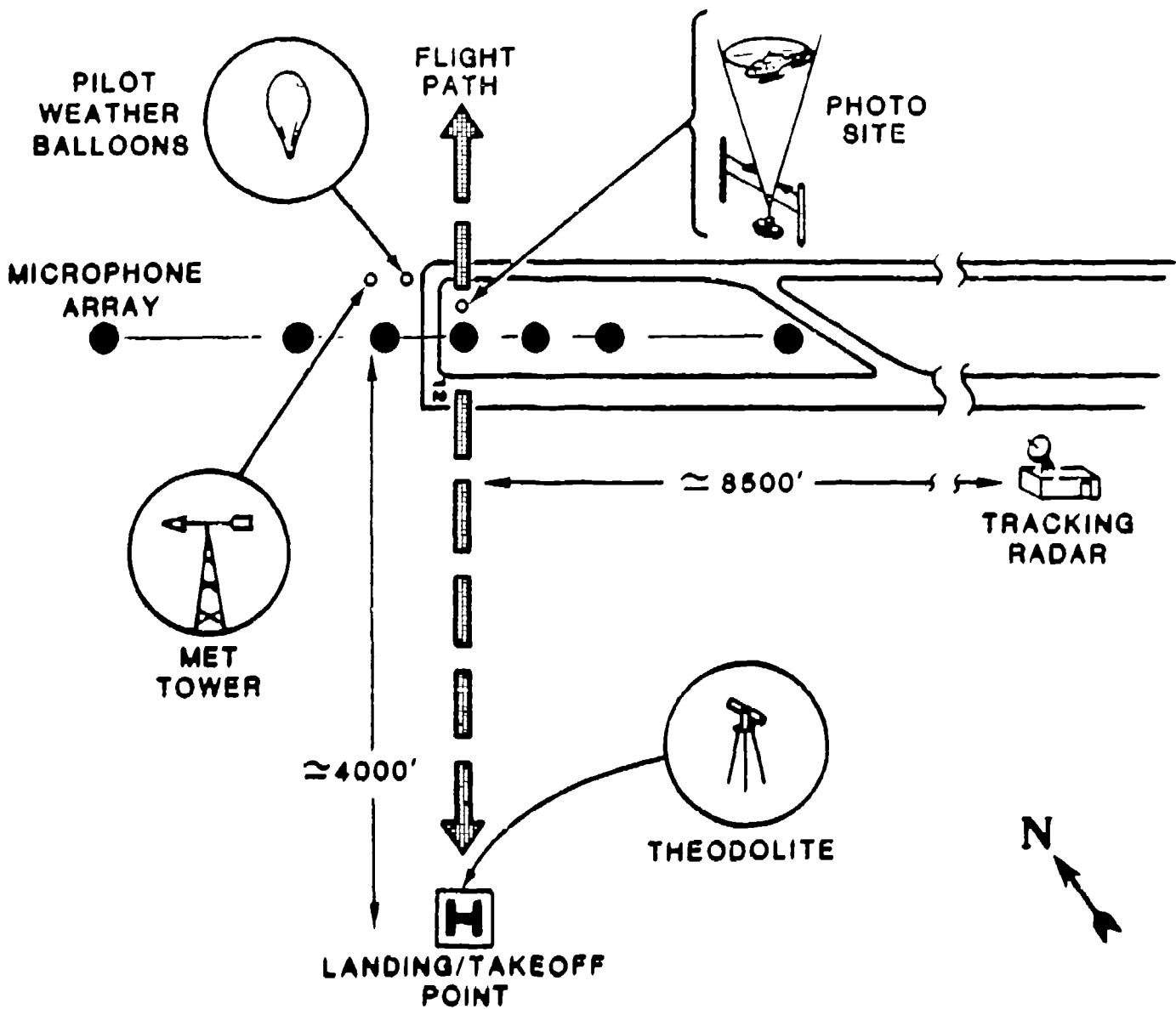


Figure 5

A. ACOUSTICAL MEASUREMENT INSTRUMENTATION

The microphone array consisted of seven noise measurement sites aligned perpendicular to the flight path as shown in Figure 6. Industry supplied the equipment and personnel for three of the seven sites. The CLC microphone site was located directly under the flight path, with the remaining sites at 500, 1000 and 2000 feet on either side of CLC. Six of the

SCHEMATIC OF MICROPHONE ARRAY FOR 'BASIC PROGRAM'

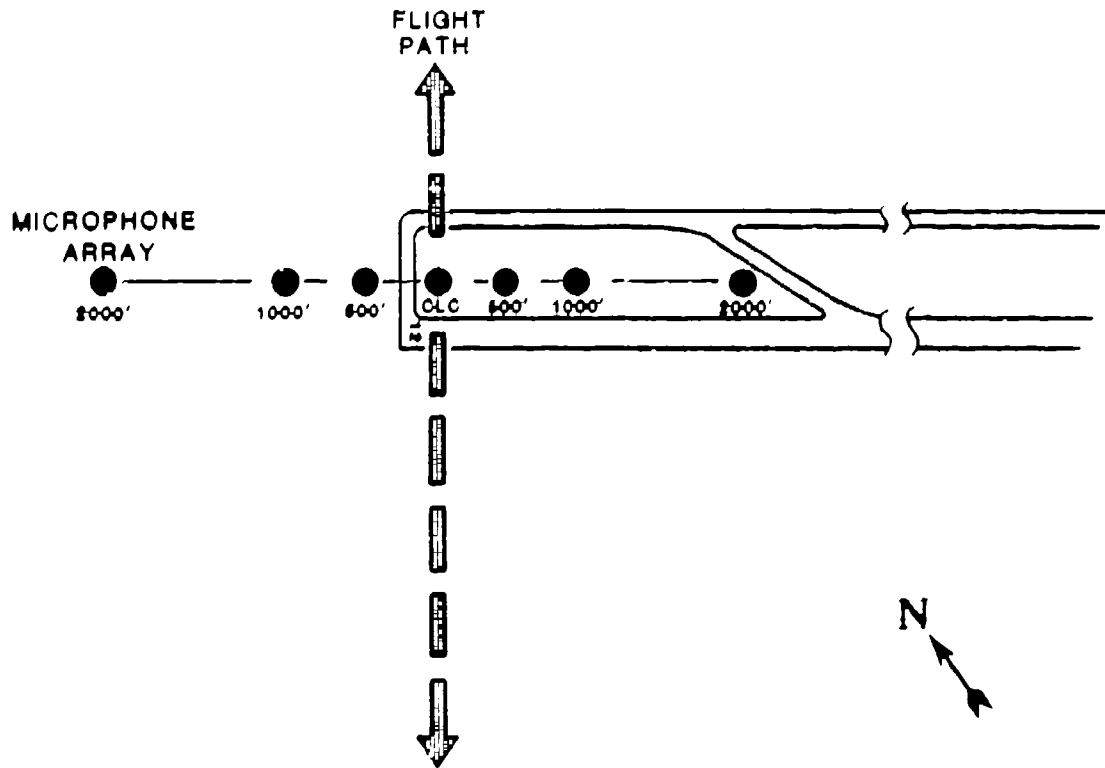


Figure 6

Seven noise measurement sites were equipped with a Type-1 precision integrating sound level meter (SLM) and a two-channel Nagra recorder. The seventh site had only a SLM. The typical measurement system consisted of a one-half inch microphone, mounted four feet above ground level on a tripod and oriented for grazing incidence. Each microphone was covered with a three-inch diameter wind screen. In addition, at the CLC, 500 feet west and 1000 feet west sites a ground plane microphone was used. A photo of a four feet and ground plane microphone is shown in Figure 7. The noise levels from the SLM's are presented in the Noise Level Data section of each appendix.

FOUR FEET AND GROUND PLANE MICROPHONES



Figure 7

B. METEOROLOGICAL MEASUREMENTS

Three different types of meteorological equipment were used to collect weather data. A ten-meter weather (MET) tower located in the vicinity of the microphone array provided a record of temperature, dew point, windspeed, and wind direction on a strip chart recorder. A psychrometer at the base of the MET tower measured surface temperature and relative humidity. A photo of the MET tower is shown in Figure 8. Additionally, pilot weather balloons were launched and tracked by the

10-METER METEOROLOGICAL TOWER

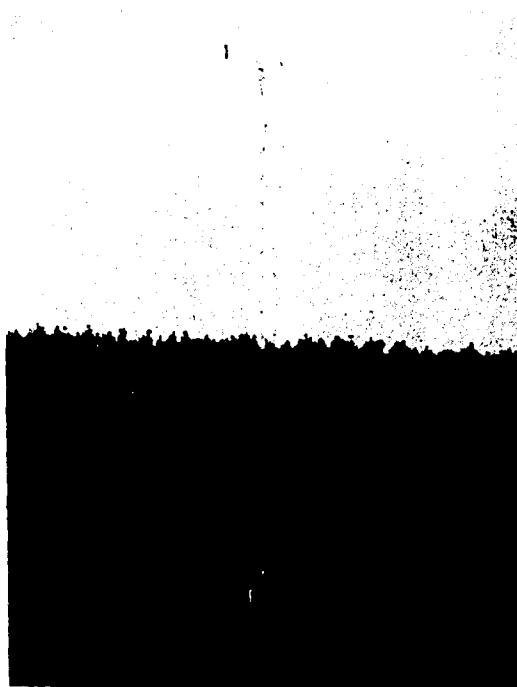


Figure 8

National Weather Service in the area every 15 to 30 minutes. These balloons provided real time windspeed and wind direction from ground to 3000 feet altitude in 300 foot intervals. Figure 9 is a photo of a pilot weather balloon and tracker. Also, the temperature from the helicopter's outside air temperature (OAT) gauge was recorded periodically at different test altitudes. This information was used to identify the existence of any temperature inversions. This data can be found in the Meteorological Data section of each appendix.

C. POSITION DATA

The FAA's portable tracking radar system was used for helicopter position determination. The radar, as shown in Figure 10, transmits helicopter position data to a nine track magnetic tape recorder equipped with a time code generator. For each event the azimuth and elevation angles, range and time were recorded every tenth of a second on magnetic tape. The radar tapes were then processed at the FAA's Noise Laboratory at Washington Dulles. The processed data included the closest point of approach (CPA), time of CPA, elevation angle, rate of climb or descent, the climb or descent angle and ground speed. A graphics plot of the flight profile was also generated. These data and the plots can be found in the Position Data section of each appendix.

PILOT WIND BALLOON AND TRACER



Figure 8

FAB'S PORTABLE TRACKING RADAR



Figure 10

D. COCKPIT INSTRUMENT RECORDING SYSTEM

A video recording system in the cockpit of each test helicopter recorded instrument panel information during each test event. A clock, which was set to range time, was mounted on the instrument panel. The video system provided a continuous record of airspeed, vertical speed, altitude, rotor torque and time. After the test, the video tapes were replayed on a monitor and the above parameters were read and logged every five seconds. These data were then inputted into a computer, the glideslopes calculated, and listings made of all parameters. This system was invaluable in reconstructing and documenting the operational procedures actually flown, especially for the normal and noise abatement approaches. Plots and listings of these data can be found in the Cockpit Data section of each appendix.

E. GROUND PHOTO SYSTEM

A ground photo site, which consisted of a camera and operator, was located under the flight path, 125 feet north of the OLC microphone. The camera was equipped with a data-back which recorded time to the second on each of the slides. The data-back time was synchronized with the radar time code and the

clock on the cockpit instrument panel. This aided in determining the time the helicopter passed over the CLC microphone position. A picture was taken of each of the Helicopters as it passed directly over the photo site. An alignment rig was used to aid the photographer in determining when the helicopter was directly overhead. A picture of the photographer and the alignment rig is shown in Figure 11. The altitude was determined from the slide prints, using a photo scaling technique. This system was used as a back-up to the tracking radar. The position data presented in this report is tracking radar data only.

GROUND PHOTOGRAPHER AND ALIGNMENT RIG



Figure 11

VI. TEST DATA COMPARISONS AND TRENDS

Appendices A through I contain all test data measured during the FAA/HAI Helicopter Flight Operations Noise Test Program. Included in each appendix are the A-weighted sound level and sound exposure level for each flight condition in the form of bar charts, summary tables and individual event listings. Also included are helicopter position data, flight track plots, meteorological data and listings and plots from cockpit instrument readings.

In this section, the sound exposure levels of the eight helicopters are compared and trends in the data are noted. Tables of comparative data are presented for level flyovers, normal takeoffs, six degree approach, normal approach, and noise abatement approaches. Each table is arranged from the lightest to the heaviest helicopter.

A. LEVEL FLYOVERS

Measured SEL's of the eight test helicopters during 500 and 1000 foot level flyovers are presented below in Tables 3 and 4. Also listed in the tables are the indicated airspeeds (IAS) flown by each helicopter. (Noise levels of the 876 and the 222A are from the 'extended program')

TABLE 3

500 FT. LEVEL FLYOVER
SEL, dB

| | 2000' | 1000' | 500' | C.L.C. | 500' | 1000' | 2000' | LAW |
|--------|-------------|-------|------|--------|--------------|-------|-------|-------|
| | (LEFT SIDE) | | | | (RIGHT SIDE) | | | (KFB) |
| R22 | 68.7 | 74.4 | 77.4 | 78.0 | 77.8 | 74.7 | 68.8 | 83 |
| 5000 | NO DATA | | | | | | | |
| 206L-1 | 73.9 | 78.0 | 82.2 | 83.8 | 82.3 | 77.8 | 73.7 | 100 |
| 109A | 77.3 | 82.9 | 86.4 | 90.3 | 84.7 | 81.1 | 76.6 | 148 |
| BK117 | 78.3 | 80.8 | 83.4 | 84.8 | 82.6 | 81.4 | 76.6 | 126 |
| 222A | 78.8 | 81.6 | 84.2 | 85.3 | 83.1 | 82.9 | 80.8 | 129 |
| 368M | 76.7 | 82.0 | 88.9 | 86.7 | 88.8 | 80.8 | 78.2 | 138 |
| B76 | 80.4 | 83.8 | 87.1 | 88.6 | 88.4 | 82.9 | 76.8 | 120 |

TABLE 4

1000 FT. LEVEL FLYOVER
SEL, dB

| | 2000' | 1000' | 500' | C.L.C. | 500' | 1000' | 2000' | LAW |
|--------|-------------|-------|------|--------|--------------|-------|-------|-------|
| | (LEFT SIDE) | | | | (RIGHT SIDE) | | | (KFB) |
| R22 | 68.0 | 72.3 | 73.0 | 73.8 | 71.7 | 72.1 | 68.6 | 83 |
| 5000 | NO DATA | | | | | | | |
| 206L-1 | 72.8 | 76.0 | 79.4 | 79.2 | 79.2 | 76.3 | 73.1 | 100 |
| 109A | 76.7 | 81.1 | 82.4 | 84.7 | 82.8 | 80.6 | 78.8 | 148 |
| BK117 | 76.0 | 79.2 | 80.6 | 81.0 | 79.6 | 78.8 | 77.6 | 126 |
| 222A | 77.0 | 79.6 | 80.8 | 81.8 | 80.8 | 80.3 | 77.4 | 129 |
| 368M | 78.7 | 80.8 | 81.8 | 80.7 | 80.7 | 79.6 | 78.0 | 138 |
| B76 | 79.1 | 83.0 | 82.4 | 81.6 | 81.6 | 81.4 | 76.7 | 120 |

As shown in Tables 3 and 4 the noise emitted to the sidelines is bidirectional for the majority of the test helicopters. One exception is the B76. For this helicopter at this airspeed, SEL's on the left side are 3dB higher than on the right side.

D. NORMAL TAKEOFF

Measured SEL's of the eight test helicopters during normal takeoffs are presented in Table 5. Average altitudes and IAS read from the video tape recordings of the altimeter and airspeed gauges are also listed.

TABLE 5
NORMAL TAKEOFF
SEL, dB

| | 2000' (LEFT SIDE) | 1000' | 500' | CLC | 500' | 1000' | 2000' (RIGHT SIDE) | AVG. ALT. (FT) | IAS (KTS) |
|--------|----------------------|-------|------|------|------|-------|-----------------------|-------------------|--------------|
| A22 | 72.3 | 77.4 | 81.2 | 79.0 | 80.5 | 76.0 | 71.4 | 405 | 59 |
| 800D | 74.0 | 78.2 | 81.3 | 82.1 | 80.3 | 77.1 | 72.9 | 400 | 86 |
| 206L-1 | 75.1 | 79.7 | 83.2 | 83.9 | 82.6 | 79.6 | 74.0 | 483 | 84 |
| 109A | 79.5 | 84.2 | 87.0 | 86.1 | 85.5 | 83.6 | 76.0 | 558 | 64 |
| BK117 | --- | 78.3 | 78.8 | 77.4 | 76.0 | 77.5 | 75.8 | 1457 | 67 |
| 222A | --- | 78.4 | 79.7 | 83.0 | 83.0 | 78.0 | 72.5 | 240 | 79 |
| 369N | 79.4 | 83.2 | 84.4 | 80.3 | 84.0 | 80.2 | 73.2 | 418 | 86 |
| 076 | --- | 85.3 | 86.5 | 83.2 | 86.0 | 83.0 | 78.0 | 493 | 83 |

NOTE: Altimeter and IAS readings made when helicopter passed over CLC microphone position.

As shown in Table 5, the takeoff noise is for the most part omnidirectional to the sidelines. The exception to this is the 369N which generates 3 to 6 dB lower SEL's to the right side than to the left.

C. SIX-DEGREE APPROACH

The measured SEL's of the eight test helicopters are presented below in Table 6. The table also lists the average altitude and indicated airspeed.

TABLE 6
6-DEGREE APPROACH
SEL, dB

| | 2000' (LEFT SIDE) | 1000' | 500' | CLC | 500' (RIGHT SIDE) | 1000' | 2000' | AVG. ALT. (FT) | IAS (KTS) |
|--------|----------------------|-------|------|------|----------------------|-------|-------|-------------------|--------------|
| R22 | 66.4 | 72.1 | 78.9 | 87.5 | 84.1 | 78.5 | 69.9 | 420 | 55 |
| 500D | 71.4 | 76.5 | 80.5 | 86.8 | 83.7 | 78.2 | 74.7 | 430 | 65 |
| 206L-1 | 74.0 | 77.9 | 82.6 | 89.1 | 87.8 | 82.1 | 76.0 | 380 | 60 |
| 109A | 76.8 | 83.7 | 89.9 | 97.9 | 90.5 | 83.7 | 76.7 | 410 | 62 |
| BK117 | 74.8 | 80.5 | 85.3 | 91.1 | 89.0 | 83.5 | 79.1 | 380 | 65 |
| 222A | 74.4 | 79.9 | 84.6 | 90.2 | 86.9 | 80.6 | 73.9 | 430 | 65 |
| 365N | 77.8 | 84.5 | 90.7 | 94.6 | 88.4 | 81.4 | 78.4 | 380 | 68 |
| S76 | 76.3 | 82.0 | 86.9 | 94.8 | 89.4 | 85.2 | --- | 390 | 80 |

NOTE: Altimeter and IAS readings made when helicopter passed over CLC microphone position.

Six-degree approaches produce a highly directional noise to the sidelines. For all eight helicopters, the SEL is higher to the side corresponding to the respective main rotor's advancing blade. Main rotors of the R22, 500D, 206L-1, 109A, BK117, 222A and the S76 turn counterclockwise, as viewed from the top. This results in a right sideline sound directivity. The main rotor of the 365N turns clockwise, resulting in a left sideline sound directivity.

D. NORMAL APPROACH

The measured SEL's of the eight test helicopters for normal approaches are presented in Table 7.

TABLE 7
NORMAL APPROACH
SEL, dB

| | 2000' (LEFT SIDE) | 1000' | 500' | CLC | 500' (RIGHT SIDE) | 1000' | 2000' | AVG. ALT. (FT) | IAS (KTS) |
|--------|----------------------|-------|------|------|----------------------|-------|-------|-------------------|--------------|
| R22 | 65.2 | 70.7 | 75.4 | 81.4 | 80.8 | 76.6 | 68.4 | 620 | 58-50 |
| 590D | 71.3 | 77.1 | 80.7 | 86.4 | 82.6 | 77.6 | 73.8 | 360 | 80-60 |
| 206L-1 | 72.1 | 77.2 | 82.7 | 89.8 | 86.7 | 80.0 | 74.6 | 300 | 68-53 |
| 109A | 76.1 | 81.9 | 85.7 | 93.3 | 88.5 | 81.5 | 75.6 | 460 | 97-73 |
| BK117 | 75.0 | 80.3 | 84.8 | 90.7 | 88.5 | 83.2 | --- | 380 | 75-53 |
| 222A | 74.9 | 79.5 | 83.7 | 86.3 | 85.0 | 83.8 | --- | 580 | 83-66 |
| 365N | 76.1 | 81.6 | 86.2 | 89.4 | 85.4 | 80.8 | 77.6 | 400 | 75-53 |
| 576 | 75.2 | 80.9 | 83.7 | 83.9 | 84.0 | 82.8 | --- | 620 | 85-64 |

NOTE: Altimeter readings made when helicopter passed over CLC microphone position. Ranges of indicated airspeed taken when helicopter was within 15 seconds of CLC.

Normal approaches produce directional sound patterns to the sideline identical to those produced by the six-degree approach. The difference in SEL between the left and right sides is less in most cases for the normal approaches than for a six-degree approach.

Normal approaches are characterized by continuous deceleration of airspeed and variable rates of descent that result in near constant rate of closure with respect to the ground. Airspeed/rate of descent profile plots for the normal

approaches can be found in the Cockpit Data section of each appendix.

E. NOISE ABATEMENT APPROACHES

The noise abatement approaches that were tested fall into three categories. The category for each test helicopter which resulted in the least sound exposure level is as follows:

1. CONSTANT SPEED/CONSTANT GLIDESLOPE

222A - 6 DEG., 45 KTS.

876 - 12 DEG., 60 KTS.

2. DECELERATING SPEED/CONSTANT GLIDESLOPE

500D - 9 DEG.

BK117 - 10 DEG.

3. DECELERATING SPEED/VARIABLE GLIDESLOPE

R22, 206L-1, 109A AND 365N

Representative flight profiles for the category 3 noise abatement approach can be found in the appendices for the four helicopters listed above.

The measured SEL's of the eight test helicopters are listed in Table B for the 'best' noise abatement approach. Average altitudes and ranges of indicated airspeed are also given. It should be noted that the three categories of approaches were

not evaluated on all eight helicopters. In several instances, only one or two noise abatement approaches were flown.

TABLE B

'BEST' NOISE ABATEMENT APPROACH
SEL, dB

| | 2000' (LEFT SIDE) | 1000' | 500' | CLC | 500' | 1000' | 2000' (RIGHT SIDE) | AVG. ALT. (FT) | IAB (KTS) |
|--------|----------------------|-------|------|------|------|-------|-----------------------|-------------------|--------------|
| R22 | 65.8 | 70.7 | 75.0 | 81.7 | 80.4 | 76.1 | 68.3 | 620 | 69-52 |
| S00D | 70.7 | 75.1 | 78.7 | 83.0 | 82.5 | 79.3 | 75.3 | 520 | 70-59 |
| 206L-1 | 72.1 | 75.7 | 80.8 | 83.9 | 84.4 | 79.9 | 74.5 | 492 | 79-49 |
| 109A | 75.5 | 80.8 | 84.0 | 88.0 | 87.0 | 82.1 | 76.2 | 650 | 89-69 |
| BK117 | 75.4 | 79.6 | 83.1 | 85.7 | 85.2 | 82.4 | 77.2 | 620 | 63-56 |
| 222A | 75.2 | 82.0 | 87.0 | 90.2 | 85.8 | 79.9 | 77.2 | 425 | 57-53 |
| 365N | 78.7 | 84.7 | 87.5 | 86.5 | 82.4 | 80.4 | 77.9 | 650 | 92-60 |
| 876 | 75.4 | 80.4 | 82.8 | 84.2 | 84.4 | 83.1 | --- | 700 | 67-62 |

NOTE: Altimeter readings made when helicopter passed over CLC microphone position. Ranges of indicated airspeed taken when helicopter was within 15 seconds of CLC.

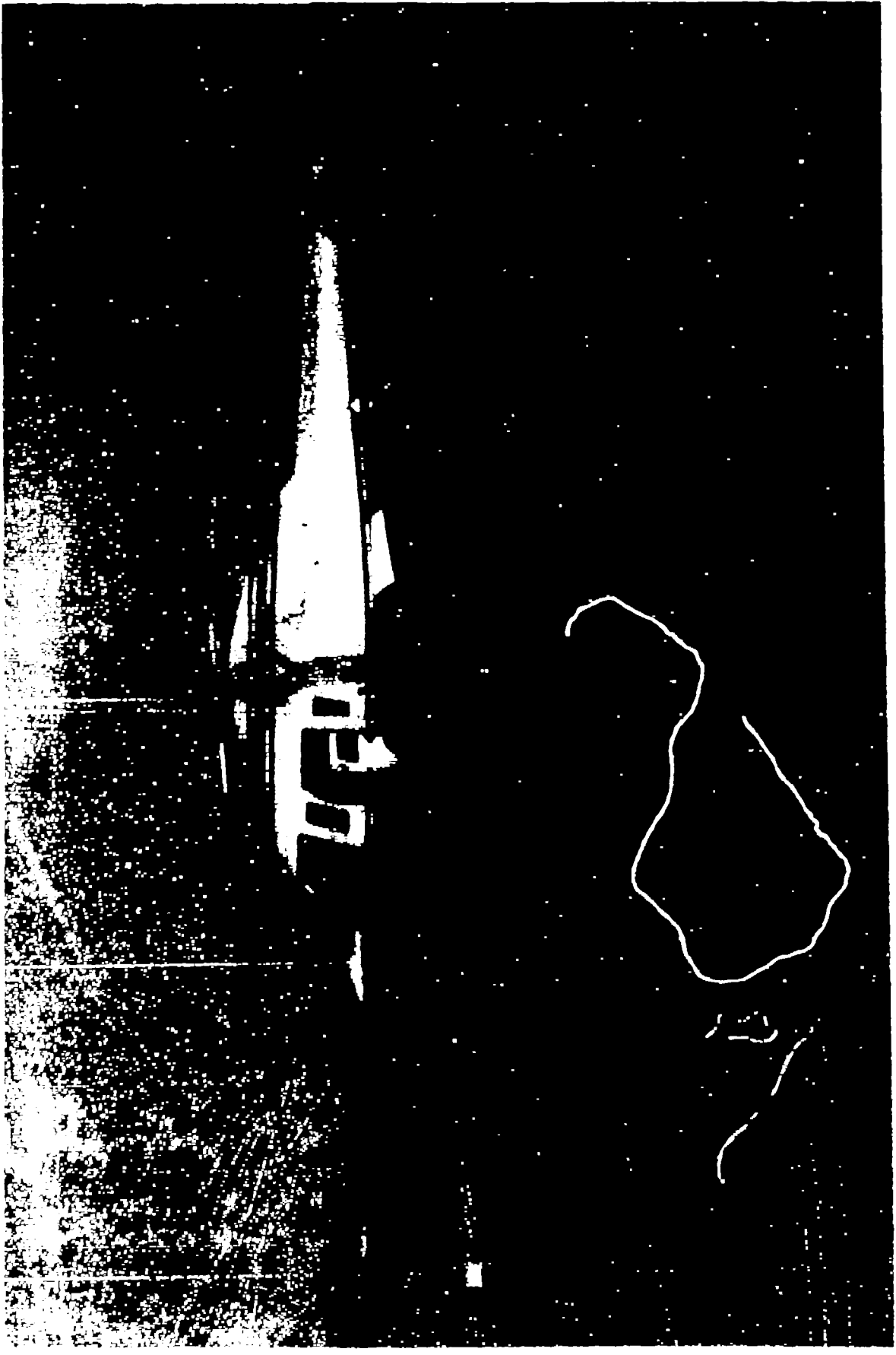
The sound directionality to one side of the helicopter is evident for this type of approach as it is for the six degree and normal approaches. The only exception is the 222A which now exhibits a left side directivity instead of the right side as shown previously.

APPENDIX A

SIFOREKY 1576

PAGE NUMBERS

| | |
|---|-------------|
| <u>HELICOPTER CHARACTERISTICS</u> | A-1 |
| <u>NOISE LEVEL DATA</u> | |
| SOUND EXPOSURE LEVEL | |
| Bar Charts | |
| Approaches..... | A-5 |
| Takeoff..... | A-6 |
| Level Flyovers..... | A-8 |
| Summary Tables..... | A-9 - A-11 |
| Individual Event Data..... | A-12 - A-20 |
| A-WEIGHTED SOUND LEVEL | |
| Bar Charts | |
| Approaches..... | A-22 |
| Takeoff..... | A-23 |
| Level Flyovers..... | A-24 |
| Summary Tables..... | A-25 - A-28 |
| Individual Event Data..... | A-29 - A-41 |
| <u>RADAR TRACKING DATA</u> | |
| Position Data..... | A-44 - A-61 |
| Tracking Plots..... | A-62 - A-70 |
| <u>METEOROLOGICAL DATA</u> | |
| 10-meter Tower Data..... | A-72 - A-76 |
| 4 ft. Data and Aircraft DAT Data..... | A-77 - A-79 |
| Pilot Balloon Wind Data..... | A-80 - A-82 |
| <u>COCKPIT VIDEO DATA</u> | |
| Normal Approach Plot..... | A-84 |
| Individual Event Data..... | A-85 - A-93 |



HELICOPTER CHARACTERISTICS

HELICOPTER MANUFACTURER : SIKORSKY
HELICOPTER MODEL : 876
TEST HELICOPTER N-NUMBER : N766SA
MAX INTERNAL GROSS WEIGHT : 10,300 LBS.
NUMBER OF ENGINES : TWO
UNINSTALLED TAKEOFF POWER : 650 SHP (PER ENGINE)
UNINSTALLED MAX CONTINUOUS PWR. : 650 SHP (PER ENGINE)
NEVER EXCEED SPEED (VNE) : 155 KTS.
MAX SPEED IN LEVEL FLIGHT
WITH MAX CONTINUOUS POWER : 155 KTS.
SPEED FOR BEST RATE OF CLIMB (VY) : 74 KTS.
CRUISE SPEED FOR BEST RANGE (VCR) : 146 KTS.
BEST RATE OF CLIMB AT
TAKEOFF POWER (BRC) : 1730 RPM
"TOP OF GREEN ARC" ROTOR SPEED : 293 RPM 100%

MAIN AND TAIL ROTOR SPECIFICATIONS

| | MAIN | TAIL |
|------------------|------------------|-------------|
| DIAMETER (FT.) : | 44.0 | 8.0 |
| NO. OF BLADES : | 4 | 4 |
| TIPSPEED (FPS) : | 675 | 674 |
| TIP SHAPE : | SWEPT TAPERED | RECTANGULAR |

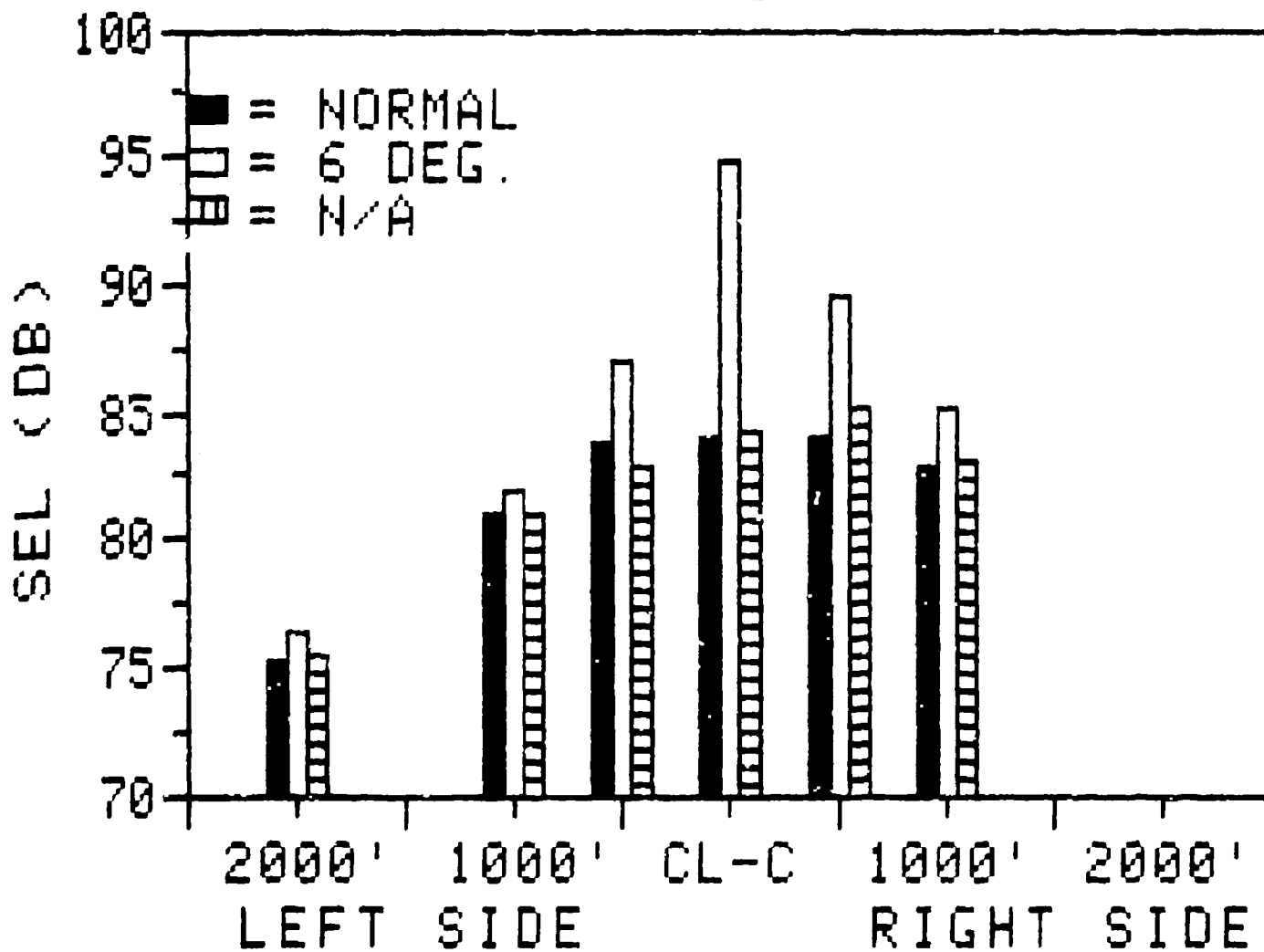
NOISE LEVEL DATA

'as-measured'

SOUND EXPOSURE LEVEL (dB)

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- SOUND EXPOSURE LEVELS (SEL) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN. -

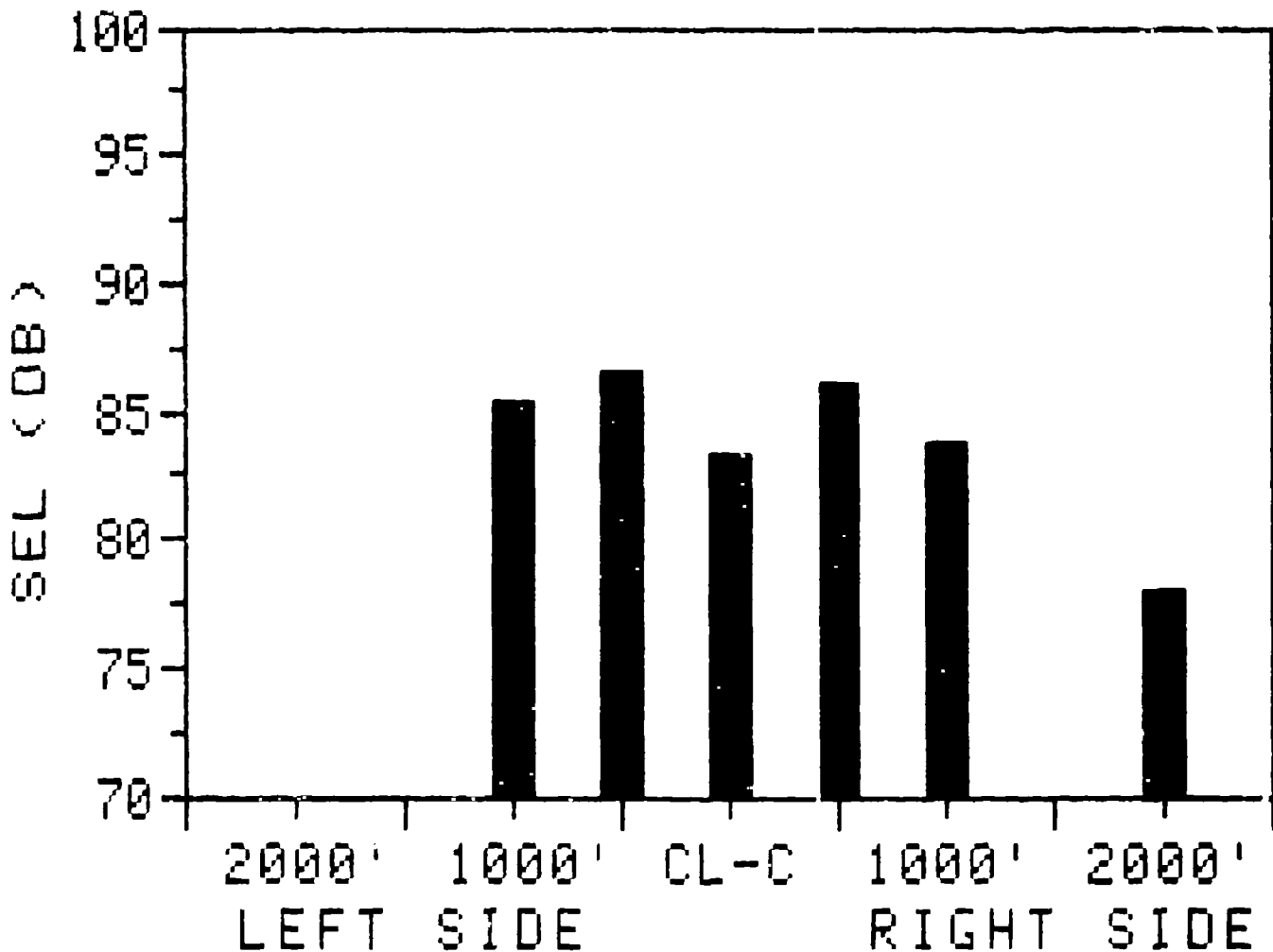
APPROACHES S76



| OPERATION | AVG. ALT. OVER CL-C (FT., AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|---|-----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 620 | 65-64 | 4.2- 9.9 |
| SIX DEG. APPROACH | 390 | 80 | 6.0 |
| NOISE ABATEMENT APP. 12° TARGET, 60 KTS. (EVENTS D30-D33) | 700 | 67-62 | 4.5-11.5 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN 215 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF 876



| OPERATION | AVG. ALT. OVER CLC (FT. AGL) | INDICATED AIRSPEED (KTS.) |
|-----------|---------------------------------|------------------------------|
|-----------|---------------------------------|------------------------------|

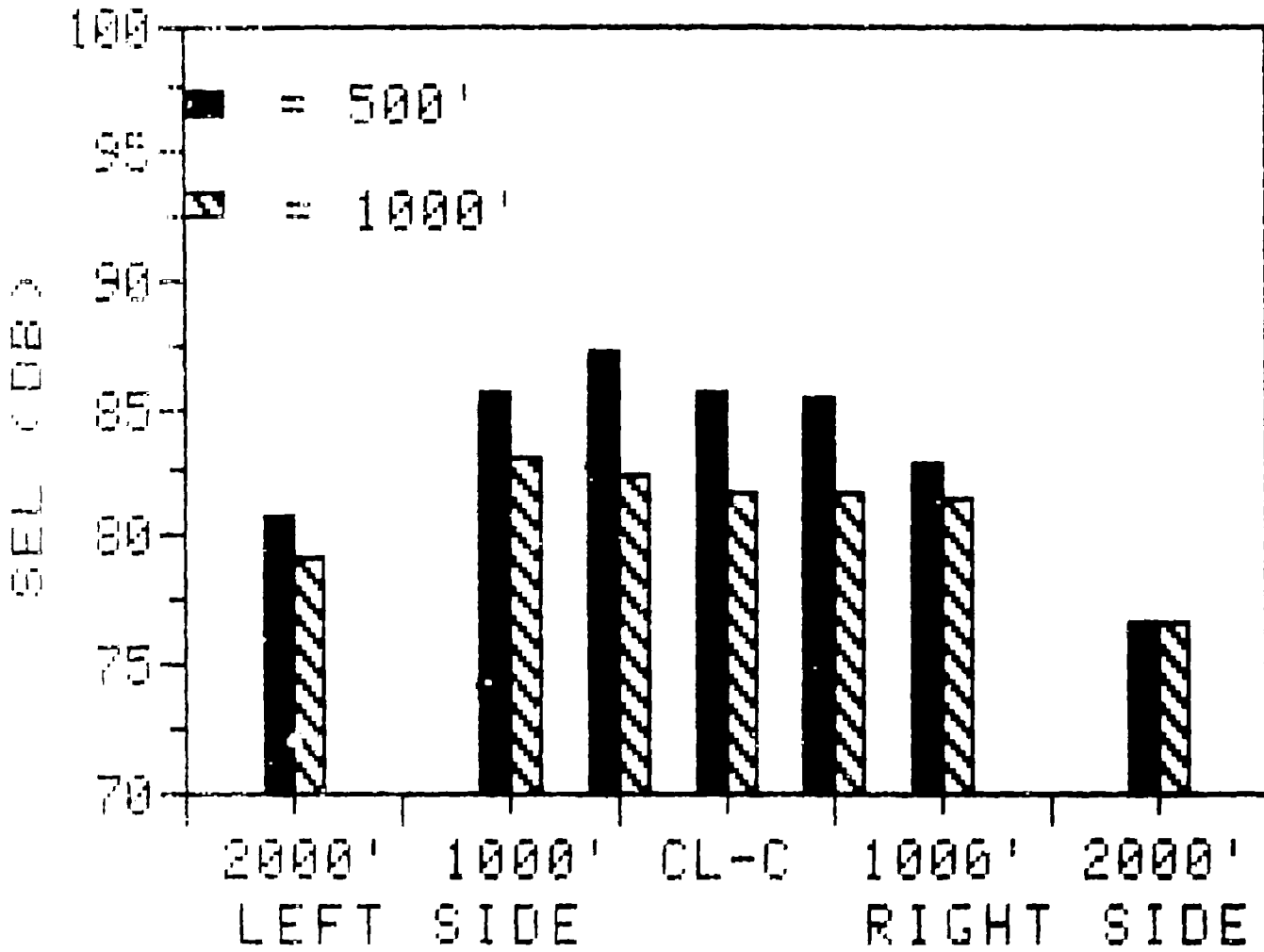
NORMAL TAKEOFF

493

83

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN
THE HELICOPTER PASSED OVER CLC MICROPHONE POSITION

LEVEL FLYOVERS 876



UNFLOWN AIRSPEED: 120 KTS.

S76 SUMMARY SHEET (6/03-6/06/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 74 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 76.3 | 82.0 | 86.9 | 94.8 | 89.4 | 85.2 | -- |
| N | 7 | 7 | 8 | 7 | 8 | 8 | -- |
| S.D. | .5 | .7 | 1.4 | .8 | 1.0 | .4 | -- |
| 90% CI | .4 | .5 | .9 | .6 | .6 | .4 | -- |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 75.2 | 80.9 | 83.7 | 83.9 | 84.0 | 82.8 | -- |
| N | 6 | 6 | 7 | 7 | 7 | 7 | -- |
| S.D. | .6 | .4 | .5 | .7 | .7 | .7 | -- |
| 90% CI | .5 | .4 | .3 | .5 | .5 | .5 | -- |

* NOISE ABATEMENT APPROACH (9.5 DEG. TARGET, 60 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 76.5 | 82.4 | 85.9 | 91.4 | 88.9 | 86.3 | -- |
| N | 5 | 6 | 5 | 6 | 6 | 6 | -- |
| S.D. | .9 | .6 | 1.0 | 1.6 | 1.3 | 1.3 | -- |
| 90% CI | .9 | .5 | 1.0 | 1.3 | 1.1 | 1.1 | -- |

* NOISE ABATEMENT APPROACH (12 DEG. TARGET, 60 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 75.4 | 80.9 | 82.8 | 84.2 | 85.2 | 83.1 | -- |
| N | 3 | 4 | 4 | 4 | 4 | 4 | -- |
| S.D. | .7 | .7 | .6 | 1.3 | .7 | .9 | -- |
| 90% CI | 1.1 | .8 | .7 | 1.5 | .8 | 1.0 | -- |

876 SUMMARY SHEET (6/05-6/06/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* 1000 FT. LEVEL FLYOVER AT 120 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 79.1 | 83.0 | 82.4 | 81.6 | 81.6 | 81.4 | 76.7 |
| N | 6 | 6 | 6 | 11 | 6 | 6 | 6 |
| S.D. | .7 | .6 | .7 | .9 | .6 | .6 | .6 |
| 90% CI | .6 | .5 | .6 | .5 | .5 | .5 | .5 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/04/84

OPERATION : LEVEL FLYOVER (1000' @ 120 KTS)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' EAST | 1000' EAST | 2000' EAST |
| S46 | 79.30 | 82.70 | 83.10 | 81.40 | ----- | ----- | ----- |
| S47 | ----- | ----- | ----- | 82.70 | 82.00 | 81.80 | 77.10 |
| S48 | 80.20 | 84.00 | 82.30 | 81.30 | ----- | ----- | ----- |
| S49 | ----- | ----- | ----- | 82.30 | 81.80 | 81.70 | 77.10 |
| S50 | 79.20 | 83.40 | 83.20 | 83.20 | ----- | ----- | ----- |
| S51 | ----- | ----- | ----- | -- | 82.30 | 81.90 | 77.30 |
| S52 | 78.90 | 82.40 | 82.50 | 81.40 | ----- | ----- | ----- |
| S53 | ----- | ----- | ----- | 79.90 | 80.80 | 80.70 | 76.10 |
| S54 | 78.00 | 82.70 | 81.60 | 81.20 | ----- | ----- | ----- |
| S55 | ----- | ----- | ----- | 81.00 | 81.60 | 81.70 | 75.80 |
| S56 | 79.00 | 82.60 | 81.60 | 81.60 | ----- | ----- | ----- |
| S57 | ----- | ----- | ----- | 81.10 | 81.10 | 80.60 | 76.60 |
| AVERAGE | 79.10 | 82.97 | 82.38 | 81.55 | 81.60 | 81.40 | 76.67 |
| STD. DEV. | 0.71 | 0.58 | 0.70 | 0.90 | 0.56 | 0.59 | 0.61 |
| 90% C.I. | 0.59 | 0.48 | 0.57 | 0.49 | 0.46 | 0.48 | 0.50 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6.05.84

OPERATION : 6 DEGREE APPROACH AT VY, 74 KTS.)

(LEFT SIDE)

(RIGHT SIDE)

| EVENT NO. | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
|--------------|-------|-------|-------|-------|-------|-------|-------|
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| A1 | 75.90 | 81.70 | 87.60 | 95.10 | 90.70 | 85.80 | -- |
| A2 | 76.70 | 82.70 | 88.00 | 95.20 | 89.20 | 85.20 | -- |
| A3 | 77.00 | 82.90 | 89.20 | 96.00 | 87.40 | 84.10 | -- |
| A4 | 76.50 | 82.20 | 86.20 | 95.50 | 89.80 | 85.90 | -- |
| A5 | 75.70 | 80.70 | 85.00 | -- | 89.90 | 85.00 | -- |
| A6 | 75.90 | 82.10 | 87.10 | 94.00 | 89.50 | 85.50 | -- |
| A7 | -- | -- | 85.50 | 94.40 | 88.90 | 84.80 | -- |
| A8 | 76.10 | 81.70 | 86.40 | 93.70 | 89.40 | 85.10 | -- |
| AVERAGE | 76.26 | 82.00 | 86.88 | 94.84 | 89.35 | 85.19 | -- |
| STD. DEV. | 0.48 | 0.73 | 1.38 | 0.83 | 0.95 | 0.59 | -- |
| 90% C. I. | 0.35 | 0.54 | 0.92 | 0.61 | 0.64 | 0.39 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: SIKORSKY 876

TEST DATE: 06/05/84

OPERATION : NOISE ABATEMENT APPROACH (9.5 DEG. TARGET, 60 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D9 | 77.90 | 83.00 | 86.10 | 91.10 | 89.90 | 87.60 | -- |
| D10 | 76.30 | 82.90 | 85.40 | 89.90 | 87.60 | 84.70 | -- |
| D11 | -- | -- | -- | -- | -- | -- | -- |
| D12 | -- | 82.10 | 87.40 | 94.00 | 89.90 | 87.60 | -- |
| D13 | 76.30 | 82.40 | 85.80 | 92.50 | 90.40 | 87.40 | -- |
| D14 | 75.30 | 81.50 | 84.60 | 90.20 | 87.90 | 85.80 | -- |
| D15 | 76.50 | 82.50 | -- | 90.80 | 87.50 | 85.20 | -- |
| AVEF | 76 | 82.40 | 85.86 | 91.42 | 88.87 | 86.33 | -- |
| STD. | 0.93 | 0.55 | 1.03 | 1.56 | 1.33 | 1.34 | -- |
| 90% C.. | 0.89 | 0.45 | 0.98 | 1.28 | 1.10 | 1.11 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BIKORSKY B76

TEST DATE: 6/06/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B17 | 75.90 | 81.40 | 84.50 | 84.70 | 84.20 | 82.40 | -- |
| B19 | -- | 80.70 | 83.80 | 83.50 | 84.20 | 82.40 | -- |
| B21 | 74.70 | -- | 83.30 | 83.00 | 82.90 | 82.00 | -- |
| B23 | 75.40 | 80.70 | 83.60 | 84.80 | 85.10 | 84.10 | -- |
| B25 | 75.80 | 80.70 | 83.20 | 83.50 | 83.50 | 82.70 | -- |
| B27 | 74.90 | 80.50 | 83.30 | 83.50 | 84.20 | 83.10 | -- |
| B29 | 74.60 | 81.50 | 84.00 | 84.30 | 84.20 | 83.10 | -- |
| AVERAGE | 75.22 | 80.92 | 83.67 | 83.90 | 84.04 | 82.83 | -- |
| STD. DEV. | 0.86 | 0.42 | 0.47 | 0.70 | 0.69 | 0.69 | -- |
| 90% C.I. | 0.46 | 0.35 | 0.34 | 0.51 | 0.50 | 0.50 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/06/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| C18 | -- | 86.00 | 86.70 | 83.30 | 86.40 | 86.10 | 78.50 |
| C20 | -- | 85.40 | 86.70 | 83.40 | 86.30 | 83.10 | 78.40 |
| C22 | -- | 84.50 | 86.50 | 83.30 | 85.40 | 83.10 | 77.00 |
| C24 | -- | 87.10 | 87.30 | 82.40 | 87.90 | 85.60 | 79.90 |
| C26 | -- | 84.60 | 86.50 | 83.90 | 85.90 | 82.80 | 77.60 |
| C28 | -- | 84.00 | 85.50 | 83.00 | 83.90 | 82.10 | 76.50 |
| AVERAGE | -- | 85.27 | 86.53 | 83.22 | 85.97 | 83.80 | 77.98 |
| STD. DEV. | -- | 1.14 | 0.59 | 0.50 | 1.31 | 1.64 | 1.22 |
| 90% C.I. | -- | 0.94 | 0.48 | 0.41 | 1.08 | 1.35 | 1.01 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/06/84

OPERATION : NOISE ABATEMENT APPROACH (12 DEG. TARGET, 60 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-D | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D30 | -- | 81.10 | 82.50 | 84.20 | 85.80 | 84.10 | -- |
| D31 | 76.10 | 81.80 | 82.90 | 85.10 | 85.50 | 82.60 | -- |
| D32 | 74.80 | 80.20 | 82.20 | 82.40 | 84.30 | 82.30 | -- |
| D33 | 75.40 | 80.50 | 83.60 | 85.20 | 85.20 | 83.50 | -- |
| AVERAGE | 75.43 | 80.90 | 82.80 | 84.23 | 85.20 | 83.13 | -- |
| STD. DEV. | 0.65 | 0.71 | 0.61 | .30 | 0.65 | 0.83 | -- |
| 90% C.I. | 1.10 | 0.83 | 0.71 | 1.52 | 0.76 | 0.97 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BIKORSKY S76

TEST DATE: 6/06/84

OPERATION : NOISE ABATEMENT APPROACH (3 DEG. TARGET, 60 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D34 | 76.50 | 83.50 | 88.80 | 93.30 | 88.40 | 83.00 | -- |
| D35 | 76.10 | 81.80 | 87.40 | 95.40 | 87.50 | 82.10 | -- |
| D36 | 76.50 | 82.70 | -- | 95.80 | 88.20 | 82.00 | -- |
| D37 | 76.30 | 82.80 | 87.60 | 95.30 | 89.30 | 82.80 | -- |
| D38 | 76.60 | 83.20 | -- | 95.60 | 88.80 | 83.00 | -- |
| AVERAGE | 76.40 | 82.80 | 87.93 | 95.08 | 88.44 | 82.58 | -- |
| STD. DEV. | 0.20 | 0.64 | 0.76 | 1.01 | 0.67 | 0.49 | -- |
| 90% C.I. | 0.19 | 0.61 | 1.28 | 0.97 | 0.64 | 0.47 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BIKORSKY B76

TEST DATE: 6/06/84

OPERATION : NOISE ABATEMENT APPROACH (3 DEG. TARGET, 120 KTS.)

(LEFT SIDE)

(RIGHT SIDE)

| EVENT NO. | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
|--------------|-------|-------|-------|-------|-------|-------|-------|
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| D39 | 78.20 | -- | 88.80 | 88.60 | 86.10 | 81.80 | -- |
| D40 | 77.90 | 83.90 | 88.70 | 90.20 | 85.50 | 82.00 | -- |
| D41 | 77.00 | 83.80 | 88.20 | 92.20 | 86.40 | 81.70 | -- |
| D42 | 77.50 | 83.70 | 88.40 | 90.00 | 85.80 | 81.50 | -- |
| D43 | 78.40 | 85.00 | 89.10 | 90.60 | 86.00 | 83.40 | -- |
| AVERAGE | 77.80 | 84.10 | 88.64 | 90.32 | 85.96 | 82.08 | -- |
| STD. DEV. | 0.56 | 0.61 | 0.35 | 1.29 | 0.34 | 0.76 | -- |
| 90% C.I. | 0.53 | 0.71 | 0.33 | 1.23 | 0.32 | 0.72 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BIKORSKY 976

TEST DATE: 6/05/84

OPERATION : LEVEL FLYOVER (500' @ 120 KTS)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' EAST | 1000' EAST | 2000' EAST |
| Q100 | ----- | ----- | ----- | 85.30 | 85.70 | 83.30 | 77.90 |
| Q101 | 81.00 | 85.70 | 87.40 | 86.00 | ----- | ----- | ----- |
| Q102 | ----- | ----- | ----- | 86.90 | 85.20 | 83.00 | 75.90 |
| Q103 | -- | 85.50 | 87.50 | 86.50 | ----- | ----- | ----- |
| Q104 | ----- | ----- | ----- | 85.50 | 86.00 | 83.50 | 76.50 |
| Q105 | 81.50 | 85.60 | 86.70 | 86.10 | ----- | ----- | ----- |
| Q106 | ----- | ----- | ----- | 85.20 | 85.20 | 82.90 | 77.40 |
| Q107 | 80.50 | 85.70 | 86.90 | 86.20 | ----- | ----- | ----- |
| Q108 | ----- | ----- | ----- | 84.20 | 84.50 | 83.10 | 75.90 |
| Q109 | 80.40 | 85.50 | 87.30 | 85.90 | ----- | ----- | ----- |
| Q110 | ----- | ----- | ----- | 85.20 | 85.90 | 83.00 | 76.40 |
| Q111 | 81.00 | 86.00 | 86.20 | 86.00 | ----- | ----- | ----- |
| Q112 | ----- | ----- | ----- | 84.20 | 85.00 | 81.60 | 75.90 |
| Q113 | 80.40 | 85.00 | 87.40 | 85.60 | ----- | ----- | ----- |
| AVERAGE | 80.80 | 85.57 | 87.06 | 85.60 | 85.36 | 82.91 | 76.56 |
| STD. DEV. | 0.44 | 0.30 | 0.46 | 0.78 | 0.54 | 0.61 | 0.80 |
| 90% C.I. | 0.37 | 0.22 | 0.34 | 0.38 | 0.39 | 0.45 | 0.59 |

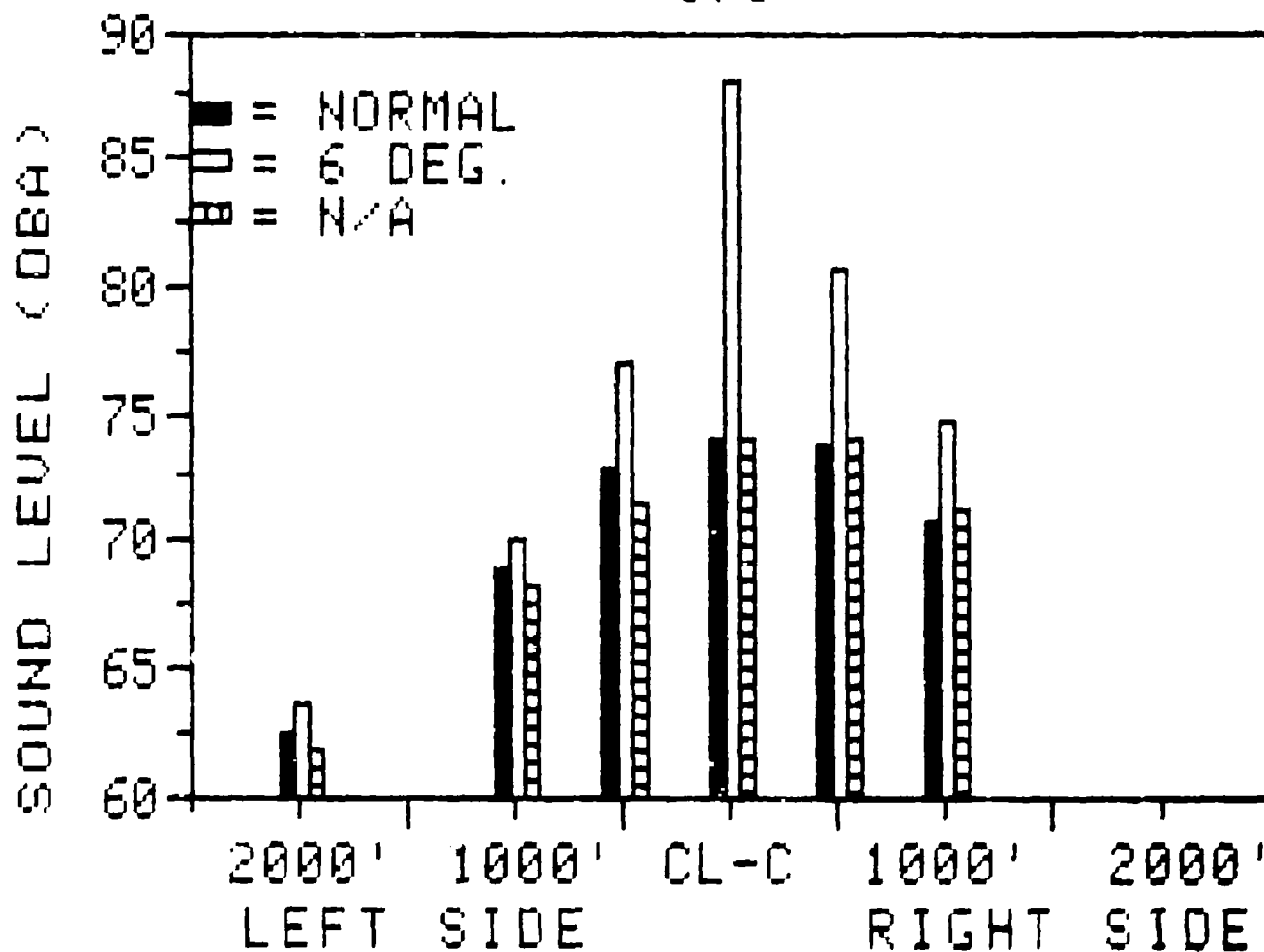
NOISE LEVEL DATA

'as-measured'

A-WEIGHTED SOUND LEVEL (dBA)

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- A-WEIGHTED SOUND LEVEL (dBA) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN. -

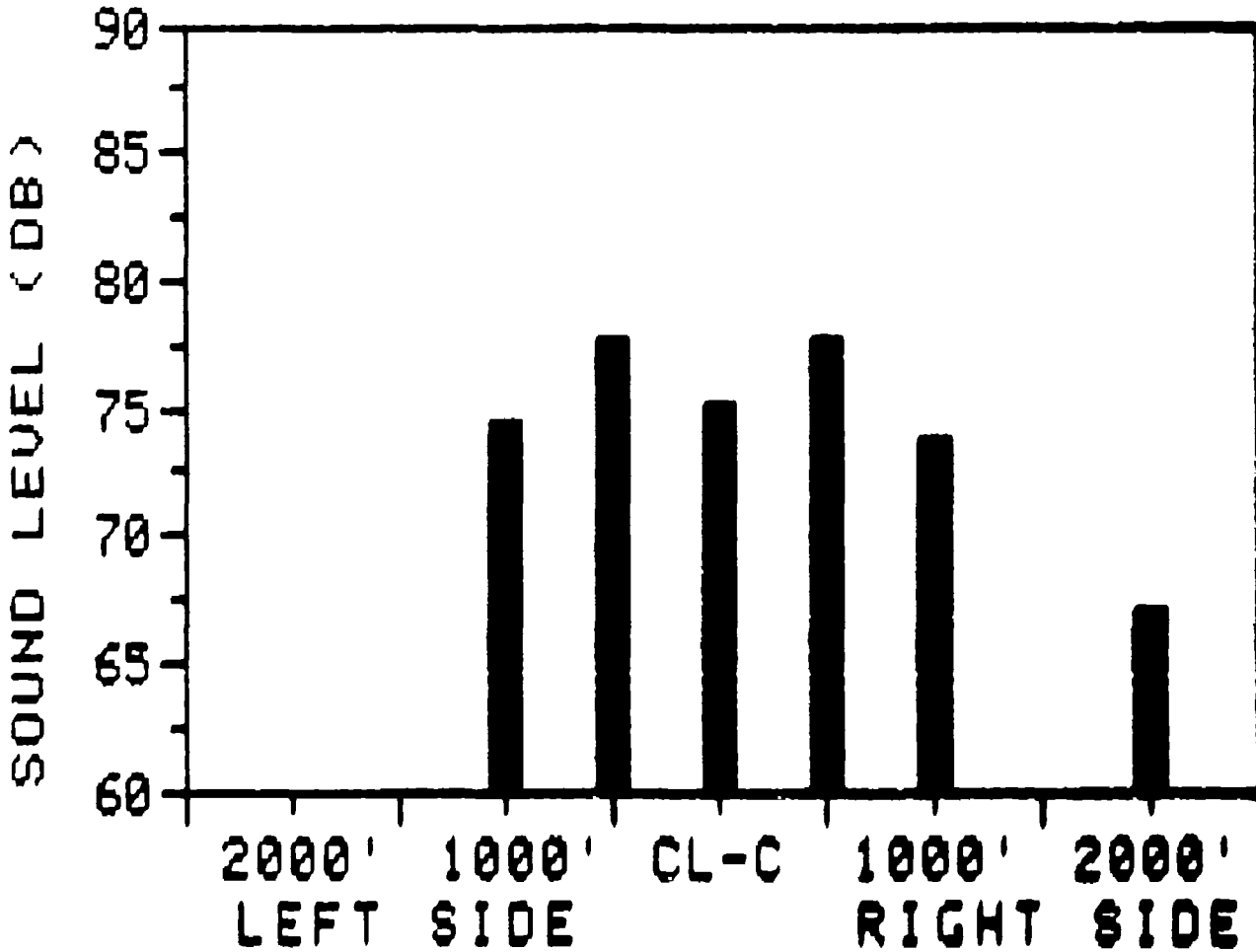
APPROACHES 576



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|---|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 420 | 85-64 | 4.2- 9.9 |
| SIX DEG. APPROACH | 390 | 80 | 6.0 |
| NOISE ABATEMENT APP. | 700 | 67-62 | 4.8-11.8 |
| 12° TARGET, 60 KTS. (EVENTS D30-D33) | | | |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN 118 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF S76

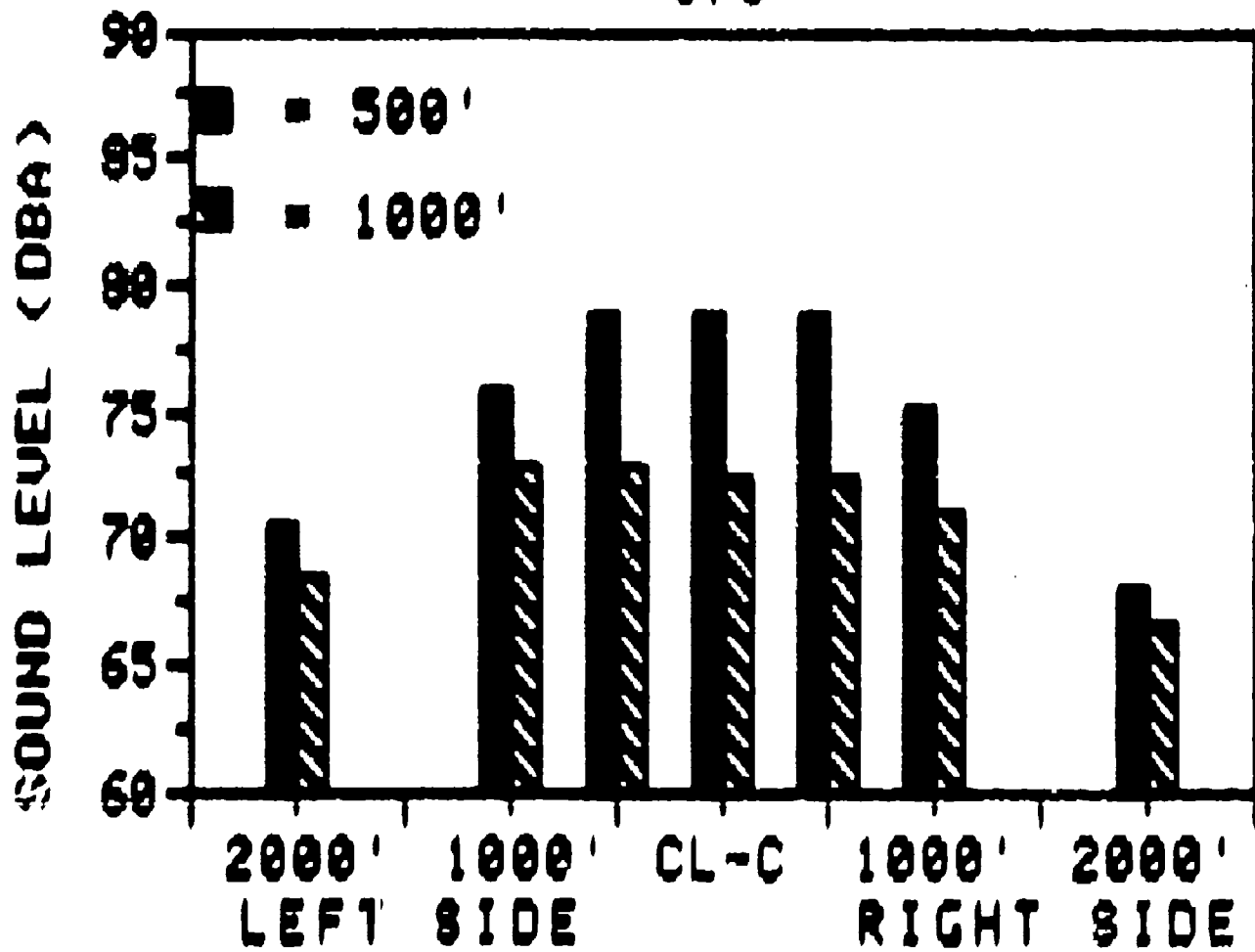


| OPERATION | AVG. ALT. OVER CLC (FT. AGL) | INDICATED AIRSPEED (KTS.) |
|-----------|---------------------------------|------------------------------|
|-----------|---------------------------------|------------------------------|

| | | |
|----------------|-----|----|
| NORMAL TAKEOFF | 493 | 83 |
|----------------|-----|----|

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN THE HELICOPTER PASSED OVER CLC MICROPHONE POSITION

LEVEL FLYOVERS 876



INDICATED AIRSPEED = 120 MPH.

876 SUMMARY SHEET (6/05-6/06/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* 1000 FT. LEVEL FLYOVER AT 120 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 68.5 | 72.9 | 72.7 | 72.3 | 72.4 | 71.0 | 66.5 |
| N | 6 | 6 | 6 | 11 | 6 | 6 | 6 |
| S.D. | 1.0 | .3 | .9 | 1.3 | .9 | .9 | .9 |
| 90% CI | .8 | .3 | .8 | .7 | .7 | .7 | .7 |

974 SUMMARY SHEET (6/05-6/06/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE) (RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VV, 74 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 63.5 | 70.1 | 77.0 | 88.1 | 80.6 | 74.7 | -- |
| N | 7 | 8 | 8 | 7 | 8 | 8 | -- |
| S.D. | 1.2 | .7 | 1.2 | 1.7 | 2.0 | 1.3 | -- |
| 90% CI | .9 | .4 | .8 | 1.2 | 1.3 | .8 | -- |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|-----|------|------|----|
| AVERAGE | 62.4 | 68.9 | 72.8 | 74 | 73.7 | 70.7 | -- |
| N | 6 | 6 | 7 | 7 | 6 | 6 | -- |
| S.D. | .9 | .5 | .7 | 1.0 | .7 | 1.0 | -- |
| 90% CI | .7 | .4 | .5 | .7 | .6 | .9 | -- |

* NOISE ABATEMENT APPROACH (9.5 DEG. TARGET, 60 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 62.3 | 69.5 | 75.1 | 82.1 | 79.0 | 75.1 | -- |
| N | 6 | 6 | 5 | 6 | 6 | 6 | -- |
| S.D. | 1.6 | .5 | .8 | 1.7 | 1.2 | 2.1 | -- |
| 90% CI | 1.3 | .4 | .8 | 1.4 | 1.0 | 1.8 | -- |

* NOISE ABATEMENT APPROACH (12 DEG. TARGET, 60 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 61.8 | 68.1 | 71.4 | 73.9 | 74.0 | 71.1 | -- |
| N | 4 | 4 | 4 | 4 | 4 | 4 | -- |
| S.D. | 1.1 | .9 | 1.2 | 1.9 | 1.2 | 1.8 | -- |
| 90% CI | 1.3 | 1.0 | 1.4 | 2.2 | 1.4 | 2.1 | -- |

S76 SUMMARY SHEET (6/05-6/06/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* NOISE ABATEMENT APPROACH (3 DEG. TARGET, 60 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 64.3 | 70.9 | 77.5 | 88.8 | 78.8 | 70.6 | -- |
| N | 5 | 5 | 3 | 5 | 5 | 5 | -- |
| S.D. | 1.2 | .8 | .9 | 1.9 | 1.0 | .6 | -- |
| 90% CI | 1.2 | .8 | 1.6 | 1.8 | 1.0 | .6 | -- |

* NOISE ABATEMENT APPROACH (3 DEG. TARGET, 120 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 67.7 | 75.1 | 80.9 | 85.0 | 79.2 | 72.6 | -- |
| N | 5 | 4 | 5 | 5 | 5 | 5 | -- |
| S.D. | .4 | .4 | .2 | 1.4 | .6 | .6 | -- |
| 90% CI | .4 | .4 | .2 | 1.3 | .5 | .6 | -- |

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|----|------|------|------|------|------|------|
| AVERAGE | -- | 74.5 | 77.6 | 75.1 | 77.6 | 73.7 | 67.1 |
| N | -- | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | -- | 1.4 | 1.1 | .8 | 2.0 | 1.3 | 1.6 |
| 90% CI | -- | 1.2 | .9 | .6 | 1.7 | 1.1 | 1.3 |

* 500 FT. LEVEL FLYOVER AT 120KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 70.4 | 75.9 | 78.8 | 78.7 | 78.9 | 75.2 | 68.0 |
| N | 7 | 7 | 7 | 14 | 7 | 7 | 7 |
| S.D. | 1.3 | .7 | .6 | 1.1 | 1.0 | 1.2 | 1.0 |
| 90% CI | .9 | .5 | .4 | .5 | .7 | .9 | .8 |

876 SUMMARY SHEET (06/06/84)

A-WEIGHTED SOUND LEVEL (DB)

(INSIDE OF TURN) (OUTSIDE OF TURN)

2000' 1000' 500' CL-C 500' 1000' 2000'

(RIGHT SIDE)

(RIGHT SIDE)

§ 15 DEG. BANK ANGLE TURN, 65 KTS. §

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 61.9 | 68.7 | 74.5 | 77.7 | 73.9 | 69.2 | -- |
| N | 4 | 4 | 4 | 7 | 4 | 3 | -- |
| S.D. | .5 | .5 | 1.3 | 4.3 | 2.9 | 1.3 | -- |
| 90% CI | .6 | .6 | 1.6 | 3.2 | 3.4 | 2.1 | -- |

§ 30 DEG. BANK ANGLE TURN, 65 KTS.

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 64.4 | 72.2 | 77.2 | 78.8 | 76.1 | 70.6 | -- |
| N | 4 | 4 | 4 | 8 | 4 | 4 | -- |
| S.D. | 1.6 | 1 | 1.5 | 2.7 | 4.4 | 3.9 | -- |
| 1.9 | 1.1 | 1.8 | 1.8 | 1.8 | 5.2 | 4.6 | -- |

(LEFT SIDE)

(LEFT SIDE)

§ 15 DEG. BANK ANGLE TURN, 65 KTS.

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 63.6 | 71.0 | 78.2 | 77.7 | 78.1 | 74.0 | -- |
| N | 4 | 4 | 3 | 7 | 4 | 3 | -- |
| S.D. | .4 | 1.6 | 1.4 | 4.3 | 4.7 | 2.2 | -- |
| 90% CI | .4 | 1.8 | 2.4 | 3.2 | 5.8 | 3.7 | -- |

§ 30 DEG. BANK ANGLE TURN, 65 KTS.

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 64.8 | 70.4 | 75.3 | 78.8 | 77.6 | 74.2 | -- |
| N | 4 | 4 | 4 | 8 | 4 | 4 | -- |
| S.D. | .8 | 1.3 | 1.7 | 2.7 | 2.7 | 2.3 | -- |
| 90% CI | .9 | 1.8 | 2 | 1.8 | 3.1 | 2.7 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY 876

TEST DATE: 6/04/84

OPERATION : LEVEL FLYOVER (1000' @ 120 KTS)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|-----------|-------------|------------|-----------|-------|--------------|------------|------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' EAST | 1000' EAST | 2000' EAST |
| 846 | 67.80 | 72.50 | 73.00 | 72.60 | ----- | ----- | ----- |
| 847 | ----- | ----- | ----- | 74.10 | 72.10 | 71.50 | 65.50 |
| 848 | 69.30 | 72.80 | 71.30 | 71.80 | ----- | ----- | ----- |
| 849 | ----- | ----- | ----- | 73.20 | 72.90 | 71.10 | 66.60 |
| 850 | 68.40 | 72.80 | 74.20 | 75.00 | ----- | ----- | ----- |
| 851 | ----- | ----- | ----- | -- | 73.60 | 71.00 | 66.30 |
| 852 | 69.30 | 73.50 | 72.50 | 71.90 | ----- | ----- | ----- |
| 853 | ----- | ----- | ----- | 70.70 | 71.60 | 70.20 | 65.20 |
| 854 | 67.00 | 72.70 | 72.80 | 71.90 | ----- | ----- | ----- |
| 855 | ----- | ----- | ----- | 71.40 | 72.80 | 72.30 | 66.10 |
| 856 | 69.20 | 72.80 | 72.40 | 71.40 | ----- | ----- | ----- |
| 857 | ----- | ----- | ----- | 71.60 | 71.20 | 70.00 | 67.50 |
| AVERAGE | 68.50 | 72.85 | 72.70 | 72.33 | 72.37 | 71.02 | 66.50 |
| STD. DEV. | 0.98 | 0.34 | 0.94 | 1.29 | 0.90 | 0.85 | 0.88 |
| 90% C.I. | 0.78 | 0.28 | 0.78 | 0.70 | 0.74 | 0.70 | 0.73 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKGRSKY 976

TEST DATE: 6/05/84

OPERATION : 6 DEGREE APPROACH AT VY, 74 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A1 | 62.90 | 70.10 | 78.20 | 87.80 | 82.40 | 74.70 | -- |
| A2 | 64.60 | 69.70 | 77.20 | 88.80 | 78.60 | 75.10 | -- |
| A3 | 64.90 | 71.20 | 78.80 | 90.90 | 76.60 | 71.80 | -- |
| A4 | 63.70 | 69.30 | 77.40 | 89.10 | 80.30 | 75.70 | -- |
| A5 | 62.80 | 69.50 | 76.20 | -- | 81.80 | 74.30 | -- |
| A6 | 61.60 | 70.10 | 77.30 | 86.20 | 81.90 | 75.00 | -- |
| A7 | -- | 70.90 | 75.70 | 87.50 | 81.10 | 75.80 | -- |
| A8 | 64.30 | 70.10 | 75.30 | 86.30 | 81.80 | 74.90 | -- |
| AVERAGE | 63.54 | 70.11 | 77.01 | 88.09 | 80.56 | 74.66 | -- |
| STD. DEV. | 1.18 | 0.66 | 1.21 | 1.66 | 2.00 | 1.26 | -- |
| 90% C. I. | 0.86 | 0.44 | 0.81 | 1.22 | 1.34 | 0.84 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/05/84

OPERATION : LEVEL FLYOVER (500' @ 120 KTS)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' EAST | 1000' EAST | 2000' EAST |
| Q100 | ----- | ----- | ----- | 79.30 | 79.80 | 76.00 | 68.60 |
| Q101 | 72.60 | 77.00 | 79.20 | 79.30 | ----- | ----- | ----- |
| Q102 | ----- | ----- | ----- | 81.00 | 78.20 | 76.20 | 68.50 |
| Q103 | 69.30 | 75.70 | 78.90 | 80.10 | ----- | ----- | ----- |
| Q104 | ----- | ----- | ----- | 79.20 | 79.40 | 75.90 | 67.60 |
| Q105 | 70.50 | 75.50 | 78.70 | 78.80 | ----- | ----- | ----- |
| Q106 | ----- | ----- | ----- | 78.30 | 79.30 | 74.00 | 69.30 |
| Q107 | 70.90 | 76.00 | 78.20 | 78.20 | ----- | ----- | ----- |
| Q108 | ----- | ----- | ----- | 77.40 | 77.50 | 75.40 | 68.80 |
| Q109 | 70.20 | 76.50 | 79.80 | 78.20 | ----- | ----- | ----- |
| Q110 | ----- | ----- | ----- | 79.20 | 80.20 | 76.00 | 66.90 |
| Q111 | 71.00 | 75.00 | 78.00 | 78.50 | ----- | ----- | ----- |
| Q112 | ----- | ----- | ----- | 77.20 | 78.20 | 73.00 | 66.50 |
| Q113 | 68.60 | 75.60 | 79.10 | 77.10 | ----- | ----- | ----- |
| AVERAGE | 70.44 | 75.90 | 78.84 | 78.70 | 78.94 | 75.21 | 68.03 |
| STD. DEV. | 1.29 | 0.67 | 0.60 | 1.10 | 0.99 | 1.23 | 1.08 |
| 90% C.I. | 0.94 | 0.49 | 0.44 | 0.53 | 0.72 | 0.90 | 0.77 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY 876

TEST DATE: 6/06/84

OPERATION : NOISE ABATEMENT APPROACH (9.5 DEG. TARGET, 60 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D9 | 64.80 | 70.20 | 74.90 | 80.60 | 79.90 | 76.00 | -- |
| D10 | 63.60 | 69.50 | 74.80 | 80.50 | 77.60 | 71.50 | -- |
| D11 | -- | -- | -- | -- | -- | -- | -- |
| D12 | 61.30 | 69.00 | 76.50 | 85.20 | 79.80 | 77.30 | -- |
| D13 | 61.30 | 69.90 | 75.00 | 81.90 | 80.20 | 76.70 | -- |
| D14 | 60.80 | 69.10 | 74.30 | 81.70 | 77.40 | 74.00 | -- |
| D15 | 61.70 | 69.20 | -- | 82.80 | 78.80 | 75.30 | -- |
| AVERAGE | 62.25 | 69.48 | 75.10 | 82.12 | 78.95 | 75.13 | -- |
| STD. DEV. | 1.58 | 0.48 | 0.83 | 1.74 | 1.22 | 2.12 | -- |
| 90% C.I. | 1.31 | 0.40 | 0.79 | 1.43 | 1.01 | 1.75 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/06/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | CL-C | 500' WEST | 1000' WEST | 2000' WEST |
| B17 | 62.10 | 69.70 | 74.00 | 75.70 | 74.20 | 70.00 | -- |
| B19 | -- | 68.60 | 73.40 | 73.90 | 74.40 | 70.00 | -- |
| B21 | 61.30 | -- | 73.10 | 73.00 | 72.50 | 70.00 | -- |
| B23 | 63.00 | 68.70 | 72.20 | 74.80 | -- | -- | -- |
| B25 | 63.20 | 68.40 | 72.50 | 74.30 | 73.90 | 72.00 | -- |
| B27 | 61.40 | 69.00 | 72.20 | 72.90 | 73.50 | 70.00 | -- |
| B29 | 63.20 | 68.90 | 72.50 | 73.60 | 73.60 | 72.00 | -- |
| AVERAGE | 62.37 | 68.88 | 72.84 | 74.03 | 73.68 | 70.67 | -- |
| STD. DEV. | 0.89 | 0.45 | 0.68 | 1.00 | 0.67 | 1.03 | -- |
| 90% C.I. | 0.73 | 0.37 | 0.50 | 0.73 | 0.56 | 0.85 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/06/84

OPERATION : NORMAL TAKEOFF

| EVENT | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|-----------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | | 500' | 1000' | 2000' |
| NO. | WEST | WEST | WEST | | EAST | EAST | EAST |
| C18 | -- | 75.70 | 77.80 | 74.70 | 77.60 | 73.80 | 68.40 |
| C20 | -- | 74.20 | 77.50 | 74.70 | 77.50 | 73.40 | 67.50 |
| C22 | -- | 73.80 | 78.40 | 74.70 | 76.50 | 73.90 | 65.30 |
| C24 | -- | 76.50 | 78.80 | 76.20 | 80.60 | 75.90 | 68.70 |
| C26 | -- | 74.10 | 77.40 | 76.00 | 78.50 | 73.30 | 67.60 |
| C28 | -- | 72.60 | 75.60 | 74.40 | 74.60 | 71.90 | 64.90 |
| AVERAGE | -- | 74.48 | 77.58 | 75.12 | 77.55 | 73.70 | 67.07 |
| STD. DEV. | -- | 1.40 | 1.11 | 0.77 | 2.00 | 1.29 | 1.60 |
| 90% C.I. | -- | 1.15 | 0.92 | 0.64 | 1.65 | 1.07 | 1.32 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/06/84

OPERATION : NOISE ABATEMENT APPROACH (12 DEG.TARGET, 60 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D30 | 63.00 | 68.10 | 70.70 | 74.90 | 75.70 | 73.00 | -- |
| D31 | 62.40 | 69.00 | 71.50 | 74.90 | 73.90 | 70.50 | -- |
| D32 | 60.50 | 66.90 | 70.40 | 71.10 | 73.20 | 69.00 | -- |
| D33 | 61.40 | 68.20 | 73.00 | 74.80 | 73.20 | 72.00 | -- |
| AVERAGE | 61.83 | 68.05 | 71.40 | 73.93 | 74.00 | 71.13 | -- |
| STD. DEV. | 1.10 | 0.87 | 1.16 | 1.88 | 1.18 | 1.75 | -- |
| 90% C.I. | 1.30 | 1.02 | 1.37 | 2.21 | 1.39 | 2.06 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/06/84

OPERATION : NOISE ABATEMENT APPROACH (3 DEG. TARGET, 60 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | CL-C | 500' WEST | 1000' WEST | 2000' WEST |
| D34 | 63.40 | 70.80 | 78.50 | 85.40 | 77.60 | 71.80 | -- |
| D35 | 64.00 | 70.30 | 76.70 | 89.60 | 78.80 | 70.20 | -- |
| D36 | 63.10 | 70.20 | -- | 89.70 | 78.20 | 70.00 | -- |
| D37 | 66.10 | 70.80 | 77.30 | 89.60 | 78.90 | 70.60 | -- |
| D38 | 64.90 | 72.20 | -- | 89.80 | 80.30 | 70.80 | -- |
| AVERAGE | 64.3 | 70.86 | 77.50 | 88.82 | 78.76 | 70.86 | -- |
| STD. DEV. | 1.22 | 0.80 | 0.92 | 1.91 | 1.01 | 0.88 | -- |
| 90% C.I. | 1.16 | 0.76 | 1.88 | 1.82 | 0.96 | 0.88 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/06/84

OPERATION : NOISE ABATEMENT APPROACH (3 DEG. TARGET, 120 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CLIC | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D39 | 67.90 | -- | 81.20 | 83.70 | 79.00 | 78.00 | -- |
| D40 | 67.80 | 78.00 | 80.80 | 85.90 | 78.70 | 78.60 | -- |
| D41 | 67.00 | 74.70 | 80.90 | 87.00 | 79.70 | 78.70 | -- |
| D42 | 67.80 | 78.20 | 80.60 | 84.00 | 78.90 | 78.00 | -- |
| D43 | 68.20 | 78.60 | 80.80 | 84.80 | 78.70 | 78.80 | -- |
| AVERAGE | 67.74 | 78.13 | 80.86 | 85.03 | 79.16 | 78.56 | -- |
| STD. DEV. | 0.44 | 0.38 | 0.23 | 1.59 | 0.88 | 0.62 | -- |
| 90% C.I. | 0.42 | 0.44 | 0.21 | 1.38 | 0.82 | 0.59 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY 576

TEST DATE: 6/06/64

OPERATION: 15 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (RIGHT SIDE) | | | CL-C | OUTSIDE OF TURN (RIGHT SIDE) | | |
|-----------|--------------------------------|---------------|--------------|-------|---------------------------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| 044 | 62.60 | 69.40 | 72.70 | 73.80 | ----- | ----- | ----- |
| 045 | ----- | ----- | ----- | -- | 77.00 | -- | -- |
| 046 | 61.70 | 68.20 | 75.20 | 82.00 | ----- | ----- | ----- |
| 047 | ----- | ----- | ----- | 74.70 | 71.20 | 69.00 | -- |
| 048 | 61.40 | 68.80 | 74.30 | 74.60 | ----- | ----- | ----- |
| 049 | ----- | ----- | ----- | 81.60 | 78.70 | 70.80 | -- |
| 050 | 61.80 | 68.40 | 78.70 | 83.30 | ----- | ----- | ----- |
| 051 | ----- | ----- | ----- | 74.10 | 71.60 | 68.00 | -- |
| AVERAGE | 61.88 | 68.70 | 74.48 | 77.73 | 73.88 | 69.17 | -- |
| STD. DEV. | 0.81 | 0.83 | 1.32 | 4.32 | 2.91 | 1.26 | -- |
| 90% C.I. | 0.60 | 0.62 | 1.88 | 3.17 | 3.42 | 2.12 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BIKORSKY 976

TEST DATE: 6/06/84

OPERATION : 15 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (LEFT SIDE) | | | CL-C | OUTSIDE OF TURN (LEFT SIDE) | | |
|--------------|-------------------------------|---------------|--------------|-------|--------------------------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| 044 | ----- | ----- | ----- | 73.80 | 74.90 | -- | -- |
| 045 | 63.70 | 68.70 | 73.70 | -- | ----- | ----- | ----- |
| 046 | ----- | ----- | ----- | 82.00 | 82.70 | 75.50 | -- |
| 047 | 62.90 | 71.50 | 76.50 | 74.70 | ----- | ----- | ----- |
| 048 | ----- | ----- | ----- | 74.60 | 73.20 | 71.20 | -- |
| 049 | 63.50 | 72.20 | 75.50 | 81.60 | ----- | ----- | ----- |
| 050 | ----- | ----- | ----- | 83.30 | 81.40 | 75.30 | -- |
| 051 | 64.30 | 71.50 | -- | 74.10 | ----- | ----- | ----- |
| AVERAGE | 63.60 | 70.98 | 75.23 | 77.73 | 78.05 | 74.00 | -- |
| STD. DEV. | 0.41 | 1.55 | 1.42 | 4.32 | 4.70 | 2.18 | -- |
| 90% C. I. | 0.48 | 1.82 | 2.39 | 3.17 | 5.52 | 3.68 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: SIKORSKY S76

TEST DATE: 6/06/84

OPERATION : 30 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (RIGHT SIDE) | | | CL-C | OUTSIDE OF TURN (RIGHT SIDE) | | |
|-----------|--------------------------------|---------------|--------------|-------|---------------------------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| H52 | 66.00 | 72.50 | 75.50 | 80.30 | ----- | ----- | ----- |
| H53 | ----- | ----- | ----- | 76.50 | 72.90 | 69.00 | -- |
| H54 | 62.30 | 70.80 | 76.40 | 76.80 | ----- | ----- | ----- |
| H55 | ----- | ----- | ----- | 77.80 | 74.50 | 68.00 | -- |
| H56 | 65.10 | 72.80 | 78.60 | 82.50 | ----- | ----- | ----- |
| H57 | ----- | ----- | ----- | 78.50 | 74.40 | 69.00 | -- |
| H58 | 64.10 | 72.80 | 78.30 | 75.30 | ----- | ----- | ----- |
| H59 | ----- | ----- | ----- | 82.40 | 82.60 | 76.50 | -- |
| AVERAGE | 64.38 | 72.23 | 77.20 | 78.76 | 76.10 | 70.63 | -- |
| STD. DEV. | 1.59 | 0.96 | 1.49 | 2.71 | 4.39 | 3.94 | -- |
| 90% C.I. | 1.86 | 1.13 | 1.76 | 1.81 | 5.16 | 4.64 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BIKORSKY B76

TEST DATE: 6/06/84

OPERATION : 30 DEG. BANK ANGLE TURN AT 65 KTS.

INSIDE OF TURN
(LEFT SIDE)

OUTSIDE OF TURN
(LEFT SIDE)

| EVENT NO. | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
|--------------|-------|-------|-------|-------|-------|-------|-------|
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| H52 | ----- | ----- | ----- | 80.30 | 79.10 | 76.00 | -- |
| H53 | 66.10 | 72.30 | 77.80 | 76.50 | ----- | ----- | ----- |
| H54 | ----- | ----- | ----- | 76.80 | 75.90 | 74.00 | -- |
| H55 | 63.90 | 69.30 | 74.80 | 77.80 | ----- | ----- | ----- |
| H56 | ----- | ----- | ----- | 82.50 | 80.60 | 78.80 | -- |
| H57 | 64.70 | 70.10 | 74.80 | 78.50 | ----- | ----- | ----- |
| H58 | ----- | ----- | ----- | 78.30 | 74.90 | 71.00 | -- |
| H59 | 64.40 | 70.00 | 73.80 | 82.40 | ----- | ----- | ----- |
| AVERAGE | 64.78 | 70.43 | 75.30 | 78.76 | 77.63 | 74.20 | -- |
| STD. DEV. | 0.80 | 1.30 | 1.73 | 2.71 | 2.67 | 2.32 | -- |
| 90% C.I. | 0.94 | 1.53 | 2.04 | 1.81 | 3.14 | 2.72 | -- |

RADAR TRACKING DATA

THIS SECTION OF THE APPENDIX CONTAINS THE HELICOPTER POSITION DATA AND TRACKING PLOTS DERIVED FROM THE FAN'S PORTABLE TRACKING RADAR SYSTEM. THE POSITION DATA LISTED THE CLOSEST POINT OF APPROACH (CPA), TIME OF CPA, ELEVATION ANGLE, RATE OF CLIMB OR DESCENT, THE CLIMB OR DESCENT ANGLE, AND GROUND SPEED FOR ALL FLIGHT CONDITIONS. TRACKING PLOTS OF THE ACTUAL FLIGHT PROFILE PLOTTED ARE PROVIDED FOR EACH FLIGHT CONDITION.

SIKORSKY 676
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 08/05/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|-----|--------|------|------------|--------|-------|------|
| SIX DEG. APPROACH AT VY, 74 KTS. | | | | | | | |
| 1 | APP | 369.9 | 78.3 | 13:26:08.6 | -637.0 | -6.0 | 59.6 |
| 2 | APP | 368.8 | 81.6 | 13:33:52.5 | -551.3 | -4.8 | 64.0 |
| 3 | APP | 385.7 | 74.1 | 13:38:08.0 | -584.4 | -4.6 | 69.0 |
| 4 | APP | 366.8 | 85.4 | 13:44:23.0 | -475.7 | -4.1 | 66.0 |
| 5 | APP | 424.0 | 75.4 | 13:49:58.0 | -948.0 | -7.2 | 74.1 |
| 6 | APP | 378.8 | 66.5 | 13:54:27.0 | -951.3 | -8.1 | 61.4 |
| 7 | APP | 376.8 | 84.8 | 13:59:05.5 | -610.0 | -4.3 | 68.8 |
| 8 | APP | 368.0 | 81.1 | 14:03:03.5 | -796.7 | -6.5 | 68.7 |

NOISE ABATEMENT APPROACH (9.5 DEG. TARGET, 60 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|------|
| 9 | APP | 526.7 | 74.6 | 14:21:45.0 | -803.4 | -8.2 | 54.0 |
| 10 | APP | 551.8 | 75.5 | 14:29:24.4 | -726.0 | -8.1 | 50.1 |
| 11 | APP | 615.7 | 65.1 | 14:39:41.1 | -814.7 | -8.6 | 53.1 |
| 12 | APP | 538.6 | 80.2 | 14:38:24.0 | -755.8 | -8.7 | 48.7 |
| 13 | APP | 530.6 | 78.7 | 14:40:10.5 | -951.4 | -10.4 | 50.0 |
| 14 | APP | 557.5 | 79.5 | 14:47:21.6 | -1212.3 | -13.0 | 48.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

SIKORSKY S76
POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE: 06/06/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------|-----|--------|------|------------|---------|-------|------|
| NORMAL APPROACH | | | | | | | |
| 17 | APP | 547.9 | 73.4 | 10:18:17.6 | -953.2 | -8.3 | 64.7 |
| 19 | APP | 570.4 | 80.7 | 10:22:41.1 | -1078.6 | -9.0 | 67.4 |
| 21 | APP | 604.4 | 78.6 | 10:27:00.0 | -1117.1 | -8.7 | 71.0 |
| 23 | APP | 723.4 | 78.1 | 10:32:37.0 | -1382.2 | -10.5 | 73.0 |
| 25 | APP | 594.2 | 76.4 | 10:36:47.6 | -1487.1 | -11.7 | 70.8 |
| 27 | APP | 580.1 | 74.3 | 10:41:09.6 | -1298.3 | -11.1 | 65.2 |
| 29 | APP | 616.5 | 84.5 | 10:45:31.0 | -1312.7 | -11.0 | 66.4 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|---------|------------|--------|-----|------|
| 18 | DEP | 515.3 | 84.2 | 10:20:11.8 | 1287.8 | 9.3 | 77.8 |
| 20 | DEP | 493.7 | 72.3 | 10:24:23.4 | 1011.2 | 7.0 | 81.2 |
| 22 | DEP | 537.0 | 86.5 | 10:28:42.1 | 1125.7 | 7.0 | 80.5 |
| 24 | DEP | 509.3 | 80.1 | 10:34:15.3 | 1124.4 | 7.3 | 86.4 |
| 26 | DEP | 453.3 | 72.8 | 10:38:22.7 | 943.4 | 6.0 | 77.5 |
| 28 | | | NO DATA | | | | |

NOISE ABATEMENT APPROACH (12 DEG. TARGET, 60 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|------|
| 30 | APP | 731.4 | 71.7 | 11:01:09.4 | -1576.7 | -14.0 | 58.6 |
| 31 | APP | 714.5 | 73.9 | 11:05:31.4 | -1238.3 | -12.0 | 57.7 |
| 32 | APP | 672.7 | 71.3 | 11:09:45.0 | -1200.5 | -12.6 | 52.8 |
| 33 | APP | 673.5 | 72.6 | 11:14:15.8 | -1053.0 | -10.3 | 57.0 |

NOISE ABATEMENT APPROACH (3 DEG. TARGET, 60 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 34 | APP | 187.1 | 79.1 | 11:27:41.0 | -338.2 | -3.4 | 56.7 |
| 35 | APP | 165.1 | 85.0 | 11:32:23.5 | -361.6 | -3.3 | 61.7 |
| 36 | APP | 190.3 | 86.0 | 11:36:58.8 | -466.8 | -3.0 | 68.4 |
| 37 | APP | 190.3 | 87.3 | 11:41:16.7 | -337.1 | -3.3 | 57.0 |
| 38 | APP | 181.3 | 89.1 | 11:45:40.3 | -203.6 | -1.0 | 59.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

SIKORSKY S76
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE: 06/06/08

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

NOISE ABATEMENT APPROACH (3 DEG. TARGET, 120 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|-------|
| 30 | APP | 185.2 | 84.9 | 12:01:10.6 | -337.8 | -1.6 | 120.7 |
| 40 | APP | 150.4 | 85.4 | 12:04:31.3 | -785.0 | -3.6 | 121.5 |
| 41 | APP | 195.5 | 86.0 | 12:08:04.8 | -7.8 | 0.0 | 111.8 |
| 42 | APP | 190.3 | 87.0 | 12:12:18.6 | -848.2 | -3.0 | 121.6 |
| 43 | APP | 200.6 | 89.1 | 12:15:52.1 | -330.0 | -1.4 | 135.8 |
| 44 | APP | 433.8 | 89.8 | 12:37:01.6 | 65.3 | 0.7 | 58.6 |

15 DEGREE BANK TURN AT 65 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|------|
| 45 | F/O | 436.7 | 85.2 | 12:39:07.0 | 500.1 | 4.4 | 64.3 |
| 46 | F/O | 461.4 | 85.5 | 12:42:24.4 | -445.5 | -4.3 | 58.2 |
| 47 | F/O | 526.9 | 68.5 | 12:44:24.7 | -14.7 | -0.1 | 77.1 |
| 48 | F/O | 519.9 | 73.7 | 12:46:41.2 | -2814.7 | -19.7 | 77.5 |
| 49 | F/O | 392.9 | 79.1 | 12:48:50.0 | -341.8 | -3.0 | 63.4 |
| 50 | F/O | 471.4 | 80.7 | 12:51:15.8 | 520.0 | 0.4 | 71.4 |
| 51 | F/O | 510.0 | 74.6 | 12:53:25.9 | 128.2 | 1.0 | 69.6 |

30 DEGREE BANK TURN AT 65 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 52 | F/O | 437.6 | 81.4 | 12:55:37.3 | 122.0 | 1.0 | 67.2 |
| 53 | F/O | 480.1 | 65.0 | 12:57:35.2 | -147.2 | -1.3 | 66.2 |
| 54 | F/O | 459.8 | 74.7 | 12:59:40.3 | 18.2 | 0.2 | 65.3 |
| 55 | F/O | 527.6 | 70.3 | 13:01:56.2 | 221.4 | 1.0 | 66.8 |
| 56 | F/O | 463.3 | 76.2 | 13:04:00.6 | 105.3 | 0.0 | 64.0 |
| 57 | F/O | 466.6 | 80.3 | 13:05:55.6 | -19.3 | -0.2 | 64.0 |
| 58 | F/O | 475.0 | 74.6 | 13:08:08.4 | 48.4 | 0.4 | 63.8 |
| 59 | F/O | 473.9 | 84.8 | 13:09:56.6 | -299.7 | -2.5 | 69.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

SIKORSKY S76
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 500 FT. EAST

DATE: 06/05/84

FAR/AE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|----------------------------------|--------|-------|----------|------------|---------|------|------|
| SIX DEG. APPROACH AT VY, 74 KTS. | | | | | | | |
| 1 | APP | 524.4 | 41.3 | 13:28:08.4 | -645.4 | -6.0 | 69.3 |
| 2 | APP | 550.1 | 40.0 | 13:33:58.3 | -588.1 | -5.1 | 64.0 |
| 3 | APP | 550.0 | 42.7 | 13:38:08.0 | -584.3 | -4.0 | 69.0 |
| 4 | APP | 587.5 | 38.6 | 13:44:23.7 | -505.7 | -4.3 | 68.4 |
| 5 | APP | 651.5 | 41.4 | 13:49:58.1 | -1031.5 | -8.2 | 70.5 |
| 6 | APP | 540.0 | 42.5 | 13:54:28.4 | -559.6 | -7.3 | 67.3 |
| 7 | APP | 593.2 | 39.6 | 13:59:05.3 | -535.5 | -4.4 | 68.3 |
| 8 | APP | 600.8 | 37.2 | 14:03:03.8 | -794.7 | -6.5 | 68.7 |

NOISE ABATEMENT APPROACH (9.5 DEG. TARGET, 60 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|------|
| 9 | APP | 685.7 | 49.3 | 14:21:44.6 | -708.7 | -7.2 | 55.2 |
| 10 | APP | 708.5 | 49.7 | 14:26:24.4 | -728.1 | -8.1 | 50.1 |
| 11 | APP | 641.0 | 64.0 | 14:30:40.4 | -862.0 | -9.0 | 54.0 |
| 12 | APP | 717.3 | 48.6 | 14:35:28.0 | -858.8 | -10.3 | 48.8 |
| 13 | APP | 728.8 | 45.9 | 14:40:10.0 | -971.3 | -10.7 | 50.0 |
| 14 | APP | 768.8 | 51.0 | 14:47:21.4 | -1109.1 | -13.3 | 50.1 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

SIKORSKY S76

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 106/06/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--|-----|--------|---------|------------|---------|-------|------|
| NORMAL APPROACH | | | | | | | |
| 17 | APP | 654.3 | 52.7 | 10:18:17.0 | -990.2 | -8.5 | 65.3 |
| 19 | APP | 713.5 | 52.0 | 10:22:41.7 | -1145.6 | -9.8 | 65.1 |
| 21 | APP | 720.0 | 56.4 | 10:26:50.4 | -1210.2 | -9.7 | 72.2 |
| 23 | APP | 811.8 | 58.0 | 10:33:37.0 | -1552.2 | -12.1 | 71.4 |
| 25 | APP | 773.0 | 48.5 | 10:38:47.6 | -1486.8 | -11.7 | 70.8 |
| 27 | APP | 750.2 | 49.4 | 10:41:09.6 | -1298.3 | -11.1 | 65.2 |
| 29 | APP | 784.5 | 49.7 | 10:45:31.8 | -1420.8 | -12.0 | 66.4 |
| NORMAL TAKEOFF | | | | | | | |
| 18 | DEP | 723.1 | 43.8 | 10:20:11.0 | 1306.5 | 9.4 | 77.5 |
| 20 | DEP | 731.0 | 42.6 | 10:24:24.5 | 1136.8 | 7.7 | 82.6 |
| 22 | DEP | 744.9 | 46.3 | 10:28:42.2 | 1110.5 | 7.8 | 80.4 |
| 24 | DEP | 718.4 | 46.5 | 10:34:16.0 | 1080.8 | 7.1 | 86.1 |
| 26 | DEP | 668.1 | 43.1 | 10:38:23.8 | 1098.5 | 7.3 | 84.6 |
| 28 | | | NO DATA | | | | |
| NOISE ABATEMENT APPROACH (12 DEG. TARGET, 60 KTS.) | | | | | | | |
| 30 | APP | 805.8 | 63.1 | 11:01:08.0 | -1212.6 | -11.3 | 60.1 |
| 31 | APP | 763.0 | 64.5 | 11:05:31.4 | -1238.3 | -12.0 | 57.7 |
| 32 | APP | 811.5 | 52.0 | 11:09:45.0 | -1200.2 | -12.0 | 52.0 |
| 33 | APP | 734.6 | 61.5 | 11:14:15.7 | -1030.2 | -10.2 | 57.0 |
| NOISE ABATEMENT APPROACH (3 DEG. TARGET, 60 KTS.) | | | | | | | |
| 34 | APP | 539.5 | 20.3 | 11:27:40.0 | -344.4 | -3.4 | 56.5 |
| 35 | APP | 513.3 | 18.0 | 11:32:23.5 | -361.4 | -3.3 | 61.7 |
| 36 | APP | 526.2 | 21.4 | 11:36:58.8 | -466.8 | -3.0 | 68.4 |
| 37 | APP | 525.6 | 21.4 | 11:41:16.8 | -467.6 | -4.6 | 66.8 |
| 38 | APP | 525.6 | 20.4 | 11:45:40.0 | -41.0 | -0.4 | 60.6 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

SIKORSKY S76
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE: 06/06/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--|-----|--------|------|------------|--------|-------|-------|
| NOISE ABATEMENT APPROACH (3 DEG. TARGET, 120 KTS.) | | | | | | | |
| 39 | APP | 542.7 | 20.1 | 12:01:10.6 | -337.7 | -1.6 | 120.7 |
| 40 | APP | 521.2 | 16.9 | 12:04:31.3 | -785.0 | -2.6 | 121.5 |
| 41 | APP | 545.9 | 21.1 | 12:08:04.6 | -8.5 | 0.0 | 111.1 |
| 42 | APP | 525.4 | 21.4 | 12:12:18.4 | -816.0 | -3.7 | 123.0 |
| 43 | APP | 534.2 | 23.3 | 12:15:51.9 | -256.8 | -1.1 | 136.7 |
| 44 | APP | 639.5 | 42.1 | 12:36:56.9 | 1186.5 | 4.0 | 136.9 |

15 DEGREE BANK TURN AT 65 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|-------|
| 45 | F/O | 650.1 | 42.1 | 12:39:06.7 | 464.2 | 4.1 | 63.3 |
| 46 | F/O | 612.9 | 43.1 | 12:42:20.5 | 2054.6 | -7.2 | 150.5 |
| 47 | F/O | 582.9 | 57.7 | 12:44:24.7 | -14.9 | -0.1 | 77.1 |
| 48 | F/O | 682.9 | 43.7 | 12:46:42.4 | -1235.1 | -10.2 | 67.7 |
| 49 | F/O | 572.2 | 42.6 | 12:48:59.7 | -206.3 | -1.0 | 62.6 |
| 50 | F/O | 684.7 | 43.7 | 12:51:15.3 | -44.7 | -0.3 | 74.1 |
| 51 | F/O | 614.9 | 54.1 | 12:53:26.5 | 32.2 | 0.3 | 7.1 |

30 DEGREE BANK TURN AT 65 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 52 | F/O | 595.2 | 46.7 | 12:55:37.0 | 18.7 | 0.2 | 65.6 |
| 53 | F/O | 519.6 | 56.4 | 12:57:36.5 | -76.8 | -0.7 | 62.0 |
| 54 | F/O | 575.9 | 50.6 | 12:59:40.8 | 13.2 | 0.1 | 66.3 |
| 55 | F/O | 596.3 | 55.7 | 13:01:56.0 | 304.2 | 2.6 | 66.4 |
| 56 | F/O | 565.7 | 51.9 | 13:03:56.3 | -454.0 | -2.6 | 90.6 |
| 57 | F/O | 626.4 | 46.7 | 13:05:56.1 | -41.8 | -0.2 | 67.6 |
| 58 | F/O | 590.1 | 51.2 | 13:08:00.1 | 584.2 | 5.2 | 63.0 |
| 59 | F/O | 705.9 | 42.3 | 13:09:55.9 | -516.4 | -4.4 | 66.0 |

- CPA-FT : CLOSEST POINT OF APPROACH
- E-A : ELEVATION ANGLE
- CPA-TIME : CLOSEST POINT OF APPROACH TIME
- RC-FPM : RATE OF CLIMB
- C/D-A : CLIMB OR DESCENT ANGLE
- GS-K : GROUND SPEED

SIKORSKY S76
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE: 06/05/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|-----|--------|------|------------|--------|-------|------|
| SIX DEG. APPROACH AT VY, 74 KTS. | | | | | | | |
| 1 | APP | 640.0 | 33.0 | 13:26:00.8 | -557.8 | -5.3 | 59.3 |
| 2 | APP | 654.3 | 33.7 | 13:33:52.9 | -492.3 | -4.3 | 64.6 |
| 3 | APP | 681.4 | 33.7 | 13:38:07.8 | -504.8 | -4.1 | 60.4 |
| 4 | APP | 639.1 | 34.9 | 13:44:23.9 | -475.9 | -4.1 | 66.0 |
| 5 | APP | 641.0 | 39.6 | 13:49:59.4 | -905.1 | -6.7 | 76.1 |
| 6 | APP | 673.4 | 38.5 | 13:54:28.0 | -925.8 | -8.5 | 61.4 |
| 7 | APP | 649.5 | 35.2 | 13:59:05.5 | -510.7 | -4.2 | 68.8 |
| 8 | APP | 630.8 | 33.9 | 14:03:04.0 | -761.8 | -6.2 | 69.6 |

NOISE ABATEMENT APPROACH (9.5 DEG. TARGET, 60 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|------|
| 9 | APP | 753.4 | 44.2 | 14:21:43.8 | -648.8 | -6.6 | 55.5 |
| 10 | APP | 727.4 | 49.7 | 14:26:23.3 | -829.6 | -8.7 | 53.3 |
| 11 | APP | 802.0 | 38.4 | 14:30:42.6 | -856.8 | -9.4 | 50.8 |
| 12 | APP | 718.7 | 47.0 | 14:35:25.3 | -814.8 | -9.6 | 47.5 |
| 13 | APP | 720.0 | 45.8 | 14:40:10.8 | -1002.7 | -11.1 | 50.2 |
| 14 | APP | 765.6 | 45.8 | 14:47:21.7 | -1210.5 | -14.0 | 48.0 |

- CPA-FT : CLOSEST POINT OF APPROACH
- E-A : ELEVATION ANGLE
- CPA-TIME : CLOSEST POINT OF APPROACH TIME
- RC-FPM : RATE OF CLIMB
- C/D-A : CLIMB OR DESCENT ANGLE
- GS-K : GROUND SPEED

SIKORSKY 870
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 100 FT. WEST

DATE: 08/00/84

SEPAR/RESE

EVENT OPA-TIME E-A OPA-TIME RO-FPH O/D-A O-S-K

NOISE MEASUREMENT APPROACH (9 DEG. TARGET, 100 KTS.)



15 DEGREE BANK TURN AT 65 KTS.



30 DEGREE BANK TURN AT 65 KTS.



OPA-TIME POINT OF APPROACH
 OPA-TIME APPROACH TIME
 O-S-K DEPARTURE ANGLE
 O-S-K DEPARTURE ANGLE

SUKORSKY 876
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 1000 FT. EAST

DATE: 06/06/84

ISFAA/AEEXX

| EVENT | OPA-PT | E-A | OPA-TIME | RO-FPM | O/D-A | OS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

SIX DEG. APPROACH AT VY, 74 KTS.

| | | | | | | |
|---|--------|--------|--------|--------|--------|--------|
| 1 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 2 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 3 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 4 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 5 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 6 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 7 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 8 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 9 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 0 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |

NOISE ABATEMENT APPROACH (SIX DEG. APPROACH, 80 KTS.)

| | | | | | | |
|---|--------|--------|--------|--------|--------|--------|
| 1 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 2 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 3 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 4 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 5 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 6 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 7 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 8 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 9 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |
| 0 | 222222 | 000000 | 111111 | 111111 | 111111 | 000000 |

| | |
|----------|--------------------------------|
| OPA-PT | CLOSEST POINT OF APPROACH |
| OPA-TIME | CLOSEST POINT OF APPROACH TIME |
| RO-FPM | ANGLE |
| OS-K | |

SIKORSKY S76
POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 06/06/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------|-----|--------|------|------------|---------|-------|------|
| NORMAL APPROACH | | | | | | | |
| 17 | APP | 1023.1 | 30.7 | 10:18:17.0 | -900.2 | -8.5 | 65.3 |
| 19 | APP | 1086.8 | 31.3 | 10:22:41.7 | -1145.6 | -9.8 | 65.1 |
| 21 | APP | 1089.6 | 34.0 | 10:26:59.4 | -1349.2 | -9.7 | 70.2 |
| 23 | APP | 1134.8 | 37.0 | 10:32:37.0 | -1552.2 | -12.1 | 71.4 |
| 25 | APP | 1144.8 | 33.3 | 10:36:46.5 | -1608.0 | -12.3 | 72.7 |
| 27 | APP | 1130.7 | 30.3 | 10:41:09.6 | -1288.3 | -11.1 | 65.2 |
| 29 | APP | 1160.8 | 31.3 | 10:45:31.7 | -1410.6 | -11.0 | 66.8 |

| | | | | | | | |
|----------------|-----|--------|---------|------------|--------|-----|------|
| NORMAL TAKEOFF | | | | | | | |
| 18 | DEP | 1130.5 | 28.5 | 10:20:12.8 | 1282.0 | 9.2 | 78.5 |
| 20 | DEP | 1146.0 | 23.4 | 10:24:22.8 | 1076.7 | 7.7 | 78.7 |
| 22 | DEP | 1149.4 | 28.1 | 10:28:42.2 | 1110.5 | 7.8 | 80.4 |
| 24 | DEP | 1123.6 | 27.8 | 10:34:16.0 | 1080.8 | 7.1 | 86.1 |
| 26 | DEP | 1089.1 | 24.9 | 10:38:23.5 | 1068.0 | 7.2 | 83.1 |
| 28 | | | NO DATA | | | | |

NOISE ABATEMENT APPROACH (12 DEG. TARGET, 60 KTS.)

| | | | | | | | |
|----|-----|--------|------|------------|---------|-------|------|
| 30 | APP | 1121.6 | 40.0 | 11:01:06.1 | -1232.2 | -11.4 | 60.1 |
| 31 | APP | 1073.0 | 40.2 | 11:05:31.3 | -1240.7 | -12.1 | 57.6 |
| 32 | APP | 1180.6 | 36.6 | 11:09:42.6 | -897.5 | -9.2 | 54.6 |
| 33 | APP | 1056.0 | 38.6 | 11:14:15.5 | -1047.6 | -10.3 | 57.0 |

NOISE ABATEMENT APPROACH (3 DEG. TARGET, 60 KTS.)

| | | | | | | | |
|----|-----|--------|------|------------|--------|------|------|
| 34 | APP | 1023.3 | 10.6 | 11:27:40.0 | -344.4 | -3.4 | 56.5 |
| 35 | APP | 990.0 | 9.7 | 11:32:23.5 | -361.4 | -3.3 | 61.7 |
| 36 | APP | 710.8 | 11.5 | 11:37:05.2 | -218.5 | -1.7 | 72.0 |
| 37 | APP | 816.0 | 10.4 | 11:41:22.8 | -337.7 | -2.8 | 68.3 |
| 38 | APP | 990.0 | 6.8 | 11:45:44.2 | 52.6 | 0.5 | 60.1 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

SIKORSKY 576

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 106/06/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--|-----|--------|------|------------|---------|-------|-------|
| NOISE ABATEMENT APPROACH (3 DEG. TARGET, 120 KTS.) | | | | | | | |
| 39 | APP | 1026.8 | 10.6 | 12:01:10.7 | -329.4 | -1.5 | 120.5 |
| 40 | APP | 1010.3 | 8.8 | 12:04:31.3 | -755.0 | -3.6 | 121.5 |
| 41 | APP | 977.0 | 10.1 | 12:08:07.0 | -59.1 | -0.2 | 122.0 |
| 42 | APP | 893.0 | 9.5 | 12:12:21.6 | -452.4 | -2.0 | 122.8 |
| 43 | APP | 1011.0 | 12.2 | 12:15:51.0 | -246.8 | -1.1 | 126.7 |
| 44 | APP | 793.7 | 27.9 | 12:36:53.4 | -360.3 | -5.7 | 26.3 |
| 15 DEGREE BANK TURN AT 65 KTS. | | | | | | | |
| 45 | F/O | 764.1 | 30.4 | 12:39:15.3 | -72.6 | -0.8 | 74.7 |
| 46 | F/O | 765.1 | 30.7 | 12:42:10.5 | 1550.3 | 0.0 | 97.4 |
| 47 | F/O | 828.7 | 20.0 | 12:44:30.0 | 000.0 | 0.0 | 56.2 |
| 48 | F/O | 781.8 | 20.1 | 12:46:35.5 | 14033.1 | 45.3 | 137.0 |
| 49 | F/O | 820.7 | 27.0 | 12:49:03.7 | 174.6 | 0.0 | 105.8 |
| 50 | F/O | 874.1 | 25.0 | 12:51:10.4 | -255.6 | -2.5 | 57.0 |
| 51 | F/O | 820.5 | 34.0 | 12:53:31.0 | -1123.0 | -6.3 | 50.7 |
| 30 DEGREE BANK TURN AT 65 KTS. | | | | | | | |
| 52 | F/O | 750.3 | 30.1 | 12:55:28.6 | -1794.0 | -10.8 | 49.3 |
| 53 | F/O | 740.1 | 34.8 | 12:57:30.3 | -502.0 | -2.8 | 107.0 |
| 54 | F/O | 752.3 | 30.3 | 12:59:40.3 | -781.3 | -3.7 | 50.3 |
| 55 | F/O | 759.7 | 30.6 | 13:02:03.5 | -492.0 | -3.4 | 67.3 |
| 56 | F/O | 761.3 | 35.6 | 13:03:55.7 | -927.3 | -5.8 | 100.7 |
| 57 | F/O | 801.5 | 33.2 | 13:06:02.5 | -140.1 | -1.0 | 48.3 |
| 58 | F/O | 776.0 | 35.6 | 13:08:04.3 | 942.8 | 4.5 | 118.3 |
| 59 | F/O | 818.1 | 30.2 | 13:10:03.8 | 822.8 | 14.8 | 32.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

SIKORSKY 576

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE: 06/05/84

KEFAA/AEES

| EVENT | OPA-FT | E-A | OPA-TIME | RO-FPM | O/D-A | OS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

SIX DEG. APPROACH AT VY, 74 KTS.

| | | | | | | |
|---|-----|--------|-------|--------|-------|--------|
| 1 | APP | 1078.8 | 115.8 | 1133.0 | 115.8 | 1133.0 |
| 2 | APP | 1110.4 | 116.0 | 1133.0 | 116.0 | 1133.0 |
| 3 | APP | 1121.3 | 116.0 | 1133.0 | 116.0 | 1133.0 |
| 4 | APP | 1088.1 | 116.0 | 1133.0 | 116.0 | 1133.0 |
| 5 | APP | 1084.0 | 116.0 | 1133.0 | 116.0 | 1133.0 |
| 6 | APP | 1084.0 | 116.0 | 1133.0 | 116.0 | 1133.0 |
| 7 | APP | 1078.8 | 116.0 | 1133.0 | 116.0 | 1133.0 |
| 8 | APP | 1078.8 | 116.0 | 1133.0 | 116.0 | 1133.0 |

NOISE ABATEMENT APPROACH (9.5 DEG. TARGET, 60 KTS.)

| | | | | | | |
|---|-----|--------|-------|--------|-------|--------|
| 1 | APP | 1105.6 | 114.0 | 1142.8 | 114.0 | 1142.8 |
| 2 | APP | 1111.0 | 114.0 | 1142.8 | 114.0 | 1142.8 |
| 3 | APP | 1111.0 | 114.0 | 1142.8 | 114.0 | 1142.8 |
| 4 | APP | 1111.0 | 114.0 | 1142.8 | 114.0 | 1142.8 |
| 5 | APP | 1111.0 | 114.0 | 1142.8 | 114.0 | 1142.8 |
| 6 | APP | 1111.0 | 114.0 | 1142.8 | 114.0 | 1142.8 |
| 7 | APP | 1111.0 | 114.0 | 1142.8 | 114.0 | 1142.8 |
| 8 | APP | 1111.0 | 114.0 | 1142.8 | 114.0 | 1142.8 |

OPA-FT : CLOSEST POINT OF APPROACH
 OPA-EA : ELEVATION POINT OF APPROACH
 OPA-TIME : TIME OF APPROACH
 O/D-FPM : RATE OF CLIMB
 O/D-A : ALTITUDE OR ALTITUDE ANGLE
 OS-K : GROUND SPEED

SIKORSKY S76
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 1000 FT. WEST

DATE 06/06/84

XXFAA/AEEXX

| EVENT | OPA-FT | E-A | OPA-TIME | RC-FPH | C/D-A | OS-K |
|------------------------|--------|------|------------|---------|-------|------|
| NORMAL APPROACH | | | | | | |
| 17 | 2237.3 | 22.8 | 10:18:17.3 | -866.0 | -8.4 | 84.4 |
| 19 | 2239.0 | 22.8 | 10:18:41.3 | -1085.1 | -9.1 | 87.0 |
| 21 | 2240.0 | 22.8 | 10:19:01.4 | -1070.1 | -9.3 | 88.7 |
| 22 | 2240.0 | 22.8 | 10:19:20.4 | -1384.4 | -10.0 | 74.1 |
| 23 | 2240.0 | 22.8 | 10:19:47.8 | -1488.8 | -11.7 | 70.8 |
| 24 | 2240.0 | 22.8 | 10:20:08.8 | -1410.4 | -11.7 | 87.8 |
| 25 | 2240.0 | 22.8 | 10:20:31.8 | -1381.0 | -11.0 | 88.3 |

| | | | | | | |
|-----------------------|--------|------|------------|--------|-----|------|
| NORMAL TAKEOFF | | | | | | |
| 100 | 2000.0 | 22.4 | 10:20:00.0 | 1888.8 | 8.8 | 78.1 |
| 101 | 2000.0 | 22.4 | 10:20:24.0 | 1147.7 | 7.7 | 81.4 |
| 102 | 2000.0 | 22.4 | 10:20:44.0 | 1841.7 | 8.8 | 88.1 |
| 103 | 2000.0 | 22.4 | 10:21:08.0 | 1111.0 | 7.0 | 88.5 |
| 104 | 2000.0 | 22.4 | 10:21:32.0 | 841.0 | 7.0 | 79.7 |
| ----- NO DATA ----- | | | | | | |

| | | | | | | |
|---|--------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (18 DEG. TARGET, 60 KTS.) | | | | | | |
| 300 | 2239.0 | 21.8 | 11:01:08.8 | -1878.8 | -18.8 | 88.1 |
| 301 | 2239.0 | 21.8 | 11:01:32.4 | -1883.8 | -18.8 | 88.4 |
| 302 | 2239.0 | 21.8 | 11:01:56.0 | -1978.8 | -19.3 | 88.0 |
| 303 | 2239.0 | 21.8 | 11:02:20.0 | -1818.8 | -18.8 | 88.4 |

| | | | | | | |
|--|--------|------|------------|--------|------|------|
| NOISE ABATEMENT APPROACH (3 DEG. TARGET, 60 KTS.) | | | | | | |
| 304 | 2239.0 | 19.8 | 11:07:48.3 | -117.4 | -1.8 | 83.1 |
| 305 | 2239.0 | 19.8 | 11:08:12.3 | -184.0 | -1.8 | 88.1 |
| 306 | 2239.0 | 19.8 | 11:08:36.3 | -333.0 | -3.1 | 79.3 |
| 307 | 2239.0 | 19.8 | 11:09:00.3 | -89.0 | -0.7 | 81.8 |

OPA-FT : CLOSEST POINT OF APPROACH
 OPA-A : ALTITUDE ON POINT OF APPROACH
 OPA-TIME : TIME OF APPROACH
 C/D-A : CLIMB OR DESCENT ANGLE
 OS-K : GROUND SPEED

SIKORSKY S76

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE: 06/06/84

FAA/AEE

EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

NOISE ABATEMENT APPROACH (3 DEG. TARGET, 120 KTS.)

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--------|--------|------|------------|--------|-------|-------|
| 39 APP | 995.3 | 10.8 | 12:01:10.4 | -391.4 | -1.8 | 121.3 |
| 40 APP | 1004.6 | 8.7 | 12:04:31.4 | -788.7 | -3.7 | 121.6 |
| 41 APP | 991.2 | 11.5 | 12:08:04.4 | -13.6 | -0.1 | 110.0 |
| 42 APP | 988.5 | 11.5 | 12:12:19.3 | -773.2 | -3.6 | 110.7 |
| 43 APP | 985.1 | 12.5 | 12:15:51.5 | -41.1 | -0.2 | 135.0 |
| 44 F/O | 1095.6 | 23.4 | 12:37:01.6 | 65.4 | 0.7 | 52.6 |

15 DEGREE BANK TURN AT 65 KTS.

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--------|--------|------|------------|---------|-------|------|
| 45 F/O | 1086.2 | 24.0 | 12:39:07.4 | 514.4 | 4.5 | 64.7 |
| 46 F/O | 1104.5 | 24.8 | 12:42:25.0 | -253.3 | -2.2 | 64.6 |
| 47 F/O | 1222.0 | 23.3 | 12:44:24.3 | -52.1 | -0.4 | 77.6 |
| 48 F/O | 1138.4 | 26.1 | 12:46:41.2 | -2815.2 | -10.7 | 77.5 |
| 49 F/O | 1129.3 | 26.1 | 12:48:59.4 | -385.7 | -3.4 | 69.0 |
| 50 F/O | 1093.7 | 25.7 | 12:51:16.1 | 30.4 | 0.3 | 69.2 |
| 51 F/O | 1224.0 | 23.9 | 12:53:25.6 | 125.8 | 1.0 | 70.0 |

30 DEGREE BANK TURN AT 65 KTS.

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--------|--------|------|------------|--------|-------|------|
| 52 F/O | 1136.0 | 22.5 | 12:55:37.4 | 158.1 | 1.3 | 67.1 |
| 53 F/O | 1275.3 | 20.4 | 12:57:33.7 | -77.3 | -0.7 | 66.5 |
| 54 F/O | 1200.2 | 21.8 | 12:59:49.3 | 18.1 | 0.2 | 65.2 |
| 55 F/O | 1265.1 | 23.5 | 13:01:57.2 | 53.2 | 0.5 | 62.5 |
| 56 F/O | 1178.5 | 22.6 | 13:04:01.7 | 98.5 | 0.8 | 66.0 |
| 57 F/O | 1151.3 | 23.0 | 13:05:54.7 | -94.1 | -0.8 | 64.5 |
| 58 F/O | 1203.6 | 22.6 | 13:08:08.0 | 444.1 | 4.0 | 62.3 |
| 59 F/O | 1053.9 | 26.0 | 13:09:56.7 | -253.0 | -2.1 | 60.1 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

SIKORSKY S76
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

DATE: 06/05/84

2000 FT. EAST

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|------------|--------|------|
| SIX DEG. APPROACH AT VV, 74 KTS. | | | | | | |
| 1 | APP | 1921.4 | 11.5 | 13:26:07.4 | -667.0 | 63.1 |
| 2 | APP | 1957.8 | 11.8 | 13:33:50.3 | -984.2 | 62.3 |
| 3 | APP | 1938.4 | 11.4 | 13:38:08.6 | -540.6 | 60.6 |
| 4 | APP | 1994.0 | 10.8 | 13:44:23.7 | -595.7 | 66.4 |
| 5 | APP | 2031.3 | 13.1 | 13:49:57.0 | -810.7 | 67.1 |
| 6 | APP | 1942.0 | 11.2 | 13:54:26.4 | -860.6 | 67.3 |
| 7 | APP | 1991.8 | 10.9 | 13:59:06.3 | -540.8 | 68.1 |
| 8 | APP | 2008.4 | 11.1 | 14:03:03.0 | -790.2 | 68.4 |

NOISE ABATEMENT APPROACH (9.5 DEG. TARGET, 60 KTS.)

| | | | | | | |
|----|-----|--------|------|------------|---------|------|
| 9 | APP | 2009.4 | 14.3 | 14:21:46.5 | -1052.6 | 52.1 |
| 10 | APP | 2007.5 | 16.1 | 14:26:23.9 | -755.1 | 52.5 |
| 11 | APP | 1862.5 | 18.2 | 14:30:40.4 | -862.0 | 54.0 |
| 12 | APP | 2033.6 | 15.0 | 14:35:26.0 | -858.8 | 46.8 |
| 13 | APP | 2062.4 | 15.4 | 14:40:00.4 | -821.0 | 52.1 |
| 14 | APP | 2011.5 | 15.2 | 14:47:23.1 | -908.0 | 50.6 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

SIKORSKY S76

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 06/06/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--|-----|--------------------------------|---------|------------|---------|-------|------|
| NORMAL APPROACH | | | | | | | |
| 17 | APP | 1943.8 | 15.7 | 10:18:18.1 | -1016.6 | -8.6 | 66.1 |
| 19 | APP | 2068.2 | 16.4 | 10:22:41.7 | -1145.6 | -9.8 | 65.1 |
| 21 | APP | 1999.6 | 17.8 | 10:26:59.4 | -1249.2 | -9.7 | 72.8 |
| 23 | APP | 2011.2 | 20.4 | 10:32:37.9 | -1552.2 | -12.1 | 71.4 |
| 25 | APP | 2056.6 | 17.9 | 10:36:46.6 | -1608.9 | -12.3 | 72.7 |
| 27 | APP | 2051.5 | 16.6 | 10:41:09.1 | -1411.2 | -11.6 | 67.7 |
| 29 | APP | 2074.7 | 18.3 | 10:45:29.3 | -1166.6 | -9.6 | 68.6 |
| NORMAL TAKEOFF | | | | | | | |
| 18 | DEP | 2063.9 | 15.4 | 10:20:13.3 | 1275.0 | 8.6 | 81.8 |
| 20 | DEP | 2086.6 | 12.7 | 10:24:22.8 | 1076.7 | 7.7 | 78.7 |
| 22 | DEP | 2086.5 | 15.1 | 10:28:42.2 | 1119.6 | 7.8 | 80.4 |
| 24 | DEP | 2062.7 | 14.8 | 10:34:16.0 | 1080.8 | 7.1 | 86.1 |
| 26 | DEP | 2040.8 | 13.1 | 10:38:23.6 | 1068.0 | 7.8 | 83.1 |
| 28 | | | NO DATA | | | | |
| NOISE ABATEMENT APPROACH (12 DEG. TARGET, 60 KTS.) | | | | | | | |
| 30 | APP | 1993.4 | 21.3 | 11:01:08.1 | -1232.2 | -11.4 | 60.1 |
| 31 | APP | 1946.2 | 22.1 | 11:05:29.8 | -1180.7 | -11.8 | 65.8 |
| 32 | APP | 2053.3 | 19.8 | 11:09:42.6 | -897.6 | -9.8 | 64.6 |
| 33 | APP | 1939.0 | 20.6 | 11:14:14.2 | -1357.6 | -13.4 | 66.0 |
| NOISE ABATEMENT APPROACH (3 DEG. TARGET, 60 KTS.) | | | | | | | |
| 34 | APP | 1923.2 | 6.6 | 11:27:47.4 | -16.8 | -0.8 | 60.3 |
| 35 | APP | 1940.6 | 4.9 | 11:32:28.3 | -117.6 | -0.9 | 74.6 |
| 36 | APP | 1416.6 | 6.9 | 11:37:05.2 | -218.6 | -1.7 | 72.9 |
| 37 | APP | 1848.8 | 5.2 | 11:41:23.0 | -315.3 | -2.7 | 65.6 |
| 38 | APP | 1937.3 | 4.6 | 11:45:44.2 | 62.6 | 0.6 | 60.1 |
| CPA-FT | : | CLOSEST POINT OF APPROACH | | | | | |
| E-A | : | ELEVATION ANGLE | | | | | |
| CPA-TIME | : | CLOSEST POINT OF APPROACH TIME | | | | | |
| RC-FPM | : | RATE OF CLIMB | | | | | |
| C/D-A | : | CLIMB OR DESCENT ANGLE | | | | | |
| GS-K | : | GROUND SPEED | | | | | |

SIKORSKY 878
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE: 06/06/84

**FAA/AEEX*

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--|-----|--------|------|------------|--------|-------|-------|
| NOISE ABATEMENT APPROACH (3 DEG. TARGET, 120 KTS.) | | | | | | | |
| 39 | APP | 2017.0 | 5.5 | 12:01:11.3 | -240.5 | -1.1 | 110.1 |
| 40 | APP | 1850.5 | 4.7 | 12:04:34.0 | -113.0 | -0.5 | 128.4 |
| 41 | APP | 1839.7 | 5.5 | 12:08:07.0 | -50.1 | -0.2 | 128.0 |
| 42 | APP | 1737.7 | 5.0 | 12:12:21.0 | -452.4 | -2.0 | 128.8 |
| 43 | APP | 1907.2 | 4.6 | 12:15:55.7 | -574.2 | -2.2 | 118.1 |
| 44 | APP | 1814.2 | 24.4 | 12:37:24.5 | -227.1 | -2.1 | 78.4 |

15 DEGREE BANK TURN AT 65 KTS.

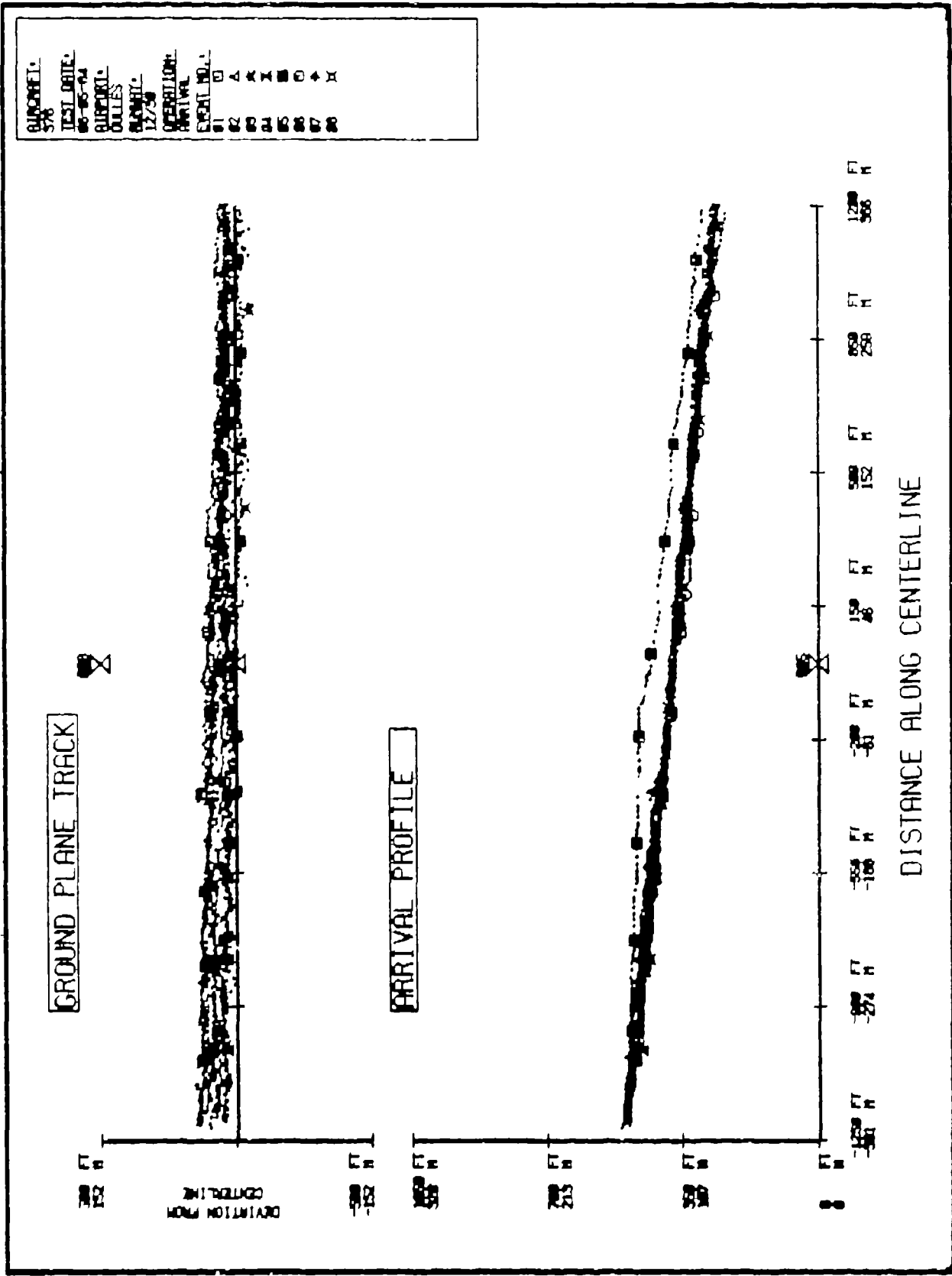
| | | | | | | | |
|----|-----|--------|------|------------|---------|------|-------|
| 45 | F/O | 1405.9 | 16.1 | 12:39:15.3 | -78.6 | -0.6 | 74.7 |
| 46 | F/O | 1441.9 | 15.6 | 12:42:19.3 | 1218.8 | 0.7 | 60.0 |
| 47 | F/O | 1522.0 | 15.4 | 12:44:30.0 | 909.0 | 0.9 | 56.8 |
| 48 | F/O | 1438.7 | 15.5 | 12:46:35.5 | 14033.1 | 45.3 | 137.0 |
| 49 | F/O | 1568.1 | 16.5 | 12:49:15.8 | 478.1 | 3.6 | 73.0 |
| 50 | F/O | 1554.7 | 14.4 | 12:51:10.4 | -255.5 | -2.5 | 57.5 |
| 51 | F/O | 1560.3 | 16.2 | 12:53:32.1 | 87.8 | 0.7 | 70.8 |

30 DEGREE BANK TURN AT 65 KTS.

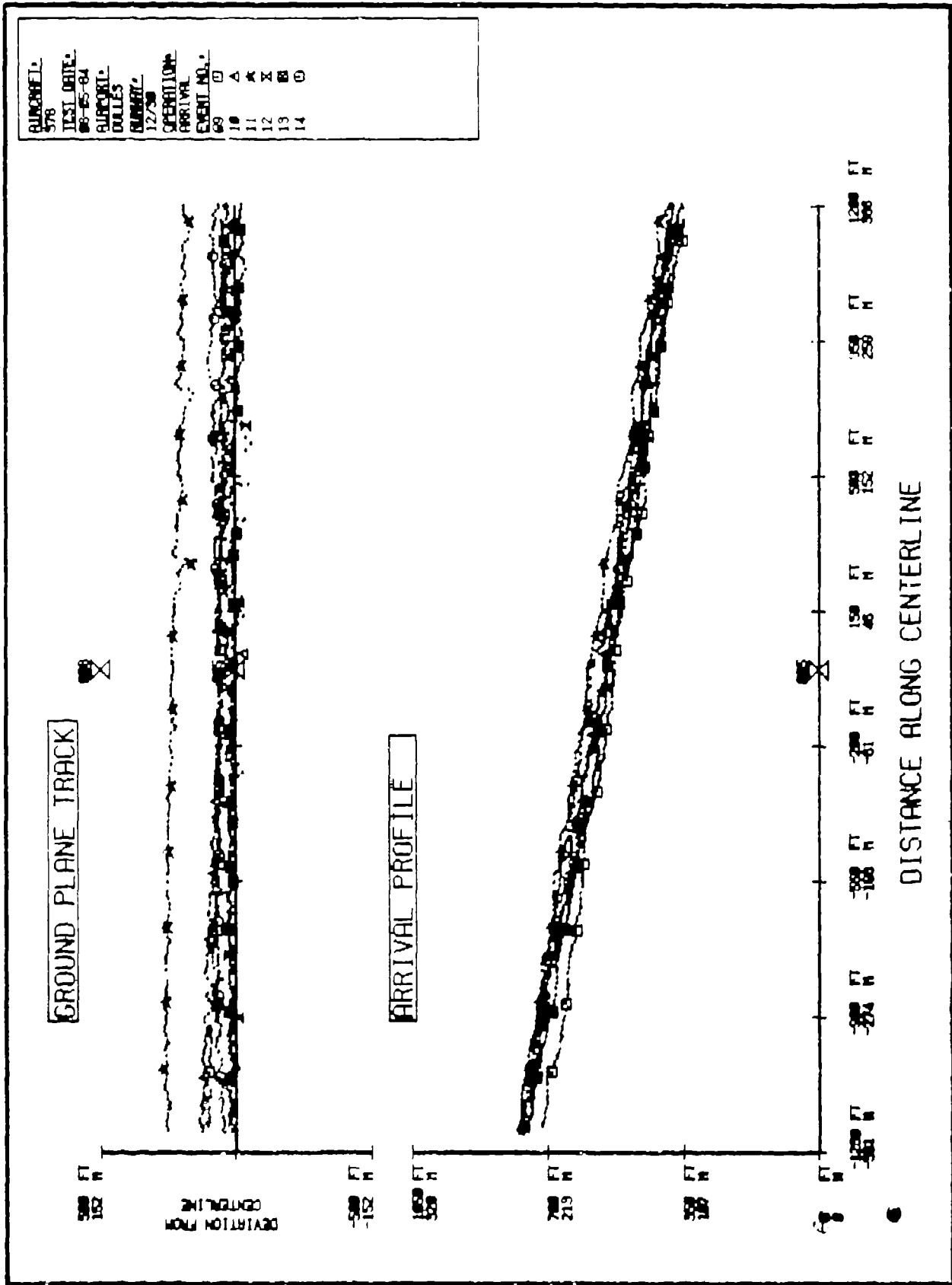
| | | | | | | | |
|----|-----|--------|------|------------|--------|------|------|
| 52 | F/O | 1395.7 | 17.9 | 12:55:58.2 | -13.1 | -0.1 | 76.2 |
| 53 | F/O | 1102.0 | 21.3 | 12:57:50.6 | 290.5 | 2.0 | 81.3 |
| 54 | F/O | 1343.7 | 23.0 | 12:59:27.0 | -215.7 | -1.0 | 65.0 |
| 55 | F/O | 1393.4 | 24.0 | 13:02:13.2 | 261.5 | 1.0 | 77.0 |
| 56 | F/O | 1372.4 | 23.2 | 13:03:43.3 | 4.2 | 0.0 | 62.0 |
| 57 | F/O | 1370.4 | 19.5 | 13:06:09.0 | 270.4 | 1.0 | 70.6 |
| 58 | F/O | 1438.7 | 21.2 | 13:07:47.2 | -114.0 | -1.0 | 62.2 |
| 59 | F/O | 1412.6 | 18.4 | 13:10:13.7 | 236.2 | 1.2 | 72.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

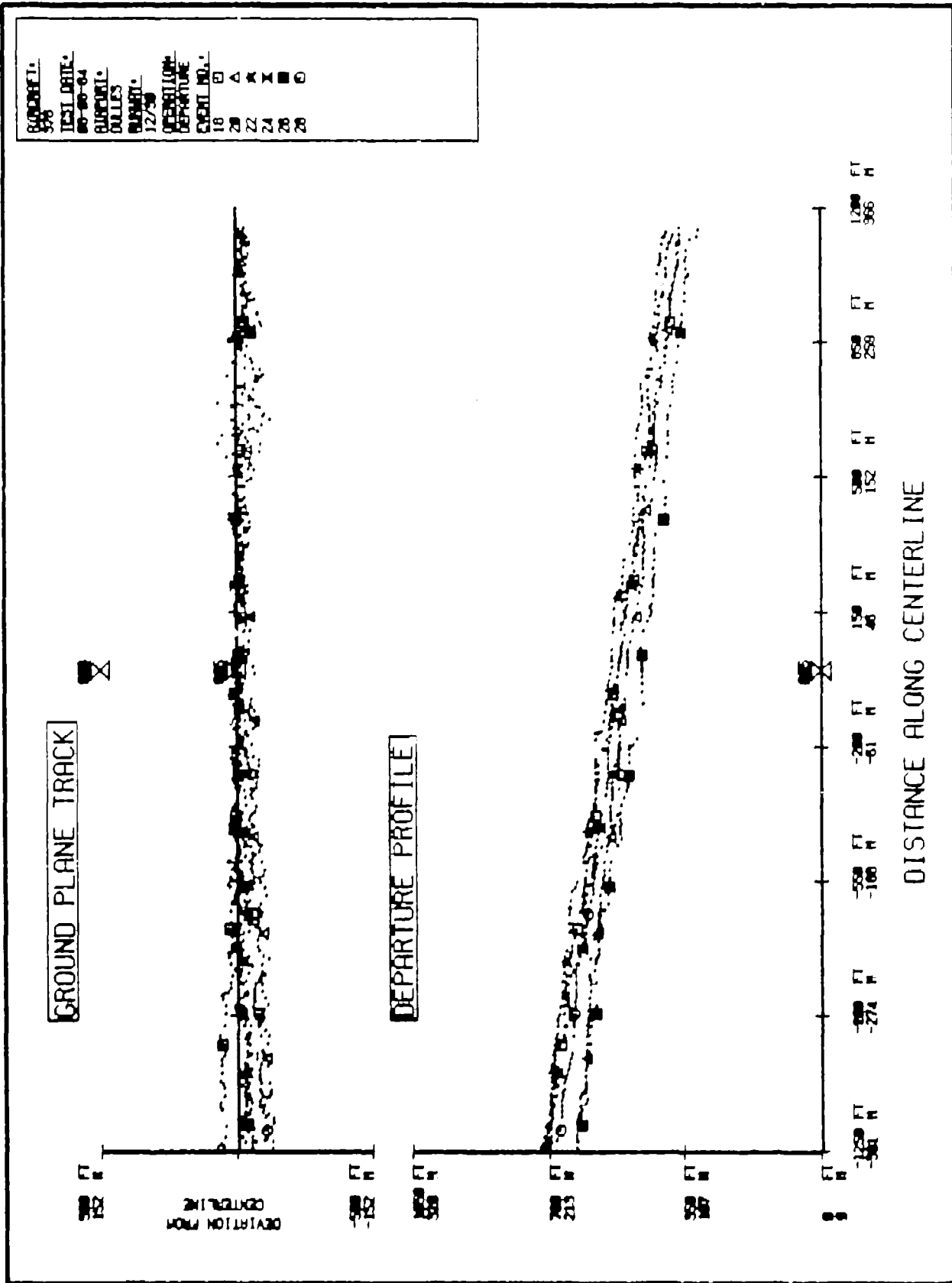
SIX⁰ APPROACH at Vy, 74 Kts.



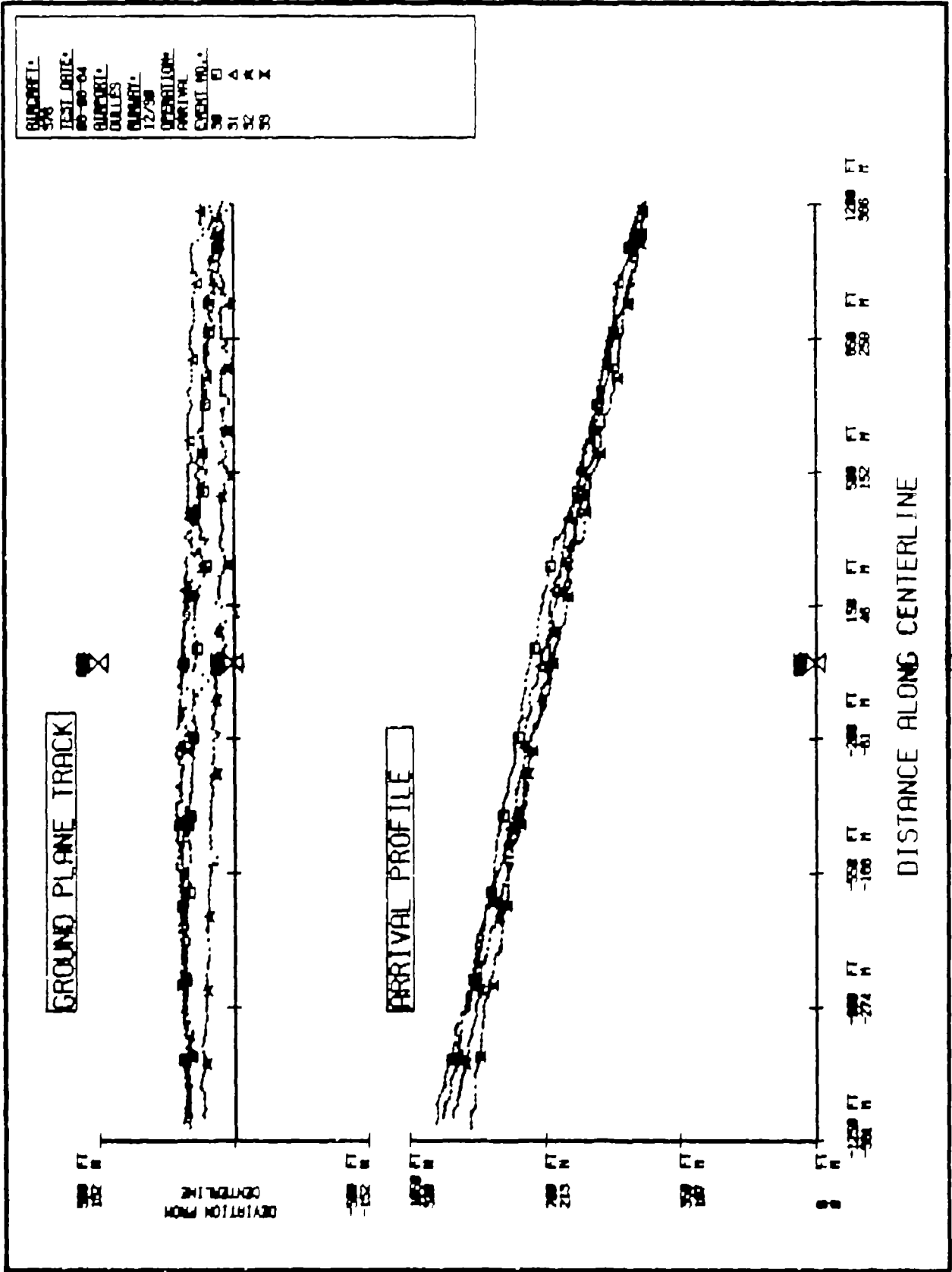
NOISE ABATEMENT APPROACH (9.5° target, 60 Kts.)



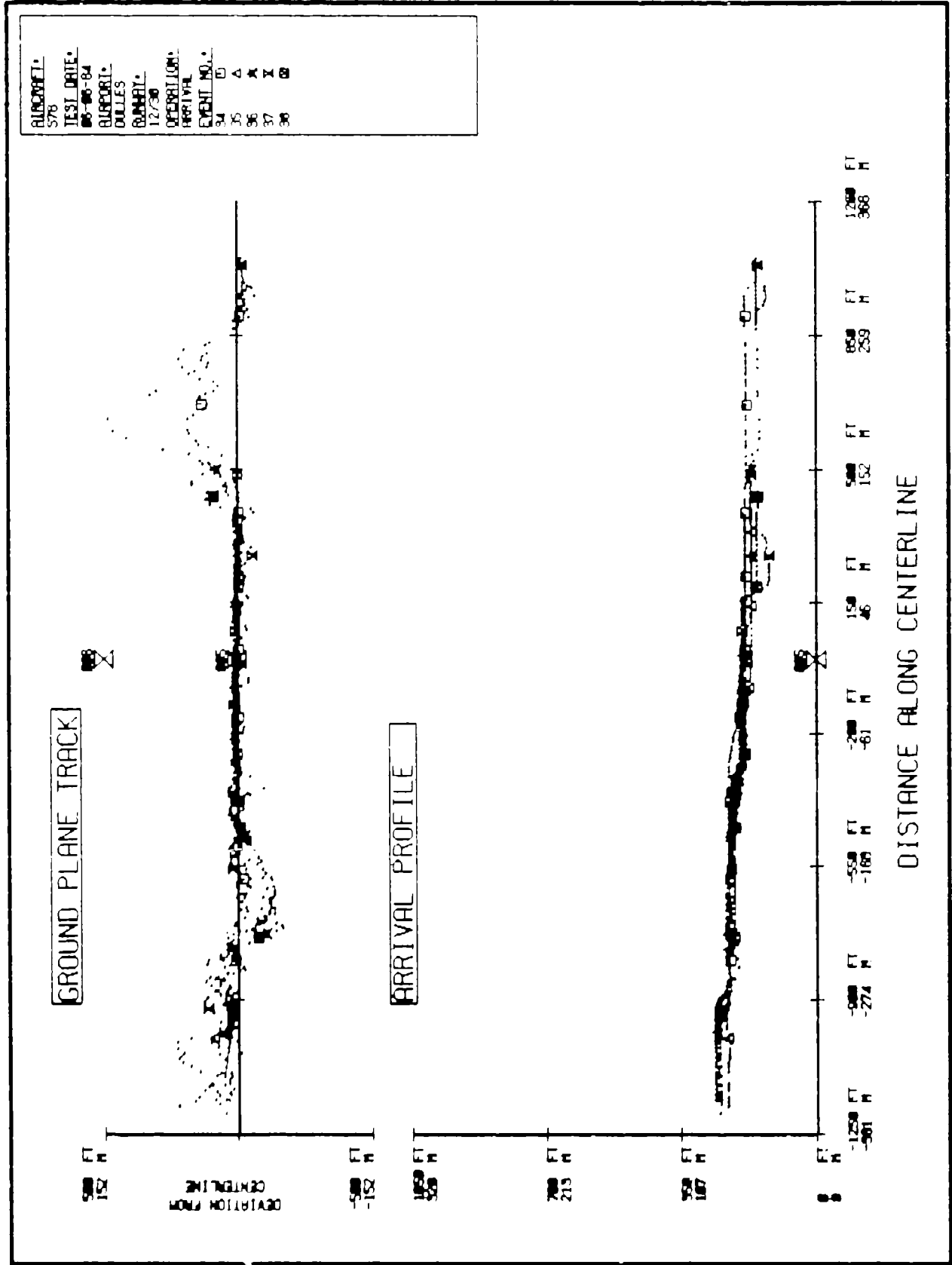
NORMAL TAKEOFF



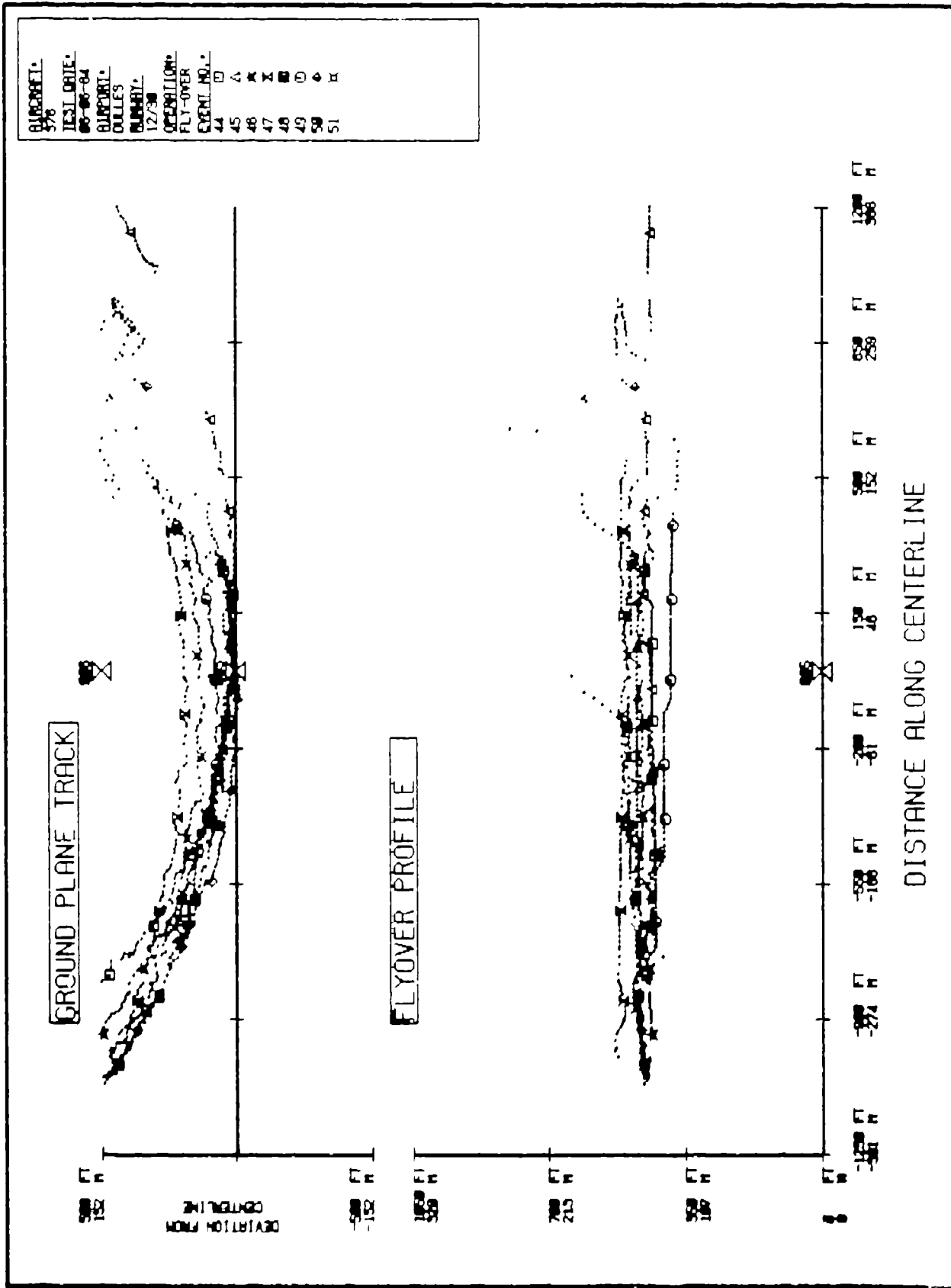
NOISE ABATEMENT APPROACH (12° Target, 60 Kts.)



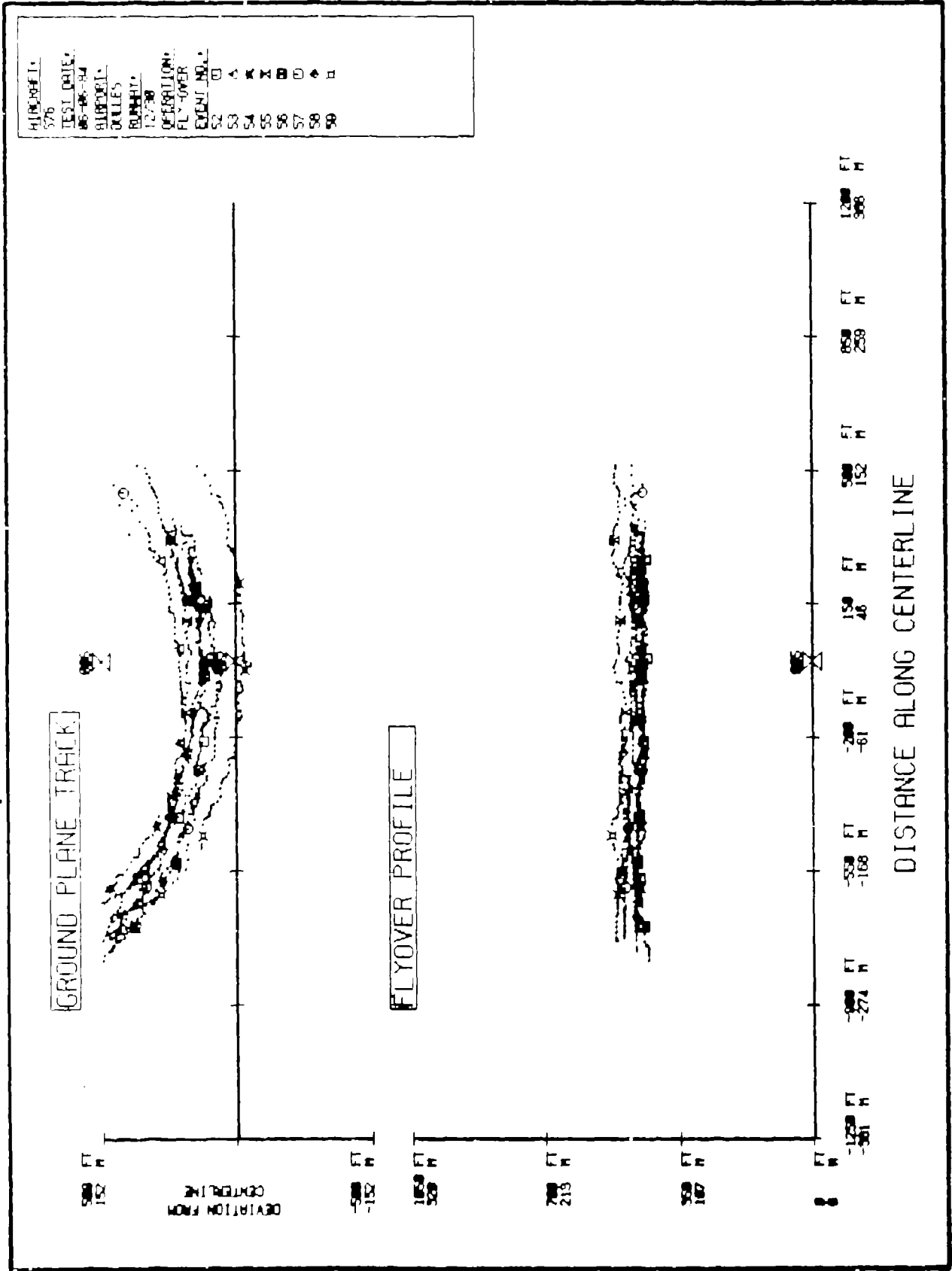
NOISE ABATEMENT APPROACH (3° TARGET, 60 Kts.)



15 DEG. BANK ANGLE TURN



30 DEG. BANK ANGLE TURN



METEOROLOGICAL DATA

THIS SECTION OF THE APPENDIX CONTAINS WEATHER DATA FROM SEVERAL TYPES OF METEOROLOGICAL EQUIPMENT: TEN-METER TOWER (MET), GROUND LEVEL PRESSURE LOG, AIRCRAFT DAT, AND PILOT BALLOONS. DATA FROM THE MET TOWER INCLUDE THE TEMPERATURE, RELATIVE HUMIDITY, WIND DIRECTION AND WIND SPEED MEASURED TYPICALLY EVERY 15 MINUTES DURING EACH FLIGHT EVENT. BECAUSE OF A FAILURE OF THE MET TOWER DEW POINT SENSOR, THE RELATIVE HUMIDITY WAS CALCULATED USING TEMPERATURE FROM THE MET TOWER AND DEW POINT FROM THE DULLES MID FIELD WEATHER STATION. GROUND LEVEL (4 FEET) TEMPERATURE AND RELATIVE HUMIDITY ARE GIVEN FOR DIFFERENT TIMES OF EACH TEST DAY, AND THE HELICOPTER'S DAT READINGS ARE SHOWN FOR DIFFERENT FLIGHT ALTITUDES AT VARIOUS TIMES OF THE DAY. THE PILOT BALLOON WIND DATA, TAKEN PERIODICALLY DURING EACH TEST DAY, INCLUDES THE WIND DIRECTION AND WIND SPEED AT VARIOUS ALTITUDES.

METEOROLOGICAL DATA
(MEASURED AT 30 FT. AGL.)

HELICOPTER: SIKORSKY 976

DATE: 6/04/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|--|
| | (DEG. F) | % | (DEG.) | AVG. (MAX) | |
| | | | | (MPH) | |

1000 FT. LEVEL FLYOVER AT 120 KTS.

| | | | | | |
|------|----|----|-----|---|---|
| 1:00 | 77 | 36 | 360 | 3 | 6 |
| 1:15 | 76 | -- | 020 | 4 | 6 |
| 1:30 | 77 | -- | -- | 2 | 4 |
| 1:45 | 78 | -- | -- | 3 | 5 |
| 2:00 | 78 | 35 | 300 | 3 | 6 |

METEOROLOGICAL DATA
(MEASURED AT 30 FT. AGL)

HELICOPTER: SIKORSKY S76

DATE: 6/05/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

(MPH)

500 FT. LEVEL FLYOVER AT 120 KTS.

| | | | | | |
|-------|----|----|-----|----|----|
| 11:00 | 72 | 66 | 210 | 8 | 10 |
| 11:15 | 73 | -- | 210 | 8 | 10 |
| 11:30 | 76 | -- | 210 | 8 | 11 |
| 11:45 | 76 | -- | 210 | 7 | 10 |
| 12:00 | 76 | 58 | 210 | 10 | 15 |

SIX DEGREE APPROACH AT VY, 74 KTS.

| | | | | | |
|------|----|----|-----|---|----|
| 1:00 | 79 | 56 | 230 | 9 | 13 |
| 1:15 | 79 | -- | 220 | 8 | 11 |
| 1:30 | 80 | -- | 200 | 8 | 11 |
| 1:45 | 80 | -- | 180 | 8 | 12 |
| 2:00 | 80 | 60 | 200 | 8 | 11 |

9.5 DEGREE TARGET, 60 KTS.

| | | | | | |
|------|----|----|-----|---|----|
| 2:00 | 80 | 60 | 200 | 9 | 13 |
| 2:15 | 80 | -- | 210 | 8 | 11 |
| 2:30 | 80 | -- | 200 | 8 | 11 |
| 2:45 | 81 | -- | 200 | 8 | 12 |
| 3:00 | 82 | 60 | 230 | 8 | 11 |

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: SIKORSKY 576

DATE: 6/05/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

(MPH)

500 FT. LEVEL FLYOVER AT 120 KTS.

| | | | | | |
|-------|----|----|-----|----|----|
| 11:00 | 72 | 66 | 210 | 8 | 10 |
| 11:15 | 73 | -- | 210 | 8 | 10 |
| 11:30 | 76 | -- | 210 | 8 | 11 |
| 11:45 | 76 | -- | 210 | 7 | 10 |
| 12:00 | 76 | 58 | 210 | 10 | 15 |

SIX DEGREE APPROACH AT 74 KTS.

| | | | | | |
|------|----|----|-----|---|----|
| 1:00 | 79 | 56 | 230 | 9 | 13 |
| 1:15 | 79 | -- | 220 | 8 | 11 |
| 1:30 | 80 | -- | 200 | 8 | 11 |
| 1:45 | 80 | -- | 180 | 8 | 12 |
| 2:00 | 80 | 60 | 200 | 8 | 11 |

9.5 DEGREE TARGET, 60 KTS.

| | | | | | |
|------|----|----|-----|---|----|
| 2:00 | 80 | 60 | 200 | 9 | 13 |
| 2:15 | 80 | -- | 210 | 8 | 11 |
| 2:30 | 80 | -- | 200 | 8 | 11 |
| 2:45 | 81 | -- | 200 | 8 | 12 |
| 3:00 | 82 | 60 | 230 | 8 | 11 |

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: SIKORSKY S76

DATE: 6/06/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

(MPH)

NORMAL APPROACH AND TAKEOFF

| | | | | | |
|-------|----|----|-----|---|---|
| 9:00 | 75 | 93 | 180 | 3 | - |
| 9:15 | 76 | -- | 180 | 3 | - |
| 9:30 | 76 | -- | 180 | 3 | - |
| 9:45 | 78 | -- | 180 | 3 | - |
| 10:00 | 80 | 72 | 200 | 3 | - |
| 10:15 | 81 | -- | 220 | 3 | - |
| 10:30 | 81 | -- | 230 | 3 | 5 |
| 10:45 | 84 | -- | 210 | 3 | - |
| 11:00 | 84 | 57 | 230 | 3 | 5 |

12 DEGREE APPROACH AT 60 KTS.

| | | | | | |
|-------|----|----|-----|---|---|
| 11:00 | 84 | 57 | 230 | 3 | 5 |
| 11:15 | 85 | -- | 230 | 4 | 6 |

3 DEGREE APPROACH AT 60 KTS

| | | | | | |
|-------|----|----|-----|---|----|
| 11:30 | 86 | -- | 250 | 5 | - |
| 11:45 | 86 | -- | 280 | 5 | 10 |

3 DEGREE APPROACH AT 120 KTS.

| | | | | | |
|-------|----|----|-----|---|---|
| 12:00 | 86 | 53 | 280 | 6 | 8 |
| 12:15 | 87 | -- | 280 | 7 | 9 |

A-75

METEOROLOGICAL DATA
(MEASURED AT 30 FT. AGL)

HELICOPTER: SIKORSKY S76

DATE: 6/06/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

15 DEGREE BANK TURNS AT 65 KTS.

| | | | | | |
|-------|----|----|-----|---|----|
| 12:30 | 88 | -- | 270 | 7 | 10 |
| 12:45 | 88 | -- | 360 | 6 | 10 |

30 DEGREE BANK TURNS AT 65 KTS.

| | | | | | |
|------|----|----|-----|---|----|
| 1:00 | 88 | 42 | 280 | 5 | 11 |
| 1:15 | 89 | -- | 280 | 6 | 10 |

METEOROLOGICAL DATA

HELICOPTER: SIKORSKY 876

DATE: 06/04/84

TEMPERATURE AND RELATIVE HUMIDITY DATA

(MEASURED AT 4 FT. AGL)

| TIME | TEMP. | R.H. |
|-------|-------|------|
| 11:00 | 74 F | 30% |
| 12:13 | 79 F | 28% |
| 1:15 | 80 F | 31% |
| 2:27 | 81 F | 24% |

HELICOPTERS OAT GAUGE DATA

| TIME | ALTITUDE | TEMP. |
|-------|----------|-------|
| 8:50 | 200' | 68 F |
| | 400' | 66 F |
| | 600' | 66 F |
| 10:15 | 200' | 72 F |
| | 400' | 72 F |
| | 600' | 70 F |

METEOROLOGICAL DATA

HELICOPTER: SIKORSKY S76

DATE: 06/05/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS OAT GAUGE DATA

TIME TEMP. R.H.

TIME ALTITUDE TEMP.

N
O

D
A
T
A

8:20 200' 64 F
 400' 64 F
 600' 68 F
 1000' 72 F

METEOROLOGICAL DATA

HELICOPTER: SIKORSKY S76

DATE: 06/06/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS DAT BUAGE DATA

TIME TEMP. R.H.

TIME ALTITUDE TEMP.

N

N

O

O

D

D

A

A

T

T

A

A

PILOT BALLOON WIND DATA

BIKORSKY 976

06/04/84

| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
| ----- | | | | |
| LAUNCH TIME: | 8:24 | | 10:00 | |
| 8FC | 280 | 6 | 310 | 6 |
| 354 | 305 | 6 | 330 | 9 |
| 708 | 314 | 7 | 329 | 9 |
| 1033 | 333 | 8 | 327 | 9 |
| 1358 | 346 | 10 | 328 | 9 |
| | 11:30 | | 12:35 | |
| 8FC | 300 | 3 | 320 | 2 |
| 354 | 353 | 4 | 278 | 4 |
| 708 | 347 | 3 | 274 | 3 |
| 1033 | 337 | 3 | 257 | 2 |
| 1358 | 335 | 4 | 243 | 2 |
| | 1:15 | | | |
| 8FC | 310 | 3 | | |
| 354 | 012 | 3 | | |
| 708 | 005 | 3 | | |
| 1033 | 337 | 3 | | |
| 1358 | 322 | 4 | | |

PILOT BALLOON WIND DATA

SIKORSKY S76

06/05/84

FEET WIND DIR. WIND SPD. WIND DIR. WIND SPD.
 (AGL) (DEG.) (KTS) (DEG.) (KTS)

LAUNCH TIME:

8:05

9:00

| | | | | |
|------|-----|----|-----|----|
| SFC | 180 | 5 | 180 | 8 |
| 354 | 227 | 13 | 226 | 13 |
| 708 | 230 | 16 | 229 | 15 |
| 1033 | 232 | 21 | 231 | 19 |
| 1358 | 231 | 23 | 230 | 22 |

9:35

10:20

| | | | | |
|------|-----|----|-----|---|
| SFC | 190 | 11 | 180 | 8 |
| 354 | 223 | 9 | 213 | 7 |
| 708 | 226 | 12 | 215 | 9 |
| 1033 | 227 | 16 | 217 | 8 |
| 1358 | 277 | 19 | -- | - |

10:45

11:35

| | | | | |
|------|-----|----|-----|----|
| SFC | 180 | 10 | 180 | 13 |
| 354 | 209 | 10 | 219 | 6 |
| 708 | 205 | 6 | 217 | 6 |
| 1033 | -- | -- | 219 | 7 |
| 1358 | -- | -- | 218 | 7 |

12:35

1:20

| | | | | |
|------|-----|----|-----|---|
| SFC | 220 | 8 | 200 | 8 |
| 354 | 206 | 17 | 224 | 7 |
| 708 | 207 | 15 | 220 | 6 |
| 1033 | 209 | 17 | 208 | 6 |
| 1358 | 214 | 17 | 204 | 6 |

PILOT BALLOON WIND DATA

BIKORSKY S76

06/06/84

| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
| ----- | | | | |
| LAUNCH TIME: | 9:45 | | 09:48 | |
| 8FC | 360 | 0 | 250 | 3 |
| 354 | 276 | 5 | 250 | 4 |
| 708 | 259 | 2 | 263 | 5 |
| 1033 | --- | - | 273 | 6 |
| 1358 | --- | - | 282 | 7 |
| | 10:40 | | 11:45 | |
| 8FC | 260 | 8 | 270 | 7 |
| 354 | 280 | 11 | 269 | 10 |
| 708 | 278 | 12 | 271 | 10 |
| 1033 | 274 | 13 | 274 | 9 |
| 1358 | 271 | 12 | 281 | 6 |

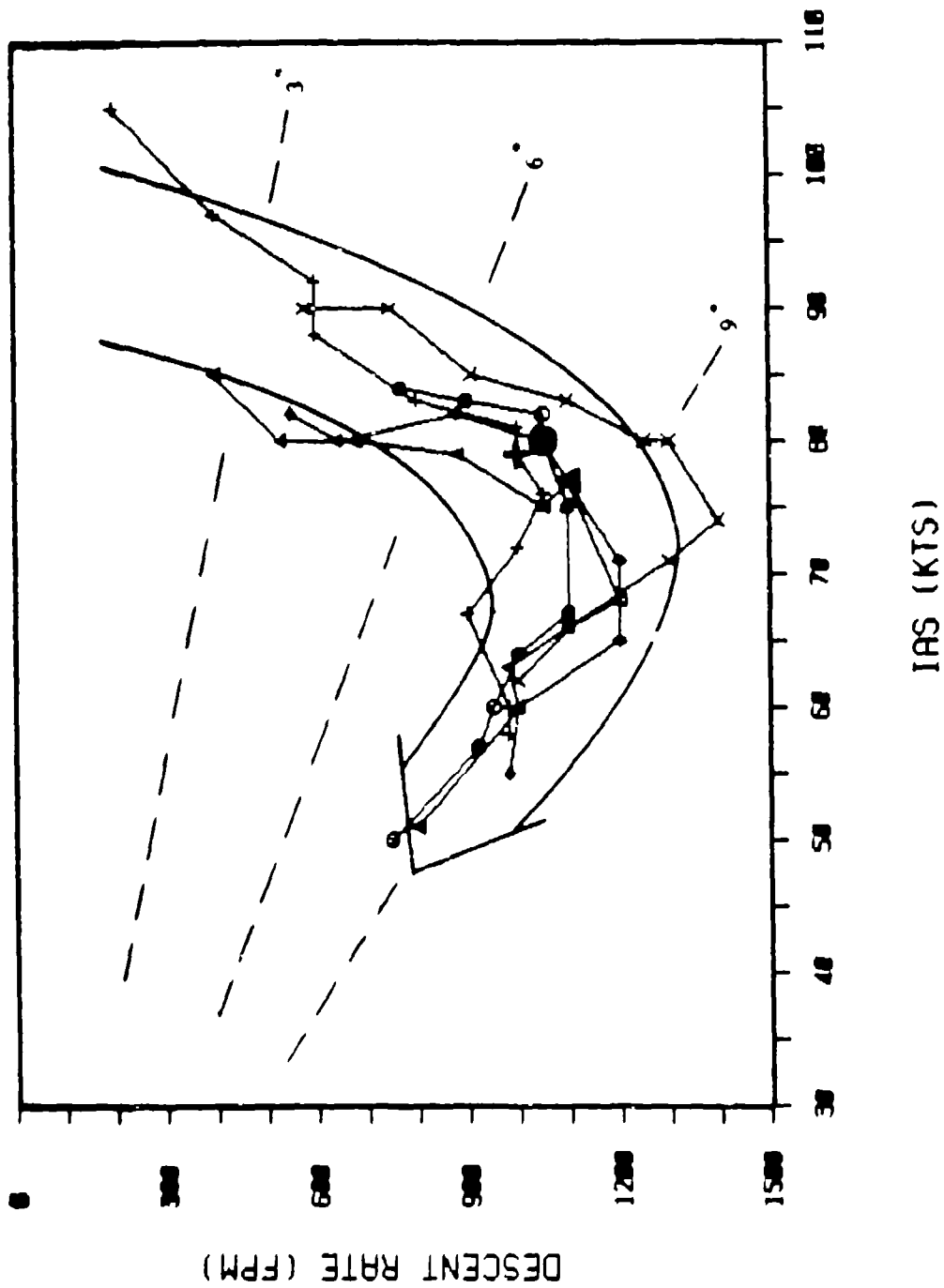
COCKPIT VIDEO

DATA

- - - - -

- THIS SECTION OF THE APPENDIX CONTAINS FLIGHT PROFILE -
- PLOTS AND INDIVIDUAL EVENT DATA READ EVERY 5 SECONDS -
- FROM PLAYBACK OF THE COCKPIT VIDEO RECORDINGS. IN THE -
- PROFILE PLOTS, INDICATED AIRSPEED VS. DESCENT RATE -
- ARE PLOTTED FOR THE NORMAL APPROACHES. AN ARROW IS -
- DRAWN WHICH BOUNDS THE DATA POINTS AND PORTRAYS THE -
- SPEED/DESCENT RATE TREND WITH TIME. THE DARKER DATA -
- POINTS INDICATE WHEN THE HELICOPTER PASSED OVER THE CLC -
- POSITION. THE INDIVIDUAL EVENT DATA CONTAINS LISTINGS -
- OF ALL THE COCKPIT INSTRUMENT READINGS OBTAINED FROM THE -
- VIDEO PLAYBACK. THIS DATA ENCOMPASSES THE HELICOPTERS'S -
- FLIGHT PARAMETERS THROUGHOUT THE ENTIRE DATA RUN PLUS OR -
- MINUS 15 SECONDS (MINIMUM) FROM CLC. -
- - - - -

NORMAL APPROACH
576



B19
B21
B25
B27
B29

○ + X △ ◇

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: SIKORSKY S76

DATE: 06/06/84

EVENT: B19

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -13 | 850 | 10 | 770 | 84 | 5.19 |
| -8 | 720 | 13 | 900 | 83 | 6.15 |
| -3 | 640 | 2 | 1050 | 82 | 7.24 |
| CLC 0 | 580 | 1 | 1050 | 80 | 7.45 |
| 2 | 530 | 2 | 1100 | 75 | 8.33 |
| 7 | 480 | 0 | 1100 | 67 | 9.33 |
| 12 | 380 | 10 | 1000 | 64 | 8.88 |
| 17 | 250 | 6 | 950 | 60 | 9.00 |
| 22 | 200 | 7 | 920 | 57 | 9.17 |

EVENT: B23

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -19 | 1010 | 22 | 500 | 85 | 3.33 |
| -14 | 940 | 17 | 670 | 85 | 4.46 |
| -9 | 860 | 13 | 700 | 82 | 4.84 |
| -4 | 800 | 22 | 650 | 84 | 4.38 |
| CLC 0 | 710 | 3 | 850 | 80 | 6.02 |
| 1 | 690 | 2 | 900 | 80 | 6.38 |
| 6 | 590 | 4 | 1200 | 78 | 8.74 |
| 11 | 490 | 0 | 1400 | 70 | 11.39 |
| 16 | 310 | 0 | 1550 | 64 | 13.84 |
| 21 | 220 | 2 | 1400 | 56 | 14.29 |

EVENT: B21

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 990 | 25 | 200 | 105 | 1.08 |
| -22 | 960 | 11 | 400 | 97 | 2.33 |
| -17 | 900 | 14 | 600 | 92 | 3.69 |
| -12 | 840 | 9 | 600 | 88 | 3.86 |
| -7 | 710 | 11 | 800 | 83 | 5.46 |
| -2 | 630 | 2 | 1000 | 81 | 7.00 |
| CLC 0 | 610 | 3 | 1000 | 79 | 7.18 |
| 3 | 550 | 5 | 1050 | 76 | 7.84 |
| 8 | 500 | 5 | 1000 | 72 | 7.88 |
| 13 | 400 | 3 | 900 | 67 | 7.62 |
| 18 | 290 | 2 | 980 | 60 | 9.28 |
| 23 | 210 | 6 | 980 | 58 | 9.60 |

EVENT: B25

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -19 | 1020 | 17 | 580 | 90 | 3.65 |
| -14 | 940 | 16 | 750 | 90 | 4.72 |
| -9 | 830 | 6 | 910 | 85 | 6.07 |
| -4 | 710 | 2 | 1100 | 83 | 7.52 |
| 0 | 630 | 0 | 1250 | 80 | 8.88 |
| 1 | 590 | 0 | 1300 | 80 | 9.23 |
| 6 | 500 | 0 | 1400 | 74 | 10.77 |
| 11 | 410 | 4 | 1300 | 71 | 10.42 |
| 16 | 290 | 7 | 1100 | 66 | 9.47 |
| 21 | 220 | 8 | 1000 | 62 | 9.16 |

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: SIKORSKY S76

DATE: 06/06/84

EVENT: B27

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -21 | 950 | 26 | 400 | 85 | 2.66 |
| -16 | 880 | 21 | 530 | 80 | 3.75 |
| -11 | 800 | 14 | 680 | 80 | 4.81 |
| -6 | 710 | 2 | 880 | 79 | 6.32 |
| -1 | 610 | 2 | 1050 | 75 | 7.95 |
| CLC 0 | 590 | 2 | 1100 | 77 | 8.11 |
| 4 | 510 | 3 | 1200 | 68 | 10.04 |
| 9 | 460 | 6 | 1100 | 66 | 9.47 |
| 14 | 350 | 11 | 980 | 63 | 8.84 |
| 19 | 240 | 10 | 1000 | 60 | 9.47 |
| 24 | 170 | 13 | 800 | 51 | 8.91 |

EVENT: B29

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -18 | 960 | 30 | 550 | 82 | 3.80 |
| -13 | 880 | 16 | 650 | 80 | 4.60 |
| -8 | 800 | 10 | 880 | 82 | 6.08 |
| -3 | 690 | 6 | 1050 | 80 | 7.45 |
| CLC 0 | 630 | 3 | 1050 | 80 | 7.45 |
| 2 | 580 | 0 | 1100 | 77 | 8.11 |
| 7 | 500 | 2 | 1200 | 71 | 9.61 |
| 12 | 400 | 7 | 1200 | 65 | 10.50 |
| 17 | 250 | 2 | 1000 | 60 | 9.47 |
| 22 | 190 | 12 | 980 | 55 | 10.13 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (9.5 DEG. TARGET, 60 KTS.)

HELICOPTER: SIKORSKY S76

DATE: 06/05/84

EVENT: D9

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 1000 | 32 | 150 | 66 | 1.29 |
| -25 | 940 | 5 | 500 | 68 | 4.16 |
| -20 | 850 | 18 | 850 | 64 | 7.54 |
| -15 | 770 | 20 | 800 | 60 | 7.57 |
| -10 | 670 | 20 | 750 | 64 | 6.65 |
| -5 | 610 | 20 | 820 | 68 | 6.84 |
| 0 | 550 | 20 | 700 | 65 | 6.10 |
| 5 | 500 | 15 | 750 | 65 | 6.54 |
| 10 | 440 | 18 | 800 | 68 | 6.67 |
| 15 | 380 | 13 | 750 | 65 | 6.54 |
| 20 | 260 | 23 | 800 | 64 | 7.09 |

EVENT: D10

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -25 | 950 | 28 | 100 | 65 | 0.87 |
| -20 | 880 | 8 | 500 | 65 | 4.36 |
| -15 | 800 | 11 | 750 | 65 | 6.54 |
| -10 | 700 | 15 | 700 | 65 | 6.10 |
| -5 | 640 | 13 | 750 | 65 | 6.54 |
| 0 | 570 | 10 | 650 | 65 | 7.42 |
| 5 | 510 | 11 | 800 | 65 | 6.98 |
| 10 | 470 | 20 | 700 | 62 | 6.40 |
| 15 | 390 | 10 | 750 | 65 | 6.54 |
| 20 | 290 | 11 | 780 | 62 | 7.14 |

EVENT: D11

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -23 | 900 | 20 | 100 | 78 | 0.73 |
| -18 | 840 | 6 | 450 | 78 | 3.27 |
| -13 | 770 | 14 | 700 | 74 | 5.36 |
| -8 | 680 | 18 | 750 | 70 | 6.07 |
| -3 | 610 | 13 | 800 | 67 | 6.77 |
| 0 | 570 | 18 | 800 | 68 | 6.67 |
| 2 | 540 | 22 | 800 | 70 | 6.40 |
| 7 | 490 | 22 | 840 | 68 | 7.01 |
| 12 | 430 | 20 | 800 | 68 | 6.67 |
| 17 | 340 | 19 | 850 | 65 | 7.42 |
| 22 | 250 | 22 | 770 | 60 | 7.28 |

EVENT: D12

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -25 | 950 | 32 | 200 | 79 | 1.43 |
| -20 | 900 | 11 | 500 | 73 | 3.88 |
| -15 | 820 | 10 | 700 | 70 | 5.67 |
| -10 | 710 | 16 | 800 | 64 | 7.09 |
| -5 | 650 | 20 | 830 | 65 | 7.24 |
| 0 | 570 | 20 | 840 | 65 | 7.51 |
| 5 | 500 | 23 | 800 | 67 | 6.77 |
| 10 | 470 | 23 | 700 | 65 | 6.10 |
| 15 | 410 | 25 | 700 | 67 | 5.92 |
| 20 | 310 | 25 | 750 | 68 | 6.25 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (9.5 DEG. TARGET, 60 KTS.)

HELICOPTER: SIKORSKY S76

DATE: 06/05/84

EVENT: D13

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -25 | 930 | 40 | 150 | 71 | 1.20 |
| -20 | 910 | 39 | 150 | 71 | 1.20 |
| -15 | 840 | 10 | 550 | 73 | 4.27 |
| -10 | 730 | 11 | 600 | 69 | 6.57 |
| -5 | 640 | 10 | 980 | 67 | 8.30 |
| 0 | 560 | 20 | 900 | 69 | 7.40 |
| 5 | 500 | 18 | 850 | 64 | 7.54 |
| 10 | 450 | 15 | 800 | 63 | 7.20 |
| 15 | 390 | 30 | 720 | 60 | 6.81 |
| 20 | 320 | 17 | 700 | 60 | 6.62 |

EVENT: D15

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -22 | 940 | 29 | 50 | 88 | 0.32 |
| -17 | 890 | 8 | 350 | 83 | 2.39 |
| -12 | 820 | 9 | 620 | 82 | 4.28 |
| -7 | 720 | 7 | 750 | 75 | 5.67 |
| -2 | 660 | 11 | 800 | 71 | 6.39 |
| 0 | 640 | 12 | 820 | 67 | 6.94 |
| 3 | 590 | 14 | 900 | 67 | 7.62 |
| 8 | 500 | 19 | 950 | 65 | 8.30 |
| 13 | 450 | 27 | 850 | 63 | 7.66 |
| 18 | 330 | 20 | 800 | 67 | 6.77 |
| 23 | 240 | 17 | 900 | 66 | 7.74 |

EVENT: D14

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 950 | 32 | 50 | 94 | 0.30 |
| -22 | 930 | 25 | 200 | 89 | 1.27 |
| -17 | 880 | 17 | 370 | 84 | 2.49 |
| -12 | 800 | 3 | 650 | 74 | 4.98 |
| -7 | 690 | 1 | 900 | 68 | 7.51 |
| -2 | 630 | 10 | 850 | 63 | 7.66 |
| 0 | 570 | 14 | 850 | 66 | 7.31 |
| 3 | 550 | 13 | 800 | 61 | 7.44 |
| 8 | 490 | 15 | 850 | 63 | 7.66 |
| 13 | 440 | 23 | 750 | 61 | 6.97 |
| 18 | 360 | 22 | 750 | 62 | 6.86 |
| 23 | 240 | 22 | 730 | 60 | 6.90 |
| 28 | 200 | 23 | 700 | 60 | 6.62 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (12 DEG. TARGET, 60 KTS.)

HELICOPTER: SIKORSKY S76

DATE: 06/06/84

EVENT: D30

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -24 | 1190 | 36 | 150 | 61 | 1.39 |
| -19 | 1090 | 23 | 450 | 66 | 3.86 |
| -14 | 1020 | 17 | 700 | 67 | 5.92 |
| -9 | 920 | 14 | 880 | 67 | 7.45 |
| -4 | 810 | 9 | 1200 | 67 | 10.19 |
| CLC 0 | 730 | 8 | 1200 | 68 | 10.04 |
| 1 | 720 | 7 | 1200 | 68 | 10.04 |
| 6 | 610 | 0 | 1400 | 64 | 12.48 |
| 11 | 500 | 0 | 1500 | 64 | 13.38 |
| 16 | 400 | 12 | 1400 | 62 | 12.88 |
| 21 | 300 | 10 | 1150 | 60 | 10.91 |

EVENT: D32

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 1100 | 14 | 150 | 68 | 1.25 |
| -15 | 990 | 9 | 680 | 66 | 5.84 |
| -10 | 890 | 3 | 1050 | 66 | 9.04 |
| -5 | 770 | 8 | 1200 | 66 | 10.34 |
| CLC 0 | 660 | 5 | 1200 | 66 | 10.34 |
| 5 | 560 | 6 | 1050 | 62 | 9.63 |
| 10 | 500 | 4 | 1000 | 58 | 9.80 |
| 15 | 430 | 12 | 1000 | 57 | 9.98 |
| 20 | 310 | 10 | 920 | 60 | 8.71 |

EVENT: D31

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 1110 | 36 | 50 | 68 | 0.42 |
| -22 | 1110 | 37 | 100 | 68 | 0.83 |
| -17 | 1080 | 28 | 200 | 68 | 1.66 |
| -12 | 980 | 13 | 680 | 68 | 5.67 |
| -7 | 880 | 9 | 900 | 68 | 7.51 |
| -2 | 770 | 5 | 1200 | 66 | 10.34 |
| CLC 0 | 730 | 2 | 1250 | 65 | 10.95 |
| 3 | 650 | 7 | 1250 | 65 | 10.95 |
| 8 | 560 | 10 | 1200 | 66 | 10.34 |
| 13 | 460 | 12 | 1300 | 66 | 11.22 |
| 18 | 280 | 8 | 1450 | 68 | 12.16 |

EVENT: D33

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -36 | 1070 | 45 | 100 | 63 | 0.90 |
| -31 | 1050 | 46 | 100 | 64 | 0.88 |
| -26 | 1060 | 40 | 100 | 70 | 0.81 |
| -21 | 1040 | 34 | 120 | 68 | 1.00 |
| -16 | 980 | 11 | 420 | 70 | 3.40 |
| -11 | 870 | 2 | 800 | 71 | 6.39 |
| -6 | 810 | 8 | 920 | 66 | 7.91 |
| -1 | 700 | 13 | 1000 | 63 | 9.02 |
| CLC 0 | 670 | 10 | 1100 | 63 | 9.93 |
| 4 | 610 | 12 | 1200 | 63 | 10.84 |
| 9 | 520 | 9 | 1150 | 61 | 10.73 |
| 14 | 470 | 11 | 1050 | 62 | 9.63 |
| 19 | 320 | 10 | 1050 | 62 | 9.63 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(3 DEG. TARGET, 60 KTS.)

HELICOPTER: SIKORSKY S76

DATE: 06/06/84

EVENT: D34

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -33 | 340 | 8 | 400 | 63 | 3.59 |
| -28 | 320 | 34 | 300 | 62 | 2.74 |
| -23 | 210 | 35 | 200 | 60 | 1.89 |
| -18 | 290 | 38 | 180 | 60 | 1.70 |
| -13 | 240 | 33 | 200 | 60 | 1.89 |
| -6 | 220 | 30 | 200 | 63 | 1.80 |
| -3 | 210 | 34 | 200 | 60 | 1.89 |
| CLC 0 | 195 | 36 | 200 | 60 | 1.89 |
| 2 | 185 | 35 | 200 | 60 | 1.89 |
| 7 | 175 | 35 | 200 | 60 | 1.89 |
| 12 | 165 | 35 | 200 | 60 | 1.89 |
| 17 | 105 | 33 | 200 | 60 | 1.89 |

EVENT: D35

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -31 | 360 | 35 | 150 | 62 | 1.37 |
| -26 | 350 | 35 | 190 | 65 | 1.65 |
| -21 | 300 | 35 | 300 | 62 | 2.74 |
| -16 | 280 | 35 | 250 | 60 | 2.36 |
| -11 | 240 | 35 | 250 | 68 | 2.08 |
| -6 | 240 | 25 | 200 | 68 | 1.66 |
| CLC 0 | 195 | 32 | 400 | 68 | 3.33 |
| 4 | 170 | 32 | 350 | 65 | 3.05 |
| 9 | 155 | 34 | 250 | 65 | 2.18 |
| 14 | 115 | 30 | 200 | 65 | 1.74 |

EVENT: D36

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -16 | 320 | 34 | 400 | 69 | 3.28 |
| -11 | 270 | 30 | 360 | 69 | 2.95 |
| -6 | 240 | 24 | 400 | 71 | 3.19 |
| CLC 0 | 200 | 29 | 400 | 67 | 3.38 |
| 4 | 175 | 30 | 380 | 68 | 3.16 |
| 9 | 165 | 24 | 350 | 68 | 2.91 |
| 14 | 115 | 33 | 300 | 70 | 2.43 |

EVENT: D37

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -24 | 370 | 33 | 300 | 63 | 2.70 |
| -19 | 340 | 32 | 250 | 65 | 2.18 |
| -14 | 390 | 30 | 350 | 74 | 2.88 |
| -9 | 350 | 28 | 400 | 72 | 3.14 |
| -4 | 330 | 25 | 400 | 69 | 3.28 |
| CLC 0 | 300 | 30 | 350 | 69 | 2.87 |
| 6 | 275 | 32 | 300 | 65 | 2.61 |
| 11 | 155 | 30 | 300 | 65 | 2.61 |
| 16 | 100 | 37 | 250 | 65 | 2.18 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(3 DEG. TARGET, 60 KTS.)

SIKORSKY S76

DATE: 06/06/84

EVENT: D38

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -23 | 370 | 31 | 300 | 69 | 2.46 |
| -18 | 320 | 23 | 400 | 67 | 3.38 |
| -13 | 270 | 30 | 400 | 65 | 3.48 |
| -8 | 220 | 30 | 400 | 68 | 3.33 |
| -3 | 210 | 30 | 300 | 68 | 2.50 |
| CLC 0 | 195 | 26 | 300 | 68 | 2.50 |
| 2 | 180 | 32 | 300 | 68 | 2.50 |
| 7 | 165 | 36 | 300 | 65 | 2.61 |
| 12 | 140 | 32 | 250 | 67 | 2.11 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (3 DEG. TARGET, 120 KTS.)

HELICOPTER: SIKORSKY S76

DATE: 06/06/84

EVENT: D39

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -19 | 430 | 20 | 650 | 122 | 3.02 |
| -14 | 360 | 32 | 750 | 118 | 3.60 |
| -9 | 290 | 42 | 700 | 120 | 3.30 |
| -4 | 220 | 46 | 600 | 120 | 2.83 |
| CLC 0 | 200 | 46 | 500 | 120 | 2.36 |
| 6 | 165 | 48 | 450 | 123 | 2.07 |
| 11 | 95 | 50 | 400 | 127 | 1.78 |

EVENT: D40

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 390 | 18 | 700 | 120 | 3.30 |
| -15 | 350 | 30 | 700 | 122 | 3.25 |
| -10 | 290 | 37 | 650 | 122 | 3.02 |
| -5 | 210 | 36 | 580 | 120 | 2.74 |
| CLC 0 | 180 | 42 | 400 | 119 | 1.90 |
| 5 | 155 | 42 | 380 | 120 | 1.79 |
| 10 | 100 | 53 | 300 | 123 | 1.38 |

EVENT: D41

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -23 | 450 | 35 | 500 | 122 | 2.32 |
| -18 | 410 | 32 | 650 | 122 | 3.02 |
| -13 | 370 | 34 | 600 | 121 | 2.81 |
| -8 | 300 | 33 | 600 | 120 | 2.83 |
| -3 | 220 | 34 | 600 | 125 | 2.72 |
| CLC 0 | 200 | 34 | 600 | 120 | 2.83 |
| 2 | 175 | 35 | 600 | 120 | 2.83 |
| 7 | 115 | 35 | 500 | 122 | 2.32 |
| 12 | 85 | 40 | 300 | 120 | 1.41 |

EVENT: D42

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -22 | 460 | 32 | 500 | 120 | 2.36 |
| -17 | 400 | 38 | 570 | 120 | 2.69 |
| -12 | 350 | 40 | 600 | 120 | 2.83 |
| -7 | 290 | 48 | 600 | 120 | 2.83 |
| -2 | 210 | 34 | 600 | 130 | 2.61 |
| CLC 0 | 195 | 40 | 600 | 128 | 2.65 |
| 3 | 175 | 38 | 580 | 125 | 2.63 |
| 8 | 125 | 44 | 500 | 128 | 2.21 |
| 13 | 85 | 50 | 300 | 122 | 1.39 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(3 DEG. TARGET, 120 KTS.)

BIKORSKY 876

DATE: 06/06/84

EVENT: D43

| TIME (SEC.) | ALT. (ASL) | G (X) | R/D (PPH) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -16 | 300 | 35 | 850 | 121 | 2.87 |
| -11 | 320 | 30 | 600 | 123 | 2.76 |
| -6 | 230 | 30 | 850 | 120 | 2.99 |
| CLC 0 | 200 | 40 | 800 | 123 | 2.30 |
| 4 | 170 | 34 | 800 | 121 | 2.34 |
| 9 | 85 | 35 | 450 | 120 | 2.12 |

APPENDIX B

MRB BK117

| | <u>PAGE NUMBERS</u> |
|---|---------------------|
| <u>HELICOPTER CHARACTERISTICS</u> | B-97 |
| <u>NOISE LEVEL DATA</u> | |
| SOUND EXPOSURE LEVEL | |
| Bar Charts | |
| Approaches..... | B-100 |
| Takeoff..... | B-101 |
| Level Flyovers..... | B-102 |
| Summary Tables..... | B-103 - B-105 |
| Individual Event Data..... | B-106 - B-115 |
| A-WEIGHTED SOUND LEVEL | |
| Bar Charts | |
| Approaches..... | B-118 |
| Takeoff..... | B-119 |
| Level Flyovers..... | B-120 |
| Summary Tables..... | B-121 - B-124 |
| Individual Event Data..... | B-125 - B-138 |
| HOVER DATA (1eq) | |
| Plots..... | B-140 |
| Individual Event Data..... | B-141 - B-142 |
| <u>RADAR TRACKING DATA</u> | |
| Position Data..... | B-144 - B-177 |
| Tracking Plots..... | B-178 - B-191 |
| <u>METEOROLOGICAL DATA</u> | |
| 10-meter Tower Data..... | B-194 - B-197 |
| 4 ft. Data and Aircraft OAT Data..... | B-198 - B-200 |
| Pilot Balloon Wind Data..... | B-201 - B-203 |
| <u>COCKPIT VIDEO DATA</u> | |
| Normal Approach Plot..... | B-206 |
| Individual Event Data..... | B-207 - B-212 |



HELICOPTER CHARACTERISTICS

HELICOPTER MANUFACTURER : MBB
HELICOPTER MODEL : BK117 A-1
TEST HELICOPTER N-NUMBER : N39187
MAX INTERNAL GROSS WEIGHT : 7283 LBS.
NUMBER OF ENGINES : TWO
UNINSTALLED TAKEOFF POWER : 592 SHP (PER ENGINE)
UNINSTALLED MAX CONTINUOUS PWR. : 550 SHP (PER ENGINE)
NEVER EXCEED SPEED (VNE) : 150 KTS.
MAX SPEED IN LEVEL FLIGHT
WITH MAX CONTINUOUS POWER : 136 KTS.
SPEED FOR BEST RATE OF CLIMB (VY) : 65 KTS.
CRUISE SPEED FOR BEST RANGE (VCR) : 126 KTS.
BEST RATE OF CLIMB AT
TAKEOFF POWER (BRC) : 2150 FPM
"TOP OF GREEN ARC" ROTOR SPEED : 391 RPM 102%

MAIN AND TAIL ROTOR SPECIFICATIONS

| | MAIN | TAIL |
|------------------------|-------|------|
| DIAMETER (FT.) : | 36.09 | 6.29 |
| NO. OF BLADES : | 4 | 2 |
| TIPSPEED (FPS) @100% : | 725 | 714 |
| TIP SHAPE : | --- | --- |

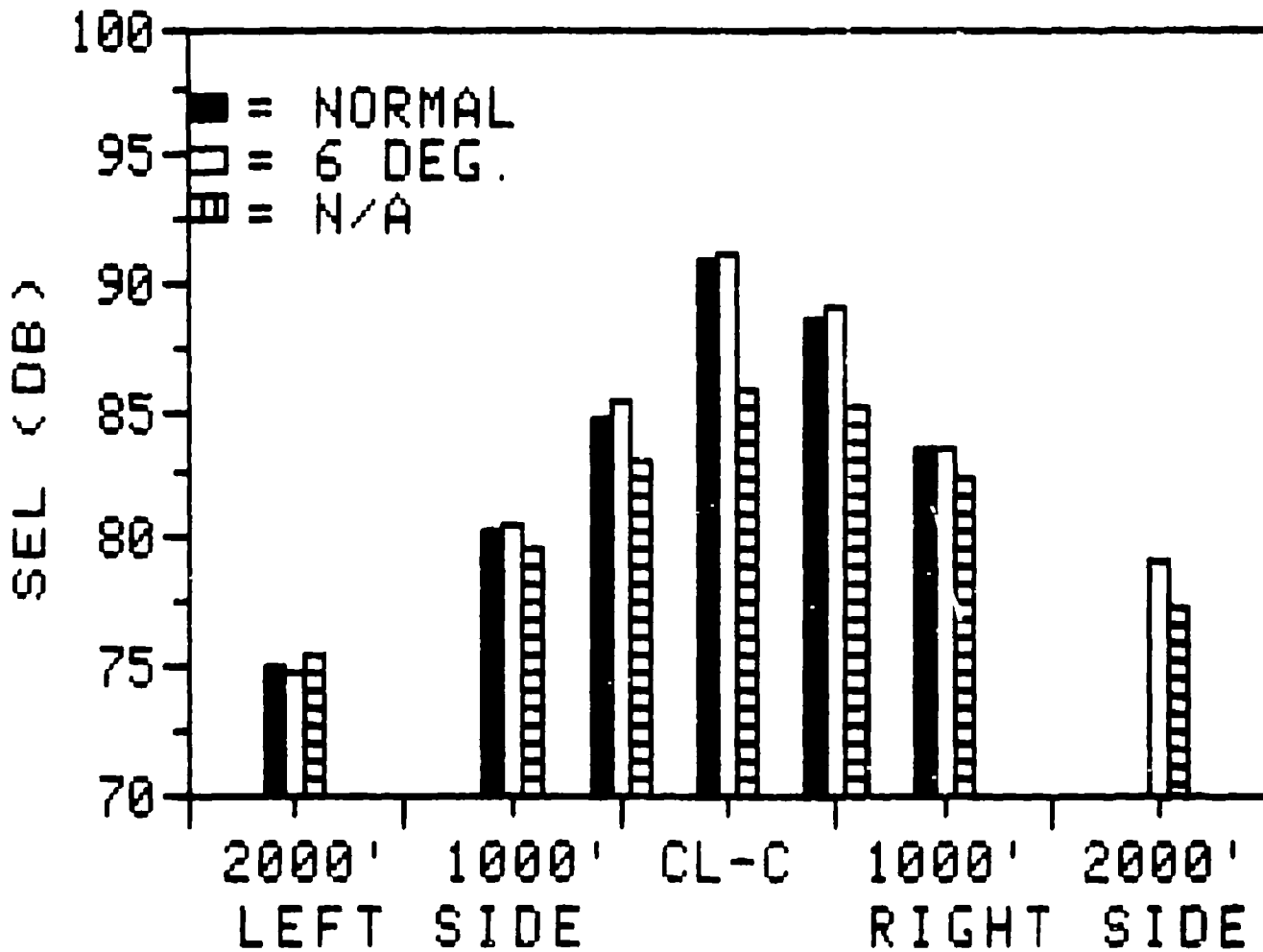
NOISE LEVEL DATA

'as-measured'

SOUND EXPOSURE LEVEL

THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' SOUND EXPOSURE LEVELS (SEL) FOR ALL FLIGHT EVENTS. THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, STANDARD DEVIATION AND THE 95 PERCENT CONFIDENCE INTERVAL FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR EACH CONDITION IS THEN GIVEN.

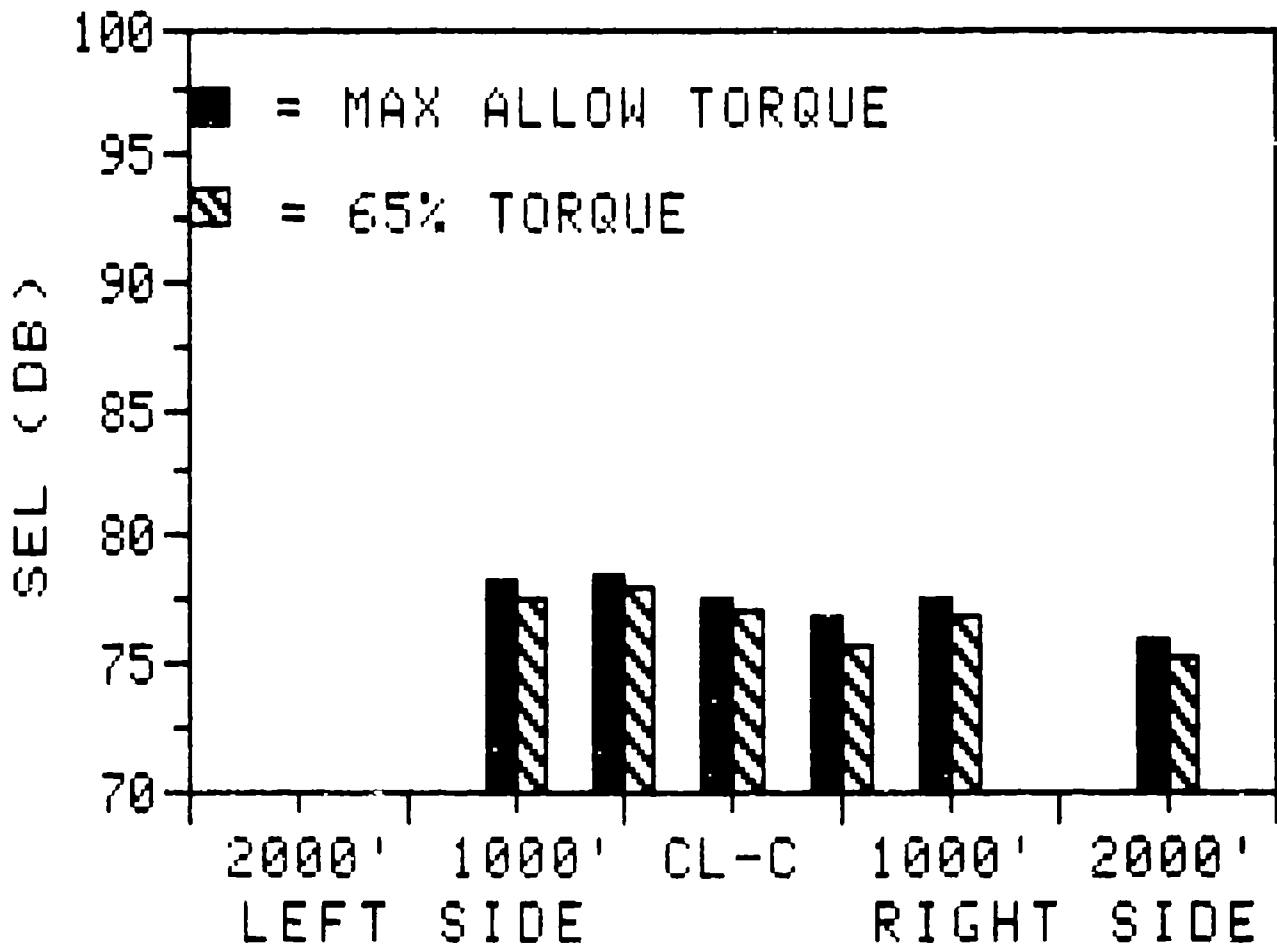
APPROACHES BK117



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|---|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 380 | 78-83 | 6.1-6.6 |
| SIX DEG. APPROACH | 380 | 68 | 6.0 |
| NOISE ABATEMENT APP. 10 TARGET, VAR. A/B (EVENTS D29-D39) | 620 | 63-86 | 7.3-11.3 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN ±15 SEC OF THE CL-C MICROPHONE POSITION.

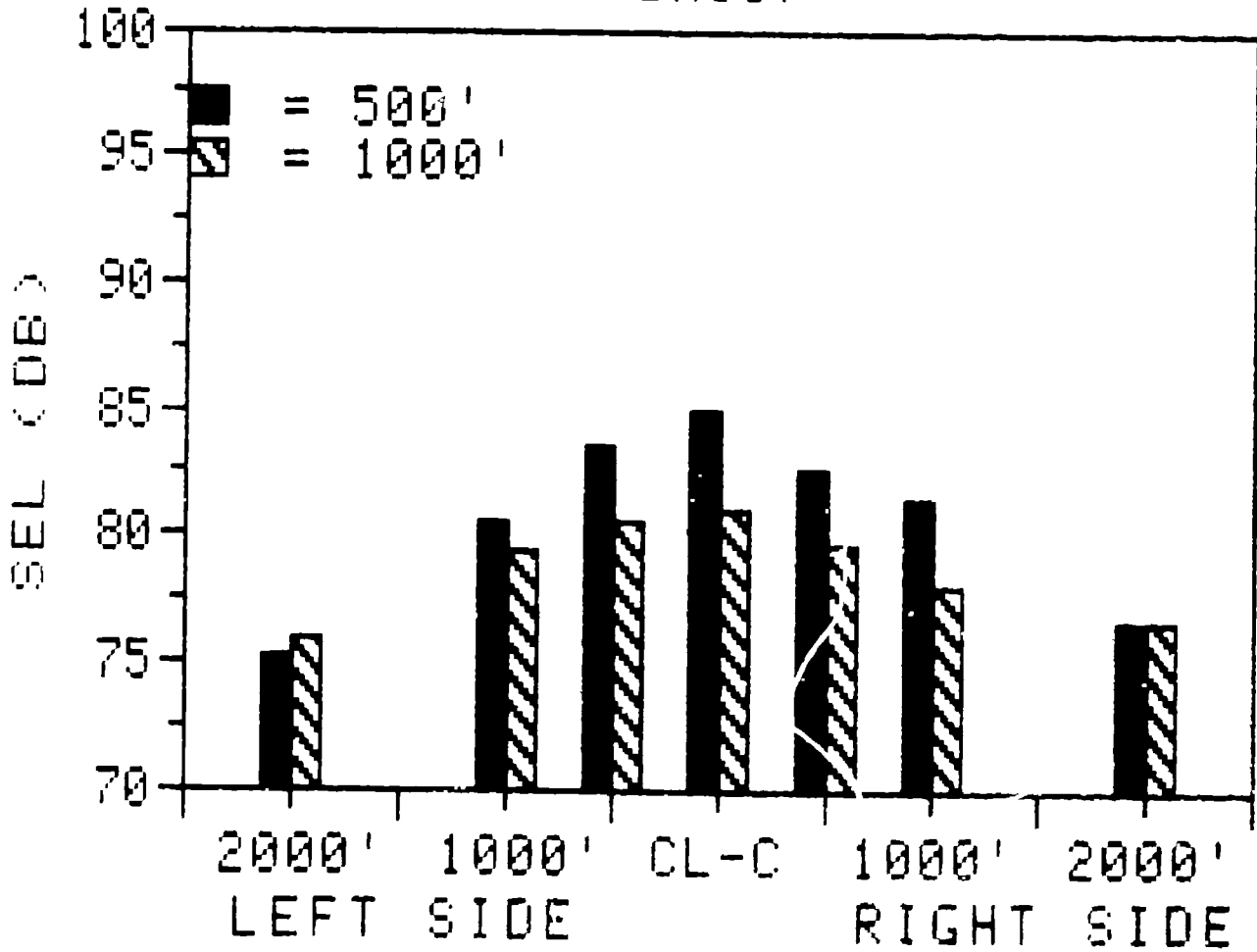
TAKEOFFS BK117



| OPERATION | AVG. ALT. OVER CLC (FT. AGL) | INDICATED AIRSPEED (KTS.) |
|------------------|---------------------------------|------------------------------|
| <u>TAKEOFF</u> | | |
| MAX ALLOW TORQUE | 1480 | 67 |
| 65% TORQUE | 1450 | 65 |

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN THE HELICOPTER PASSED OVER CLC MICROPHONE POSITION

LEVEL FLYOVERS BK117



INDICATED EFFECTIVE SEL (DB)

BK117 SUMMARY SHEET (6/25 & 6/27)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 65 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 74.8 | 80.5 | 85.3 | 91.1 | 89.0 | 83.5 | 79.1 |
| N | 8 | 7 | 8 | 8 | 8 | 7 | 7 |
| S.D. | 1.2 | .5 | 1.4 | .9 | 1.0 | 1.0 | 1.1 |
| 90% CI | .8 | .4 | .9 | .6 | .7 | .7 | .8 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 75.0 | 80.3 | 84.7 | 90.9 | 88.6 | 83.5 | -- |
| N | 5 | 6 | 6 | 6 | 6 | 6 | -- |
| S.D. | .8 | .8 | .9 | .9 | .9 | .4 | -- |
| 90% CI | .8 | .7 | .7 | .8 | .8 | .3 | -- |

* NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 76.2 | 82.4 | 88.8 | 93.1 | 87.8 | 85.5 | 79.3 |
| N | 4 | 4 | 4 | 5 | 5 | 5 | 5 |
| S.D. | .5 | .3 | .9 | 1.4 | .7 | .6 | .9 |
| 90% CI | .6 | .4 | 1.0 | 1.3 | .7 | .6 | .9 |

* NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 75.7 | 81.9 | 87.4 | 92.6 | 86.9 | 84.6 | 78.4 |
| N | 5 | 5 | 5 | 5 | 5 | 5 | 4 |
| S.D. | .5 | .6 | 1.4 | 1.1 | .5 | .6 | 1.0 |
| 90% CI | .5 | .5 | 1.4 | 1.0 | .5 | .6 | 1.2 |

BK117 SUMMARY SHEET (6/25 & 6/27)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 75.4 | 79.6 | 83.1 | 85.7 | 85.2 | 82.4 | 77.2 |
| N | 6 | 7 | 7 | 7 | 7 | 7 | 7 |
| S.D. | .6 | .6 | 1.2 | 2.2 | 1.3 | .9 | 1.0 |
| 90% CI | .5 | .4 | .9 | 1.6 | 1.0 | .7 | .7 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 74.8 | 80.7 | 84.8 | 88.1 | 87.2 | 83.2 | 78.5 |
| N | 7 | 8 | 8 | 8 | 8 | 8 | 8 |
| S.D. | .7 | .6 | 1.3 | 2.3 | 1.4 | 1.0 | .8 |
| 90% CI | .5 | .4 | .8 | 1.5 | 1.0 | .7 | .5 |

* TAKEOFF (MAX TORQUE) *

| | | | | | | | |
|---------|----|------|------|------|------|------|------|
| AVERAGE | -- | 78.3 | 78.5 | 77.4 | 76.8 | 77.5 | 75.8 |
| N | -- | 7 | 7 | 7 | 7 | 6 | 7 |
| S.D. | -- | .3 | 1.1 | .9 | .5 | 1.1 | .8 |
| 90% CI | -- | .3 | .8 | .6 | .4 | .9 | .6 |

* TAKEOFF (65% TORQUE) *

| | | | | | | | |
|---------|----|------|------|------|------|------|------|
| AVERAGE | -- | 77.6 | 78.0 | 77.1 | 75.6 | 76.9 | 75.3 |
| N | -- | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | -- | .9 | .6 | .5 | 1 | .6 | .4 |
| 90% CI | -- | .8 | .5 | .4 | .8 | .5 | .4 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 5/25/84

OPERATION : 6 DEGREE APPROACH AT VY, 65 KTS.

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | CL-D | 500' | 1000' | 2000' |
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| A1 | 72.90 | -- | 84.30 | 90.90 | 90.20 | 85.30 | 80.18 |
| A2 | 74.10 | 79.80 | 85.20 | 91.30 | 89.80 | 84.20 | 79.60 |
| A4 | 73.50 | 79.90 | 82.50 | 89.10 | 89.40 | 83.30 | 79.40 |
| A6 | 75.60 | 81.00 | 86.90 | 91.60 | 87.70 | 82.20 | 77.30 |
| A8 | 75.70 | 81.00 | 86.20 | 91.10 | 88.20 | -- | 78.50 |
| A10 | 76.30 | 80.90 | 85.30 | 91.50 | 90.00 | 83.30 | 80.30 |
| A12 | 75.90 | 80.50 | 85.40 | 91.60 | 88.70 | 82.90 | -- |
| A14 | 74.70 | 80.20 | 86.30 | 92.00 | 87.80 | 83.20 | 78.40 |
| AVERAGE | 74.84 | 80.47 | 85.26 | 91.14 | 88.98 | 83.49 | 79.10 |
| STD. DEV. | 1.24 | 0.52 | 1.37 | 0.89 | 1.01 | 1.00 | 1.08 |
| 90% C.I. | 0.83 | 0.38 | 0.92 | 0.59 | 0.67 | 0.73 | 0.79 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6-25-84

OPERATION : TAKEOFF (MAX TORQUE)

(LEFT SIDE)

(RIGHT SIDE)

| EVENT NO. | 2000' | 1000' | 500' | CL-FC | 500' | 1000' | 2000' |
|--------------|-------|-------|-------|-------|-------|-------|-------|
| | WEST | WEST | WEST | | EAST | EAST | EAST |
| 03 | -- | 78.60 | 78.40 | 77.60 | 77.60 | 78.00 | 74.70 |
| 05 | -- | 79.70 | 80.60 | 78.60 | 78.90 | 78.70 | 75.90 |
| 07 | -- | 78.50 | 77.40 | 75.90 | 76.40 | 70.80 | 76.70 |
| 09 | -- | 78.00 | 77.90 | 76.80 | 76.50 | -- | 75.00 |
| 011 | -- | 78.40 | 79.40 | 77.70 | 77.20 | 77.90 | 77.00 |
| 013 | -- | 77.80 | 77.90 | 77.90 | 76.80 | 76.80 | 74.70 |
| 015 | -- | 78.00 | 78.00 | 77.10 | 76.00 | 77.50 | 75.70 |
| AVERAGE | -- | 78.07 | 78.91 | 77.75 | 77.77 | 77.48 | 75.71 |
| STD. DEV. | -- | 0.34 | 1.11 | 0.38 | 0.50 | 1.05 | 0.79 |
| 90% C. I. | -- | 0.25 | 0.61 | 0.60 | 0.79 | 0.61 | 0.53 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B16 | -- | 81.00 | 84.80 | 89.70 | 87.80 | 83.80 | -- |
| B18 | 76.40 | 80.80 | 85.40 | 90.70 | 88.90 | 83.70 | -- |
| B20 | 74.50 | 81.20 | 85.90 | 91.70 | 87.90 | 83.10 | -- |
| B22 | 74.50 | 79.20 | 83.50 | 89.80 | 90.30 | 83.50 | -- |
| B24 | 74.50 | 79.80 | 84.00 | 91.50 | 88.40 | 84.00 | -- |
| B26 | -- | -- | -- | -- | -- | -- | -- |
| B28 | 75.10 | 79.70 | 84.80 | 91.70 | 88.40 | 83.10 | -- |
| AVERAGE | 75.00 | 80.28 | 84.73 | 90.85 | 88.62 | 83.53 | -- |
| BTD. DEV. | 0.82 | 0.82 | 0.88 | 0.93 | 0.92 | 0.37 | -- |
| 90% C.I. | 0.79 | 0.68 | 0.73 | 0.77 | 0.75 | 0.31 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : TAKEOFF (65% TORQUE)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| C17 | -- | 78.60 | 77.30 | 76.50 | 76.70 | 77.20 | 75.50 |
| C19 | -- | 78.80 | 78.70 | 77.50 | 76.80 | 77.70 | 75.80 |
| C21 | -- | 77.70 | 78.20 | 77.80 | 75.30 | 77.30 | 74.70 |
| C23 | -- | 77.10 | 77.70 | 76.60 | 74.70 | 76.70 | 74.80 |
| C25 | -- | 76.40 | 77.50 | 77.30 | 74.50 | 76.10 | 75.40 |
| C27 | -- | 77.10 | 78.80 | 76.90 | 75.60 | 76.30 | 75.40 |
| AVERAGE | -- | 77.62 | 78.03 | 77.10 | 75.60 | 76.88 | 75.27 |
| STD. DEV. | -- | 0.94 | 0.63 | 0.52 | 0.98 | 0.62 | 0.43 |
| 90% C. I. | -- | 0.77 | 0.52 | 0.43 | 0.80 | 0.51 | 0.35 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D29 | 74.90 | 80.20 | 81.90 | 83.40 | 83.70 | 81.60 | 77.20 |
| D30 | 75.30 | 79.40 | 81.90 | 83.40 | 84.20 | 81.20 | 76.80 |
| D31 | 74.70 | 79.50 | 82.70 | 85.10 | 85.80 | 82.20 | 76.90 |
| D32 | 75.60 | 79.80 | 84.30 | 87.50 | 85.90 | 83.20 | 78.00 |
| D33 | -- | 78.70 | 82.40 | 84.90 | 84.30 | 82.80 | 75.90 |
| D34 | 75.60 | 80.30 | 85.00 | 89.40 | 87.60 | 83.80 | 79.00 |
| D35 | 76.30 | 79.30 | 83.50 | 86.00 | 84.90 | 81.90 | 76.90 |
| AVERAGE | 75.40 | 79.60 | 83.10 | 85.67 | 85.20 | 82.39 | 77.24 |
| STD. DEV. | 0.57 | 0.55 | 1.21 | 2.18 | 1.34 | 0.92 | 0.99 |
| 90% C.I. | 0.47 | 0.41 | 0.88 | 1.60 | 0.98 | 0.68 | 0.73 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/64

OPERATION : NOISE ABATEMENT APPROACH (VAR. A/S AND R/D)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D38 | 75.60 | 80.30 | 84.80 | 89.30 | 88.10 | 84.60 | 79.20 |
| D39 | 75.30 | 79.40 | 83.00 | 85.00 | 85.70 | 82.20 | 77.80 |
| D40 | 74.60 | 81.10 | 83.80 | 85.10 | 84.70 | 82.40 | 79.30 |
| D41 | 75.00 | 80.80 | 84.90 | 88.00 | 87.20 | 84.60 | 78.80 |
| D42 | 75.10 | 80.60 | 83.80 | 86.80 | 86.50 | 83.70 | 77.50 |
| D43 | 74.10 | 80.80 | 85.90 | 90.20 | 88.20 | 82.10 | 79.50 |
| D44 | 73.80 | 81.50 | 86.60 | 91.10 | 88.60 | 83.40 | 78.30 |
| D45 | -- | 80.80 | 85.90 | 88.90 | 88.40 | 82.90 | 77.90 |
| AVERAGE | 74.79 | 80.66 | 84.84 | 88.05 | 87.18 | 83.24 | 78.54 |
| STD. DEV. | 0.65 | 0.62 | 1.25 | 2.26 | 1.42 | 1.01 | 0.77 |
| 90% C. I. | 0.48 | 0.41 | 0.83 | 1.51 | 0.95 | 0.67 | 0.51 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : LEVEL FLYOVER (500 FT. AT 126 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| F46 | 74.50 | 80.20 | -- | 84.00 | 81.80 | 81.30 | -- |
| F47 | -- | 80.00 | 83.10 | 84.20 | -- | 81.20 | 76.60 |
| F48 | 75.80 | 80.50 | 83.00 | 84.00 | 82.20 | 80.60 | -- |
| F49 | -- | 80.30 | 83.20 | 85.00 | 82.80 | 82.20 | 77.40 |
| F50 | 76.50 | 81.60 | 84.00 | 85.20 | 82.20 | 81.40 | -- |
| F51 | -- | 80.70 | 83.60 | 85.20 | 82.90 | 82.40 | 76.10 |
| F52 | 74.60 | 79.60 | 82.30 | 84.80 | 82.20 | 81.10 | -- |
| F53 | -- | 80.40 | 83.60 | 84.50 | 82.10 | 81.20 | 76.30 |
| F54 | 75.00 | 81.10 | 84.20 | 86.20 | 83.70 | 81.80 | -- |
| F55 | -- | 80.70 | 82.80 | 85.00 | 81.40 | 81.40 | 75.90 |
| F56 | 75.30 | 80.60 | 82.30 | 84.20 | 82.90 | 79.80 | -- |
| F57 | -- | 79.50 | 84.70 | 85.20 | 82.50 | 81.80 | 75.70 |
| F58 | 73.90 | 80.10 | 83.20 | 84.50 | 82.50 | 81.10 | -- |
| F59 | -- | 80.50 | 84.50 | 85.80 | 82.50 | 82.20 | 77.10 |
| F60 | 75.40 | 81.50 | 83.10 | 84.00 | 83.90 | 81.00 | -- |
| F61 | -- | 80.20 | 83.90 | -- | 82.20 | 81.70 | 77.40 |
| F62 | 76.40 | 80.70 | 83.10 | -- | 83.80 | 81.60 | -- |
| AVERAGE | 75.27 | 80.48 | 83.41 | 84.79 | 82.60 | 81.40 | 76.56 |
| STD. DEV. | 0.87 | 0.57 | 0.71 | 0.67 | 0.71 | 0.63 | 0.67 |
| 90% C. I. | 0.54 | 0.25 | 0.32 | 0.31 | 0.32 | 0.28 | 0.45 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : LEVEL FLYOVER (1000 FT. @ 126 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| E63 | -- | 79.50 | 82.00 | 82.50 | 79.70 | 80.20 | 78.00 |
| E64 | 76.50 | -- | 80.80 | 81.40 | 80.20 | 78.70 | -- |
| E65 | -- | 79.30 | 81.80 | 81.20 | 79.30 | 78.50 | 76.70 |
| E66 | 76.20 | 79.50 | 79.10 | 80.50 | 81.60 | 78.00 | -- |
| E67 | -- | 79.70 | 82.00 | 81.10 | 77.90 | 79.40 | 78.10 |
| E68 | 76.80 | 79.50 | 80.30 | 81.50 | 81.70 | 78.70 | -- |
| E69 | -- | 79.30 | 81.90 | 81.30 | 78.80 | 80.40 | 76.80 |
| | 75.60 | 79.00 | 79.60 | 79.80 | 80.50 | 78.20 | -- |
| | -- | 78.90 | 81.40 | 80.90 | 78.70 | 79.30 | 75.60 |
| | 74.90 | 78.70 | 79.10 | 80.20 | 79.10 | 77.80 | -- |
| | -- | 79.10 | 80.70 | 80.70 | 78.50 | 78.70 | 74.90 |
| | 75.80 | 79.10 | 79.20 | 79.60 | 79.10 | 77.80 | -- |
| E70 | -- | 79.50 | 80.20 | 81.70 | 79.00 | 79.10 | 75.80 |
| AVERAGE | 75.97 | 79.26 | 80.62 | 80.95 | 79.55 | 78.83 | 76.56 |
| STD. DEV. | 0.68 | 0.30 | 1.13 | 0.80 | 1.16 | 0.83 | 1.21 |
| 90% C.I. | 0.56 | 0.16 | 0.57 | 0.40 | 0.58 | 0.42 | 0.89 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/27/84

OPERATION : NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D1 | 75.70 | 82.40 | 88.50 | 92.40 | 86.60 | 84.60 | 78.40 |
| D2 | 76.20 | 82.70 | 90.00 | 95.00 | 87.80 | 85.80 | 80.00 |
| D3 | 76.90 | 82.00 | 88.80 | 94.00 | 88.40 | 86.30 | 80.30 |
| D4 | -- | -- | -- | 92.20 | 88.20 | 85.50 | 79.40 |
| D5 | 75.80 | 82.60 | 87.90 | 91.70 | 87.90 | 85.20 | 78.30 |
| AVERAGE | 76.15 | 82.43 | 88.80 | 93.06 | 87.78 | 85.48 | 79.28 |
| STD. DEV. | 0.54 | 0.31 | 0.88 | 1.38 | 0.70 | 0.64 | 0.91 |
| 90% C. I. | 0.64 | 0.36 | 1.04 | 1.32 | 0.67 | 0.61 | 0.87 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/27/84

OPERATION : NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.)

| EVENT NO. | E) (LEFT SID | | | DE) (RIGHT SI | | | |
|--------------|---------------|---------------|--------------|---------------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D6 | 76.00 | 81.30 | 85.10 | 91.10 | 86.30 | 83.90 | 77.20 |
| D7 | 75.70 | 82.20 | 88.90 | 92.50 | 87.30 | 85.40 | 78.60 |
| D8 | 76.10 | 81.90 | 87.90 | 93.40 | 86.90 | 84.60 | 78.30 |
| D9 | 76.00 | 81.50 | 87.30 | 93.90 | 87.50 | 85.00 | -- |
| D10 | 74.80 | 82.70 | 87.90 | 92.30 | 86.70 | 84.10 | 79.60 |
| AVERAGE | 75.72 | 81.92 | 87.42 | 92.64 | 86.94 | 84.60 | 78.43 |
| STD. DEV. | 0.54 | 0.56 | 1.42 | 1.08 | 0.48 | 0.62 | 0.99 |
| 90% C.I. | 0.51 | 0.53 | 1.35 | 1.03 | 0.45 | 0.59 | 1.16 |

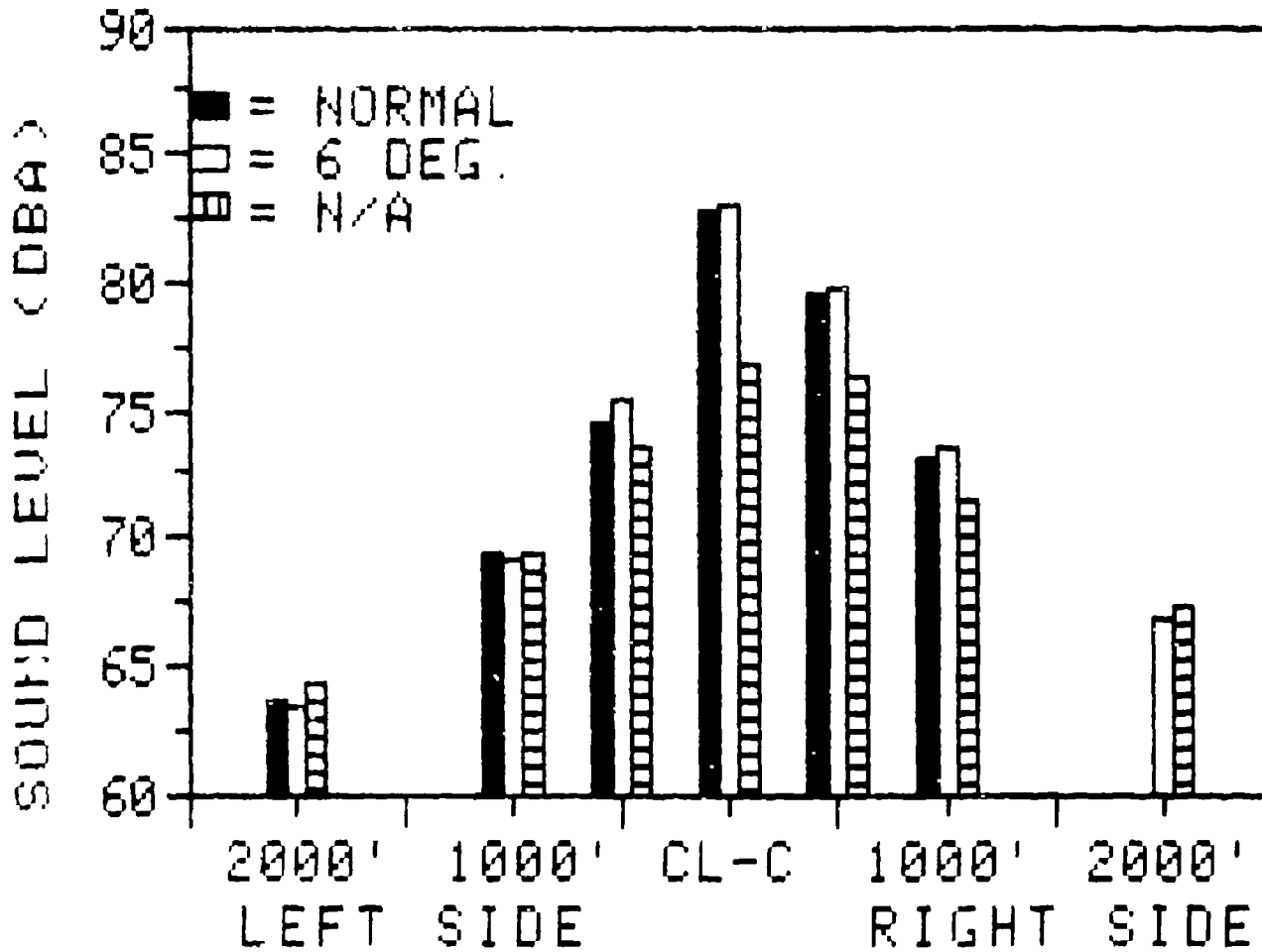
NOISE LEVEL DATA

'as-measured'

A-WEIGHTED SOUND LEVEL (dBA)

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- A-WEIGHTED SOUND LEVEL (dBA) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN. -

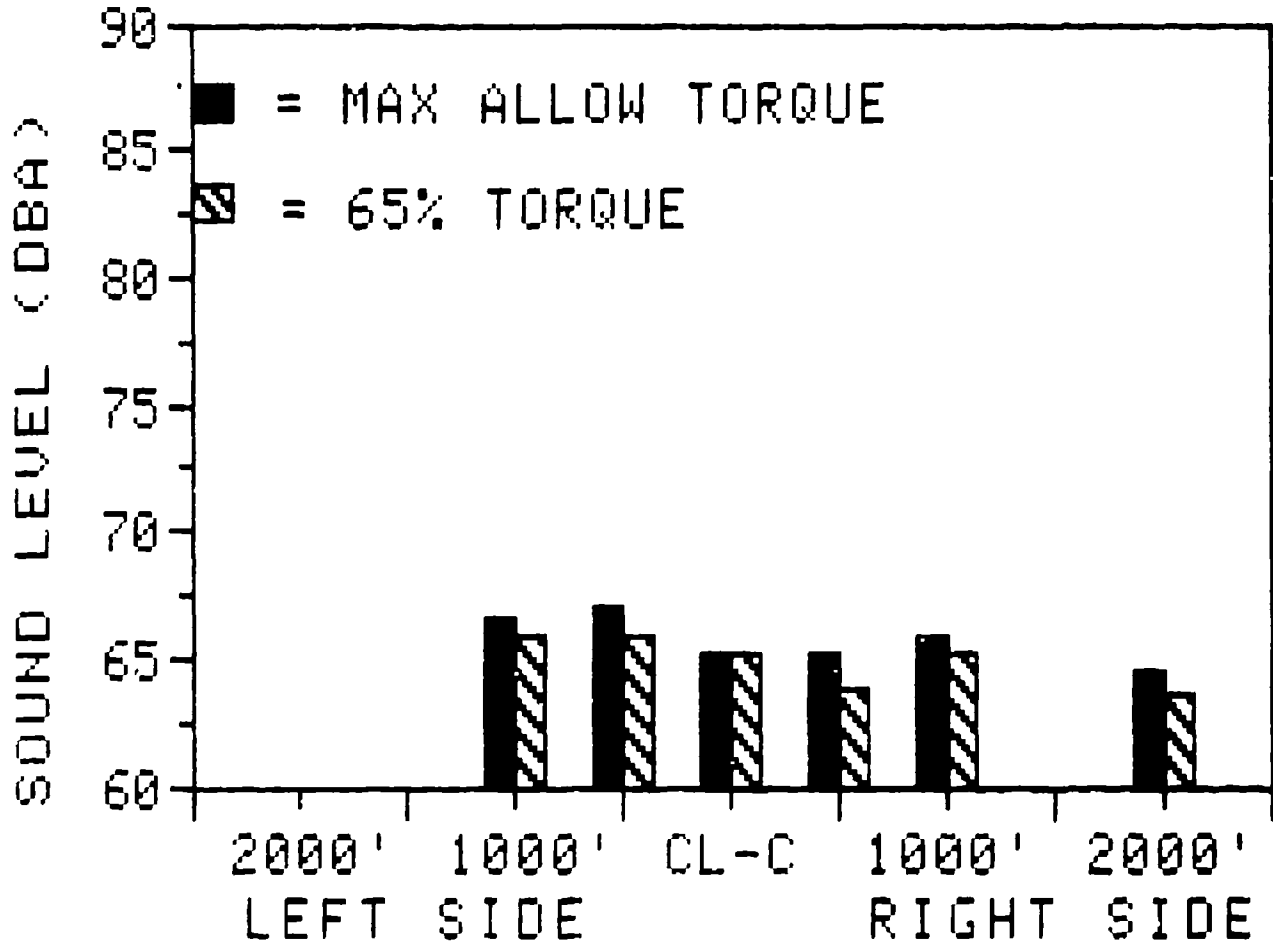
APPROACHES BK117



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDEBLOPE RANGE (DEG.) |
|---|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 380 | 75-53 | 6.1-6.6 |
| SIX DEG. APPROACH | 380 | 65 | 6.0 |
| NOISE ABATEMENT APP. 10 TARGET, VAR. A/B (EVENTS D29-D35) | 620 | 63-56 | 7.3-11.3 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDEBLOPE RANGE WAS CALCULATED WITHIN 215 SEC OF THE CL-C MICROPHONE POSITION.

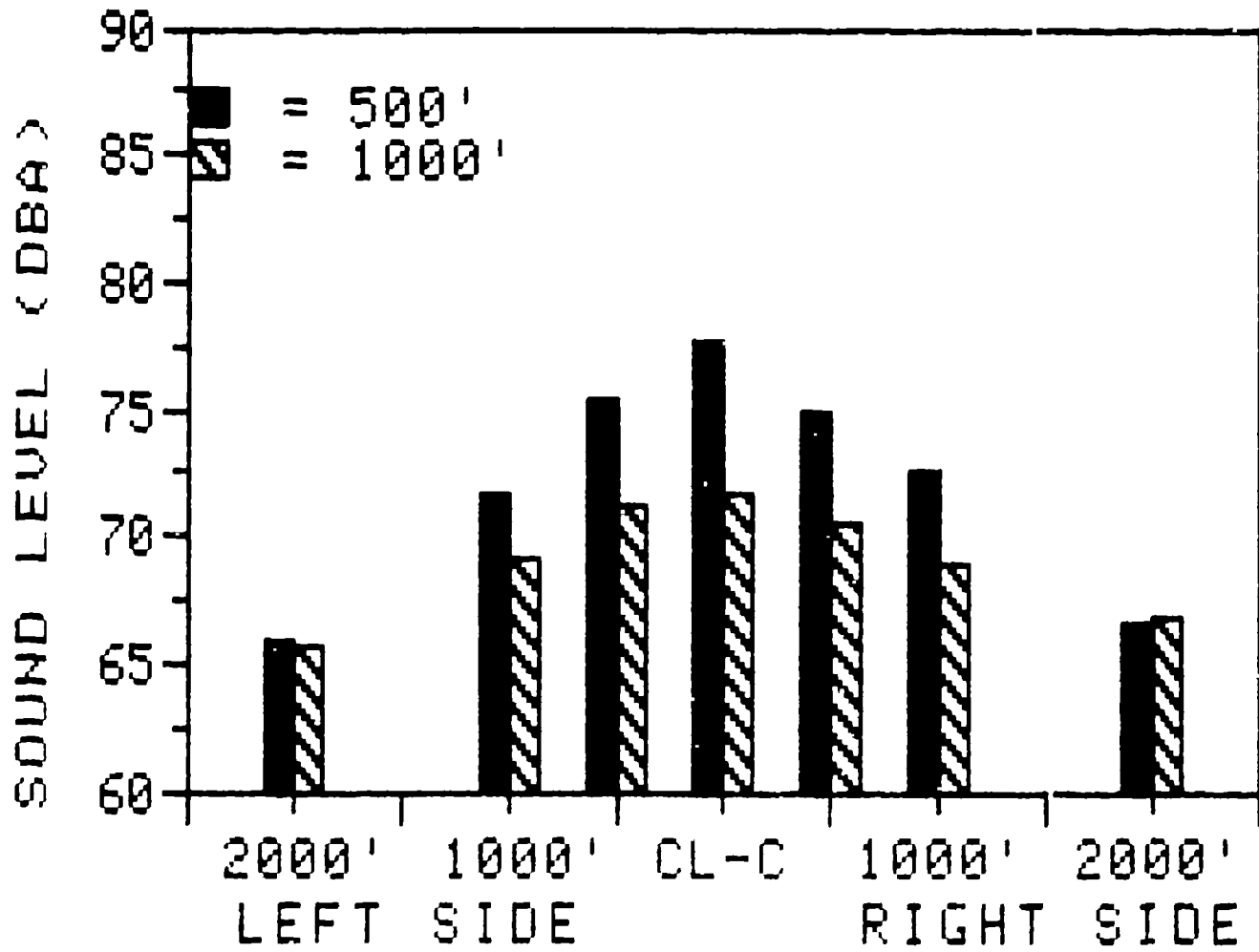
TAKEOFFS BK117



| OPERATION | MAX. ALTITUDE (CLC - FT. AGL) | INDICATED AIRSPEED (KTS.) |
|--------------------|----------------------------------|------------------------------|
| TAKEOFF | | |
| MAX. ALLOW. TORQUE | 1450 | 67 |
| 65% TORQUE | 1450 | 65 |

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN THE HELICOPTER PASSED OVER CLC MICROPHONE POSITION

LEVEL FLYOVERS BK117



INDICATED AIRSPEED 412 KTS.

BK117 SUMMARY SHEET (6/25 & 6/27)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 65 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 63.4 | 69.1 | 75.4 | 83.0 | 79.8 | 73.4 | 66.9 |
| N | 8 | 7 | 8 | 8 | 8 | 8 | 6 |
| S.D. | 2.0 | .5 | 1.5 | 1.4 | 1.5 | 1.3 | 2.2 |
| 90% CI | 1.3 | .4 | 1.0 | .9 | 1 | .9 | 1.8 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 63.6 | 69.3 | 74.5 | 82.7 | 79.6 | 73.0 | -- |
| N | 5 | 6 | 6 | 6 | 6 | 6 | -- |
| S.D. | 2.6 | 1.5 | 1.4 | .9 | 1.0 | 1.1 | -- |
| 90% CI | 2.5 | 1.2 | 1.1 | .8 | .9 | .9 | -- |

* NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 62.2 | 69.2 | 76.6 | 82.3 | 75.6 | 72.4 | 66.2 |
| N | 4 | 4 | 4 | 5 | 5 | 5 | 5 |
| S.D. | 1.4 | .9 | 1.8 | 1.6 | 1.1 | 1.2 | 1.7 |
| 90% CI | 1.6 | 1.1 | 2.1 | 2.5 | 1.1 | 1.2 | 1.6 |

* NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 63.0 | 68.6 | 75.4 | 82.0 | 74.8 | 72.2 | 65.7 |
| N | 5 | 5 | 5 | 5 | 5 | 5 | 4 |
| S.D. | 1.1 | 1.1 | 2.1 | 1.2 | .5 | 1.2 | 1.2 |
| 90% CI | 1.0 | 1.1 | 2.0 | 1.2 | .4 | 1.2 | 1.4 |

BK117 SUMMARY SHEET (6/25 & 6/27)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE) (RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 64.2 | 69.3 | 73.4 | 76.7 | 76.2 | 71.5 | 67.3 |
| N | 6 | 7 | 7 | 7 | 7 | 7 | 7 |
| S.D. | 1.1 | 1.2 | 1.6 | 3.1 | 2.5 | 1.7 | 1.7 |
| 90% CI | .7 | .9 | 1.2 | 2.3 | 1.9 | 1.3 | 1.3 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 63.7 | 69.1 | 74.5 | 77.9 | 77.4 | 72.2 | 67.1 |
| N | 7 | 8 | 8 | 8 | 7 | 8 | 8 |
| S.D. | 1.3 | .8 | 1.8 | 2.3 | .9 | 1.9 | 1.8 |
| 90% CI | .9 | .5 | 1.2 | 1.5 | .7 | 1.3 | 1.2 |

* TAKEOFF (MAX TORQUE) *

| | | | | | | | |
|---------|----|------|------|------|------|------|------|
| AVERAGE | -- | 66.5 | 67.1 | 65.2 | 65.1 | 65.9 | 64.6 |
| N | -- | 6 | 7 | 7 | 7 | 6 | 7 |
| S.D. | -- | .4 | 2.0 | 1.4 | .9 | 1.1 | 1.1 |
| 90% CI | -- | .4 | 1.4 | 1.0 | .7 | .9 | .8 |

* TAKEOFF (65% TORQUE) *

| | | | | | | | |
|---------|----|------|------|------|------|------|------|
| AVERAGE | -- | 65.9 | 65.8 | 65.1 | 63.8 | 65.1 | 63.5 |
| N | -- | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | -- | .7 | .8 | 1.2 | .7 | .6 | .5 |
| 90% CI | -- | .6 | .7 | 1.0 | .5 | .5 | .4 |

BK117 SUMMARY SHEET (6/25 & 6/27)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* 500 FT. LEVEL FLYOVER AT 126 KTS. TARGET, VAR. A/S *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 66.0 | 71.7 | 75.3 | 77.7 | 74.9 | 72.6 | 66.5 |
| N | 9 | 18 | 17 | 16 | 17 | 18 | 8 |
| S.D. | 1.2 | 1.1 | 1.0 | .7 | .6 | 1.0 | .9 |
| 90% CI | .7 | .5 | .5 | .3 | .3 | .4 | .6 |

* 1000 FT. LEVEL FLYOVER AT 126 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 65.7 | 69.2 | 71.1 | 71.6 | 70.5 | 69.0 | 66.8 |
| N | 6 | 12 | 13 | 13 | 13 | 13 | 7 |
| S.D. | 1.0 | .5 | .8 | .7 | 1.3 | .8 | 1.1 |
| 90% CI | .8 | .3 | .4 | .4 | .7 | .4 | .8 |

BK117 SUMMARY SHEET (06/28/84)

A-WEIGHTED SOUND LEVEL (DB)

(INSIDE OF TURN) (OUTSIDE OF TURN)

2000' 1000' 500' CL-C 500' 1000' 2000'

(RIGHT SIDE)

(RIGHT SIDE)

* 15 DEG. BANK ANGLE TURN, 65 KTS. *

| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' | |
|---------|-------|-------|------|------|------|-------|-------|----|
| AVERAGE | 62.7 | 67.2 | 73.3 | 75.2 | 72.3 | 68.8 | | -- |
| N | 4 | 5 | 5 | 11 | 6 | 6 | | -- |
| S.D. | 1.0 | .8 | .4 | 1.8 | 1.0 | .4 | | -- |
| 90% CI | 1.2 | .8 | .4 | 1.0 | .8 | .4 | | -- |

* 30 DEG. BANK ANGLE TURN, 65 KTS.

| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' | |
|---------|-------|-------|------|------|------|-------|-------|----|
| AVERAGE | 62.7 | 69.0 | 72.4 | 75.9 | 74.6 | 70.1 | | -- |
| N | 4 | 4 | 4 | 8 | 4 | 3 | | -- |
| S.D. | .9 | 1.6 | .9 | 2.3 | .8 | 1.0 | | -- |
| 90% CI | 1.1 | 1.9 | 1.1 | 1.5 | .9 | 1.6 | | -- |

(LEFT SIDE)

(LEFT SIDE)

* 15 DEG. BANK ANGLE TURN, 65 KTS.

| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' | |
|---------|-------|-------|------|------|------|-------|-------|----|
| AVERAGE | 62.0 | 67.5 | 73.2 | 75.2 | 71.4 | 67.1 | | -- |
| N | 3 | 6 | 6 | 11 | 5 | 5 | | -- |
| S.D. | 1.8 | 1.2 | 2.3 | 1.8 | 2.6 | 2.3 | | -- |
| 90% CI | 3.0 | 1.0 | 1.9 | 1.0 | 2.5 | 2.2 | | -- |

* 30 DEG. BANK ANGLE TURN, 65 KTS.

| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' | |
|---------|-------|-------|------|------|------|-------|-------|----|
| AVERAGE | 62.9 | 69.2 | 73.3 | 75.9 | 71.7 | 69.3 | | -- |
| N | 2 | 4 | 4 | 8 | 4 | 4 | | -- |
| S.D. | 1.4 | 1.6 | .8 | 2.3 | 2.8 | 4.2 | | -- |
| 90% CI | -- | 1.8 | 1.0 | 1.5 | 3.3 | 4.9 | | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : 6 DEGREE APPROACH AT VY, 65 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A1 | 62.90 | -- | 74.70 | 82.40 | 81.20 | 76.00 | 63.10 |
| A2 | 60.40 | 68.60 | 76.40 | 83.80 | 81.50 | 74.00 | 68.60 |
| A4 | 62.40 | 69.10 | 72.50 | 80.50 | 80.10 | 72.00 | -- |
| A6 | 64.70 | 69.60 | 77.30 | 84.30 | 78.80 | 73.00 | 66.10 |
| A8 | 63.40 | 69.50 | 75.60 | 82.10 | 77.40 | 73.00 | 67.30 |
| A10 | 66.50 | 69.50 | 75.30 | 82.80 | 80.40 | 73.30 | 69.40 |
| A12 | 65.30 | 68.20 | 74.90 | 83.50 | 80.90 | 73.80 | -- |
| A14 | 61.90 | 69.10 | 76.50 | 84.70 | 78.20 | 72.00 | 66.60 |
| AVERAGE | 63.44 | 69.09 | 75.40 | 83.01 | 79.81 | 73.39 | 66.85 |
| STD. DEV. | 1.98 | 0.52 | 1.46 | 1.36 | 1.50 | 1.28 | 2.21 |
| 90% C. I. | 1.32 | 0.38 | 0.98 | 0.91 | 1.00 | 0.86 | 1.82 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : TAKEOFF (MAX TORQUE)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| C3 | -- | 66.70 | 67.30 | 65.20 | 65.30 | 67.50 | 64.00 |
| C5 | -- | -- | 71.40 | 67.70 | 65.80 | 66.40 | 65.50 |
| C7 | -- | 66.30 | 66.10 | 63.60 | 65.50 | 64.50 | 65.50 |
| C9 | -- | 66.00 | 67.00 | 65.40 | 63.90 | -- | 62.90 |
| C11 | -- | 66.80 | 66.40 | 63.70 | 66.00 | 66.60 | 65.20 |
| C13 | -- | 67.00 | 65.70 | 65.60 | 63.70 | 64.90 | 63.60 |
| C15 | -- | 66.00 | 66.00 | 64.90 | 65.20 | 65.70 | 65.40 |
| AVERAGE | -- | 66.47 | 67.13 | 65.16 | 65.06 | 65.93 | 64.59 |
| STD. DEV. | -- | 0.43 | 1.97 | 1.37 | 0.90 | 1.12 | 1.07 |
| 90% C.I. | -- | 0.35 | 1.44 | 1.01 | 0.66 | 0.93 | 0.78 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B16 | -- | 68.10 | 73.20 | 81.80 | 78.40 | 73.00 | -- |
| B18 | 67.20 | 69.50 | 75.90 | 83.10 | 79.80 | 73.00 | -- |
| B20 | 61.90 | 70.40 | 75.20 | 83.40 | 78.70 | 71.00 | -- |
| B22 | 61.50 | 67.40 | 72.50 | 81.30 | 81.30 | 72.80 | -- |
| B24 | 61.90 | 68.90 | 74.70 | 82.90 | 79.40 | 74.00 | -- |
| B26 | -- | -- | -- | -- | -- | -- | -- |
| B28 | 65.60 | 71.30 | 75.60 | 83.60 | 80.00 | 74.00 | -- |
| AVERAGE | 63.62 | 69.27 | 74.52 | 82.68 | 79.60 | 72.97 | -- |
| STD. DEV. | 2.61 | 1.45 | 1.37 | 0.92 | 1.04 | 1.10 | -- |
| 90% C.I. | 2.48 | 1.19 | 1.13 | 0.76 | 0.86 | 0.91 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : TAKEOFF (65% TORQUE)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| C17 | -- | 67.00 | 65.00 | 64.40 | 63.60 | 64.90 | 62.90 |
| C19 | -- | 66.30 | 65.80 | 64.00 | 63.60 | 65.80 | 63.50 |
| C21 | -- | 65.50 | 67.00 | 66.90 | 63.80 | 65.50 | 63.50 |
| C23 | -- | 66.00 | 65.70 | 65.80 | 63.10 | 65.30 | 64.40 |
| C25 | -- | 65.00 | 64.80 | 65.50 | 63.50 | 64.20 | 63.30 |
| C27 | -- | 65.40 | 66.40 | 63.90 | 65.00 | 64.90 | 63.10 |
| AVERAGE | -- | 65.87 | 65.78 | 65.08 | 63.77 | 65.10 | 63.45 |
| STD. DEV. | -- | 0.72 | 0.83 | 1.19 | 0.65 | 0.56 | 0.52 |
| 90% C.I. | -- | 0.59 | 0.68 | 0.98 | 0.53 | 0.46 | 0.43 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D29 | 62.80 | 70.00 | 71.90 | 72.90 | 72.80 | 69.00 | 67.90 |
| D30 | 64.40 | 71.70 | 71.70 | 73.40 | 73.60 | 70.00 | 65.60 |
| D31 | 63.90 | 68.90 | 73.50 | 75.90 | 77.20 | 71.30 | 66.80 |
| D32 | 64.30 | 68.30 | 75.10 | 78.00 | 77.70 | 73.10 | 69.50 |
| D33 | -- | 68.90 | 71.70 | 76.20 | 74.50 | 71.00 | 65.30 |
| D34 | 63.80 | 68.90 | 75.00 | 81.40 | 78.40 | 74.00 | 69.50 |
| D35 | 66.00 | 68.60 | 74.60 | 79.20 | 79.20 | 72.30 | 66.80 |
| AVERAGE | 64.20 | 69.33 | 73.36 | 76.71 | 76.20 | 71.53 | 67.34 |
| BTD. DEV. | 1.05 | 1.17 | 1.58 | 3.06 | 2.53 | 1.74 | 1.70 |
| 90% C.I. | 0.86 | 0.86 | 1.16 | 2.25 | 1.85 | 1.28 | 1.25 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. A/S & R/D)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D38 | 65.10 | 68.60 | 73.90 | 80.60 | 78.00 | 76.00 | 70.90 |
| D39 | 62.90 | 68.80 | 73.40 | 75.80 | 76.40 | 71.00 | 66.40 |
| D40 | 62.60 | 70.40 | 73.60 | 74.80 | -- | 71.00 | 67.00 |
| D41 | 65.00 | 68.10 | 72.70 | 76.60 | 76.40 | 73.20 | 65.50 |
| D42 | 65.00 | 68.50 | 72.60 | 76.00 | 76.70 | 73.00 | 65.40 |
| D43 | 62.20 | 70.00 | 76.40 | 79.30 | 78.90 | 71.00 | 68.30 |
| D44 | 63.00 | 69.30 | 76.60 | 80.60 | 77.40 | 72.20 | 66.60 |
| D45 | -- | 69.20 | 76.70 | 79.40 | 77.80 | 70.00 | 66.40 |
| AVERAGE | 63.69 | 69.11 | 74.49 | 77.89 | 77.37 | 72.18 | 67.06 |
| STD. DEV. | 1.29 | 0.78 | 1.78 | 2.33 | 0.94 | 1.90 | 1.78 |
| 90% C.I. | 0.94 | 0.52 | 1.19 | 1.56 | 0.69 | 1.27 | 1.19 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : LEVEL FLYOVER (500 FT. AT 126 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | WEST | WEST | WEST | | EAST | EAST | EAST |
| F46 | 66.00 | 72.80 | -- | 77.70 | 74.40 | 74.00 | -- |
| F47 | -- | 74.00 | 74.30 | 77.00 | -- | 72.10 | 67.40 |
| F48 | 68.20 | 72.70 | 75.40 | 77.50 | 75.30 | 72.80 | -- |
| F49 | -- | 71.00 | 74.60 | 77.60 | 74.30 | 72.90 | 66.40 |
| F50 | 66.30 | 73.40 | 77.30 | 79.00 | 75.90 | 73.80 | -- |
| F51 | -- | 71.20 | 75.20 | 78.20 | 75.20 | 73.40 | 66.80 |
| F52 | 66.00 | 70.30 | 74.10 | 77.80 | 74.50 | 71.80 | -- |
| F53 | -- | 71.20 | 75.50 | 77.00 | 74.30 | 72.30 | 66.80 |
| F54 | 66.00 | 72.20 | 75.30 | 77.90 | 75.10 | 71.80 | -- |
| F55 | -- | 71.50 | 74.20 | 77.80 | 74.00 | 72.00 | 64.90 |
| F56 | 65.50 | 70.80 | 74.50 | 77.80 | 74.20 | 71.00 | -- |
| F57 | -- | 70.00 | 76.80 | 78.40 | 74.90 | 74.00 | 66.30 |
| F58 | 64.40 | 71.60 | 75.90 | 77.20 | 75.00 | 72.50 | -- |
| F59 | -- | 71.00 | 77.00 | 78.40 | 75.00 | 73.60 | 67.60 |
| F60 | 64.50 | 71.60 | 74.40 | 76.40 | 74.40 | 70.80 | -- |
| F61 | -- | 70.90 | 75.30 | -- | 75.20 | 72.30 | 65.40 |
| F62 | 66.80 | 71.80 | 74.30 | -- | 76.00 | 72.20 | -- |
| AVERAGE | 65.97 | 71.65 | 75.26 | 77.71 | 74.86 | 72.55 | 66.45 |
| STD. DEV. | 1.15 | 1.07 | 1.04 | 0.65 | 0.59 | 0.97 | 0.93 |
| 90% C.I. | 0.71 | 0.47 | 0.47 | 0.30 | 0.27 | 0.43 | 0.62 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/25/84

OPERATION : LEVEL FLYOVER (1000 FT. @ 126 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| E63 | -- | 68.50 | 71.60 | 72.10 | 69.90 | 70.50 | 67.80 |
| E64 | 66.00 | -- | 71.00 | 72.70 | 71.20 | 69.00 | -- |
| E65 | -- | 69.50 | 71.80 | 71.00 | 70.40 | 69.10 | 65.10 |
| E66 | 66.60 | 69.30 | 69.80 | 71.80 | 73.20 | 68.00 | -- |
| E67 | -- | 69.00 | 71.90 | 71.20 | 69.10 | 69.30 | 66.20 |
| E68 | 66.80 | 70.50 | 71.30 | 73.20 | 73.20 | 69.00 | -- |
| E69 | -- | 68.80 | 72.10 | 71.40 | 69.80 | 70.50 | 66.90 |
| E70 | 65.30 | 69.60 | 70.60 | 71.10 | 71.00 | 68.30 | -- |
| E71 | -- | 69.00 | 72.20 | 71.10 | 69.70 | 69.60 | 66.30 |
| E72 | 64.60 | 69.50 | 70.20 | 70.80 | 70.20 | 68.00 | -- |
| E73 | -- | 68.70 | 70.60 | 71.20 | 69.80 | 68.60 | 68.30 |
| E74 | 64.60 | 69.30 | 69.90 | 71.10 | 69.60 | 68.70 | -- |
| E75 | -- | 69.00 | 70.90 | 71.60 | 69.40 | 68.70 | 66.90 |
| AVERAGE | 65.65 | 69.23 | 71.07 | 71.56 | 70.50 | 69.02 | 66.79 |
| BTD. DEV. | 0.97 | 0.53 | 0.82 | 0.72 | 1.33 | 0.81 | 1.06 |
| 90% C. I. | 0.80 | 0.28 | 0.41 | 0.36 | 0.67 | 0.40 | 0.78 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/27/84

OPERATION : NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D1 | 60.60 | 68.00 | 75.60 | 80.40 | 73.80 | 70.50 | 64.20 |
| D2 | 62.40 | 70.20 | 79.10 | 85.60 | 75.70 | 72.50 | 66.90 |
| D3 | 63.90 | 69.10 | 76.70 | 84.60 | 76.20 | 73.00 | 68.70 |
| D4 | -- | -- | -- | 81.00 | 76.80 | 73.80 | 66.00 |
| D5 | 61.90 | 69.60 | 75.20 | 80.00 | 75.50 | 72.00 | 65.30 |
| AVERAGE | 62.20 | 69.23 | 76.65 | 82.32 | 75.60 | 72.36 | 66.22 |
| STD. DEV. | 1.36 | 0.93 | 1.75 | 2.59 | 1.12 | 1.23 | 1.70 |
| 90% C. I. | 1.60 | 1.10 | 2.06 | 2.46 | 1.07 | 1.18 | 1.62 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 5/27/84

OPERATION : NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D6 | 62.00 | 68.00 | 73.10 | 81.50 | 75.40 | 71.00 | 64.80 |
| D7 | 63.40 | 69.10 | 78.70 | 80.80 | 74.70 | 72.00 | 66.40 |
| D8 | 62.30 | 67.40 | 75.70 | 83.10 | 74.50 | 71.30 | 64.60 |
| D9 | 64.70 | 68.40 | 76.80 | 83.60 | 75.00 | 74.00 | -- |
| D10 | 62.70 | 70.30 | 77.60 | 81.20 | 74.20 | 72.80 | 66.90 |
| AVERAGE | 63.02 | 68.64 | 76.38 | 82.04 | 74.76 | 72.22 | 65.68 |
| STD. DEV. | 1.08 | 1.11 | 2.14 | 1.23 | 0.46 | 1.21 | 1.15 |
| 90% C.I. | 1.02 | 1.06 | 2.04 | 1.18 | 0.44 | 1.16 | 1.35 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/28/84

OPERATION : 15 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (RIGHT SIDE) | | | | OUTSIDE OF TURN (RIGHT SIDE) | | |
|-----------|--------------------------------|---------------|--------------|-------|---------------------------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | CL-C | 500' WEST | 1000' WEST | 2000' WEST |
| G1 | ----- | ----- | ----- | 74.50 | 70.90 | 68.20 | -- |
| G2 | 61.40 | 65.90 | 73.10 | 72.30 | ----- | ----- | ----- |
| G3 | ----- | ----- | ----- | 75.00 | 72.50 | 68.90 | -- |
| G4 | -- | 67.10 | 72.80 | 76.30 | ----- | ----- | ----- |
| G5 | ----- | ----- | ----- | 78.90 | 73.40 | 69.50 | -- |
| G6 | 63.90 | 68.00 | 73.20 | 74.40 | ----- | ----- | ----- |
| G7 | ----- | ----- | ----- | 74.60 | 72.40 | 69.00 | -- |
| G8 | 62.60 | 67.30 | 73.80 | 75.70 | ----- | ----- | ----- |
| G9 | ----- | ----- | ----- | 77.30 | 75.20 | 68.80 | -- |
| G10 | 62.80 | 67.80 | 73.70 | 74.30 | ----- | ----- | ----- |
| G11 | ----- | ----- | ----- | 74.10 | 71.20 | 68.50 | -- |
| AVERAGE | 62.68 | 67.22 | 73.32 | 75.22 | 72.27 | 68.82 | -- |
| STD. DEV. | 1.02 | 0.82 | 0.42 | 1.78 | 1.02 | 0.44 | -- |
| 90% C.I. | 1.20 | 0.78 | 0.40 | 0.97 | 0.84 | 0.37 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/28/84

OPERATION : 15 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (LEFT SIDE) | | | | OUTSIDE OF TURN (LEFT SIDE) | | |
|--------------|-------------------------------|-------|-------|-------|--------------------------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| G1 | 61.90 | 67.30 | 71.70 | 74.50 | ----- | ----- | ----- |
| G2 | ----- | ----- | ----- | 72.30 | 67.80 | 65.00 | -- |
| G3 | -- | 68.80 | 71.90 | 75.00 | ----- | ----- | ----- |
| G4 | ----- | ----- | ----- | 76.30 | 74.60 | 70.50 | -- |
| G5 | 63.90 | 68.90 | 77.60 | 78.90 | ----- | ----- | ----- |
| G6 | ----- | ----- | ----- | 74.40 | 72.80 | 68.20 | -- |
| G7 | -- | 66.00 | 72.40 | 74.60 | ----- | ----- | ----- |
| G8 | ----- | ----- | ----- | 75.70 | 71.80 | 66.80 | -- |
| G9 | -- | 67.30 | 74.00 | 77.30 | ----- | ----- | ----- |
| G10 | ----- | ----- | ----- | 74.30 | 69.80 | 65.00 | -- |
| G11 | 60.30 | 66.50 | 71.50 | 74.10 | ----- | ----- | ----- |
| AVERAGE | 62.03 | 67.47 | 73.18 | 75.22 | 71.36 | 67.10 | -- |
| STD. DEV. | 1.80 | 1.18 | 2.34 | 1.78 | 2.64 | 2.33 | -- |
| 90% C.I. | 3.04 | 0.97 | 1.93 | 0.97 | 2.51 | 2.22 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

TEST DATE: 6/28/84

OPERATION : 30 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (RIGHT SIDE) | | | | OUTSIDE OF TURN (RIGHT SIDE) | | |
|--------------|--------------------------------|---------------|--------------|-------|---------------------------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | CL-C | 500' WEST | 1000' WEST | 2000' WEST |
| H12 | ----- | ----- | ----- | 77.90 | 74.30 | 69.00 | -- |
| H13 | 63.80 | 69.80 | 73.60 | 73.40 | ----- | ----- | ----- |
| H14 | ----- | ----- | ----- | 78.70 | 74.50 | -- | -- |
| H15 | 62.80 | 70.70 | 72.50 | 73.90 | ----- | ----- | ----- |
| H16 | ----- | ----- | ----- | 75.90 | 73.90 | 70.40 | -- |
| H17 | 62.70 | 68.10 | 72.30 | 77.00 | ----- | ----- | ----- |
| H18 | ----- | ----- | ----- | 77.70 | 75.70 | 70.80 | -- |
| H19 | 61.60 | 67.20 | 71.30 | 72.90 | ----- | ----- | ----- |
| AVERAGE | 62.73 | 68.95 | 72.43 | 75.93 | 74.60 | 70.07 | -- |
| STD. DEV. | 0.90 | 1.59 | 0.94 | 2.25 | 0.77 | 0.95 | -- |
| 90% C. I. | 1.06 | 1.87 | 1.11 | 1.51 | 0.91 | 1.59 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: MBB BK117

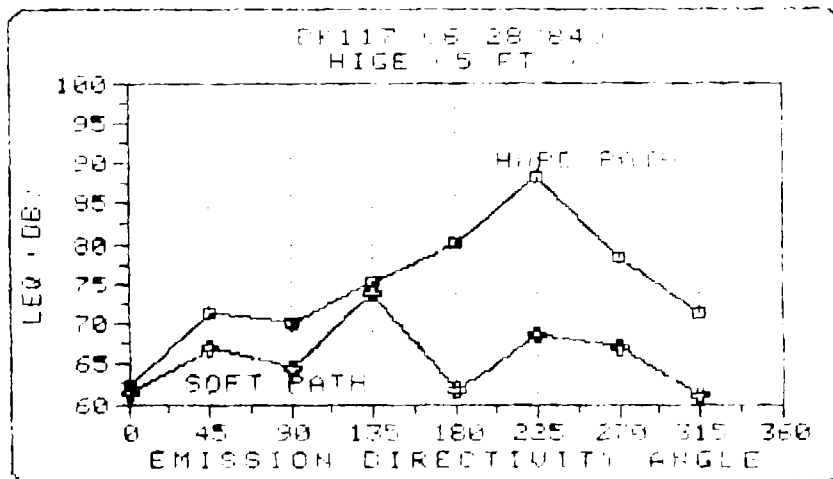
TEST DATE: 6/28/84

OPERATION : 30 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (LEFT SIDE) | | | | OUTSIDE OF TURN (LEFT SIDE) | | |
|--------------|-------------------------------|---------------|--------------|-------|--------------------------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | CL-C | 500' WEST | 1000' WEST | 2000' WEST |
| H12 | 61.90 | 71.50 | 73.60 | 77.90 | ----- | ----- | ----- |
| H13 | ----- | ----- | ----- | 73.40 | 69.20 | 65.00 | -- |
| H14 | -- | 68.20 | 73.90 | 78.70 | ----- | ----- | ----- |
| H15 | ----- | ----- | ----- | 73.90 | 70.70 | 70.80 | -- |
| H16 | 63.90 | 66.80 | 72.10 | 75.90 | ----- | ----- | ----- |
| H17 | ----- | ----- | ----- | 77.00 | 75.70 | 74.50 | -- |
| H18 | -- | 70.10 | 73.70 | 77.70 | ----- | ----- | ----- |
| H19 | ----- | ----- | ----- | 72.90 | 71.20 | 67.00 | -- |
| AVERAGE | 62.90 | 69.15 | 73.33 | 75.93 | 71.70 | 69.33 | -- |
| STD. DEV. | 1.41 | 1.56 | 0.83 | 2.25 | 2.80 | 4.21 | -- |
| 90% C.I. | NA | 1.84 | 0.97 | 1.51 | 3.29 | 4.94 | -- |

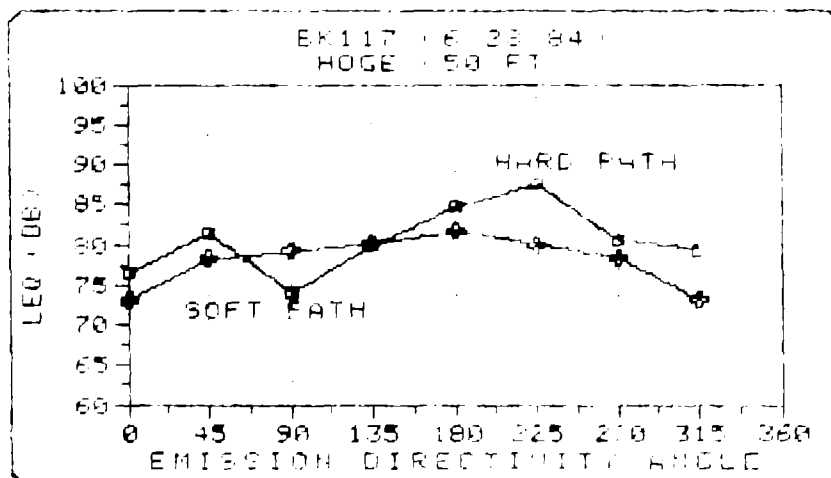
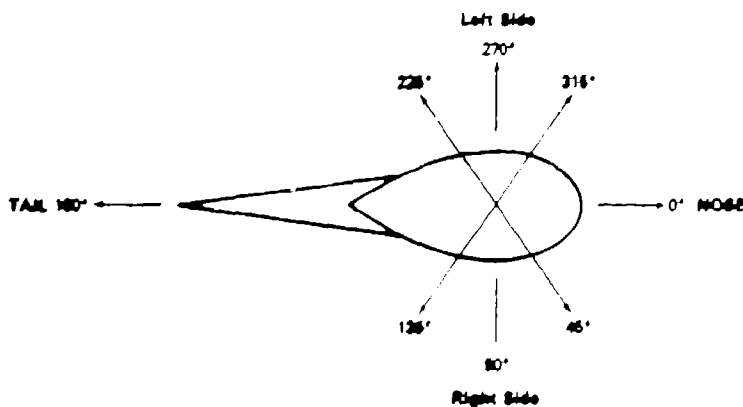
HOVER DATA

- - - - -
- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- EQUIVALENT SOUND LEVELS (LEQ) FOR EIGHT DIRECTIVITY -
- ANGLES. THESE DATA ARE PRESENTED IN THE FORM OF PLOTS -
- AND INDIVIDUAL EVENT DATA TABLES. THE PLOTS SHOW THE -
- EFFECT OF 'HARD' SURFACE VS. 'SOFT' SURFACE 500 FEET FROM -
- THE HOVER POINT FOR IN-GROUND-EFFECT AND OUT-OF-GROUND- -
- EFFECT HOVER. INDIVIDUAL EVENT DATA FOR EACH DIRECTIVITY -
- ANGLE AT DISTANCES OF 500, 1000 AND 1500 FEET FROM -
- HOVER POINT OVER A 'SOFT' PATH AND 500, 1000 AND 2000 -
- FEET FROM HOVER POINT OVER A 'HARD' PATH IS THEN GIVEN. -
- - - - -



500 FT. FROM HOVER POINT

Acoustical Emission Angle Convention



500 FT. FROM HOVER POINT

HOVER DATA (LEQ)

HELICOPTER: MBB BK117

DATE: 6/28/84

MICROPHONE: 500 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (SOFT PATH) | | (HARD PATH) | |
|---------------------------------|-------------|------------|-------------|------------|
| | HOVER | HOVER | HOVER | HOVER |
| | 5 FT. AGL | 80 FT. AGL | 5 FT AGL | 80 FT. AGL |
| (NOSE) 0 | 61.5 | 73.2 | 62.2 | 76.6 |
| 45 | 66.8 | 78.4 | 71.1 | 81.3 |
| (LEFT) 90 | 64.4 | 79.3 | 70.1 | 74.0 |
| 135 | 73.7 | 80.1 | 75.2 | 79.8 |
| (TAIL) 180 | 61.8 | 81.7 | 80.3 | 84.8 |
| 225 | 68.4 | 81.4 | 88.3 | 87.4 |
| (RIGHT) 270 | 66.9 | 79.9 | 78.4 | 80.4 |
| 315 | 61.1 | 78.2 | 71.1 | 79.1 |

MICROPHONE: 1000 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (SOFT PATH) | | (HARD PATH) | |
|---------------------------------|-------------|------------|-------------|------------|
| | HOVER | HOVER | HOVER | HOVER |
| | 5 FT. AGL | 80 FT. AGL | 5 FT AGL | 80 FT. AGL |
| (NOSE) 0 | 48.0 | 66.4 | -- | 67.9 |
| 45 | 50.6 | 72.2 | 60.9 | 75.2 |
| (LEFT) 90 | 48.8 | 71.1 | 60.2 | 65.8 |
| 135 | 54.7 | 73.7 | 65.6 | 72.1 |
| (TAIL) 180 | 49.4 | 74.8 | 68.5 | 77.2 |
| 225 | 52.9 | 75.2 | 79.8 | 80.0 |
| (RIGHT) 270 | 50.3 | 74.0 | 68.8 | 73.3 |
| 315 | 47.0 | 71.5 | 61.8 | 72.1 |

HOVER DATA (LEQ)

HELICOPTER: MBB BK117

DATE: 6/28/84

MICROPHONE: 1500 FT. FROM HOVER POINT

(SOFT PATH)

| DIRECTIVITY ANGLES (DEGREES) | HOVER 5 FT. AGL | HOVER 80 FT. AGL |
|---------------------------------|--------------------|---------------------|
| (NOSE) 0 | 46.9 | 54.3 |
| 45 | 48.4 | 61.0 |
| (LEFT) 90 | 46.6 | 60.4 |
| 135 | 49.3 | 64.1 |
| (TAIL) 180 | 47.5 | 60.4 |
| 225 | 49.0 | 64.1 |
| (RIGHT) 270 | 49.2 | 59.0 |
| 315 | 47.5 | 54.9 |

MICROPHONE: 2000 FT. FROM HOVER POINT

(HARD PATH)

| DIRECTIVITY ANGLES (DEGREES) | HOVER 5 FT. AGL | HOVER 80 FT. AGL |
|---------------------------------|--------------------|---------------------|
| (NOSE) 0 | -- | 62.6 |
| 45 | -- | 70.1 |
| (LEFT) 90 | 53.2 | 60.0 |
| 135 | 58.2 | 67.3 |
| (TAIL) 180 | 57.6 | 70.8 |
| 225 | 64.3 | 72.6 |
| (RIGHT) 270 | 55.7 | 68.5 |
| 315 | 54.3 | 65.1 |

RADAR TRACKING DATA

- - - - -
- THIS SECTION OF THE APPENDIX CONTAINS THE HELICOPTER -
- POSITION DATA AND TRACKING PLOTS DERIVED FROM THE FAA'S -
- PORTABLE TRACKING RADAR SYSTEM. THE POSITION DATA LISTS -
- THE CLOSEST POINT OF APPROACH (CPA), TIME OF CPA, -
- ELEVATION ANGLE, RATE OF CLIMB OR DESCENT, THE CLIMB OR -
- DESCENT ANGLE, AND GROUND SPEED FOR ALL FLIGHT -
- CONDITIONS. TRACKING PLOTS OF THE ACTUAL FLIGHT PROFILE -
- FLOWN ARE PROVIDED FOR EACH FLIGHT CONDITIONS. -
- - - - -

MBB BK117
POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 106/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|---------------------|----------|-----------|---------|-----------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | ----- NO DATA ----- | | | | |
| 2 | APP | 394.8 | 87.2 | 0:15:00.5 | -580.4 | -4.4 74.3 |
| 4 | APP | 384.6 | 74.5 | 0:22:55.9 | -1054.0 | -8.5 69.4 |
| 6 | APP | 384.9 | 78.5 | 0:28:10.7 | -656.5 | -5.0 73.5 |
| 8 | APP | 394.1 | 83.5 | 0:35:01.5 | -947.8 | -7.5 70.8 |
| 10 | APP | 387.7 | 83.1 | 0:40:34.4 | -724.3 | -5.8 70.4 |
| 12 | APP | 355.0 | 88.7 | 0:46:53.0 | -490.5 | -3.9 71.4 |
| 14 | APP | 375.7 | 75.5 | 0:52:49.1 | -905.5 | -7.4 69.3 |

TAKEOFF, MAX ALLOW TORQUE

| | | | | | | |
|----|-----|---------------------|------|-----------|--------|-----------|
| 3 | DEP | 1125.5 | 65.7 | 9:19:59.7 | 2814.9 | 24.9 59.7 |
| 5 | | ----- NO DATA ----- | | | | |
| 7 | DEP | 1421.4 | 66.3 | 9:30:24.8 | 2803.5 | 27.5 53.1 |
| 9 | DEP | 1398.9 | 60.3 | 9:36:47.9 | 2815.1 | 30.8 46.6 |
| 11 | DEP | 1425.7 | 59.2 | 9:42:35.6 | 2701.8 | 28.0 50.2 |
| 13 | DEP | 1411.3 | 59.3 | 9:48:48.0 | 2818.7 | 28.0 52.3 |
| 15 | | ----- NO DATA ----- | | | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|---------------------|------|------------|--------|-----------|
| 16 | | ----- NO DATA ----- | | | | |
| 18 | APP | 368.0 | 84.7 | 10:07:01.5 | -953.4 | -7.4 72.8 |
| 20 | APP | 363.6 | 84.7 | 10:13:23.6 | -830.5 | -5.6 63.2 |
| 22 | APP | 404.1 | 80.9 | 10:35:11.8 | -917.7 | -7.0 74.2 |
| 24 | | ----- NO DATA ----- | | | | |
| 26 | APP | 379.0 | 70.3 | 10:52:14.5 | -960.9 | -7.5 72.4 |
| 28 | APP | 407.3 | 76.1 | 10:58:35.5 | -871.0 | -6.0 81.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 06/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---------------------|--------|--------|----------|------------|--------|-----------|
| TAKEOFF, 65% TORQUE | | | | | | |
| 17 | DEP | 1328.5 | 56.9 | 10:01:30.2 | 2600.8 | 27.7 49.0 |
| 19 | DEP | 1409.3 | 70.1 | 10:09:09.8 | 1904.1 | 22.8 48.0 |
| 21 | DEP | 1286.1 | 61.6 | 10:28:08.8 | 2898.3 | 30.6 48.3 |
| 23 | DEP | 1323.8 | 63.5 | 10:38:02.8 | 2520.2 | 26.2 51.7 |
| 25 | DEP | 1444.7 | 66.1 | 10:48:04.0 | 2689.2 | 26.2 53.8 |
| 27 | DEP | 1376.6 | 57.6 | 10:54:31.1 | 2809.4 | 30.8 46.6 |

NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|-------|---------|------------|---------|------------|
| 29 | | ----- | NO DATA | ----- | | |
| 30 | APP | 590.0 | 79.3 | 12:02:27.3 | -1700.8 | -14.1 68.6 |
| 31 | | ----- | NO DATA | ----- | | |
| 32 | APP | 596.8 | 75.4 | 12:09:30.2 | -1506.2 | -11.8 71.4 |
| 33 | APP | 552.0 | 71.8 | 12:13:21.7 | -1741.2 | -13.7 70.4 |
| 34 | APP | 567.9 | 80.4 | 12:17:01.5 | -1021.1 | -8.2 69.0 |
| 35 | APP | 566.7 | 82.2 | 12:20:44.8 | -1104.6 | -8.7 71.5 |

NOISE ABATEMENT APPROACH (VAR. A/S AND R/D)

| | | | | | | |
|----|-----|-------|---------|------------|--------|-----------|
| 38 | | ----- | NO DATA | ----- | | |
| 39 | APP | 543.4 | 85.2 | 12:35:38.7 | -920.6 | -8.1 63.5 |
| 40 | APP | 623.7 | 84.3 | 12:39:18.4 | -818.8 | -7.3 82.5 |
| 41 | APP | 636.4 | 82.5 | 12:42:58.2 | -812.3 | -8.5 53.4 |
| 42 | APP | 653.5 | 79.5 | 12:46:22.0 | -978.7 | -8.0 61.8 |
| 43 | | ----- | NO DATA | ----- | | |
| 44 | | ----- | NO DATA | ----- | | |
| 45 | APP | 582.8 | 76.9 | 12:55:40.5 | -769.8 | -6.8 63.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 106/25/84

***FAA/AEE**

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------------------------|--------|-------|----------|------------|--------|------|
| 500 FT. LEVEL FLYOVER AT 126 KTS. | | | | | | |
| 46 | | ---- | NO DATA | ---- | | |
| 47 | F/O | 529.0 | 85.1 | 13:16:44.1 | 289.8 | 1.4 |
| 48 | F/O | 488.7 | 88.6 | 13:19:07.2 | 911.8 | 1.3 |
| 49 | F/O | 502.8 | 74.8 | 13:21:05.9 | -295.3 | -1.4 |
| 50 | F/O | 479.3 | 83.9 | 13:23:22.0 | -158.0 | -0.6 |
| 51 | F/O | 463.4 | 80.3 | 13:25:29.5 | -186.5 | -0.9 |
| 52 | F/O | 484.3 | 78.6 | 13:27:39.9 | -299.9 | -1.3 |
| 53 | F/O | 511.9 | 84.6 | 13:29:54.0 | -346.7 | -1.6 |
| 54 | F/O | 509.1 | 83.0 | 13:32:07.8 | 962.4 | 4.3 |
| 55 | F/O | 483.2 | 84.4 | 13:34:29.3 | 78.1 | 0.4 |
| 56 | F/O | 625.9 | 83.3 | 13:37:02.4 | 724.6 | 3.0 |
| 57 | F/O | 424.2 | 81.9 | 13:42:13.2 | 25.6 | 0.1 |
| 58 | F/O | 495.6 | 85.7 | 13:44:31.4 | 91.3 | 0.4 |
| 59 | F/O | 502.9 | 77.8 | 13:49:21.5 | 461.8 | 2.1 |
| 60 | F/O | 527.3 | 88.0 | 13:51:34.8 | -296.3 | -1.3 |
| 61 | | ---- | NO DATA | ---- | | |
| 62 | F/O | 494.2 | 86.7 | 13:57:10.4 | 95.3 | 0.4 |

1000 FT. LEVEL FLYOVER AT 126 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 63 | F/O | 889.1 | 84.9 | 14:28:34.3 | 172.4 | 0.8 |
| 64 | F/O | 946.6 | 84.2 | 14:31:03.7 | 48.4 | 0.2 |
| 65 | F/O | 910.7 | 87.6 | 14:33:30.7 | -52.6 | -0.2 |
| 66 | | ---- | NO DATA | ---- | | |
| 67 | F/O | 971.9 | 84.3 | 14:39:24.7 | -259.6 | -1.2 |
| 68 | F/O | 964.4 | 83.7 | 14:41:41.0 | -233.9 | -1.0 |
| 69 | | ---- | NO DATA | ---- | | |
| 70 | | ---- | NO DATA | ---- | | |
| 71 | F/O | 943.6 | 84.8 | 14:50:42.1 | -20.4 | -0.1 |
| 72 | | ---- | NO DATA | ---- | | |
| 73 | F/O | 980.6 | 80.5 | 14:56:02.7 | 12.3 | 0.1 |
| 74 | F/O | 1016.6 | 88.9 | 14:58:19.0 | 103.5 | 0.4 |
| 75 | F/O | 934.4 | 81.2 | 15:00:57.8 | -122.7 | -0.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE: 06/27/84

FAA/AEE

EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.)

| | | | | | | | |
|---|-----|-------|---------|------------|--------|-------|------|
| 1 | APP | 516.7 | 86.9 | 12:12:50.8 | -151.6 | -2.8 | 30.1 |
| 2 | APP | 441.6 | 75.7 | 12:25:39.4 | -676.0 | -11.5 | 32.7 |
| 3 | APP | 457.2 | 73.3 | 12:32:05.9 | -736.1 | -12.9 | 31.8 |
| 4 | | ----- | NO DATA | ----- | | | |
| 5 | | ----- | NO DATA | ----- | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|--------|-------|------|
| 6 | APP | 426.7 | 78.6 | 12:52:12.4 | -245.8 | -3.7 | 37.6 |
| 7 | APP | 449.3 | 83.6 | 12:58:51.5 | -713.1 | -11.9 | 33.5 |
| 8 | APP | 413.3 | 84.9 | 13:04:37.4 | -463.7 | -6.5 | 40.3 |
| 9 | APP | 353.8 | 77.1 | 13:10:51.1 | -598.4 | -10.5 | 31.8 |
| 10 | APP | 411.2 | 81.3 | 13:16:48.7 | -123.0 | -1.8 | 38.1 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 06/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---------------------|--------|-------|----------|------------|---------|------|-------|
| 15 DEGREE BANK TURN | | | | | | | |
| 1 | F/O | 509.6 | 82.2 | 11:19:45.1 | -305.7 | -2.6 | 65.6 |
| 2 | | ----- | NO DATA | ----- | | | |
| 3 | | ----- | NO DATA | ----- | | | |
| 4 | F/O | 518.4 | 84.3 | 11:24:56.8 | 730.6 | 6.3 | 64.8 |
| 5 | F/O | 502.5 | 67.8 | 11:26:36.0 | -472.9 | -4.0 | 66.4 |
| 6 | F/O | 517.6 | 84.2 | 11:28:36.8 | 64.4 | 0.6 | 65.2 |
| 7 | | ----- | NO DATA | ----- | | | |
| 8 | F/O | 578.7 | 79.2 | 11:32:30.9 | -120.8 | -1.0 | 68.8 |
| 9 | F/O | 464.9 | 85.2 | 11:34:29.7 | -169.1 | -1.5 | 64.4 |
| 10 | F/O | 698.5 | 16.5 | 11:36:42.7 | 10568.1 | 25.5 | 218.6 |
| 11 | F/O | 474.5 | 89.0 | 11:38:34.3 | 229.0 | 2.0 | 63.7 |

30 DEGREE BANK TURN

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 12 | F/O | 584.8 | 77.3 | 11:44:05.2 | -232.0 | -2.2 | 60.7 |
| 13 | | ----- | NO DATA | ----- | | | |
| 14 | F/O | 519.8 | 72.2 | 11:45:51.7 | 74.6 | 0.6 | 67.6 |
| 15 | F/O | 597.3 | 85.8 | 11:50:11.2 | 602.1 | 4.7 | 72.6 |
| 16 | F/O | 544.7 | 83.2 | 11:52:26.2 | -129.7 | -1.3 | 57.8 |
| 17 | F/O | 552.1 | 76.4 | 11:54:31.8 | 552.9 | 4.8 | 65.0 |
| 18 | F/O | 611.2 | 88.6 | 11:56:52.2 | -1.6 | 0.0 | 63.3 |
| 19 | F/O | 607.1 | 84.9 | 11:58:56.9 | -217.8 | -1.9 | 65.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE: 06/25/84

Y*FAA/AEEX*

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|-------|----------|-----------|---------|-----------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | ----- | NO DATA | ----- | | |
| 2 | APP | 645.5 | 38.0 | 9:15:09.4 | -609.8 | -4.6 74.7 |
| 4 | APP | 703.6 | 32.0 | 9:22:55.0 | -1054.8 | -8.5 69.4 |
| 6 | APP | 571.3 | 41.9 | 9:28:10.5 | -684.7 | -5.2 73.8 |
| 8 | APP | 580.5 | 41.5 | 9:35:02.2 | -841.6 | -6.2 68.6 |
| 10 | APP | 653.3 | 36.6 | 9:40:34.3 | -725.8 | -5.8 70.2 |
| 12 | APP | 608.0 | 36.1 | 9:46:52.8 | -510.1 | -4.1 71.1 |
| 14 | APP | 568.0 | 40.1 | 9:52:49.1 | -906.0 | -7.4 69.3 |

TAKEOFF, MAX ALLOW TORQUE

| | | | | | | |
|----|-----|--------|---------|-----------|--------|-----------|
| 3 | DEP | 1201.4 | 51.2 | 9:19:57.8 | 2961.1 | 26.5 58.7 |
| 5 | | ----- | NO DATA | ----- | | |
| 7 | DEP | 1487.3 | 61.4 | 9:30:24.9 | 2819.2 | 27.6 53.2 |
| 9 | DEP | 1463.5 | 56.3 | 9:36:47.9 | 2814.7 | 26.8 46.6 |
| 11 | DEP | 1491.1 | 55.4 | 9:42:35.6 | 2701.8 | 28.9 50.2 |
| 13 | DEP | 1462.9 | 56.4 | 9:48:48.1 | 2836.2 | 28.3 52.1 |
| 15 | | ----- | NO DATA | ----- | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|-------|---------|------------|--------|-----------|
| 16 | | ----- | NO DATA | ----- | | |
| 18 | APP | 585.5 | 39.3 | 10:07:01.3 | -983.3 | -7.6 73.0 |
| 20 | APP | 596.9 | 37.9 | 10:13:23.4 | -627.0 | -5.6 63.4 |
| 22 | APP | 670.2 | 37.8 | 10:35:11.6 | -956.4 | -7.3 73.9 |
| 24 | | ----- | NO DATA | ----- | | |
| 26 | APP | 520.5 | 43.6 | 10:52:14.5 | -950.8 | -7.5 72.4 |
| 28 | APP | 584.7 | 45.5 | 10:58:34.5 | -779.8 | -5.3 82.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE: 06/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---------------------|--------|--------|----------|------------|--------|-----------|
| TAKEOFF, 65% TORQUE | | | | | | |
| 17 | DEP | 1415.1 | 52.0 | 10:01:30.2 | 2600.9 | 27.7 49.0 |
| 19 | DEP | 1468.7 | 60.1 | 10:09:07.6 | 2114.0 | 24.0 46.8 |
| 21 | DEP | 1352.2 | 57.0 | 10:28:08.8 | 2891.9 | 30.6 48.3 |
| 23 | DEP | 1397.3 | 60.0 | 10:38:02.8 | 2487.1 | 25.7 51.0 |
| 25 | DEP | 1466.2 | 56.7 | 10:48:02.2 | 2661.7 | 26.1 53.6 |
| 27 | DEP | 1410.9 | 55.6 | 10:54:31.1 | 2809.5 | 30.8 46.6 |

NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|-------|---------|------------|---------|------------|
| 29 | | ----- | NO DATA | ----- | | |
| 30 | APP | 779.6 | 50.1 | 12:02:26.9 | -1536.1 | -12.6 67.6 |
| 31 | | ----- | NO DATA | ----- | | |
| 32 | APP | 745.7 | 51.7 | 12:09:30.1 | -1507.4 | -11.7 71.0 |
| 33 | APP | 738.2 | 46.1 | 12:13:21.7 | -1741.5 | -13.7 70.4 |
| 34 | APP | 702.6 | 53.1 | 12:17:01.5 | -1021.3 | -8.0 60.9 |
| 35 | APP | 714.6 | 52.7 | 12:20:44.3 | -1202.3 | -9.6 70.9 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|-------|---------|------------|--------|-----------|
| 38 | | ----- | NO DATA | ----- | | |
| 39 | APP | 711.5 | 47.3 | 12:35:40.1 | -994.1 | -9.0 61.8 |
| 40 | APP | 791.2 | 51.0 | 12:39:18.4 | -816.0 | -7.0 62.5 |
| 41 | APP | 786.7 | 53.5 | 12:42:58.2 | -812.0 | -8.5 53.4 |
| 42 | APP | 773.0 | 56.3 | 12:46:22.2 | -973.5 | -8.0 61.2 |
| 43 | | ----- | NO DATA | ----- | | |
| 44 | | ----- | NO DATA | ----- | | |
| 45 | APP | 705.5 | 53.0 | 12:55:40.9 | -748.7 | -6.7 63.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE: 06/25/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------------------------|--------|-------|----------|------------|--------|------------|
| 500 FT. LEVEL FLYOVER AT 126 KTS. | | | | | | |
| 46 | | ---- | NO DATA | ---- | | |
| 47 | F/O | 604.6 | 49.6 | 13:16:44.4 | 222.6 | 1.0 121.2 |
| 48 | F/O | 603.8 | 44.8 | 13:19:07.1 | 201.8 | -1.2 137.0 |
| 49 | F/O | 618.6 | 52.0 | 13:21:05.0 | -205.6 | -1.4 121.3 |
| 50 | F/O | 727.6 | 41.1 | 13:23:22.9 | -157.0 | -0.6 146.2 |
| 51 | F/O | 612.4 | 48.4 | 13:25:29.4 | -182.4 | -0.8 121.4 |
| 52 | F/O | 749.2 | 39.6 | 13:27:39.0 | -285.0 | -1.0 132.7 |
| 53 | F/O | 689.2 | 47.8 | 13:29:54.3 | -330.7 | -1.5 125.7 |
| 54 | F/O | 695.0 | 46.7 | 13:32:07.7 | 000.0 | 4.4 127.3 |
| 55 | F/O | 715.7 | 42.3 | 13:34:29.7 | 31.0 | 0.4 125.4 |
| 56 | F/O | 841.6 | 47.8 | 13:37:02.7 | 583.8 | 2.4 135.8 |
| 57 | F/O | 642.8 | 40.8 | 13:42:13.3 | 25.6 | 0.1 116.3 |
| 58 | F/O | 728.6 | 42.0 | 13:44:31.4 | 91.0 | 0.4 136.3 |
| 59 | F/C | 696.6 | 51.6 | 13:49:21.8 | 386.3 | -1.7 126.2 |
| 60 | F/C | 726.3 | 45.0 | 13:51:35.5 | -368.7 | -1.6 127.0 |
| 61 | | ---- | NO DATA | ---- | | |
| 62 | F/O | 716.0 | 42.8 | 13:57:10.4 | 95.4 | 0.4 131.7 |

1000 FT. LEVEL FLYOVER AT 126 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|------------|
| 63 | F/O | 972.0 | 65.6 | 14:28:34.5 | 183.1 | 0.8 123.0 |
| 64 | F/O | 1101.4 | 59.0 | 14:31:03.7 | 48.3 | 0.2 134.7 |
| 65 | F/O | 1034.9 | 62.1 | 14:33:31.1 | -19.2 | -0.1 124.3 |
| 66 | | ---- | NO DATA | ---- | | |
| 67 | F/O | 1069.0 | 65.3 | 14:39:24.8 | 272.3 | 1.2 124.8 |
| 68 | F/O | 1124.4 | 58.6 | 14:41:41.5 | -178.2 | -0.7 138.4 |
| 69 | | ---- | NO DATA | ---- | | |
| 70 | | ---- | NO DATA | ---- | | |
| 71 | F/O | 1029.9 | 34.9 | 14:50:42.1 | -20.4 | -0.1 127.0 |
| 72 | | ---- | NO DATA | ---- | | |
| 73 | F/O | 1051.9 | 60.0 | 14:56:02.7 | 12.1 | 0.1 124.6 |
| 74 | F/O | 1142.3 | 63.1 | 14:58:19.0 | 103.7 | 0.4 133.0 |
| 75 | F/O | 995.6 | 68.6 | 15:00:57.1 | -120.2 | -0.5 124.1 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE: 06/27/84

FAA/AEE

EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.)

| | | | | | | | |
|---|-----|-------|---------|------------|--------|-------|------|
| 1 | APP | 691.9 | 48.4 | 12:18:51.7 | -174.6 | -3.4 | 28.8 |
| 2 | APP | 633.3 | 43.2 | 12:25:39.3 | -683.1 | -11.7 | 32.5 |
| 3 | APP | 680.4 | 40.3 | 12:32:05.9 | -735.6 | -12.9 | 31.8 |
| 4 | | ----- | NO DATA | ----- | | | |
| 5 | | ----- | NO DATA | ----- | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|--------|-------|------|
| 6 | APP | 697.7 | 37.8 | 12:52:11.3 | -272.0 | -4.1 | 37.1 |
| 7 | APP | 687.5 | 48.5 | 12:58:52.2 | -713.6 | -12.2 | 32.6 |
| 8 | APP | 621.2 | 41.8 | 13:04:37.4 | -463.4 | -6.5 | 40.3 |
| 9 | APP | 608.3 | 34.8 | 13:10:51.0 | -582.8 | -10.2 | 31.8 |
| 10 | APP | 599.6 | 42.6 | 13:16:49.9 | -165.7 | -2.3 | 40.1 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 106/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--------------------------------|--------|-------|----------|------------|---------|------------|
| 15 DEGREE BANK TURN AT 65 KTS. | | | | | | |
| 1 | F/O | 741.7 | 44.2 | 11:19:44.5 | -359.3 | -3.2 63.6 |
| 2 | | ----- | NO DATA | ----- | | |
| 3 | | ----- | NO DATA | ----- | | |
| 4 | F/O | 693.2 | 49.0 | 11:24:57.4 | 656.1 | 5.7 65.2 |
| 5 | F/O | 568.0 | 55.3 | 11:26:36.0 | -472.7 | -4.0 66.4 |
| 6 | F/O | 687.2 | 49.7 | 11:28:36.9 | 63.4 | 0.6 65.2 |
| 7 | | ----- | NO DATA | ----- | | |
| 8 | F/O | 704.9 | 54.0 | 11:32:30.9 | -120.7 | -1.0 68.8 |
| 9 | F/O | 649.7 | 45.4 | 11:34:30.9 | -106.2 | -0.9 63.7 |
| 10 | F/O | 284.5 | 51.8 | 11:36:42.7 | 10568.0 | 25.5 218.6 |
| 11 | F/O | 688.5 | 43.7 | 11:38:34.0 | 196.1 | 1.7 63.3 |

30 DEGREE BANK TURN AT 65 KTS.

| | | | | | | |
|----|-----|-------|---------|------------|--------|-----------|
| 12 | F/O | 652.9 | 59.6 | 11:44:07.8 | -211.5 | -2.0 59.3 |
| 13 | | ----- | NO DATA | ----- | | |
| 14 | F/O | 602.3 | 55.6 | 11:45:51.6 | 87.5 | 0.7 67.8 |
| 15 | F/O | 694.3 | 56.0 | 11:50:09.9 | 459.0 | 3.8 68.7 |
| 16 | F/O | 775.3 | 44.7 | 11:52:22.3 | -105.0 | -1.0 61.5 |
| 17 | F/O | 757.6 | 44.6 | 11:54:30.1 | -95.2 | -0.8 68.1 |
| 18 | F/O | 786.3 | 50.0 | 11:56:55.4 | -100.0 | -1.8 62.0 |
| 19 | F/O | 774.5 | 51.6 | 11:58:54.0 | -171.0 | -1.4 68.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 106/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|-----------|---------|-----------|--------|-------|------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | NO DATA | | | | |
| 2 | APP 615.4 | 39.9 | 9:15:09.7 | -534.3 | -4.1 | 74.4 |
| 4 | | NO DATA | | | | |
| 6 | APP 682.7 | 35.4 | 9:28:09.7 | -716.3 | -5.5 | 73.0 |
| 8 | APP 665.5 | 34.8 | 9:35:02.5 | -760.8 | -6.4 | 67.2 |
| 10 | APP 601.8 | 39.0 | 9:40:35.2 | -782.1 | -6.1 | 71.0 |
| 12 | APP 605.8 | 36.1 | 9:46:53.4 | -436.1 | -3.4 | 71.5 |
| 14 | APP 676.4 | 32.3 | 9:52:49.5 | -861.9 | -6.9 | 69.8 |

TAKEOFF, MAX ALLOW TORQUE

| | | | | | | |
|----|------------|---------|-----------|--------|------|------|
| 3 | DEP 1252.0 | 54.9 | 9:19:59.6 | 2842.7 | 25.1 | 60.0 |
| 5 | | NO DATA | | | | |
| 7 | DEP 1527.1 | 58.5 | 9:30:24.8 | 2803.3 | 27.5 | 53.1 |
| 9 | DEP 1508.4 | 54.1 | 9:36:48.0 | 2835.3 | 31.9 | 46.6 |
| 11 | DEP 1528.0 | 53.8 | 9:42:35.8 | 2716.0 | 28.0 | 50.6 |
| 13 | DEP 1531.4 | 52.4 | 9:48:48.0 | 2819.1 | 28.0 | 52.3 |
| 15 | | NO DATA | | | | |

NORMAL APPROACH

| | | | | | | |
|----|-----------|---------|------------|--------|------|------|
| 16 | | NO DATA | | | | |
| 18 | APP 645.0 | 34.7 | 10:07:01.8 | -934.1 | -7.3 | 72.1 |
| 20 | APP 629.6 | 35.2 | 10:13:23.7 | -830.6 | -5.7 | 63.2 |
| 22 | APP 603.0 | 41.4 | 10:35:11.8 | -917.8 | -7.0 | 74.2 |
| 24 | | NO DATA | | | | |
| 26 | APP 719.1 | 29.7 | 10:52:14.7 | -981.7 | -7.8 | 71.0 |
| 28 | APP 698.0 | 34.5 | 10:58:35.5 | -871.4 | -6.0 | 81.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117
POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 106/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---------------------|--------|--------|----------|------------|--------|------|
| TAKEOFF, 65% TORQUE | | | | | | |
| 17 | DEP | 1425.5 | 51.3 | 10:01:30.2 | 2600.0 | 49.0 |
| 19 | DEP | 1521.7 | 61.8 | 10:09:09.7 | 1978.7 | 47.9 |
| 21 | DEP | 1408.6 | 53.5 | 10:28:08.8 | 2891.9 | 48.3 |
| 23 | DEP | 1431.4 | 55.9 | 10:38:02.2 | 2580.3 | 51.7 |
| 25 | DEP | 1569.7 | 57.3 | 10:48:04.0 | 2669.0 | 53.6 |
| 27 | DEP | 1517.8 | 50.0 | 10:54:31.1 | 2809.5 | 46.6 |

NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|-------|---------|------------|---------|------|
| 29 | | ----- | NO DATA | ----- | | |
| 30 | APP | 751.5 | 49.0 | 12:02:28.1 | -1896.4 | 66.2 |
| 31 | | ----- | NO DATA | ----- | | |
| 32 | APP | 784.4 | 46.8 | 12:09:30.6 | -1480.3 | 70.8 |
| 33 | APP | 747.0 | 44.8 | 12:13:21.8 | -1744.3 | 70.0 |
| 34 | APP | 798.3 | 44.5 | 12:17:02.0 | -871.2 | 72.8 |
| 35 | APP | 784.2 | 44.0 | 12:20:45.9 | -973.9 | 69.3 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|-------|---------|------------|---------|------|
| 38 | | ----- | NO DATA | ----- | | |
| 39 | APP | 753.6 | 45.7 | 12:35:30.3 | -1009.4 | 63.7 |
| 40 | APP | 803.2 | 50.4 | 12:39:18.7 | -793.0 | 62.5 |
| 41 | APP | 832.7 | 49.2 | 12:42:58.2 | -812.0 | 53.4 |
| 42 | APP | 857.6 | 48.5 | 12:46:22.0 | -976.9 | 61.8 |
| 43 | | ----- | NO DATA | ----- | | |
| 44 | | ----- | NO DATA | ----- | | |
| 45 | APP | 819.9 | 43.0 | 12:55:41.1 | -745.2 | 62.1 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE: 06/25/84

***FAA/AEE**

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|-----------------------------------|--------|---------|----------|------------|--------|------|-------|
| 500 FT. LEVEL FLYOVER AT 126 KTS. | | | | | | | |
| 46 | | NO DATA | | | | | |
| 47 | F/O | 757.2 | 44.1 | 13:16:44.2 | 270.6 | 1.3 | 120.5 |
| 48 | F/O | 658.3 | 47.7 | 13:19:07.5 | 352.2 | -1.5 | 136.0 |
| 49 | F/O | 775.7 | 39.8 | 13:21:05.4 | -263.6 | -1.2 | 129.6 |
| 50 | F/O | 642.1 | 47.7 | 13:23:22.8 | -114.6 | -0.4 | 145.7 |
| 51 | F/O | 735.1 | 38.5 | 13:25:20.6 | -103.1 | -0.9 | 121.6 |
| 52 | F/O | 617.9 | 51.8 | 13:27:40.5 | 260.4 | 1.2 | 130.6 |
| 53 | F/O | 737.8 | 44.0 | 13:29:53.8 | -343.9 | -1.6 | 125.2 |
| 54 | F/O | 702.5 | 46.4 | 13:32:03.0 | 931.1 | 4.1 | 126.7 |
| 55 | F/O | 659.2 | 46.8 | 13:34:28.2 | 89.7 | 0.4 | 124.5 |
| 56 | F/O | 723.9 | 58.5 | 13:37:01.7 | 1014.3 | 4.2 | 134.7 |
| 57 | F/O | 611.1 | 43.6 | 13:42:13.0 | 26.0 | 0.1 | 120.6 |
| 58 | F/O | 671.2 | 47.5 | 13:44:31.6 | 61.8 | 0.3 | 130.8 |
| 59 | F/O | 778.0 | 39.1 | 13:49:21.5 | 462.0 | 2.1 | 124.7 |
| 60 | F/O | 712.5 | 47.6 | 13:51:35.1 | -339.4 | -1.5 | 127.6 |
| 61 | | NO DATA | | | | | |
| 62 | F/O | 650.8 | 49.7 | 13:57:10.7 | 104.6 | 0.4 | 131.5 |

1000 FT. LEVEL FLYOVER AT 126 KTS.

| | | | | | | | |
|----|-----|---------|------|------------|--------|------|-------|
| 63 | F/O | 1056.8 | 57.0 | 14:28:34.2 | 165.6 | 0.8 | 122.1 |
| 64 | F/O | 1030.0 | 67.0 | 14:31:04.0 | 16.5 | 0.1 | 133.5 |
| 65 | F/O | 1038.5 | 61.2 | 14:33:30.7 | -52.6 | -0.2 | 123.0 |
| 66 | | NO DATA | | | | | |
| 67 | F/O | 1102.4 | 60.9 | 14:39:24.3 | 193.4 | 0.9 | 121.0 |
| 68 | F/O | 1043.2 | 66.9 | 14:41:41.2 | -212.8 | -0.9 | 130.5 |
| 69 | | NO DATA | | | | | |
| 70 | | NO DATA | | | | | |
| 71 | F/O | 1092.1 | 59.6 | 14:50:41.6 | 87.1 | 0.4 | 126.3 |
| 72 | | NO DATA | | | | | |
| 73 | F/O | 1167.1 | 56.0 | 14:56:02.7 | 12.1 | 0.1 | 124.6 |
| 74 | F/O | 1115.8 | 67.2 | 14:58:19.4 | 120.2 | 0.5 | 133.0 |
| 75 | F/O | 1119.9 | 55.6 | 15:00:58.0 | -147.1 | -0.7 | 126.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 106/27/84

***FAA/AEE**

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|-------|----------|------------|--------|-------|------|
| NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.) | | | | | | | |
| 1 | APP | 710.7 | 47.3 | 12:18:49.7 | -220.5 | -3.7 | 33.3 |
| 2 | APP | 683.1 | 38.1 | 12:25:40.3 | -644.0 | -11.1 | 32.4 |
| 3 | APP | 642.6 | 46.6 | 12:32:04.8 | -543.3 | -9.2 | 32.9 |
| 4 | | ----- | NO DATA | ----- | | | |
| 5 | | ----- | NO DATA | ----- | | | |
| NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.) | | | | | | | |
| 6 | APP | 571.8 | 48.6 | 12:52:10.4 | -215.6 | -3.2 | 37.6 |
| 7 | APP | 705.8 | 39.2 | 12:58:51.5 | -713.0 | -11.0 | 33.5 |
| 8 | APP | 657.9 | 39.0 | 13:04:37.6 | -470.8 | -6.8 | 39.2 |
| 9 | APP | 587.0 | 34.2 | 13:10:53.7 | -486.0 | -8.5 | 32.1 |
| 10 | APP | 660.8 | 38.5 | 13:16:47.7 | -101.3 | -1.6 | 35.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 06/28/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|--------------------------------|--------|-------|----------|------------|--------|------|------|
| 15 DEGREE BANK TURN AT 65 KTS. | | | | | | | |
| 1 | F/O | 684.8 | 47.5 | 11:19:45.1 | -306.0 | -2.6 | 65.6 |
| 2 | | ----- | NO DATA | ----- | | | |
| 3 | | ----- | NO DATA | ----- | | | |
| 4 | F/O | 715.5 | 46.3 | 11:24:56.7 | 725.1 | 6.3 | 64.6 |
| 5 | F/O | 818.5 | 35.8 | 11:26:36.4 | -365.5 | -3.1 | 66.9 |
| 6 | F/O | 735.2 | 44.9 | 11:28:36.7 | 81.2 | 0.7 | 65.1 |
| 7 | | ----- | NO DATA | ----- | | | |
| 8 | F/O | 796.6 | 47.6 | 11:32:30.2 | -217.7 | -1.8 | 70.0 |
| 9 | F/O | 699.3 | 41.6 | 11:34:29.4 | -157.3 | -1.4 | 64.6 |
| 10 | | ----- | NO DATA | ----- | | | |
| 11 | F/O | 680.7 | 43.6 | 11:38:33.7 | 109.3 | 1.0 | 62.8 |

30 DEGREE BANK TURN AT 65 KTS.

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 12 | F/O | 837.0 | 42.9 | 11:44:03.9 | 55.0 | 0.5 | 57.4 |
| 13 | | ----- | NO DATA | ----- | | | |
| 14 | F/O | 814.5 | 38.4 | 11:45:50.3 | 262.5 | 2.3 | 64.7 |
| 15 | F/O | 806.4 | 47.6 | 11:50:11.2 | 601.8 | 4.7 | 72.6 |
| 16 | F/O | 697.2 | 50.9 | 11:52:26.1 | -133.3 | -1.3 | 57.6 |
| 17 | F/O | 697.6 | 50.3 | 11:54:31.8 | 552.7 | 4.8 | 65.0 |
| 18 | F/O | 781.9 | 51.4 | 11:56:52.0 | -21.2 | -0.2 | 62.8 |
| 19 | F/O | 753.6 | 53.4 | 11:58:57.3 | -301.0 | -2.6 | 66.1 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE: 06/25/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|-----------|---------|-----------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | ----- | NO DATA | ----- | | |
| 2 | APP | 1085.0 | 21.6 | 0:15:09.4 | -609.8 | -4.6 74.7 |
| 4 | APP | 1157.1 | 18.0 | 0:22:56.5 | -1047.3 | -8.3 70.9 |
| 6 | APP | 997.6 | 22.0 | 0:28:11.5 | -555.6 | -4.3 72.5 |
| 8 | APP | 1006.7 | 22.6 | 0:35:22.2 | -841.6 | -6.0 68.6 |
| 10 | APP | 1095.6 | 21.9 | 0:40:33.0 | -810.8 | -4.0 70.3 |
| 12 | APP | 1054.1 | 20.0 | 0:46:52.8 | -510.1 | -4.1 71.1 |
| 14 | APP | 714.8 | 33.0 | 0:52:55.1 | 822.4 | 3.5 131.0 |

TAKEOFF, MAX ALLOW TORQUE

| | | | | | | |
|----|-----|--------|---------|-----------|--------|-----------|
| 3 | DEP | 1442.9 | 38.5 | 0:19:57.0 | 2937.8 | 28.6 57.8 |
| 5 | | ----- | NO DATA | ----- | | |
| 7 | DEP | 1703.7 | 50.2 | 0:30:24.9 | 2819.2 | 27.6 53.2 |
| 9 | DEP | 1681.2 | 46.5 | 0:36:47.0 | 2814.7 | 30.8 46.6 |
| 11 | DEP | 1707.1 | 46.0 | 0:42:35.6 | 2701.8 | 28.0 50.2 |
| 13 | DEP | 1669.5 | 47.0 | 0:48:48.1 | 2836.2 | 28.3 52.1 |
| 15 | | ----- | NO DATA | ----- | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 16 | | ----- | NO DATA | ----- | | |
| 18 | APP | 1023.2 | 21.4 | 10:07:01.3 | -983.3 | -7.6 73.0 |
| 20 | APP | 1036.1 | 21.7 | 10:13:28.1 | -681.5 | -6.1 62.8 |
| 22 | APP | 1108.5 | 22.4 | 10:35:10.6 | -973.3 | -7.4 73.7 |
| 24 | | ----- | NO DATA | ----- | | |
| 26 | APP | 758.4 | 17.9 | 10:52:20.2 | -258.7 | -6.3 76.9 |
| 28 | APP | 1000.2 | 24.8 | 10:58:34.5 | -779.8 | -5.3 82.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 06/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---------------------|--------|--------|----------|------------|--------|------|------|
| TAKEOFF, 85% TORQUE | | | | | | | |
| 17 | DEP | 1655.2 | 42.4 | 10:01:30.2 | 2600.0 | 27.7 | 49.0 |
| 19 | DEP | 1681.1 | 49.3 | 10:09:07.6 | 2114.0 | 24.0 | 46.8 |
| 21 | DEP | 1580.6 | 40.8 | 10:28:00.0 | 2916.1 | 30.9 | 48.1 |
| 23 | DEP | 1628.1 | 48.1 | 10:38:02.8 | 2487.1 | 25.7 | 51.0 |
| 25 | DEP | 1677.8 | 47.8 | 10:48:02.2 | 2651.7 | 26.1 | 53.6 |
| 27 | DEP | 1608.3 | 46.5 | 10:54:31.1 | 2800.5 | 30.8 | 46.6 |

NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|---------|------------|---------|-------|------|
| 29 | | ----- | NO DATA | ----- | | | |
| 30 | APP | 1183.9 | 31.0 | 12:02:28.9 | -1538.1 | -12.6 | 67.6 |
| 31 | | ----- | NO DATA | ----- | | | |
| 32 | APP | 1119.8 | 32.7 | 12:09:29.6 | -1410.9 | -10.7 | 73.5 |
| 33 | APP | 1130.0 | 29.2 | 12:13:21.4 | -1707.0 | -13.5 | 70.4 |
| 34 | APP | 1079.0 | 31.6 | 12:17:01.4 | -1051.7 | -8.5 | 69.5 |
| 35 | APP | 1093.5 | 31.4 | 12:20:44.3 | -1202.3 | -9.5 | 70.0 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|------|
| 38 | | ----- | NO DATA | ----- | | | |
| 39 | APP | 1101.3 | 28.5 | 12:35:40.1 | -994.1 | -9.0 | 61.8 |
| 40 | APP | 1184.9 | 32.1 | 12:39:19.1 | -819.5 | -7.4 | 62.1 |
| 41 | APP | 1184.5 | 33.4 | 12:42:58.2 | -812.0 | -8.5 | 63.4 |
| 42 | APP | 1124.3 | 35.0 | 12:46:22.2 | -973.5 | -8.9 | 61.2 |
| 43 | | ----- | NO DATA | ----- | | | |
| 44 | | ----- | NO DATA | ----- | | | |
| 45 | APP | 1070.9 | 31.8 | 12:55:40.9 | -748.7 | -6.7 | 63.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 06/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|-----------------------------------|--------|---------|----------|------------|--------|------|-------|
| 500 FT. LEVEL FLYOVER AT 126 KTS. | | | | | | | |
| 46 | | NO DATA | | | | | |
| 47 | F/O | 1086.7 | 29.3 | 13:16:44.4 | 222.6 | 1.0 | 121.2 |
| 48 | F/O | 1096.8 | 26.2 | 13:19:07.1 | 201.8 | 1.2 | 137.0 |
| 49 | F/O | 1086.2 | 29.1 | 13:21:05.9 | -295.6 | -1.4 | 121.0 |
| 50 | F/O | 1152.8 | 24.6 | 13:23:22.0 | -157.0 | -0.6 | 146.2 |
| 51 | F/O | 1013.8 | 27.2 | 13:25:20.1 | -204.5 | -1.0 | 121.4 |
| 52 | F/O | 1166.9 | 24.1 | 13:27:39.3 | 285.3 | 1.2 | 132.7 |
| 53 | F/O | 1088.6 | 28.3 | 13:29:53.5 | -334.3 | -1.5 | 126.0 |
| 54 | F/O | 1097.6 | 27.6 | 13:32:07.7 | 83.0 | 4.4 | 127.9 |
| 55 | F/O | 1135.4 | 25.2 | 13:34:28.7 | 81.8 | 0.4 | 125.4 |
| 56 | F/O | 1234.2 | 30.4 | 13:37:02.8 | 512.1 | 2.1 | 135.6 |
| 57 | F/O | 1070.7 | 23.2 | 13:42:13.3 | 25.6 | 0.1 | 116.3 |
| 58 | F/O | 1147.2 | 25.7 | 13:44:31.4 | 91.2 | 0.4 | 135.0 |
| 59 | F/O | 1019.7 | 29.1 | 13:49:21.3 | -405.0 | -2.3 | 123.0 |
| 60 | F/O | 1123.9 | 27.8 | 13:51:35.5 | -368.7 | -1.6 | 127.0 |
| 61 | | NO DATA | | | | | |
| 62 | F/O | 1131.9 | 26.1 | 13:57:10.4 | 95.4 | 0.4 | 131.7 |

1000 FT. LEVEL FLYOVER AT 126 KTS.

| | | | | | | | |
|----|-----|---------|------|------------|--------|------|-------|
| 63 | F/O | 1263.3 | 44.6 | 14:28:34.5 | 183.1 | 0.8 | 123.0 |
| 64 | F/O | 1424.8 | 41.6 | 14:31:03.7 | 48.3 | 0.2 | 134.7 |
| 65 | F/O | 1344.6 | 43.0 | 14:33:31.1 | -19.2 | -0.1 | 124.3 |
| 66 | | NO DATA | | | | | |
| 67 | F/O | 1356.3 | 45.9 | 14:39:25.3 | 291.6 | 1.3 | 126.8 |
| 68 | F/O | 1448.6 | 41.6 | 14:41:41.5 | -178.2 | -0.7 | 138.4 |
| 69 | | NO DATA | | | | | |
| 70 | | NO DATA | | | | | |
| 71 | F/O | 1331.3 | 45.2 | 14:50:42.2 | -44.1 | -0.2 | 127.0 |
| 72 | | NO DATA | | | | | |
| 73 | F/O | 1291.6 | 48.8 | 14:56:02.7 | 12.1 | 0.1 | 124.6 |
| 74 | F/O | 1441.0 | 45.1 | 14:58:19.0 | 103.7 | 0.4 | 133.0 |
| 75 | F/O | 1262.4 | 47.4 | 15:00:57.1 | -120.2 | -0.5 | 124.1 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 06/27/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|--------|----------|------------|--------|------|------|
| NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.) | | | | | | | |
| 1 | APP | 1000.1 | 28.4 | 12:18:51.7 | -174.6 | -3.4 | 28.8 |
| 2 | APP | 1050.5 | 25.4 | 12:25:37.9 | -615.4 | -9.9 | 34.6 |
| 3 | APP | 1100.9 | 25.2 | 12:32:03.3 | -263.9 | -4.5 | 33.3 |
| 4 | | ----- | NO DATA | ----- | | | |
| 5 | | ----- | NO DATA | ----- | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.)

| | | | | | | | |
|----|-----|--------|------|------------|--------|-------|-------|
| 6 | APP | 1132.3 | 21.3 | 12:52:15.4 | -259.4 | -3.9 | 37.2 |
| 7 | APP | 990.2 | 26.5 | 12:58:52.2 | -713.6 | -12.2 | 32.6 |
| 8 | APP | 1040.3 | 23.3 | 13:04:37.4 | -463.4 | -6.5 | 40.3 |
| 9 | APP | 675.0 | 15.6 | 13:11:05.3 | 1769.1 | 4.1 | 242.2 |
| 10 | APP | 1010.8 | 23.6 | 13:16:49.9 | -165.7 | -2.3 | 40.1 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 106/28/84

**FHA/AEE*

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|------------------------------|--------|--------|----------|------------|---------|------|-------|
| 15 DEG. BANK TURN AT 65 KTS. | | | | | | | |
| 1 | F/O | 982.3 | 26.7 | 11:19:51.1 | 387.0 | 3.0 | 72.9 |
| 2 | | ----- | NO DATA | ----- | | | |
| 3 | | ----- | NO DATA | ----- | | | |
| 4 | F/O | 971.5 | 26.1 | 11:24:50.7 | 888.7 | 7.2 | 69.5 |
| 5 | F/O | 792.7 | 29.5 | 11:26:43.2 | 789.8 | 6.9 | 64.7 |
| 6 | F/O | 899.2 | 29.5 | 11:28:30.8 | 303.5 | 2.5 | 69.6 |
| 7 | | ----- | NO DATA | ----- | | | |
| 8 | F/O | 1074.5 | 31.8 | 11:32:34.9 | -537.7 | -4.6 | 65.8 |
| 9 | F/O | 797.9 | 27.7 | 11:34:39.4 | -1235.3 | -4.9 | 142.5 |
| 10 | F/O | 282.1 | 50.4 | 11:36:41.3 | 3865.7 | 16.2 | 131.3 |
| 11 | F/O | 857.6 | 32.3 | 11:38:40.6 | 342.1 | 2.4 | 70.3 |
| 30 DEG. BANK TURN AT 65 KTS. | | | | | | | |
| 12 | F/O | 816.5 | 42.2 | 11:44:12.5 | -153.1 | -1.3 | 64.2 |
| 13 | | ----- | NO DATA | ----- | | | |
| 14 | F/O | 837.0 | 35.0 | 11:45:56.3 | -426.5 | -3.0 | 81.5 |
| 15 | F/O | 992.6 | 34.1 | 11:50:04.9 | 347.4 | 2.9 | 68.4 |
| 16 | F/O | 1012.9 | 34.3 | 11:52:16.9 | -100.2 | -0.9 | 67.3 |
| 17 | F/O | 1037.2 | 32.0 | 11:54:24.9 | 46.4 | 0.4 | 66.7 |
| 18 | F/O | 988.0 | 35.9 | 11:57:01.8 | -252.3 | -2.1 | 69.1 |
| 19 | F/O | 948.9 | 32.1 | 11:59:04.6 | 12317.4 | 60.2 | 69.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB DK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE: 06/25/84

XXFAR/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|-----------|--------|-----------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | ---- | NO DATA | ---- | | |
| 2 | APP | 1049.6 | 22.2 | 0:15:09.7 | -534.3 | -4.1 74.4 |
| 4 | APP | 937.3 | 21.2 | 0:22:58.4 | -825.5 | -6.7 69.8 |
| 6 | APP | 1124.0 | 20.7 | 0:28:09.7 | -716.3 | -5.5 73.0 |
| 8 | APP | 1108.3 | 20.2 | 0:35:02.5 | -766.8 | -6.4 67.2 |
| 10 | APP | 1031.4 | 21.7 | 0:40:35.2 | -782.1 | -6.1 71.0 |
| 12 | APP | 1052.0 | 19.9 | 0:46:53.4 | -436.1 | -3.4 71.5 |
| 14 | APP | 1117.7 | 20.8 | 0:52:47.5 | -939.7 | -8.2 64.7 |

TAKEOFF, MAX ALLOW TORQUE

| | | | | | | |
|----|-----|--------|---------|-----------|--------|-----------|
| 3 | DEP | 1539.8 | 41.8 | 0:19:59.6 | 2842.7 | 25.1 60.0 |
| 5 | | ---- | NO DATA | ---- | | |
| 7 | DEP | 1774.5 | 47.3 | 0:36:24.8 | 2803.3 | 27.5 53.1 |
| 9 | DEP | 1757.9 | 38.0 | 0:36:45.2 | 3121.0 | 33.0 45.8 |
| 11 | DEP | 1771.6 | 44.2 | 0:42:35.8 | 2716.0 | 28.0 50.5 |
| 13 | DEP | 1788.3 | 42.9 | 0:48:47.0 | 2806.0 | 27.8 52.8 |
| 15 | | ---- | NO DATA | ---- | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 16 | | ---- | NO DATA | ---- | | |
| 18 | APP | 1093.3 | 19.7 | 10:07:01.9 | -927.8 | -7.2 72.1 |
| 20 | APP | 1075.3 | 19.2 | 10:13:24.7 | -811.0 | -7.0 65.6 |
| 22 | APP | 1032.2 | 22.9 | 10:35:11.8 | -917.8 | -7.0 74.2 |
| 24 | | ---- | NO DATA | ---- | | |
| 26 | APP | 1178.9 | 17.7 | 10:52:14.7 | -981.7 | -7.8 71.0 |
| 28 | APP | 1142.2 | 20.0 | 10:58:36.5 | -850.5 | -5.8 82.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE 106/25/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---------------------|--------|--------|----------|------------|--------|-----------|
| TAKEOFF, 65% TORQUE | | | | | | |
| 17 | DEP | 1674.4 | 41.7 | 10:01:30.2 | 2600.0 | 27.7 49.0 |
| 19 | DEP | 1770.2 | 40.4 | 10:09:09.7 | 1978.7 | 22.2 47.0 |
| 21 | DEP | 1678.0 | 42.5 | 10:28:08.8 | 2891.0 | 30.6 48.3 |
| 23 | DEP | 1688.2 | 44.7 | 10:38:02.2 | 2580.3 | 26.2 51.7 |
| 25 | DEP | 1823.0 | 42.8 | 10:48:01.0 | 2683.0 | 26.3 53.6 |
| 27 | DEP | 1793.7 | 40.5 | 10:54:31.1 | 2800.5 | 30.8 46.6 |

NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|--------|---------|------------|---------|------------|
| 29 | | ----- | NO DATA | ----- | | |
| 30 | APP | 1124.9 | 30.4 | 12:02:28.1 | -1896.4 | -15.8 66.2 |
| 31 | | ----- | NO DATA | ----- | | |
| 32 | APP | 1170.3 | 29.4 | 12:09:30.6 | -1480.3 | -11.7 70.8 |
| 33 | APP | 1143.2 | 27.5 | 12:13:21.8 | -1744.3 | -13.8 70.0 |
| 34 | APP | 1202.7 | 27.8 | 12:17:02.0 | -871.2 | -6.7 72.8 |
| 35 | APP | 1178.0 | 27.4 | 12:20:46.7 | -1080.8 | -9.0 67.1 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|--------|---------|------------|---------|-----------|
| 38 | | ----- | NO DATA | ----- | | |
| 39 | APP | 1156.0 | 27.0 | 12:35:39.3 | -1009.4 | -8.9 63.7 |
| 40 | APP | 1182.0 | 31.6 | 12:39:18.7 | -793.0 | -7.1 62.5 |
| 41 | APP | 1213.8 | 31.7 | 12:42:58.4 | -803.4 | -8.5 53.3 |
| 42 | APP | 1243.5 | 31.2 | 12:46:22.0 | -976.0 | -8.9 61.8 |
| 43 | | ----- | NO DATA | ----- | | |
| 44 | | ----- | NO DATA | ----- | | |
| 45 | APP | 1224.6 | 27.3 | 12:55:41.1 | -745.2 | -6.8 62.1 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE 106/25/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------------------------|--------|--------|----------|------------|--------|------|
| 500 FT. LEVEL FLYOVER AT 126 KTS. | | | | | | |
| 46 | | ---- | NO DATA | ---- | | |
| 47 | F70 | 1169.6 | 26.9 | 13:16:43.9 | 330.8 | 1.6 |
| 48 | F70 | 1060.4 | 27.5 | 13:19:07.5 | 352.2 | 1.5 |
| 49 | F70 | 1196.1 | 23.7 | 13:21:06.9 | -176.8 | -0.8 |
| 50 | F70 | 1046.0 | 27.1 | 13:23:22.8 | -114.6 | -0.4 |
| 51 | F70 | 1169.1 | 23.1 | 13:25:29.6 | -193.1 | -0.9 |
| 52 | F70 | 999.0 | 29.2 | 13:27:40.5 | 269.4 | 1.2 |
| 53 | F70 | 1151.7 | 26.6 | 13:29:53.8 | -343.9 | -1.6 |
| 54 | F70 | 1108.8 | 27.4 | 13:32:08.9 | 931.1 | 4.1 |
| 55 | F70 | 1066.5 | 26.9 | 13:34:28.2 | 89.7 | 0.4 |
| 56 | F70 | 1053.0 | 36.0 | 13:37:01.7 | 1014.3 | 4.2 |
| 57 | F70 | 1033.0 | 24.2 | 13:42:12.8 | 31.5 | 0.1 |
| 58 | F70 | 1070.3 | 27.4 | 13:44:39.9 | 174.1 | 0.7 |
| 59 | F70 | 1209.3 | 24.1 | 13:49:21.5 | 462.0 | 2.1 |
| 60 | F70 | 1111.4 | 28.4 | 13:51:35.1 | -339.4 | -1.5 |
| 61 | | ---- | NO DATA | ---- | | |
| 62 | F70 | 1046.1 | 28.5 | 13:57:10.7 | 104.6 | 0.4 |

1000 FT. LEVEL FLYOVER AT 126 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 63 | F70 | 1394.3 | 39.6 | 14:28:34.2 | 165.6 | 0.8 |
| 64 | F70 | 1309.8 | 46.5 | 14:31:04.0 | 16.5 | 0.1 |
| 65 | F70 | 1352.6 | 42.4 | 14:33:30.5 | -65.9 | -0.3 |
| 66 | | ---- | NO DATA | ---- | | |
| 67 | F70 | 1405.2 | 43.4 | 14:39:24.3 | 193.4 | 0.9 |
| 68 | F70 | 1322.1 | 46.6 | 14:41:40.8 | -242.0 | -1.0 |
| 69 | | ---- | NO DATA | ---- | | |
| 70 | | ---- | NO DATA | ---- | | |
| 71 | F70 | 1412.9 | 41.9 | 14:50:41.6 | 87.1 | 0.4 |
| 72 | | ---- | NO DATA | ---- | | |
| 73 | F70 | 1501.5 | 40.8 | 14:56:02.4 | 51.2 | 0.2 |
| 74 | F70 | 1386.3 | 48.0 | 14:58:19.4 | 120.2 | 0.5 |
| 75 | F70 | 1456.7 | 39.6 | 15:00:58.4 | -180.7 | -0.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 1000 FT. WEST

DATE 06/27/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|-----|--------|---------|------------|--------|-------|------|
| NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.) | | | | | | | |
| 1 | APP | 1111.7 | 28.1 | 12:18:49.7 | -220.5 | -3.7 | 33.3 |
| 2 | APP | 1112.6 | 22.4 | 12:25:40.3 | -644.0 | -11.1 | 32.4 |
| 3 | APP | 1047.9 | 26.6 | 12:32:04.8 | -543.3 | -9.2 | 32.0 |
| 4 | | ----- | NO DATA | ----- | | | |
| 5 | | ----- | NO DATA | ----- | | | |
| NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.) | | | | | | | |
| 6 | APP | 974.7 | 26.2 | 12:52:10.4 | -215.6 | -3.2 | 37.6 |
| 7 | APP | 1138.5 | 23.2 | 12:58:51.5 | -713.0 | -11.9 | 33.5 |
| 8 | APP | 1093.5 | 22.3 | 13:04:37.6 | -470.8 | -6.8 | 30.0 |
| 9 | APP | 1015.3 | 19.1 | 13:10:53.7 | -486.0 | -8.5 | 30.1 |
| 10 | APP | 1007.3 | 22.1 | 13:16:47.7 | -101.3 | -1.6 | 35.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE: 06/28/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|--------------------------------|--------|--------|----------|------------|--------|------|------|
| 15 DEGREE BANK TURN AT 65 KTS. | | | | | | | |
| 1 | F/O | 1086.3 | 27.8 | 11:19:45.1 | -306.0 | -2.6 | 65.6 |
| 2 | | ----- | NO DATA | ----- | | | |
| 3 | | ----- | NO DATA | ----- | | | |
| 4 | F/O | 1120.4 | 27.6 | 11:24:56.7 | 725.1 | 6.3 | 64.6 |
| 5 | F/O | 1259.1 | 22.5 | 11:26:36.4 | -365.5 | -3.1 | 66.9 |
| 6 | F/O | 1145.2 | 27.1 | 11:28:36.7 | 81.2 | 0.7 | 65.1 |
| 7 | | ----- | NO DATA | ----- | | | |
| 8 | F/O | 1193.0 | 29.7 | 11:32:30.2 | -217.7 | -1.8 | 70.0 |
| 9 | F/O | 1123.9 | 24.5 | 11:34:29.4 | -157.3 | -1.4 | 64.6 |
| 10 | | ----- | NO DATA | ----- | | | |
| 11 | F/O | 1096.3 | 25.4 | 11:38:33.7 | 109.3 | 1.0 | 62.8 |

30 DEGREE BANK TURN AT 65 KTS.

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|------|
| 12 | F/O | 1245.3 | 27.4 | 11:44:03.5 | 89.1 | 0.9 | 54.1 |
| 13 | | ----- | NO DATA | ----- | | | |
| 14 | F/O | 1240.4 | 24.2 | 11:45:50.3 | 262.5 | 2.3 | 64.7 |
| 15 | F/O | 1202.5 | 29.8 | 11:50:11.2 | 601.8 | 4.7 | 72.6 |
| 16 | F/O | 1079.5 | 30.5 | 11:52:26.4 | -122.2 | -1.2 | 68.6 |
| 17 | F/O | 1077.4 | 31.4 | 11:54:32.5 | 584.4 | 5.2 | 63.9 |
| 18 | F/O | 1159.7 | 32.2 | 11:56:51.5 | -70.2 | -0.6 | 62.2 |
| 19 | F/O | 1123.6 | 32.8 | 11:58:57.4 | -323.0 | -2.8 | 65.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 06/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|-----------|---------|-----------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | ---- | NO DATA | ---- | | |
| 2 | APP | 2048.3 | 11.6 | 9:15:00.2 | -646.5 | -4.8 75.6 |
| 4 | APP | 2126.6 | 10.1 | 9:22:56.5 | -1047.3 | -8.3 70.0 |
| 6 | APP | 1953.4 | 11.8 | 9:28:09.4 | -705.8 | -5.4 73.1 |
| 8 | APP | 1966.2 | 11.5 | 9:35:02.2 | -841.6 | -6.0 68.6 |
| 10 | APP | 2054.0 | 11.6 | 9:40:33.0 | -610.8 | -4.0 70.0 |
| 12 | APP | 2020.0 | 10.7 | 9:46:51.7 | -673.6 | -5.3 71.3 |
| 14 | APP | 1373.1 | 16.6 | 9:52:55.2 | 780.4 | 3.6 124.0 |

TAKEOFF, MAX ALLOW TORQUE

| | | | | | | |
|----|-----|--------|---------|-----------|--------|-----------|
| 3 | DEP | 2203.0 | 24.1 | 9:19:57.0 | 2937.8 | 26.6 57.8 |
| 5 | | ---- | NO DATA | ---- | | |
| 7 | | ---- | NO DATA | ---- | | |
| 9 | DEP | 2386.4 | 30.8 | 9:36:47.9 | 2814.7 | 30.8 46.6 |
| 11 | DEP | 2407.3 | 30.8 | 9:42:35.6 | 2701.8 | 28.0 50.2 |
| 13 | DEP | 2362.3 | 31.2 | 9:48:48.1 | 2836.2 | 28.3 52.1 |
| 15 | | ---- | NO DATA | ---- | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 16 | | ---- | NO DATA | ---- | | |
| 18 | APP | 1988.7 | 10.9 | 10:07:01.3 | -983.3 | -7.6 73.0 |
| 20 | APP | 1996.0 | 11.2 | 10:13:22.1 | -681.5 | -6.1 62.8 |
| 22 | APP | 2065.7 | 11.9 | 10:35:10.6 | -973.3 | -7.4 73.7 |
| 24 | | ---- | NO DATA | ---- | | |
| 26 | APP | 1523.2 | 8.9 | 10:52:20.4 | -678.2 | -4.1 82.3 |
| 28 | APP | 1946.1 | 13.0 | 10:58:33.2 | -523.5 | -3.5 83.6 |
| xx | | ---- | NO DATA | ---- | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE: 06/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---------------------|--------|--------|----------|------------|--------|------|
| TAKEOFF, 65% TORQUE | | | | | | |
| 17 | DEP | 2389.0 | 27.5 | 10:01:29.6 | 2482.8 | 49.5 |
| 19 | DEP | 2379.3 | 33.1 | 10:09:08.1 | 1960.4 | 46.2 |
| 21 | DEP | 2308.1 | 30.1 | 10:28:00.0 | 2916.1 | 48.1 |
| 23 | DEP | 2350.8 | 33.1 | 10:38:04.7 | 2450.5 | 52.7 |
| 25 | DEP | 2350.8 | 32.0 | 10:48:02.2 | 2661.7 | 53.6 |
| 27 | DEP | 2293.2 | 33.4 | 10:54:33.2 | 2500.6 | 44.0 |

NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|--------|---------|------------|---------|------|
| 29 | | ----- | NO DATA | ----- | | |
| 30 | APP | 2085.2 | 16.8 | 12:02:26.9 | -1536.1 | 67.6 |
| 31 | | ----- | NO DATA | ----- | | |
| 32 | APP | 2034.6 | 17.4 | 12:09:29.5 | -1410.9 | 73.5 |
| 33 | APP | 2057.1 | 16.2 | 12:13:20.8 | -1663.4 | 67.4 |
| 34 | APP | 1998.1 | 17.0 | 12:17:00.8 | -1171.6 | 70.8 |
| 35 | APP | 2011.2 | 17.1 | 12:20:43.7 | -1319.3 | 72.2 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 38 | | ----- | NO DATA | ----- | | |
| 39 | APP | 2031.1 | 15.1 | 12:35:40.1 | -994.1 | 61.8 |
| 40 | APP | 2075.6 | 17.3 | 12:39:19.5 | -846.8 | 61.7 |
| 41 | APP | 2062.0 | 18.9 | 12:42:57.7 | -822.2 | 54.1 |
| 42 | APP | 2022.1 | 19.2 | 12:46:21.4 | -924.6 | 62.9 |
| 43 | | ----- | NO DATA | ----- | | |
| 44 | | ----- | NO DATA | ----- | | |
| 45 | APP | 1986.1 | 16.6 | 12:55:40.9 | -748.7 | 63.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE: 06/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------------------------|--------|--------|----------|------------|--------|------|
| 500 FT. LEVEL FLYOVER AT 126 KTS. | | | | | | |
| 46 | | ---- | NO DATA | ---- | | |
| 47 | F/O | 2019.0 | 15.4 | 13:16:44.7 | 162.8 | 0.8 |
| 48 | F/O | 2042.9 | 13.8 | 13:19:07.1 | 291.8 | -1.2 |
| 49 | F/O | 1938.8 | 14.8 | 13:21:06.9 | -240.8 | -1.1 |
| 50 | F/O | 2104.2 | 13.3 | 13:23:22.0 | -157.0 | -0.6 |
| 51 | F/O | 1957.6 | 13.8 | 13:25:29.1 | -204.5 | -1.0 |
| 52 | F/O | 2115.1 | 13.1 | 13:27:39.3 | 285.3 | -1.2 |
| 53 | F/O | 2024.3 | 14.0 | 13:29:53.5 | -334.3 | -1.5 |
| 54 | F/O | 2036.5 | 14.5 | 13:32:07.7 | 983.0 | 4.4 |
| 55 | F/O | 2083.0 | 13.5 | 13:34:28.7 | 81.8 | 0.4 |
| 56 | F/O | 2151.0 | 16.0 | 13:37:03.3 | 260.0 | 1.1 |
| 57 | F/O | 2027.8 | 12.1 | 13:42:13.3 | 25.6 | 0.1 |
| 58 | F/O | 2094.2 | 13.0 | 13:44:31.0 | 108.0 | 0.4 |
| 59 | F/O | 1952.8 | 14.0 | 13:49:22.2 | 373.1 | 1.7 |
| 60 | F/O | 2057.6 | 14.8 | 13:51:35.5 | -368.7 | -1.6 |
| 61 | | ---- | NO DATA | ---- | | |
| 62 | F/O | 2077.9 | 13.9 | 13:57:10.4 | 95.4 | 0.4 |

1000 FT. LEVEL FLYOVER AT 126 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 63 | F/O | 2097.0 | 25.1 | 14:28:34.5 | 183.1 | 0.8 |
| 64 | F/O | 2272.3 | 24.7 | 14:31:03.7 | 48.3 | 0.2 |
| 65 | F/O | 2183.4 | 25.0 | 14:33:31.6 | 61.8 | 0.3 |
| 66 | | ---- | NO DATA | ---- | | |
| 67 | F/O | 2170.8 | 26.8 | 14:39:25.8 | 305.0 | -1.3 |
| 68 | F/O | 2293.8 | 24.9 | 14:41:41.7 | -157.5 | -0.6 |
| 69 | | ---- | NO DATA | ---- | | |
| 70 | | ---- | NO DATA | ---- | | |
| 71 | F/O | 2149.6 | 26.1 | 14:50:40.6 | 153.7 | 0.7 |
| 72 | | ---- | NO DATA | ---- | | |
| 73 | F/O | 2090.1 | 28.1 | 14:56:02.0 | 118.0 | 0.5 |
| 74 | F/O | 2262.4 | 26.0 | 14:58:19.0 | 103.7 | 0.4 |
| 75 | F/O | 2073.2 | 26.7 | 15:00:57.1 | -120.2 | -0.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE: 06/27/84

FAA/AEE

EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.)

| | | | | | | | |
|---|-----|--------|---------|------------|--------|-------|------|
| 1 | APP | 2023.7 | 14.8 | 12:18:54.3 | -117.8 | -2.3 | 28.6 |
| 2 | APP | 1998.5 | 13.6 | 12:25:36.2 | -581.5 | -10.5 | 30.9 |
| 3 | APP | 2051.1 | 13.3 | 12:32:03.3 | -263.9 | -4.5 | 33.3 |
| 4 | | ----- | NO DATA | ----- | | | |
| 5 | | ----- | NO DATA | ----- | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.)

| | | | | | | | |
|----|-----|--------|------|------------|--------|-------|-------|
| 6 | APP | 2081.5 | 11.5 | 12:52:15.4 | -259.4 | -3.9 | 37.2 |
| 7 | APP | 1936.8 | 13.3 | 12:58:52.2 | -713.6 | -12.2 | 32.6 |
| 8 | APP | 2006.8 | 12.1 | 13:04:39.4 | -296.4 | -4.4 | 37.9 |
| 9 | APP | 1342.9 | 9.9 | 13:11:05.5 | 1769.1 | 4.1 | 242.2 |
| 10 | APP | 1973.4 | 11.9 | 13:16:51.2 | -376.7 | -5.5 | 38.3 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 106/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--------------------------------|--------|--------|----------|------------|---------|------|
| 15 DEGREE BANK TURN AT 65 KTS. | | | | | | |
| 1 | F/O | 1644.3 | 15.0 | 11:19:35.2 | -31.3 | 57.8 |
| 2 | F/O | 2033.6 | 13.9 | 7:39:35.5 | -936.0 | 81.3 |
| 3 | F/O | 2023.2 | 13.1 | 7:43:23.8 | -957.0 | 77.8 |
| 4 | F/O | 2031.6 | 13.9 | 7:47:29.6 | -1009.5 | 78.0 |
| 5 | F/O | 1446.3 | 15.8 | 11:26:43.2 | 789.8 | 64.7 |
| 6 | F/O | 2038.3 | 14.5 | 7:55:58.3 | -845.1 | 72.5 |
| 7 | F/O | 2034.5 | 15.1 | 8:00:03.3 | -1013.5 | 78.7 |
| 8 | F/O | 1743.8 | 17.5 | 11:32:43.6 | -389.1 | 68.1 |
| 9 | F/O | 2046.0 | 16.2 | 8:07:39.8 | -1121.3 | 77.0 |
| 10 | | ----- | NO DATA | ----- | | |
| 11 | | ----- | NO DATA | ----- | | |

15 DEGREE BANK TURN AT 65 KTS.

| | | | | | | |
|----|-----|--------|---------|-----------|--------|------|
| 12 | F/O | 2033.1 | 11.6 | 8:20:47.1 | -711.5 | 74.7 |
| 13 | | ----- | NO DATA | ----- | | |
| 14 | F/O | 2032.2 | 16.6 | 8:28:25.3 | -888.3 | 63.2 |
| 15 | | ----- | NO DATA | ----- | | |
| 16 | | ----- | NO DATA | ----- | | |
| 17 | F/O | 2008.5 | 10.2 | 8:36:22.1 | 779.8 | 83.6 |
| 18 | | ----- | NO DATA | ----- | | |
| 19 | F/O | 2021.2 | 9.3 | 8:40:49.9 | 1190.1 | 84.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE 106/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|-----------|--------|------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | ----- | NO DATA | ----- | | |
| 2 | APP | 2008.7 | 11.0 | 9:15:09.7 | -534.3 | 74.4 |
| 4 | APP | 1863.0 | 10.1 | 9:22:58.4 | -825.5 | 69.8 |
| 6 | APP | 2085.9 | 10.6 | 9:28:09.7 | -716.3 | 73.0 |
| 8 | APP | 2070.0 | 12.0 | 9:34:58.8 | -608.4 | 70.0 |
| 10 | APP | 1987.6 | 10.7 | 9:40:35.5 | -801.8 | 71.9 |
| 12 | APP | 2010.4 | 9.5 | 9:46:55.4 | -543.0 | 68.6 |
| 14 | APP | 2077.9 | 10.7 | 9:52:47.5 | -939.7 | 64.7 |

TAKEOFF, MAX ALLOW TORQUE

| | | | | | | |
|----|-----|--------|---------|-----------|--------|------|
| 3 | DEP | 2333.4 | 25.8 | 9:19:59.6 | 2842.7 | 60.0 |
| 5 | | ----- | NO DATA | ----- | | |
| 7 | DEP | 2497.7 | 32.3 | 9:30:25.6 | 2891.9 | 52.0 |
| 9 | DEP | 2482.1 | 25.5 | 9:36:45.0 | 3121.9 | 45.8 |
| 11 | DEP | 2491.2 | 29.4 | 9:42:05.0 | 2716.0 | 50.9 |
| 13 | DEP | 2521.1 | 28.6 | 9:48:47.9 | 2806.0 | 52.6 |
| 15 | | ----- | NO DATA | ----- | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|---------|------|
| 16 | | ----- | NO DATA | ----- | | |
| 18 | APP | 2056.7 | 9.8 | 10:07:02.6 | -819.6 | 73.9 |
| 20 | APP | 2021.9 | 8.7 | 10:13:26.9 | -944.4 | 66.0 |
| 22 | APP | 1986.9 | 11.7 | 10:35:11.3 | -1005.2 | 74.1 |
| 24 | | ----- | NO DATA | ----- | | |
| 26 | APP | 2150.3 | 9.3 | 10:52:14.7 | -981.7 | 71.0 |
| 28 | APP | 2094.9 | 9.7 | 10:58:38.1 | -855.1 | 81.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE: 06/25/84

***FAA/AEE**

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

TAKEOFF, 65% TORQUE

| | | | | | | | |
|----|-----|--------|------|------------|--------|------|------|
| 17 | DEP | 2410.7 | 27.2 | 10:01:30.2 | 2600.0 | 27.7 | 40.0 |
| 19 | DEP | 2494.7 | 33.4 | 10:00:10.7 | 2031.0 | 21.0 | 52.1 |
| 21 | DEP | 2439.6 | 27.4 | 10:28:08.8 | 2891.0 | 30.6 | 48.3 |
| 23 | DEP | 2430.9 | 31.4 | 10:38:04.5 | 2437.6 | 24.0 | 51.0 |
| 25 | DEP | 2545.2 | 28.8 | 10:48:01.9 | 2683.0 | 26.0 | 53.6 |
| 27 | DEP | 2541.5 | 24.0 | 10:54:28.7 | 2877.5 | 30.5 | 48.2 |

NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|---------|------------|---------|-------|------|
| 29 | | ----- | NO DATA | ----- | | | |
| 30 | APP | 2036.7 | 15.9 | 12:02:28.1 | -1896.4 | -15.8 | 66.2 |
| 31 | | ----- | NO DATA | ----- | | | |
| 32 | APP | 2086.8 | 16.7 | 12:09:29.3 | -1320.8 | -10.0 | 73.0 |
| 33 | APP | 2069.6 | 14.4 | 12:13:22.0 | -1721.0 | -13.8 | 60.1 |
| 34 | APP | 2132.4 | 14.0 | 12:17:02.0 | -871.2 | -6.7 | 72.8 |
| 35 | APP | 2095.6 | 14.0 | 12:20:46.7 | -1080.8 | -9.0 | 67.1 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|----|-----|--------|---------|------------|---------|------|------|
| 38 | | ----- | NO DATA | ----- | | | |
| 39 | APP | 2088.6 | 14.7 | 12:35:39.3 | -1000.4 | -8.9 | 63.7 |
| 40 | APP | 2094.7 | 16.9 | 12:30:18.7 | -793.0 | -7.1 | 62.5 |
| 41 | APP | 2123.6 | 17.1 | 12:42:58.4 | -803.4 | -8.5 | 53.3 |
| 42 | APP | 2155.2 | 16.6 | 12:46:23.1 | -807.1 | -7.6 | 60.0 |
| 43 | | ----- | NO DATA | ----- | | | |
| 44 | | ----- | NO DATA | ----- | | | |
| 45 | APP | 2150.8 | 14.6 | 12:55:42.3 | -650.4 | -6.0 | 60.6 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT WEST

DATE 106/25/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------------------------|--------|--------|----------|------------|--------|------|
| 500 FT. LEVEL FLYOVER AT 126 KTS. | | | | | | |
| 46 | | ---- | NO DATA | ---- | | |
| 47 | F/O | 2104.2 | 14.4 | 13:16:45.1 | 116.7 | 0.6 |
| 48 | F/O | 1997.8 | 13.8 | 13:19:07.5 | 352.2 | -1.5 |
| 49 | F/O | 2134.1 | 12.7 | 13:21:06.9 | -176.0 | -0.8 |
| 50 | F/O | 1985.7 | 13.5 | 13:23:22.8 | -114.6 | -0.4 |
| 51 | F/O | 2117.2 | 12.5 | 13:25:28.7 | -212.0 | -1.0 |
| 52 | F/O | 1927.4 | 14.3 | 13:27:40.5 | -269.4 | -1.2 |
| 53 | F/O | 2091.5 | 13.9 | 13:29:59.2 | -343.9 | -1.6 |
| 54 | F/O | 2001.0 | 15.0 | 13:32:09.2 | 589.3 | 2.6 |
| 55 | F/O | 2002.4 | 13.6 | 13:34:29.2 | 92.3 | 0.4 |
| 56 | F/O | 1939.2 | 18.2 | 13:37:01.7 | 1014.3 | 4.2 |
| 57 | F/O | 1984.8 | 12.0 | 13:42:12.8 | 31.9 | 0.1 |
| 58 | F/O | 2002.4 | 13.9 | 13:44:30.9 | 174.1 | 0.7 |
| 59 | F/O | 2159.0 | 12.9 | 13:49:21.5 | 462.0 | 2.1 |
| 60 | F/O | 2042.9 | 14.6 | 13:51:35.1 | -339.4 | -1.5 |
| 61 | | ---- | NO DATA | ---- | | |
| 62 | F/O | 1989.0 | 14.2 | 13:57:10.7 | 104.6 | 0.4 |

1000 FT. LEVEL FLYOVER AT 126 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 63 | F/O | 2252.5 | 22.9 | 14:28:34.2 | 165.6 | 0.8 |
| 64 | F/O | 2129.1 | 26.3 | 14:31:04.0 | 16.6 | 0.1 |
| 65 | F/O | 2191.2 | 24.2 | 14:33:30.5 | -65.0 | -0.3 |
| 66 | | ---- | NO DATA | ---- | | |
| 67 | F/O | 2227.6 | 25.3 | 14:39:24.3 | -193.4 | -0.9 |
| 68 | F/O | 2128.2 | 26.5 | 14:41:40.7 | -267.8 | -1.1 |
| 69 | | ---- | NO DATA | ---- | | |
| 70 | | ---- | NO DATA | ---- | | |
| 71 | F/O | 2252.4 | 24.4 | 14:50:41.6 | 87.1 | 0.4 |
| 72 | | ---- | NO DATA | ---- | | |
| 73 | F/O | 2341.3 | 24.5 | 14:56:03.3 | -20.3 | -0.1 |
| 74 | F/O | 2177.7 | 27.0 | 14:58:19.4 | 120.2 | 0.5 |
| 75 | F/O | 2304.3 | 23.4 | 15:00:58.5 | -181.8 | -0.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

MBB BK117

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE 06/27/84

FAA/AEE

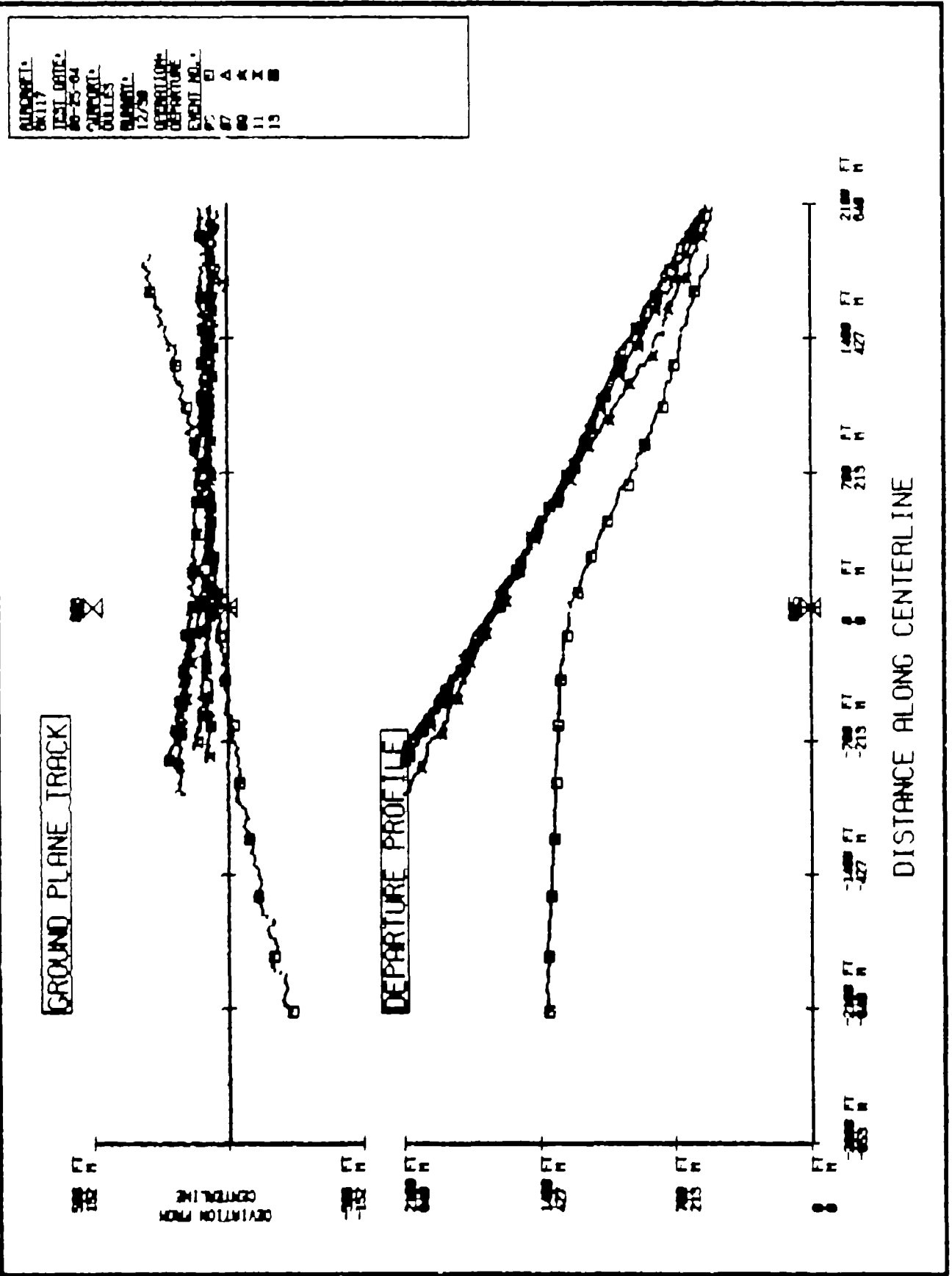
| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|--------------------------|--------|--------|----------|------------|--------|-------|------|
| NOISE ABATEMENT APPROACH | | | | | | | |
| 1 | APP | 2044.6 | 14.5 | 12:18:40.7 | -220.5 | -3.7 | 33.3 |
| 2 | APP | 2065.7 | 11.5 | 12:25:40.3 | -644.0 | -11.1 | 32.4 |
| 3 | APP | 1988.4 | 13.3 | 12:32:04.8 | -543.3 | -9.2 | 32.0 |
| 4 | | ----- | NO DATA | ----- | | | |
| 5 | | ----- | NO DATA | ----- | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.)

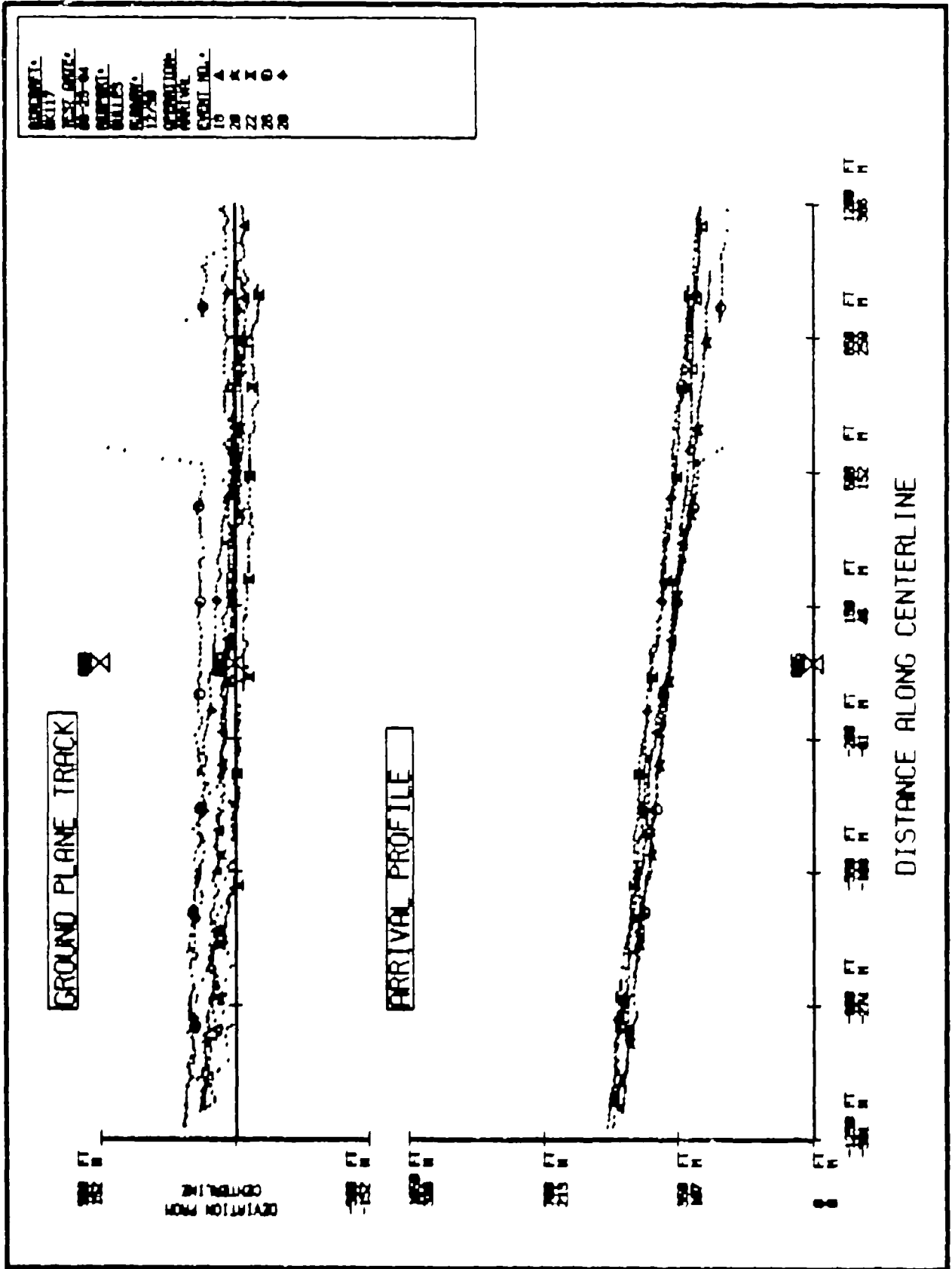
| | | | | | | | |
|----|-----|--------|------|------------|--------|-------|------|
| 6 | APP | 1910.0 | 12.6 | 12:52:10.4 | -215.6 | -3.2 | 37.6 |
| 7 | APP | 2002.4 | 12.0 | 12:58:51.5 | -713.0 | -11.0 | 33.8 |
| 8 | APP | 2051.4 | 11.3 | 13:04:37.6 | -470.8 | -6.8 | 39.2 |
| 9 | APP | 1972.5 | 9.3 | 13:10:53.7 | -486.0 | -8.6 | 32.1 |
| 10 | APP | 2055.7 | 11.2 | 13:16:47.7 | -101.3 | -1.6 | 35.0 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

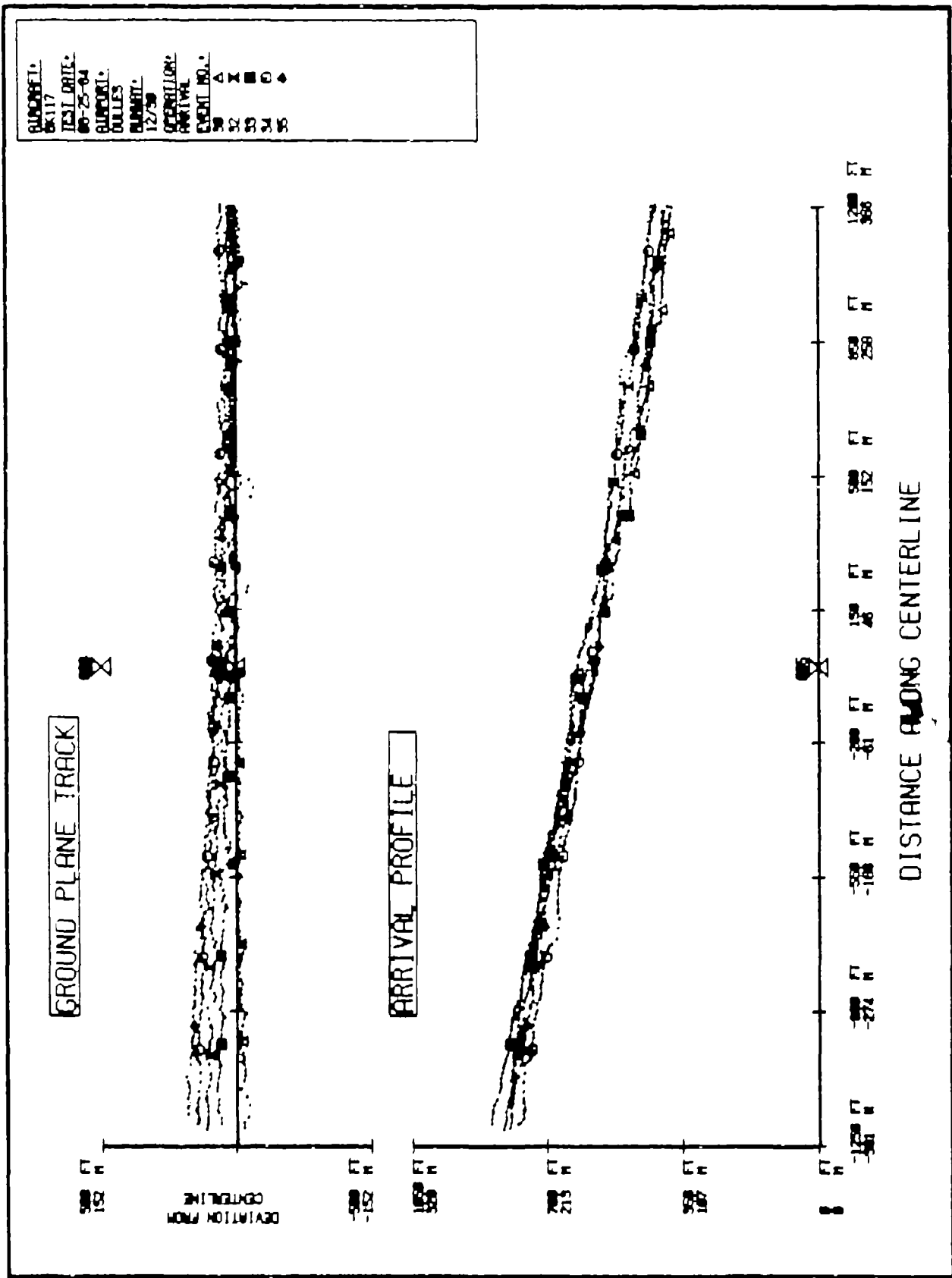
TAKEOFF, MAX ALLOW TORQUE



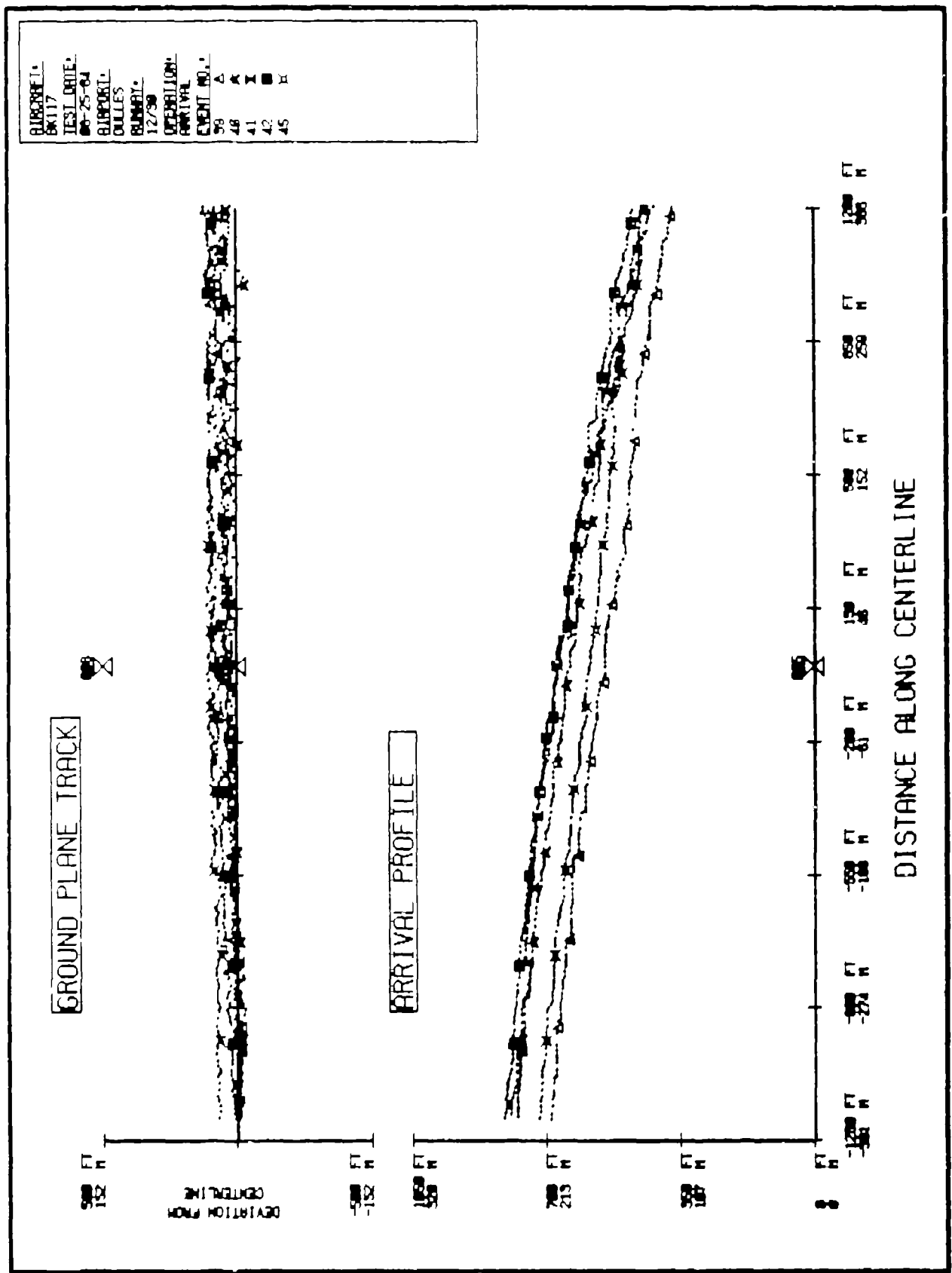
NORMAL APPROACH



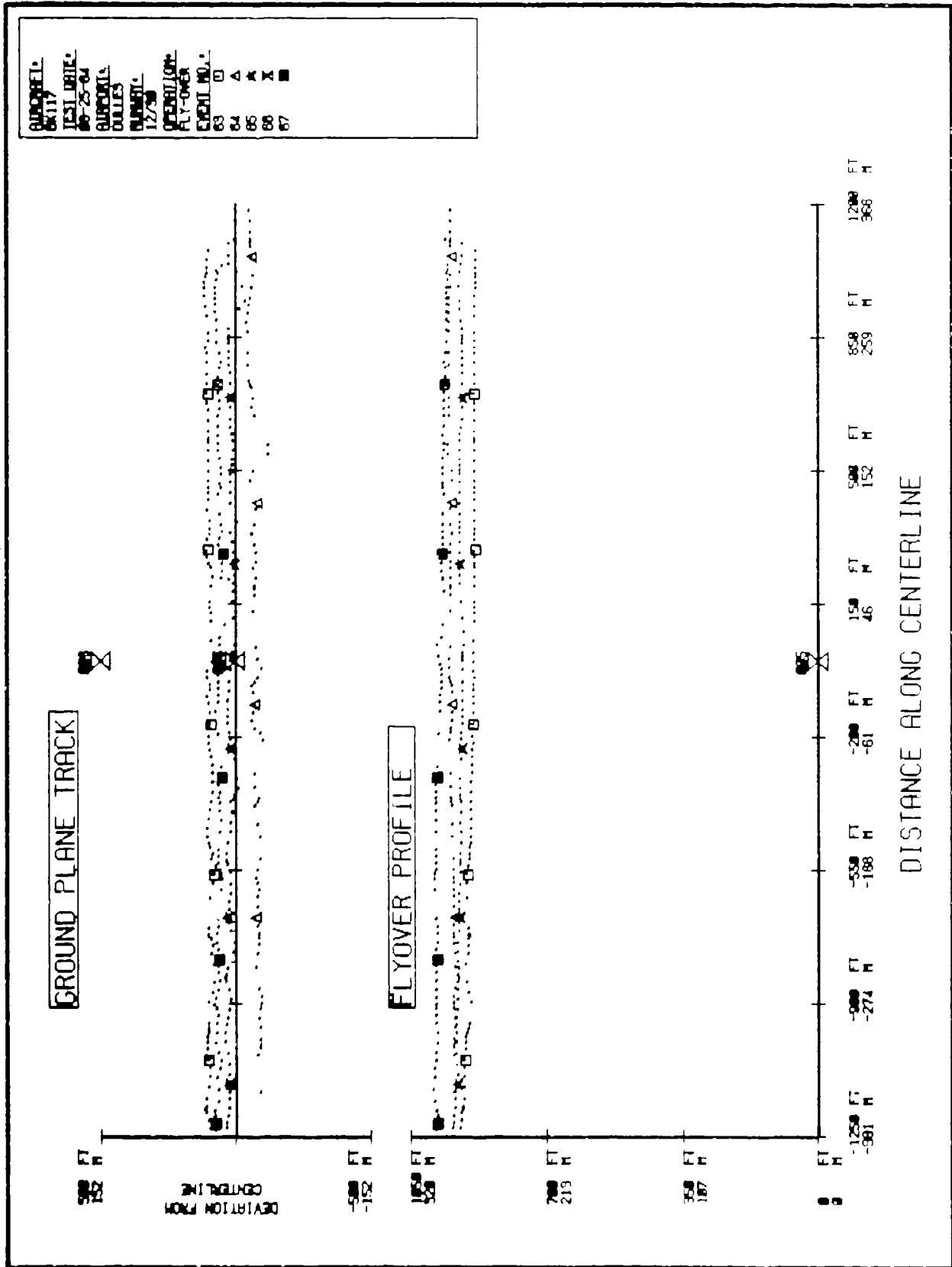
NOISE ABATEMENT APPROACH (10° target, var. A/S)



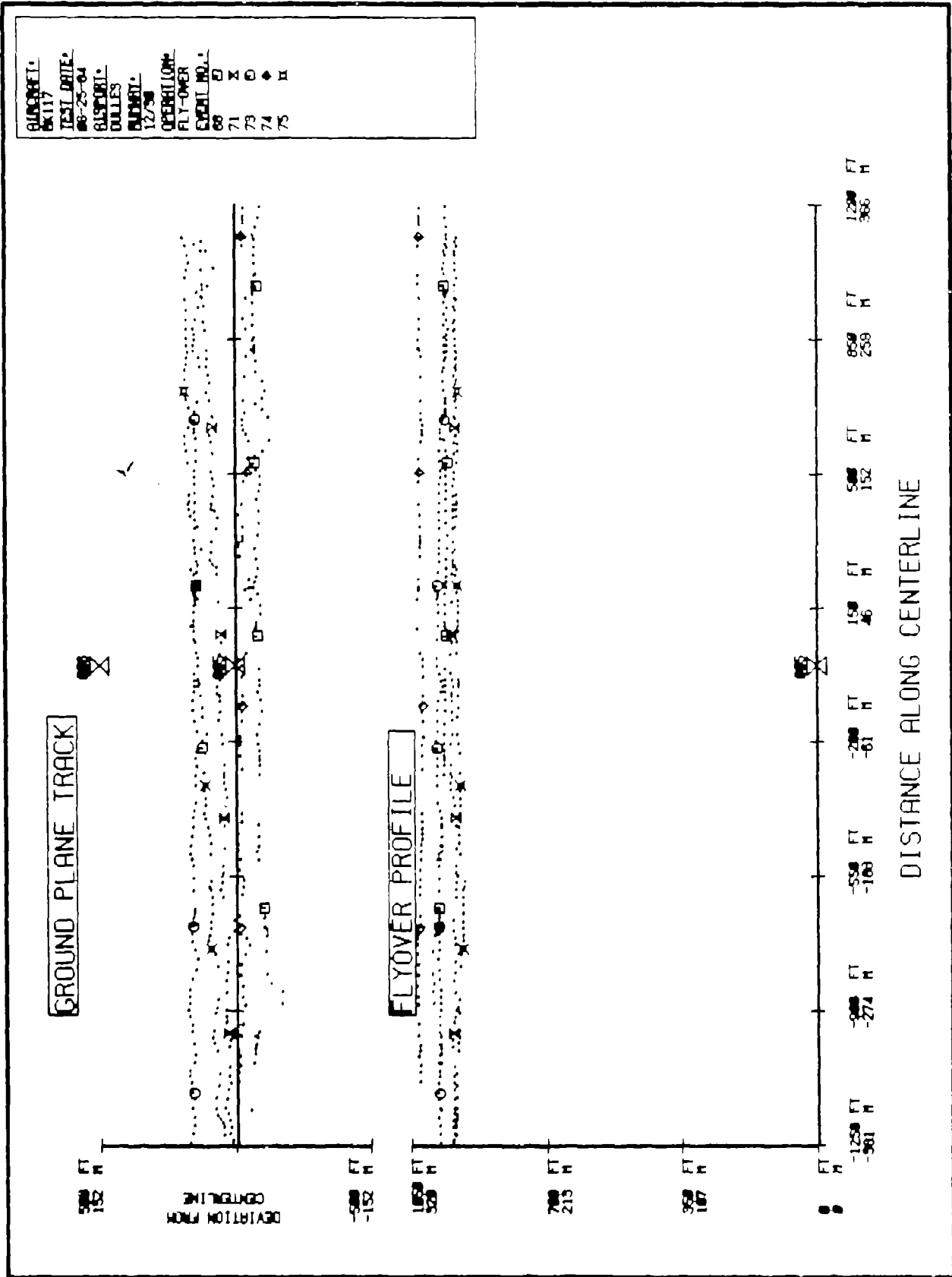
NOISE ABATEMENT APPROACH (Var. R/D & A/S)



1000 FT. LEVEL FLYOVER

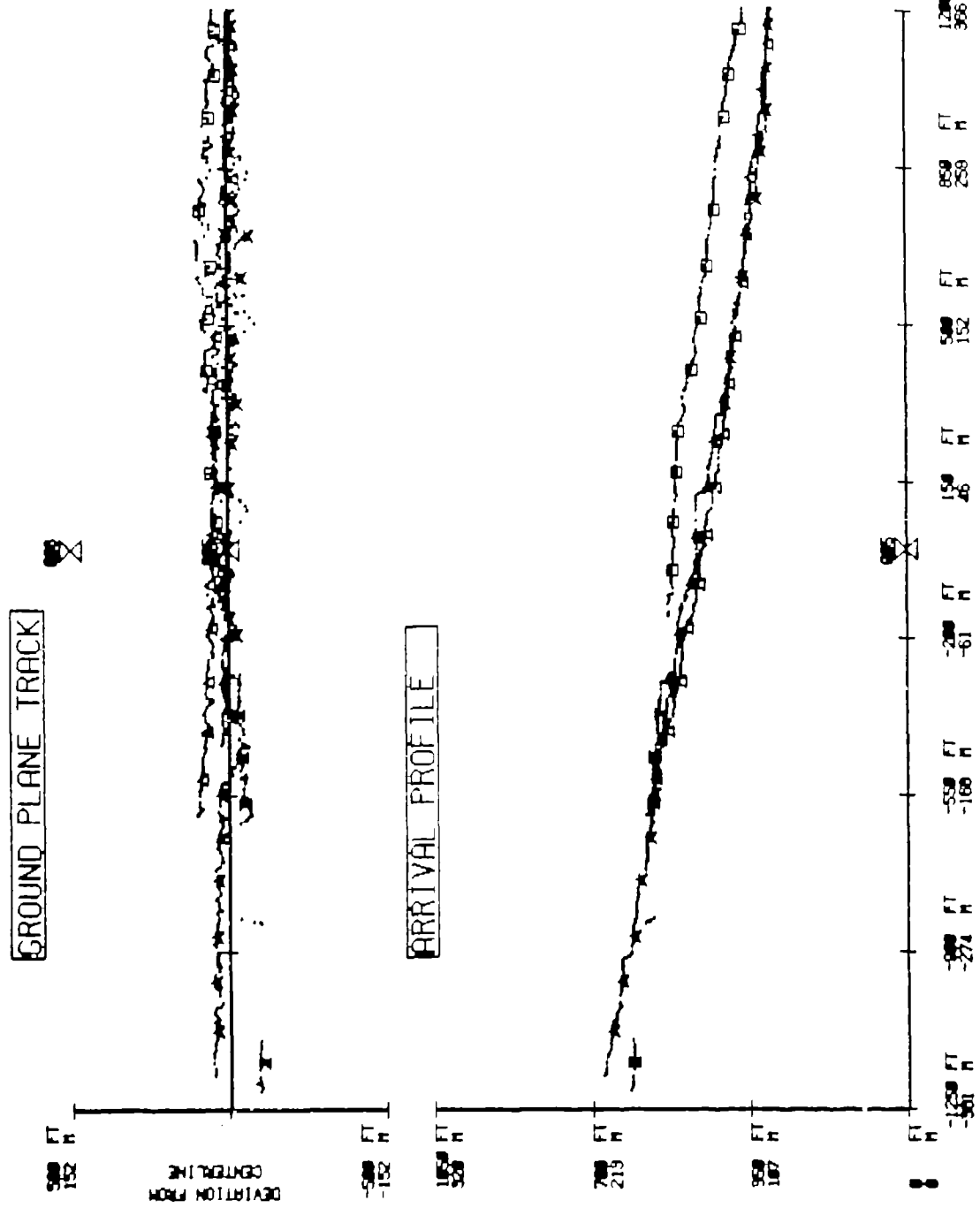


1000 FT. LEVEL FLYOVER

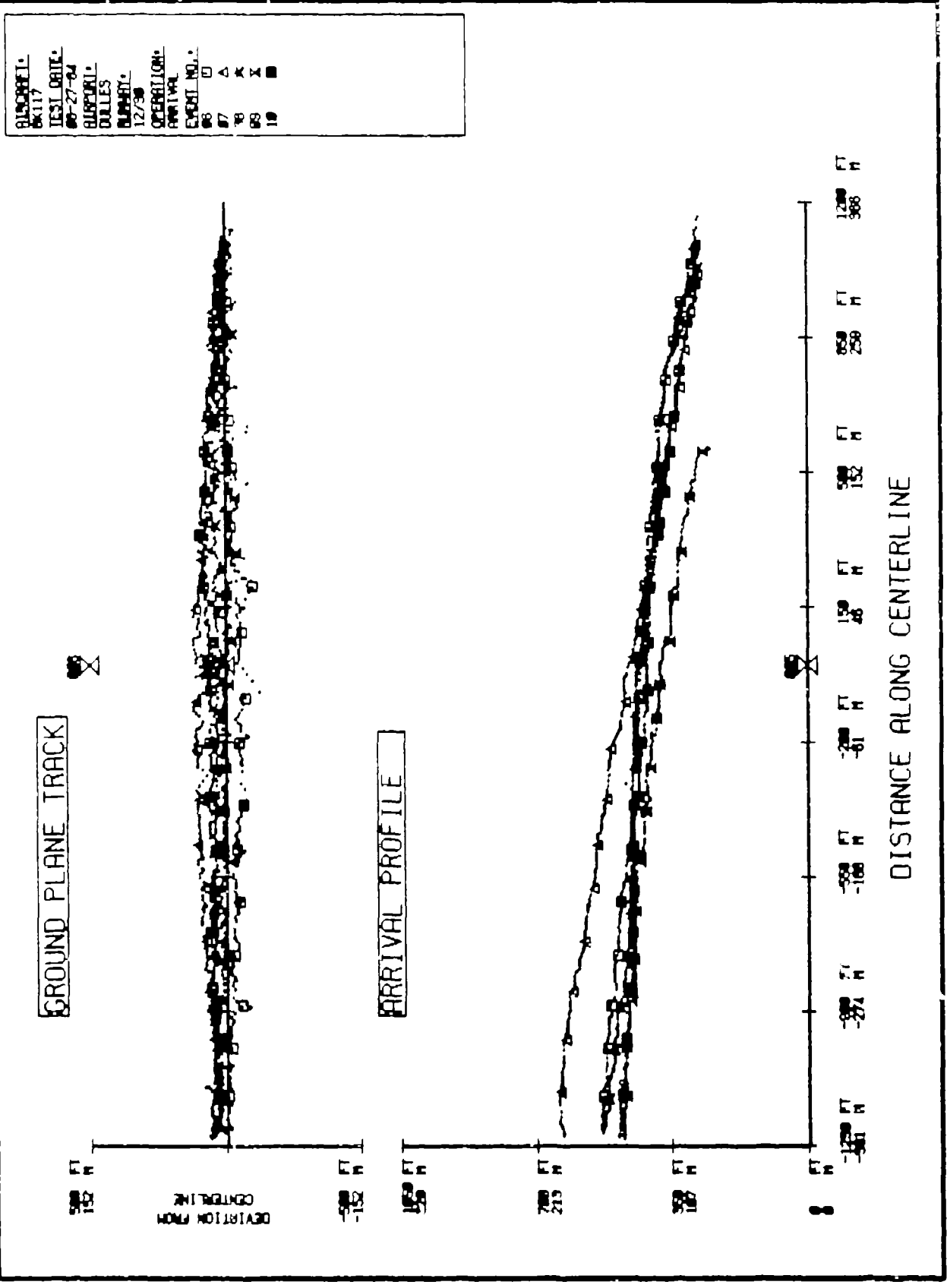


NOISE ABATEMENT APPROACH (8° target, 40 Kts.)

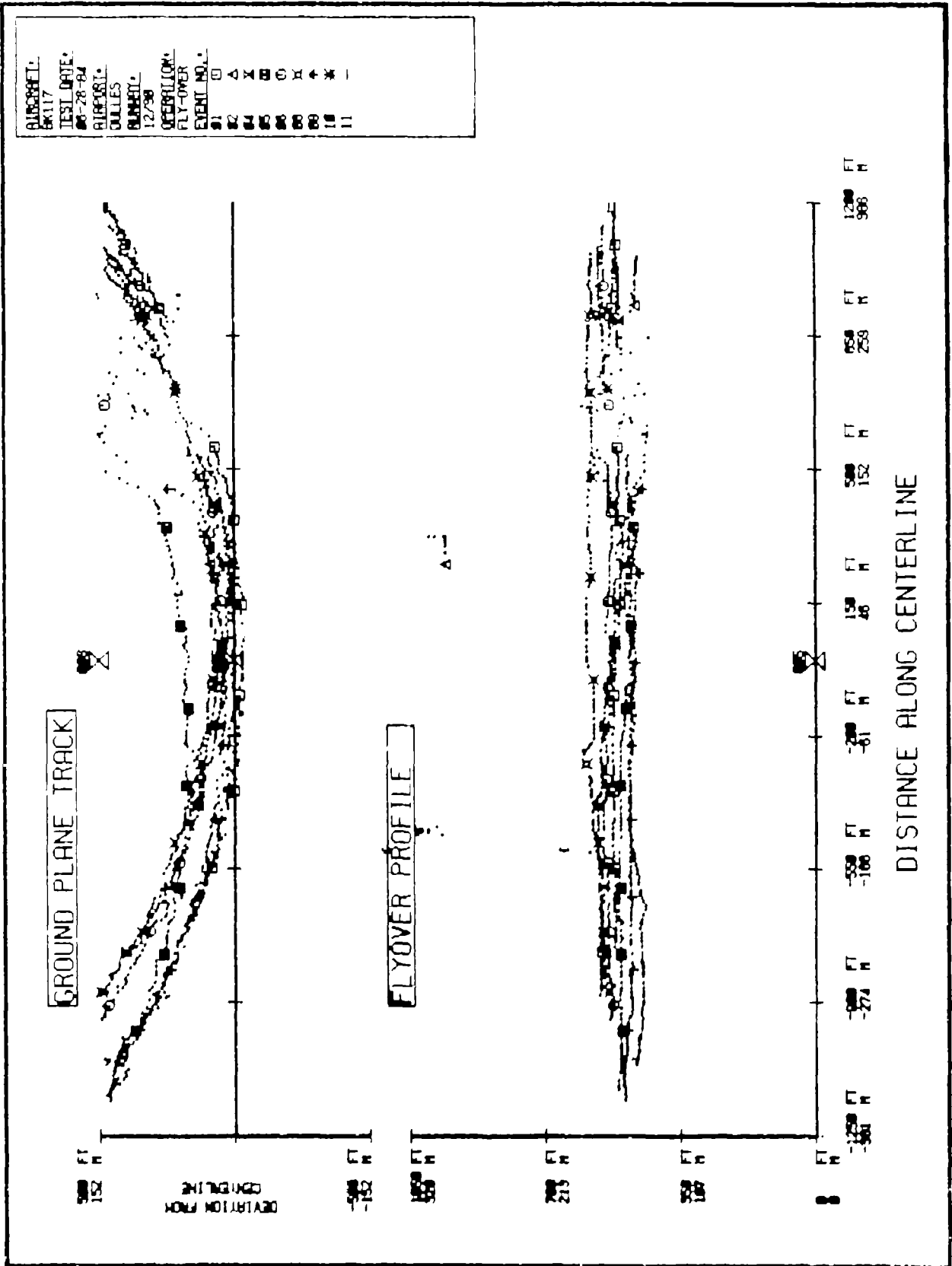
SUBJECT: BK117
 TEST DATE: 06-27-84
 AIRPORT: DALLAS
 SUBJECT: 12789
 OPERATION: ARRIVAL
 EVENT NO.: 01
 RC: A
 BS: A
 BA: X



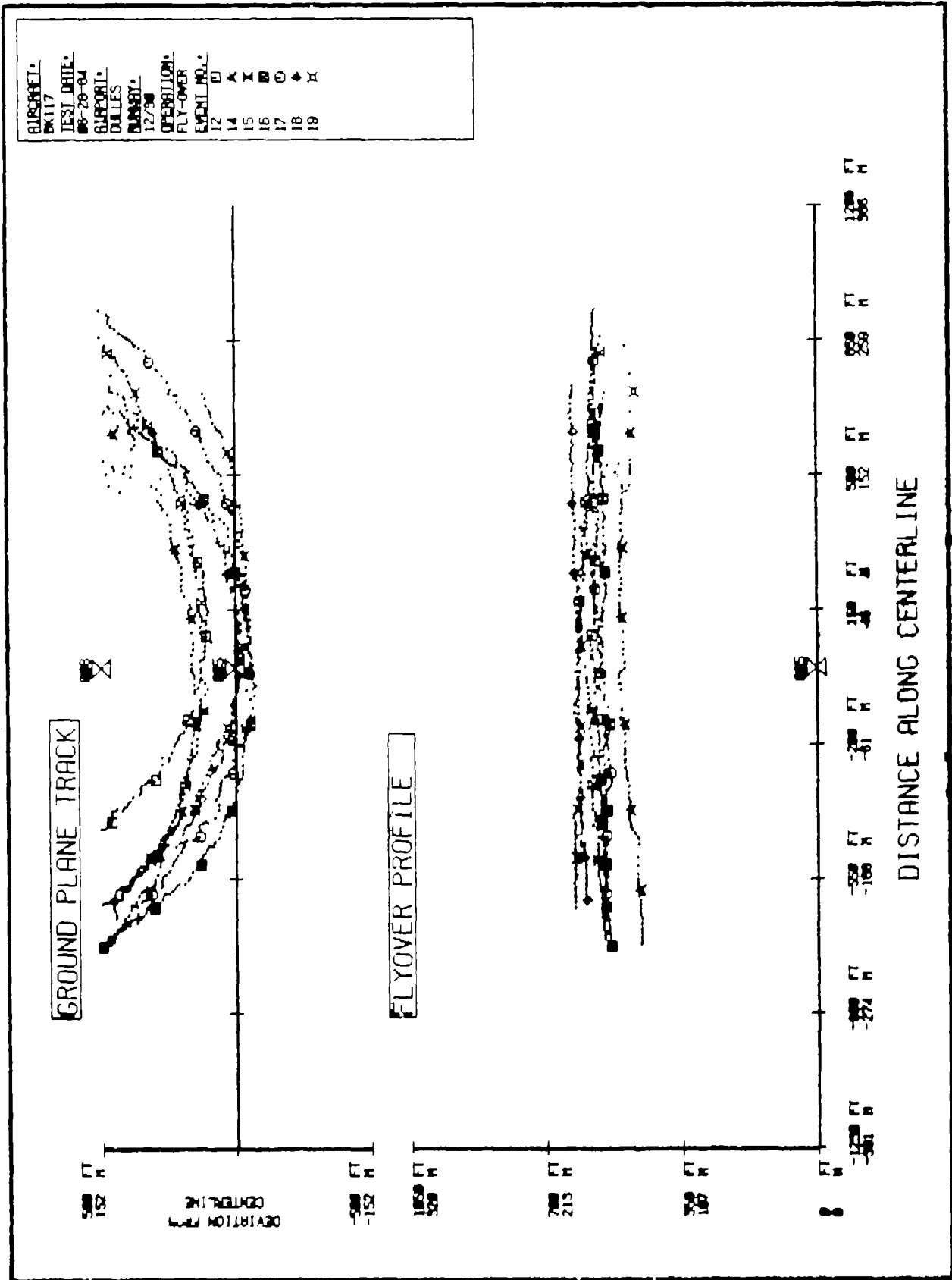
NOISE ABATEMENT APPROACH (6° Target, 40 Kts.)



15 DEG. BANK ANGLE TURN



30 DEG. BANK ANGLE TURN



METEOROLOGICAL DATA

- THIS SECTION OF THE APPENDIX CONTAINS WEATHER DATA FROM -
- SEVERAL TYPES OF METEOROLOGICAL EQUIPMENT; THERMETER -
- TOWER (MET), GROUND LEVEL PSYCHROMETER, AIRCRAFT DAT, AND -
- PILOT BALLOONS. DATA FROM THE MET TOWER INCLUDE THE -
- TEMPERATURE, RELATIVE HUMIDITY, WIND DIRECTION AND WIND -
- SPEED MEASURED TYPICALLY EVERY 15 MINUTES DURING EACH -
- FLIGHT EVENT. BECAUSE OF A FAILURE OF THE MET TOWER DEW -
- POINT SENSOR, THE RELATIVE HUMIDITY WAS CALCULATED USING -
- TEMPERATURE FROM THE MET TOWER AND DEW POINT FROM THE -
- DULLES MID FIELD WEATHER STATION. GROUND LEVEL (4 FEET) -
- TEMPERATURE AND RELATIVE HUMIDITY ARE GIVEN FOR DIFFERENT -
- TIMES OF EACH TEST DAY, AND THE HELICOPTER'S DAT READINGS -
- ARE SHOWN FOR DIFFERENT FLIGHT ALTITUDES AT VARIOUS TIMES -
- OF THE DAY. THE PILOT BALLOON WIND DATA, TAKEN -
- PERIODICALLY DURING EACH TEST DAY, INCLUDES THE WIND -
- DIRECTION AND WIND SPEED AT VARIOUS ALTITUDES. -

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: MBB BK117

DATE: 6/25/84

| TIME | TEMP. (DEG. F) | R.H. % | WIND DIR. (DEG.) | WIND SPEED | |
|------|-------------------|-----------|---------------------|------------|-----|
| | | | | AVG. | MAX |
| | | | | (MPH) | |

6 DEG. APP @ 65 KTS. & NORMAL TAKEOFF WITH MAX TORQUE

| | | | | | |
|-------|----|----|-----|---|----|
| 9:00 | 70 | 66 | 360 | 6 | 9 |
| 9:15 | 72 | -- | 360 | 3 | 6 |
| 9:30 | 72 | -- | 360 | 5 | 8 |
| 9:45 | 72 | -- | 360 | 6 | 10 |
| 10:00 | 73 | 55 | 350 | 7 | 10 |

NORMAL APPROACH AND NORMAL TAKEOFF @ 65% TORQUE

| | | | | | |
|-------|----|----|-----|---|----|
| 10:00 | 73 | 55 | 350 | 7 | 10 |
| 10:15 | 73 | -- | 360 | 6 | 9 |
| 10:30 | 74 | -- | 020 | 4 | 7 |
| 10:45 | 74 | -- | 360 | 6 | 9 |
| 11:00 | 74 | 52 | 360 | 8 | 12 |

NOISE ABATEMENT APPROACH (10 DEG. TARGET, VAR. A/S)

| | | | | | |
|-------|----|----|-----|---|----|
| 12:00 | 76 | 48 | 020 | 8 | 11 |
| 12:15 | 76 | -- | 350 | 7 | 11 |
| 12:30 | 77 | -- | 350 | 7 | 9 |

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: MBB BK117

DATE: 6/25/84

| TIME | TEMP. (DEG. F) | R.H. % | WIND DIR. (DEG.) | WIND SPEED | |
|------|-------------------|-----------|---------------------|------------|-----|
| | | | | AVG. | MAX |
| | | | | (MPH) | |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | |
|-------|----|----|-----|---|----|
| 12:30 | 77 | -- | 350 | 7 | 9 |
| 12:45 | 77 | -- | 350 | 8 | 11 |
| 1:00 | 77 | 42 | 020 | 5 | 8 |

500 FT. LEVEL FLYOVER AT 126 KTS.

| | | | | | |
|------|----|----|-----|---|----|
| 1:00 | 77 | 42 | 020 | 5 | 8 |
| 1:15 | 77 | -- | 350 | 8 | 9 |
| 1:30 | 78 | -- | 360 | 7 | 11 |
| 1:45 | 78 | -- | 360 | 5 | 7 |
| 2:00 | 76 | 48 | 310 | 8 | 11 |

1000 FT. LEVEL FLYOVER AT 126 KTS.

| | | | | | |
|------|----|----|-----|---|----|
| 2:00 | 76 | 48 | 310 | 8 | 11 |
| 2:15 | 78 | -- | 360 | 6 | 9 |
| 2:30 | 76 | -- | 350 | 5 | 8 |
| 2:45 | 76 | -- | 320 | 4 | 6 |
| 3:00 | 76 | 46 | 350 | 4 | - |

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: MBB BK117

DATE: 6/27/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

(MPH)

NOISE ABATEMENT APPROACH (8 DEG. TARGET, 40 KTS.)

| | | | | | |
|-------|----|----|-----|----|----|
| 12:00 | 80 | 42 | 200 | 10 | 13 |
| 12:15 | 81 | -- | 200 | 8 | 11 |
| 12:30 | 82 | -- | 200 | 11 | 15 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, 40 KTS.)

| | | | | | |
|-------|----|----|-----|----|----|
| 12:45 | 82 | -- | 200 | 10 | 13 |
| 1:00 | 83 | 37 | 200 | 10 | 13 |
| 1:15 | 84 | -- | 200 | 10 | 13 |

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: MBB BK117

DATE: 6/28/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

(MPH)

5 FT. AND 80 FT. HOVER (HARD PATH)

| | | | | | |
|-------|----|----|-----|---|---|
| 9:00 | 72 | 81 | 180 | 7 | - |
| 9:15 | 73 | -- | 180 | 7 | - |
| 9:30 | 74 | -- | 180 | 5 | - |
| 9:45 | 74 | -- | 180 | 5 | - |
| 10:00 | 74 | 79 | 180 | 4 | - |

5 FT. AND 80 FT. HOVER (SOFT PATH)

| | | | | | |
|-------|----|----|-----|---|---|
| 10:00 | 74 | 79 | 180 | 4 | - |
| 10:15 | 74 | -- | 180 | 3 | - |
| 10:30 | 76 | -- | 180 | 3 | - |
| 10:45 | 76 | -- | 180 | 3 | - |
| 11:00 | 80 | 65 | 180 | 2 | - |

15 AND 30 DEGREE BANK TURNS AT 65 KTS.

| | | | | | |
|-------|----|----|-----|---|---|
| 12:00 | 80 | 62 | 200 | 3 | - |
| 12:15 | 82 | -- | 200 | 3 | - |
| 12:30 | 84 | -- | 200 | 3 | - |
| 12:45 | 84 | -- | 200 | 3 | - |
| 1:00 | 82 | 57 | 200 | 3 | - |

METEOROLOGICAL DATA

HELICOPTER: MBB BK-117

DATE: 06/25/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS OAT GAUGE DATA

| TIME | TEMP. | R.H. |
|-------|-------|------|
| 09:30 | 76 F | 41% |
| 09:48 | 78 F | 36% |
| 10:04 | 78 F | 36% |
| 10:17 | 78 F | 36% |
| 10:39 | 78 F | 34% |
| 10:48 | 79 F | 31% |
| 11:06 | 79 F | 31% |
| 11:17 | 80 F | 35% |
| 11:32 | 80 F | 29% |
| 11:48 | 80 F | 31% |
| 12:05 | 81 F | 33% |
| 12:19 | 82 F | 31% |
| 12:34 | 80 F | 35% |
| 12:48 | 81 F | 29% |
| 13:02 | 79 F | 31% |
| 13:22 | 79 F | 31% |
| 13:33 | 79 F | 33% |
| 13:45 | 79 F | 37% |
| 13:58 | 78 F | 33% |

| TIME | ALTITUDE | TEMP. |
|-------|----------|-------|
| 9:00 | 500' | 68 F |
| | 1000' | 64 F |
| 11:50 | 200' | 75 F |
| | 400' | 73 F |
| | 600' | 73 F |
| | 800' | 70 F |
| 1:00 | 200' | 79 F |
| | 400' | 75 F |
| | 600' | 75 F |
| | 800' | 75 F |
| 2:30 | 200' | 79 F |
| | 400' | 79 F |
| | 600' | 77 F |
| | 800' | 75 F |
| | 1000' | 75 F |

METEOROLOGICAL DATA

HELICOPTER: MBB BK117

DATE: 06/27/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS DAT GUAGE DATA

| TIME | TEMP. | R.H. |
|-------|-------|------|
| 11:19 | 86 F | 28% |
| 11:41 | 81 F | 35% |
| 12:14 | 87 F | 24% |
| 12:41 | 87 F | 22% |
| 13:11 | 87 F | 24% |
| 13:48 | 90 F | 22% |

| TIME | ALTITUDE | TEMP. |
|------|----------|-------|
| | N | |
| | O | |
| | | |
| | D | |
| | A | |
| | T | |
| | A | |

METEOROLOGICAL DATA

HELICOPTER: MBB BK117

DATE: 06/28/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS OAT GAUGE DATA

| TIME | TEMP. | R.H. |
|-------|-------|------|
| 10:07 | 83 F | 52% |
| 10:30 | 83 F | 58% |
| 10:45 | 81 F | 56% |
| 12:05 | 81 F | 58% |

| TIME | ALTITUDE | TEMP. |
|------|----------|-------|
| 9:00 | 200' | 72 F |
| | 400' | 70 F |
| | 600' | 70 F |
| | 800' | 70 F |
| | 1000' | 70 F |
| | | |
| 1:30 | 200' | 82 F |
| | 400' | 82 F |
| | 600' | 81 F |
| | 800' | 81 F |
| | 1000' | 79 F |

PILOT BALLOON WIND DATA

MBB BK117

06/25/84

| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
| ----- | | | | |
| LAUNCH TIME: | 9:09 | | 9:39 | |
| SFC | 340 | 7 | 40 | 5 |
| 354 | 354 | 11 | 351 | 9 |
| 708 | 356 | 11 | 350 | 10 |
| 1033 | 359 | 12 | 343 | 12 |
| 1358 | 360 | 11 | 344 | 13 |
| | 10:57 | | 11:56 | |
| SFC | 10 | 4 | 340 | 5 |
| 354 | 3 | 8 | 322 | 4 |
| 708 | 36 | 8 | 329 | 4 |
| 1033 | 359 | 9 | 323 | 5 |
| 1358 | 357 | 9 | 345 | 5 |
| | 12:55 | | 1:36 | |
| SFC | 280 | 7 | 350 | 3 |
| 354 | 302 | 9 | 330 | 5 |
| 708 | 306 | 8 | 330 | 5 |
| 1033 | 303 | 7 | 334 | 5 |
| 1358 | 212 | 4 | 335 | 6 |

PILOT BALLOON WIND DATA

MBB BK117

06/27/84

| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
| ----- | | | | |
| LAUNCH TIME: | 11:01 | | 11:30 | |
| SFC | 210 | 8 | 230 | 10 |
| 354 | 224 | 10 | 232 | 10 |
| 708 | 223 | 10 | 229 | 11 |
| 1033 | 226 | 8 | 225 | 12 |
| 1358 | 227 | 8 | 222 | 12 |
| | 12:04 | | 12:33 | |
| SFC | 240 | 9 | 240 | 8 |
| 354 | 224 | 9 | 211 | 11 |
| 708 | 225 | 7 | 210 | 10 |
| 1033 | 231 | 7 | 213 | 9 |
| 1358 | 243 | 8 | 218 | 8 |
| | 1:00 | | | |
| SFC | 230 | 9 | | |
| 354 | 230 | 16 | | |
| 708 | 230 | 17 | | |
| 1033 | 230 | 19 | | |
| 1358 | 232 | 21 | | |

PILOT BALLOON WIND DATA

MBB BK117

06 28/84

| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
|---------------|---------------------|--------------------|---------------------|--------------------|

LAUNCH TIME:

9:30

10:11

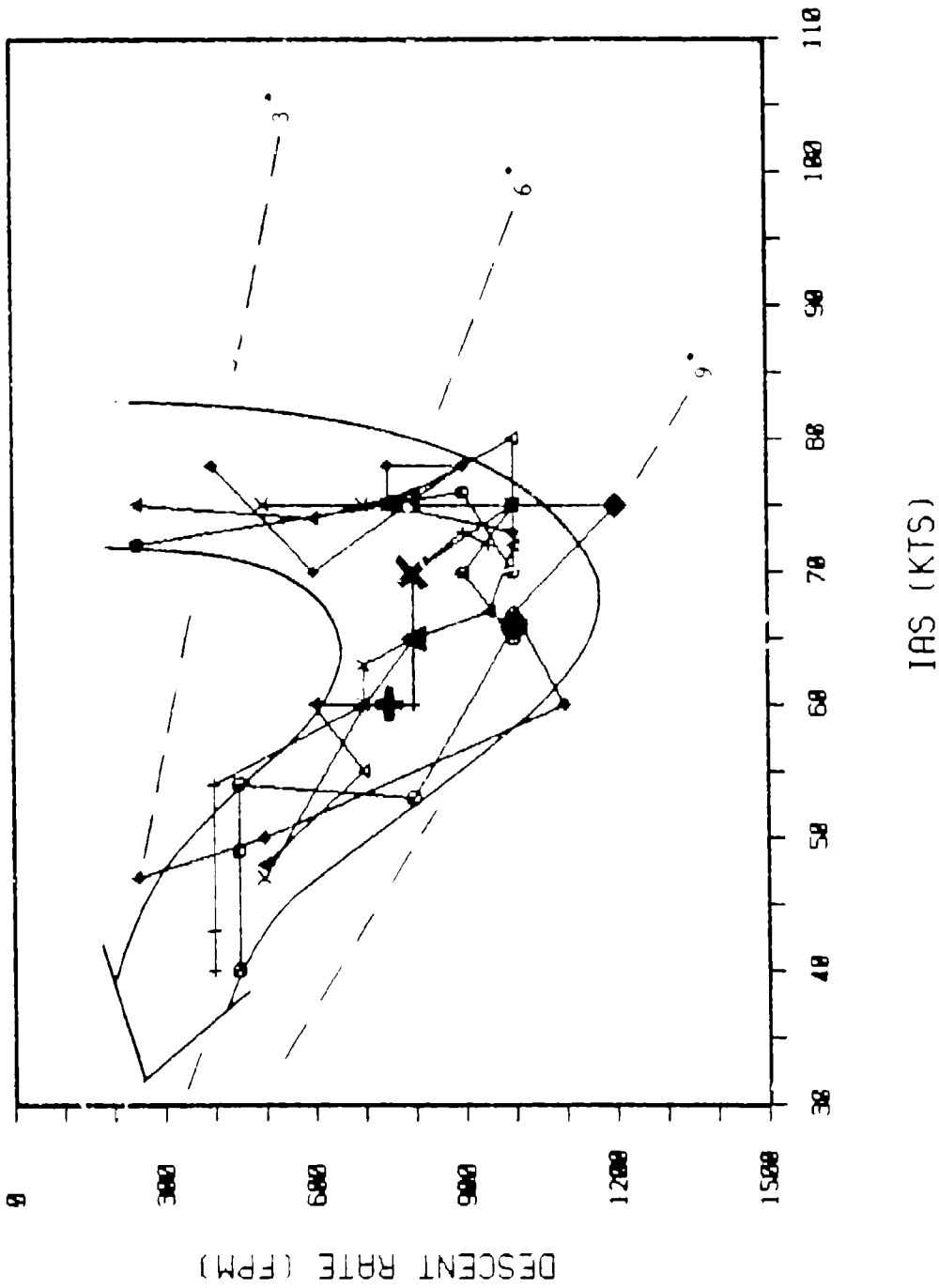
| | | | | |
|------|-------|---|-------|---|
| SFC | 250 | 2 | 240 | 2 |
| 354 | 233 | 3 | 206 | 3 |
| 708 | 242 | 3 | 203 | 3 |
| 1033 | 265 | 2 | 201 | 3 |
| 1358 | 298 | 3 | 202 | 3 |
| | 10:33 | | 11:00 | |
| SFC | 360 | 0 | 230 | 2 |
| 354 | 283 | 2 | 281 | 4 |
| 708 | 280 | 3 | 278 | 4 |
| 1033 | 267 | 4 | 268 | 5 |
| 1358 | 272 | 4 | 280 | 5 |

COCKPIT VIDEO

DATA

- THIS SECTION OF THE APPENDIX CONTAINS FLIGHT PROFILE -
- PLOTS AND INDIVIDUAL EVENT DATA READ EVERY 5 SECONDS -
- FROM PLAYBACK OF THE COCKPIT VIDEO RECORDINGS. IN THE -
- PROFILE PLOTS, INDICATED AIRSPEED VS. DESCENT RATE -
- ARE PLOTTED FOR THE NORMAL APPROACHES. AN ARROW IS -
- DRAWN WHICH BOUNDS THE DATA POINTS AND PORTRAYS THE -
- SPEED/DESCENT RATE TREND WITH TIME. THE DARKER DATA -
- POINTS INDICATE WHEN THE HELICOPTER PASSED OVER THE LLC -
- POSITION. THE INDIVIDUAL EVENT DATA CONTAINS LISTINGS -
- OF ALL THE COCKPIT INSTRUMENT READINGS OBTAINED FROM THE -
- VIDEO PLAYBACK. THIS DATA ENCOMPASSES THE HELICOPTER'S -
- FLIGHT PARAMETERS THROUGHOUT THE ENTIRE DATA RUN PLUS OR -
- MINUS 15 SECONDS (MINIMUM) FROM LLC. -
-

NORMAL APPROACH
BK117



⊙ B16
+ B20
× B22
△ B24
◇ B26

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: MBB BK117

DATE: 06/25/84

EVENT: B20

EVENT: B16

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -35 | 940 | 10 | 250 | 72 | 1.96 |
| -30 | 850 | 7 | 900 | 76 | 6.72 |
| -25 | 750 | 9 | 1000 | 70 | 8.11 |
| -20 | 650 | 8 | 1000 | 75 | 7.57 |
| -15 | 610 | 8 | 1000 | 75 | 7.57 |
| -10 | 520 | 8 | 900 | 70 | 7.29 |
| -5 | 450 | 5 | 1000 | 65 | 8.74 |
| CLC 0 | 380 | 5 | 1000 | 66 | 8.60 |
| 5 | 290 | 14 | 800 | 53 | 8.57 |
| 10 | 260 | 8 | 450 | 54 | 4.72 |
| 15 | 230 | 7 | 450 | 49 | 5.20 |
| 20 | 170 | 9 | 450 | 40 | 6.38 |

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 720 | 8 | 950 | 72 | 7.49 |
| -22 | 650 | 10 | 900 | 73 | 6.99 |
| -17 | 580 | 8 | 800 | 70 | 6.48 |
| -12 | 520 | 9 | 800 | 65 | 6.98 |
| -7 | 420 | 7 | 800 | 60 | 7.57 |
| -2 | 370 | 11 | 800 | 60 | 7.57 |
| CLC 0 | 360 | 11 | 750 | 60 | 7.09 |
| 3 | 325 | 10 | 700 | 60 | 6.62 |
| 8 | 250 | 11 | 700 | 60 | 6.62 |
| 13 | 225 | 11 | 400 | 54 | 4.19 |
| 18 | 200 | 7 | 400 | 43 | 5.27 |
| 23 | 1150 | 5 | 400 | 40 | 5.67 |

EVENT: B24

EVENT: B22

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -40 | 940 | 11 | 500 | 75 | 3.77 |
| -35 | 900 | 12 | 700 | 75 | 5.29 |
| -30 | 810 | 13 | 750 | 75 | 5.67 |
| -25 | 770 | 13 | 700 | 75 | 5.29 |
| -20 | 700 | 12 | 750 | 75 | 5.67 |
| -15 | 610 | 12 | 800 | 75 | 6.05 |
| -10 | 560 | 9 | 1000 | 75 | 7.57 |
| -5 | 460 | 8 | 1000 | 75 | 7.57 |
| CLC 0 | 400 | 8 | 800 | 70 | 6.48 |
| 5 | 330 | 8 | 800 | 65 | 6.98 |
| 10 | 280 | 8 | 700 | 63 | 6.30 |
| 15 | 220 | 7 | 700 | 60 | 6.62 |
| 20 | 180 | 7 | 500 | 47 | 6.03 |

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -39 | 920 | 10 | 250 | 75 | 1.89 |
| -34 | 880 | 8 | 600 | 74 | 4.59 |
| -29 | 810 | 7 | 800 | 76 | 5.97 |
| -24 | 740 | 6 | 800 | 75 | 6.05 |
| -19 | 680 | 5 | 750 | 75 | 5.67 |
| -14 | 580 | 5 | 1000 | 80 | 7.09 |
| -9 | 490 | 8 | 1000 | 72 | 7.88 |
| -4 | 400 | 8 | 950 | 67 | 8.05 |
| CLC 0 | 360 | 7 | 800 | 65 | 6.98 |
| 5 | 300 | 8 | 700 | 60 | 6.62 |
| 10 | --- | 7 | 600 | 60 | 7.22 |
| 15 | 240 | 8 | 700 | 55 | 5.90 |
| 20 | 140 | 8 | 500 | 48 | 5.90 |

B-207

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: MBB BK117

DATE: 06/25/84

EVENT: B26

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -34 | 950 | 11 | 400 | 78 | 2.90 |
| -29 | 910 | 8 | 600 | 70 | 4.86 |
| -24 | 830 | 9 | 900 | 78 | 6.54 |
| -19 | 790 | 8 | 750 | 78 | 5.45 |
| -14 | 730 | 7 | 750 | 75 | 5.67 |
| -9 | 610 | 5 | 1000 | 73 | 7.77 |
| -4 | 510 | 8 | 1000 | 75 | 7.57 |
| CLC 0 | 420 | 5 | 1200 | 75 | 9.09 |
| 6 | 320 | 7 | 1000 | 67 | 8.48 |
| 11 | 240 | 7 | 1100 | 60 | 10.43 |
| 16 | 200 | 18 | 500 | 50 | 5.67 |
| 21 | 180 | 10 | 250 | 47 | 3.01 |

EVENT: B28

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -38 | 930 | 7 | 700 | 75 | 5.29 |
| -33 | 880 | 11 | 800 | 75 | 6.05 |
| -28 | 790 | 11 | 1000 | 77 | 7.37 |
| -23 | 710 | 11 | 800 | 74 | 6.13 |
| -18 | 660 | 10 | 700 | 70 | 5.67 |
| -13 | 590 | 11 | 800 | 75 | 6.05 |
| -8 | 500 | 8 | 1000 | 72 | 7.88 |
| -3 | 420 | 9 | 800 | 77 | 5.89 |
| CLC 0 | --- | - | --- | -- | -- |
| 2 | 350 | 9 | 750 | 74 | 5.74 |
| 7 | 300 | 5 | 750 | 72 | 5.90 |
| 12 | 250 | 5 | 700 | 70 | 5.67 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (10 DEG. TARGET, VAR. A/S)

HELICOPTER: MBB BK117

DATE: 06/25/84

EVENT: D30

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -25 | 780 | 30 | 0 | 63 | 0.00 |
| -20 | 780 | 28 | 0 | 65 | 0.00 |
| -15 | 800 | 27 | 0 | 63 | 0.00 |
| -10 | 780 | 18 | 0 | 70 | 0.00 |
| -5 | 720 | 2 | 600 | 66 | 5.15 |
| CLC 0 | 610 | 0 | 1100 | 65 | 9.62 |
| 5 | 500 | 0 | 1400 | 65 | 12.28 |
| 10 | 450 | 5 | 1200 | 60 | 11.39 |
| 15 | 280 | 6 | 1000 | 50 | 11.39 |
| 20 | 250 | 12 | 900 | 40 | 12.84 |
| 25 | 210 | 11 | 700 | 35 | 11.39 |

EVENT: D31

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -15 | 920 | 0 | 1200 | 65 | 10.50 |
| -10 | 820 | 2 | 1500 | 65 | 13.17 |
| -5 | 740 | 0 | 1400 | 65 | 12.28 |
| CLC 0 | 650 | 0 | 1200 | 69 | 9.89 |
| 5 | 520 | 2 | 1200 | 65 | 10.50 |
| 10 | 410 | 0 | 1200 | 65 | 10.50 |
| 15 | 300 | 0 | 1100 | 55 | 11.39 |
| 20 | 210 | 0 | 700 | 47 | 8.46 |

EVENT: D32

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 980 | 2 | 500 | 65 | 4.36 |
| -15 | 900 | 0 | 1200 | 60 | 11.39 |
| -10 | 790 | 3 | 1300 | 65 | 11.39 |
| -5 | 690 | 3 | 1400 | 68 | 12.28 |
| CLC 0 | 580 | 4 | 1200 | 65 | 10.50 |
| 5 | 500 | 3 | 1200 | 69 | 9.89 |
| 10 | 360 | 1 | 1100 | 68 | 9.19 |
| 15 | 280 | 0 | 1100 | 58 | 10.79 |
| 20 | 230 | 1 | 1100 | 48 | 13.08 |

EVENT: D33

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -13 | 920 | 0 | 500 | 65 | 4.36 |
| -8 | 850 | 0 | 1200 | 70 | 9.75 |
| -3 | 690 | 0 | 1500 | 60 | 14.29 |
| CLC 0 | 610 | 0 | 1500 | 65 | 13.17 |
| 2 | 580 | 0 | 1500 | 62 | 13.82 |
| 7 | 480 | 1 | 1500 | 63 | 13.60 |
| 12 | 400 | 1 | 1000 | 68 | 8.74 |
| 17 | 320 | 0 | 1100 | 58 | 10.79 |
| 22 | 240 | 12 | 900 | 45 | 11.39 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (10 DEG. TARGET, VAR. A/S)

HELICOPTER: MBB BK117

DATE: 06/25/84

EVENT: D34

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -14 | 920 | 0 | 1000 | 65 | 8.74 |
| -9 | 810 | 2 | 1200 | 64 | 10.67 |
| -4 | 700 | 4 | 1500 | 65 | 13.17 |
| CLC 0 | 590 | 2 | 1300 | 65 | 11.39 |
| 1 | 510 | 2 | 1000 | 65 | 8.74 |
| 6 | 420 | 1 | 1000 | 70 | 8.11 |
| 11 | 350 | 0 | 1000 | 65 | 8.74 |
| 16 | 250 | 0 | 1300 | 60 | 12.35 |

EVENT: D35

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -13 | 920 | 2 | 1200 | 64 | 10.67 |
| -8 | 790 | 1 | 1200 | 70 | 9.75 |
| -3 | 650 | 0 | 1000 | 65 | 8.74 |
| CLC 0 | 600 | 0 | 1000 | 60 | 9.47 |
| 2 | 570 | 3 | 1000 | 60 | 9.47 |
| 7 | 480 | 1 | 1100 | 65 | 9.62 |
| 12 | 370 | 0 | 1100 | 60 | 10.43 |
| 17 | 320 | 0 | 1200 | 49 | 13.99 |
| 22 | 240 | 27 | 800 | 40 | 11.39 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: MBB BK117

DATE: 06/25/84

EVENT: D39

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -32 | 950 | 20 | 0 | 65 | 0.00 |
| -27 | 940 | 10 | 100 | 65 | 0.87 |
| -23 | 890 | 7 | 500 | 68 | 4.16 |
| -17 | 820 | 5 | 700 | 65 | 6.10 |
| -12 | 750 | 4 | 1000 | 67 | 8.48 |
| -7 | 680 | 3 | 1000 | 67 | 8.48 |
| -2 | 600 | 2 | 700 | 65 | 6.10 |
| CLC 0 | -- | -- | -- | -- | -- |
| 3 | 500 | 0 | 1000 | 58 | 9.80 |
| 8 | 480 | 0 | 700 | 55 | 7.22 |
| 13 | 380 | 0 | 700 | 48 | 8.28 |
| 18 | 320 | 12 | 900 | 45 | 11.39 |
| 23 | 240 | 10 | 800 | 40 | 11.39 |

EVENT: D41

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -25 | 910 | 15 | 300 | 65 | 2.61 |
| -20 | 870 | 10 | 500 | 62 | 4.57 |
| -15 | 800 | 8 | 500 | 60 | 4.72 |
| -10 | 750 | 8 | 500 | 55 | 5.15 |
| -5 | 700 | 5 | 500 | 59 | 4.80 |
| CLC 0 | 690 | 4 | 500 | 60 | 4.72 |
| 5 | 600 | 2 | 600 | 53 | 6.42 |
| 10 | 530 | 6 | 1000 | 52 | 10.95 |
| 15 | 440 | 8 | 1000 | 48 | 11.87 |
| 20 | 370 | 12 | 1000 | 42 | 13.60 |

EVENT: D40

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -25 | 950 | 16 | 100 | 70 | 0.81 |
| -20 | 920 | 11 | 200 | 70 | 1.62 |
| -15 | 900 | 8 | 500 | 70 | 4.04 |
| -10 | 840 | 8 | 500 | 66 | 4.29 |
| -5 | 780 | 2 | 800 | 67 | 6.77 |
| CLC 0 | 700 | 2 | 900 | 60 | 8.52 |
| 5 | 630 | 2 | 900 | 60 | 8.52 |
| 10 | 510 | 2 | 1000 | 50 | 11.39 |
| 15 | 420 | 13 | 900 | 45 | 11.39 |
| 20 | 360 | 6 | 900 | 45 | 11.39 |
| 25 | 290 | 3 | 1000 | 41 | 13.94 |

EVENT: D42

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 910 | 10 | 0 | 65 | 0.00 |
| -15 | 870 | 8 | 400 | 63 | 3.59 |
| -10 | 800 | 5 | 500 | 60 | 4.72 |
| -5 | 750 | 4 | 600 | 58 | 5.86 |
| CLC 0 | 680 | 3 | 800 | 52 | 8.74 |
| 5 | 600 | 2 | 800 | 55 | 8.26 |
| 10 | 510 | 1 | 900 | 50 | 10.24 |
| 15 | 420 | 1 | 1000 | 49 | 11.63 |
| 20 | 300 | 5 | 1000 | 42 | 13.60 |
| 25 | 250 | 5 | 1000 | 42 | 13.60 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/B)

HELICOPTER: MBB BK117

DATE: 06/25/84

EVENT: D43

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (PPH) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -17 | 750 | 18 | 0 | 65 | 0.00 |
| -22 | 700 | 12 | 300 | 65 | 2.61 |
| -17 | 660 | 15 | 400 | 65 | 3.48 |
| -12 | 630 | 11 | 400 | 60 | 3.77 |
| -7 | 600 | 10 | 400 | 65 | 3.48 |
| -2 | 540 | 8 | 400 | 58 | 3.91 |
| CLC 0 | --- | - | --- | -- | -- |
| | | 9 | 500 | 55 | 5.15 |
| | | 11 | 600 | 52 | 6.54 |
| | | 12 | 700 | 48 | 8.28 |
| | | 10 | 700 | 45 | 8.84 |

EVENT: D44

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (PPH) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 780 | 16 | 0 | 65 | 0.00 |
| -15 | 760 | 14 | 400 | 65 | 3.48 |
| -10 | 710 | 9 | 400 | 60 | 3.77 |
| -5 | 670 | 10 | 500 | 60 | 4.72 |
| CLC 0 | 600 | 7 | 600 | 57 | 5.97 |
| 5 | 540 | 8 | 600 | 48 | 7.09 |
| 10 | 480 | 5 | 700 | 46 | 8.64 |
| 15 | 400 | 5 | 800 | 45 | 9.47 |
| 20 | 330 | 2 | 800 | 45 | 10.11 |
| 25 | 270 | 6 | 800 | 40 | 11.39 |

EVENT: D45

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (PPH) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -18 | 800 | 10 | 0 | 68 | 0.00 |
| -13 | 750 | 5 | 400 | 63 | 2.73 |
| -8 | 680 | 4 | 600 | 62 | 4.14 |
| -3 | 600 | 5 | 800 | 75 | 6.05 |
| CLC 0 | --- | - | --- | 71 | -- |
| 2 | 530 | 9 | 900 | 67 | 7.62 |
| 7 | 500 | 2 | 800 | 67 | 4.23 |
| 12 | 420 | 3 | 1000 | 65 | 8.74 |
| 17 | 330 | 6 | 1000 | 63 | 9.02 |
| 22 | 260 | 5 | 900 | 67 | 7.62 |

APPENDIX C

BELL 222A

| | <u>PAGE NUMBERS</u> |
|---|---------------------|
| <u>HELICOPTER CHARACTERISTICS</u> | C-215 |
| <u>NOISE LEVEL DATA</u> | |
| SOUND EXPOSURE LEVEL | |
| Bar Charts | |
| Approaches..... | C-218 |
| Takeoff..... | C-219 |
| Level Flyovers..... | C-220 |
| Summary Tables..... | C-221 - C-223 |
| Individual Event Data..... | C-224 - C-231 |
| A-WEIGHTED SOUND LEVEL | |
| Bar Charts | |
| Approaches..... | C-234 |
| Takeoff..... | C-235 |
| Level Flyovers..... | C-236 |
| Summary Tables..... | C-237 - C-240 |
| Individual Event Data..... | C-241 - C-252 |
| <u>RADAR TRACKING DATA</u> | |
| Position Data..... | C-254 - C-261 |
| Tracking Plots..... | C-284 - C-292 |
| <u>METEOROLOGICAL DATA</u> | |
| 10-meter Tower Data..... | C-294 - C-295 |
| 4 ft. Data and Aircraft OAT Data..... | C-296 - C-298 |
| Pilot Balloon Wind Data..... | C-299 - C-301 |
| <u>COCKPIT VIDEO DATA</u> | |
| Normal Approach Plot..... | C-304 |
| Individual Event Data..... | C-305 - C-311 |



HELICOPTER CHARACTERISTICS

HELICOPTER MANUFACTURER : BELL
HELICOPTER MODEL : 222A
TEST HELICOPTER N-NUMBER : N2057B
MAX INTERNAL GROSS WEIGHT : 7850 LBS.
NUMBER OF ENGINES : TWO
UNINSTALLED TAKEOFF POWER : 600 SHP (PER ENGINE)
UNINSTALLED MAX CONTINUOUS PWR. : 550 SHP (PER ENGINE)
NEVER EXCEED SPEED (VNE) : 150 KTS.
MAX SPEED IN LEVEL FLIGHT
WITH MAX CONTINUOUS POWER : 143 KTS.
SPEED FOR BEST RATE OF CLIMB (VY) : 65 KTS.
CRUISE SPEED FOR BEST RANGE (VCR) : 133 KTS.
BEST RATE OF CLIMB AT
TAKEOFF POWER (BRC) : 1550 FPM
"TOP OF GREEN ARC" ROTOR SPEED : 348 RPM 100%

MAIN AND TAIL ROTOR SPECIFICATIONS

| | MAIN | TAIL |
|------------------|--------|--------|
| DIAMETER (FT.) : | 39.8 | 6.5 |
| NO. OF BLADES : | 2 | 2 |
| TIPSPEED (FPS) : | 724 | 641 |
| TIP SHAPE : | SQUARE | SQUARE |

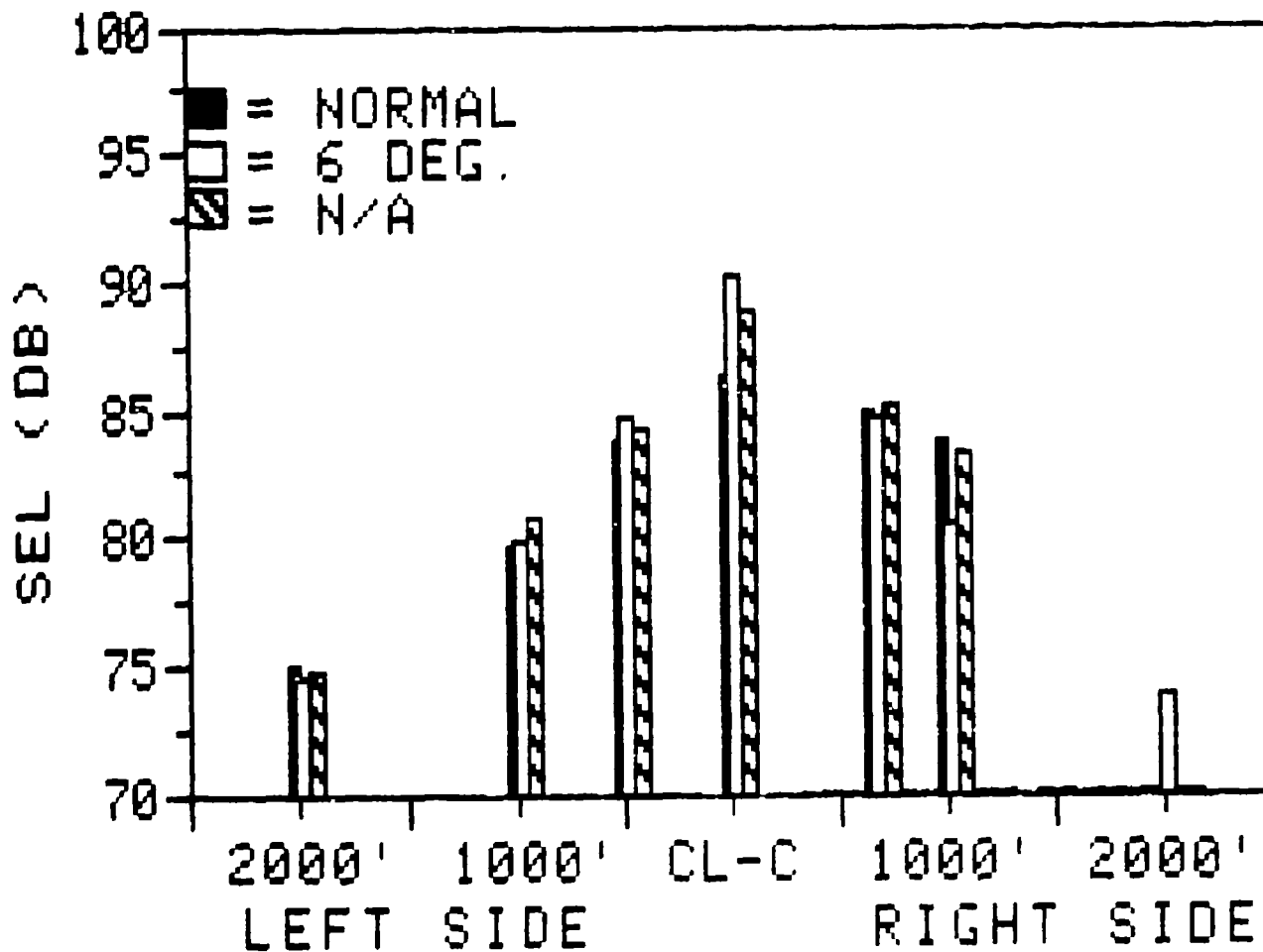
NOISE LEVEL DATA

'as-measured'

SOUND EXPOSURE LEVEL

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- SOUND EXPOSURE LEVELS (SEL) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN. -
- -

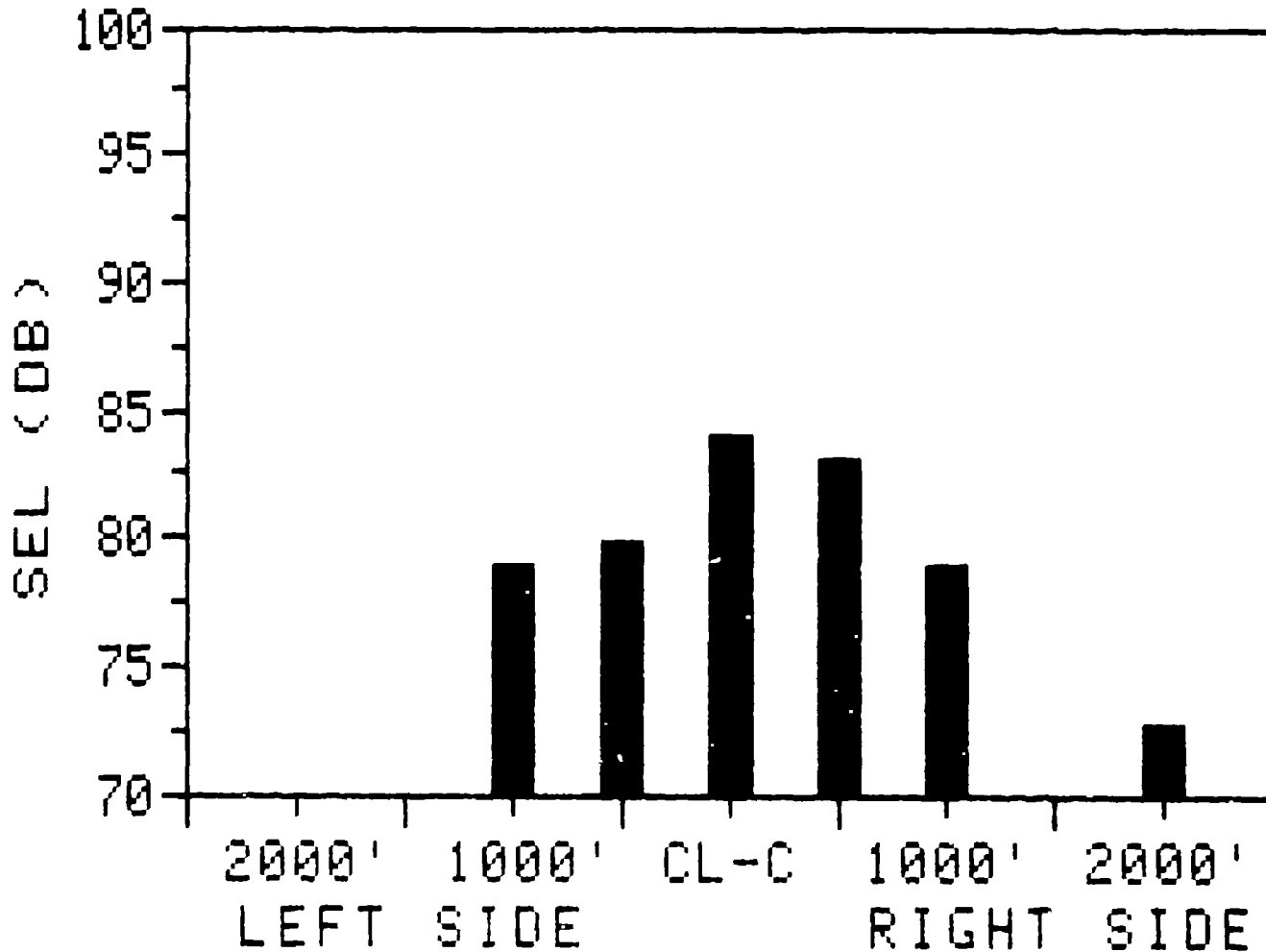
APPROACHES 222A



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|---|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 400 | 90-70 | 6.0 |
| SIX DEG. APPROACH | 430 | 79 | 6.0 |
| NOISE ASSESSMENT APP. 6 TARGET, VAR. A/B (EVENTS D10-D13) | 425 | 57-53 | 6.5-6.4 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN 315 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF 222A

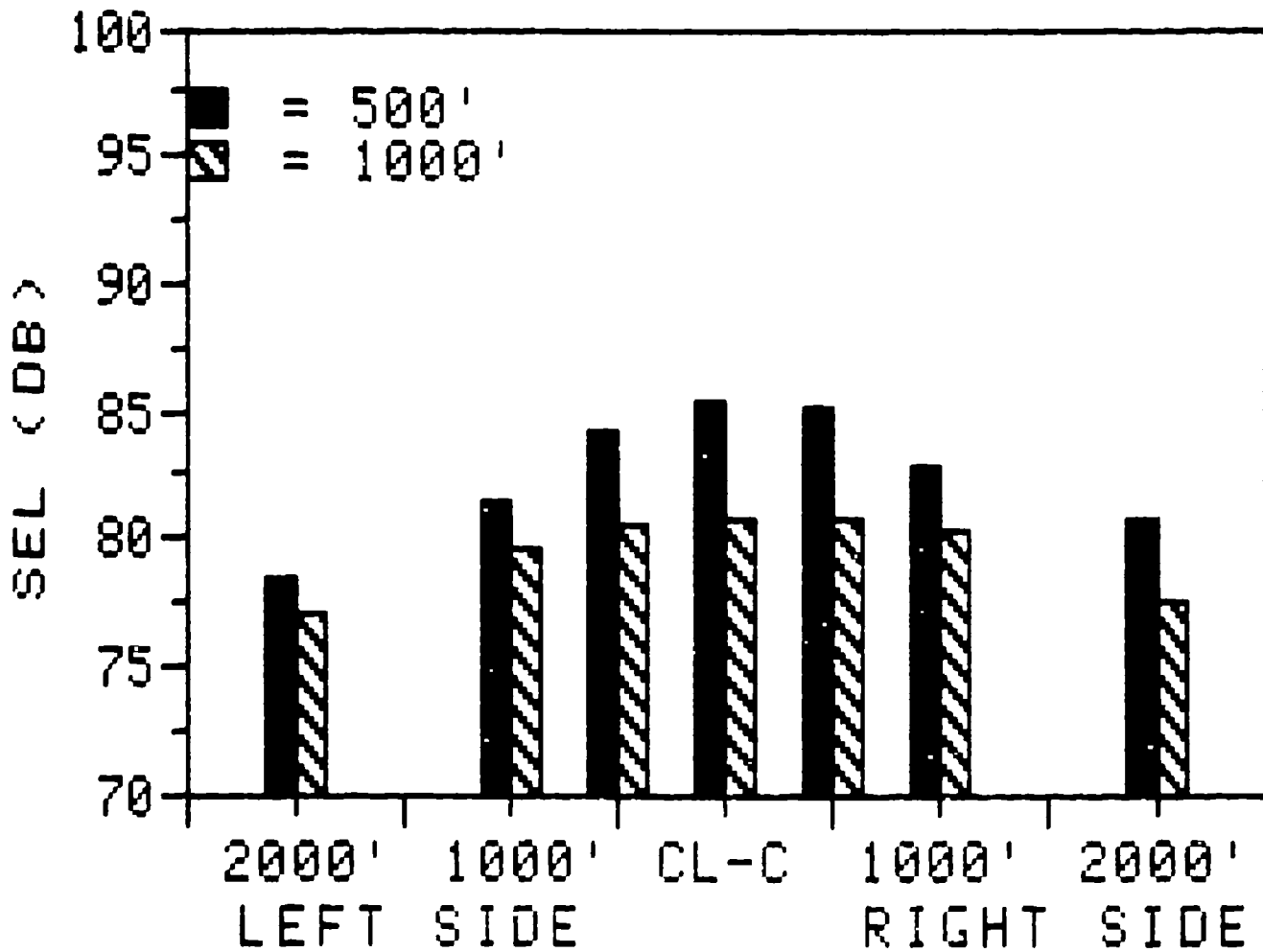


| OPERATION | AVG. ALT. OVER CLC (FT. AGL) | INDICATED AIRSPEED (KTS.) |
|-----------|---------------------------------|------------------------------|
|-----------|---------------------------------|------------------------------|

| | | |
|----------------|-----|----|
| NORMAL TAKEOFF | 240 | 79 |
|----------------|-----|----|

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN
THE HELICOPTER PASSED OVER CLC MICROPHONE POSITION

LEVEL FLYOVERS 222A



INDICATED AIRSPEED = 170 KTS.

222A SUMMARY SHEET (6/27/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* 500 FT. LEVEL FLYOVER AT 120 KTS. *

| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
|---------|-------|-------|------|------|------|-------|-------|
| AVERAGE | 78.5 | 81.6 | 84.2 | 85.3 | 85.1 | 82.9 | 80.8 |
| N | 4 | 4 | 4 | 8 | 4 | 4 | 4 |
| S.D | .4 | .1 | .2 | .3 | .2 | .3 | .8 |
| 90% CI | .5 | .1 | .3 | .2 | .2 | .3 | .9 |

* 1000 FT. LEVEL FLYOVER AT 120 KTS. *

| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
|---------|-------|-------|------|------|------|-------|-------|
| AVERAGE | 77.0 | 79.5 | 80.5 | 80.8 | 80.8 | 80.3 | 77.6 |
| N | 6 | 6 | 6 | 12 | 6 | 6 | 6 |
| S.D | .2 | .4 | .3 | .4 | .6 | .6 | .6 |
| 90% CI | .2 | .3 | .3 | .2 | .5 | .5 | .5 |

222A SUMMARY SHEET (6/27/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 670' CL-C 670' 1000' 2000'

* SIX DEG. APPROACH AT VY, 65 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 74.4 | 79.9 | 84.7 | 90.2 | 84.7 | 80.6 | 73.9 |
| N | 6 | 5 | 6 | 6 | 6 | 6 | 5 |
| S.D. | .8 | .8 | .4 | 1.1 | 1.1 | .4 | .9 |
| 90% CI | .7 | .7 | .3 | .9 | .9 | .4 | .9 |

* NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 74.9 | 79.0 | 82.9 | 88.4 | 85.1 | 82.5 | 76.2 |
| N | 6 | 7 | 7 | 7 | 7 | 7 | 5 |
| S.D. | .8 | .5 | .7 | .7 | .7 | .4 | .7 |
| 90% CI | .7 | .4 | .5 | .5 | .5 | .3 | .7 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/27/84

OPERATION : LEVEL FLYOVER (500' @ 120 KTS)

(LEFT SIDE)

(RIGHT SIDE)

| EVENT NO. | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
|--------------|-------|-------|-------|-------|-------|-------|-------|
| | EAST | EAST | EAST | | EAST | EAST | EAST |
| T10 | ----- | ----- | ----- | 85.00 | 85.20 | 83.00 | 80.90 |
| T11 | 78.70 | 81.70 | 83.80 | 85.70 | ----- | ----- | ----- |
| T12 | ----- | ----- | ----- | 85.50 | 85.20 | 82.90 | 80.10 |
| T13 | 78.90 | 81.50 | 84.30 | 85.60 | ----- | ----- | ----- |
| T14 | ----- | ----- | ----- | 84.90 | 84.80 | 83.10 | 80.20 |
| T15 | 78.30 | 81.50 | 84.20 | 85.30 | ----- | ----- | ----- |
| T16 | ----- | ----- | ----- | 85.40 | 85.10 | 82.50 | 81.80 |
| T17 | 78.00 | 81.50 | 84.30 | 85.30 | ----- | ----- | ----- |
| AVERAGE | 78.48 | 81.55 | 84.15 | 85.34 | 85.08 | 82.88 | 80.75 |
| STD. DEV. | 0.40 | 0.10 | 0.24 | 0.28 | 0.19 | 0.26 | 0.79 |
| 90% C. I. | 0.47 | 0.12 | 0.28 | 0.19 | 0.22 | 0.31 | 0.92 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/27/84

OPERATION : LEVEL FLYOVER (1000' @ 120 KTS)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' EAST | 1000' EAST | 2000' EAST |
| W18 | ----- | ----- | ----- | 80.90 | 81.90 | 80.00 | 77.10 |
| W19 | 77.00 | 79.80 | 80.80 | 81.10 | ----- | ----- | ----- |
| W20 | 77.20 | 79.50 | 80.80 | 81.10 | ----- | ----- | ----- |
| W21 | ----- | ----- | ----- | 80.20 | 80.50 | 80.90 | 77.80 |
| W22 | -- | 79.80 | 80.50 | 81.40 | ----- | ----- | ----- |
| W23 | ----- | ----- | ----- | 80.30 | 80.90 | 80.90 | 78.20 |
| W24 | 76.70 | 79.10 | 80.60 | 80.80 | ----- | ----- | ----- |
| W25 | ----- | ----- | ----- | 80.50 | 80.00 | 79.30 | 78.20 |
| W26 | 76.80 | 78.90 | 80.50 | 81.20 | ----- | ----- | ----- |
| W27 | ----- | ----- | ----- | 81.20 | 81.00 | 79.90 | 76.60 |
| W28 | 77.20 | 79.60 | 79.80 | 80.30 | ----- | ----- | ----- |
| W29 | ----- | ----- | ----- | 80.50 | 80.60 | 80.70 | 77.60 |
| AVERAGE | 76.98 | 79.45 | 80.50 | 80.79 | 80.82 | 80.28 | 77.58 |
| STD. DEV. | 0.23 | 0.37 | 0.34 | 0.42 | 0.62 | 0.60 | 0.63 |
| 90% C.I. | 0.22 | 0.31 | 0.28 | 0.22 | 0.51 | 0.50 | 0.52 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/27/84

OPERATION : 6 DEGREE APPROACH AT VY, 65 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| A40 | 74.10 | 80.50 | 84.90 | 89.60 | 82.60 | 80.50 | 73.90 |
| A41 | 75.90 | 80.90 | 85.10 | 91.40 | 85.40 | 80.80 | 73.70 |
| A42 | 73.90 | -- | 84.70 | 90.10 | 85.80 | 80.20 | 74.00 |
| A43 | 74.00 | 79.40 | 84.00 | 88.50 | 85.00 | 81.20 | -- |
| A44 | 73.70 | 79.80 | 84.50 | 91.40 | 84.50 | 80.90 | 75.20 |
| A45 | 74.50 | 79.10 | 84.70 | 90.10 | 84.60 | 80.10 | 75.10 |
| AVERAGE | 74.35 | 79.94 | 84.65 | 90.18 | 84.65 | 80.62 | 73.90 |
| STD. DEV. | 0.80 | 0.75 | 0.38 | 1.11 | 1.12 | 0.43 | 0.89 |
| 90% C. I. | 0.66 | 0.71 | 0.31 | 0.91 | 0.92 | 0.35 | 0.85 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/27/84

OPERATION : NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D46 | 74.30 | 78.70 | 84.20 | 88.80 | 85.60 | 83.00 | -- |
| D47 | 75.40 | 79.10 | 82.90 | 88.80 | 85.10 | 82.20 | 75.60 |
| D48 | -- | 79.60 | 83.40 | 88.80 | 83.70 | 82.00 | 76.80 |
| D49 | 74.50 | 78.80 | 82.10 | 88.20 | 85.20 | 82.90 | 76.90 |
| D50 | 74.80 | 78.00 | 82.80 | 89.00 | 85.50 | 82.20 | -- |
| D51 | 76.30 | 79.40 | 83.10 | 87.10 | 85.10 | 82.70 | 76.40 |
| D52 | 74.30 | 79.30 | 82.10 | 87.80 | 85.70 | 82.20 | 75.30 |
| AVERAGE | 74.93 | 78.99 | 82.94 | 88.36 | 85.13 | 82.46 | 76.20 |
| STD. DEV. | 0.79 | 0.54 | 0.74 | 0.70 | 0.68 | 0.40 | 0.72 |
| 90% C. I. | 0.65 | 0.40 | 0.54 | 0.51 | 0.49 | 0.29 | 0.68 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D1 | 76.90 | 80.90 | 84.60 | 86.40 | 86.00 | 84.20 | -- |
| D2 | 75.80 | 80.10 | 83.50 | 87.00 | 86.20 | 83.90 | -- |
| D3 | -- | 80.00 | 84.30 | 87.50 | 85.90 | 83.60 | -- |
| D4 | 76.10 | 80.60 | 84.00 | 86.60 | 86.00 | 84.40 | -- |
| D5 | 75.20 | 79.40 | 84.00 | 86.70 | 85.80 | 84.10 | -- |
| D6 | 75.20 | 80.10 | 84.00 | 87.10 | 85.10 | 84.10 | -- |
| D7 | 75.90 | 81.40 | 84.20 | 86.50 | 86.20 | 84.60 | -- |
| D8 | 76.10 | 80.30 | 84.60 | 86.90 | 85.50 | 83.90 | -- |
| D9 | 76.70 | 80.40 | 83.70 | 86.10 | 85.60 | 84.40 | -- |
| AVERAGE | 75.99 | 80.36 | 84.10 | 86.76 | 85.81 | 84.13 | -- |
| STD. DEV. | 0.62 | 0.57 | 0.37 | 0.42 | 0.36 | 0.31 | -- |
| 90% C.I. | 0.41 | 0.35 | 0.23 | 0.26 | 0.22 | 0.19 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D10 | 75.00 | 80.20 | 84.30 | 89.00 | 84.20 | 82.20 | -- |
| D11 | 75.00 | 80.30 | 83.30 | 88.40 | 85.60 | 83.60 | -- |
| D12 | 74.10 | 81.90 | 85.40 | 88.80 | 85.80 | 83.80 | -- |
| D13 | 74.70 | -- | 84.30 | 88.60 | 84.70 | -- | -- |
| AVERAGE | 74.70 | 80.80 | 84.33 | 88.70 | 85.08 | 83.20 | -- |
| STD. DEV. | 0.42 | 0.95 | 0.86 | 0.26 | 0.75 | 0.87 | -- |
| 90% C. I. | 0.50 | 1.61 | 1.01 | 0.30 | 0.89 | 1.47 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| B14 | 75.1 | 80.10 | 84.10 | 86.80 | 85.20 | 84.00 | -- |
| B16 | -- | 79.60 | 83.50 | 86.10 | 85.00 | 84.30 | -- |
| B18 | 75.2 | 79.50 | 83.70 | 86.00 | 85.10 | 84.10 | -- |
| B20 | -- | -- | 84.40 | 86.50 | 85.30 | 83.40 | -- |
| B22 | 75.6 | 79.50 | 83.80 | 85.70 | 84.50 | 83.60 | -- |
| B24 | 74.9 | 79.50 | 83.70 | 86.10 | 85.20 | 84.10 | -- |
| B26 | 74.2 | -- | 83.40 | 87.30 | 84.40 | 83.40 | -- |
| B28 | 74.2 | 79.00 | 83.10 | 86.00 | 85.10 | 83.50 | -- |
| AVERAGE | 74.87 | 79.53 | 83.71 | 86.31 | 84.98 | 83.80 | -- |
| STD. DEV. | 0.56 | 0.35 | 0.41 | 0.52 | 0.34 | 0.36 | -- |
| 90% C.I. | 0.48 | 0.30 | 0.27 | 0.35 | 0.23 | 0.24 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 670' WEST | | 670' EAST | 1000' EAST | 2000' EAST |
| C15 | -- | 79.50 | 79.70 | 84.10 | 84.10 | 79.30 | 73.20 |
| C17 | -- | 77.60 | 79.20 | 83.00 | 82.40 | 79.00 | 71.70 |
| C19 | -- | 79.10 | 80.00 | 83.70 | 83.00 | 78.50 | 71.10 |
| C21 | -- | 79.10 | 79.80 | 84.90 | 83.40 | 78.70 | 73.50 |
| C23 | -- | -- | 79.90 | 83.20 | 82.90 | -- | -- |
| C25 | -- | 79.30 | 79.60 | 84.00 | 82.50 | 78.70 | 72.80 |
| C27 | -- | 79.10 | 80.70 | 84.40 | 83.10 | 78.80 | 72.50 |
| C29 | -- | 79.10 | 80.10 | 84.20 | 82.70 | 78.90 | 73.10 |
| AVERAGE | -- | 78.97 | 79.88 | 83.94 | 83.01 | 78.84 | 72.56 |
| STD. DEV. | -- | 0.76 | 0.34 | 0.70 | 0.63 | 0.31 | 1.03 |
| 90% C.I. | -- | 0.72 | 0.28 | 0.58 | 0.52 | 0.30 | 0.98 |

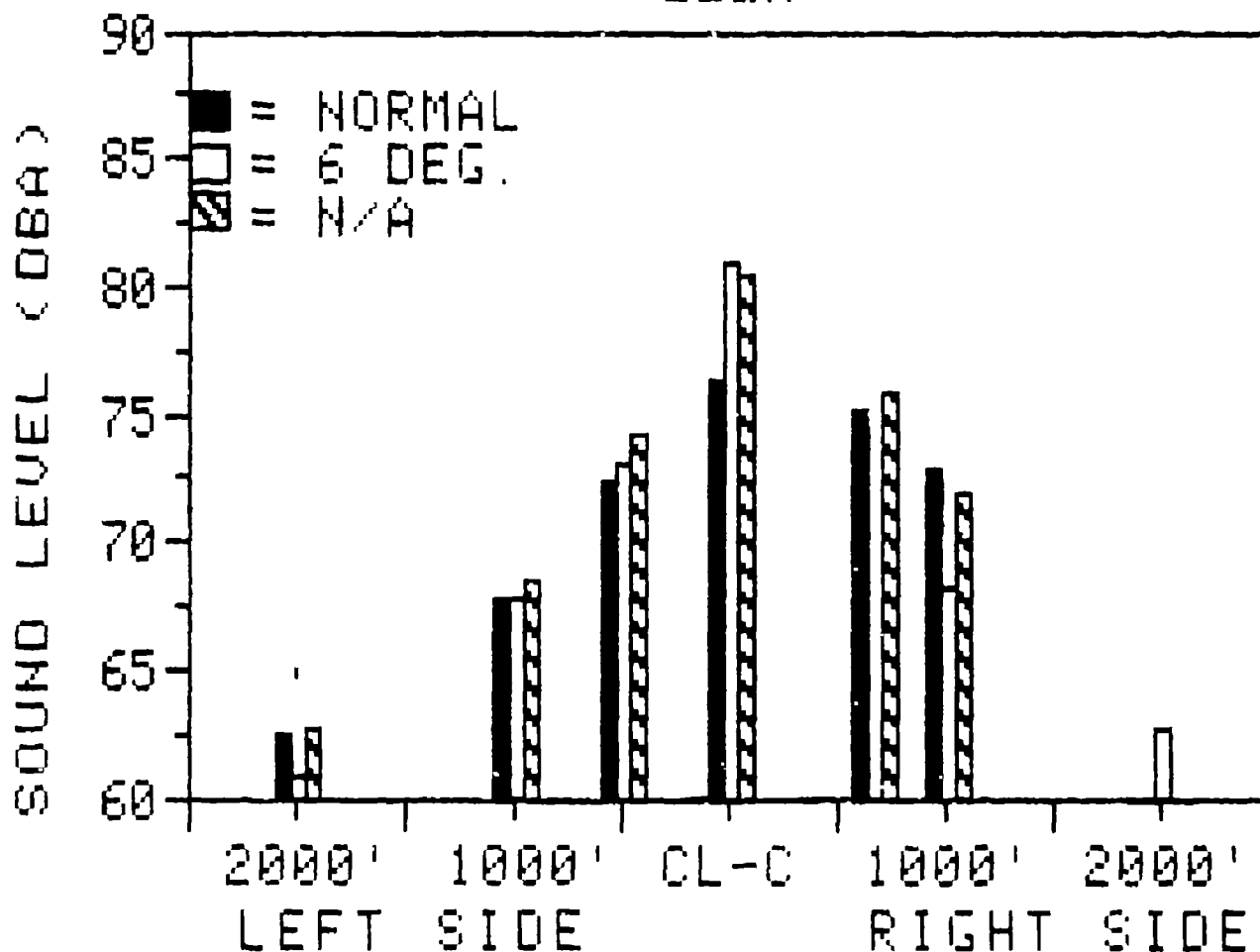
NOISE LEVEL DATA

'as-measured'

A-WEIGHTED SOUND LEVEL (dBA)

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- A-WEIGHTED SOUND LEVEL (dBA) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN. -

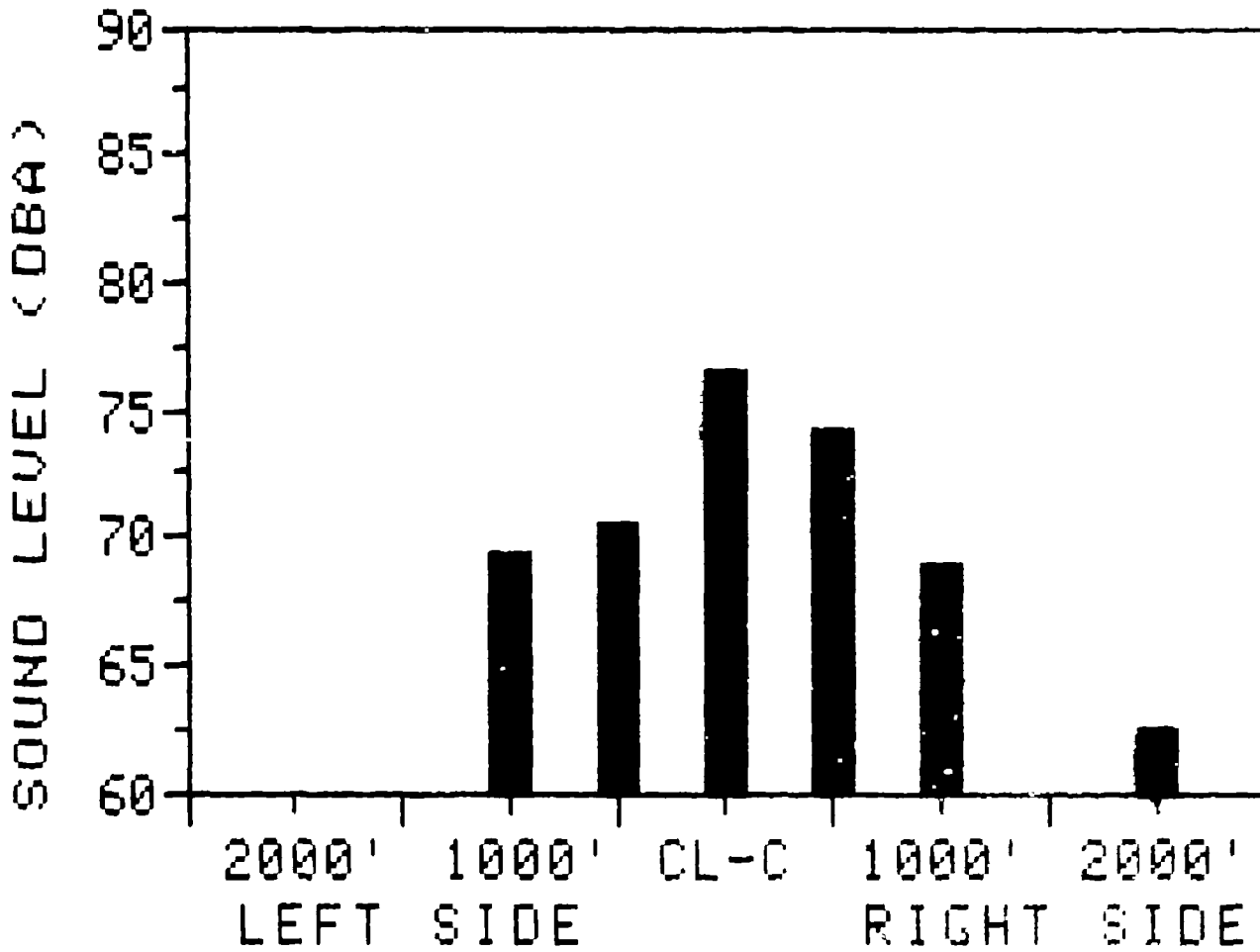
APPROACHES 222A



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 400 | 90-70 | 6.0 |
| SIX DEG. APPROACH | 430 | 79 | 6.0 |
| NOISE ABATEMENT APP. 6 TARGET, VAR. A/S (EVENTS D10-D13) | 425 | 57-53 | 6.5-8.4 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN ±15 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF 222A

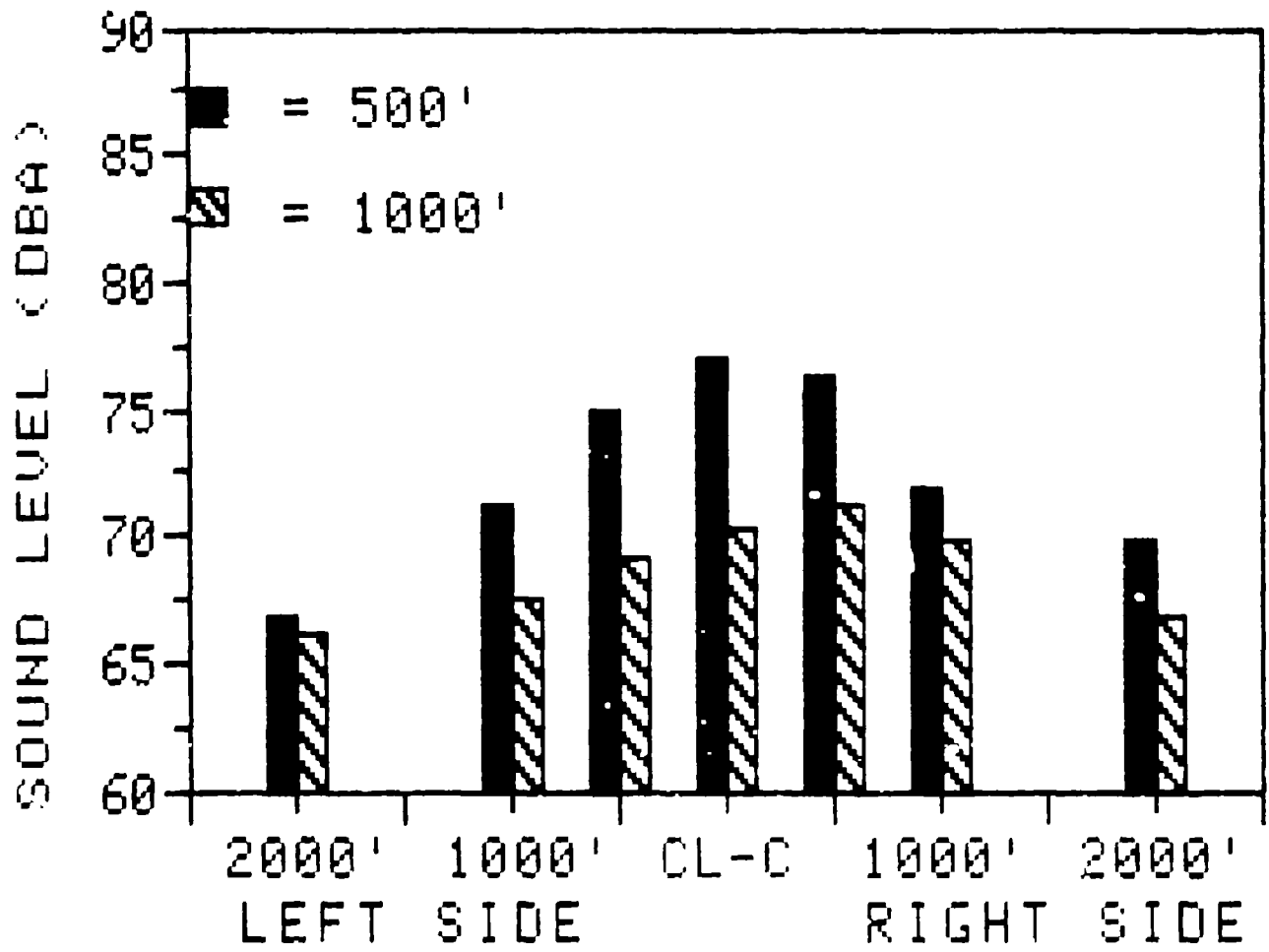


| | | |
|-----------|----------------|--------------------|
| OPERATION | AVG. ALT. OVER | INDICATED ALTITUDE |
| | CLC HPT. ADJ. | FEET |

| | | |
|----------------|-----|----|
| NORMAL TAKEOFF | 240 | 15 |
|----------------|-----|----|

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE AT THE
THE HELICOPTER PASSED OVER CLC MICROPHONE POSITIONS

LEVEL FLYOVERS 222A



INDICATED AIRSPEED - 100 KTS.

222A SUMMARY SHEET (6/27/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE) (RIGHT SIDE)
 2000' 1000' 670' CL-C 670' 1000' 2000'

* SIX DEG. APPROACH AT VY, 65 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 60.8 | 67.8 | 73.0 | 80.8 | 73.9 | 68.2 | 62.6 |
| N | 6 | 5 | 6 | 6 | 6 | 6 | 5 |
| S.D. | 1.0 | 2.4 | 1.0 | 1.4 | 2.3 | 1.3 | 1.4 |
| 90% CI | .9 | 2.3 | .8 | 1.1 | 1.9 | 1.0 | 1.4 |

* NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 63.5 | 67.9 | 73.1 | 79.8 | 75.8 | 71.1 | 66.0 |
| N | 6 | 6 | 7 | 7 | 7 | 7 | 5 |
| S.D. | 1.5 | .5 | .9 | 1.1 | 1.3 | .8 | 1.5 |
| 90% CI | 1.2 | .4 | .6 | .8 | 1.0 | .6 | 1.5 |

222A SUMMARY SHEET (6/27/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE) (RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* 500 FT. LEVEL FLYOVER AT 120 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 66.7 | 71.1 | 74.8 | 76.9 | 76.2 | 71.9 | 69.7 |
| N | 4 | 4 | 4 | 8 | 4 | 4 | 4 |
| S.D | .3 | .1 | .3 | .6 | .4 | .4 | .2 |
| 90% CI | .4 | .1 | .3 | .4 | .5 | .5 | .2 |

* 1000 FT. LEVEL FLYOVER AT 120 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 66.1 | 67.5 | 69.2 | 70.3 | 71.1 | 69.9 | 66.8 |
| N | 5 | 6 | 6 | 12 | 6 | 6 | 6 |
| S.D | 1.1 | .4 | .4 | .7 | .6 | .8 | .6 |
| 90% CI | 1.1 | .3 | .3 | .3 | .5 | .6 | .5 |

222A SUMMARY SHEET (6/28/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 670' CL-C 670' 1000' 2000'

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 62.5 | 67.8 | 72.3 | 76.3 | 75.1 | 72.9 | -- |
| N | 6 | 8 | 8 | 8 | 8 | 8 | -- |
| S.D. | .6 | .8 | .5 | .8 | .5 | .7 | -- |
| 90% CI | .2 | .5 | .3 | .5 | .3 | .5 | -- |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/B) *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 63.2 | 68.9 | 73.9 | 78.2 | 76.2 | 73.6 | -- |
| N | 8 | 9 | 9 | 9 | 9 | 9 | -- |
| S.D. | .9 | 1.2 | .8 | .7 | .6 | .5 | -- |
| 90% CI | .6 | .7 | .5 | .5 | .4 | .3 | -- |

* NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/B) *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 62.6 | 68.5 | 74.3 | 80.4 | 75.9 | 72.0 | -- |
| N | 3 | 4 | 4 | 4 | 4 | 4 | -- |
| S.D. | .3 | .8 | .6 | .9 | .7 | .7 | -- |
| 90% CI | .5 | .9 | .7 | 1.1 | .8 | .8 | -- |

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|----|------|------|------|------|------|------|
| AVERAGE | -- | 69.3 | 70.4 | 76.4 | 74.1 | 68.9 | 62.5 |
| N | -- | 7 | 8 | 8 | 8 | 8 | 7 |
| S.D. | -- | .8 | .6 | .9 | .9 | .8 | 1.8 |
| 90% CI | -- | .8 | .5 | .8 | .7 | .7 | 1.7 |

222A SUMMARY SHEET (06/28/84)

A-WEIGHTED SOUND LEVEL (DB)

(INSIDE OF TURN) (OUTSIDE OF TURN)

2000' 1000' 500' CL-C 500' 1000' 2000'

(RIGHT SIDE)

(RIGHT SIDE)

* 15 DEG. BANK ANGLE TURN, 65 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 62.1 | 66.4 | 73.0 | 77.4 | 72.0 | 67.4 | -- |
| N | 3 | 3 | 3 | 6 | 3 | 2 | -- |
| S.D. | .4 | 1.2 | .8 | 3.5 | 1.7 | 2.0 | -- |
| 90% CI | .7 | 2.0 | 1.4 | 2.9 | 2.9 | -- | -- |

* 30 DEG. BANK ANGLE TURN, 65 KTS.

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 64.3 | 67.0 | 72.5 | 74.7 | 71.0 | 67.5 | -- |
| N | 3 | 3 | 2 | 5 | 3 | 3 | -- |
| S.D. | 1.7 | .7 | 1.1 | 2.7 | 2.4 | 1.8 | -- |
| 90% CI | 2.8 | 1.1 | -- | 2.6 | 4.1 | 3.0 | -- |

(LEFT SIDE)

(LEFT SIDE)

* 15 DEG. BANK ANGLE TURN, 65 KTS.

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 61.4 | 66.0 | 70.9 | 77.4 | 76.5 | 68.7 | -- |
| N | 3 | 3 | 3 | 6 | 3 | 2 | -- |
| S.D. | .3 | .6 | 1.2 | 3.5 | 1.4 | .9 | -- |
| 90% CI | .5 | 1.0 | 2.0 | 2.9 | 2.4 | -- | -- |

* 30 DEG. BANK ANGLE TURN, 65 KTS.

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 67.2 | 68.4 | 72.9 | 74.7 | 75.8 | 68.3 | -- |
| N | 3 | 3 | 3 | 5 | 3 | 2 | -- |
| S.D. | 1.1 | 2.1 | .4 | 2.7 | 3.1 | .4 | -- |
| 90% CI | 1.8 | 3.5 | .6 | 2.6 | 5.2 | -- | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/27/84

OPERATION : LEVEL FLYOVER (500' @ 120 KTS)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| T10 | ----- | ----- | ----- | 77.30 | 76.10 | 71.40 | 69.90 |
| T11 | 67.00 | 71.20 | 74.40 | 76.60 | ----- | ----- | ----- |
| T12 | ----- | ----- | ----- | 77.70 | 76.80 | 72.00 | 69.60 |
| T13 | 66.90 | 71.00 | 74.80 | 77.00 | ----- | ----- | ----- |
| T14 | ----- | ----- | ----- | 76.20 | 75.80 | 72.40 | 69.50 |
| T15 | 66.70 | 71.00 | 74.80 | 76.90 | ----- | ----- | ----- |
| T16 | ----- | ----- | ----- | 77.20 | 76.20 | 71.80 | 69.70 |
| T17 | 66.30 | 71.10 | 75.00 | 75.90 | ----- | ----- | ----- |
| AVERAGE | 66.73 | 71.08 | 74.75 | 76.85 | 76.23 | 71.90 | 69.68 |
| 10% DEV. | 0.31 | 0.10 | 0.25 | 0.59 | 0.42 | 0.42 | 0.17 |
| 90% C.I. | 0.36 | 0.11 | 0.30 | 0.40 | 0.49 | 0.49 | 0.20 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/27/84

OPERATION : LEVEL FLYOVER (1000' @ 120 KTS)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|-----------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' EAST | 1000' EAST | 2000' EAST |
| W18 | ----- | ----- | ----- | 69.70 | 71.40 | 69.30 | 66.10 |
| W19 | 65.70 | 67.70 | 70.00 | 70.00 | ----- | ----- | ----- |
| W20 | 67.50 | 67.20 | 68.90 | 69.90 | ----- | ----- | ----- |
| W21 | ----- | ----- | ----- | 71.30 | 71.00 | 70.50 | 67.60 |
| W22 | -- | 67.90 | 68.80 | 70.60 | ----- | ----- | ----- |
| W23 | ----- | ----- | ----- | 69.60 | 70.20 | 70.20 | 66.50 |
| W24 | 67.20 | 67.90 | 69.70 | 70.10 | ----- | ----- | ----- |
| W25 | ----- | ----- | ----- | 70.30 | 70.90 | 68.50 | 67.00 |
| W26 | 65.30 | 67.00 | 69.20 | 70.20 | ----- | ----- | ----- |
| W27 | ----- | ----- | ----- | 71.00 | 71.90 | 70.00 | 66.30 |
| W28 | 65.00 | 67.20 | 68.60 | 69.60 | ----- | ----- | ----- |
| W29 | ----- | ----- | ----- | 71.50 | 71.40 | 71.10 | 67.40 |
| AVERAGE | 66.14 | 67.48 | 69.20 | 70.32 | 71.13 | 69.93 | 66.82 |
| STD. DEV. | 1.14 | 0.40 | 0.41 | 0.65 | 0.58 | 0.75 | 0.61 |
| 90% C.I. | 1.08 | 0.33 | 0.34 | 0.34 | 0.47 | 0.62 | 0.50 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/27/84

OPERATION : 6 DEGREE APPROACH AT VY, 65 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| A40 | 60.50 | 70.20 | 74.40 | 80.10 | 70.90 | 67.20 | 62.60 |
| A41 | 61.90 | 70.10 | 74.10 | 82.20 | 75.20 | 69.00 | 61.20 |
| A42 | 60.60 | -- | 72.60 | 81.30 | 77.40 | 67.00 | 61.70 |
| A43 | 59.00 | 65.10 | 72.40 | 78.50 | 74.30 | 70.00 | -- |
| A44 | 61.20 | 67.90 | 72.40 | 82.00 | 72.60 | 69.00 | 63.90 |
| A45 | 61.60 | 65.60 | 72.30 | 80.70 | 73.00 | 67.20 | 64.50 |
| AVERAGE | 60.80 | 67.78 | 73.03 | 80.80 | 73.90 | 68.23 | 62.60 |
| STD. DEV. | 1.04 | 2.41 | 0.95 | 1.37 | 2.26 | 1.26 | 1.42 |
| 90% C.I. | 0.86 | 2.29 | 0.79 | 1.13 | 1.87 | 1.04 | 1.35 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/27/84

OPERATION : NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D46 | 61.60 | 68.10 | 73.70 | 79.90 | 76.60 | 70.30 | -- |
| D47 | 63.40 | 68.10 | 73.30 | 80.60 | 77.00 | 70.30 | 64.10 |
| D48 | -- | 68.50 | 74.70 | 81.50 | 73.30 | 71.50 | 66.50 |
| D49 | 62.60 | -- | 72.80 | 79.70 | 75.80 | 72.20 | 68.20 |
| D50 | 64.40 | 67.10 | 72.30 | 80.10 | 76.50 | 71.00 | -- |
| D51 | 65.90 | 68.30 | 72.50 | 78.00 | 74.90 | 71.80 | 65.20 |
| D52 | 63.00 | 67.50 | 72.60 | 79.00 | 76.60 | 70.50 | 66.00 |
| AVERAGE | 63.48 | 67.93 | 73.13 | 79.83 | 75.81 | 71.09 | 66.00 |
| STD. DEV. | 1.50 | 0.53 | 0.85 | 1.12 | 1.31 | 0.76 | 1.53 |
| 90% C.I. | 1.24 | 0.44 | 0.62 | 0.82 | 0.96 | 0.56 | 1.46 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/B)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D1 | 62.70 | 68.00 | 74.60 | 78.10 | 76.30 | 74.00 | -- |
| D2 | 63.40 | 68.10 | 73.00 | 78.20 | 76.70 | 73.20 | -- |
| D3 | -- | 68.30 | 74.20 | 79.60 | 76.60 | 72.80 | -- |
| D4 | 62.40 | 68.40 | 74.30 | 78.20 | 76.00 | 74.00 | -- |
| D5 | 62.20 | 67.90 | 73.30 | 78.00 | 76.10 | 73.30 | -- |
| D6 | 62.50 | 67.80 | 72.80 | 78.00 | 75.30 | 73.80 | -- |
| D7 | 64.60 | 70.90 | 74.50 | 77.80 | 77.40 | 74.50 | -- |
| D8 | 63.70 | 69.80 | 75.10 | 78.70 | 75.70 | 73.20 | -- |
| D9 | 64.30 | 70.40 | 73.10 | 76.90 | 76.10 | 73.80 | -- |
| AVERAGE | 63.23 | 68.84 | 73.88 | 78.17 | 76.24 | 73.62 | -- |
| STD. DEV. | 0.91 | 1.19 | 0.83 | 0.72 | 0.61 | 0.53 | -- |
| 90% C. I. | 0.61 | 0.74 | 0.52 | 0.45 | 0.38 | 0.33 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER; BELL 222A

TEST DATE; 6/28/84

OPERATION ; NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | | 670' WEST | 1000' WEST | 2000' WEST |
| D10 | 62.30 | 68.80 | 74.40 | 81.70 | 74.90 | 71.20 | -- |
| D11 | 62.90 | 68.40 | 73.90 | 80.00 | 76.40 | 71.90 | -- |
| D12 | 62.50 | 69.30 | 75.10 | 80.40 | 76.30 | 71.90 | -- |
| D13 | -- | 67.50 | 73.90 | 79.60 | 75.90 | 72.80 | -- |
| AVERAGE | 62.57 | 68.50 | 74.33 | 80.43 | 75.88 | 71.95 | -- |
| STD. DEV. | 0.31 | 0.76 | 0.57 | 0.91 | 0.68 | 0.66 | -- |
| 90% C.I. | 0.52 | 0.89 | 0.67 | .07 | 0.80 | 0.77 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 670' EAST | CL-C | 670' WEST | 1000' WEST | 2000' WEST |
| B14 | 62.50 | 67.60 | 72.10 | 76.50 | 75.40 | 73.00 | -- |
| B16 | -- | 68.30 | 72.60 | 75.50 | 74.70 | 74.00 | -- |
| B18 | 62.80 | 68.30 | 72.30 | 76.00 | 75.40 | 73.50 | -- |
| B20 | -- | 69.30 | 73.30 | 77.50 | 75.10 | 72.00 | -- |
| B22 | 63.20 | 67.20 | 72.30 | 75.70 | 74.20 | 72.50 | -- |
| B24 | 62.20 | 67.50 | 72.30 | 75.90 | 75.70 | 73.20 | -- |
| B26 | 62.40 | 67.20 | 71.90 | 77.40 | 75.30 | 73.00 | -- |
| B28 | 61.60 | 66.80 | 71.90 | 75.90 | 75.10 | 71.80 | -- |
| AVERAGE | 62.45 | 67.78 | 72.34 | 76.30 | 75.11 | 72.88 | -- |
| STD. DEV. | 0.54 | 0.81 | 0.45 | 0.77 | 0.47 | 0.74 | -- |
| 90% C.I. | 0.23 | 0.54 | 0.30 | 0.51 | 0.31 | 0.50 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 670' WEST | | 670' EAST | 1000' EAST | 2000' EAST |
| C15 | -- | 70.00 | 70.80 | 76.60 | 75.40 | 69.30 | 64.10 |
| C17 | -- | 68.00 | 69.40 | 75.00 | 73.20 | 69.00 | 59.80 |
| C19 | -- | 69.00 | 70.50 | 76.10 | 73.30 | 67.60 | 61.00 |
| C21 | -- | 70.00 | 70.80 | 77.70 | 74.60 | 69.00 | 63.20 |
| C23 | -- | -- | 70.00 | 76.00 | 74.70 | 70.00 | -- |
| C25 | -- | 69.50 | 70.40 | 76.90 | 73.90 | 68.30 | 63.00 |
| C27 | -- | 69.30 | 71.30 | 76.80 | 74.30 | 68.90 | 63.00 |
| C29 | -- | 69.50 | 70.20 | 76.40 | 73.10 | 68.90 | 63.70 |
| AVERAGE | -- | 69.33 | 70.43 | 76.44 | 74.06 | 68.88 | 62.54 |
| STD. DEV. | -- | 0.84 | 0.55 | 0.92 | 0.88 | 0.83 | 1.80 |
| 90% C.I. | -- | 0.80 | 0.45 | 0.76 | 0.72 | 0.68 | 1.72 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : 15 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (RIGHT SIDE) | | | | OUTSIDE OF TURN (RIGHT SIDE) | | |
|--------------|--------------------------------|-------|-------|-------|---------------------------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| G30 | ----- | ----- | ----- | 72.30 | 71.00 | -- | -- |
| G31 | 62.00 | 65.50 | 73.10 | 80.60 | ----- | ----- | ----- |
| G32 | ----- | ----- | ----- | 74.70 | 71.00 | 66.00 | -- |
| G33 | 62.70 | 67.70 | 72.10 | 76.90 | ----- | ----- | ----- |
| G34 | ----- | ----- | ----- | 81.20 | 74.00 | 68.80 | -- |
| G35 | 61.50 | 65.90 | 73.70 | 78.60 | ----- | ----- | ----- |
| AVERAGE | 62.07 | 66.37 | 72.97 | 77.38 | 72.00 | 67.40 | -- |
| STD. DEV. | 0.40 | 1.17 | 0.81 | 3.45 | 1.73 | 1.98 | -- |
| 90% C. I. | 0.68 | 1.98 | 1.36 | 2.85 | 2.92 | -- | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : 15 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (LEFT SIDE) | | | | OUTSIDE OF TURN (LEFT SIDE) | | |
|--------------|-------------------------------|-------|-------|-------|--------------------------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| 030 | 61.10 | 65.30 | 70.20 | 72.30 | ----- | ----- | ----- |
| 031 | ----- | ----- | ----- | 80.60 | 78.10 | -- | -- |
| 032 | 61.50 | 66.10 | 72.30 | 74.70 | ----- | ----- | ----- |
| 033 | ----- | ----- | ----- | 76.90 | 75.30 | 69.30 | -- |
| 034 | 61.60 | 66.50 | 70.30 | 81.20 | ----- | ----- | ----- |
| 035 | ----- | ----- | ----- | 78.60 | 76.20 | 68.00 | -- |
| AVERAGE | 61.40 | 65.97 | 70.93 | 77.38 | 76.53 | 68.65 | -- |
| STD. DEV. | 0.26 | 0.61 | 1.18 | 3.45 | 1.43 | 0.92 | -- |
| 90% C.I. | 0.45 | 1.03 | 2.00 | 2.85 | 2.41 | -- | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 8/26/84

OPERATION : 30 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (RIGHT SIDE) | | | | OUTSIDE OF TURN (RIGHT SIDE) | | |
|--------------|--------------------------------|-------|-------|-------|---------------------------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| H36 | ----- | ----- | ----- | 71.10 | 68.20 | 69.50 | -- |
| H37 | 67.70 | 67.70 | 76.20 | 83.20 | ----- | ----- | ----- |
| H38 | ----- | ----- | ----- | 75.10 | 72.40 | 67.00 | -- |
| H39 | 64.10 | 66.40 | 73.30 | 78.20 | ----- | ----- | ----- |
| H40 | ----- | ----- | ----- | 73.10 | 72.40 | 66.00 | -- |
| H41 | 66.00 | 67.00 | 71.70 | 76.00 | ----- | ----- | ----- |
| AVERAGE | 64.27 | 67.03 | 73.73 | 76.12 | 71.00 | 67.50 | -- |
| STD. DEV. | 1.63 | 0.65 | 2.28 | 4.24 | 2.42 | 1.80 | -- |
| 90% C.I. | 2.79 | 1.10 | 3.85 | 3.50 | 4.09 | 3.04 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 6/28/84

OPERATION : 30 DEG. BANK ANGLE TURN AT 65 KTS.

| EVENT NO. | INSIDE OF TURN (LEFT SIDE) | | | | OUTSIDE OF TURN (LEFT SIDE) | | |
|--------------|-------------------------------|-------|-------|-------|--------------------------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| H36 | 68.10 | 70.80 | 73.30 | 71.10 | ----- | ----- | ----- |
| H37 | ----- | ----- | ----- | -- | 78.80 | -- | -- |
| H38 | 66.00 | 67.00 | 72.80 | 75.10 | ----- | ----- | ----- |
| H39 | ----- | ----- | ----- | 78.20 | 76.00 | 68.50 | -- |
| H40 | 67.40 | 67.40 | 72.60 | 73.10 | ----- | ----- | ----- |
| H41 | ----- | ----- | ----- | 76.00 | 72.70 | 68.00 | -- |
| AVERAGE | 67.17 | 68.40 | 72.90 | 74.70 | 75.83 | 68.25 | -- |
| STD. DEV. | 1.07 | 2.09 | 0.36 | 2.72 | 3.05 | 0.35 | -- |
| 90% C.I. | 1.80 | 3.52 | 0.61 | 2.59 | 5.15 | -- | -- |

RADAR TRACKING DATA

- THIS SECTION OF THE APPENDIX CONTAINS THE HELICOPTER
- POSITION DATA AND TRACKING PLOTS DERIVED FROM THE FAA'S
- PORTABLE TRACKING RADAR SYSTEM. THE POSITION DATA LISTS
- THE CLOSEST POINT OF APPROACH (CPA), TIME OF CPA,
- ELEVATION ANGLE, RATE OF CLIMB OR DESCENT, THE CLIMB OR
- DESCENT ANGLE, AND GROUND SPEED FOR ALL FLIGHT
- CONDITIONS. TRACKING PLOTS OF THE ACTUAL FLIGHT PROFILE
- FLOWN ARE PROVIDED FOR EACH FLIGHT CONDITIONS.
-

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 06/27/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|-----|--------|---------|-----------|--------|-------|-------|
| 500 FT. LEVEL FLYOVER AT 120 KTS. | | | | | | | |
| 10 | F/O | 481.7 | 83.2 | 0:46:44.6 | 42.6 | 0.2 | 125.7 |
| 11 | F/O | 486.2 | 85.3 | 0:49:43.0 | 61.7 | 0.3 | 118.9 |
| 12 | | ----- | NO DATA | ----- | | | |
| 13 | | ----- | NO DATA | ----- | | | |
| 14 | | ----- | NO DATA | ----- | | | |
| 15 | F/O | 498.2 | 83.9 | 0:01:16.4 | 19.3 | 0.1 | 120.4 |
| 16 | F/O | 493.2 | 80.0 | 0:04:13.0 | -64.1 | -0.3 | 125.2 |
| 17 | F/O | 508.3 | 88.1 | 0:06:58.7 | 143.1 | 0.7 | 117.4 |
| 1000 FT. LEVEL FLYOVER AT 120 KTS. | | | | | | | |
| 18 | F/O | 980.7 | 83.7 | 0:09:54.4 | 98.7 | 0.4 | 137.9 |
| 19 | F/O | 1019.5 | 86.6 | 0:12:47.7 | 149.5 | 0.8 | 110.8 |
| 20 | | ----- | NO DATA | ----- | | | |
| 21 | F/O | 1006.0 | 84.2 | 0:22:12.5 | 191.9 | 0.8 | 130.4 |
| 22 | F/O | 1016.3 | 85.3 | 0:25:18.4 | 453.7 | 2.3 | 124.9 |
| 23 | F/O | 1032.3 | 87.0 | 0:27:46.6 | -43.7 | -0.2 | 125.6 |
| 24 | F/O | 1021.7 | 85.6 | 0:31:01.5 | 415.0 | 2.2 | 125.8 |
| 25 | F/O | 1029.0 | 85.7 | 0:33:28.4 | 190.0 | 0.8 | 135.8 |
| 26 | F/O | 1011.9 | 88.2 | 0:36:49.3 | -47.1 | -0.2 | 110.5 |
| 27 | F/O | 995.2 | 85.0 | 0:38:35.9 | 78.4 | 0.3 | 125.8 |
| 28 | F/O | 1025.5 | 86.6 | 0:43:04.1 | 593.0 | 2.7 | 105.0 |
| 29 | F/O | 989.3 | 82.7 | 0:45:49.6 | 253.3 | 0.9 | 135.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 06/27/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--|-----|--------|---------|------------|--------|-------|------|
| SIX DEG. APPROACH AT YY, 65 KTS. | | | | | | | |
| 40 | APP | 350.2 | 86.5 | 13:37:37.2 | -289.4 | -3.1 | 52.7 |
| 41 | APP | 308.1 | 89.5 | 13:42:22.2 | -240.4 | -2.5 | 54.0 |
| 42 | APP | 368.5 | 83.6 | 13:47:42.3 | -632.1 | -7.5 | 47.3 |
| 43 | APP | 395.5 | 84.4 | 13:53:36.5 | -486.0 | -5.1 | 54.2 |
| 44 | APP | 370.8 | 87.1 | 13:59:37.1 | -461.4 | -5.1 | 50.0 |
| 45 | APP | 362.0 | 82.5 | 14:05:28.6 | -350.6 | -3.5 | 56.2 |
| NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. H/S) | | | | | | | |
| 46 | APP | 360.0 | 79.8 | 14:14:55.6 | -817.7 | -7.0 | 65.4 |
| 47 | | | NO DATA | | | | |
| 48 | APP | 370.6 | 85.8 | 14:24:13.4 | -704.7 | -4.9 | 81.2 |
| 49 | APP | 381.3 | 87.3 | 14:29:26.8 | -125.2 | -1.0 | 69.6 |
| 50 | APP | 390.6 | 79.0 | 14:34:18.3 | -587.7 | -5.1 | 65.6 |
| 51 | APP | 391.2 | 84.1 | 14:41:20.7 | -405.8 | -3.2 | 71.1 |
| 52 | APP | 399.2 | 83.9 | 14:46:27.8 | -586.7 | -5.3 | 62.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 106/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|---|-----|-------|------|-----------|---------|------|------|
| 1 | APP | 518.9 | 83.5 | 7:35:07.6 | -1084.3 | -8.0 | 76.5 |
| 2 | APP | 503.5 | 86.8 | 7:39:34.4 | -948.6 | -6.7 | 79.9 |
| 3 | APP | 435.7 | 79.1 | 7:43:25.1 | -1081.6 | -8.1 | 75.4 |
| 4 | APP | 489.8 | 79.3 | 7:47:29.6 | -1039.4 | -7.4 | 78.9 |
| 5 | APP | 515.3 | 89.5 | 7:51:54.4 | -885.9 | -6.4 | 77.5 |
| 6 | APP | 503.2 | 78.6 | 7:55:58.5 | -893.8 | -6.9 | 72.6 |
| 7 | APP | 518.1 | 82.9 | 8:00:03.6 | -1017.2 | -7.4 | 77.4 |
| 8 | APP | 499.9 | 85.3 | 8:03:58.2 | -1108.9 | -7.9 | 78.9 |
| 9 | APP | 547.7 | 81.8 | 8:07:41.0 | -1080.5 | -7.7 | 78.5 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|-------|---------|-----------|--------|------|------|
| 10 | | ----- | NO DATA | ----- | | | |
| 11 | | ----- | NO DATA | ----- | | | |
| 12 | APP | 386.8 | 84.8 | 8:20:47.8 | -858.3 | -6.5 | 74.6 |
| 13 | | ----- | NO DATA | ----- | | | |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|---------|-----------|---------|------|------|
| 14 | APP | 585.8 | 84.2 | 8:29:24.8 | -851.4 | -7.7 | 62.4 |
| 16 | | ----- | NO DATA | ----- | | | |
| 18 | | ----- | NO DATA | ----- | | | |
| 20 | APP | 519.5 | 77.2 | 8:43:42.9 | -987.2 | -7.7 | 71.7 |
| 22 | APP | 581.7 | 86.1 | 8:48:34.6 | -922.2 | -7.0 | 73.6 |
| 24 | APP | 571.8 | 87.1 | 8:53:34.4 | -1085.9 | -8.6 | 70.7 |
| 26 | | ----- | NO DATA | ----- | | | |
| 28 | APP | 584.3 | 82.2 | 9:13:00.3 | -1036.2 | -8.1 | 72.1 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|---------|-----------|--------|-----|------|
| 15 | | ----- | NO DATA | ----- | | | |
| 17 | DEP | 347.4 | 86.4 | 8:36:21.9 | 764.6 | 5.1 | 84.2 |
| 19 | DEP | 324.3 | 88.4 | 8:40:50.4 | 1216.4 | 8.2 | 83.8 |
| 21 | | ----- | NO DATA | ----- | | | |
| 23 | | ----- | NO DATA | ----- | | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE: 06/88/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------|--------|---------|-----------|--------|-------|------|
| NORMAL TAKEOFF | | | | | | |
| 25 DEP | 293.1 | 87.8 | 8:55:08.3 | 831.5 | 5.4 | 86.1 |
| 27 | ----- | NO DATA | ----- | | | |
| 29 DEP | 325.4 | 84.9 | 9:15:34.6 | 1032.5 | 6.8 | 86.0 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 06/28/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|-----|--------|---------|------------|--------|-------|------|
| 15 DEG. BANK ANGLE TURN, 65 KTS. | | | | | | | |
| 30 | F/O | 483.4 | 86.3 | 12:14:35.0 | -140.6 | -1.4 | 58.5 |
| 31 | | ----- | NO DATA | ----- | | | |
| 32 | F/O | 421.5 | 82.4 | 12:17:40.2 | -113.8 | -1.0 | 65.0 |
| 33 | F/O | 464.7 | 82.0 | 12:19:20.0 | -28.1 | -0.3 | 66.6 |
| 34 | | ----- | NO DATA | ----- | | | |
| 35 | F/O | 433.6 | 77.3 | 12:22:41.8 | 169.9 | 1.5 | 65.1 |
| 30 DEG. BANK ANGLE TURN, 65 KTS. | | | | | | | |
| 36 | F/O | 585.6 | 54.0 | 12:24:52.8 | 51.7 | 0.5 | 64.8 |
| 37 | F/O | 473.4 | 85.8 | 12:26:24.8 | 207.8 | 1.5 | 76.4 |
| 38 | F/O | 434.1 | 76.5 | 12:27:50.0 | -17.8 | -0.2 | 64.6 |
| 39 | F/O | 460.6 | 80.9 | 12:29:38.2 | -174.1 | -1.5 | 67.0 |
| 40 | F/O | 462.3 | 86.7 | 12:31:13.9 | 198.4 | 1.7 | 67.4 |
| 41 | | ----- | NO DATA | ----- | | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 06/27/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|-----|--------|---------|-----------|--------|-------|-------|
| 500 FT. LEVEL FLYOVER AT 120 KTS. | | | | | | | |
| 10 | F/O | 645.7 | 48.1 | 8:46:44.7 | 28.7 | 0.1 | 125.7 |
| 11 | F/O | 669.4 | 46.6 | 8:49:42.9 | 56.2 | 0.3 | 119.8 |
| 12 | | ----- | NO DATA | ----- | | | |
| 13 | | ----- | NO DATA | ----- | | | |
| 14 | | ----- | NO DATA | ----- | | | |
| 15 | F/O | 668.4 | 48.1 | 9:01:16.1 | 45.5 | 0.2 | 119.8 |
| 16 | F/O | 638.9 | 49.7 | 9:04:13.1 | -70.4 | -0.3 | 125.8 |
| 17 | F/O | 691.7 | 47.4 | 9:06:58.4 | 176.8 | 0.8 | 119.0 |
| 1000 FT. LEVEL FLYOVER AT 120 KTS. | | | | | | | |
| 18 | F/O | 1053.6 | 68.2 | 9:09:54.7 | 173.0 | 0.7 | 130.3 |
| 19 | F/O | 1110.3 | 66.7 | 9:12:47.7 | 149.5 | 0.8 | 110.8 |
| 20 | | ----- | NO DATA | ----- | | | |
| 21 | F/O | 1078.6 | 68.4 | 9:22:12.6 | 201.3 | 0.8 | 130.3 |
| 22 | F/O | 1096.6 | 67.6 | 9:25:18.4 | 422.7 | 0.3 | 104.0 |
| 23 | F/O | 1137.5 | 65.4 | 9:27:46.8 | -43.6 | -0.2 | 136.7 |
| 24 | F/O | 1111.1 | 66.7 | 9:31:01.5 | 415.0 | 0.2 | 106.8 |
| 25 | F/O | 1129.7 | 65.5 | 9:33:32.4 | 190.0 | 0.8 | 105.6 |
| 26 | F/O | 1118.8 | 65.1 | 9:36:40.6 | -35.5 | -0.2 | 109.7 |
| 27 | F/O | 1080.6 | 66.9 | 9:39:36.0 | 75.0 | 0.3 | 136.1 |
| 28 | F/O | 1125.4 | 66.0 | 9:43:04.1 | 503.0 | 0.7 | 106.0 |
| 29 | F/O | 1085.1 | 65.0 | 9:45:49.6 | 223.3 | 0.9 | 135.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 282A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE: 06/27/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|-------|----------|------------|--------|------|
| SIX DEG. APPROACH AT VY, 85 KTS. | | | | | | |
| 40 | APP | 582.0 | 37.4 | 13:37:37.0 | -313.7 | 53.6 |
| 41 | APP | 638.5 | 39.1 | 13:42:22.6 | -489.6 | 52.4 |
| 42 | APP | 607.9 | 37.3 | 13:47:42.3 | -631.9 | 47.3 |
| 43 | APP | 633.3 | 38.6 | 13:53:36.6 | -471.1 | 54.1 |
| 44 | APP | 593.6 | 38.6 | 13:59:27.6 | -484.1 | 51.9 |
| 45 | APP | 595.1 | 37.3 | 14:05:28.6 | -350.4 | 56.2 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|-------|---------|------------|--------|------|
| 46 | APP | 598.3 | 38.6 | 14:14:55.7 | -814.3 | 65.5 |
| 47 | | ----- | NO DATA | ----- | | |
| 48 | APP | 607.3 | 37.7 | 14:24:13.4 | -785.0 | 81.2 |
| 49 | APP | 616.4 | 38.4 | 14:29:28.8 | -125.2 | 69.6 |
| 50 | APP | 618.0 | 39.8 | 14:34:17.7 | -641.7 | 66.1 |
| 51 | APP | 628.7 | 39.0 | 14:41:20.4 | -374.3 | 70.6 |
| 52 | APP | 634.0 | 38.9 | 14:46:27.9 | -588.4 | 62.6 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 06/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|-------|----------|-----------|---------|------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 1 | APP | 713.5 | 46.5 | 7:35:07.6 | -1084.3 | -8.0 | 76.5 |
| 2 | APP | 693.4 | 44.1 | 7:39:35.5 | -936.8 | -6.5 | 81.9 |
| 3 | APP | 648.9 | 42.8 | 7:43:24.3 | -1016.1 | -7.6 | 75.4 |
| 4 | APP | 679.6 | 45.3 | 7:47:29.6 | -1039.5 | -7.4 | 78.0 |
| 5 | APP | 711.4 | 46.3 | 7:51:54.7 | -917.0 | -6.7 | 76.0 |
| 6 | APP | 696.5 | 46.4 | 7:55:58.3 | -845.1 | -6.6 | 72.5 |
| 7 | APP | 701.4 | 46.9 | 8:00:04.0 | -987.7 | -7.5 | 74.1 |
| 8 | APP | 683.2 | 47.1 | 8:03:58.2 | -1198.4 | -7.9 | 78.9 |
| 9 | APP | 722.3 | 48.9 | 8:07:41.0 | -1080.5 | -7.7 | 78.5 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|-------|---------|-----------|--------|------|------|
| 10 | | ----- | NO DATA | ----- | | | |
| 11 | | ----- | NO DATA | ----- | | | |
| 12 | APP | 635.8 | 39.2 | 8:20:47.1 | -711.5 | -5.4 | 74.7 |
| 13 | | ----- | NO DATA | ----- | | | |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|---------|-----------|---------|------|------|
| 14 | APP | 736.3 | 51.4 | 8:29:25.3 | -888.3 | -7.9 | 63.2 |
| 16 | | ----- | NO DATA | ----- | | | |
| 18 | | ----- | NO DATA | ----- | | | |
| 20 | APP | 698.8 | 46.5 | 8:43:43.2 | -984.5 | -7.8 | 70.5 |
| 22 | APP | 738.0 | 52.0 | 8:48:35.3 | -932.3 | -7.2 | 72.9 |
| 24 | APP | 755.6 | 49.3 | 8:53:34.5 | -1073.8 | -8.5 | 70.8 |
| 26 | | ----- | NO DATA | ----- | | | |
| 28 | APP | 760.1 | 50.6 | 9:12:59.8 | -1060.2 | -8.6 | 68.9 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|---------|-----------|--------|-----|------|
| 15 | | ----- | NO DATA | ----- | | | |
| 17 | DEP | 592.0 | 36.1 | 8:36:21.9 | 764.7 | 5.1 | 84.2 |
| 19 | DEP | 593.3 | 33.0 | 8:40:50.1 | 1206.5 | 8.1 | 83.9 |
| 21 | | ----- | NO DATA | ----- | | | |
| 23 | | ----- | NO DATA | ----- | | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE: 06/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------|--------|---------|-----------|--------|-------|------|
| NORMAL TAKEOFF | | | | | | |
| 25 DEP | 568.1 | 31.2 | 8:55:08.1 | 709.0 | 4.7 | 85.0 |
| 27 | ----- | NO DATA | ----- | | | |
| 29 DEP | 579.7 | 34.0 | 9:15:34.3 | 1054.5 | 6.9 | 85.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

DATE: 06/28/84

500 FT. EAST

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|-------|----------|------------|--------|------------|
| 15 DEG. BANK ANGLE TURN, 65 KTS | | | | | | |
| 30 | F/O | 700.1 | 41.5 | 12:14:35.4 | -136.1 | -1.3 60.5 |
| 31 | | ----- | NO DATA | ----- | | |
| 32 | F/O | 587.7 | 40.4 | 12:17:44.5 | -752.8 | -3.8 113.0 |
| 33 | F/O | 608.4 | 45.8 | 12:19:22.3 | -550.1 | -5.6 55.6 |
| 34 | | ----- | NO DATA | ----- | | |
| 35 | F/O | 591.2 | 46.0 | 12:22:41.8 | 169.6 | 1.5 65.1 |
| 30 DEG. BANK ANGLE TURN, 65 KTS. | | | | | | |
| 36 | F/O | 497.6 | 73.2 | 12:24:53.4 | 109.7 | 1.0 64.3 |
| 37 | F/O | 618.2 | 49.2 | 12:26:24.2 | 96.4 | 0.7 77.5 |
| 38 | F/O | 559.9 | 47.6 | 12:27:51.2 | -180.7 | -1.6 65.6 |
| 39 | F/O | 570.8 | 44.8 | 12:29:33.8 | 2163.2 | 8.6 141.6 |
| 40 | F/O | 665.7 | 44.1 | 12:31:12.3 | -45.3 | -0.4 62.7 |
| 41 | | ----- | NO DATA | ----- | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 106/27/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|----------------------------------|--------|-------|----------|------------|--------|------|------|
| SIX DEG. APPROACH AT VV, 65 KTS. | | | | | | | |
| 40 | APP | 607.6 | 35.2 | 13:37:37.0 | -270.2 | -3.0 | 52.6 |
| 41 | APP | 606.7 | 41.3 | 13:42:21.5 | -72.7 | -0.8 | 53.2 |
| 42 | APP | 617.1 | 36.5 | 13:47:42.8 | -678.8 | -0.9 | 45.7 |
| 43 | APP | 611.8 | 39.8 | 13:53:37.6 | -478.0 | -5.1 | 52.0 |
| 44 | APP | 621.7 | 36.7 | 13:59:36.0 | -451.0 | -5.0 | 50.7 |
| 45 | APP | 620.8 | 36.2 | 14:05:28.2 | -380.0 | -3.0 | 56.8 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 46 | APP | 617.4 | 38.1 | 14:14:54.6 | -867.6 | -7.5 | 65.1 |
| 47 | | ----- | NO DATA | ----- | | | |
| 48 | APP | 627.1 | 36.1 | 14:24:13.6 | -710.7 | -5.0 | 82.0 |
| 49 | APP | 630.3 | 37.5 | 14:29:26.1 | -192.1 | -1.6 | 68.6 |
| 50 | APP | 630.1 | 37.2 | 14:34:10.4 | -614.5 | -5.2 | 67.1 |
| 51 | APP | 629.0 | 38.0 | 14:41:19.7 | -402.8 | -3.9 | 69.3 |
| 52 | APP | 634.2 | 39.0 | 14:46:27.1 | -600.0 | -5.0 | 64.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 106/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|-------|----------|-----------|---------|------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 1 | APP | 726.8 | 45.5 | 7:35:07.5 | -1074.3 | -7.8 | 77.2 |
| 2 | APP | 713.1 | 44.8 | 7:30:34.4 | -948.3 | -6.7 | 79.9 |
| 3 | APP | 672.3 | 39.4 | 7:43:25.2 | -1085.3 | -8.1 | 75.6 |
| 4 | APP | 706.7 | 43.0 | 7:47:30.2 | -1054.1 | -7.7 | 77.0 |
| 5 | APP | 711.0 | 46.8 | 7:51:54.2 | -883.3 | -6.4 | 77.6 |
| 6 | APP | 701.6 | 44.7 | 7:55:58.9 | -963.4 | -7.6 | 71.5 |
| 7 | APP | 695.8 | 47.6 | 8:00:03.6 | -1017.0 | -7.4 | 77.4 |
| 8 | APP | 707.0 | 46.2 | 8:03:57.5 | -1151.1 | -8.1 | 79.4 |
| 9 | APP | 752.9 | 45.3 | 8:07:41.6 | -1186.7 | -8.7 | 76.9 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|-------|---------|-----------|--------|------|------|
| 10 | | ----- | NO DATA | ----- | | | |
| 11 | | ----- | NO DATA | ----- | | | |
| 12 | APP | 616.0 | 42.3 | 8:20:46.4 | -842.7 | -5.0 | 72.8 |
| 13 | | ----- | NO DATA | ----- | | | |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|---------|-----------|---------|------|------|
| 14 | APP | 788.3 | 47.1 | 8:29:25.1 | -866.8 | -7.8 | 62.7 |
| 16 | | ----- | NO DATA | ----- | | | |
| 18 | | ----- | NO DATA | ----- | | | |
| 20 | APP | 738.8 | 43.3 | 8:43:42.9 | -986.6 | -7.7 | 71.7 |
| 22 | APP | 787.2 | 47.7 | 8:48:34.8 | -920.4 | -7.1 | 73.4 |
| 24 | APP | 758.9 | 49.3 | 8:53:34.0 | -1101.6 | -8.8 | 70.5 |
| 26 | | ----- | NO DATA | ----- | | | |
| 28 | APP | 769.6 | 48.8 | 9:13:00.3 | -1036.1 | -8.1 | 72.1 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|---------|-----------|--------|-----|------|
| 15 | | ----- | NO DATA | ----- | | | |
| 17 | DEP | 589.6 | 37.6 | 8:36:22.5 | 898.4 | 6.1 | 82.3 |
| 19 | DEP | 592.2 | 33.4 | 8:40:50.5 | 1220.1 | 8.1 | 84.2 |
| 21 | | ----- | NO DATA | ----- | | | |
| 23 | | ----- | NO DATA | ----- | | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 106/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------|--------|---------|-----------|--------|-------|------|
| NORMAL TAKEOFF | | | | | | |
| 25 DEP | 572.4 | 30.9 | 8:55:07.8 | 641.1 | 4.3 | 85.0 |
| 27 | ----- | NO DATA | ----- | | | |
| 29 DEP | 597.9 | 36.2 | 9:15:35.8 | 1185.3 | 7.6 | 87.2 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 06/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|-------|----------|------------|--------|-----------|
| 15 DEG. BANK ANGLE TURN, 65 KTS. | | | | | | |
| 30 | F/O | 657.0 | 44.8 | 12:14:34.8 | -128.4 | -1.3 57.1 |
| 31 | | ----- | NO DATA | ----- | | |
| 32 | F/O | 681.5 | 38.8 | 12:17:39.9 | -113.8 | -1.0 64.9 |
| 33 | F/O | 716.9 | 39.0 | 12:19:18.6 | 30.0 | 0.4 46.3 |
| 34 | | ----- | NO DATA | ----- | | |
| 35 | F/O | 713.3 | 36.6 | 12:22:41.5 | 62.9 | 0.5 66.6 |
| 30 DEG. BANK ANGLE TURN, 65 KTS. | | | | | | |
| 36 | F/O | 943.1 | 30.4 | 12:24:51.3 | -135.6 | -1.2 62.0 |
| 37 | F/O | 690.9 | 43.1 | 12:26:24.8 | 208.3 | 1.5 76.4 |
| 38 | F/O | 731.6 | 35.7 | 12:27:49.7 | 104.3 | 0.9 63.3 |
| 39 | F/O | 710.7 | 40.8 | 12:29:38.4 | -200.2 | -1.7 67.4 |
| 40 | F/O | 674.3 | 43.6 | 12:31:13.7 | 181.9 | 1.5 67.0 |
| 41 | | ----- | NO DATA | ----- | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 1000 FT. EAST

DATE: 06/27/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|-----|--------|---------|-----------|--------|-------|-------|
| 500 FT. LEVEL FLYOVER AT 120 KTS. | | | | | | | |
| 10 | F/O | 1048.7 | 27.4 | 8:46:44.7 | 28.7 | 0.1 | 125.7 |
| 11 | F/O | 1075.0 | 27.0 | 8:49:42.6 | 44.9 | 0.2 | 121.6 |
| 12 | | ----- | NO DATA | ----- | | | |
| 13 | | ----- | NO DATA | ----- | | | |
| 14 | | ----- | NO DATA | ----- | | | |
| 15 | F/O | 1068.1 | 27.9 | 9:01:16.1 | 45.5 | 0.2 | 119.8 |
| 16 | F/O | 1035.2 | 28.1 | 9:04:13.3 | -84.2 | -0.4 | 128.2 |
| 17 | F/O | 1094.6 | 27.8 | 9:06:58.4 | 176.8 | 0.8 | 119.0 |
| 1000 FT. LEVEL FLYOVER AT 120 KTS. | | | | | | | |
| 18 | F/O | 1324.6 | 47.7 | 9:09:54.7 | 173.0 | 0.7 | 139.3 |
| 19 | F/O | 1387.9 | 47.4 | 9:12:47.7 | 149.5 | 0.8 | 110.8 |
| 20 | | ----- | NO DATA | ----- | | | |
| 21 | F/O | 1346.9 | 48.2 | 9:22:12.8 | 229.8 | 0.9 | 140.6 |
| 22 | F/O | 1369.0 | 47.9 | 9:25:18.4 | 422.7 | 2.3 | 104.0 |
| 23 | F/O | 1421.9 | 46.8 | 9:27:46.8 | -43.6 | -0.2 | 136.7 |
| 24 | F/O | 1387.6 | 47.5 | 9:31:01.5 | 415.0 | 2.2 | 105.0 |
| 25 | F/O | 1411.7 | 47.2 | 9:33:33.3 | 178.6 | 0.7 | 137.3 |
| 26 | F/O | 1401.7 | 46.4 | 9:36:49.6 | -35.5 | -0.2 | 109.7 |
| 27 | F/O | 1357.6 | 47.2 | 9:39:36.2 | 71.8 | 0.3 | 136.6 |
| 28 | F/O | 1399.6 | 47.5 | 9:43:04.2 | 499.7 | 2.7 | 105.1 |
| 29 | F/O | 1369.7 | 46.0 | 9:45:49.6 | 223.3 | 0.9 | 135.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE: 06/27/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|-----|--------|------|------------|--------|-------|------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | | |
| 40 | APP | 1025.7 | 20.3 | 13:37:37.0 | -313.7 | -3.3 | 53.6 |
| 41 | APP | 1067.2 | 22.1 | 13:42:22.0 | -420.6 | -4.5 | 52.4 |
| 42 | APP | 1049.8 | 21.0 | 13:47:41.4 | -509.4 | -7.1 | 47.7 |
| 43 | APP | 1070.2 | 21.8 | 13:53:36.6 | -471.1 | -4.0 | 54.1 |
| 44 | APP | 1031.0 | 21.2 | 13:59:37.6 | -484.1 | -5.3 | 51.0 |
| 45 | APP | 1038.0 | 20.5 | 14:05:28.6 | -350.4 | -3.5 | 56.2 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|------|
| 46 | APP | 1041.1 | 20.9 | 14:14:55.3 | -800.3 | -6.0 | 65.1 |
| 47 | | ----- | NO DATA | ----- | | | |
| 48 | APP | 1046.2 | 21.5 | 14:24:12.9 | -659.5 | -4.6 | 80.8 |
| 49 | APP | 1053.7 | 21.5 | 14:29:27.2 | -120.0 | -0.0 | 71.7 |
| 50 | APP | 1052.7 | 22.2 | 14:34:17.7 | -641.7 | -5.6 | 66.1 |
| 51 | APP | 1065.7 | 21.9 | 14:41:20.4 | -374.3 | -3.0 | 70.6 |
| 52 | APP | 1069.6 | 21.0 | 14:46:27.9 | -588.4 | -5.3 | 62.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 06/28/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|-----|--------|------|-----------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 1 | APP | 1116.5 | 27.3 | 7:35:08.2 | -1091.7 | -7.8 | 78.4 |
| 2 | APP | 1095.1 | 26.3 | 7:39:35.5 | -936.8 | -6.5 | 81.3 |
| 3 | APP | 1071.1 | 24.4 | 7:43:24.3 | -1016.1 | -7.6 | 75.4 |
| 4 | APP | 1088.1 | 26.5 | 7:47:29.6 | -1039.5 | -7.4 | 78.0 |
| 5 | APP | 1115.5 | 27.6 | 7:51:54.8 | -929.8 | -6.0 | 76.2 |
| 6 | APP | 1099.3 | 27.4 | 7:55:58.3 | -845.1 | -6.6 | 72.5 |
| 7 | APP | 1099.1 | 28.7 | 8:00:03.3 | -1013.5 | -7.2 | 78.7 |
| 8 | APP | 1087.8 | 27.6 | 8:03:58.3 | -1109.6 | -7.0 | 78.4 |
| 9 | APP | 1115.1 | 29.3 | 8:07:41.0 | -1086.5 | -7.7 | 78.5 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|---------|-----------|--------|------|------|
| 10 | | ----- | NO DATA | ----- | | | |
| 11 | | ----- | NO DATA | ----- | | | |
| 12 | APP | 1071.2 | 22.2 | 8:20:47.1 | -711.5 | -5.4 | 74.7 |
| 13 | | ----- | NO DATA | ----- | | | |

NORMAL APPROACH

| | | | | | | | |
|----|-----|--------|---------|-----------|---------|------|------|
| 14 | APP | 1112.8 | 31.2 | 8:29:25.3 | -888.3 | -7.9 | 63.2 |
| 16 | | ----- | NO DATA | ----- | | | |
| 18 | | ----- | NO DATA | ----- | | | |
| 20 | APP | 1095.2 | 27.7 | 8:43:43.2 | -994.5 | -7.8 | 70.5 |
| 22 | APP | 1116.5 | 31.5 | 8:48:35.3 | -932.3 | -7.2 | 72.0 |
| 24 | APP | 1146.3 | 30.1 | 8:53:34.5 | -1073.8 | -8.5 | 70.8 |
| 26 | | ----- | NO DATA | ----- | | | |
| 28 | APP | 1144.3 | 30.5 | 9:13:00.7 | -1027.1 | -7.9 | 73.3 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|--------|---------|-----------|--------|-----|------|
| 15 | | ----- | NO DATA | ----- | | | |
| 17 | DEP | 1038.5 | 19.9 | 8:36:22.1 | 779.8 | 5.3 | 83.6 |
| 19 | DEP | 1047.4 | 18.1 | 8:40:50.1 | 1206.5 | 8.1 | 83.0 |
| 21 | | ----- | NO DATA | ----- | | | |
| 23 | | ----- | NO DATA | ----- | | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 06/28/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------|--------|---------|-----------|--------|-------|-------|
| NORMAL TAKEOFF | | | | | | |
| 25 DEP | 641.9 | 3.5 | 8:55:04.6 | 3812.8 | 17.4 | 120.2 |
| 27 | ----- | NO DATA | ----- | | | |
| 29 DEP | 1031.6 | 18.4 | 9:15:34.3 | 1054.5 | 6.9 | 85.5 |

- CPA-FT : CLOSEST POINT OF APPROACH
- E-A : ELEVATION ANGLE
- CPA-TIME : CLOSEST POINT OF APPROACH TIME
- RC-FPM : RATE OF CLIMB
- C/D-A : CLIMB OR DESCENT ANGLE
- GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 1000 FT. WEST

DATE: 06/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|----------------------------------|--------|--------|----------|------------|--------|------|------|
| 15 DEG. BANK ANGLE TURN, 65 KTS. | | | | | | | |
| 30 | F/O | 1071.5 | 25.7 | 12:14:34.4 | -138.5 | -1.4 | 57.6 |
| 31 | | ----- | NO DATA | ----- | | | |
| 32 | F/O | 1116.5 | 22.6 | 12:17:39.3 | -246.5 | -2.3 | 61.3 |
| 33 | F/O | 1141.6 | 23.4 | 12:19:18.6 | 30.0 | 0.4 | 46.3 |
| 34 | | ----- | NO DATA | ----- | | | |
| 35 | F/O | 1151.4 | 21.8 | 12:22:41.5 | 62.0 | 0.5 | 66.6 |
| 30 DEG. BANK ANGLE TURN, 65 KTS. | | | | | | | |
| 36 | F/O | 1300.4 | 20.2 | 12:24:51.3 | -135.6 | -1.2 | 62.0 |
| 37 | F/O | 1110.1 | 25.3 | 12:26:24.8 | 208.3 | 1.5 | 76.4 |
| 38 | F/O | 1120.3 | 22.7 | 12:27:43.8 | 155.6 | 1.8 | 49.9 |
| 39 | F/O | 1137.3 | 24.2 | 12:29:38.4 | -200.2 | -1.7 | 67.4 |
| 40 | F/O | 1082.0 | 25.3 | 12:31:13.7 | 181.9 | 1.5 | 67.0 |
| 41 | | ----- | NO DATA | ----- | | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE 06/27/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|------------|--------|------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 40 | APP | 1056.9 | 19.5 | 13:37:37.3 | -279.2 | 52.6 |
| 41 | APP | 1035.6 | 20.9 | 13:42:21.5 | -72.7 | 53.2 |
| 42 | APP | 1060.5 | 20.4 | 13:47:42.8 | -678.8 | 45.7 |
| 43 | APP | 1039.0 | 20.2 | 13:53:37.6 | -478.9 | 52.9 |
| 44 | APP | 1066.0 | 20.5 | 13:59:36.9 | -451.0 | 50.7 |
| 45 | APP | 1066.5 | 20.2 | 14:05:28.2 | -389.0 | 56.8 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 46 | APP | 1056.6 | 21.2 | 14:14:54.6 | -867.6 | 65.1 |
| 47 | | ----- | NO DATA | ----- | | |
| 48 | APP | 1071.1 | 19.9 | 14:24:13.9 | -790.9 | 80.7 |
| 49 | APP | 1068.5 | 21.1 | 14:29:27.9 | -227.9 | 71.4 |
| 50 | APP | 1055.4 | 21.3 | 14:34:19.4 | -614.5 | 67.1 |
| 51 | APP | 1064.4 | 21.9 | 14:41:19.7 | -402.8 | 60.3 |
| 52 | APP | 1067.4 | 22.5 | 14:46:27.1 | -609.0 | 64.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE 106/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|--------|----------|-----------|---------|------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 1 | APP | 1134.4 | 27.8 | 7:35:07.3 | -1061.1 | -7.6 | 78.6 |
| 2 | APP | 1125.0 | 26.7 | 7:39:34.4 | -948.3 | -6.7 | 79.9 |
| 3 | APP | 1102.6 | 22.9 | 7:43:25.2 | -1085.3 | -8.1 | 75.6 |
| 4 | APP | 1110.6 | 25.9 | 7:47:30.3 | -1058.0 | -7.7 | 77.0 |
| 5 | APP | 1114.2 | 26.7 | 7:51:55.8 | -1027.1 | -8.0 | 71.8 |
| 6 | APP | 1105.7 | 26.6 | 7:55:58.9 | -963.4 | -7.6 | 71.5 |
| 7 | APP | 1096.2 | 28.1 | 8:00:03.6 | -1017.0 | -7.4 | 77.4 |
| 8 | APP | 1107.2 | 25.4 | 8:03:59.8 | -883.8 | -6.9 | 78.8 |
| 9 | APP | 1153.6 | 27.8 | 8:07:41.6 | -1186.7 | -8.7 | 76.9 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|---------|-----------|--------|------|------|
| 10 | | ----- | NO DATA | ----- | | | |
| 11 | | ----- | NO DATA | ----- | | | |
| 12 | APP | 1036.9 | 23.7 | 8:20:46.4 | -642.7 | -5.0 | 72.8 |
| 13 | | ----- | NO DATA | ----- | | | |

NORMAL APPROACH

| | | | | | | | |
|----|-----|--------|---------|-----------|---------|-------|------|
| 14 | APP | 1183.9 | 29.3 | 8:29:25.1 | -866.3 | -7.8 | 62.7 |
| 16 | | ----- | NO DATA | ----- | | | |
| 18 | | ----- | NO DATA | ----- | | | |
| 20 | APP | 1150.4 | 25.5 | 8:43:43.9 | -908.7 | -7.1 | 72.0 |
| 22 | APP | 1184.1 | 29.6 | 8:48:34.8 | -920.4 | -7.1 | 73.4 |
| 24 | APP | 1150.2 | 30.1 | 8:53:34.0 | -1101.6 | -8.8 | 70.5 |
| 26 | | ----- | NO DATA | ----- | | | |
| 28 | APP | 1146.2 | 29.0 | 9:13:02.1 | -1230.0 | -10.1 | 68.4 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|--------|---------|-----------|--------|-----|------|
| 15 | | ----- | NO DATA | ----- | | | |
| 17 | DEP | 1030.2 | 20.5 | 8:36:22.5 | 898.4 | 6.1 | 82.2 |
| 19 | DEP | 1046.6 | 18.4 | 8:40:50.6 | 1217.2 | 8.1 | 84.4 |
| 21 | | ----- | NO DATA | ----- | | | |
| 23 | | ----- | NO DATA | ----- | | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE 06/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------|--------|--------|----------|-----------|--------|----------|
| NORMAL TAKEOFF | | | | | | |
| 25 | DEP | 1032.6 | 16.6 | 8:55:07.8 | 641.1 | 4.3 85.0 |
| 27 | | ----- | NO DATA | ----- | | |
| 29 | DEP | 1028.5 | 20.3 | 9:15:35.9 | 1211.9 | 7.8 87.0 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 106/27/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------------------------|--------|--------|----------|-----------|-------|------------|
| 500 FT. LEVEL FLYOVER AT 120 KTS. | | | | | | |
| 10 | F/O | 1991.2 | 14.1 | 8:46:44.7 | 28.7 | 0.1 125.7 |
| 11 | F/O | 2016.3 | 14.1 | 8:49:42.6 | 44.9 | 0.2 121.6 |
| 12 | | ----- | NO DATA | ----- | | |
| 13 | | ----- | NO DATA | ----- | | |
| 14 | | ----- | NO DATA | ----- | | |
| 15 | F/O | 2007.2 | 14.5 | 9:01:16.1 | 45.5 | 0.2 119.8 |
| 16 | F/O | 1973.9 | 14.4 | 9:04:13.3 | -84.2 | -0.4 128.2 |
| 17 | F/O | 2034.0 | 14.7 | 9:06:58.4 | 176.8 | 0.8 119.0 |

1000 FT. LEVEL FLYOVER AT 120 KTS.

| | | | | | | |
|----|-----|--------|---------|-----------|-------|------------|
| 18 | F/O | 2101.4 | 27.5 | 9:09:54.7 | 173.0 | 0.7 130.3 |
| 19 | F/O | 2193.7 | 27.0 | 9:12:47.7 | 149.5 | 0.8 110.8 |
| 20 | | ----- | NO DATA | ----- | | |
| 21 | F/O | 2145.5 | 28.0 | 9:22:13.0 | 241.1 | 1.0 140.0 |
| 22 | F/O | 2171.8 | 28.0 | 9:25:18.4 | 422.7 | -2.3 104.0 |
| 23 | F/O | 2230.8 | 27.8 | 9:27:46.8 | -49.6 | -0.2 136.7 |
| 24 | F/O | 2192.3 | 27.9 | 9:31:01.5 | 415.0 | 2.2 105.8 |
| 25 | F/O | 2213.5 | 28.0 | 9:33:33.0 | 178.6 | 0.7 137.3 |
| 26 | F/O | 2214.1 | 27.4 | 9:36:49.6 | -35.5 | -0.2 109.7 |
| 27 | F/O | 2166.1 | 27.5 | 9:39:36.2 | 71.8 | 0.3 136.6 |
| 28 | F/O | 2204.1 | 28.0 | 9:43:04.2 | 499.7 | 2.7 105.1 |
| 29 | F/O | 2184.7 | 26.0 | 9:45:49.6 | 223.3 | 0.0 135.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 06/27/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|------------|--------|------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 40 | APP | 1994.5 | 10.4 | 13:37:37.0 | -313.7 | 53.6 |
| 41 | APP | 2025.0 | 11.5 | 13:42:20.2 | -269.6 | 49.5 |
| 42 | APP | 2013.3 | 11.2 | 13:47:41.4 | -500.4 | 47.7 |
| 43 | APP | 2029.0 | 12.2 | 13:53:34.0 | -685.6 | 55.7 |
| 44 | APP | 1997.1 | 11.3 | 13:59:35.5 | -396.4 | 49.4 |
| 45 | APP | 2005.4 | 10.6 | 14:05:27.6 | -440.7 | 55.8 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 46 | APP | 2007.3 | 10.8 | 14:14:55.3 | -800.3 | 65.1 |
| 47 | | ----- | NO DATA | ----- | | |
| 48 | APP | 2009.2 | 11.4 | 14:24:11.5 | -453.5 | 78.0 |
| 49 | APP | 2017.4 | 11.1 | 14:29:27.2 | -120.0 | 71.7 |
| 50 | APP | 2014.3 | 12.0 | 14:34:16.4 | -559.7 | 70.0 |
| 51 | APP | 2028.0 | 11.4 | 14:41:20.4 | -374.3 | 70.6 |
| 52 | APP | 2031.5 | 11.4 | 14:46:28.4 | -574.0 | 62.4 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE: 06/28/84

FAA/AEE

EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|---|-----|--------|------|-----------|---------|------|------|
| 1 | APP | 2054.2 | 14.5 | 7:35:08.2 | -1091.7 | -7.8 | 78.4 |
| 2 | APP | 2033.6 | 13.9 | 7:39:35.5 | -936.8 | -6.5 | 81.3 |
| 3 | APP | 2023.2 | 13.1 | 7:43:23.8 | -957.0 | -6.0 | 77.8 |
| 4 | APP | 2031.6 | 13.9 | 7:47:29.6 | -1039.5 | -7.4 | 78.0 |
| 5 | APP | 2053.8 | 14.7 | 7:51:54.8 | -929.8 | -6.0 | 76.2 |
| 6 | APP | 2038.3 | 14.5 | 7:55:58.3 | -845.1 | -6.6 | 72.5 |
| 7 | APP | 2034.5 | 15.1 | 8:00:03.3 | -1013.6 | -7.2 | 78.7 |
| 8 | APP | 2024.9 | 14.8 | 8:03:57.1 | -1127.0 | -7.6 | 82.0 |
| 9 | APP | 2046.0 | 16.2 | 8:07:39.8 | -1121.3 | -8.2 | 77.0 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|---------|-----------|--------|------|------|
| 10 | | ----- | NO DATA | ----- | | | |
| 11 | | ----- | NO DATA | ----- | | | |
| 12 | APP | 2033.1 | 11.6 | 8:20:47.1 | -711.5 | -5.4 | 74.7 |
| 13 | | ----- | NO DATA | ----- | | | |

NORMAL APPROACH

| | | | | | | | |
|----|-----|--------|---------|-----------|---------|------|------|
| 14 | APP | 2032.2 | 16.6 | 8:29:25.3 | -888.3 | -7.9 | 63.2 |
| 16 | | ----- | NO DATA | ----- | | | |
| 18 | | ----- | NO DATA | ----- | | | |
| 20 | APP | 2030.1 | 14.6 | 8:43:13.2 | -984.5 | -7.8 | 70.5 |
| 22 | APP | 2037.1 | 16.7 | 8:48:35.3 | -932.3 | -7.2 | 72.0 |
| 24 | APP | 2073.5 | 16.2 | 8:53:34.5 | -1073.8 | -8.5 | 70.8 |
| 26 | | ----- | NO DATA | ----- | | | |
| 28 | APP | 2066.5 | 16.4 | 9:13:00.7 | -1027.1 | -7.9 | 73.3 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|--------|---------|-----------|--------|-----|------|
| 15 | | ----- | NO DATA | ----- | | | |
| 17 | DEP | 2008.5 | 19.2 | 8:30:22.1 | 779.8 | 5.3 | 83.6 |
| 19 | DEP | 2021.3 | 9.3 | 8:40:49.9 | 1190.1 | 8.0 | 84.0 |
| 21 | | ----- | NO DATA | ----- | | | |
| 23 | | ----- | NO DATA | ----- | | | |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 06/28/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------|--------|---------|-----------|--------|-------|-------|
| NORMAL TAKEOFF | | | | | | |
| 25 DEP | 1368.0 | 1.8 | 8:55:04.6 | 3812.8 | 17.4 | 120.2 |
| 27 | ----- | NO DATA | ----- | | | |
| 29 DEP | 2005.1 | 9.5 | 9:15:34.3 | 1054.5 | 6.9 | 85.5 |

- CPA-FT : CLOSEST POINT OF APPROACH
- E-A : ELEVATION ANGLE
- CPA-TIME : CLOSEST POINT OF APPROACH TIME
- RC-FPM : RATE OF CLIMB
- C/D-A : CLIMB OR DESCENT ANGLE
- GS-K : GROUND SPEED

BELL 228A

POSITION DATA
NOISE MEASUREMENT PROGRAM

8000 FT. WEST

DATE: 08/27/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|------------|--------|-----------|
| SIX DEG. APPROACH AT VY, 65 KTS. | | | | | | |
| 40 | APP | 2025.2 | 9.7 | 13:37:37.3 | -270.8 | -3.0 52.6 |
| 41 | APP | 1998.1 | 11.3 | 13:42:21.6 | -72.7 | -0.8 53.8 |
| 42 | APP | 2021.0 | 9.3 | 13:47:45.5 | -418.2 | -4.5 52.0 |
| 43 | APP | 1994.4 | 11.0 | 13:53:37.6 | -478.9 | -5.1 52.9 |
| 44 | APP | 2030.9 | 10.2 | 13:59:36.9 | -451.0 | -5.0 50.7 |
| 45 | APP | 2025.9 | 9.4 | 14:05:31.1 | -595.9 | -6.7 50.1 |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 46 | APP | 2018.6 | 10.6 | 14:14:54.6 | -867.6 | -7.5 65.1 |
| 47 | | ----- | NO DATA | ----- | | |
| 48 | APP | 2035.3 | 10.0 | 14:24:13.9 | -790.9 | -5.5 80.7 |
| 49 | APP | 2027.5 | 10.6 | 14:29:27.9 | -287.9 | -1.8 71.4 |
| 50 | APP | 2008.8 | 10.6 | 14:34:19.4 | -614.5 | -5.2 67.1 |
| 51 | APP | 2023.0 | 11.0 | 14:41:19.7 | -402.8 | -3.3 69.3 |
| 52 | APP | 2018.5 | 11.9 | 14:48:25.1 | -700.8 | -5.6 70.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. WEST

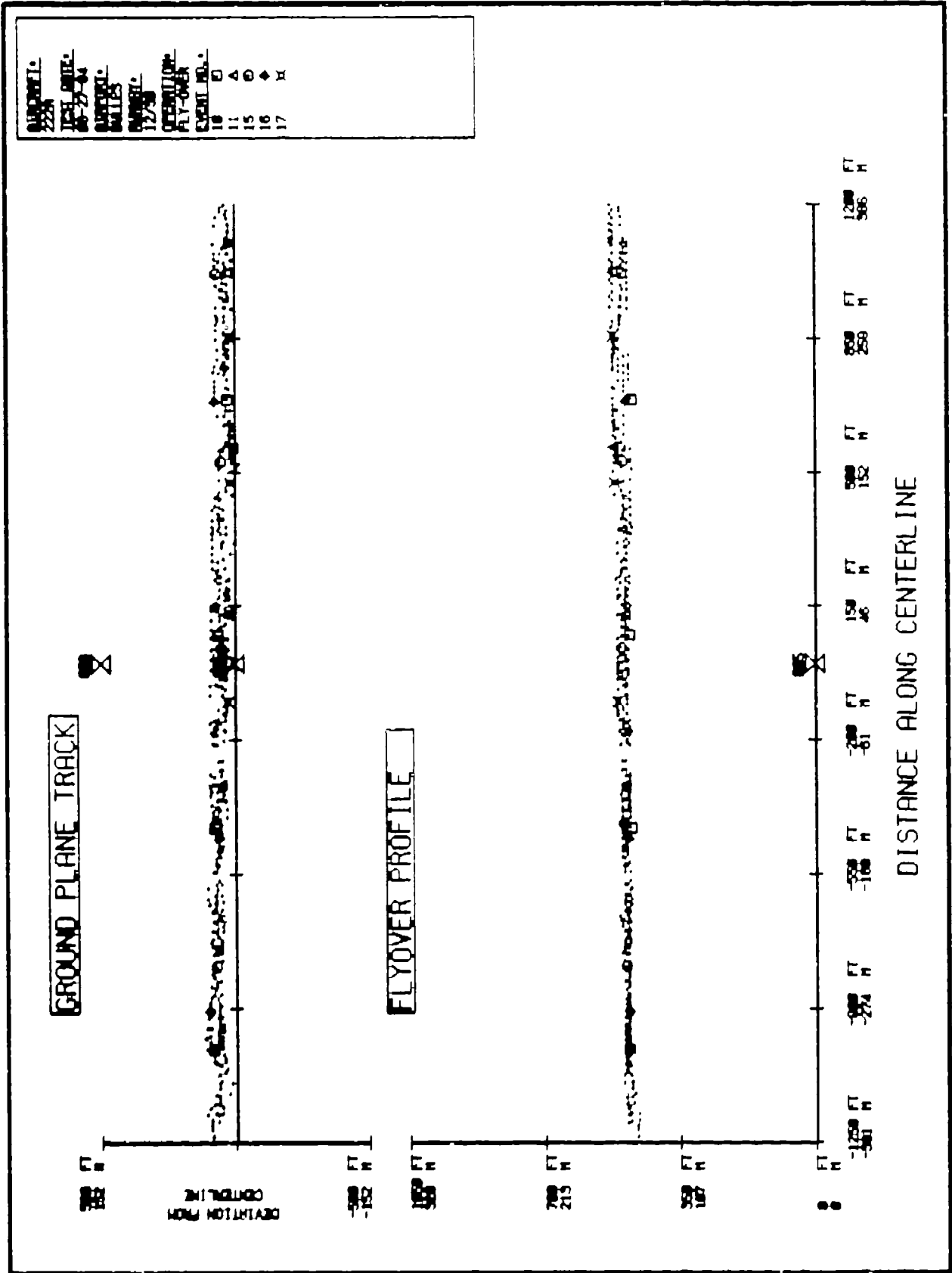
DATE 06/28/84

XXFAA/AEEXX

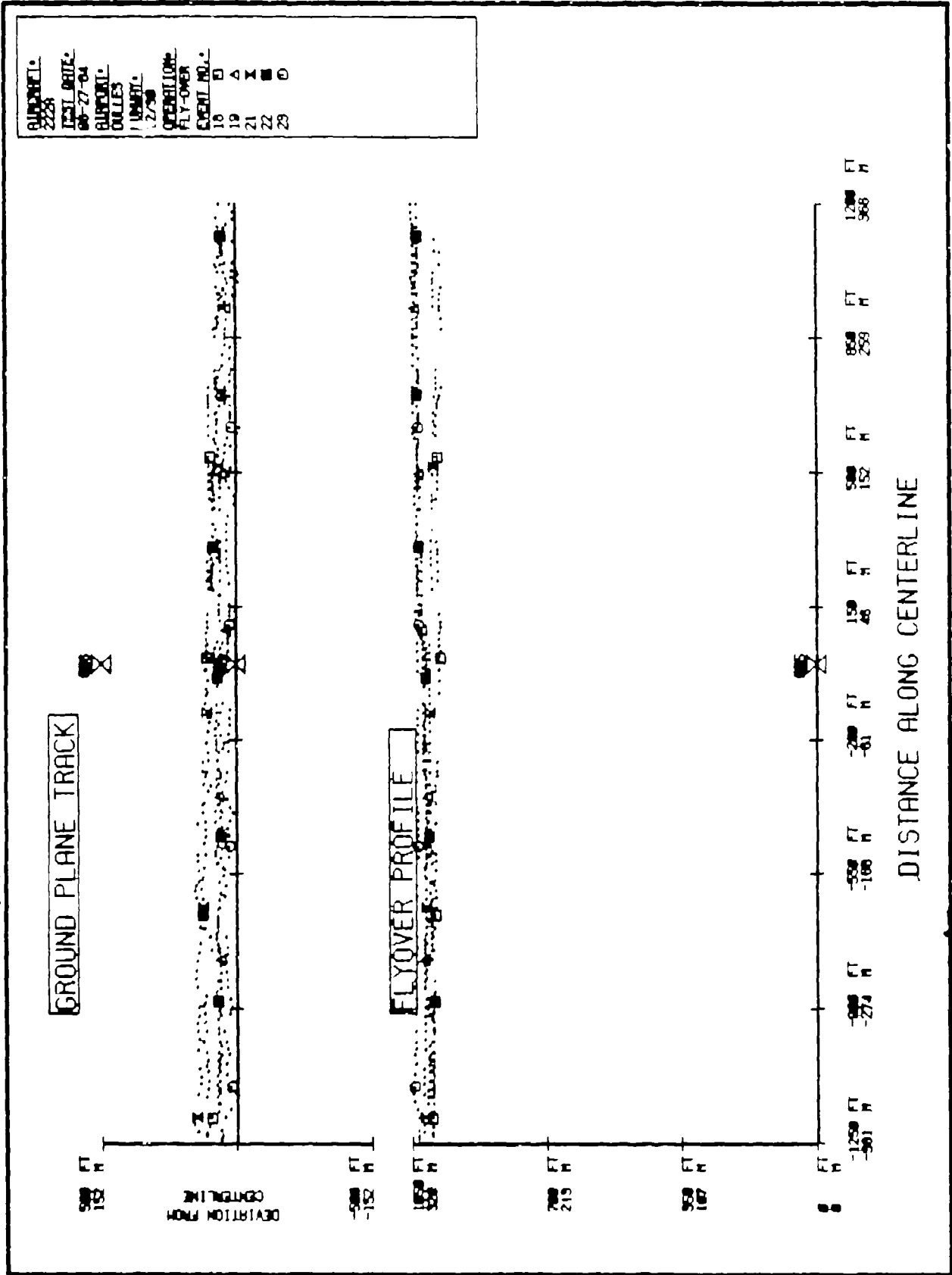
| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|-----|--------|---------|------------|--------|-------|------|
| 15 DEG. BANK ANGLE TURN, 65 KTS. | | | | | | | |
| 30 | F/O | 2012.2 | 13.1 | 12:14:33.1 | 11.5 | 0.1 | 60.7 |
| 31 | | ----- | NO DATA | ----- | | | |
| 32 | F/O | 2071.9 | 11.6 | 12:17:39.3 | -246.5 | -2.3 | 61.3 |
| 33 | F/O | 2089.8 | 12.2 | 12:19:18.6 | 30.0 | 0.4 | 46.3 |
| 34 | | ----- | NO DATA | ----- | | | |
| 35 | F/O | 2108.5 | 11.4 | 12:22:41.5 | 62.9 | 0.5 | 66.6 |
| 30 DEG. BANK ANGLE TURN, 65 KTS. | | | | | | | |
| 36 | F/O | 2346.5 | 11.5 | 12:24:51.3 | -135.6 | -1.2 | 62.0 |
| 37 | F/O | 2058.1 | 13.0 | 12:26:24.8 | 208.3 | 1.5 | 70.4 |
| 38 | F/O | 1903.0 | 12.7 | 12:27:43.8 | 155.6 | 1.8 | 49.0 |
| 39 | F/O | 2087.0 | 12.6 | 12:29:38.4 | -200.2 | -1.7 | 67.4 |
| 40 | F/O | 2037.9 | 12.9 | 12:31:13.7 | 181.0 | 1.5 | 67.0 |
| 41 | | ----- | NO DATA | ----- | | | |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

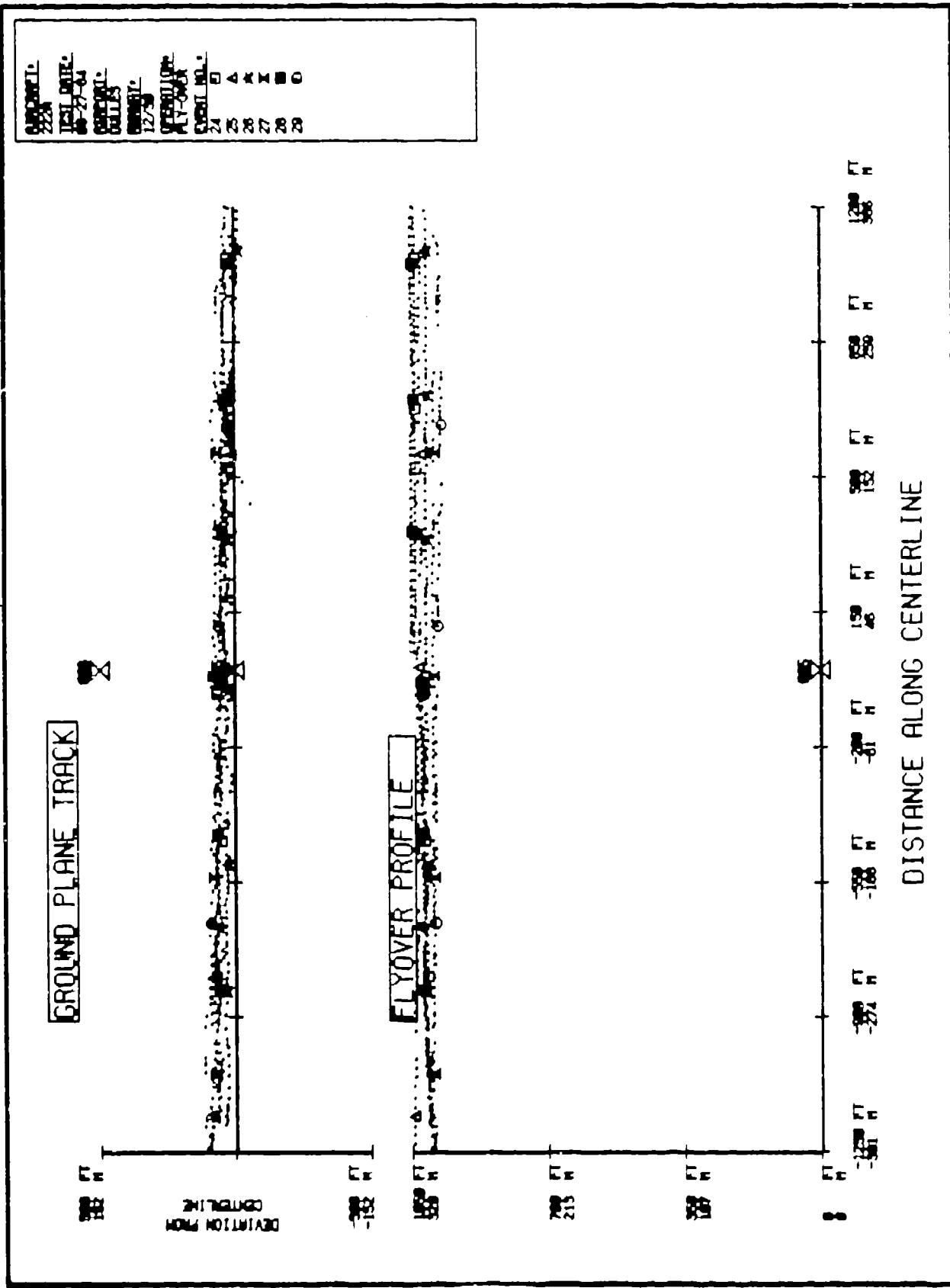
500 FT. LEVEL FLYOVER



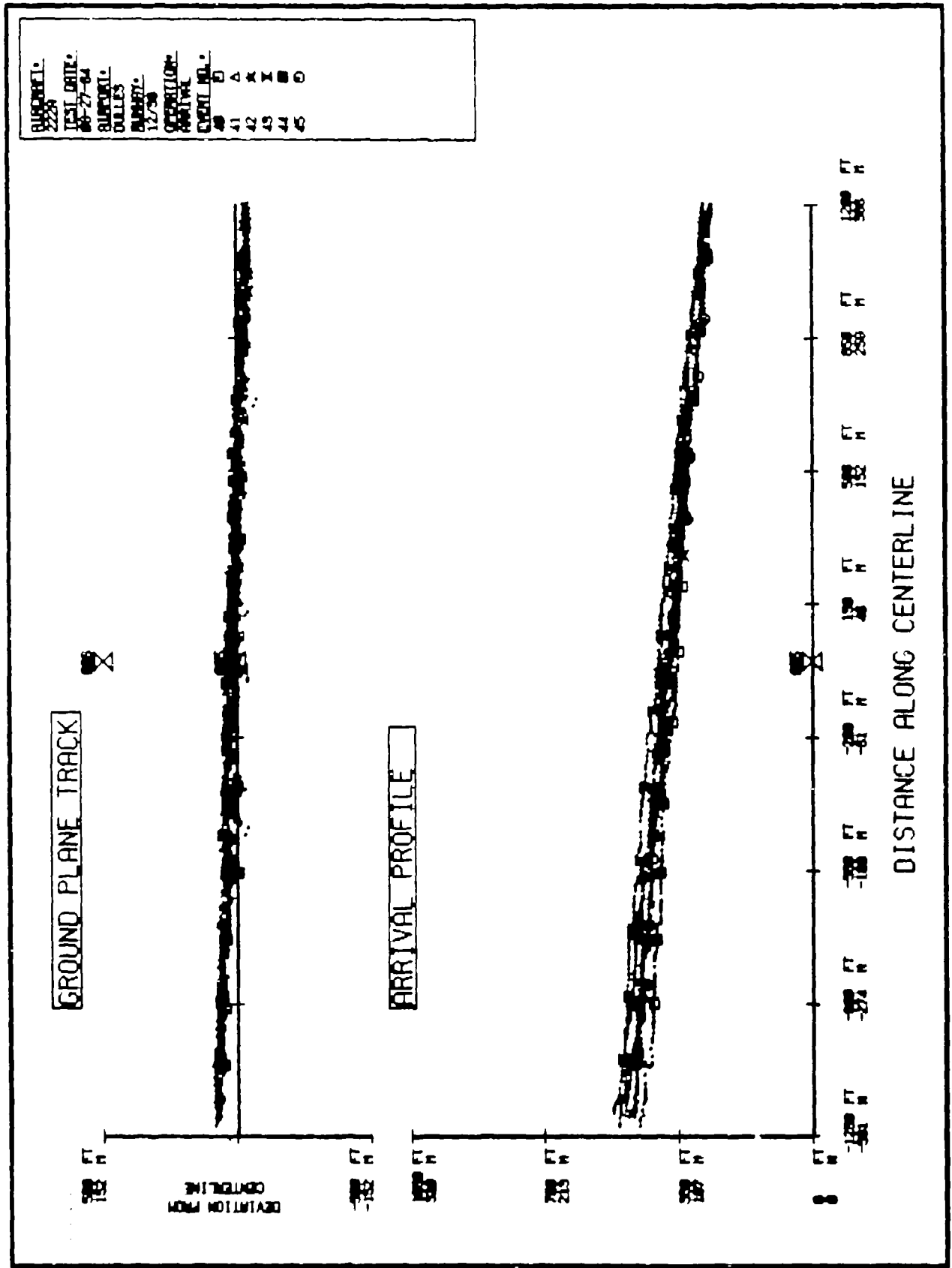
1000 FT. LEVEL FLYOVER



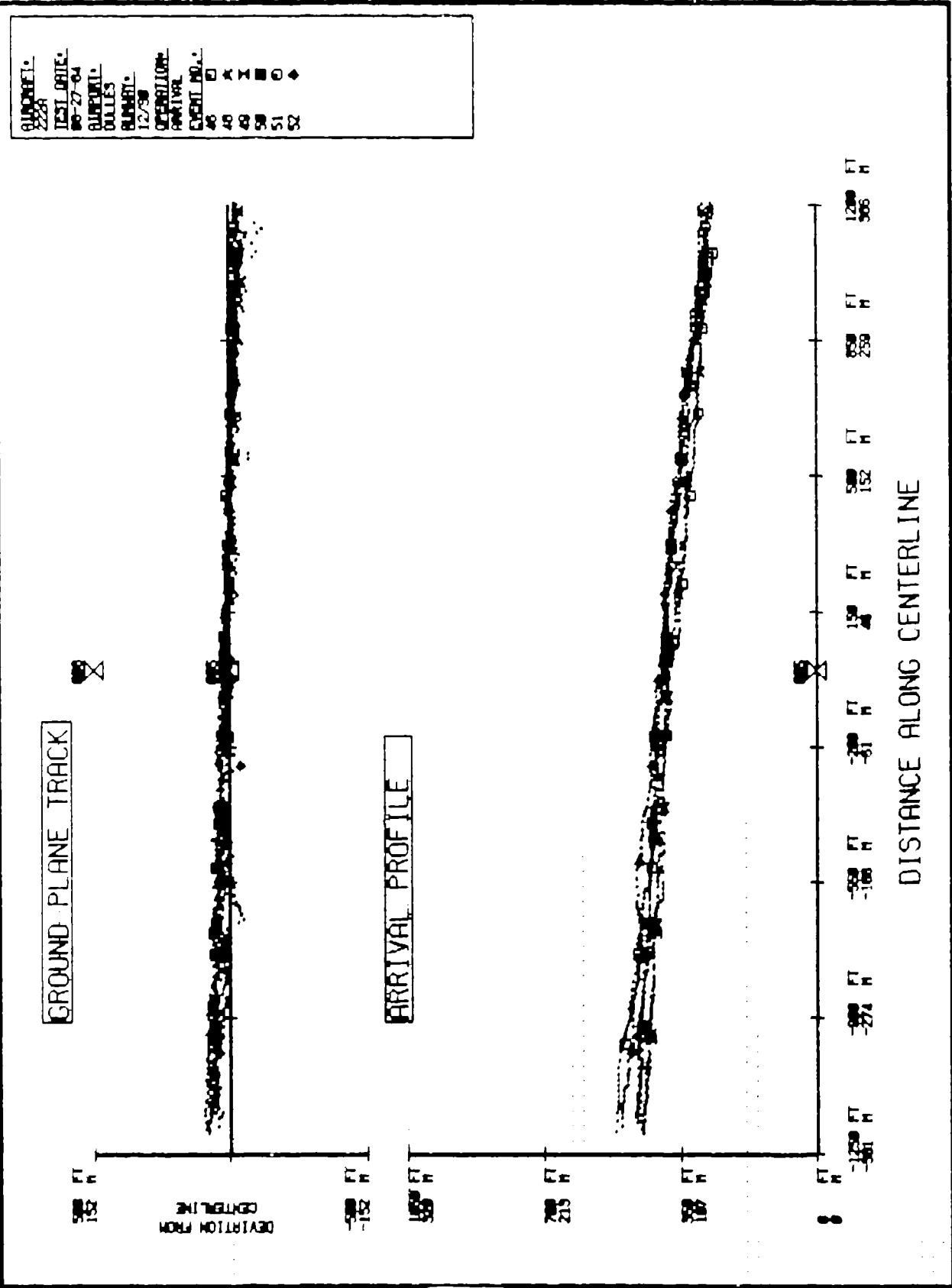
1000 FT. LEVEL FLYOVER



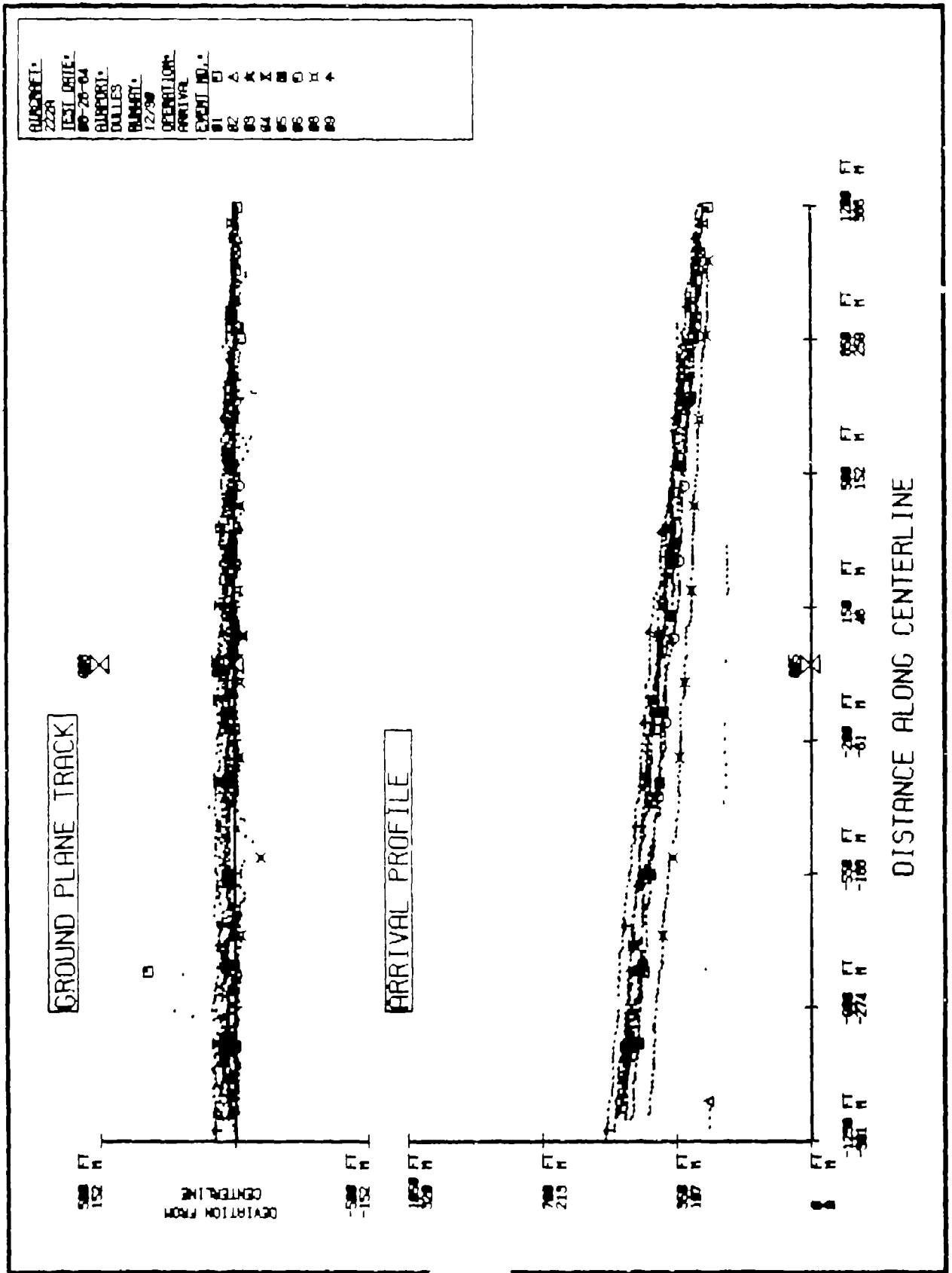
SIX APPROACH at Vy, 65 Kts.



NOISE ABATEMENT APPROACH (6° target, Var. A/S)

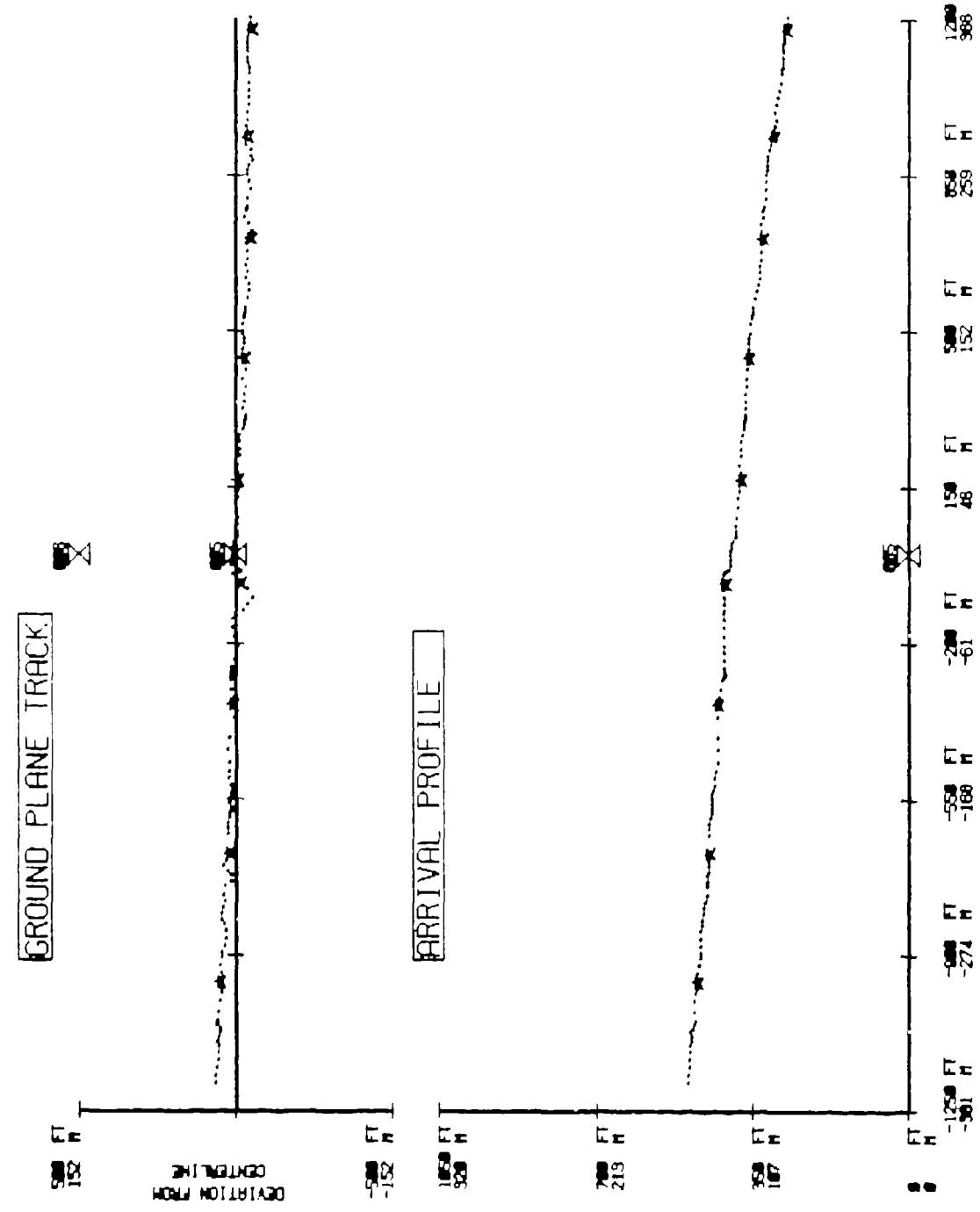


NOISE ABATEMENT APPROACH (Var. R/D & A/S)

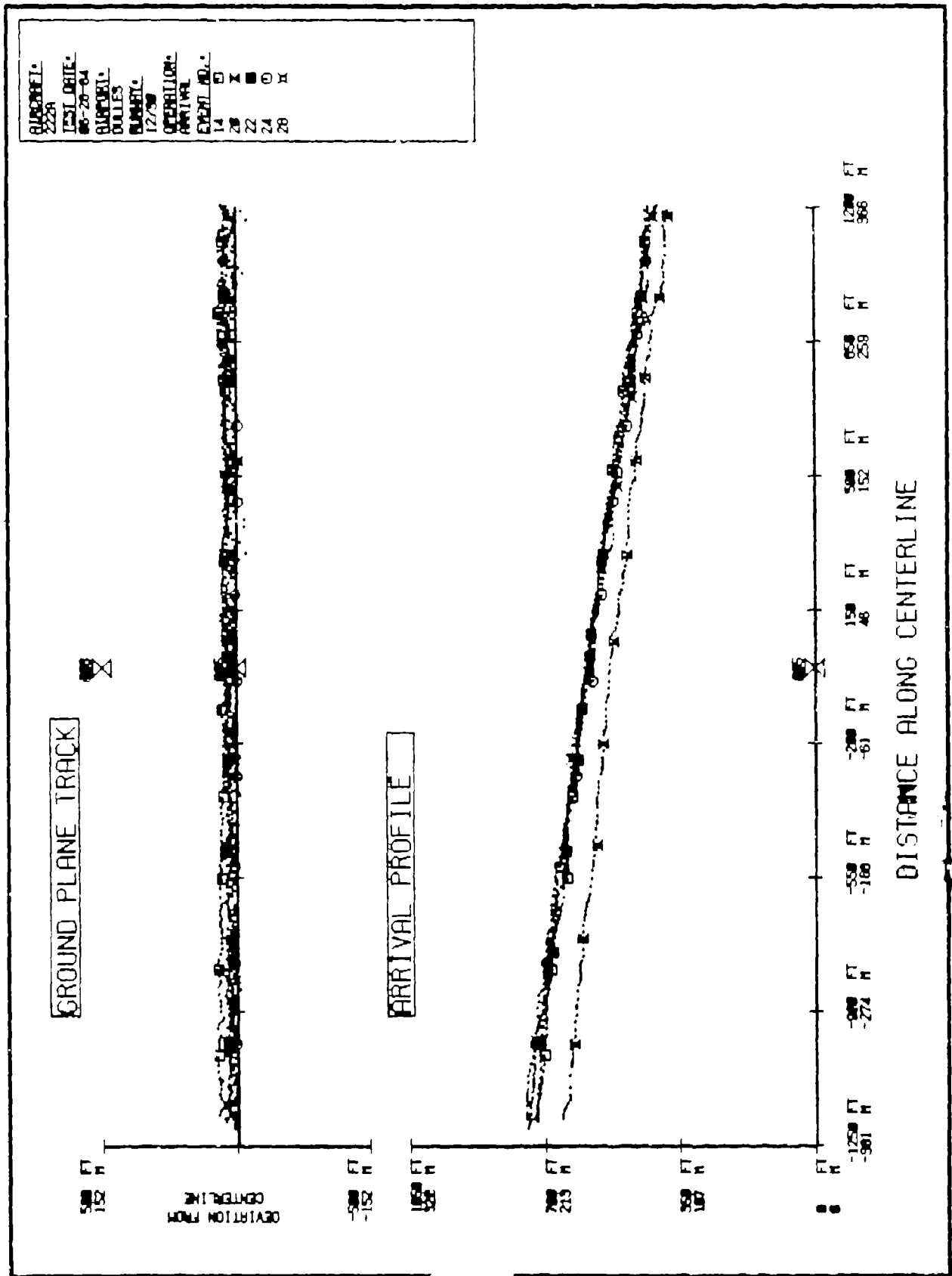


NOISE ABATEMENT APPROACH (6° Target, Var. A/S)

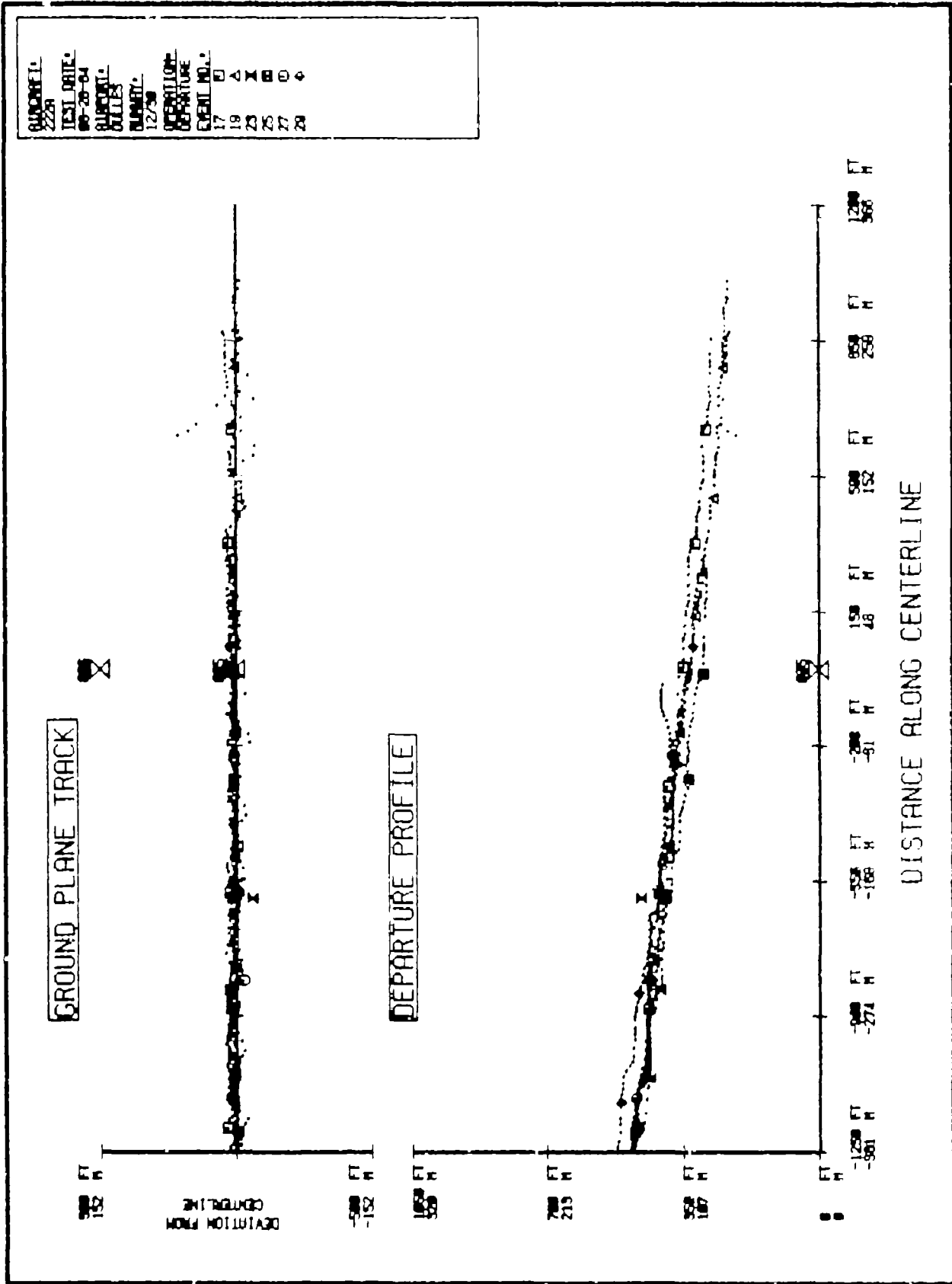
AIRCRAFT: 222A
 TEST DATE: 00-20-04
 AIRCRAFT: BULLES
 ALTITUDE: 12750
 OPERATIONS: ARRIVAL
 EVENT NO.: 12 A



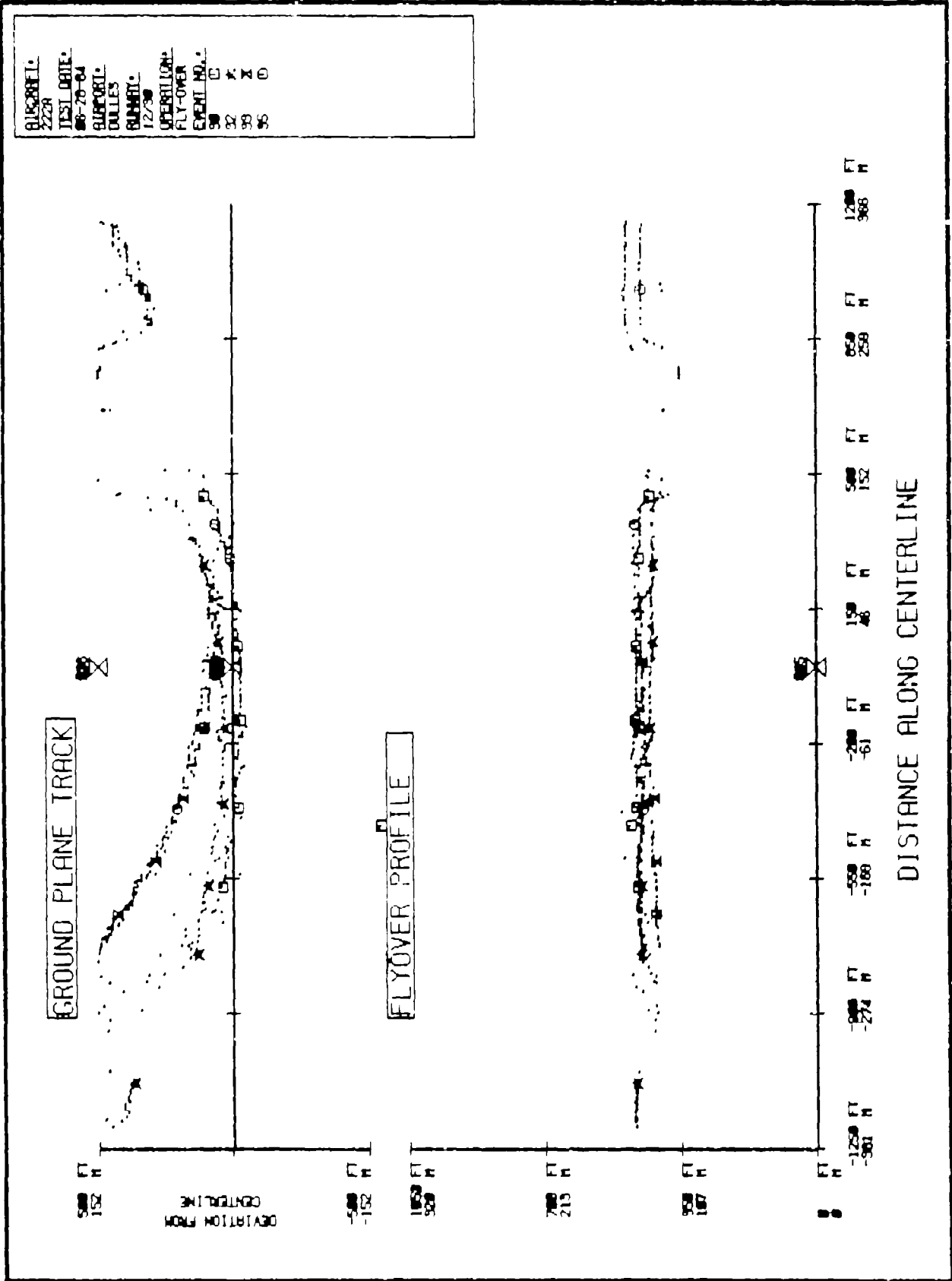
NORMAL APPROACH



NORMAL TAKEOFF



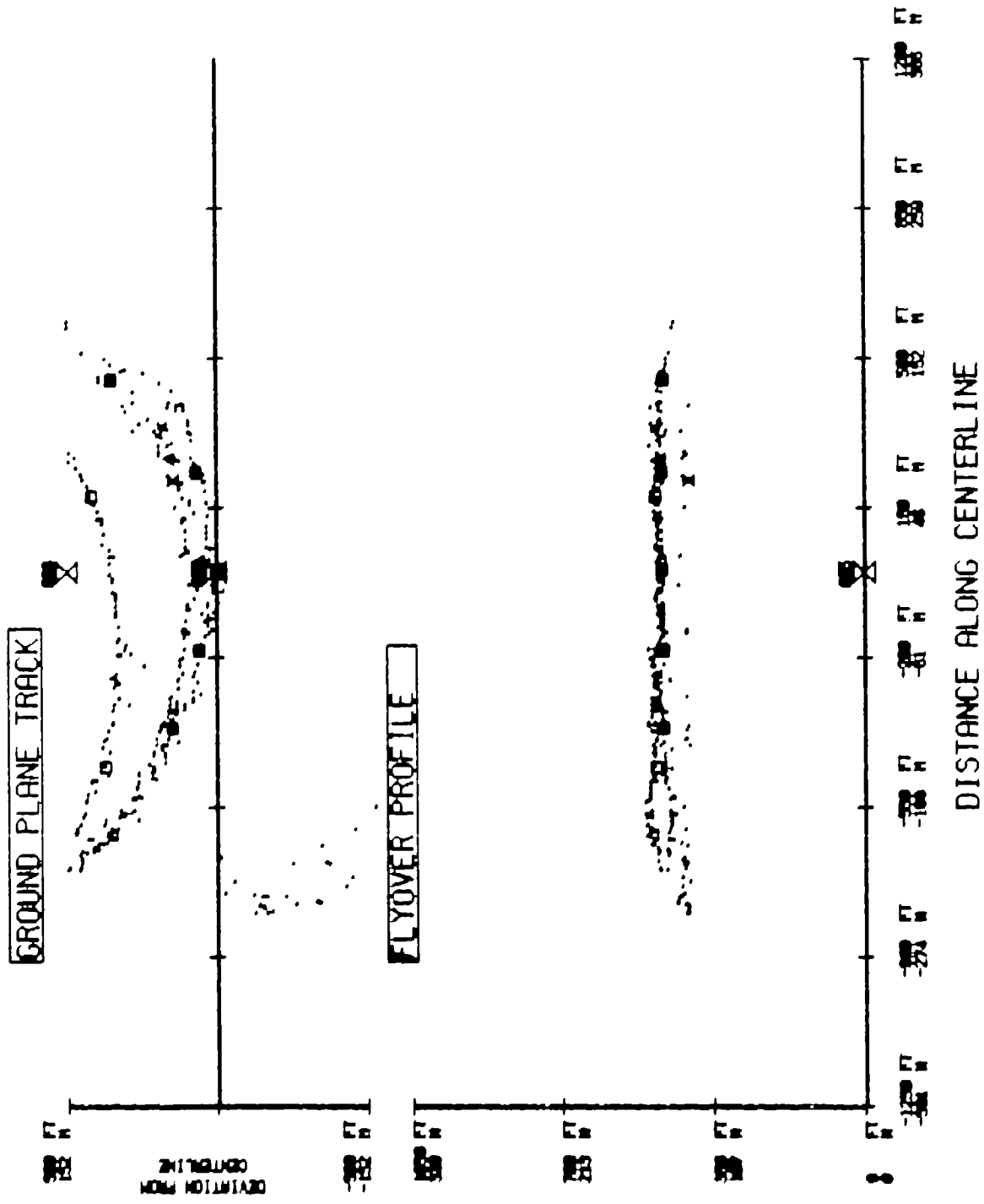
15 DEG. BANK ANGLE TURN



AIRCRAFT: 222A
 TEST DATE: 86-70-04
 AIRPORT: DULLES
 SUMMARY: 12/2/86
 OPERATION: FLY-OVER
 EVENT NO.: 98
 ID: X
 ID: 96

30 DEG. BANK ANGLE TURN

SUBJECT: 222A
 TEST DATE: 8-28-64
 SUBJECT: GULLES
 SUBJECT: BUNNETT
 OPERATOR: FLY-500A
 EVENT NO.: 36 A 4 X 0
 37 A 4 X 0
 38 A 4 X 0
 39 A 4 X 0
 40 A 4 X 0



METEOROLOGICAL DATA

THIS SECTION OF THE APPENDIX CONTAINS WEATHER DATA FROM SEVERAL TYPES OF METEOROLOGICAL EQUIPMENT: THERMISTOR TOWER (MET), GROUND LEVEL PSYCHROMETER, AIRCRAFT (Q1), AND PNEUMO BALLOONS. DATA FROM THE MET TOWER INCLUDE THE TEMPERATURE, RELATIVE HUMIDITY, WIND DIRECTION AND WIND SPEED MEASURED FREQUENTLY EVERY 15 MINUTES DURING EACH PLIGHT EVENT. RECORDS OF A FAILURE OF THE MET TOWER DEW POINT SENSOR. THE RELATIVE HUMIDITY WAS CALCULATED USING TEMPERATURE FROM THE MET TOWER AND DEW POINT FROM THE GROUND LEVEL PSYCHROMETER STATION. GROUND LEVEL (4 FEET) TEMPERATURE AND RELATIVE HUMIDITY ARE GIVEN FOR DIFFERENT TIMES OF EACH TEST DAY, AND THE HELICOPTER'S (Q1) READINGS ARE SHOWN FOR DIFFERENT ALTITUDE READINGS AT VARIOUS TIMES OF THE DAY. THE PNEUMO BALLOON WIND DATA, TAKEN INDIVIDUALLY DURING EACH TEST DAY, INCLUDES THE WIND DIRECTION AND WIND SPEED AT VARIOUS ALTITUDES.

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: BELL 222A

DATE: 6/28/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |
| | | | | (MPH) | |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | |
|------|----|----|-----|---|---|
| 8:00 | 71 | 81 | 180 | 5 | - |
| 8:15 | 72 | -- | 180 | 5 | - |

6 DEGREE TARGET, VAR. AIRSPEED

| | | | | | |
|------|----|----|-----|---|----|
| 8:30 | 72 | -- | 180 | 6 | 9 |
| 8:45 | 72 | -- | 180 | 7 | 10 |

NORMAL APPROACH AND TAKEOFF

| | | | | | |
|------|----|----|-----|---|----|
| 8:45 | 72 | -- | 180 | 7 | 10 |
| 9:00 | 72 | 81 | 180 | 7 | - |
| 9:15 | 73 | -- | 180 | 7 | - |

15 AND 30 DEGREE TURNS AT 65 KTS.

| | | | | | |
|-------|----|----|-----|---|---|
| 12:00 | 80 | 62 | 200 | 3 | - |
| 12:15 | 82 | -- | 200 | 3 | - |
| 12:30 | 84 | -- | 200 | 3 | - |
| 12:45 | 84 | -- | 200 | 3 | - |
| 13:00 | 82 | 57 | 200 | 4 | - |

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: BELL 222A

DATE: 6/27/84

| TIME | TEMP. (DEG. F) | R.H. % | WIND DIR. (DEG.) | WIND SPEED | |
|------|-------------------|-----------|---------------------|------------|-----|
| | | | | AVG. | MAX |

(MPH)

500 FT. LEVEL FLYOVER AT 120 KTS.

| | | | | | |
|------|----|----|-----|---|---|
| 9:00 | 67 | 75 | 200 | 4 | - |
| 9:15 | 68 | -- | 200 | 4 | - |

1000 FT. LEVEL FLYOVER AT 120 KTS.

| | | | | | |
|-------|----|----|-----|---|---|
| 9:30 | 70 | -- | 200 | 3 | 5 |
| 9:45 | 71 | -- | 200 | 4 | - |
| 10:00 | 72 | 71 | 200 | 4 | - |

6 DEGREE APPROACH AT 65 KTS.

| | | | | | |
|------|----|----|-----|----|----|
| 1:30 | 84 | -- | 200 | 8 | 12 |
| 1:45 | 84 | -- | 200 | 10 | 14 |
| 2:00 | 84 | 36 | 200 | 12 | 15 |

6 DEGREE APPROACH, VAR. AIRSPEED

| | | | | | |
|------|----|----|-----|----|----|
| 2:00 | 84 | 36 | 200 | 12 | 15 |
| 2:15 | 84 | -- | 200 | 11 | 15 |
| 2:30 | 86 | -- | 200 | 12 | 16 |
| 2:45 | 86 | -- | 200 | 10 | 13 |
| 3:00 | 86 | 35 | 200 | 12 | 18 |

METEOROLOGICAL DATA

HELICOPTER: BELL 222A

DATE: 06/26/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS OAT GAUGE DATA

| TIME | TEMP. | R.H. |
|-------|-------|------|
| 08:08 | 68 F | 59% |
| 08:22 | 68 F | 55% |
| 08:38 | 69 F | 51% |
| 08:54 | 69 F | 47% |
| 09:36 | 70 F | 44% |
| 10:05 | 69 F | 43% |
| 11:05 | 71 F | 41% |
| 11:24 | 75 F | 34% |
| 12:09 | 75 F | 37% |
| 12:23 | 75 F | 31% |
| 13:08 | 74 F | 36% |
| 13:21 | 76 F | 35% |
| 13:50 | 78 F | 30% |

| TIME | ALTITUDE | TEMP. |
|-------|----------|-------|
| 8:00 | 200' | 61 F |
| | 500' | 61 F |
| | 1000' | 59 F |
| 10:50 | 200' | 68 F |
| | 500' | 64 F |
| | 1000' | 63 F |

METEOROLOGICAL DATA

HELICOPTER: BELL 222A

DATE: 06/27/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS 04' JUAGE DATA

| TIME | TEMP. | R.H. |
|-------|-------|------|
| 07:45 | 69 F | 55% |
| 08:07 | 70 F | 55% |
| 08:27 | 72 F | 50% |
| 08:45 | 73 F | 50% |
| 09:05 | 75 F | 48% |
| 09:18 | 77 F | 45% |
| 09:38 | 80 F | 41% |
| 10:19 | 82 F | 36% |
| 10:32 | 85 F | 36% |
| 10:59 | 85 F | 30% |
| 01:33 | 89 F | 23% |
| 01:48 | 90 F | 22% |

| TIME | ALTITUDE | TEMP. |
|------|----------|-------|
| 8:15 | 200' | 63 F |
| | 400' | 63 F |
| | 600' | 66 F |
| | | |
| | 200' | 70 F |
| | 350' | 70 F |
| | 400' | 70 F |
| | 600' | 68 F |

METEOROLOGICAL DATA

HELICOPTER: BELL 222A

DATE: 06/28/84

TEMPERATURE AND RELATIVE HUMIDITY DATA

(MEASURED AT 4 FT. AGL)

HELICOPTERS OAT GUAGE DATA

| TIME | TEMP. | R.H. |
|-------|-------|------|
| 07:45 | 72 F | 68% |
| 07:58 | 76 F | 59% |
| 08:15 | 76 F | 62% |
| 08:34 | 76 F | 59% |
| 08:45 | 76 F | 59% |
| 09:15 | 77 F | 60% |
| 09:38 | 78 F | 60% |
| 12:17 | 85 F | 61% |

| TIME | ALTITUDE | TEMP. |
|------|----------|-------|
| 7:30 | 200' | 70 F |
| | 400' | 70 F |
| | 600' | 70 F |
| | 800' | 70 F |
| | 1000' | 70 F |
| | | |
| | 200' | 72 F |
| | 400' | 70 F |
| | 600' | 70 F |
| | 800' | 70 F |
| | 1000' | 70 F |

PILOT BALLOON WIND DATA

BELL 222A

06/26/84

| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
|---------------|---------------------|--------------------|---------------------|--------------------|

LAUNCH TIME:

7:58

9:39

| | | | | |
|------|-----|----|-----|----|
| SFC | 340 | 6 | 360 | 7 |
| 354 | 333 | 9 | 328 | 9 |
| 708 | 339 | 10 | 331 | 9 |
| 1033 | 345 | 13 | 338 | 11 |
| 1358 | 350 | 15 | 346 | 13 |

10:07

10:33

| | | | | |
|------|-----|----|-----|----|
| SFC | 340 | 10 | 360 | 9 |
| 354 | 346 | 22 | 345 | 10 |
| 708 | 347 | 24 | 342 | 12 |
| 1033 | 349 | 25 | 339 | 17 |
| 1358 | 350 | 25 | 338 | 21 |

11:14

1:28

| | | | | |
|------|-----|----|-----|----|
| SFC | 360 | 12 | 340 | 10 |
| 354 | 359 | 17 | 319 | 9 |
| 708 | 357 | 18 | 319 | 9 |
| 1033 | 354 | 19 | 317 | 9 |
| 1358 | 352 | 18 | 320 | 8 |

PILOT BALLOON WIND DATA

BELL 222A

06/27/84

| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
|---------------|---------------------|--------------------|---------------------|--------------------|

LAUNCH TIME:

7:48

8:49

| | | | | |
|------|-----|----|-----|----|
| SFC | 210 | 6 | 180 | 5 |
| 354 | 229 | 8 | 242 | 5 |
| 708 | 224 | 5 | 239 | 9 |
| 1033 | 236 | 12 | 236 | 13 |
| 1358 | 237 | 13 | 232 | 17 |

1:37

| | | | | |
|------|-----|----|--|--|
| SFC | 270 | 10 | | |
| 354 | 243 | 8 | | |
| 708 | 241 | 8 | | |
| 1033 | 235 | 7 | | |
| 1358 | 229 | 7 | | |

PILOT BALLOON WIND DATA

BELL 222A

(6/28/84)

06/28/84

| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
| ----- | | | | |
| LAUNCH TIME: | | 7:50 | | 8:37 |
| SFC | 210 | 8 | 235 | 5 |
| 354 | 212 | 9 | 239 | 5 |
| 708 | 212 | 7 | 251 | 3 |
| 1033 | 218 | 5 | 281 | 3 |
| 1358 | 233 | 3 | 295 | 3 |
| | | 9:05 | | |
| SFC | 210 | 2 | | |
| 354 | 231 | 4 | | |
| 708 | 230 | 3 | | |
| 1033 | 253 | 2 | | |
| 1358 | 297 | 2 | | |

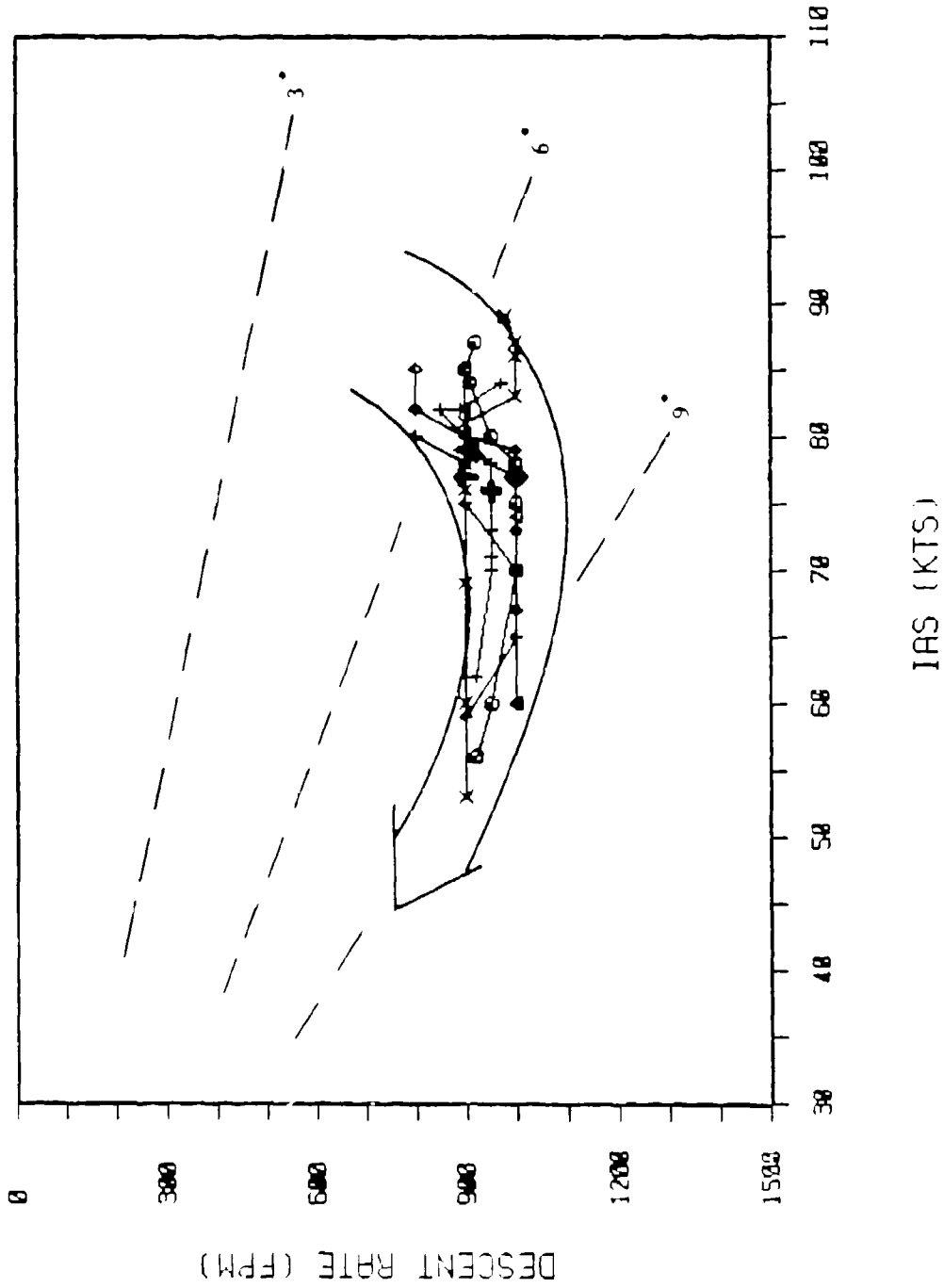
COCKPIT VIDEO

DATA

- - - - -

- THIS SECTION OF THE APPENDIX CONTAINS FLIGHT PROFILE -
- PLOTS AND INDIVIDUAL EVENT DATA READ EVERY 3 SECONDS -
- FROM PLAYBACK OF THE COCKPIT VIDEO RECORDINGS. IN THE -
- PROFILE PLOTS, INDICATED AIRSPEED VS. DESCENT RATE -
- ARE PLOTTED FOR THE NORMAL APPROACHES. AN ARROW IS -
- DRAWN WHICH BOUNDS THE DATA POINTS AND PORTRAYS THE -
- SPEED-DESCENT RATE TREND WITH TIME. THE DARKER DATA -
- POINTS INDICATE WHEN THE HELICOPTER PASSED OVER THE CLL -
- POSITION. THE INDIVIDUAL EVENT DATA CONTAINS LISTINGS -
- OF ALL THE COCKPIT INSTRUMENT READINGS OBTAINED FROM THE -
- VIDEO PLAYBACK. THIS DATA ENCOMPASSES THE HELICOPTERS'S -
- FLIGHT PARAMETERS THROUGHOUT THE ENTIRE DATA RUN PLUS OR -
- MINUS 15 SECONDS (MINIMUM) FROM CLL. -
- - - - -

NORMAL APPROACH
222A



○ B16
+ B18
x B20
△ B22
◇ B24
⋈ B26

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(6 DEG. TARGET, VAR. A/S)

HELICOPTER: BELL 222A

DATE: 06/27/84

EVENT: D46

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 790 | 32 | 800 | 92 | 4.93 |
| -22 | 740 | -- | 800 | 93 | 4.87 |
| -17 | 660 | 22 | 850 | 90 | 5.35 |
| -12 | 590 | 22 | 1000 | 90 | 6.30 |
| -7 | 520 | 20 | 900 | 87 | 5.86 |
| -2 | 440 | 20 | 1000 | 85 | 6.67 |
| CLC 0 | 420 | 20 | 900 | 83 | 6.15 |
| 3 | 360 | 20 | 900 | 80 | 6.38 |
| 8 | 330 | 18 | 900 | 75 | 6.81 |
| 13 | 260 | 16 | 800 | 65 | 6.98 |
| 18 | 220 | 19 | 600 | 57 | 5.97 |
| 23 | 200 | 18 | 570 | 48 | 5.90 |

EVENT: D47

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -33 | 940 | 30 | 920 | 90 | 5.79 |
| -28 | 750 | 31 | 950 | 88 | 6.12 |
| -23 | 690 | 27 | 900 | 90 | 5.67 |
| -18 | 630 | 21 | 1000 | 90 | 6.30 |
| -13 | 580 | 20 | 900 | 90 | 5.67 |
| -8 | 520 | 29 | 900 | 90 | 5.67 |
| -3 | 470 | 38 | 800 | 85 | 5.33 |
| CLC 0 | 440 | 20 | 850 | 85 | 5.67 |
| 2 | 420 | 19 | 850 | 84 | 5.71 |
| 7 | 360 | 16 | 850 | 73 | 6.60 |
| 12 | 290 | 20 | 700 | 73 | 5.43 |
| 17 | 240 | 18 | 700 | 67 | 5.92 |

EVENT: D48

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 800 | 27 | 900 | 90 | 5.67 |
| -25 | 740 | 24 | 1000 | 86 | 6.59 |
| -20 | 660 | 20 | 1000 | 90 | 6.30 |
| -15 | 620 | 19 | 920 | 86 | 6.06 |
| -10 | 520 | 20 | 900 | 88 | 5.80 |
| -5 | 460 | 32 | 800 | 88 | 5.15 |
| CLC 0 | 420 | 29 | 900 | 90 | 5.67 |
| 5 | 350 | 19 | 900 | 83 | 6.15 |
| 10 | 300 | 11 | 900 | 80 | 6.38 |
| 15 | 280 | 10 | 850 | 76 | 6.34 |
| 20 | 220 | 5 | 700 | 63 | 6.30 |

EVENT: D49

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -38 | 880 | 20 | 900 | 90 | 5.67 |
| -33 | 870 | 20 | 1000 | 89 | 6.37 |
| -28 | 820 | 17 | 1000 | 90 | 6.30 |
| -23 | 690 | 17 | 1000 | 90 | 6.30 |
| -18 | 620 | 12 | 1000 | 90 | 6.30 |
| -13 | 540 | 19 | 1000 | 88 | 6.44 |
| -8 | 490 | 18 | 1000 | 85 | 6.67 |
| -3 | 450 | 18 | 850 | 80 | 6.02 |
| CLC 0 | 430 | 18 | 700 | 78 | 5.08 |
| 2 | 420 | 18 | 700 | 78 | 5.08 |
| 7 | 360 | 20 | 600 | 77 | 4.41 |
| 12 | 320 | 17 | 690 | 70 | 5.59 |
| 17 | 270 | 9 | 650 | 65 | 5.67 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (6 DEG. TARGET, VAR. A/S)

HELICOPTER: BELL 222A

DATE: 06/27/84

EVENT: D50

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -34 | 890 | 25 | 900 | 90 | 5.67 |
| -29 | 820 | 24 | 900 | 86 | 5.93 |
| -24 | 725 | 21 | 1000 | 90 | 6.30 |
| 19 | 640 | 20 | 1000 | 85 | 6.67 |
| -14 | 580 | 19 | 1000 | 85 | 6.67 |
| -9 | 500 | 20 | 900 | 83 | 6.15 |
| -4 | 460 | 21 | 800 | 80 | 5.67 |
| CLC 0 | 440 | 20 | 680 | 75 | 5.14 |
| 6 | 390 | 18 | 750 | 73 | 5.62 |
| 11 | 320 | 20 | 800 | 65 | 6.98 |
| 16 | 280 | 25 | 690 | 60 | 6.52 |
| 21 | 230 | 20 | 700 | 52 | 7.64 |

EVENT: D52

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -39 | 920 | 27 | 1000 | 90 | 6.30 |
| -34 | 860 | 30 | 900 | 92 | 5.54 |
| -29 | 810 | 25 | 900 | 92 | 5.54 |
| -24 | 730 | 29 | 1000 | 90 | 6.30 |
| -19 | 660 | 20 | 1000 | 85 | 6.67 |
| -14 | 580 | 20 | 1000 | 90 | 6.30 |
| -9 | 510 | 22 | 900 | 89 | 5.73 |
| -4 | 500 | 20 | 800 | 86 | 5.27 |
| CLC 0 | 450 | 20 | 800 | 83 | 5.46 |
| 6 | 400 | 20 | 800 | 80 | 5.67 |
| 11 | 350 | 20 | 850 | 75 | 6.43 |
| 16 | 280 | 20 | 850 | 70 | 6.89 |
| 21 | 220 | 20 | 700 | 60 | 6.62 |

EVENT: D51

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 780 | 10 | 1100 | 90 | 6.93 |
| -25 | 690 | 20 | 1100 | 95 | 6.57 |
| -20 | 620 | 18 | 1000 | 95 | 5.97 |
| -15 | 530 | 18 | 1000 | 90 | 6.30 |
| -10 | 480 | 20 | 900 | 88 | 5.80 |
| -5 | 470 | 20 | 900 | 88 | 5.80 |
| CLC 0 | 430 | 18 | 800 | 78 | 5.81 |
| 5 | 420 | 17 | 800 | 75 | 6.05 |
| 10 | 380 | 18 | 800 | 72 | 6.30 |
| 15 | 300 | 10 | 800 | 65 | 6.98 |
| 20 | 250 | 15 | 700 | 62 | 6.40 |
| 25 | 200 | 20 | 600 | 60 | 5.67 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: BELL 222A

DATE: 06/28/84

EVENT: D2

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -35 | 1060 | 25 | 750 | 90 | 4.72 |
| -30 | 1000 | 25 | 900 | 90 | 5.67 |
| -25 | 930 | 29 | 900 | 95 | 5.37 |
| -20 | 840 | 25 | 1000 | 95 | 5.97 |
| -15 | 730 | 18 | 1300 | 93 | 7.93 |
| -10 | 660 | 10 | 1200 | 90 | 7.57 |
| -5 | 590 | 16 | 1000 | 85 | 6.67 |
| CLC 0 | 530 | 16 | 900 | 84 | 6.07 |
| 5 | 460 | 19 | 1000 | 84 | 6.75 |
| 10 | 360 | 10 | 1000 | 80 | 7.09 |
| 15 | 280 | 3 | 900 | 70 | 7.29 |
| 20 | 230 | 5 | 900 | 54 | 9.47 |

EVENT: D4

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -34 | 1010 | 25 | 600 | 90 | 3.77 |
| -29 | 960 | 30 | 750 | 90 | 4.72 |
| -24 | 920 | 20 | 1000 | 93 | 6.10 |
| -19 | 820 | 20 | 1000 | 93 | 6.10 |
| -14 | 720 | 20 | 1000 | 90 | 6.30 |
| -9 | 640 | 17 | 1000 | 90 | 6.30 |
| -4 | 580 | 19 | 1000 | 90 | 6.30 |
| CLC 0 | 530 | 17 | 1000 | 85 | 6.67 |
| 6 | 430 | 12 | 1000 | 80 | 7.09 |
| 11 | 360 | 10 | 1000 | 78 | 7.27 |
| 16 | 280 | 10 | 900 | 72 | 7.09 |
| 21 | 230 | 7 | 900 | 60 | 8.52 |

EVENT: D3

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -38 | 1020 | 36 | 600 | 90 | 3.77 |
| -33 | 960 | 28 | 780 | 90 | 4.91 |
| -28 | 900 | 20 | 1200 | 90 | 7.57 |
| -23 | 800 | 18 | 1100 | 90 | 6.93 |
| -18 | 700 | 18 | 1050 | 90 | 6.62 |
| -13 | 620 | 10 | 1200 | 89 | 7.65 |
| -8 | 540 | 13 | 1100 | 85 | 7.34 |
| -3 | 460 | 15 | 1000 | 83 | 6.83 |
| CLC 0 | --- | -- | -- | -- | -- |
| 2 | 390 | 11 | 1050 | 80 | 7.45 |
| 7 | 300 | 20 | 900 | 79 | 6.46 |
| 12 | 240 | 13 | 900 | 75 | 6.81 |
| 17 | 200 | 10 | 800 | 65 | 6.98 |

EVENT: D5

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 980 | 22 | 700 | 94 | 4.22 |
| -25 | 920 | 20 | 900 | 90 | 5.67 |
| -20 | 820 | 20 | 950 | 90 | 5.98 |
| -15 | 740 | 20 | 1000 | 90 | 6.30 |
| 10 | 660 | 17 | 1000 | 89 | 6.37 |
| -5 | 600 | 17 | 1000 | 85 | 6.67 |
| CLC 0 | 530 | 10 | 1000 | 80 | 7.09 |
| 5 | 460 | 12 | 900 | 80 | 6.38 |
| 10 | 390 | 10 | 900 | 75 | 6.81 |
| 15 | 330 | 10 | 900 | 70 | 7.29 |
| 20 | 280 | 10 | 900 | 60 | 8.52 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: BELL 222A

DATE: 06/28/84

EVENT: D6

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -38 | 1060 | 32 | 500 | 95 | 2.98 |
| -33 | 1000 | 30 | 700 | 95 | 4.17 |
| -28 | 930 | 20 | 900 | 90 | 5.67 |
| -23 | 860 | 20 | 1050 | 90 | 6.62 |
| -18 | 740 | 12 | 1200 | 89 | 7.65 |
| -13 | 660 | 10 | 1100 | 86 | 7.26 |
| -8 | 620 | 20 | 900 | 85 | 6.00 |
| -3 | 560 | 20 | 900 | 82 | 6.22 |
| CLC 0 | 540 | 20 | 900 | 80 | 6.38 |
| 2 | 520 | 18 | 900 | 80 | 6.38 |
| 7 | 420 | 10 | 900 | 75 | 6.81 |
| 12 | 350 | 10 | 900 | 70 | 7.29 |
| 17 | 290 | 10 | 900 | 60 | 8.52 |

EVENT: D8

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -38 | 1000 | 20 | 700 | 92 | 4.31 |
| -30 | 940 | 20 | 900 | 90 | 5.67 |
| -28 | 880 | 20 | 1000 | 92 | 6.16 |
| -20 | 820 | 22 | 1000 | 90 | 6.30 |
| -18 | 730 | 22 | 1000 | 92 | 6.16 |
| -10 | 650 | 20 | 1000 | 92 | 6.16 |
| -5 | 580 | 20 | 1000 | 90 | 6.30 |
| CLC 0 | 510 | 20 | 1000 | 89 | 6.37 |
| 5 | 430 | 18 | 1000 | 85 | 6.67 |
| 10 | 310 | 9 | 1000 | 80 | 7.09 |
| 18 | 240 | 2 | 900 | 70 | 7.29 |
| 20 | 200 | 2 | 900 | 60 | 8.52 |

EVENT: D7

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 1020 | 29 | 700 | 89 | 4.45 |
| -25 | 990 | 29 | 800 | 90 | 5.04 |
| -20 | 900 | 20 | 1000 | 90 | 6.30 |
| -15 | 820 | 12 | 1200 | 90 | 7.57 |
| -10 | 700 | 13 | 1150 | 90 | 7.25 |
| -5 | 620 | 15 | 1100 | 90 | 6.93 |
| CLC 0 | 540 | 10 | 1200 | 86 | 7.92 |
| 5 | 430 | 10 | 1150 | 80 | 8.16 |
| 10 | 350 | 5 | 900 | 79 | 6.46 |
| 15 | 290 | 1 | 1000 | 70 | 8.11 |
| 20 | 220 | 0 | 920 | 58 | 9.01 |

EVENT: D9

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -36 | 1040 | 40 | 400 | 95 | 2.38 |
| -31 | 1020 | 40 | 400 | 90 | 2.52 |
| -26 | 1000 | 25 | 650 | 90 | 4.09 |
| -21 | 930 | 22 | 900 | 90 | 5.67 |
| -16 | 840 | 22 | 1000 | 95 | 5.97 |
| -11 | 760 | 20 | 1100 | 95 | 6.57 |
| -6 | 650 | 12 | 1100 | 90 | 6.93 |
| -1 | 580 | 10 | 1000 | 89 | 6.44 |
| CLC 0 | 570 | 10 | 1000 | 88 | 6.44 |
| 3 | 530 | 10 | 1050 | 85 | 7.01 |
| 9 | 430 | 5 | 1000 | 80 | 7.09 |
| 14 | 320 | 2 | 1000 | 72 | 7.88 |
| 19 | 230 | 0 | 1000 | 60 | 9.47 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (6 DEG. TARGET, VAR. A/S)

HELICOPTER: BELL 222A

DATE: 06/28/84

EVENT: D10

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -38 | 1000 | 25 | 750 | 90 | 4.72 |
| -33 | 935 | 25 | 800 | 92 | 4.93 |
| -28 | 860 | 20 | 1000 | 91 | 6.23 |
| -23 | 760 | 20 | 1100 | 92 | 6.78 |
| -18 | 690 | 20 | 1100 | 94 | 6.64 |
| -13 | 605 | 12 | 1300 | 90 | 8.20 |
| -8 | 520 | 18 | 1050 | 90 | 6.62 |
| -3 | 440 | 20 | 1000 | 86 | 6.59 |
| CLC 0 | 400 | 28 | 900 | 87 | 5.96 |
| 2 | 370 | 29 | 900 | 85 | 6.00 |
| 7 | 330 | 20 | 900 | 84 | 6.07 |
| 12 | 260 | 15 | 900 | 80 | 6.38 |
| 17 | 200 | 10 | 850 | 73 | 6.60 |

EVENT: D12

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -33 | 870 | 20 | 1000 | 88 | 6.44 |
| -28 | 760 | 16 | 1000 | 89 | 6.37 |
| -23 | 680 | 25 | 1000 | 90 | 6.30 |
| -18 | 610 | 20 | 1000 | 90 | 6.30 |
| -13 | 570 | 40 | 800 | 90 | 5.04 |
| -8 | 530 | 28 | 900 | 90 | 5.67 |
| -3 | 440 | 30 | 800 | 90 | 5.04 |
| CLC 0 | 400 | 20 | 900 | 88 | 5.80 |
| 2 | 380 | 20 | 900 | 85 | 6.00 |
| 7 | 300 | 18 | 900 | 80 | 6.38 |
| 12 | 240 | 10 | 900 | 75 | 6.81 |
| 17 | 200 | 10 | 800 | 65 | 6.98 |

EVENT: D11

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -38 | 900 | 22 | 900 | 89 | 5.73 |
| -33 | 820 | 20 | 950 | 90 | 5.98 |
| -28 | 750 | 25 | 900 | 90 | 5.67 |
| -23 | 680 | 25 | 900 | 90 | 5.67 |
| -18 | 640 | 22 | 900 | 90 | 5.67 |
| -13 | 590 | 20 | 900 | 86 | 5.93 |
| -8 | 550 | 20 | 900 | 85 | 6.00 |
| -3 | 480 | 20 | 900 | 80 | 6.38 |
| CLC 0 | 440 | 19 | 1000 | 80 | 7.09 |
| 2 | 400 | 20 | 900 | 80 | 6.38 |
| 7 | 300 | 20 | 900 | 78 | 6.54 |
| 12 | 250 | 20 | 900 | 75 | 6.81 |
| 17 | 200 | 10 | 850 | 70 | 6.89 |

EVENT: D13

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -35 | 820 | 27 | 900 | 90 | 5.67 |
| -30 | 750 | 25 | 900 | 93 | 5.48 |
| -25 | 690 | 20 | 1000 | 90 | 6.30 |
| -20 | 610 | 20 | 900 | 90 | 5.67 |
| -15 | 550 | 18 | 900 | 84 | 6.07 |
| -10 | 500 | 20 | 900 | 82 | 6.22 |
| -4 | 430 | 22 | 850 | 80 | 6.02 |
| CLC 0 | 370 | 19 | 900 | 80 | 6.38 |
| 5 | 300 | 15 | 900 | 75 | 6.81 |
| 10 | 240 | 19 | 900 | 70 | 7.29 |
| 15 | 200 | 10 | 850 | 65 | 7.42 |
| 20 | 180 | 12 | 800 | 56 | 0.00 |

C-309

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: BELL 222A

DATE: 06/28/84

EVENT: B16

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -38 | 1080 | 37 | 500 | 86 | 3.29 |
| -33 | 1010 | 30 | 650 | 87 | 4.23 |
| -28 | 970 | 27 | 680 | 87 | 4.43 |
| -23 | 930 | 27 | 780 | 88 | 5.02 |
| -18 | 870 | 21 | 920 | 87 | 5.99 |
| -13 | 800 | 20 | 900 | 85 | 6.00 |
| -8 | 740 | 19 | 910 | 84 | 6.14 |
| -3 | 660 | 13 | 950 | 80 | 6.73 |
| CLC 0 | 620 | 10 | 1000 | 78 | 7.27 |
| 2 | 590 | 10 | 1000 | 78 | 7.27 |
| 7 | 530 | 10 | 1000 | 75 | 7.57 |
| 12 | 440 | 10 | 1000 | 70 | 8.11 |
| 17 | 350 | 10 | 950 | 60 | 9.00 |

EVENT: B18

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -34 | 600 | 37 | 600 | 91 | 3.73 |
| -29 | 820 | 20 | 820 | 88 | 5.28 |
| -24 | 860 | 20 | 860 | 86 | 5.67 |
| 19 | 970 | 14 | 970 | 84 | 6.55 |
| 14 | 890 | 18 | 890 | 82 | 6.15 |
| -9 | 850 | 18 | 850 | 82 | 5.88 |
| -4 | 950 | 14 | 950 | 78 | 6.91 |
| CLC 0 | 580 | 10 | 1000 | 78 | 7.27 |
| 1 | 950 | 10 | 950 | 76 | 7.09 |
| 6 | 950 | 10 | 950 | 73 | 7.38 |
| 11 | 950 | 11 | 950 | 71 | 7.59 |
| 16 | 950 | 13 | 950 | 70 | 7.70 |
| 21 | 920 | 12 | 920 | 62 | 8.43 |

EVENT: B20

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -37 | 1040 | 25 | 670 | 93 | 4.08 |
| -32 | 980 | 121 | 800 | 91 | 4.98 |
| -27 | 930 | 25 | 830 | 91 | 5.17 |
| -22 | 870 | 16 | 980 | 89 | 6.24 |
| -17 | 770 | 12 | 1000 | 87 | 6.52 |
| -12 | 700 | 17 | 1000 | 86 | 6.59 |
| -7 | 620 | 12 | 1000 | 83 | 6.83 |
| -2 | 560 | 15 | 900 | 81 | 6.30 |
| CLC 0 | 550 | 15 | 900 | 80 | 6.38 |
| 3 | 500 | 12 | 900 | 78 | 6.54 |
| 8 | 440 | 11 | 900 | 76 | 6.72 |
| 13 | 360 | 10 | 900 | 69 | 7.40 |
| 18 | 300 | 7 | 900 | 60 | 8.52 |

EVENT: B22

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 970 | 20 | 600 | 90 | 3.77 |
| -25 | 920 | 20 | 800 | 85 | 5.33 |
| -20 | 850 | 18 | 900 | 85 | 6.00 |
| -15 | 780 | 17 | 900 | 85 | 6.00 |
| -10 | 730 | 20 | 900 | 82 | 6.22 |
| -5 | 660 | 15 | 900 | 80 | 6.38 |
| CLC 0 | 600 | 10 | 900 | 79 | 6.46 |
| 5 | 530 | 10 | 1000 | 77 | 7.37 |
| 10 | 450 | 10 | 1000 | 74 | 7.67 |
| 15 | 360 | 10 | 1000 | 70 | 8.11 |
| 20 | 280 | 5 | 1000 | 60 | 9.47 |

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: BELL 222A

DATE: 06/28/84

EVENT: B24

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -35 | 990 | 22 | 500 | 85 | 3.33 |
| -30 | 940 | 22 | 350 | 84 | 2.36 |
| -25 | 900 | 21 | 750 | 83 | 5.12 |
| -20 | 840 | 20 | 800 | 85 | 5.33 |
| -15 | 780 | 20 | 800 | 82 | 5.53 |
| -10 | 730 | 20 | 900 | 80 | 6.38 |
| -5 | 660 | 12 | 1000 | 79 | 7.18 |
| CLC 0 | 580 | 10 | 1000 | 77 | 7.37 |
| 5 | 610 | 10 | 1000 | 73 | -- |
| 10 | 440 | 5 | 1000 | 70 | 8.11 |
| 15 | 360 | 8 | 1000 | 67 | 8.48 |
| 20 | 260 | 10 | 1000 | 60 | 9.47 |

EVENT: B26

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -36 | 980 | 20 | 700 | 80 | 4.96 |
| -31 | 940 | 20 | 700 | 80 | 4.96 |
| -26 | 900 | 30 | 800 | 83 | 5.46 |
| -21 | 840 | 20 | 800 | 80 | 5.67 |
| -16 | 760 | 20 | 800 | 80 | 5.67 |
| -11 | 720 | 20 | 800 | 80 | 5.67 |
| -6 | 660 | 20 | 900 | 78 | 6.54 |
| -1 | 590 | 19 | 900 | 75 | 6.81 |
| CLC 0 | 580 | 19 | 900 | 77 | 6.63 |
| 4 | 550 | 14 | 900 | 75 | 6.81 |
| 9 | 460 | 9 | 1000 | 70 | 8.11 |
| 14 | 380 | 5 | 1000 | 65 | 8.74 |
| 19 | 280 | 5 | 900 | 59 | 8.66 |

EVENT: B28

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 940 | 25 | 400 | 83 | 2.73 |
| -25 | 900 | 25 | 600 | 80 | 4.25 |
| -20 | 860 | 21 | 700 | 80 | 4.96 |
| -15 | 800 | 20 | 700 | 80 | 4.96 |
| -10 | 740 | 19 | 800 | 79 | 5.74 |
| -5 | 660 | 17 | 1000 | 75 | 7.57 |
| CLC 0 | 580 | 12 | 1000 | 75 | 7.57 |
| 5 | 520 | 9 | 1000 | 73 | 7.77 |
| 10 | 430 | 8 | 1100 | 65 | 9.62 |
| 15 | 300 | 10 | 1000 | 60 | 9.47 |
| 20 | 250 | 12 | 1000 | 59 | 9.64 |

APPENDIX D

ROBINSON F21

| | PAGE NUMBER |
|---------------------------------------|---------------|
| HELICOPTER CHARACTERISTICS..... | D-315 |
| <u>NOISE LEVEL DATA</u> | |
| SOUND EXPOSURE LEVEL | |
| Bar Charts | |
| Approaches..... | D-318 |
| Takeoff..... | D-319 |
| Level Flavors..... | D-320 |
| Summary Tables..... | D-321 - D-327 |
| Individual Event Data..... | D-328 - D-329 |
| A-WEIGHTED SOUND LEVEL | |
| Bar Charts | |
| Approaches..... | D-330 |
| Takeoff..... | D-331 |
| Level Flavors..... | D-332 |
| Summary Tables..... | D-333 - D-334 |
| Individual Event Data..... | D-335 - D-340 |
| HOVER DATA (leq) | |
| Plots..... | D-342 |
| Individual Event Data..... | D-343 - D-344 |
| <u>RADAR TRACKING DATA</u> | |
| Position Data..... | D-346 - D-359 |
| Tracking Plots..... | D-360 - D-365 |
| <u>METEOROLOGICAL DATA</u> | |
| 10-meter Tower Data..... | D-368 - D-369 |
| 4 ft. Data and Aircraft OAT Data..... | D-370 |
| Pilot Balloon Wind Data..... | D-371 |
| <u>SCHEMATIC VIDEO DATA</u> | |
| Normal Approach Plot..... | D-374 |
| Noise Abatement Approach Plot..... | D-375 |
| Individual Event Data..... | D-376 - D-379 |



HELICOPTER MAIN ROTOR DATA

HELICOPTER MODEL ACQUIRED : UH-1H
HELICOPTER MODEL : R22
TYPE HELICOPTER (HUBBARD) : NOISE
FAIRING TYPE (HUBBARD) : 1300-157
NUMBER OF ENGINES : ONE
ENGINE TYPE (FAIRING) : 167-HP
ENGINE MAKE (FAIRING) : 167-HP
ENGINE SPEED (FAIRING) : 3100-RPM
MAX SPEED IN LEVEL FLIGHT : 130 KTS.
WITH MAX CONTINUOUS POWER : 130 KTS.
SPEED FOR BEST RATE OF CLIMB (V_X) : 85 KTS.
CRUISE SPEED FOR BEST RANGE (V_{CR}) : 80 KTS.
BEST RATE OF CLIMB AT
THROTTLE POWER (RPM) : 3100-RPM
TYPE OF ROTOR (HUBBARD) : 337-FT 100%

MAIN ROTOR IDENTIFICATION

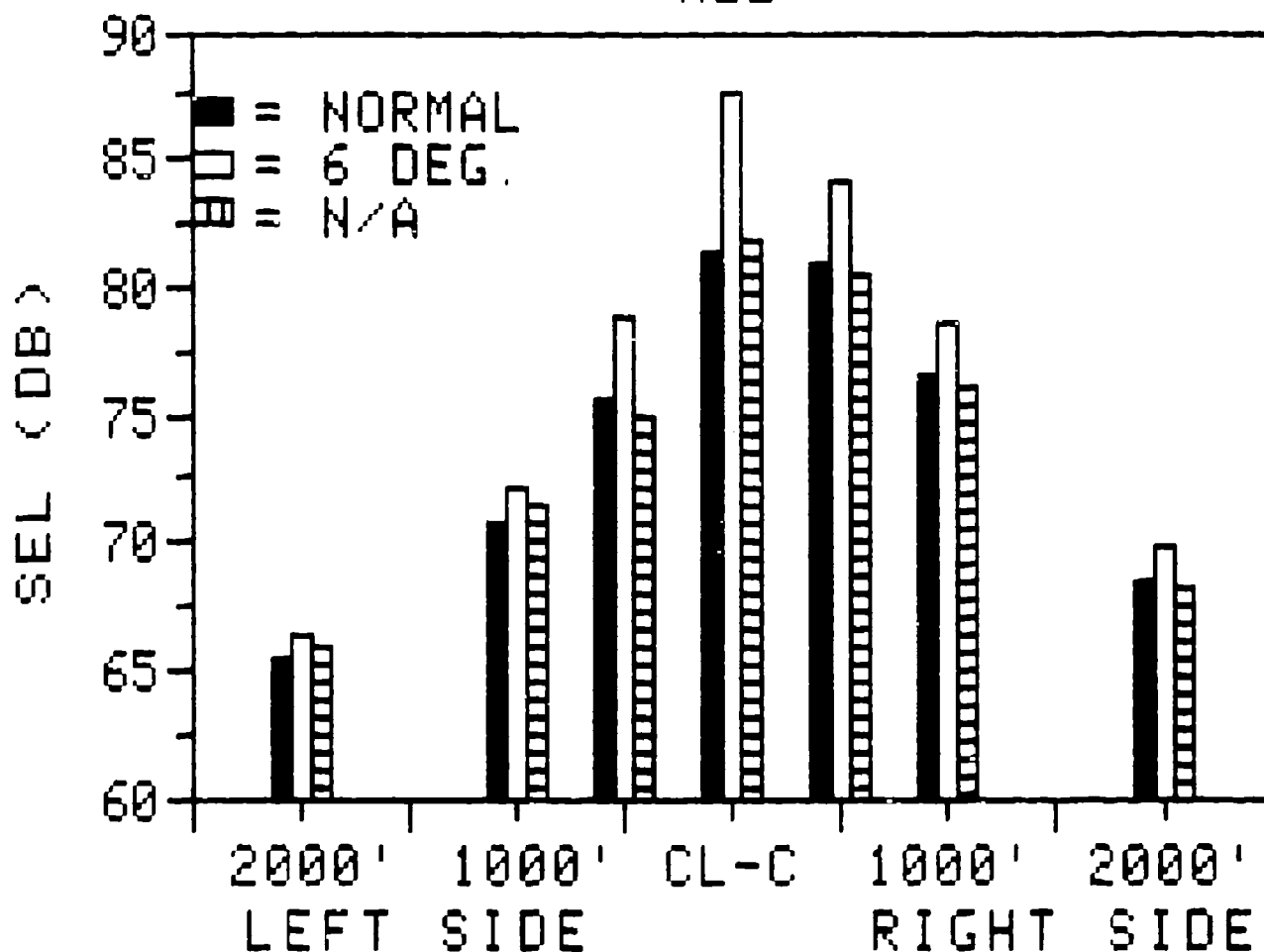
| | MAIN | 100% |
|--------------------|-------------|-------------|
| DIAMETER (FEET) : | 33.7 | 33.7 |
| NO. OF BLADES : | 2 | 2 |
| TIP SPEED (FEET) : | 490 | 490 |
| TIP SHAPE : | RECTANGULAR | RECTANGULAR |

NOISE LEVEL DATA

'as-measured'

SOUND EXPOSURE LEVEL

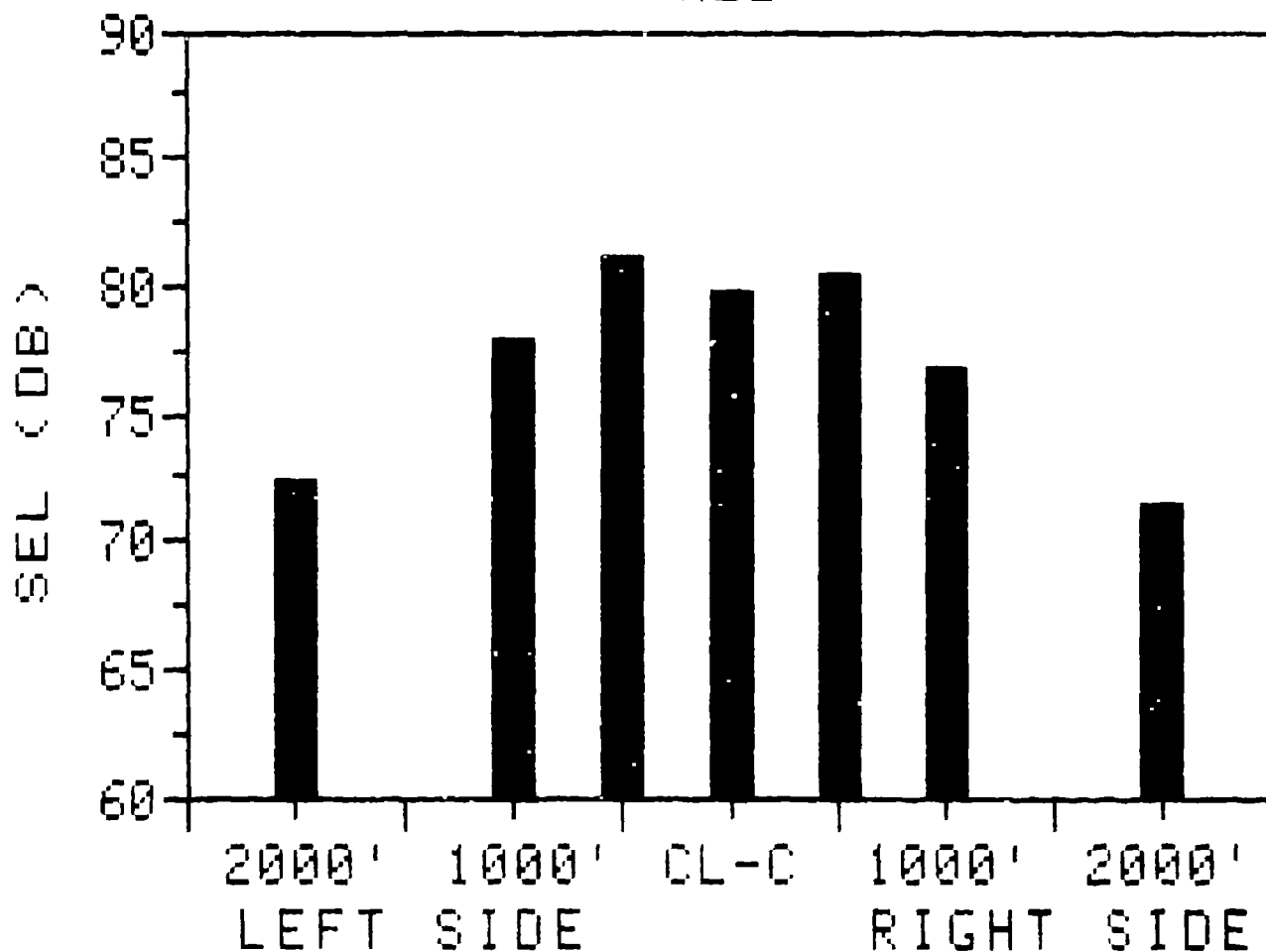
APPROACHES R22



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 620 | 50-50 | 2.7-8.3 |
| SIX DEG. APPROACH | 420 | 55 | 6.0 |
| NOISE ABATEMENT APP. VAR. R/D AND A/S (EVENTS D22-D29) | 620 | 69-52 | 1.7-7.5 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN 215 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF R22

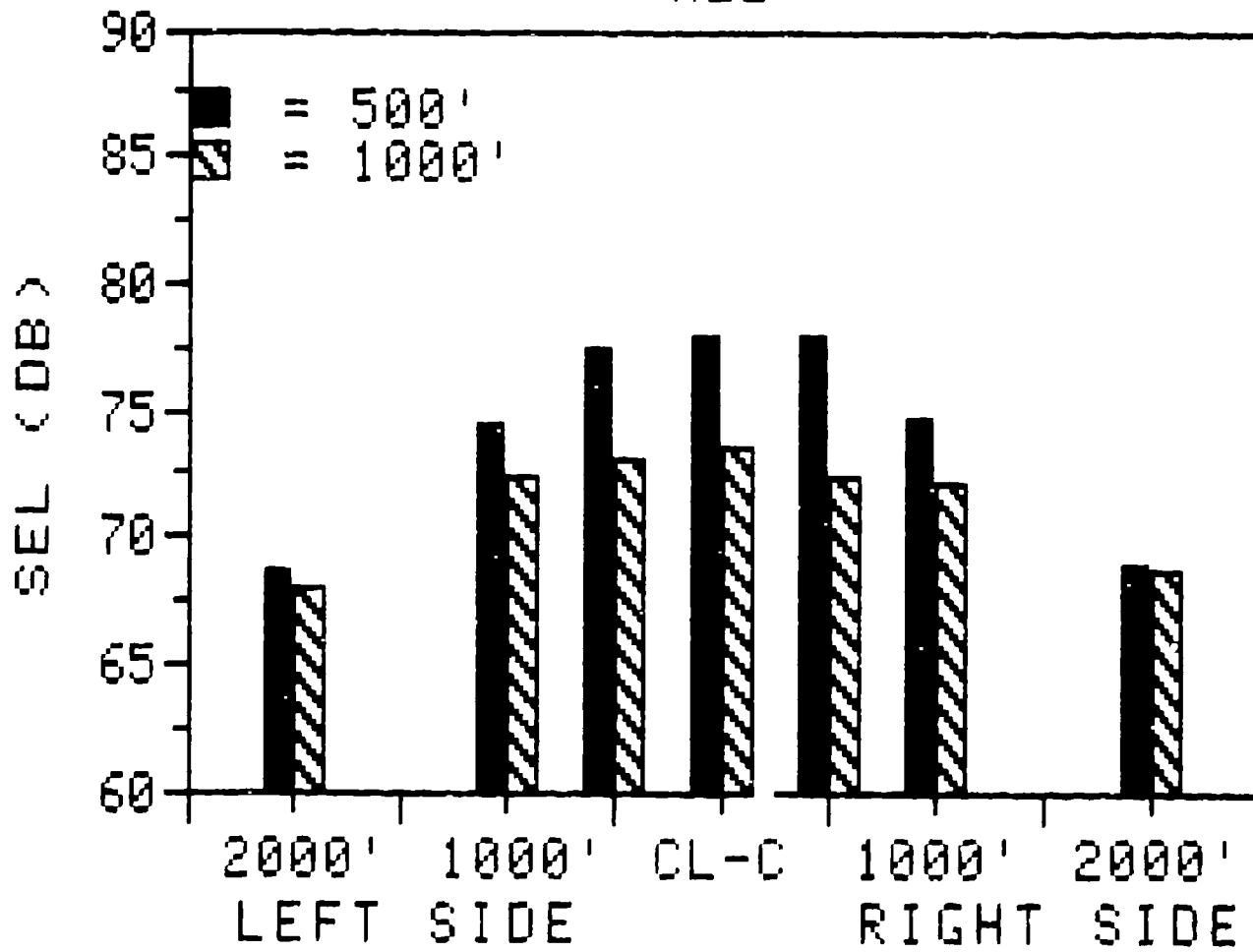


OPERATION: NORMAL TAKEOFF ALTITUDE: 1000' INSTRUMENT: SEL ELD: 100'

NORMAL TAKEOFF ALTITUDE: 1000' INSTRUMENT: SEL ELD: 100'

NOTE: ALL METERS AND THE DATA ATTACHED TO THEM ARE IN METERS.
 AND ALL 1000' IS PAIRED BECAUSE METERS ARE USED FOR ALL DATA.

LEVEL FLYOVERS R22



INDICATED AIRSPEED = 100 KTS.

R22 SUMMARY SHEET (7/09/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* 500 FT. LEVEL FLYOVER AT 83 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 68.7 | 74.4 | 77.4 | 78.0 | 77.8 | 74.7 | 68.8 |
| N | 4 | 6 | 7 | 7 | 6 | 6 | 3 |
| S.D. | .4 | .6 | .4 | .5 | .7 | .5 | .2 |
| 90% CI | .4 | .5 | .3 | .4 | .6 | .4 | .4 |

* 1000 FT. LEVEL FLYOVER AT 83 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 68.0 | 72.3 | 73.0 | 73.5 | 72.3 | 72.1 | 68.6 |
| N | 3 | 6 | 5 | 6 | 5 | 6 | 3 |
| S.D. | .6 | .6 | .8 | .5 | .6 | .8 | .4 |
| 90% CI | 1.1 | .5 | .8 | .4 | .6 | .6 | .7 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : 6 DEGREE APPROACH AT VY, 55 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A1 | 66.10 | 70.30 | 79.20 | 90.20 | 83.40 | -- | -- |
| A2 | 66.10 | 71.00 | 79.40 | 87.50 | 83.80 | -- | -- |
| A3 | 67.40 | 72.90 | 78.90 | 86.70 | 84.10 | 78.40 | 70.10 |
| A4 | 65.90 | 72.20 | 78.90 | 87.60 | 86.30 | 79.20 | 68.50 |
| A5 | 66.70 | 72.40 | 77.20 | 84.50 | 83.40 | 78.40 | 70.20 |
| A6 | 66.40 | 72.80 | 79.60 | 88.30 | 83.10 | 78.40 | 68.90 |
| A7 | -- | 73.30 | 79.10 | 88.00 | 84.50 | 77.90 | 71.90 |
| AVERAGE | 66.43 | 72.13 | 78.90 | 87.54 | 84.09 | 78.46 | 69.92 |
| STD. DEV. | 0.55 | 1.09 | 0.79 | 1.72 | 1.09 | 0.47 | 1.33 |
| 90% C.I. | 0.45 | 0.80 | 0.58 | 1.26 | 0.80 | 0.44 | 1.27 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B8 | 66.90 | 72.20 | 77.60 | 84.40 | 83.20 | 78.10 | -- |
| B10 | 65.10 | 71.90 | 75.80 | 82.60 | 82.30 | 77.70 | 69.50 |
| B12 | 64.90 | 68.60 | 73.50 | 77.30 | 77.10 | 73.50 | 65.10 |
| B14 | -- | -- | -- | -- | -- | -- | -- |
| B16 | 65.00 | 69.70 | 75.00 | 78.30 | 79.70 | 76.40 | 69.80 |
| B18 | 65.20 | 70.40 | 74.50 | 80.30 | 79.60 | 76.40 | 69.50 |
| B20 | 65.60 | 71.50 | 76.30 | 85.40 | 82.60 | 77.40 | 68.20 |
| AVERAGE | 65.45 | 70.72 | 75.45 | 81.38 | 80.75 | 76.58 | 68.42 |
| STD. DEV. | 0.42 | 1.38 | 1.20 | 3.35 | 2.32 | 1.69 | 1.96 |
| 90% C. I. | 0.40 | 1.32 | 1.14 | 3.19 | 2.21 | 1.61 | 1.86 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| C9 | | 77.20 | 81.10 | 79.90 | 81.30 | 77.30 | 70.80 |
| C11 | 70.30 | 77.50 | 81.40 | 79.50 | 80.50 | 76.60 | 72.70 |
| C13 | 72.30 | 77.80 | 81.20 | 79.70 | 80.50 | 77.00 | 72.60 |
| C15 | 73.70 | 77.50 | 81.80 | 80.10 | 80.70 | 76.20 | 71.2 |
| C17 | 72.90 | 78.00 | 80.90 | 80.10 | 80.00 | 76.60 | 71.10 |
| C19 | 72.40 | 79.60 | 81.10 | 80.40 | 80.50 | 76.90 | 71.00 |
| C21 | 72.30 | 77.40 | 81.00 | 79.10 | 79.90 | 76.90 | 70.30 |
| AVERAGE | 72.32 | 77.69 | 81.21 | 79.83 | 80.49 | 76.79 | 71.40 |
| STD. DEV. | 1.13 | 0.88 | 0.70 | 0.43 | 0.46 | 0.35 | 0.90 |
| 90% C.I. | 0.93 | 0.65 | 0.22 | 0.32 | 0.34 | 0.26 | 0.65 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D22 | 64.60 | 71.40 | 75.50 | 81.20 | 80.70 | 76.30 | 67.20 |
| D23 | 68.10 | 73.00 | 74.40 | 82.30 | 80.20 | 76.90 | -- |
| D24 | 66.40 | 71.00 | 74.70 | 81.30 | 80.70 | 76.60 | 67.90 |
| D25 | 66.20 | 70.60 | 73.90 | 78.70 | 79.30 | 75.40 | 67.30 |
| D26 | -- | 71.70 | 72.40 | 79.90 | 78.80 | -- | 68.60 |
| D27 | 63.80 | 69.90 | 73.40 | 79.10 | 78.50 | 74.40 | 68.10 |
| D28 | 65.20 | 71.50 | 77.40 | 85.20 | 81.60 | 76.00 | 69.30 |
| D29 | 66.30 | 72.30 | 78.40 | 86.00 | 83.40 | 77.20 | 69.40 |
| AVERAGE | 65.80 | 71.43 | 75.01 | 81.71 | 80.40 | 76.11 | 68.26 |
| STD. DEV. | 1.41 | 0.96 | 2.02 | 2.69 | 1.61 | 0.96 | 0.88 |
| 90% C. I. | 1.03 | 0.64 | 1.35 | 1.79 | 1.07 | 0.70 | 0.65 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : LEVEL FLYOVER (500 FT. @ 83 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | WEST | WEST | WEST | | EAST | EAST | EAST |
| F30 | 68.80 | 74.20 | 77.40 | 78.50 | 77.80 | 74.40 | -- |
| F31 | -- | -- | 78.00 | 77.00 | 77.20 | 74.50 | 68.60 |
| F32 | 68.60 | 74.80 | 77.60 | 78.10 | 78.20 | 75.10 | -- |
| F33 | -- | 73.30 | 77.10 | 77.90 | 76.70 | 74.10 | 68.90 |
| F34 | 69.10 | 74.90 | 77.10 | 78.40 | 78.10 | -- | -- |
| F35 | -- | 74.20 | 76.90 | 77.80 | -- | 74.80 | 69.00 |
| F36 | 68.20 | 74.90 | 77.90 | 78.50 | 78.60 | 75.30 | -- |
| AVERAGE | 68.68 | 74.38 | 77.43 | 78.03 | 77.77 | 74.70 | 68.63 |
| STD. DEV. | 0.38 | 0.62 | 0.42 | 0.57 | 0.70 | 0.45 | 0.21 |
| 90% C.I. | 0.44 | 0.51 | 0.31 | 0.39 | 0.58 | 0.37 | 0.35 |

SOUND EXPOSURE LEVEL (DE)

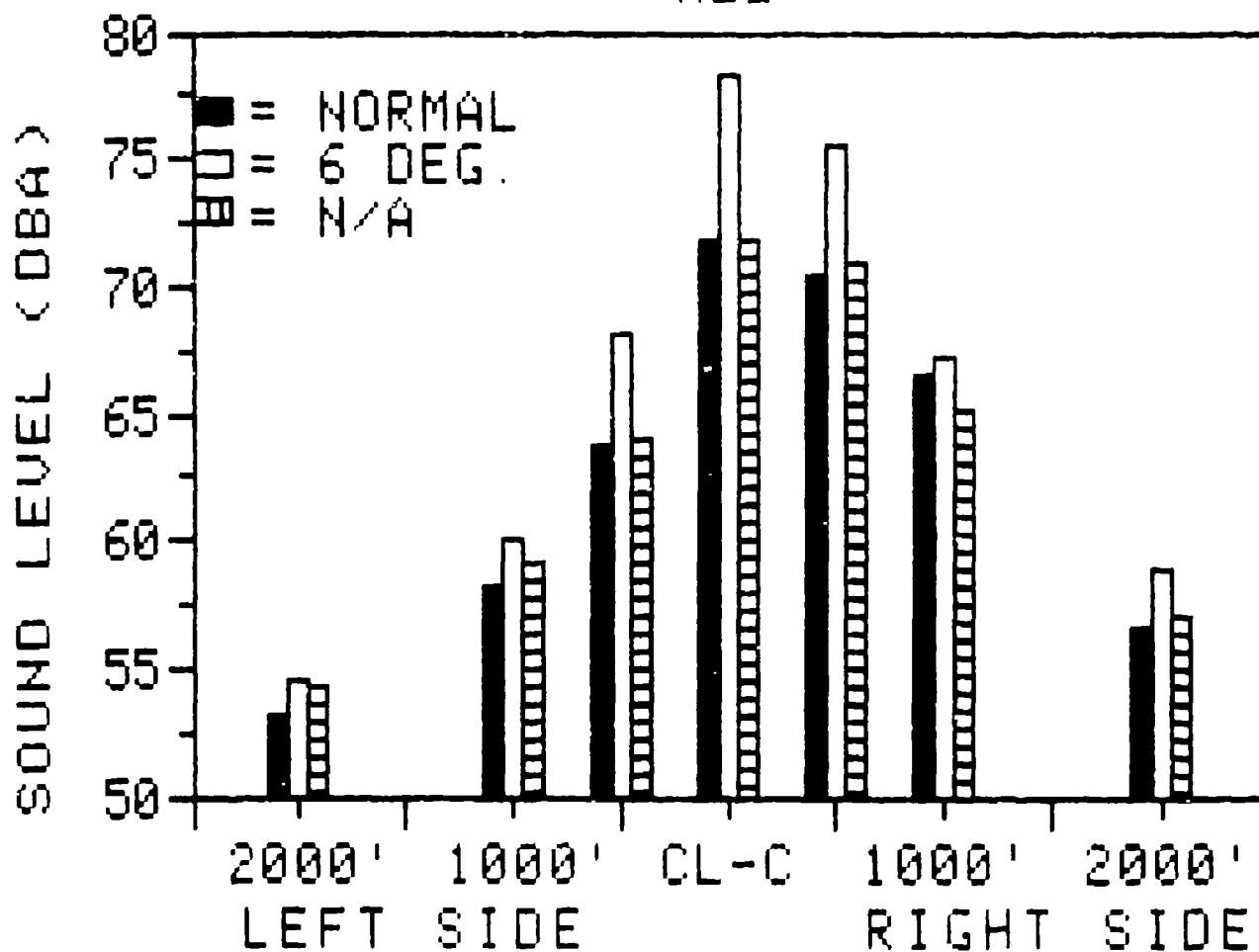
HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : LEVEL FLYOVER (1000 FT. AT 83 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| E37 | -- | 72.10 | -- | 74.00 | 71.80 | 71.50 | 68.20 |
| E38 | 67.30 | 72.10 | 72.40 | 73.70 | 73.10 | 72.40 | -- |
| E39 | -- | 72.70 | 73.00 | 73.00 | 71.70 | 71.60 | 69.00 |
| E40 | 68.40 | 72.80 | 73.70 | 74.20 | 72.80 | 73.50 | -- |
| E41 | -- | 71.40 | 73.80 | 73.00 | -- | 71.50 | 68.60 |
| E42 | 68.40 | 72.90 | 72.00 | 73.10 | 72.30 | 72.10 | -- |
| AVERAGE | 68.03 | 72.33 | 72.98 | 73.50 | 72.34 | 72.10 | 68.60 |
| STD. DEV. | 0.64 | 0.58 | 0.79 | 0.54 | 0.61 | 0.78 | 0.40 |
| 90% C.I. | 1.07 | 0.47 | 0.75 | 0.44 | 0.58 | 0.64 | 0.67 |

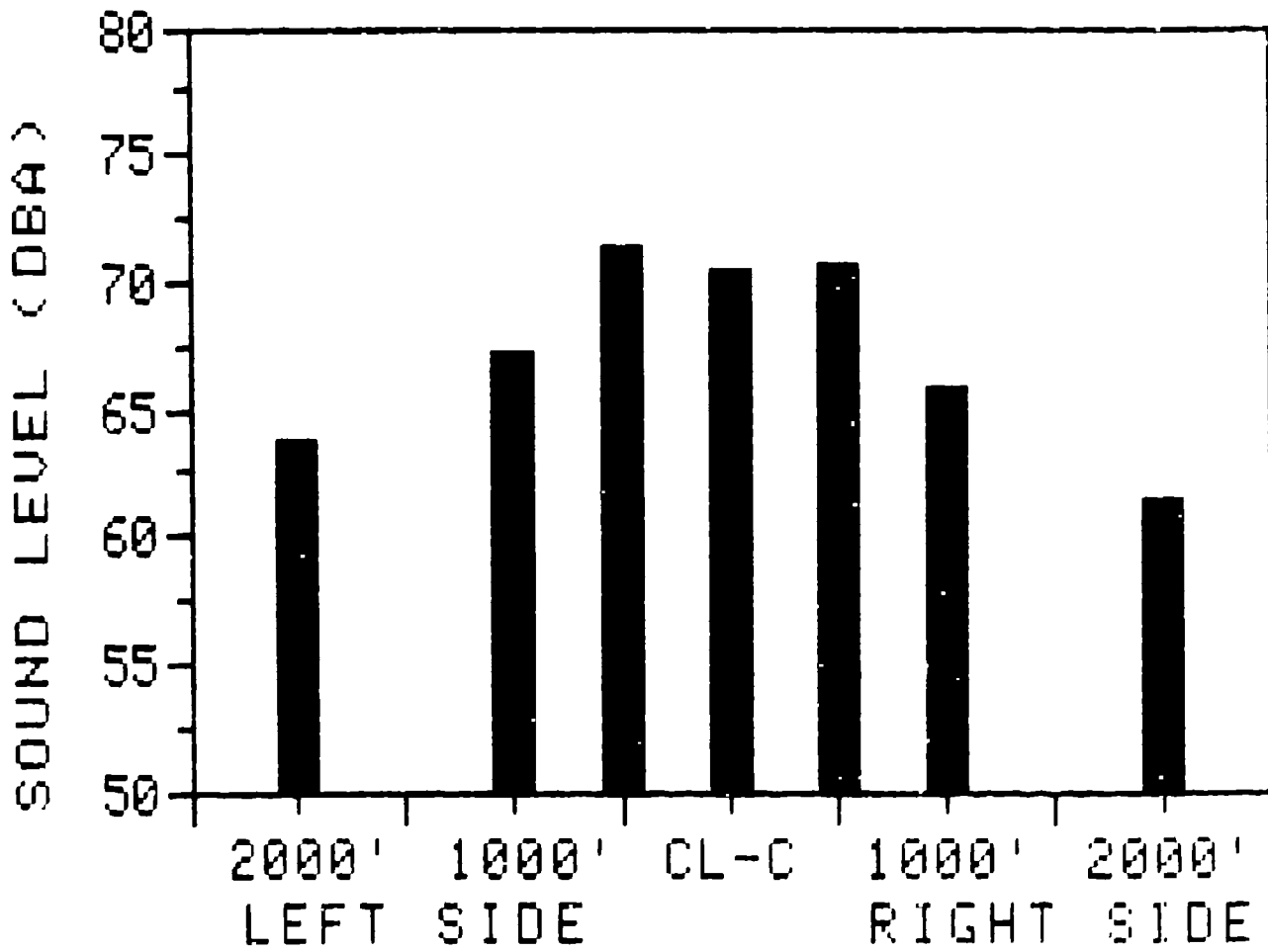
APPROACHES R22



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 620 | 58-50 | 2.7-8.3 |
| SIX DEG. APPROACH | 420 | 55 | 6.0 |
| NOISE ABATEMENT APP. VAR. R/D AND A/S (EVENTS D22-D29) | 620 | 69-52 | 1.7-7.5 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEOTAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN ±15 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF R22

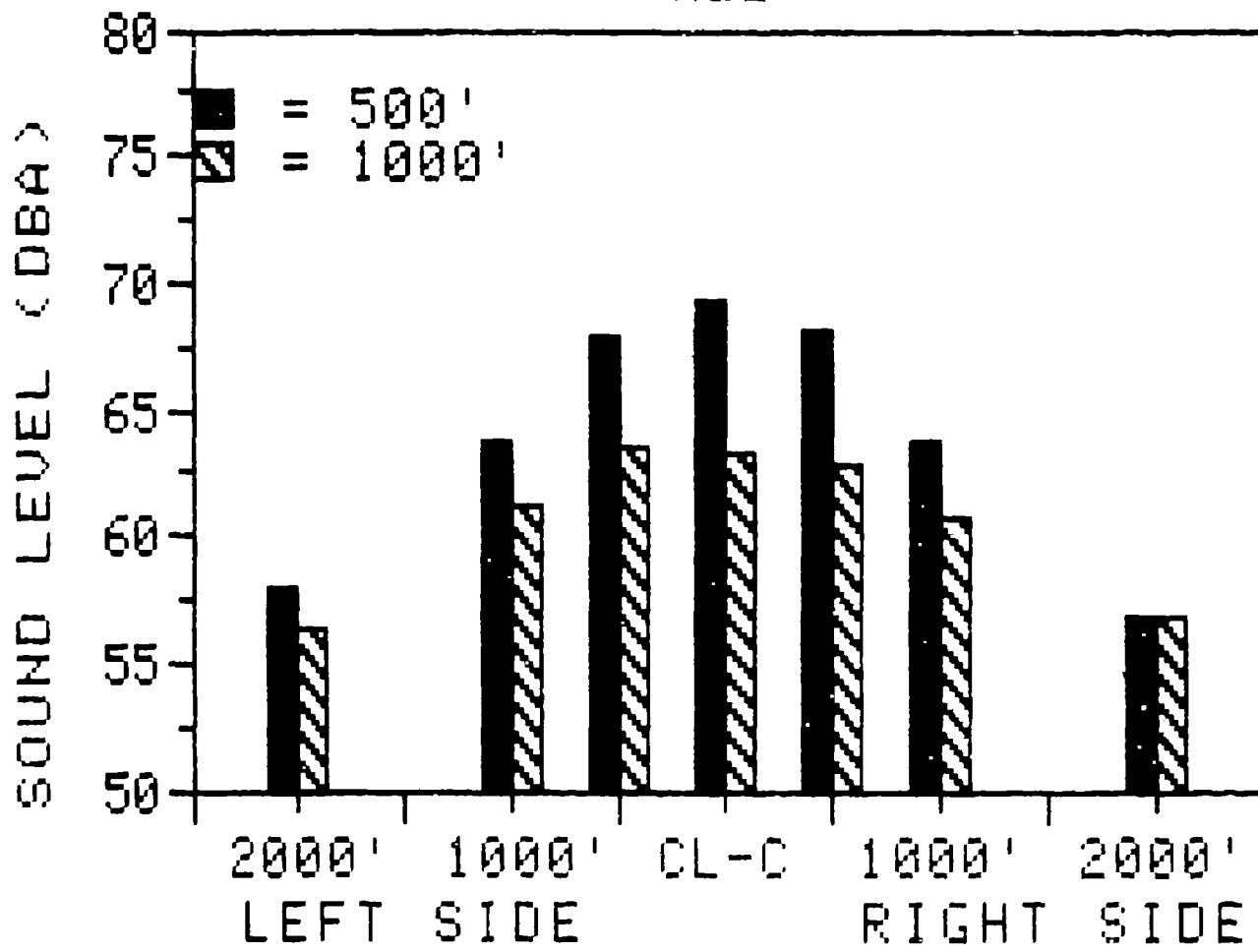


1.000' 2000' 1000' 2000' 1000' 2000'

NORMAL TAKEOFF R22

NOTE: ALL DISTANCES ARE MEASURED FROM THE CENTERLINE OF THE AIRCRAFT TO THE OBSERVATION POINT.

LEVEL FLYOVERS R22



UNCLASSIFIED - AIR FORCE - UNCLASSIFIED

R22 SUMMARY SHEET (7/09/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 55 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 54.5 | 60.1 | 68.2 | 78.3 | 75.4 | 67.3 | 58.8 |
| N | 7 | 7 | 7 | 7 | 7 | 5 | 5 |
| S.D. | 1.4 | 1.2 | 1.9 | 2.6 | 2.5 | .6 | 1.3 |
| 90% CI | 1.0 | .9 | 1.4 | 1.9 | 1.8 | .6 | 1.2 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 53.1 | 58.2 | 63.7 | 71.9 | 70.5 | 66.4 | 56.5 |
| N | 6 | 6 | 6 | 6 | 6 | 6 | 5 |
| S.D. | 1.1 | 2.1 | 3.3 | 4.5 | 3.6 | 2.1 | 2.2 |
| 90% CI | 1.0 | 2.0 | 3.1 | 4.3 | 3.5 | 2.0 | 2.1 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 54.3 | 59.2 | 64.0 | 71.7 | 70.8 | 65.2 | 57.0 |
| N | 7 | 8 | 8 | 8 | 8 | 8 | 7 |
| S.D. | 1.8 | 1.9 | 3.0 | 3.8 | 2.9 | 1.6 | 1.9 |
| 90% CI | 1.3 | 1.3 | 2.0 | 2.6 | 2.0 | 1.1 | 1.4 |

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 63.7 | 67.3 | 71.4 | 70.4 | 70.7 | 65.9 | 61.5 |
| N | 6 | 6 | 7 | 7 | 7 | 7 | 7 |
| S.D. | 1.1 | 1.5 | .7 | 1.1 | 1.0 | .8 | 2.4 |
| 90% CI | .9 | 1.2 | .5 | .8 | .7 | .6 | 1.7 |

R22 SUMMARY SHEET (7/09/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE) (RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* 500 FT. LEVEL FLYOVER AT 83 KTS. *

| | | | | | | | |
|---------|------|------|------|------|-----------------|------|------|
| AVERAGE | 57.9 | 63.8 | 68.0 | 69.3 | 68.2 | 63.8 | 56.8 |
| N | 4 | 7 | 6 | 7 | 6 | 7 | 3 |
| S.D. | 1.2 | 1.0 | .8 | .4 | .7 | .5 | 1.0 |
| 90% CI | 1.4 | .7 | .7 | .3 | .6 | .4 | 1.6 |

* 1000 FT. LEVEL FLYOVER AT 83 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|-----------------|------|
| AVERAGE | 56.4 | 61.3 | 63.6 | 63.3 | 62.8 | 60.8 | 56.9 |
| N | 3 | 6 | 5 | 6 | 6 | 6 | 3 |
| S.D. | .3 | 1.0 | 2.5 | 1.3 | 1.3 | .8 | 1.0 |
| 90% CI | .5 | .9 | 2.4 | 1.1 | 1.1 | .6 | 1.7 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : 6 DEGREE APPROACH AT VY, 55 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A1 | 52.80 | 60.90 | 69.20 | 82.20 | 76.00 | -- | -- |
| A2 | 53.70 | 60.80 | 69.30 | 79.70 | 76.30 | -- | -- |
| A3 | 56.10 | 59.00 | 66.90 | 76.50 | 75.90 | 67.50 | 59.90 |
| A4 | 54.30 | 61.30 | 67.70 | 79.30 | 79.60 | 67.80 | 57.80 |
| A5 | 52.90 | 58.50 | 65.10 | 73.90 | 72.20 | 66.20 | 58.30 |
| A6 | 55.80 | 61.20 | 70.80 | 77.60 | 72.50 | 67.30 | 57.50 |
| A7 | 55.70 | 59.30 | 68.10 | 79.10 | 75.20 | 67.50 | 60.30 |
| AVERAGE | 54.47 | 60.14 | 68.16 | 78.33 | 75.39 | 67.26 | 58.76 |
| STD. DEV. | 1.40 | 1.17 | 1.85 | 2.64 | 2.50 | 0.62 | 1.26 |
| 90% C. I. | 1.03 | 0.86 | 1.36 | 1.94 | 1.83 | 0.59 | 1.20 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B8 | 56.70 | 61.50 | 68.30 | 75.90 | 74.40 | 70.00 | -- |
| B10 | 53.10 | 58.80 | 64.70 | 72.40 | 73.10 | 67.10 | 59.00 |
| B12 | 51.70 | 55.70 | 61.80 | 67.40 | 66.00 | 63.00 | 54.10 |
| B14 | -- | -- | -- | -- | -- | -- | -- |
| B16 | 51.60 | 56.70 | 61.90 | 68.10 | 66.90 | 64.90 | 58.30 |
| B18 | 52.50 | 56.30 | 58.70 | 69.60 | 68.70 | 65.20 | 56.20 |
| B20 | 53.00 | 60.30 | 66.80 | 78.20 | 73.60 | 68.00 | 54.70 |
| AVERAGE | 53.10 | 58.22 | 63.70 | 71.93 | 70.45 | 66.37 | 56.46 |
| STD. DEV. | 1.07 | 2.06 | 3.26 | 4.48 | 3.62 | 2.12 | 2.15 |
| 90% C.I. | 1.02 | 1.96 | 3.10 | 4.26 | 3.45 | 2.02 | 2.05 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| C9 | -- | 67.10 | 71.30 | 70.00 | 71.30 | 65.30 | 59.30 |
| C11 | 61.60 | 66.30 | 71.70 | 70.00 | 70.70 | 67.30 | 63.90 |
| C13 | 64.20 | -- | 71.10 | 70.70 | 70.40 | 66.20 | 62.20 |
| C15 | 64.00 | 66.30 | 71.80 | 71.30 | 71.00 | 64.90 | 65.10 |
| C17 | 64.70 | 68.00 | 71.20 | 71.10 | 70.90 | 66.00 | 59.20 |
| C19 | 64.20 | 70.00 | 72.40 | 71.40 | 71.60 | 66.40 | 59.60 |
| C21 | 63.30 | 66.10 | 70.30 | 68.30 | 68.70 | 65.40 | 61.20 |
| AVERAGE | 63.67 | 67.30 | 71.40 | 70.40 | 70.66 | 65.93 | 61.50 |
| STD. DEV. | 1.11 | 1.50 | 0.66 | 1.09 | 0.95 | 0.81 | 2.35 |
| 90% C.I. | 0.91 | 1.24 | 0.48 | 0.80 | 0.69 | 0.59 | 1.72 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D22 | 53.00 | 59.30 | 64.60 | 71.90 | 70.30 | 65.00 | 55.60 |
| D23 | 57.90 | 60.70 | 63.20 | 69.60 | 70.00 | 65.00 | -- |
| D24 | 52.60 | 58.10 | 63.30 | 71.40 | 71.10 | 65.80 | 54.60 |
| D25 | 54.90 | 56.60 | 61.40 | 69.20 | 69.60 | 64.00 | 56.80 |
| D26 | -- | 60.30 | 61.10 | 68.60 | 67.70 | 64.00 | 59.30 |
| D27 | 53.00 | 56.50 | 61.30 | 67.70 | 67.50 | 63.00 | 55.70 |
| D28 | 53.80 | 60.50 | 68.30 | 76.90 | 74.40 | 66.50 | 57.40 |
| D29 | 54.80 | 61.20 | 68.60 | 78.00 | 75.70 | 68.00 | 59.50 |
| AVERAGE | 54.29 | 59.15 | 63.98 | 71.66 | 70.79 | 65.16 | 56.99 |
| STD. DEV. | 1.83 | 1.87 | 3.01 | 3.84 | 2.92 | 1.59 | 1.88 |
| 90% C.I. | 1.34 | 1.25 | 2.01 | 2.56 | 1.95 | 1.06 | 1.38 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: ROBINSON R22

TEST DATE: 7/09/84

OPERATION : LEVEL FLYOVER (500 FT. @ 83 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| F30 | 57.80 | 63.30 | 68.30 | 69.40 | 68.00 | 63.00 | -- |
| F31 | -- | 64.50 | 68.40 | 68.50 | 67.60 | 64.00 | 57.70 |
| F32 | 59.20 | 64.60 | 68.40 | 69.40 | 68.30 | 64.50 | -- |
| F33 | -- | 62.00 | 66.80 | 69.20 | 67.30 | 63.60 | 55.80 |
| F34 | 58.10 | 63.80 | 67.30 | 69.50 | 68.30 | 63.80 | -- |
| F35 | -- | 63.50 | -- | 69.50 | -- | 63.20 | 56.80 |
| F36 | 56.40 | 64.70 | 69.00 | 69.90 | 69.40 | 64.20 | -- |
| AVERAGE | 57.88 | 63.77 | 68.03 | 69.34 | 68.15 | 63.76 | 56.77 |
| STD. DEV. | 1.15 | 0.96 | 0.82 | 0.43 | 0.73 | 0.53 | 0.95 |
| 90% C.I. | 1.35 | 0.70 | 0.67 | 0.31 | 0.60 | 0.39 | 1.60 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: ROBINSON R22

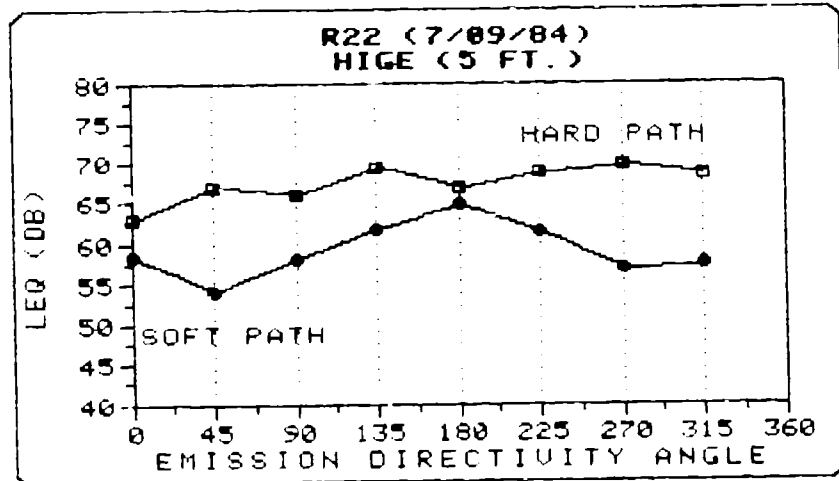
TEST DATE: 7/09/84

OPERATION : LEVEL FLYOVER (1000 FT. AT 83 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| E37 | -- | 62.00 | -- | 64.50 | 62.90 | 60.60 | 58.10 |
| E38 | 56.70 | 60.80 | 62.20 | 63.60 | 64.40 | 61.00 | -- |
| E39 | -- | 60.00 | 62.70 | 61.80 | 61.50 | 60.30 | 56.50 |
| E40 | 56.20 | 62.90 | 67.60 | 65.00 | 62.40 | 62.00 | -- |
| E41 | -- | 60.70 | 64.20 | 62.80 | 61.20 | 59.70 | 56.20 |
| E42 | 56.20 | 61.60 | 61.30 | 62.00 | 64.20 | 61.00 | -- |
| AVERAGE | 56.37 | 61.33 | 63.60 | 63.28 | 62.77 | 60.77 | 56.93 |
| STD. DEV. | 0.29 | 1.04 | 2.47 | 1.31 | 1.34 | 0.78 | 1.02 |
| 90% C.I. | 0.49 | 0.86 | 2.35 | 1.08 | 1.10 | 0.64 | 1.72 |

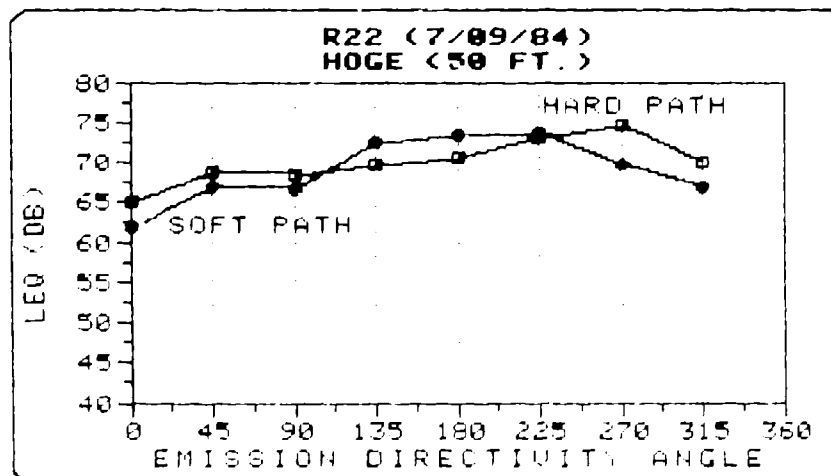
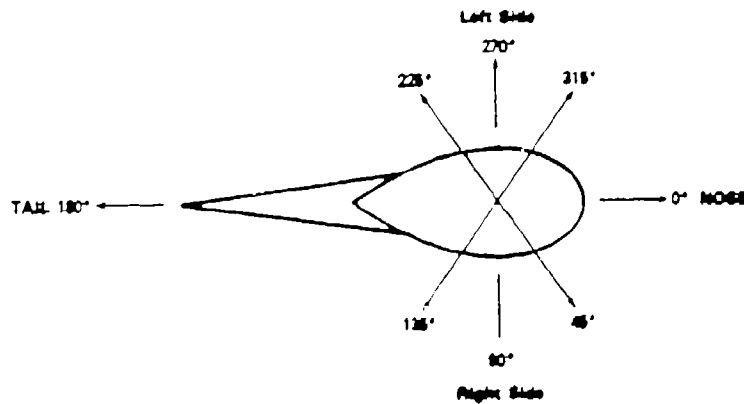
HOVER DATA

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- EQUIVALENT SOUND LEVELS (LEQ) FOR EIGHT DIRECTIVITY -
- ANGLES. THESE DATA ARE PRESENTED IN THE FORM OF PLOTS -
- AND INDIVIDUAL EVENT DATA TABLES. THE PLOTS SHOW THE -
- EFFECT OF 'HARD' SURFACE VS. 'SOFT' SURFACE 500 FEET FROM -
- THE HOVER POINT FOR IN-GROUND-EFFECT AND OUT-OF-GROUND- -
- EFFECT HOVER. INDIVIDUAL EVENT DATA FOR EACH DIRECTIVITY -
- ANGLE AT DISTANCES OF 500, 1000 AND 1500 FEET FROM -
- HOVER POINT OVER A 'SOFT' PATH AND 500, 1000 AND 2000 -
- FEET FROM HOVER POINT OVER A 'HARD' PATH IS THEN GIVEN. -
-



500 FT. FROM HOVER POINT

Acoustical Emission Angle Convention



500 FT. FROM HOVER POINT

HOVER DATA (LEQ)

HELICOPTER: ROBINSON R22

DATE: 7/09/84

MICROPHONE: 500 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (SOFT PATH) | | (HARD PATH) | |
|---------------------------------|-------------|------------|-------------|------------|
| | HOVER | HOVER | HOVER | HOVER |
| | 5 FT. AGL | 50 FT. AGL | 5 FT. AGL | 50 FT. AGL |
| (NOSE) 0 | 58.2 | 61.9 | 63.0 | 65.2 |
| 45 | 54.1 | 66.9 | 66.9 | 68.8 |
| (LEFT) 90 | 57.9 | 66.7 | 66.0 | 68.4 |
| 135 | 61.6 | 72.4 | 69.4 | 69.7 |
| (TAIL) 180 | 64.9 | 73.5 | 66.9 | 70.6 |
| 225 | 61.4 | 73.7 | 68.7 | 73.2 |
| (RIGHT) 270 | 56.8 | 69.6 | 69.8 | 74.6 |
| 315 | 57.3 | 66.9 | 68.4 | 70.1 |

MICROPHONE: 1000 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (SOFT PATH) | | (HARD PATH) | |
|---------------------------------|-------------|------------|-------------|------------|
| | HOVER | HOVER | HOVER | HOVER |
| | 5 FT. AGL | 50 FT. AGL | 5 FT. AGL | 50 FT. AGL |
| (NOSE) 0 | -- | 52.2 | 54.8 | 58.9 |
| 45 | 48.7 | 56.0 | 59.8 | 61.3 |
| (LEFT) 90 | 48.7 | 51.4 | 58.5 | 62.1 |
| 135 | 49.9 | 58.8 | 62.3 | 62.9 |
| (TAIL) 180 | -- | 63.6 | 58.1 | 63.7 |
| 225 | 50.4 | 65.9 | 58.9 | 68.0 |
| (RIGHT) 270 | 48.5 | 62.1 | 62.2 | 68.1 |
| 315 | 47.1 | 56.2 | 60.1 | 63.6 |

HOVER DATA (LEG)

HELICOPTER: ROBINSON R22

DATE: 7/09/84

MICROPHONE: 1500 FT. FROM HOVER POINT

(SOFT PATH)

| DIRECTIVITY ANGLES | | HOVER | HOVER |
|--------------------|-----|-----------|------------|
| (DEGREES) | | 5 FT. AGL | 50 FT. AGL |
| (NOSE) | 0 | 50.0 | 52.4 |
| | 45 | 54.0 | 55.7 |
| (LEFT) | 90 | 50.9 | 55.9 |
| | 135 | 53.4 | 57.7 |
| (TAIL) | 180 | 51.1 | 56.3 |
| | 225 | 50.1 | 60.6 |
| (RIGHT) | 270 | 56.6 | 62.5 |
| | 315 | 51.8 | 57.5 |

MICROPHONE: 2000 FT. FROM HOVER POINT

(HARD PATH)

| DIRECTIVITY ANGLES | | HOVER | HOVER |
|--------------------|-----|-------------|------------|
| (DEGREES) | | 5 FT. AGL | 50 FT. AGL |
| (NOSE) | 0 | BELOW | 42.4 |
| | 45 | THE AMBIENT | 44.6 |
| (LEFT) | 90 | | 42.6 |
| | 135 | | 45.4 |
| (TAIL) | 180 | | 50.4 |
| | 225 | | 52.6 |
| (RIGHT) | 270 | | 49.7 |
| | 315 | | 48.1 |

RADAR TRACKING DATA

-
- THIS SECTION OF THE APPENDIX CONTAINS THE HELICOPTER -
- POSITION DATA AND TRACKING PLOTS DERIVED FROM THE PARTS -
- PORTABLE TRACKING RADAR SYSTEM. THE POSITION DATA LIST -
- THE CLOSEST POINT OF APPROACH (CPA), TIME OF CPA, -
- ELEVATION ANGLE, RATE OF CLIMB OR DESCENT, THE CLIMB OR -
- DESCENT ANGLE, AND GROUND SPEED FOR ALL FLIGHT -
- CONDITIONS. TRACKING PLOTS OF THE ACTUAL FLIGHT PROFILE -
- FLOWN ARE PROVIDED FOR EACH FLIGHT CONDITIONS. -
-

ROBINSON R22
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 107/09/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|-----|--------|------|------------|--------|-------|------|
| SIX DEG. APPROACH AT VY, 55 KTS. | | | | | | | |
| 1 | APP | 377.5 | 86.1 | 10:20:28.8 | -505.6 | -5.1 | 55.7 |
| 2 | APP | 391.0 | 77.7 | 10:25:00.0 | -536.6 | -5.6 | 54.1 |
| 3 | APP | 385.3 | 80.8 | 10:29:27.2 | -608.4 | -6.1 | 56.5 |
| 4 | APP | 391.4 | 86.8 | 10:34:07.8 | -381.0 | -3.0 | 54.5 |
| 5 | APP | 392.4 | 80.5 | 10:39:45.5 | -636.8 | -6.7 | 53.4 |
| 6 | APP | 380.0 | 87.3 | 10:45:01.1 | -301.7 | -3.2 | 52.5 |
| 7 | APP | 367.0 | 87.0 | 10:49:44.7 | -507.7 | -5.4 | 53.4 |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 8 | | ----- | NO DATA | ----- | | | |
| 10 | | ----- | NO DATA | ----- | | | |
| 12 | APP | 573.3 | 85.4 | 11:14:07.8 | -673.7 | -6.6 | 57.5 |
| 14 | APP | 544.0 | 80.0 | 11:19:06.2 | -362.0 | -4.1 | 50.4 |
| 16 | APP | 573.8 | 83.2 | 11:24:10.2 | -818.5 | -9.1 | 50.7 |
| 18 | APP | 562.4 | 78.6 | 11:28:44.0 | -910.3 | -9.8 | 51.0 |
| 20 | APP | 538.0 | 81.0 | 11:33:32.2 | -658.5 | -7.5 | 49.5 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 9 | | ----- | NO DATA | ----- | | | |
| 11 | DEP | 391.1 | 84.6 | 11:10:22.2 | 481.7 | 5.0 | 54.3 |
| 13 | DEP | 394.1 | 83.8 | 11:16:07.0 | -169.0 | -1.5 | 62.1 |
| 15 | | ----- | NO DATA | ----- | | | |
| 17 | DEP | 376.0 | 79.8 | 11:26:03.4 | 513.7 | 5.2 | 55.5 |
| 19 | DEP | 457.2 | 55.5 | 11:30:47.1 | 759.2 | 8.8 | 48.5 |
| 21 | DEP | 515.5 | 62.0 | 11:35:23.4 | 416.2 | 5.1 | 46.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
POSITION DATA
NOISE MEASUREMENT PROGRAM

DATE: 07/09/84

CENTERLINE CENTER

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|-------|----------|------------|--------|------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 22 | APP | 576.1 | 78.9 | 11:45:40.9 | -786.4 | -7.9 | 60.4 |
| 23 | APP | 561.7 | 80.0 | 11:49:31.0 | -723.7 | -7.5 | 54.0 |
| 24 | APP | 577.7 | 78.8 | 11:54:17.5 | -923.8 | -8.9 | 62.6 |
| 25 | APP | 598.6 | 85.4 | 11:58:26.0 | -744.5 | -6.0 | 60.6 |
| 26 | APP | 561.5 | 79.1 | 12:02:08.2 | -472.2 | -5.3 | 50.0 |
| 27 | APP | 525.2 | 88.9 | 12:05:54.0 | -504.7 | -5.7 | 40.7 |
| 28 | APP | 527.6 | 84.7 | 12:09:28.3 | -518.8 | -4.9 | 50.4 |
| 29 | APP | 559.6 | 84.6 | 12:13:03.2 | -639.5 | -7.0 | 51.4 |

500 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 30 | F/O | 419.2 | 86.5 | 12:53:28.1 | -151.2 | -1.1 | 78.0 |
| 31 | | ----- | NO DATA | ----- | | | |
| 32 | F/O | 409.4 | 87.2 | 12:57:36.5 | 77.6 | 0.6 | 78.2 |
| 33 | | ----- | NO DATA | ----- | | | |
| 34 | F/O | 407.9 | 88.0 | 13:02:10.3 | 19.2 | 0.1 | 82.5 |
| 35 | | ----- | NO DATA | ----- | | | |
| 36 | F/O | 385.2 | 86.4 | 13:10:39.4 | 114.1 | 0.8 | 83.5 |

1000 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 37 | F/O | 957.4 | 80.0 | 13:13:18.0 | 645.2 | 4.5 | 81.7 |
| 38 | | ----- | NO DATA | ----- | | | |
| 39 | F/O | 935.4 | 85.3 | 13:18:15.0 | 357.6 | 2.5 | 81.2 |
| 40 | F/O | 902.6 | 86.5 | 13:23:34.2 | -352.6 | -2.5 | 80.0 |
| 41 | F/O | 900.0 | 83.0 | 13:26:04.2 | 312.5 | 2.9 | 75.6 |
| 42 | F/O | 988.6 | 80.4 | 13:28:32.5 | 42.9 | 0.3 | 87.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
POSITION DATA
NOISE MEASUREMENT PROGRAM

DATE 107/09/84

500 FT. EAST

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|-------|----------|------------|--------|------|
| SIX DEG. APPROACH AT VY, 55 KTS. | | | | | | |
| 1 | APP | 616.8 | 37.0 | 10:20:28.8 | -555.0 | 55.7 |
| 2 | APP | 620.6 | 39.1 | 10:24:59.4 | -551.0 | 53.1 |
| 3 | APP | 626.4 | 38.6 | 10:29:25.8 | -428.0 | 57.0 |
| 4 | APP | 643.4 | 37.7 | 10:34:07.6 | -405.0 | 54.5 |
| 5 | APP | 632.8 | 37.0 | 10:39:45.6 | -637.0 | 53.4 |
| 6 | APP | 633.3 | 37.3 | 10:45:00.2 | -204.0 | 51.8 |
| 7 | APP | 622.4 | 37.2 | 10:49:44.5 | -490.0 | 52.6 |

NORMAL APPROACH

| | | | | | | |
|----|-----|-------|---------|------------|--------|------|
| 8 | | ----- | NO DATA | ----- | | |
| 10 | | ----- | NO DATA | ----- | | |
| 12 | APP | 748.2 | 59.2 | 11:14:07.7 | -669.4 | 57.7 |
| 14 | APP | 732.3 | 48.4 | 11:19:06.0 | -369.0 | 50.6 |
| 16 | APP | 760.8 | 48.7 | 11:24:10.3 | -896.5 | 50.9 |
| 18 | APP | 757.3 | 46.8 | 11:28:44.1 | -917.6 | 51.7 |
| 20 | APP | 740.6 | 46.1 | 11:33:32.4 | -625.0 | 49.0 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|-------|---------|------------|--------|------|
| 9 | | ----- | NO DATA | ----- | | |
| 11 | DEP | 602.2 | 40.6 | 11:10:22.4 | 454.4 | 54.8 |
| 13 | DEP | 593.0 | 41.5 | 11:16:07.1 | -209.8 | 64.5 |
| 15 | | ----- | NO DATA | ----- | | |
| 17 | DEP | 562.6 | 41.7 | 11:26:03.6 | 480.6 | 55.0 |
| 19 | DEP | 661.9 | 34.5 | 11:30:47.2 | 854.0 | 48.5 |
| 21 | DEP | 683.3 | 42.0 | 11:35:23.4 | 417.0 | 46.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
POSITION DATA
NOISE MEASUREMENT PROGRAM

DATE 107/09/84

500 FT. EAST

FAA/AEEX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|-----|--------|------|------------|--------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 22 | APP | 748.5 | 50.5 | 11:45:40.1 | -797.1 | -7.5 | 89.5 |
| 23 | APP | 747.5 | 48.0 | 11:49:31.1 | -708.7 | -7.4 | 89.5 |
| 24 | APP | 750.8 | 49.1 | 11:54:17.8 | -914.0 | -8.3 | 81.0 |
| 25 | APP | 773.6 | 50.8 | 11:58:26.2 | -719.6 | -6.7 | 80.7 |
| 26 | APP | 751.3 | 48.7 | 12:02:07.2 | -455.3 | -5.0 | 81.3 |
| 27 | APP | 717.9 | 46.8 | 12:05:54.9 | -491.2 | -5.9 | 46.8 |
| 28 | APP | 718.7 | 47.4 | 12:09:28.2 | -519.6 | -5.9 | 59.1 |
| 29 | APP | 726.6 | 50.1 | 12:13:03.5 | -634.7 | -7.0 | 51.6 |

500 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 30 | F/O | 645.8 | 40.6 | 12:53:28.0 | -166.1 | -1.2 | 77.8 |
| 31 | | ----- | NO DATA | ----- | | | |
| 32 | F/O | 629.0 | 40.9 | 12:57:36.3 | 110.1 | 0.8 | 77.7 |
| 33 | | ----- | NO DATA | ----- | | | |
| 34 | F/O | 857.2 | 38.6 | 13:02:10.3 | 19.2 | 0.1 | 82.5 |
| 35 | | ----- | NO DATA | ----- | | | |
| 36 | F/O | 620.0 | 38.7 | 13:10:39.3 | 90.4 | 0.6 | 83.5 |

1000 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|------|
| 37 | F/O | 1027.1 | 66.9 | 13:13:18.0 | 645.6 | 4.8 | 81.7 |
| 38 | | ----- | NO DATA | ----- | | | |
| 39 | F/O | 1027.9 | 64.9 | 13:18:15.5 | -359.3 | -2.5 | 81.7 |
| 40 | F/O | 1056.2 | 59.0 | 13:23:34.1 | -353.6 | -2.5 | 81.1 |
| 41 | F/O | 988.0 | 66.6 | 13:26:04.4 | 326.2 | 2.4 | 75.6 |
| 42 | F/O | 1113.4 | 62.1 | 13:28:31.5 | 162.5 | 1.0 | 89.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 107/09/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|-------|----------|------------|--------|------|
| SIX DEG. APPROACH AT VY, 55 KTS. | | | | | | |
| 1 | APP | 629.5 | 36.4 | 10:20:20.4 | -537.7 | 55.4 |
| 2 | APP | 633.7 | 38.6 | 10:24:59.2 | -550.3 | 55.8 |
| 3 | APP | 613.8 | 36.2 | 10:29:28.1 | -739.6 | 56.0 |
| 4 | APP | 617.9 | 39.1 | 10:34:08.7 | -339.5 | 56.5 |
| 5 | APP | 639.2 | 37.1 | 10:39:45.6 | -637.5 | 53.4 |
| 6 | APP | 614.2 | 38.3 | 10:45:01.4 | -347.5 | 53.1 |
| 7 | APP | 607.2 | 37.1 | 10:49:44.7 | -507.6 | 53.4 |

NORMAL APPROACH

| | | | | | | |
|----|-----|-------|---------|------------|--------|------|
| 8 | | ----- | NO DATA | ----- | | |
| 12 | | ----- | NO DATA | ----- | | |
| 12 | APP | 760.8 | 49.1 | 11:14:07.2 | -685.0 | 57.6 |
| 14 | APP | 736.0 | 48.4 | 11:19:06.3 | -357.3 | 56.2 |
| 16 | APP | 747.3 | 51.3 | 11:24:09.5 | -901.8 | 56.1 |
| 18 | APP | 741.2 | 49.1 | 11:28:43.7 | -893.2 | 51.6 |
| 20 | APP | 728.7 | 46.8 | 11:33:32.2 | -658.6 | 49.5 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|-------|---------|------------|-------|------|
| 9 | | ----- | NO DATA | ----- | | |
| 11 | DEP | 660.8 | 36.1 | 11:10:21.9 | 545.8 | 55.4 |
| 13 | DEP | 632.4 | 38.6 | 11:16:07.7 | -31.4 | 58.9 |
| 15 | | ----- | NO DATA | ----- | | |
| 17 | DEP | 657.5 | 35.0 | 11:26:03.8 | 453.0 | 58.3 |
| 19 | DEP | 665.8 | 34.5 | 11:30:47.1 | 759.9 | 48.5 |
| 21 | DEP | 708.6 | 40.6 | 11:37:23.3 | 422.8 | 46.2 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

DATE 107/09/84

500 FT. WEST

FRA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|-----|--------|------|------------|--------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 22 | APP | 768.1 | 48.3 | 11:45:40.4 | -815.6 | -7.7 | 50.5 |
| 23 | APP | 748.7 | 49.5 | 11:49:30.5 | -774.7 | -7.8 | 55.8 |
| 24 | APP | 774.7 | 47.0 | 11:54:17.5 | -824.4 | -8.3 | 62.6 |
| 25 | APP | 769.4 | 51.1 | 11:58:26.5 | -865.2 | -8.2 | 66.1 |
| 26 | APP | 742.2 | 48.0 | 12:02:08.2 | -472.5 | -5.3 | 50.0 |
| 27 | APP | 709.2 | 45.7 | 12:05:56.4 | -698.3 | -8.2 | 48.0 |
| 28 | APP | 736.0 | 45.5 | 12:09:28.3 | -518.5 | -4.0 | 59.4 |
| 29 | APP | 768.1 | 45.6 | 12:13:04.4 | -643.0 | -7.0 | 51.4 |

500 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | | |
|----|-----|-------|---------|------------|-------|------|------|
| 30 | F/O | 652.2 | 40.4 | 12:53:28.5 | -76.2 | -0.6 | 77.9 |
| 31 | | ----- | NO DATA | ----- | | | |
| 32 | F/O | 652.0 | 39.1 | 12:57:36.0 | 133.0 | 1.0 | 77.1 |
| 33 | | ----- | NO DATA | ----- | | | |
| 34 | F/O | 630.5 | 40.4 | 13:02:00.6 | 37.8 | 0.3 | 80.4 |
| 35 | | ----- | NO DATA | ----- | | | |
| 36 | F/O | 638.5 | 36.9 | 13:10:39.1 | 3.9 | 0.0 | 83.7 |

1000 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|------|
| 37 | F/O | 1126.5 | 57.5 | 13:13:18.2 | 678.9 | 4.7 | 81.9 |
| 38 | | ----- | NO DATA | ----- | | | |
| 39 | F/O | 1083.8 | 59.6 | 13:18:15.8 | 362.9 | | 81.4 |
| 40 | F/O | 1008.0 | 63.4 | 13:23:34.2 | -352.8 | -2.5 | 80.9 |
| 41 | F/O | 1079.0 | 56.7 | 13:26:04.2 | 312.4 | 2.9 | 75.6 |
| 42 | F/O | 1103.6 | 63.6 | 13:28:32.6 | 42.0 | 0.3 | 87.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE: 07/09/84

**FAA/AEEX*

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|------------|--------|------|
| SIX DEG. APPROACH AT VY, 55 KTS. | | | | | | |
| 1 | APP | 1055.2 | 21.5 | 10:20:28.0 | -473.0 | 58.0 |
| 2 | APP | 1066.0 | 22.0 | 10:24:58.0 | -525.6 | 53.0 |
| 3 | APP | 1062.8 | 21.7 | 10:29:28.0 | -428.0 | 55.0 |
| 4 | APP | 1083.1 | 21.4 | 10:34:07.5 | -417.2 | 54.4 |
| 5 | APP | 1069.6 | 22.0 | 10:39:44.0 | -625.3 | 54.2 |
| 6 | APP | 1073.3 | 21.1 | 10:45:00.2 | -804.2 | 51.8 |
| 7 | APP | 1065.1 | 20.8 | 10:49:44.5 | -499.5 | 52.6 |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 8 | | ----- | NO DATA | ----- | | |
| 10 | | ----- | NO DATA | ----- | | |
| 12 | APP | 1135.5 | 30.9 | 11:14:07.5 | -873.0 | 58.1 |
| 14 | APP | 1125.2 | 29.4 | 11:18:05.1 | -385.8 | 48.6 |
| 16 | APP | 1152.0 | 29.0 | 11:24:10.3 | -825.8 | 50.0 |
| 18 | APP | 1152.7 | 28.7 | 11:28:44.2 | -919.3 | 51.4 |
| 20 | APP | 1141.5 | 28.0 | 11:33:32.5 | -607.0 | 48.0 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|--------|---------|------------|-------|------|
| 9 | | ----- | NO DATA | ----- | | |
| 11 | DEP | 1031.7 | 17.1 | 11:10:15.8 | 573.5 | 58.4 |
| 13 | DEP | 795.1 | 23.0 | 11:16:02.4 | 827.0 | 55.0 |
| 15 | | ----- | NO DATA | ----- | | |
| 17 | DEP | 994.0 | 22.2 | 11:26:03.6 | 480.6 | 55.0 |
| 19 | DEP | 1078.3 | 20.5 | 11:30:47.2 | 854.0 | 48.5 |
| 21 | DEP | 1080.7 | 25.1 | 11:35:23.4 | 417.0 | 48.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 107/09/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|--------|--------|----------|------------|--------|-----------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 22 | APP | 1134.5 | 30.7 | 11:45:40.1 | -797.1 | -7.5 59.5 |
| 23 | APP | 1138.9 | 30.7 | 11:49:29.8 | -748.5 | -7.4 56.7 |
| 24 | APP | 1136.2 | 30.1 | 11:54:17.8 | -914.0 | -8.3 61.0 |
| 25 | APP | 1155.1 | 31.3 | 11:58:26.2 | -710.6 | -8.7 60.7 |
| 26 | APP | 1145.5 | 29.6 | 12:02:07.2 | -455.0 | -5.0 51.3 |
| 27 | APP | 1119.5 | 28.0 | 12:05:54.9 | -491.2 | -5.9 46.8 |
| 28 | APP | 1119.8 | 28.3 | 12:09:28.2 | -519.6 | -5.0 59.1 |
| 29 | APP | 766.6 | 29.4 | 12:13:13.7 | 4.9 | 0.0 116.7 |

500 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 30 | F/O | 1075.9 | 23.1 | 12:53:28.0 | -166.1 | -1.2 77.8 |
| 31 | | ---- | NO DATA | ---- | | |
| 32 | F/O | 1059.5 | 23.0 | 12:57:36.3 | 110.1 | 0.8 77.7 |
| 33 | | ---- | NO DATA | ---- | | |
| 34 | F/O | 1092.7 | 22.2 | 13:02:10.7 | 9.1 | 0.1 82.3 |
| 35 | | ---- | NO DATA | ---- | | |
| 36 | F/O | 940.9 | 22.5 | 13:10:35.0 | 842.3 | 1.0 244.0 |

1000 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 37 | F/O | 1300.5 | 46.3 | 13:13:17.8 | 593.3 | 4.1 81.8 |
| 38 | | ---- | NO DATA | ---- | | |
| 39 | F/O | 1317.4 | 45.1 | 13:18:18.5 | 359.3 | 2.5 81.7 |
| 40 | F/O | 1382.1 | 42.0 | 13:23:33.6 | -354.1 | -2.5 81.0 |
| 41 | F/O | 1267.9 | 46.0 | 13:26:03.1 | 95.4 | 0.7 77.5 |
| 42 | F/O | 1410.5 | 44.3 | 13:28:31.5 | 182.5 | 1.0 89.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE: 07/09/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---------------------------------|--------|--------|----------|------------|--------|------|------|
| SIX DEG. APPROACH AT VY, 55 KTS | | | | | | | |
| 1 | APP | 1070.2 | 21.3 | 10:20:27.8 | -481.9 | -4.9 | 56.0 |
| 2 | APP | 1071.4 | 21.8 | 10:24:59.2 | -550.3 | -5.9 | 56.8 |
| 3 | APP | 1047.6 | 20.4 | 10:29:28.0 | -738.4 | -7.4 | 56.0 |
| 4 | APP | 1053.8 | 21.8 | 10:34:08.7 | -639.5 | -3.4 | 56.5 |
| 5 | APP | 1076.6 | 20.2 | 10:38:47.8 | -518.0 | -5.9 | 56.0 |
| 6 | APP | 1053.8 | 21.3 | 10:45:01.4 | -647.5 | -3.7 | 53.1 |
| 7 | APP | 1043.1 | 20.1 | 10:49:46.7 | -412.0 | -4.4 | 52.3 |

NORMAL APPROACH

| | | | | | | | |
|----|-----|--------|---------|------------|--------|-------|------|
| 8 | | ----- | NO DATA | ----- | | | |
| 10 | | ----- | NO DATA | ----- | | | |
| 12 | APP | 1154.3 | 29.2 | 11:14:09.2 | -672.5 | -8.7 | 56.1 |
| 14 | APP | 1126.7 | 29.1 | 11:19:06.0 | -657.3 | -4.0 | 50.8 |
| 16 | APP | 1130.2 | 31.8 | 11:24:09.5 | -901.8 | -10.1 | 50.1 |
| 18 | APP | 1131.2 | 29.8 | 11:28:49.7 | -893.2 | -9.7 | 51.6 |
| 20 | APP | 1129.0 | 28.2 | 11:33:32.2 | -658.6 | -7.5 | 49.5 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|-------|
| 9 | | ----- | NO DATA | ----- | | | |
| 11 | DEP | 1104.1 | 20.8 | 11:10:21.0 | 545.8 | 5.6 | 55.4 |
| 13 | DEP | 1068.7 | 21.8 | 11:16:07.7 | -31.4 | -0.3 | 58.0 |
| 15 | | ----- | NO DATA | ----- | | | |
| 17 | DEP | 1105.6 | 20.1 | 11:26:03.8 | 453.0 | 4.5 | 56.3 |
| 19 | DEP | 933.9 | 54.7 | 11:30:44.5 | -429.2 | -1.4 | 167.4 |
| 21 | DEP | 922.3 | 63.8 | 11:35:20.3 | -37.7 | -0.2 | 135.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE 107/09/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|--------|--------|----------|------------|--------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 22 | APP | 1161.0 | 28.9 | 11:45:41.6 | -732.5 | 59.5 |
| 23 | APP | 1139.6 | 30.1 | 11:49:30.5 | -774.7 | 55.8 |
| 24 | APP | 1170.0 | 29.1 | 11:54:17.5 | -924.4 | 62.6 |
| 25 | APP | 1149.0 | 31.5 | 11:58:26.5 | -665.2 | 60.1 |
| 26 | APP | 1134.8 | 29.1 | 12:02:08.4 | -438.6 | 49.7 |
| 27 | APP | 1101.0 | 27.6 | 12:05:56.4 | -698.3 | 48.0 |
| 28 | APP | 1134.8 | 27.7 | 12:09:29.2 | -524.6 | 61.8 |
| 29 | APP | 1167.0 | 28.2 | 12:13:04.4 | -643.9 | 51.4 |

500 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|-------|------|
| 30 | F/O | 1083.2 | 23.1 | 12:53:28.5 | -76.2 | 77.9 |
| 31 | | ----- | NO DATA | ----- | | |
| 32 | F/O | 1084.6 | 22.7 | 12:57:26.9 | 57.4 | 77.8 |
| 33 | | ----- | NO DATA | ----- | | |
| 34 | F/O | 1056.9 | 22.9 | 13:02:09.6 | 37.8 | 80.4 |
| 35 | | ----- | NO DATA | ----- | | |
| 36 | F/O | 1080.7 | 20.8 | 13:10:40.7 | 165.2 | 80.3 |

1000 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 37 | F/O | 1455.9 | 40.8 | 13:13:18.2 | 678.9 | 81.9 |
| 38 | | ----- | NO DATA | ----- | | |
| 39 | F/O | 1405.0 | 41.8 | 13:18:15.8 | 362.8 | 81.4 |
| 40 | F/O | 1311.9 | 43.5 | 13:23:34.2 | -352.8 | 80.0 |
| 41 | F/O | 1417.7 | 39.6 | 13:26:04.2 | 312.4 | 75.6 |
| 42 | F/O | 1400.9 | 45.0 | 13:28:32.6 | 42.9 | 87.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE: 07/09/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

SIX DEG. APPROACH AT VY, 55 KTS.

| | | | | | | | |
|---|-----|--------|------|------------|--------|------|------|
| 1 | APP | 2019.1 | 11.1 | 10:20:28.0 | -473.0 | -4.8 | 56.0 |
| 2 | APP | 2026.9 | 11.9 | 10:24:57.1 | -453.0 | -4.9 | 51.7 |
| 3 | APP | 2025.6 | 11.3 | 10:29:25.8 | -428.0 | -4.4 | 55.0 |
| 4 | APP | 2047.1 | 11.2 | 10:34:07.5 | -417.0 | -4.3 | 54.4 |
| 5 | APP | 2032.2 | 11.5 | 10:39:44.9 | -625.3 | -6.5 | 54.8 |
| 6 | APP | 2038.0 | 11.0 | 10:45:00.2 | -204.0 | -2.0 | 51.8 |
| 7 | APP | 2031.8 | 10.8 | 10:49:44.5 | -489.5 | -5.4 | 52.6 |

NORMAL APPROACH

| | | | | | | | |
|----|-----|--------|---------|------------|--------|-------|------|
| 8 | | ----- | NO DATA | ----- | | | |
| 10 | | ----- | NO DATA | ----- | | | |
| 12 | APP | 2059.3 | 16.6 | 11:14:07.5 | -673.0 | -6.5 | 58.1 |
| 14 | APP | 2055.1 | 15.7 | 11:19:05.1 | -385.6 | -4.4 | 49.6 |
| 16 | APP | 2076.7 | 16.1 | 11:24:11.2 | -634.7 | -7.1 | 59.1 |
| 18 | APP | 2082.0 | 15.2 | 11:28:44.9 | -920.6 | -10.5 | 48.0 |
| 20 | APP | 2076.3 | 15.0 | 11:33:32.5 | -607.0 | -7.6 | 48.0 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|-------|
| 9 | | ----- | NO DATA | ----- | | | |
| 11 | DEP | 1913.7 | 9.2 | 11:10:15.6 | 973.5 | 9.3 | 58.4 |
| 13 | DEP | 1556.2 | 11.6 | 11:16:02.4 | 2627.0 | 16.8 | 85.6 |
| 15 | | ----- | NO DATA | ----- | | | |
| 17 | DEP | 1957.2 | 11.2 | 11:26:03.6 | 480.6 | 4.9 | 55.9 |
| 19 | DEP | 1491.9 | 12.5 | 11:31:08.7 | -787.0 | -2.8 | 160.1 |
| 21 | DEP | 2017.4 | 13.3 | 11:35:23.4 | 417.0 | 5.1 | 46.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 107/09/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--------------------------|-----|--------|------|------------|--------|-------|-------|
| NOISE ABATEMENT APPROACH | | | | | | | |
| 22 | APP | 2059.2 | 16.5 | 11:45:40.1 | -797.1 | -7.5 | 59.5 |
| 23 | APP | 2063.2 | 16.5 | 11:49:29.8 | -748.5 | -7.4 | 56.7 |
| 24 | APP | 2057.6 | 17.3 | 11:54:15.0 | -834.0 | -7.4 | 63.6 |
| 25 | APP | 2076.7 | 16.0 | 11:58:26.2 | -719.6 | -6.7 | 60.7 |
| 26 | APP | 2075.3 | 15.9 | 12:02:07.2 | -455.3 | -5.0 | 51.3 |
| 27 | APP | 2056.4 | 14.9 | 12:05:54.0 | -401.2 | -5.0 | 46.8 |
| 28 | APP | 2052.8 | 15.7 | 12:09:26.2 | -434.8 | -4.6 | 53.6 |
| 29 | APP | 1404.4 | 15.7 | 12:13:13.7 | 4.9 | 0.0 | 115.7 |

500 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|------|
| 30 | F/O | 2032.0 | 12.1 | 12:53:27.4 | -199.7 | -1.4 | 80.2 |
| 31 | | ----- | NO DATA | ----- | | | |
| 32 | F/O | 2018.9 | 11.9 | 12:57:36.3 | 110.1 | 0.8 | 77.7 |
| 33 | | ----- | NO DATA | ----- | | | |
| 34 | F/O | 2053.6 | 11.7 | 13:02:10.7 | 9.1 | 0.1 | 82.3 |
| 35 | | ----- | NO DATA | ----- | | | |
| 36 | F/O | 1476.8 | 13.9 | 13:10:34.2 | -582.7 | -5.3 | 62.3 |

1000 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|------|
| 37 | F/O | 2110.1 | 26.6 | 13:13:17.6 | 593.3 | 4.1 | 81.8 |
| 38 | | ----- | NO DATA | ----- | | | |
| 39 | F/O | 2142.7 | 25.7 | 13:18:14.6 | 372.3 | 2.5 | 82.7 |
| 40 | F/O | 2228.0 | 24.6 | 13:23:33.6 | -354.1 | -2.5 | 81.0 |
| 41 | F/O | 2089.8 | 26.0 | 13:26:03.1 | 95.4 | 0.7 | 77.5 |
| 42 | F/O | 2233.4 | 26.3 | 13:28:31.5 | 162.5 | 1.0 | 89.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22
POSITION DATA
NOISE MEASUREMENT PROGRAM

DATE 107/09/84

2000 FT. WEST

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|--------|--------|----------|------------|--------|------|
| SIX DEG. APPROACH AT VY, 55 KTS. | | | | | | |
| 1 | APP | 2019.1 | 9.9 | 10:20:31.9 | -391.7 | 52.3 |
| 2 | APP | 2028.8 | 10.2 | 10:25:02.1 | -456.6 | 54.0 |
| 3 | APP | 2006.2 | 10.2 | 10:29:28.2 | -738.4 | 56.0 |
| 4 | APP | 2010.4 | 10.3 | 10:34:10.7 | -513.4 | 57.5 |
| 5 | APP | 2026.2 | 10.2 | 10:39:47.8 | -518.0 | 50.0 |
| 6 | APP | 2014.9 | 10.6 | 10:45:01.4 | -347.5 | 53.1 |
| 7 | APP | 2000.3 | 10.0 | 10:49:46.7 | -412.0 | 52.3 |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 8 | | ----- | NO DATA | ----- | | |
| 10 | | ----- | NO DATA | ----- | | |
| 12 | APP | 2072.8 | 15.4 | 11:14:09.2 | -872.5 | 56.1 |
| 14 | APP | 2052.4 | 14.8 | 11:19:08.0 | -598.8 | 51.8 |
| 16 | APP | 2048.6 | 16.3 | 11:24:09.5 | -901.8 | 50.1 |
| 18 | APP | 2051.2 | 16.6 | 11:28:41.6 | -844.3 | 50.5 |
| 20 | APP | 2060.3 | 14.7 | 11:33:32.2 | -658.6 | 49.5 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|--------|---------|------------|-------|------|
| 9 | | ----- | NO DATA | ----- | | |
| 11 | | 2036.9 | 6.8 | 11:10:11.0 | -34.1 | 77.4 |
| 13 | DEP | 2028.4 | 10.9 | 11:16:07.7 | -31.4 | 58.0 |
| 15 | | ----- | NO DATA | ----- | | |
| 17 | DEP | 2071.3 | 10.2 | 11:26:03.8 | 453.0 | 56.3 |
| 19 | DEP | 854.5 | 28.8 | 11:30:42.9 | 230.3 | 77.8 |
| 21 | DEP | 839.2 | 30.8 | 11:35:16.9 | 750.5 | 2.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

ROBINSON R22

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE: 07/09/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|--------|--------|----------|------------|--------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 22 | APP | 2082.9 | 15.3 | 11:45:41.6 | -732.5 | 59.5 |
| 23 | APP | 2063.2 | 15.7 | 11:49:30.5 | -774.7 | 55.8 |
| 24 | APP | 2004.8 | 15.4 | 11:54:17.5 | -924.4 | 62.6 |
| 25 | APP | 2053.4 | 16.6 | 11:58:26.5 | -665.2 | 60.1 |
| 26 | APP | 2057.7 | 14.9 | 12:02:10.6 | -448.1 | 44.6 |
| 27 | APP | 2028.4 | 14.2 | 12:05:56.4 | -668.9 | 48.0 |
| 28 | APP | 2064.2 | 14.5 | 12:09:20.2 | -524.6 | 61.8 |
| 29 | APP | 2006.2 | 14.9 | 12:13:04.4 | -643.9 | 61.4 |

500 FT. LEVEL FLYOVER AT 83 KTS.

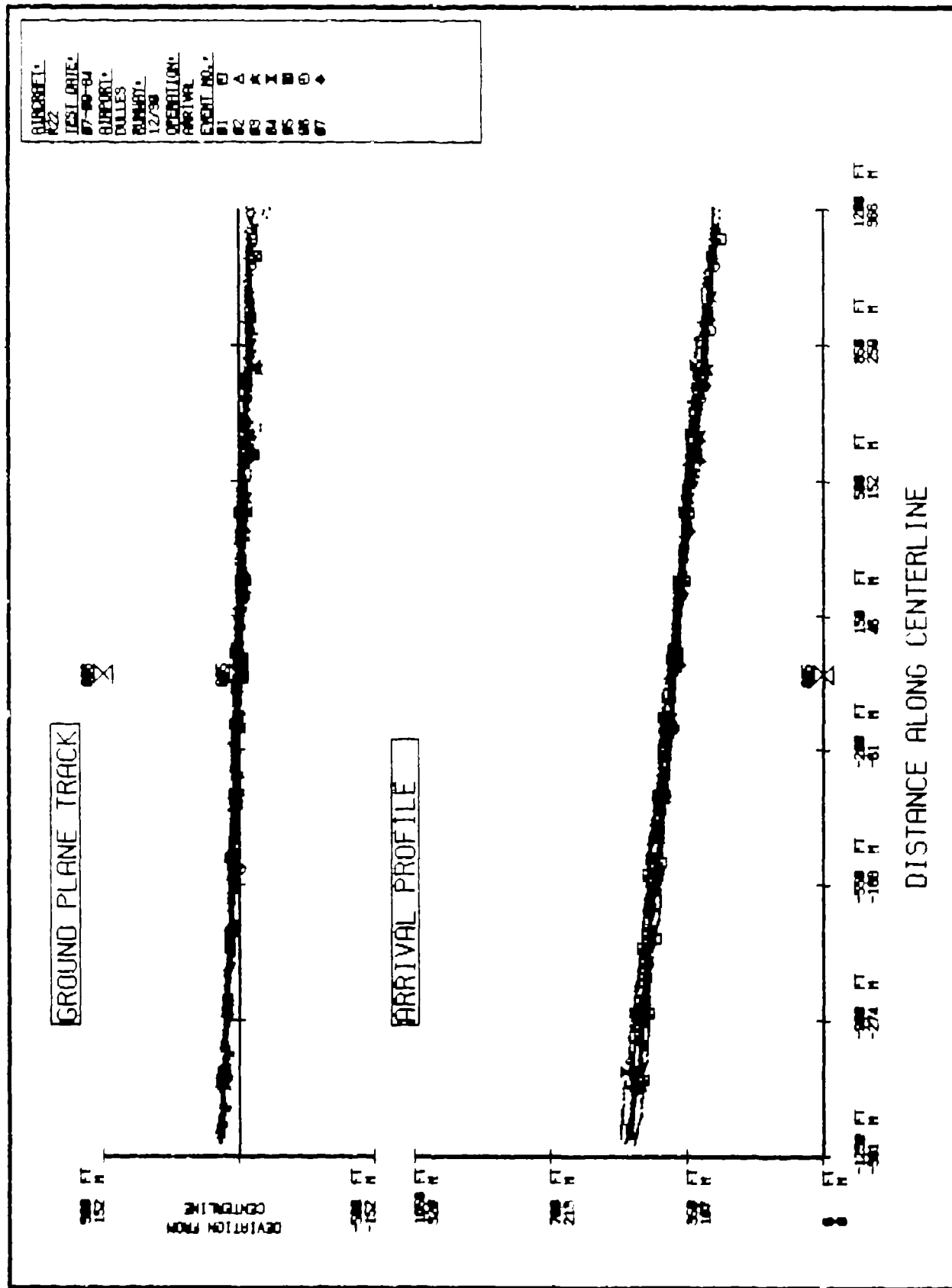
| | | | | | | |
|----|-----|--------|---------|------------|-------|------|
| 30 | F/O | 2037.6 | 11.6 | 12:53:29.2 | 21.3 | 77.9 |
| 31 | | ----- | NO DATA | ----- | | |
| 32 | F/O | 2022.0 | 11.5 | 12:57:33.3 | -41.5 | 77.6 |
| 33 | | ----- | NO DATA | ----- | | |
| 34 | F/O | 2010.7 | 11.4 | 13:02:11.6 | -16.5 | 82.6 |
| 35 | | ----- | NO DATA | ----- | | |
| 36 | F/O | 2033.1 | 10.6 | 13:10:37.8 | -69.4 | 84.8 |

1000 FT. LEVEL FLYOVER AT 83 KTS.

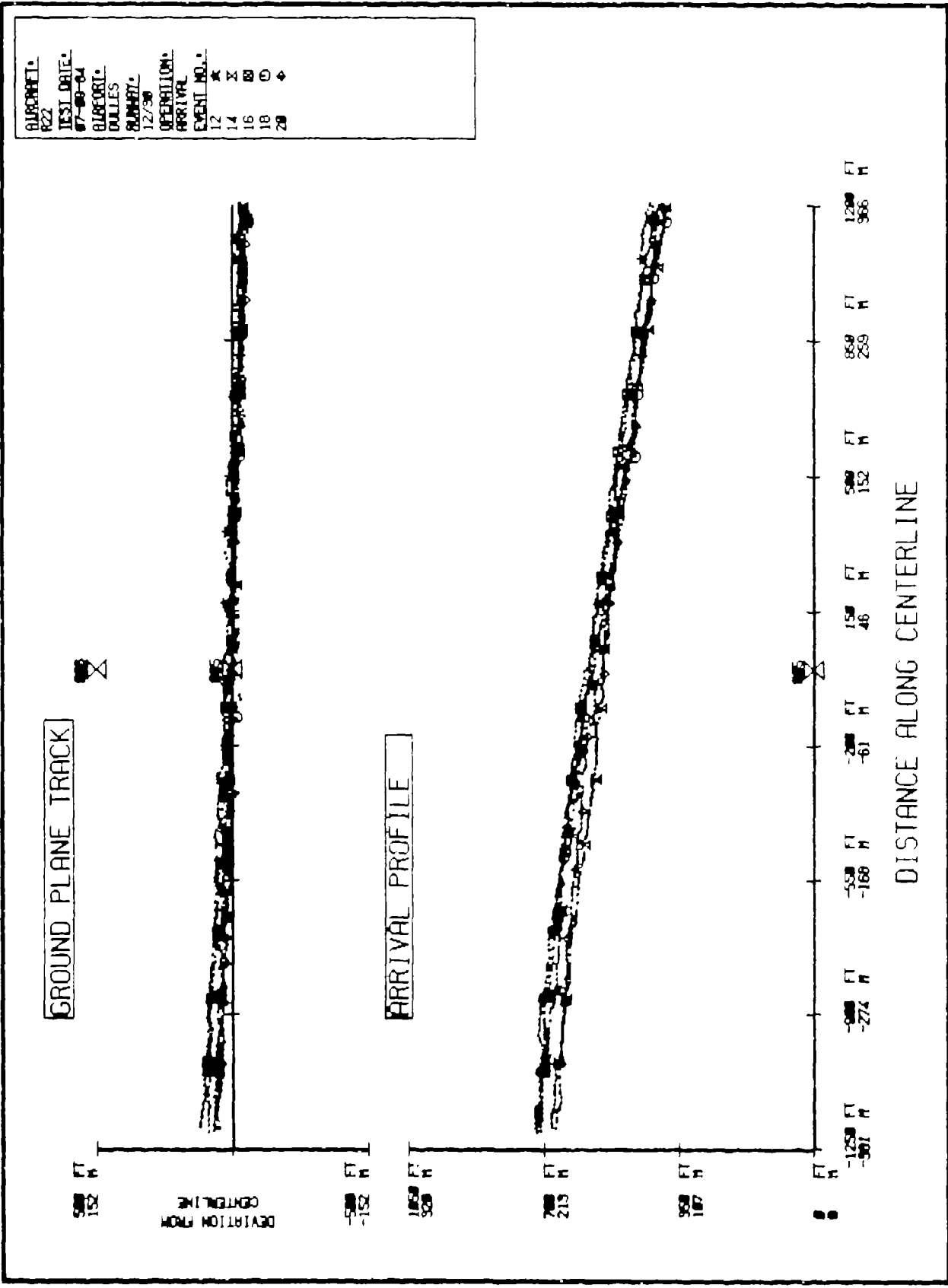
| | | | | | | |
|----|-----|--------|---------|------------|--------|------|
| 37 | F/O | 2300.0 | 24.1 | 13:19:18.2 | 678.9 | 81.9 |
| 38 | | ----- | NO DATA | ----- | | |
| 39 | F/O | 2245.8 | 24.3 | 13:18:15.7 | 364.0 | 81.6 |
| 40 | F/O | 2134.0 | 24.8 | 13:23:35.8 | -193.0 | 81.2 |
| 41 | F/O | 2273.4 | 23.1 | 13:26:04.2 | 312.4 | 75.6 |
| 42 | F/O | 2208.1 | 26.1 | 13:28:34.5 | -274.9 | 86.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

SIX⁰ APPROACH at Vy, 55 Kts.)



NORMAL APPROACH

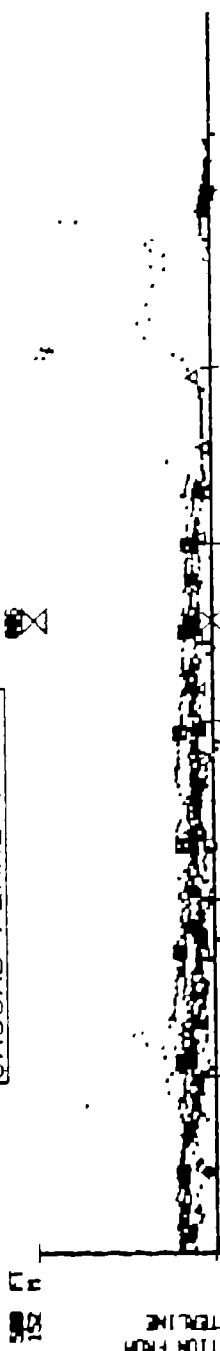


ALBUQUERQUE
 R22
 TEST DATE:
 07-03-64
 ALBUQUERQUE
 DALLAS
 ALBUQUERQUE
 12/58
 OPERATION:
 ARRIVAL
 EVENT NO.:
 12 *
 14 X
 16 0
 18 0
 20 4

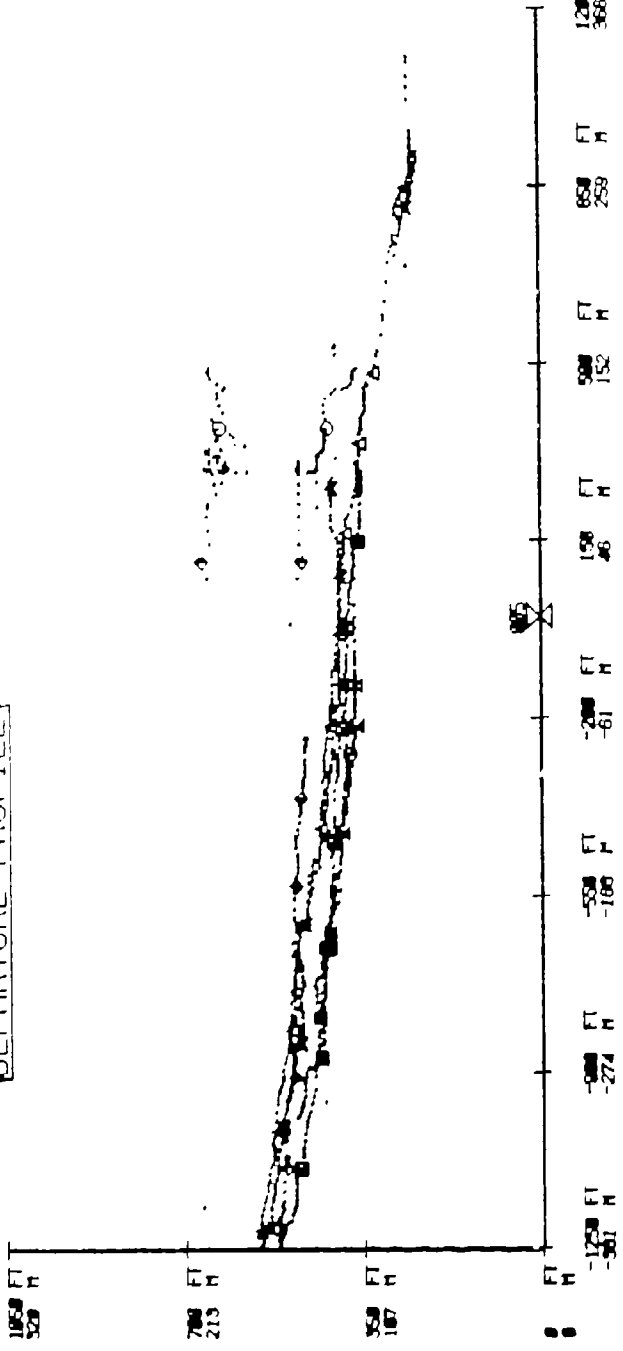
NORMAL TAKEOFF

| | |
|------------|-----------|
| AIRCRAFT: | R22 |
| TEST DATE: | 07-03-84 |
| AIRPORT: | DULLES |
| CLASSIC: | 12/30 |
| OPERATION: | DEPARTURE |
| EVENT NO.: | 00 |
| | 11 |
| | 13 |
| | 15 |
| | 17 |
| | 19 |
| | 21 |

GROUND PLANE TRACK

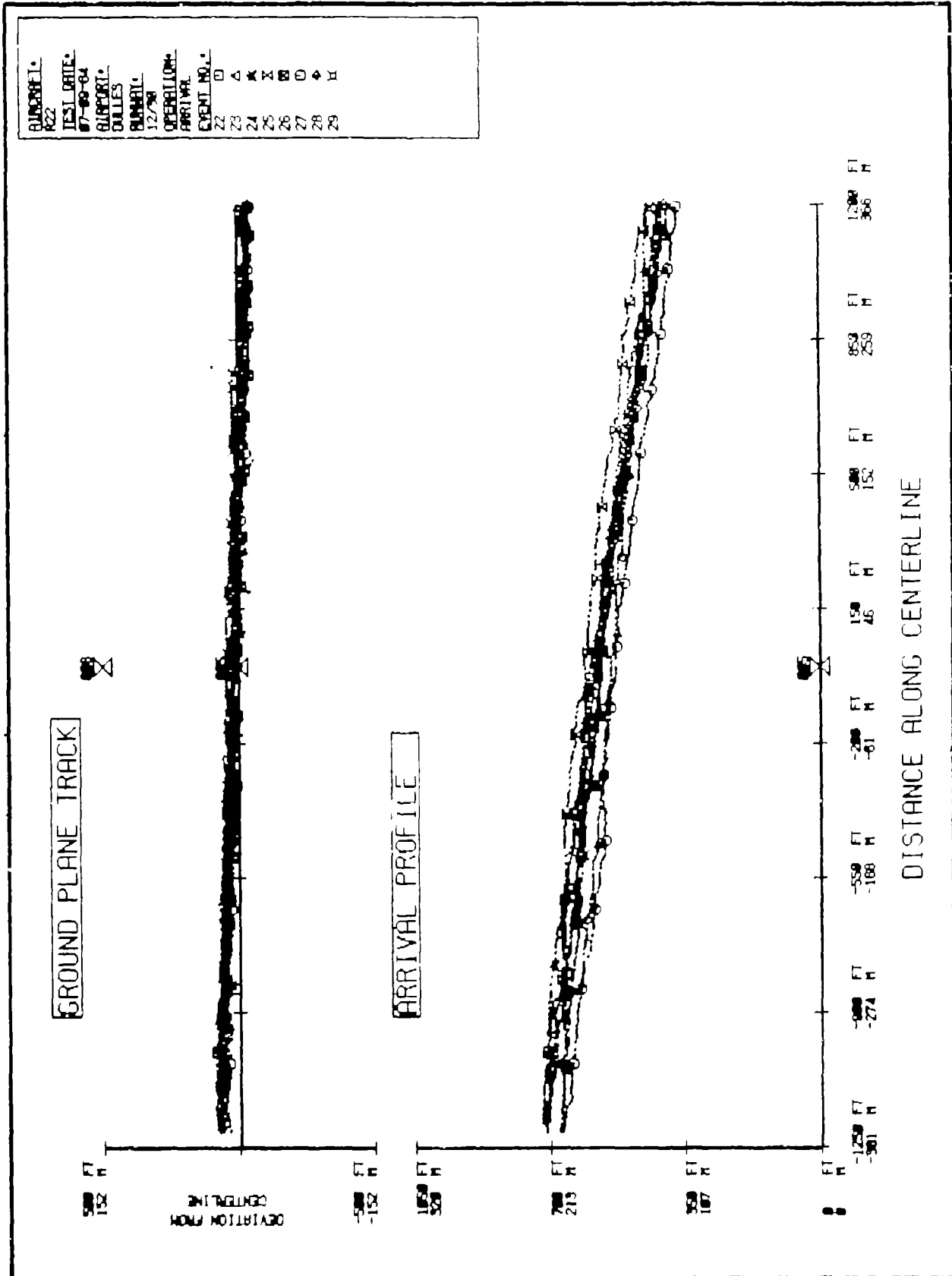


DEPARTURE PROFILE

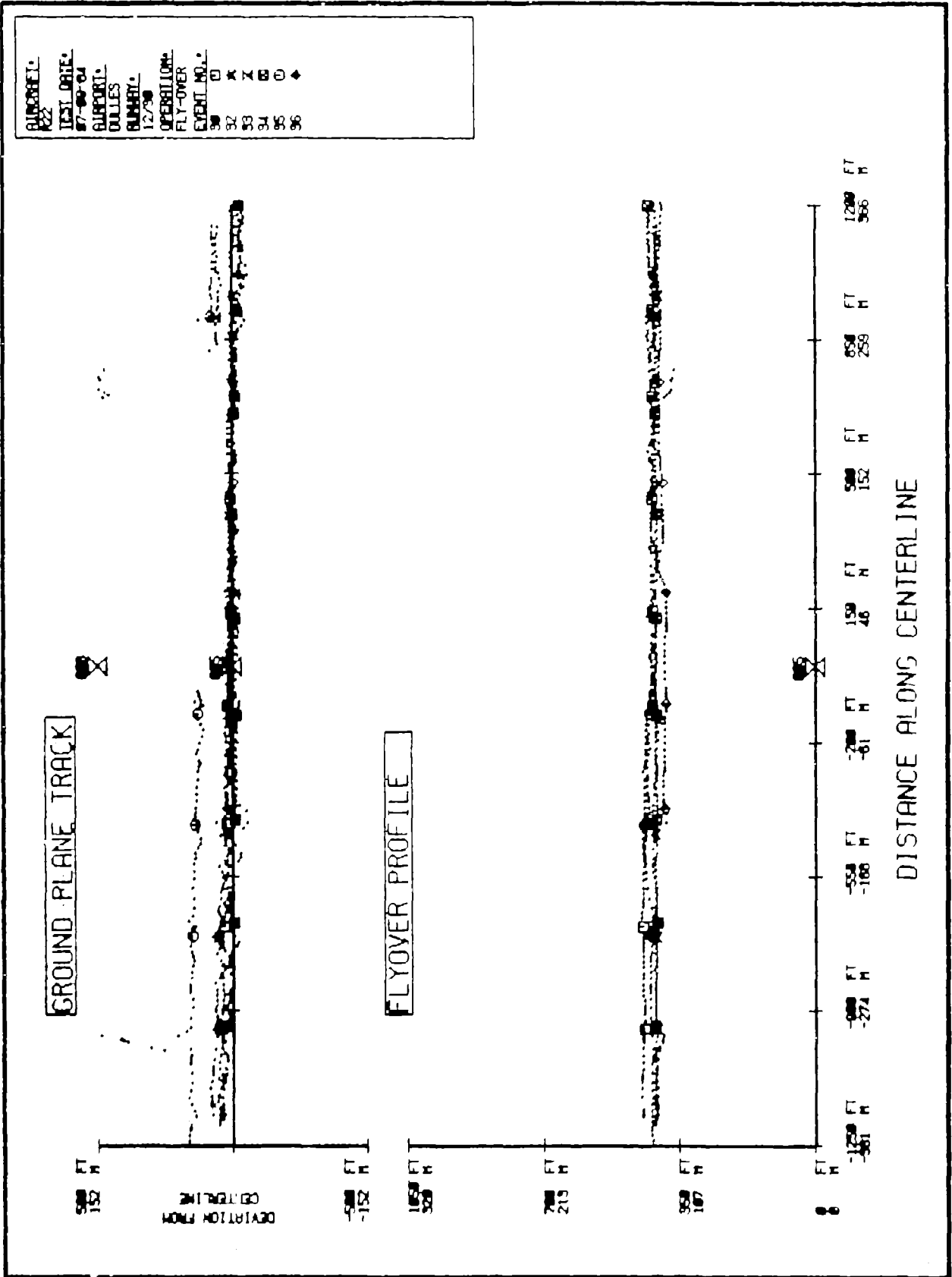


DISTANCE ALONG CENTERLINE

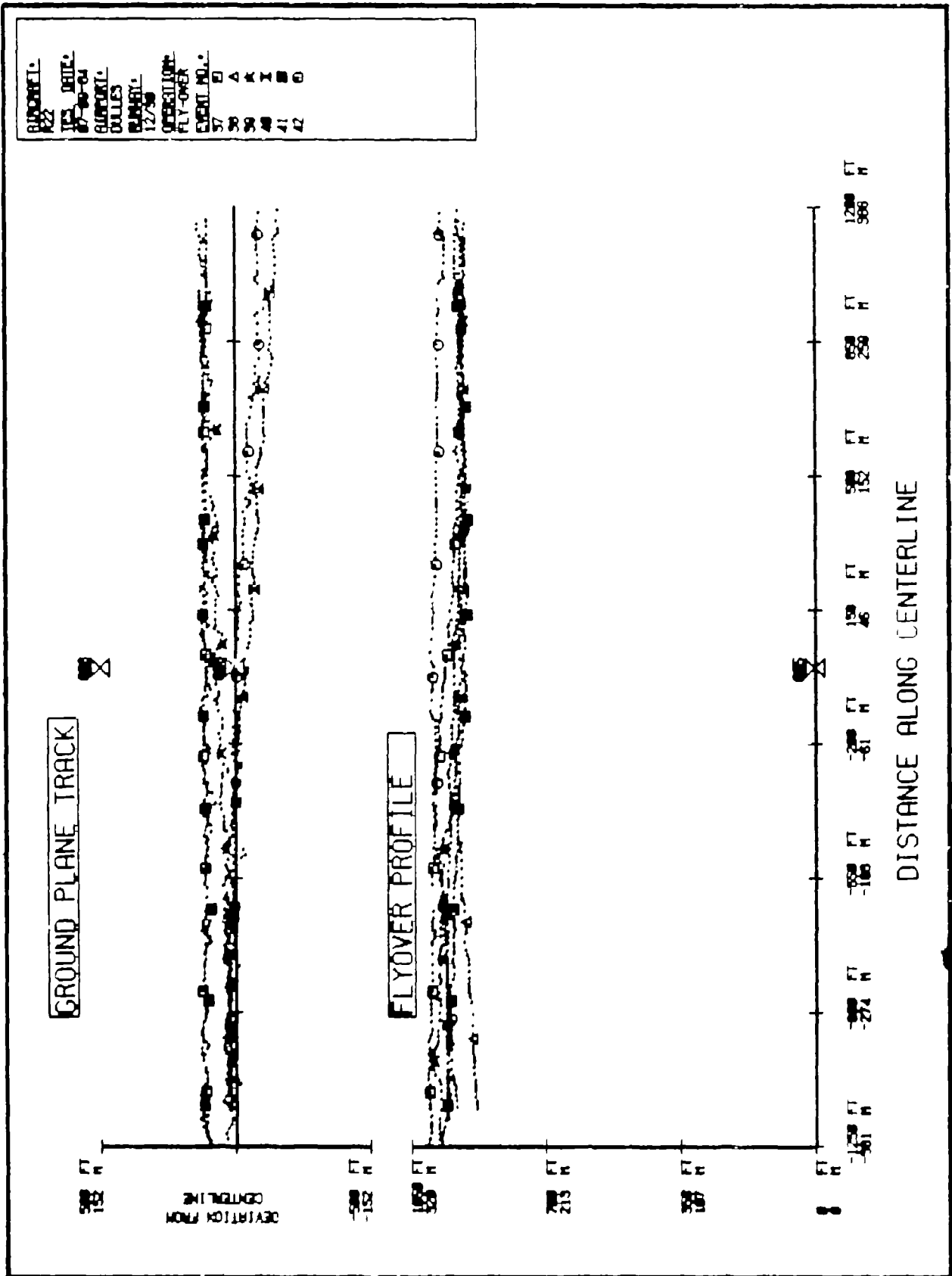
NOISE ABATEMENT APPROACH (Var. R/D & A/S)



500 FT. LEVEL FLYOVER



1000 FT. LEVEL FLYOVER



METEOROLOGICAL DATA

The meteorological data for the period from 1961 to 1965 are presented in this report. The data were obtained from the National Weather Service, and are presented in the form of a table. The table contains the following information: Date, Time, Location, Wind Speed, Wind Direction, Clouds, Visibility, and Precipitation. The data are presented in the form of a table with the following columns: Date, Time, Location, Wind Speed, Wind Direction, Clouds, Visibility, and Precipitation. The data are presented in the form of a table with the following columns: Date, Time, Location, Wind Speed, Wind Direction, Clouds, Visibility, and Precipitation.

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: ROBINSON R22

DATE: 07/09/84

| TIME | TEMP. (DEG. F) | R.H. % | WIND DIR. (DEG.) | WIND SPEED | |
|------|-------------------|-----------|---------------------|------------|-----|
| | | | | AVG. | MAX |
| | | | | (MPH) | |

5 FT. AND 50' HOVER (SOFT PATH)

| | | | | | |
|------|----|----|-----|---|---|
| 8:30 | 64 | -- | 340 | 2 | - |
| 8:45 | 64 | -- | 360 | 2 | - |

5 FT. AND 50' HOVER (HARD PATH)

| | | | | | |
|------|----|----|-----|---|---|
| 9:00 | 64 | 75 | 340 | 2 | - |
| 9:15 | 66 | -- | 340 | 2 | - |

6 DEGREE APPROACH AT VY, 55 KTS.

| | | | | | |
|-------|----|----|-----|---|---|
| 10:00 | 69 | 66 | 360 | 3 | 5 |
| 10:15 | 70 | -- | 360 | 3 | 5 |
| 10:30 | 72 | -- | -- | 3 | 5 |
| 10:45 | 72 | -- | 360 | 3 | 5 |

NORMAL TAKEOFF AND APPROACH

| | | | | | |
|-------|----|----|-----|---|---|
| 11:00 | 73 | 53 | 130 | 3 | 6 |
| 11:15 | 72 | -- | 130 | 3 | 5 |
| 11:30 | 73 | -- | -- | 2 | 6 |

METEOROLOGICAL DATA
(MEASURED AT 30 FT. AGL)

HELICOPTER: ROBINSON R22

DATE: 07/09/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | |
|-------|----|----|-----|---|----|
| 11:45 | 74 | -- | 360 | 4 | 10 |
| 12:00 | 74 | 52 | 270 | 3 | 6 |
| 12:15 | 74 | -- | 320 | 3 | 8 |

500 AND 1000 FT. LEVEL FLYOVER AT 83 KTS.

| | | | | | |
|-------|----|----|-----|---|----|
| 13:00 | 74 | 54 | 320 | 5 | 10 |
| 13:15 | 74 | -- | 320 | 5 | 10 |
| 13:30 | 76 | -- | 300 | 7 | 10 |
| 13:45 | 74 | -- | -- | 5 | 10 |

METEOROLOGICAL DATA

HELICOPTER: ROBINSON R22

DATE: 07/09/84

TEMPERATURE AND RELATIVE HUMIDITY DATA

HELICOPTERS OAT GAUGE DATA

(MEASURED AT 4 FT. AGL)

| TIME | TEMP. | R.H. |
|-------|-------|------|
| 08:07 | 66 F | 62% |
| 08:22 | 67 F | 58% |
| 08:42 | 69 F | 51% |
| 09:16 | 72 F | 42% |
| 09:39 | 74 F | 43% |
| 09:59 | 75 F | 40% |
| 10:21 | 75 F | 37% |
| 10:50 | 75 F | 37% |
| 11:18 | 77 F | 36% |
| 11:42 | 76 F | 38% |
| 11:55 | 77 F | 32% |
| 12:15 | 78 F | 33% |

| TIME | ALTITUDE | TEMP. |
|-------|----------|-------|
| 8:20 | 200' | 63 F |
| | 400' | 63 F |
| | 600' | 64 F |
| | 800' | 64 F |
| | 1000' | 64 F |
| 9:21 | 200' | 66 F |
| | 400' | 64 F |
| | 600' | 64 F |
| | 800' | 65 F |
| 10:10 | 400' | 68 F |
| | 600' | 68 F |
| | 800' | 66 F |
| 12:15 | 200' | 75 F |
| | 400' | 73 F |
| | 600' | 72 F |
| | 800' | 72 F |

PILOT BALLOON WIND DATA

ROBINSON R22

07/09/84

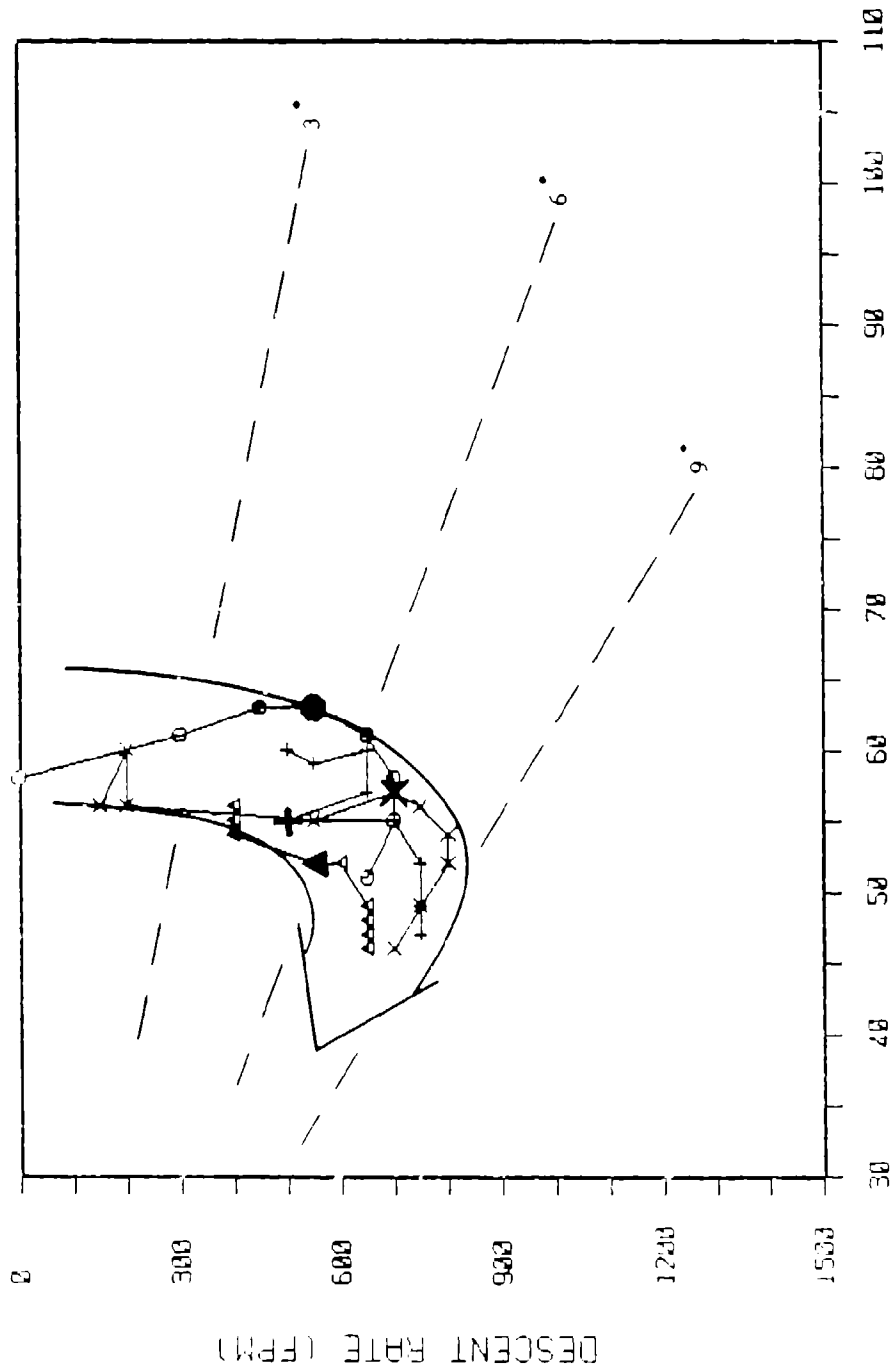
| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
| ----- | | | | |
| LAUNCH TIME: | | 7:45 | | 9:17 |
| SFC | 300 | 2 | 070 | 2 |
| 354 | 336 | 6 | 018 | 4 |
| 708 | 347 | 6 | 017 | 3 |
| 1033 | 002 | 6 | 011 | 2 |
| 1358 | 016 | 5 | 003 | 2 |
| | | 10:15 | | 11:10 |
| SFC | 310 | 4 | 340 | 4 |
| 354 | 331 | 3 | 325 | 3 |
| 708 | 331 | 3 | 319 | 3 |
| 1033 | 327 | 3 | 304 | 4 |
| 1358 | 314 | 3 | 286 | 4 |
| | | 12:00 | | |
| SFC | 290 | 5 | | |
| 354 | 278 | 9 | | |
| 708 | 277 | 11 | | |
| 1033 | 274 | 12 | | |
| 1358 | 274 | 12 | | |

COCKPIT VIDEO

DATA

- THIS SECTION OF THE APPENDIX CONTAINS FLIGHT PROFILE -
- PLOTS AND INDIVIDUAL EVENT DATA READ EVERY 5 SECONDS -
- FROM PLAYBACK OF THE COCKPIT VIDEO RECORDINGS. IN THE -
- PROFILE PLOTS, INDICATED AIRSPEED VS. DESCENT RATE -
- ARE PLOTTED FOR THE NORMAL APPROACHES AND THE 'BEST' -
- NOISE ABATEMENT APPROACH EVENTS. AN ARROW IS DRAWN -
- WHICH BOUNDS THE DATA POINTS AND PORTRAYS THE -
- SPEED/DESCENT RATE TREND WITH TIME. THE DARKER DATA -
- POINTS INDICATE WHEN THE HELICOPTER PASSED OVER THE CLC -
- POSITION. THE INDIVIDUAL EVENT DATA CONTAINS LISTINGS -
- OF ALL THE COCKPIT INSTRUMENT READINGS OBTAINED FROM THE -
- VIDEO PLAYBACK. THIS DATA ENCOMPASSES THE HELICOPTERS'S -
- FLIGHT PARAMETERS THROUGHOUT THE ENTIRE DATA RUN PLUS OR -
- MINUS 15 SECONDS (MINIMUM) FROM CLC. -

NORMAL APPROACH
R22

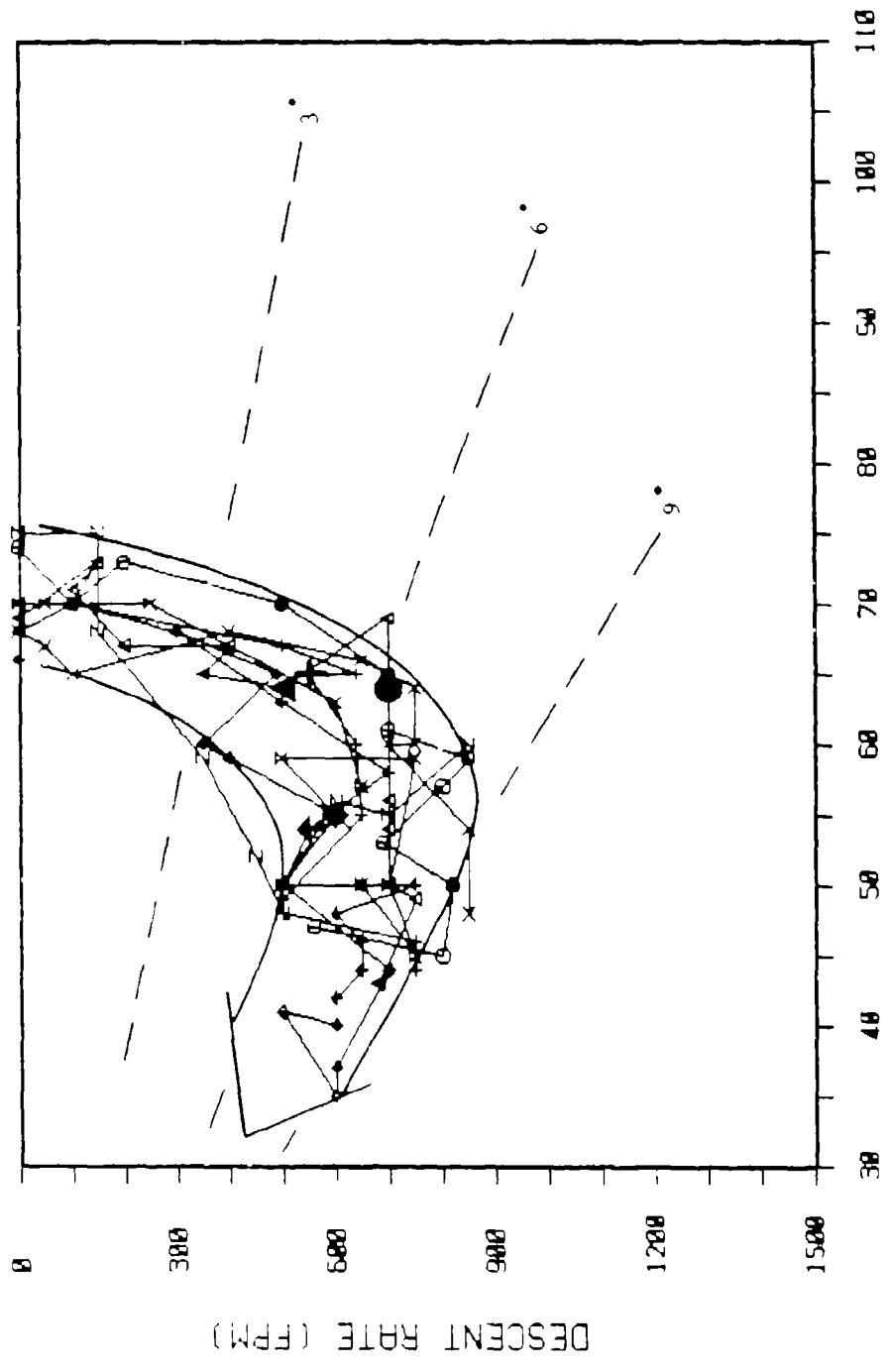


○ B12
+ B14
× B18
△ B20

IAS (KTS)

NOISE ABATEMENT APPROACH

R22



- 022
- + 023
- × 024
- △ 025
- ◇ 026
- ⋈ 027
- ⊗ 028
- ∇ 029

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: ROBINSON R22

DATE: 07/09/84

EVENT: B8

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 820 | 16 | 100 | 65 | 0.87 |
| -22 | 800 | 18 | 100 | 64 | 0.88 |
| -17 | 780 | 17 | 100 | 61 | 0.93 |
| -12 | 750 | 14 | 500 | 60 | 4.72 |
| -7 | 660 | 14 | 650 | 59 | 6.25 |
| -2 | 620 | 14 | 600 | 59 | 5.76 |
| CLC 0 | 600 | 13 | 600 | 58 | 5.86 |
| 3 | 570 | 12 | 600 | 56 | 6.07 |
| 8 | 530 | 12 | 700 | 55 | 7.22 |
| 13 | 480 | 11 | 750 | 51 | 8.35 |
| 18 | 420 | 12 | 850 | 50 | 9.66 |
| 23 | 370 | 10 | 800 | 52 | 8.74 |
| 28 | 300 | 10 | 800 | 45 | 10.11 |

EVENT: B12

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 760 | 19 | 0 | 58 | 0.00 |
| -15 | 760 | 17 | 0 | 58 | 0.00 |
| 10 | 740 | 12 | 300 | 61 | 2.78 |
| -5 | 700 | 11 | 450 | 63 | 4.04 |
| CLC 0 | 660 | 11 | 550 | 63 | 4.95 |
| 5 | 610 | 10 | 650 | 61 | 6.04 |
| 10 | 560 | 10 | 700 | 58 | 6.84 |
| 15 | 510 | 10 | 700 | 55 | 7.22 |
| 20 | 460 | 10 | 650 | 51 | 7.23 |
| 25 | 410 | 10 | 700 | 50 | 7.95 |
| 30 | 350 | 10 | 800 | 45 | 10.11 |
| 35 | 250 | 12 | 800 | 39 | 12.00 |

EVENT: B10

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -11 | 730 | 16 | 400 | 60 | 3.77 |
| -6 | 700 | 15 | 350 | 57 | 3.48 |
| CLC 0 | 630 | 13 | 500 | 55 | 5.15 |
| 4 | 600 | 12 | 600 | 55 | 6.18 |
| 9 | 550 | 12 | 700 | 53 | 7.49 |
| 14 | 500 | 12 | 750 | 50 | 8.52 |
| 19 | 440 | 11 | 750 | 47 | 9.07 |
| 24 | 380 | 10 | 750 | 46 | 9.27 |
| 29 | 330 | 11 | 750 | 42 | |

EVENT: B14

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -34 | 780 | 19 | 0 | 61 | 0.00 |
| -29 | 800 | 18 | 0 | 63 | 0.00 |
| -24 | 790 | 16 | 400 | 63 | 3.59 |
| -19 | 750 | 13 | 500 | 60 | 4.72 |
| -14 | 700 | 12 | 550 | 59 | 5.28 |
| -9 | 670 | 13 | 650 | 60 | 6.14 |
| -4 | 590 | 13 | 650 | 57 | 6.47 |
| CLC 0 | 570 | 13 | 500 | 55 | 5.15 |
| 6 | 530 | 11 | 700 | 55 | 7.22 |
| 11 | 480 | 12 | 750 | 52 | 8.19 |
| 16 | 400 | 12 | 750 | 49 | 8.69 |
| 21 | 340 | 12 | 750 | 47 | 9.07 |
| 26 | 300 | 12 | 750 | 44 | 9.69 |
| 31 | 250 | 11 | 700 | 40 | 9.95 |

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: ROBINSON R22

DATE: 07/09/84

EVENT: E18

| TIME (SEC.) | ALT. (AGL) | G (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -23 | 770 | 17 | 0 | 58 | 0.00 |
| -18 | 760 | 14 | 150 | 56 | 0.00 |
| -13 | 740 | 12 | 200 | 60 | 2.78 |
| -8 | 710 | 10 | 200 | 56 | 4.04 |
| -3 | 660 | 10 | 550 | 55 | 4.95 |
| CLC 0 | 620 | 11 | 700 | 57 | 6.04 |
| 2 | 600 | 12 | 750 | 56 | 6.84 |
| 7 | 530 | 12 | 800 | 54 | 7.22 |
| 12 | 480 | 11 | 800 | 52 | 7.23 |
| 17 | 470 | 12 | 750 | 49 | 7.95 |
| 22 | 390 | 13 | 700 | 46 | 10.11 |
| 27 | 360 | 12 | 660 | 44 | 12.00 |

EVENT: B20

| TIME (SEC.) | ALT. (AGL) | G (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -33 | 780 | 18 | 0 | 57 | 0.00 |
| -28 | 780 | 11 | 0 | 59 | 0.00 |
| -23 | 780 | 14 | 100 | 59 | 3.59 |
| -18 | 720 | 13 | 400 | 56 | 4.72 |
| -13 | 700 | 11 | 400 | 55 | 5.28 |
| -8 | 660 | 10 | 400 | 54 | 6.14 |
| -3 | 640 | 10 | 400 | 54 | 6.47 |
| CLC 0 | 560 | 11 | 550 | 52 | 6.15 |
| 2 | 560 | 12 | 600 | 52 | 7.22 |
| 7 | 500 | 13 | 650 | 49 | 8.19 |
| 12 | 470 | 13 | 650 | 47 | 8.69 |
| 17 | 430 | 12 | 650 | 48 | 9.07 |
| 22 | 380 | 12 | 650 | 46 | 9.69 |
| 27 | 340 | 11 | 700 | 42 | 9.95 |
| 32 | 260 | 11 | 700 | 40 | 9.95 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: ROBINSON R22

DATE: 07/09/84

EVENT: D22

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -22 | 760 | 19 | 0 | 74 | 0.00 |
| -17 | 770 | 16 | 100 | 70 | 0.81 |
| -12 | 750 | 14 | 200 | 73 | 1.55 |
| -7 | 720 | 12 | 500 | 70 | 4.04 |
| -2 | 630 | 13 | 700 | 65 | 6.10 |
| CLC 0 | 620 | 13 | 700 | 64 | 6.20 |
| 3 | 580 | 12 | 700 | 61 | 6.51 |
| 8 | 500 | 13 | 850 | 59 | 8.18 |
| 13 | 460 | 13 | 800 | 57 | 7.97 |
| 18 | 420 | 11 | 690 | 53 | 7.39 |
| 23 | 350 | 12 | 820 | 50 | 9.32 |
| 28 | 300 | 12 | 800 | 45 | 10.11 |
| 33 | 240 | 19 | 560 | 47 | 6.76 |

EVENT: D23

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -21 | 750 | 21 | +100 | 69 | 0.00 |
| -16 | 760 | 20 | 150 | 73 | 1.16 |
| -11 | 750 | 12 | 100 | 70 | 0.81 |
| -6 | 700 | 12 | 500 | 67 | 4.23 |
| -1 | 630 | 11 | 640 | 65 | 5.58 |
| CLC 0 | 620 | 11 | 550 | 65 | 4.79 |
| 4 | 580 | 12 | 640 | 60 | 6.05 |
| 9 | 530 | 13 | 650 | 55 | 6.70 |
| 14 | 470 | 13 | 500 | 49 | 5.78 |
| 19 | 440 | 13 | 500 | 48 | 5.90 |
| 24 | 380 | 14 | 750 | 46 | 9.27 |
| 29 | 300 | 15 | 750 | 44 | 9.69 |

EVENT: D24

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -25 | 750 | 20 | +200 | 70 | 0.00 |
| -20 | 750 | 19 | 0 | 68 | 0.00 |
| -15 | 740 | 21 | 50 | 67 | 0.42 |
| -10 | 720 | 13 | 100 | 65 | 0.87 |
| -5 | 680 | 12 | 400 | 68 | 3.33 |
| CLC 0 | 620 | 12 | 650 | 66 | 5.58 |
| 5 | 560 | 13 | 750 | 64 | 6.65 |
| 10 | 500 | 12 | 750 | 60 | 7.05 |
| 15 | 450 | 11 | 700 | 60 | 6.62 |
| 20 | 370 | 11 | 850 | 54 | 8.94 |
| 25 | 290 | 11 | 850 | 48 | 10.07 |

EVENT: D25

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -34 | 820 | 13 | +250 | 70 | 0.00 |
| -29 | 820 | 17 | 0 | 69 | 0.00 |
| -24 | 790 | 16 | 150 | 73 | 1.16 |
| -19 | 780 | 15 | 100 | 71 | 0.80 |
| -14 | 750 | 13 | 200 | 67 | 1.69 |
| -9 | 710 | 13 | 400 | 67 | 3.38 |
| -4 | 680 | 11 | 350 | 65 | 3.05 |
| CLC 0 | 650 | 11 | 500 | 64 | 4.42 |
| 6 | 570 | 11 | 700 | 69 | 5.75 |
| 11 | 510 | 10 | 700 | 56 | 7.09 |
| 16 | 460 | 10 | 700 | 54 | 7.35 |
| 21 | 400 | 10 | 700 | 50 | 7.95 |
| 26 | 350 | 10 | 750 | 49 | 8.69 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: ROBINSON R22

DATE: 07/05/84

EVENT: D26

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -19 | 750 | 13 | 300 | 68 | 2.50 |
| -14 | 700 | 13 | 490 | 65 | 4.27 |
| -9 | 680 | 11 | 350 | 60 | 3.30 |
| -4 | 660 | 10 | 400 | 59 | 3.84 |
| CLC 0 | 600 | 11 | 600 | 55 | 6.18 |
| 6 | 560 | 10 | 500 | 50 | 5.67 |
| 11 | 530 | 11 | 700 | 44 | 9.04 |
| 16 | 480 | 12 | 600 | 37 | 9.21 |
| 21 | 420 | 13 | 600 | 35 | 9.75 |
| 26 | 360 | 13 | 500 | 41 | 6.92 |
| 31 | 320 | 12 | 600 | 40 | 8.52 |

EVENT: D27

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -31 | 760 | 18 | 0 | 66 | 0.00 |
| -26 | 770 | 18 | 0 | 68 | 0.00 |
| -21 | 750 | 18 | 100 | 70 | 0.81 |
| -16 | 720 | 13 | 300 | 68 | 2.50 |
| -11 | 660 | 10 | 500 | 63 | 4.50 |
| -6 | 620 | 10 | 700 | 58 | 6.84 |
| CLC 0 | 570 | 10 | 550 | 54 | 5.77 |
| 4 | 540 | 11 | 500 | 50 | 5.67 |
| 9 | 490 | 12 | 650 | 50 | 7.38 |
| 14 | 430 | 13 | 750 | 50 | 8.52 |
| 19 | 400 | 12 | 600 | 48 | 7.09 |
| 24 | 350 | 12 | 650 | 46 | 8.02 |

EVENT: D28

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 780 | 19 | 50 | 70 | 0.40 |
| -25 | 760 | 19 | 100 | 70 | 0.81 |
| -20 | 770 | 18 | 0 | 70 | 0.00 |
| -15 | 740 | 14 | 250 | 70 | 2.02 |
| -10 | 670 | 12 | 600 | 63 | 5.40 |
| -5 | 620 | 14 | 650 | 57 | 6.47 |
| CLC 0 | 570 | 15 | 600 | 55 | 6.18 |
| 5 | 540 | 12 | 500 | 59 | 4.80 |
| 10 | 490 | 10 | 750 | 59 | 7.21 |
| 15 | 420 | 11 | 750 | 54 | 7.88 |
| 20 | 380 | 10 | 700 | 50 | 7.95 |
| 25 | 320 | 11 | 750 | 45 | 9.47 |
| 30 | 260 | 16 | 650 | 50 | 7.38 |

EVENT: D29

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 750 | 21 | 0 | 75 | 0.00 |
| -25 | 750 | 20 | 0 | 75 | 0.00 |
| -20 | 720 | 17 | 150 | 75 | 1.13 |
| -15 | 700 | 13 | 150 | 68 | 1.25 |
| -10 | 670 | 13 | 350 | 59 | 3.36 |
| -5 | 630 | 13 | 450 | 52 | 4.90 |
| CLC 0 | 590 | 14 | 500 | 48 | 5.90 |
| 5 | 560 | 14 | 500 | 50 | 5.67 |
| 10 | 520 | 11 | 600 | 56 | 6.07 |
| 15 | 470 | 11 | 700 | 55 | 7.22 |
| 20 | 380 | 10 | 850 | 60 | 8.04 |

D-379

APPENDIX E

AGUSTA 109A

| | <u>PAGE NUMBERS</u> |
|---|---------------------|
| <u>HELICOPTER CHARACTERISTICS</u> | E-383 |
| <u>NOISE LEVEL DATA</u> | |
| SOUND EXPOSURE LEVEL | |
| Bar Charts | |
| Approaches..... | E-386 |
| Takeoff..... | E-387 |
| Level Flyovers..... | E-388 |
| Summary Tables..... | E-389 - E-390 |
| Individual Event Data..... | E-391 - E-396 |
| A-WEIGHTED SOUND LEVEL | |
| Bar Charts | |
| Approaches..... | E-398 |
| Takeoff..... | E-399 |
| Level Flyovers..... | E-400 |
| Summary Tables..... | E-401 - E-402 |
| Individual Event Data..... | E-403 - E-408 |
| HOVER DATA (1eq) | |
| Plots..... | E-410 - E-412 |
| Individual Event Data..... | E-413 - E-415 |
| <u>RADAR TRACKING DATA</u> | |
| Position Data..... | E-418 - E-431 |
| Tracking Plots..... | E-432 - E-437 |
| <u>METEOROLOGICAL DATA</u> | |
| 10-meter Tower Data..... | E-440 - E-442 |
| 4 ft. Data and Aircraft OAT Data..... | E-443 |
| Pilot Balloon Wind Data..... | E-444 |
| <u>COCKPIT VIDEO DATA</u> | |
| Normal Approach Plot..... | E-446 |
| Noise Abatement Approach Plot..... | E-447 |
| Individual Event Data..... | E-448 - E-451 |



HELICOPTER CHARACTERISTICS

| | |
|-------------------------------------|----------------------|
| HELICOPTER MANUFACTURER : | AGUSTA |
| HELICOPTER MODEL : | 109 MKII |
| TEST HELICOPTER N-NUMBER : | N4210T |
| MAX INTERNAL GROSS WEIGHT : | 5730 LBS. |
| NUMBER OF ENGINES : | TWO |
| UNINSTALLED TAKEOFF POWER : | 420 SHP (PER ENGINE) |
| UNINSTALLED MAX CONTINUOUS PWR. : | 420 SHP (PER ENGINE) |
| SPECIFIC FUEL CONSUMPTION | |
| AT MAXIMUM POWER : | 30 GALLONS PER HOUR |
| NEVER EXCEED SPEED (VNE) : | 168 KTS. |
| MAX SPEED IN LEVEL FLIGHT | |
| WITH MAX CONTINUOUS POWER : | 150 KTS. |
| SPEED FOR BEST RATE OF CLIMB (VY) : | 60 KTS. |
| CRUISE SPEED FOR BEST RANGE (VCR) : | 145 KTS. |
| BEST RATE OF CLIMB AT | |
| TAKEOFF POWER (BRC) : | 1640 FPM |
| "TOP OF GREEN ARC" ROTOR SPEED : | 424 RPM 110% |

MAIN AND TAIL ROTOR SPECIFICATIONS

| | MAIN | TAIL |
|------------------|-------|------|
| DIAMETER (FT.) : | 36.09 | 6.66 |
| NO. OF BLADES : | 4 | 2 |
| TIPSPEED : | 727 | 703 |
| TIP SHAPE : | --- | -- |

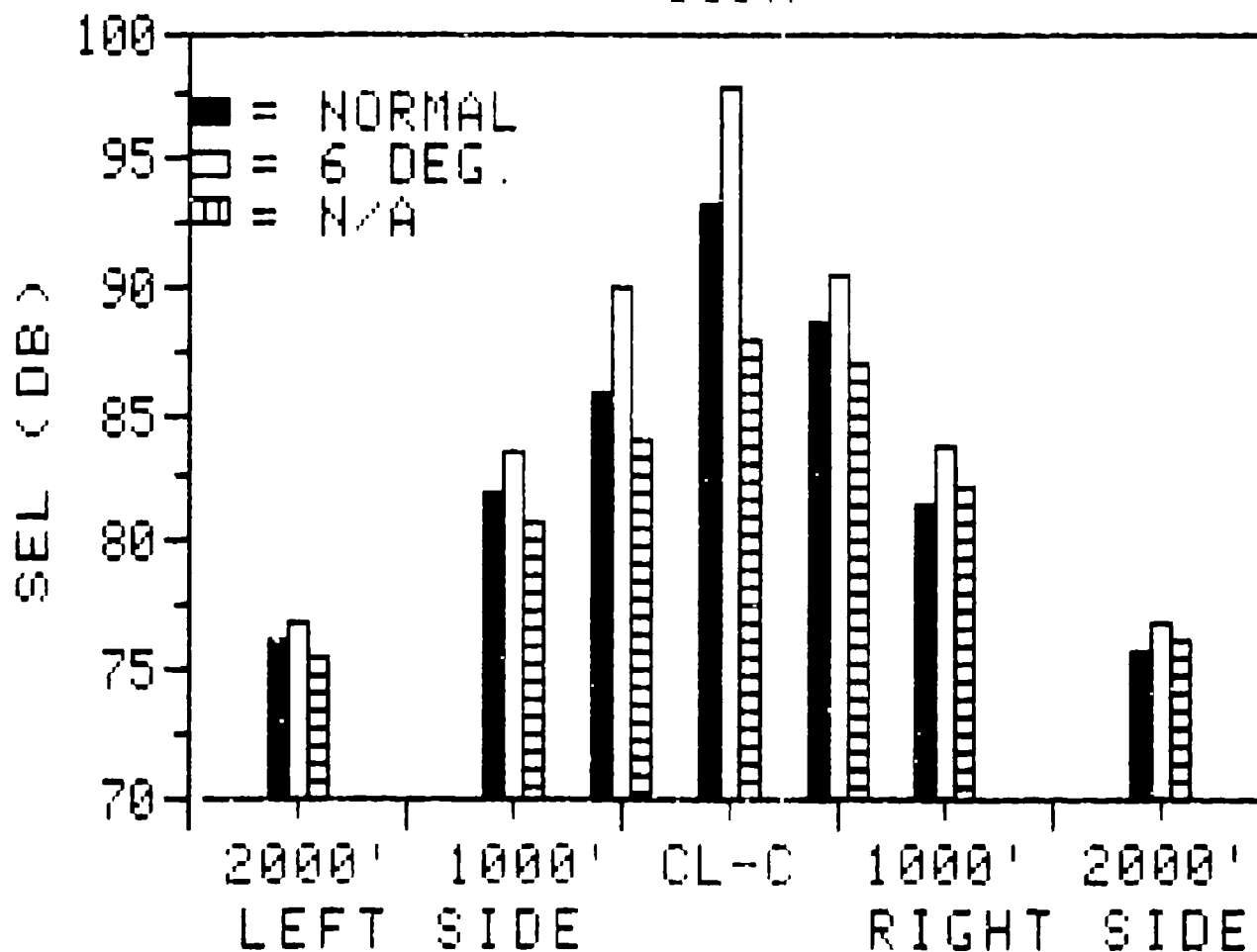
NOISE LEVEL DATA

'as-measured'

SOUND EXPOSURE LEVEL

THIS SECTION OF THE REPORT CONTAINS THE AS-MEASURED SOUND EXPOSURE LEVELS FOR EACH OF THE 12 SITES. THESE DATA ARE PRESENTED IN THE FORM OF TABLES WHICH SHOW THE MEAN, ONE-THIRD AND TWO-THIRDS BANDS OF THE PLATEAU BAND FREQUENCY AND THE SOUND EXPOSURE LEVEL NOISE LEVELS. THE MEAN BANDS ARE THE BANDS FROM WHICH THE SOUND EXPOSURE LEVELS ARE DETERMINED. THE MEAN BANDS ARE SHOWN BELOW EACH OF THE TABLES WHICH PRESENT THE SOUND EXPOSURE LEVELS. THE MEAN BANDS ARE SHOWN IN THE TABLES WHICH PRESENT THE SOUND EXPOSURE LEVELS. THE MEAN BANDS ARE SHOWN IN THE TABLES WHICH PRESENT THE SOUND EXPOSURE LEVELS.

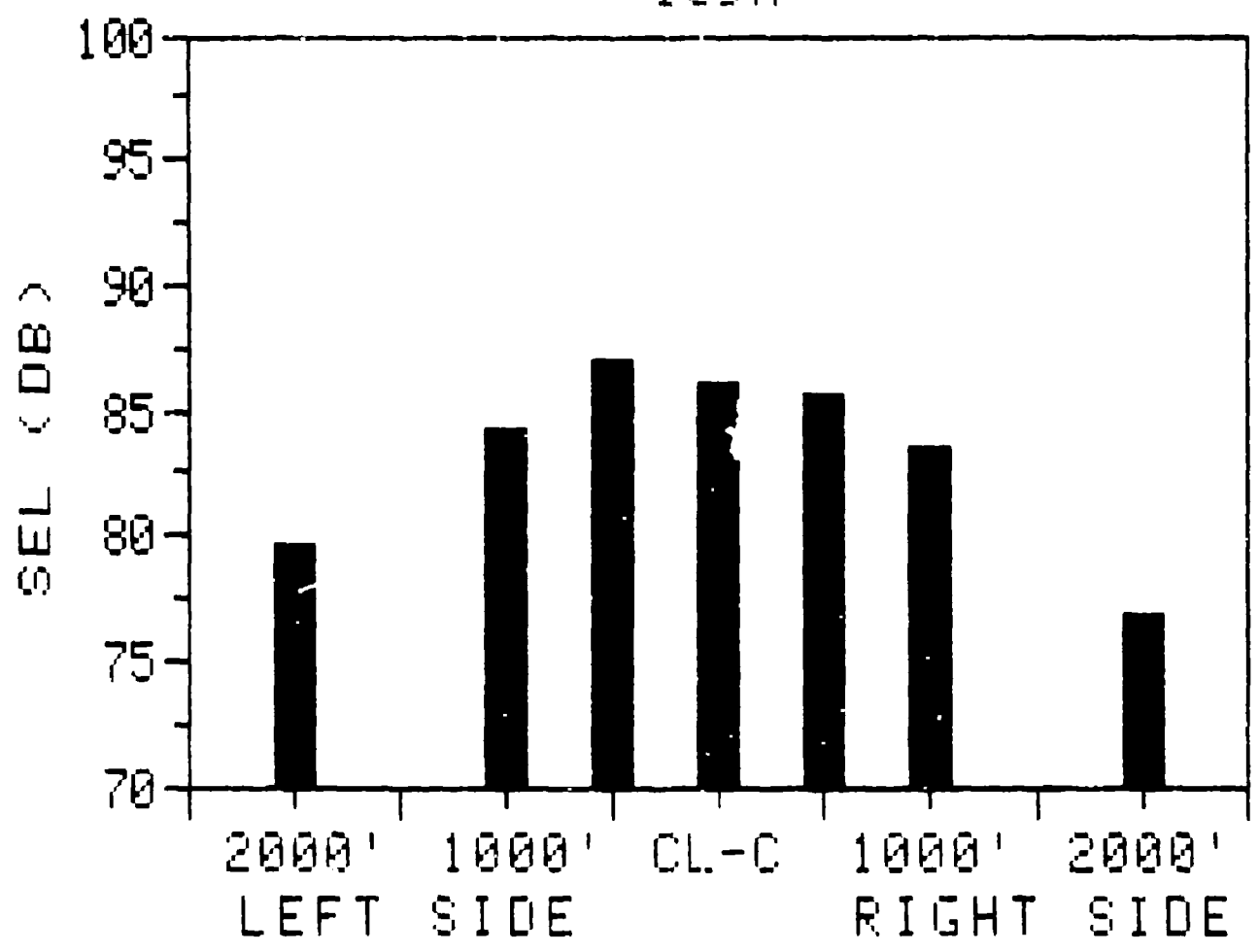
APPROACHES 109A



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 460 | 87-73 | 4.7-6.1 |
| SIX DEG. APPROACH | 410 | 62 | 6.0 |
| NOISE ABATEMENT APP. VAR. R D AND A S (EVENTS D19-D27) | 650 | 89-69 | 8.4-4.6 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN 015 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF 109A

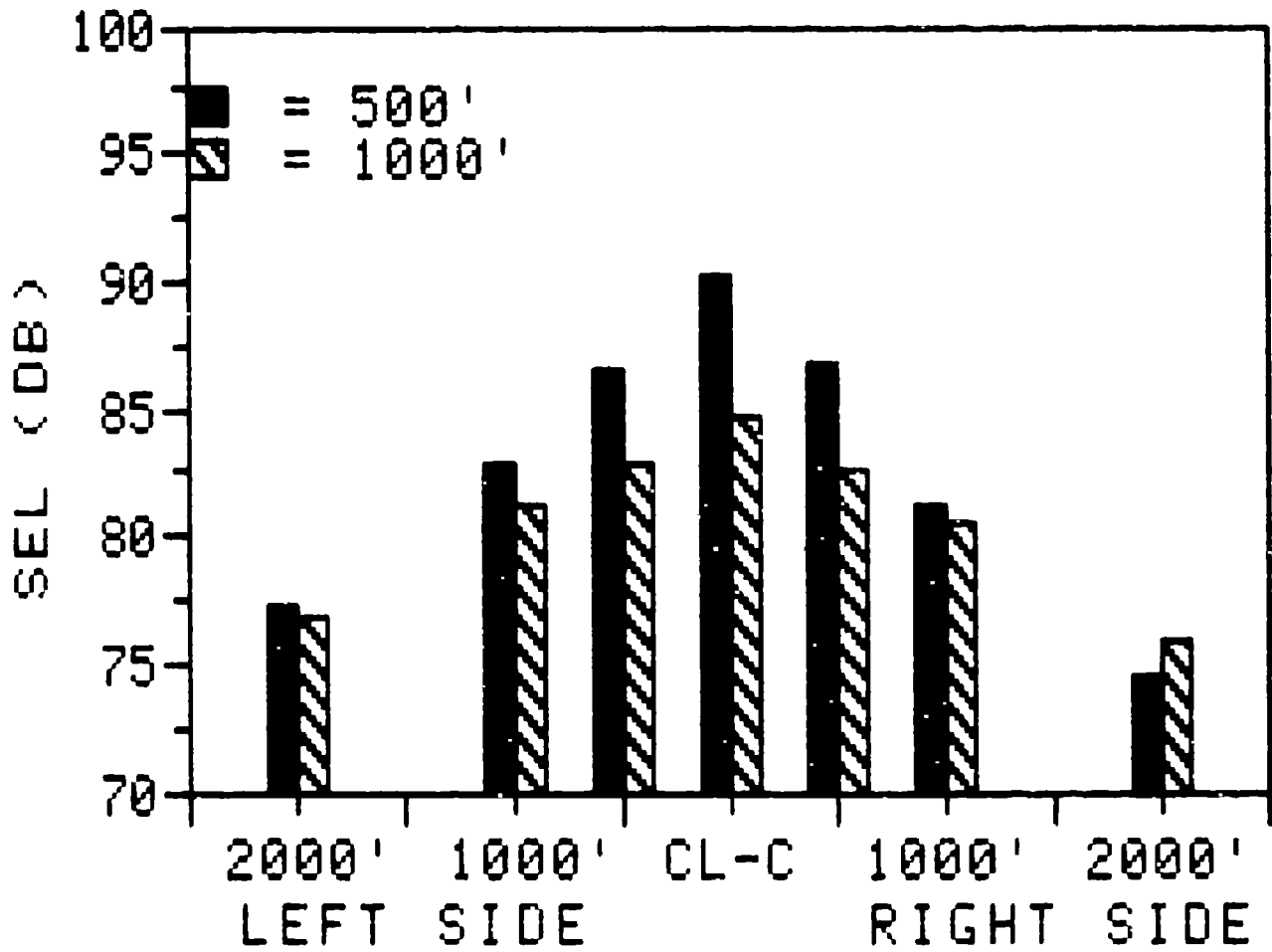


COMMENTS: [Faint text, possibly describing measurement conditions or equipment used.]

NORMAL TAKEOFF SEL

SOURCE: [Faint text, possibly identifying the data source or project name.]

LEVEL FLYOVERS 109A



INDICATED AIRSPEED - 145 KTS.

109A SUMMARY SHEET (7/11/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 60 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 76.8 | 83.4 | 89.9 | 97.9 | 90.5 | 83.7 | 76.7 |
| N | 6 | 5 | 5 | 6 | 6 | 6 | 6 |
| S.D. | .4 | .7 | .8 | .6 | .7 | .7 | .6 |
| 90% CI | .4 | .7 | .8 | .5 | .6 | .6 | .5 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 76.1 | 81.9 | 85.7 | 93.3 | 88.5 | 81.5 | 75.6 |
| N | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | .9 | .5 | .6 | 1.2 | .8 | .7 | .5 |
| 90% CI | .7 | .4 | .5 | 1.0 | .6 | .6 | .4 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 75.5 | 80.8 | 84.0 | 88.0 | 87.0 | 82.1 | 76.2 |
| N | 9 | 8 | 9 | 9 | 9 | 9 | 7 |
| S.D. | .4 | .9 | 1.2 | 1.0 | .8 | .3 | .6 |
| 90% CI | .3 | .6 | .7 | .6 | .5 | .2 | .5 |

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 79.5 | 84.2 | 87.0 | 86.1 | 85.5 | 83.4 | 76.8 |
| N | 5 | 6 | 6 | 6 | 5 | 6 | 6 |
| S.D. | .5 | .7 | .5 | .6 | .7 | .7 | .4 |
| 90% CI | .5 | .5 | .4 | .5 | .7 | .6 | .3 |

109A SUMMARY SHEET (7/11/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* 500 FT. LEVEL FLYOVER AT 145 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 77.3 | 82.9 | 86.4 | 90.3 | 86.7 | 81.1 | 74.6 |
| N | 6 | 7 | 7 | 7 | 7 | 6 | 5 |
| S.D. | .4 | .3 | 1.0 | .8 | 1.3 | .4 | .3 |
| 90% CI | .4 | .2 | .7 | .6 | .9 | .4 | .3 |

* 1000 FT. LEVEL FLYOVER AT 145 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 76.9 | 81.1 | 82.9 | 84.7 | 82.6 | 80.6 | 75.8 |
| N | 6 | 5 | 6 | 6 | 5 | 6 | 6 |
| S.D. | .9 | .6 | .8 | .3 | 1.4 | .8 | .8 |
| 90% CI | .7 | .5 | .6 | .3 | 1.4 | .6 | .7 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AGUSTA 109A

TEST DATE: 7/11/84

OPERATION : 5 DEGREE APPROACH AT VY, 60 FTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A1 | 77.10 | 84.40 | 90.90 | 97.30 | 89.20 | 82.60 | 76.40 |
| A2 | 77.00 | 83.00 | -- | 98.50 | 90.90 | 84.80 | 77.80 |
| A3 | 76.80 | 83.80 | 90.30 | 98.10 | 91.30 | 83.90 | 76.10 |
| A4 | 75.90 | 82.90 | 89.10 | 98.30 | 90.70 | 83.90 | 76.90 |
| A5 | 77.00 | 82.80 | 89.00 | 97.00 | 90.40 | 83.60 | 76.50 |
| A6 | 76.70 | -- | 90.10 | 98.00 | 90.50 | 83.30 | 76.30 |
| AVERAGE | 76.75 | 83.38 | 89.88 | 97.87 | 90.50 | 83.68 | 76.67 |
| STD. DEV. | 0.44 | 0.69 | 0.81 | 0.59 | 0.71 | 0.73 | 0.62 |
| 90% C. I. | 0.36 | 0.66 | 0.78 | 0.49 | 0.59 | 0.60 | 0.51 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AGUSTA 109A

TEST DATE: 7/11/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B7 | 77.00 | 82.20 | 85.10 | 92.20 | 88.00 | 81.50 | 75.70 |
| B9 | 76.90 | 82.20 | 86.30 | 95.50 | 88.60 | 81.60 | 75.60 |
| B11 | 76.50 | 82.10 | 86.20 | 92.40 | 87.90 | 80.90 | 74.90 |
| B13 | 75.10 | 81.90 | 85.00 | 93.20 | 88.80 | 82.00 | 75.70 |
| B15 | 75.00 | 82.10 | 85.70 | 92.70 | 89.90 | 82.50 | 76.30 |
| B17 | 76.00 | 81.00 | 85.90 | 93.70 | 88.00 | 80.50 | 75.40 |
| AVERAGE | 76.08 | 81.92 | 85.70 | 93.28 | 88.53 | 81.50 | 75.60 |
| STD. DEV. | 0.88 | 0.46 | 0.55 | 1.22 | 0.76 | 0.72 | 0.46 |
| 90% C. I. | 0.72 | 0.38 | 0.45 | 1.00 | 0.63 | 0.60 | 0.38 |

SOUND EXPOSURE LEVEL (SEL)

HELICOPTER: AGUSTA 105A

TEST DATE: 7-11-84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-0 | (RIGHT SIDE) | | |
|-----------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| C8 | 79.50 | 83.00 | 87.20 | 85.20 | 84.90 | 82.10 | 78.60 |
| C10 | 80.30 | 83.90 | 87.40 | 86.20 | 85.70 | 83.70 | 77.50 |
| C12 | 79.30 | 84.40 | 86.70 | 85.10 | 84.70 | 83.80 | 78.70 |
| C14 | 79.60 | 84.70 | 87.20 | 87.00 | 86.20 | 84.70 | 78.60 |
| C16 | -- | 84.80 | 86.20 | 86.00 | -- | 83.40 | 78.50 |
| C18 | 78.90 | 84.20 | 87.40 | 86.30 | 85.10 | 83.40 | 77.10 |
| AVERAGE | 79.48 | 84.17 | 87.02 | 86.13 | 85.45 | 83.40 | 78.63 |
| STD. DEV. | 0.52 | 0.55 | 0.48 | 0.56 | 0.58 | 0.58 | 0.39 |
| 90% C.I. | 0.50 | 0.54 | 0.39 | 0.42 | 0.55 | 0.56 | 0.33 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AGUSTA 109A

TEST DATE: 7/11/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D19 | 75.90 | 80.40 | 83.00 | 87.10 | 86.40 | 82.10 | 76.50 |
| D20 | 75.70 | 81.30 | 85.70 | 89.80 | 88.60 | 82.20 | 76.50 |
| D21 | 76.00 | 82.30 | 85.60 | 88.90 | 87.10 | 82.60 | 75.60 |
| D22 | 75.70 | 81.30 | 85.00 | 88.60 | 87.90 | 82.20 | 77.20 |
| D23 | 75.00 | 80.80 | 83.40 | 88.30 | 87.20 | 82.20 | 75.90 |
| D24 | 75.70 | 80.80 | 83.80 | 87.60 | 86.40 | 81.80 | 76.40 |
| D25 | 74.70 | 79.30 | 83.30 | 87.00 | 86.20 | 82.10 | -- |
| D26 | 75.30 | -- | 82.80 | 86.90 | 86.30 | 81.80 | 75.40 |
| D27 | 75.20 | 80.40 | 83.10 | 88.20 | 87.20 | 81.60 | -- |
| AVERAGE | 75.47 | 80.80 | 83.97 | 88.04 | 87.03 | 82.07 | 76.21 |
| STD. DEV. | 0.44 | 0.87 | 1.15 | 0.98 | 0.91 | 0.30 | 0.62 |
| 90% C. I. | 0.27 | 0.58 | 0.71 | 0.61 | 0.50 | 0.18 | 0.45 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AGUSTA 109A

TEST DATE: 7 11 84

OPERATION : LEVEL FLYOVER (500 FT. @ 145 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| F28 | 77.30 | 83.10 | 85.60 | 90.50 | 87.90 | -- | -- |
| F29 | -- | 82.90 | 86.40 | 91.00 | 86.10 | 81.00 | 74.30 |
| F30 | 77.70 | 82.70 | 86.30 | 91.60 | 88.30 | 81.80 | 74.80 |
| F31 | 76.70 | 82.50 | 87.40 | 89.80 | 85.40 | 81.40 | 74.80 |
| F32 | 77.80 | 83.00 | 85.40 | 89.40 | 87.00 | 80.60 | -- |
| F33 | 76.90 | 82.70 | 88.00 | 90.30 | 85.00 | 80.80 | 74.30 |
| F34 | 77.20 | 83.30 | 85.80 | 89.70 | 87.40 | 81.00 | 74.90 |
| AVERAGE | 77.27 | 82.89 | 86.41 | 90.34 | 86.73 | 81.10 | 74.62 |
| STD. DEV. | 0.43 | 0.27 | 0.96 | 0.78 | 1.26 | 0.43 | 0.29 |
| 90% C.I. | 0.36 | 0.20 | 0.71 | 0.57 | 0.92 | 0.36 | 0.28 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AGUSTA 109A

TEST DATE: 7/11/84

OPERATION : LEVEL FLYOVER (1000 FT. @ 145 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|-----------|-------------|------------|-----------|-------|--------------|------------|------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| E35 | 75.60 | 80.60 | 83.70 | 84.50 | 83.00 | 80.90 | 76.00 |
| E36 | 77.60 | 81.00 | 82.20 | 84.70 | 83.50 | 80.40 | 76.00 |
| E37 | 76.20 | 81.30 | 82.60 | 84.10 | 81.00 | 79.60 | 74.60 |
| E38 | 77.80 | 82.00 | 83.90 | 85.00 | 84.20 | 81.70 | 75.70 |
| E39 | 76.40 | 80.70 | 82.10 | 84.90 | 81.10 | 79.90 | 75.40 |
| E40 | 77.50 | -- | 83.10 | 85.00 | -- | 80.80 | 77.10 |
| AVERAGE | 76.85 | 81.12 | 82.93 | 84.72 | 82.56 | 80.55 | 75.80 |
| STD. DEV. | 0.80 | 0.56 | 0.76 | 0.34 | 1.44 | 0.76 | 0.82 |
| 90% C.I. | 0.74 | 0.54 | 0.63 | 0.28 | 1.37 | 0.62 | 0.68 |

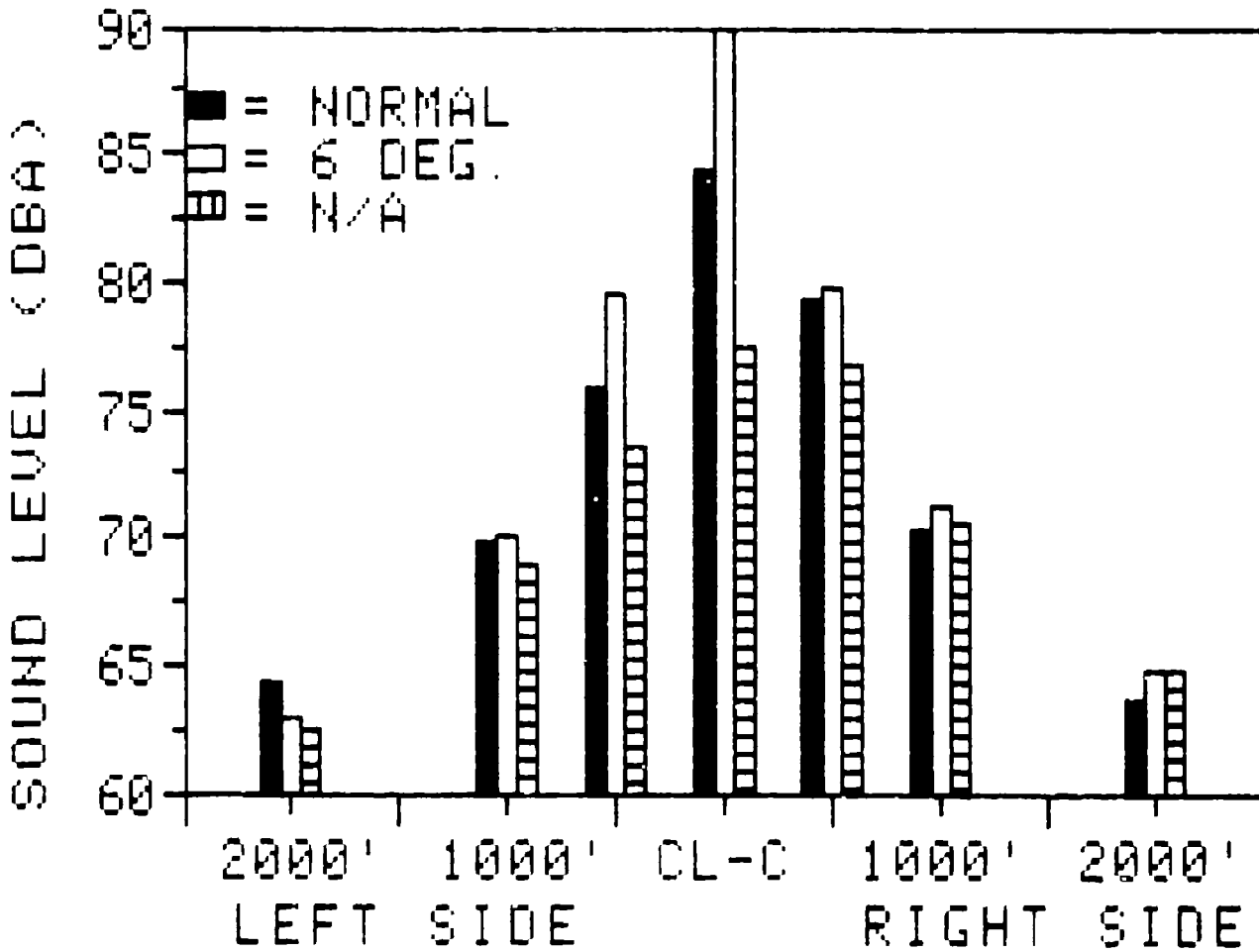
NOISE LEVEL DATA

'as-measured'

A-WEIGHTED SOUND LEVEL (dBA)

- - - - -
- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- A-WEIGHTED SOUND LEVEL (dBA) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN. -
- - - - -

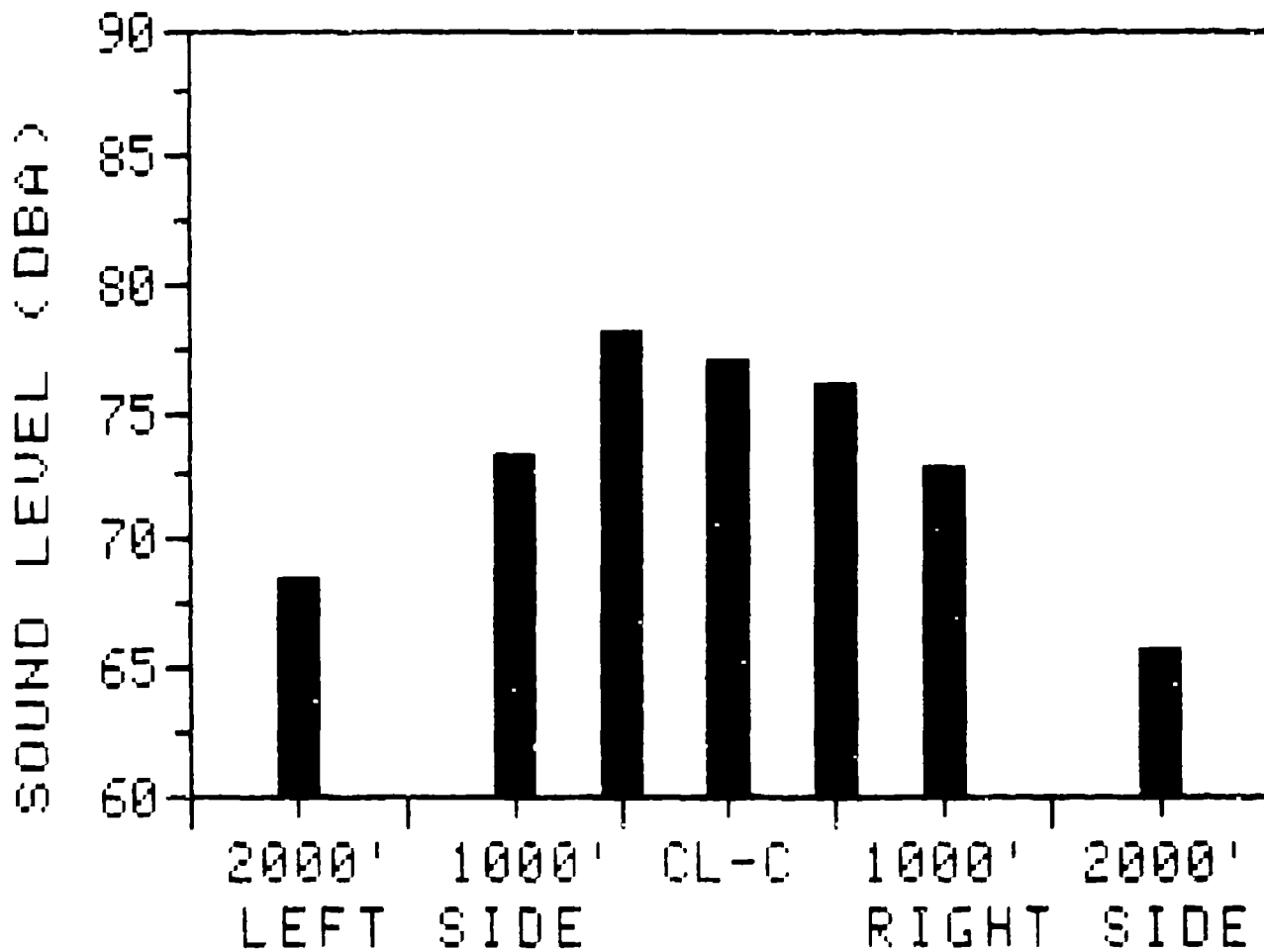
APPROACHES 109A



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|-------------------------------|---------------------------|-------------------------|
| NORMAL APPROACH | 460 | 87-73 | 4.7-6.1 |
| SIX DEG. APPROACH | 410 | 62 | 6.0 |
| NOISE ABATEMENT APP. VAR. R D AND A-B (EVENTS D19-D27) | 650 | 89-69 | 8.4-4.6 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN ±15 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF 109A



1. The sound level at the CL-C position is the highest, at approximately 78.5 DBA. The sound level at the 2000' LEFT SIDE position is approximately 68.5 DBA. The sound level at the 2000' RIGHT SIDE position is the lowest, at approximately 65.5 DBA.

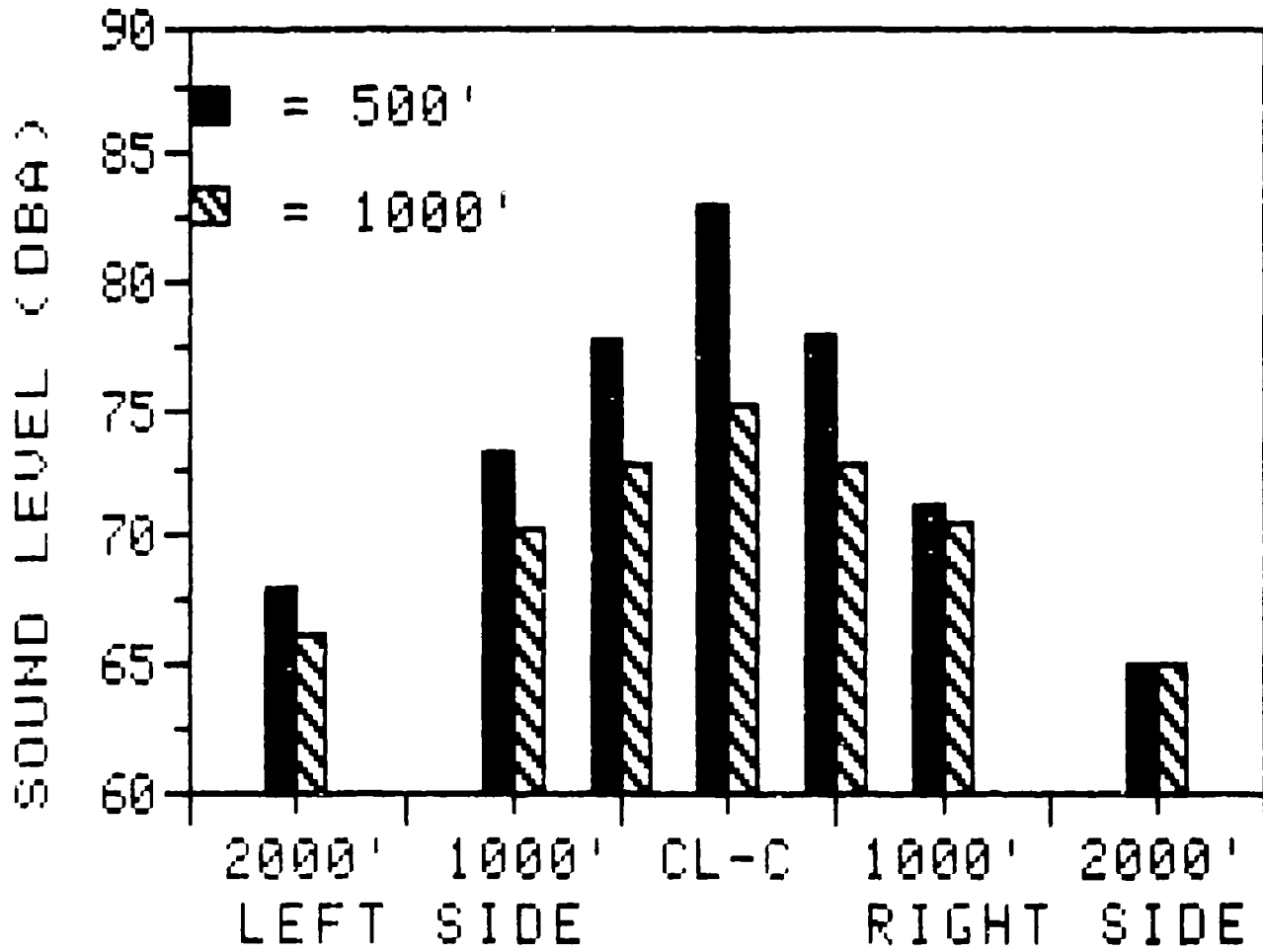
2. The sound level at the 1000' LEFT SIDE position is approximately 73.5 DBA. The sound level at the 1000' RIGHT SIDE position is approximately 76.0 DBA.

3. The sound level at the CL-C position is approximately 78.5 DBA.

4. The sound level at the 2000' LEFT SIDE position is approximately 68.5 DBA.

5. The sound level at the 2000' RIGHT SIDE position is approximately 65.5 DBA.

LEVEL FLYOVERS 109A



INDICATED AT APPROXIMATE POINTS.

109A SUMMARY SHEET (7/11/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 60 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 63.0 | 70.1 | 79.5 | 90.0 | 79.7 | 71.2 | 64.7 |
| N | 6 | 5 | 5 | 6 | 6 | 6 | 6 |
| S.D. | .7 | .7 | 1.0 | .5 | 1.0 | .7 | 1.4 |
| 90% CI | .6 | .6 | 1.0 | .4 | .8 | .6 | 1.1 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 64.2 | 69.9 | 75.7 | 84.3 | 79.3 | 70.3 | 63.6 |
| N | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | .4 | .6 | .9 | 2.5 | 1.1 | 1.5 | .7 |
| 90% CI | .3 | .5 | .7 | 2.1 | .9 | 1.3 | .6 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/B) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 62.5 | 69.0 | 73.6 | 77.4 | 76.7 | 70.6 | 64.7 |
| N | 9 | 8 | 9 | 9 | 9 | 9 | 7 |
| S.D. | .8 | 1.0 | 1.5 | 1.6 | 1.6 | 1.1 | 1.0 |
| 90% CI | .5 | .7 | 1.0 | 1.0 | 1.0 | .7 | .8 |

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 68.4 | 73.2 | 78.2 | 77.0 | 76.0 | 72.9 | 65.6 |
| N | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | 1.4 | 1.1 | 1.0 | 1.1 | .7 | .8 | 1.0 |
| 90% CI | 1.1 | .9 | .8 | .9 | .6 | .6 | .9 |

109A SUMMARY SHEET (7/11/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* 500 FT. LEVEL FLYOVER AT 145 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 67.9 | 73.3 | 77.7 | 83.0 | 77.8 | 71.3 | 64.9 |
| N | 6 | 6 | 7 | 7 | 7 | 7 | 6 |
| S.D. | 1.3 | .7 | .8 | .7 | .9 | .4 | 1.5 |
| 90% CI | 1.0 | .6 | .6 | .5 | .7 | .3 | 1.2 |

* 1000 FT. LEVEL FLYOVER AT 145 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 66.1 | 70.3 | 72.9 | 75.2 | 72.9 | 70.6 | 65.0 |
| N | 6 | 6 | 7 | 7 | 7 | 7 | 7 |
| S.D. | .8 | .5 | .8 | 1.0 | 1.5 | 1.3 | 1.1 |
| 90% CI | .7 | .5 | .7 | .8 | 1.4 | 1.1 | .9 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: ABUSTA 109A

TEST DATE: 7/11/84

OPERATION : 6 DEGREE APPROACH AT VY, 60 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A1 | 63.60 | 69.90 | 81.20 | 89.40 | 78.60 | 70.90 | 65.50 |
| A2 | 62.20 | 70.30 | -- | 90.10 | 80.20 | 71.90 | 64.00 |
| A3 | 62.10 | 71.10 | 79.70 | 90.90 | 81.20 | 72.10 | 65.00 |
| A4 | 63.80 | 69.90 | 78.60 | 90.10 | 78.70 | 71.50 | 66.90 |
| A5 | 63.30 | 69.30 | 79.00 | 89.50 | 79.60 | 70.20 | 63.80 |
| A6 | 62.80 | -- | 78.90 | 90.10 | 80.10 | 70.80 | 63.20 |
| AVERAGE | 62.97 | 70.10 | 79.48 | 90.02 | 79.73 | 71.23 | 64.73 |
| STD. DEV. | 0.72 | 0.65 | 1.04 | 0.54 | 0.99 | 0.73 | 1.35 |
| 90% C.I. | 0.59 | 0.63 | 0.99 | 0.44 | 0.81 | 0.60 | 1.11 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AGUSTA 109A

TEST DATE: 7/11/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B7 | 64.20 | 70.30 | 74.50 | 81.60 | 77.70 | 69.00 | 63.70 |
| B9 | 64.60 | 70.80 | 76.30 | 88.00 | 79.60 | 71.00 | 63.30 |
| B11 | 64.10 | 70.00 | 76.70 | 83.30 | 78.90 | 70.00 | 63.10 |
| B13 | 63.60 | 69.80 | 76.40 | 83.20 | 78.70 | 70.80 | 62.70 |
| B15 | 64.50 | 69.50 | 75.00 | 83.00 | 80.20 | 72.50 | 64.50 |
| B17 | 64.00 | 69.10 | 75.40 | 86.80 | 80.80 | 68.20 | 64.20 |
| AVERAGE | 64.17 | 69.92 | 75.72 | 84.32 | 79.32 | 70.25 | 63.58 |
| STD. DEV. | 0.36 | 0.60 | 0.88 | 2.50 | 1.12 | 1.53 | 0.68 |
| 90% C.I. | 0.30 | 0.49 | 0.73 | 2.06 | 0.92 | 1.26 | 0.56 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AGUSTA 109A

TEST DATE: 7/11/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| C8 | 67.50 | 71.50 | 77.60 | 75.40 | 75.50 | 71.90 | 64.10 |
| C10 | 70.00 | 72.40 | 79.50 | 77.10 | 76.00 | 72.50 | 66.00 |
| C12 | 68.50 | 73.50 | 78.40 | 77.40 | 75.90 | 73.00 | 65.80 |
| C14 | 67.10 | 73.50 | 77.80 | 78.50 | 77.30 | 74.00 | 64.70 |
| C16 | 70.00 | 74.30 | 76.70 | 76.10 | 76.10 | 72.40 | 65.90 |
| C18 | 67.10 | 74.00 | 79.00 | 77.70 | 75.20 | 73.50 | 67.00 |
| AVERAGE | 68.37 | 73.20 | 78.17 | 77.03 | 76.00 | 72.88 | 65.58 |
| STD. DEV. | 1.36 | 1.05 | 1.01 | 1.12 | 0.72 | 0.77 | 1.03 |
| 90% C.I. | 1.13 | 0.87 | 0.84 | 0.92 | 0.59 | 0.64 | 0.85 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AGUSTA 109A

TEST DATE: 7/11/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D19 | 64.20 | 68.20 | 72.30 | 76.10 | 75.40 | 70.00 | 64.90 |
| D20 | 62.20 | 70.20 | 76.50 | 80.00 | 78.90 | 70.10 | 64.80 |
| D21 | 62.80 | 70.70 | 76.00 | 76.90 | 75.80 | 73.00 | 63.80 |
| D22 | 62.60 | 68.90 | 73.50 | 78.80 | 77.60 | 70.00 | 66.50 |
| D23 | 61.40 | 68.60 | 72.60 | 77.10 | 76.80 | 69.70 | 65.10 |
| D24 | 63.00 | 68.80 | 73.10 | 76.50 | 75.30 | 70.30 | 64.60 |
| D25 | 61.50 | 67.50 | 73.00 | 76.50 | 76.60 | 71.50 | -- |
| D26 | 62.20 | -- | 72.60 | 75.30 | 74.60 | 70.00 | 63.30 |
| D27 | 62.70 | 69.40 | 72.90 | 79.50 | 79.30 | 71.00 | -- |
| AVERAGE | 62.51 | 69.04 | 73.61 | 77.41 | 76.70 | 70.62 | 64.71 |
| STD. DEV. | 0.84 | 1.04 | 1.54 | 1.63 | 1.63 | 1.06 | 1.02 |
| 90% C.I. | 0.52 | 0.70 | 0.95 | 1.01 | 1.01 | 0.66 | 0.75 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AGUSTA 109A

TEST DATE: 7/11/84

OPERATION : LEVEL FLYOVER (500 FT. @ 145 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| F28 | 66.70 | 74.10 | 76.80 | 83.20 | 78.30 | 71.20 | -- |
| F29 | -- | -- | 78.00 | 83.40 | 78.10 | 70.90 | 63.70 |
| F30 | 68.10 | 72.50 | 77.50 | 84.10 | 79.30 | 71.20 | 65.10 |
| F31 | 69.20 | 73.00 | 79.00 | 83.50 | 77.30 | 72.10 | 63.50 |
| F32 | 67.10 | 73.10 | 76.90 | 82.00 | 76.90 | 71.00 | 67.20 |
| F33 | 69.50 | 73.10 | 79.20 | 82.80 | 76.80 | 71.50 | 63.80 |
| F34 | 66.70 | 74.20 | 77.50 | 82.30 | 77.70 | 71.50 | 65.90 |
| AVERAGE | 67.88 | 73.33 | 77.70 | 83.04 | 77.77 | 71.34 | 64.87 |
| STD. DEV. | 1.25 | 0.67 | 0.77 | 0.73 | 0.88 | 0.40 | 1.48 |
| 90% C.I. | 1.03 | 0.55 | 0.56 | 0.53 | 0.65 | 0.30 | 1.22 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AGUSTA 109A

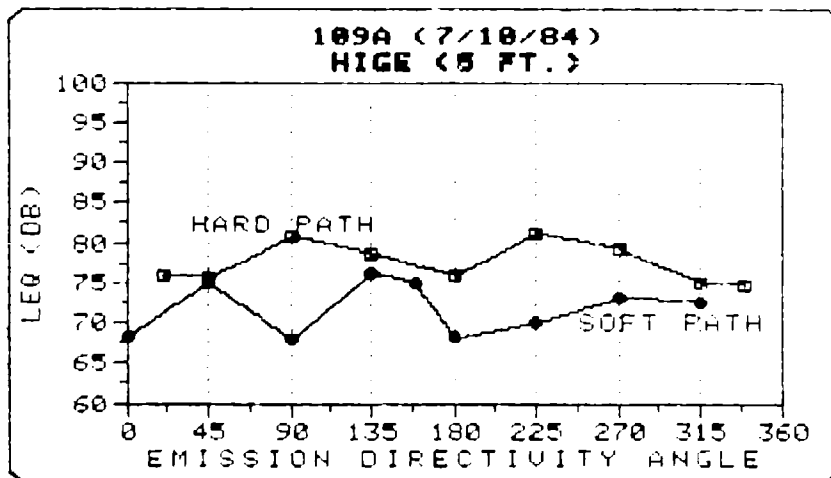
TEST DATE: 7/11/84

OPERATION : LEVEL FLYOVER (1000 FT. @ 145 KTS.)

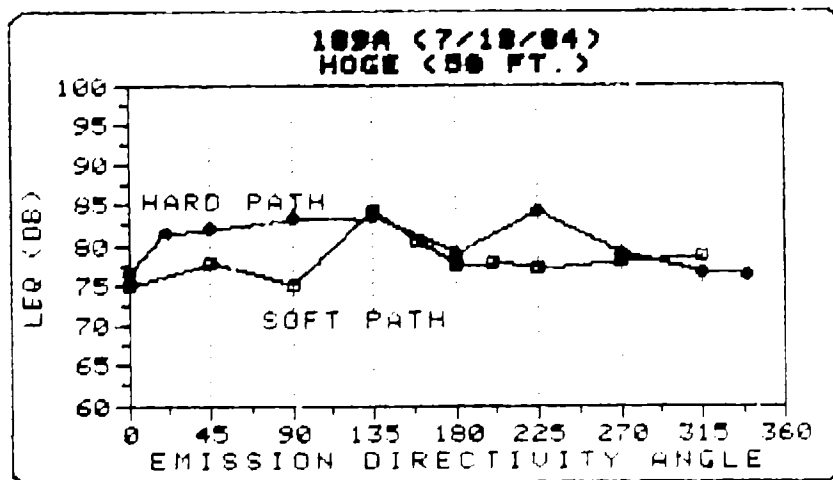
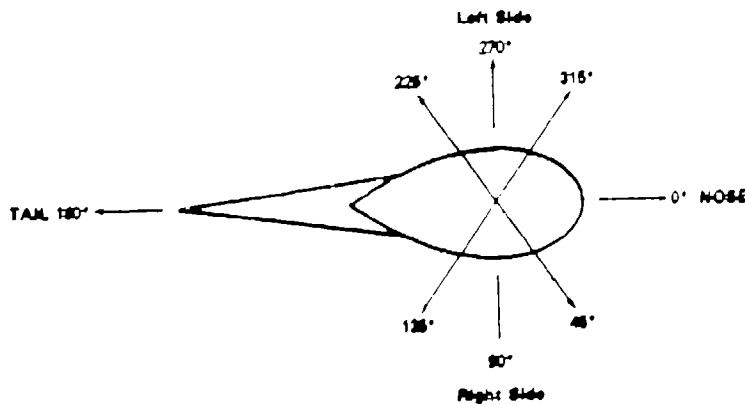
| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | WEST | WEST | WEST | | EAST | EAST | EAST |
| E35 | 64.70 | 70.50 | 73.10 | 76.90 | 74.20 | 72.90 | 65.20 |
| E36 | 66.10 | 69.70 | 72.60 | 74.30 | 72.20 | 69.80 | 65.10 |
| E37 | 65.60 | 71.00 | 72.10 | 74.40 | 71.00 | 69.60 | 64.60 |
| E38 | 66.90 | 70.30 | 73.90 | 75.40 | 74.60 | 70.80 | 65.00 |
| E39 | 66.50 | 70.00 | 72.00 | 74.60 | 72.70 | 69.60 | 63.30 |
| E40 | 66.60 | -- | 73.60 | 75.30 | -- | 70.90 | 66.70 |
| AVERAGE | 66.07 | 70.30 | 72.88 | 75.15 | 72.94 | | 64.98 |
| STD. DEV. | 0.81 | 0.49 | 0.78 | 0.97 | 1.48 | 1. | 1.09 |
| 90% C.I. | 0.67 | 0.47 | 0.65 | 0.80 | 1.41 | 1.05 | 0.90 |

HOVER DATA

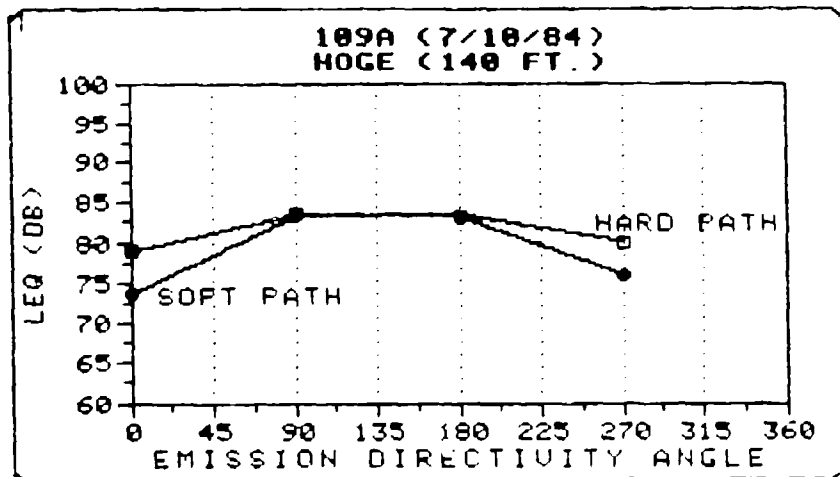
THIS SECTION OF THE APPENDIX CONTAINS THE "AS-MEASURED" EQUIVALENT SOUND LEVELS (LEQ) FOR EIGHT DIRECTIVITY ANGLES. THESE DATA ARE PRESENTED IN THE FORM OF PLOTS AND INDIVIDUAL EVENT DATA TABLES. THE PLOTS SHOW THE EFFECT OF "HARD" SURFACE VS. "SOFT" SURFACE 500 FEET FROM THE HOVER POINT FOR IN-GROUND-EFFECT AND OUT-OF-GROUND-EFFECT HOVER. INDIVIDUAL EVENT DATA FOR EACH DIRECTIVITY ANGLE AT DISTANCES OF 500, 1000 AND 1500 FEET FROM HOVER POINT OVER A "SOFT" PATH AND 500, 1000 AND 2000 FEET FROM HOVER POINT OVER A "HARD" PATH IS THEN GIVEN.



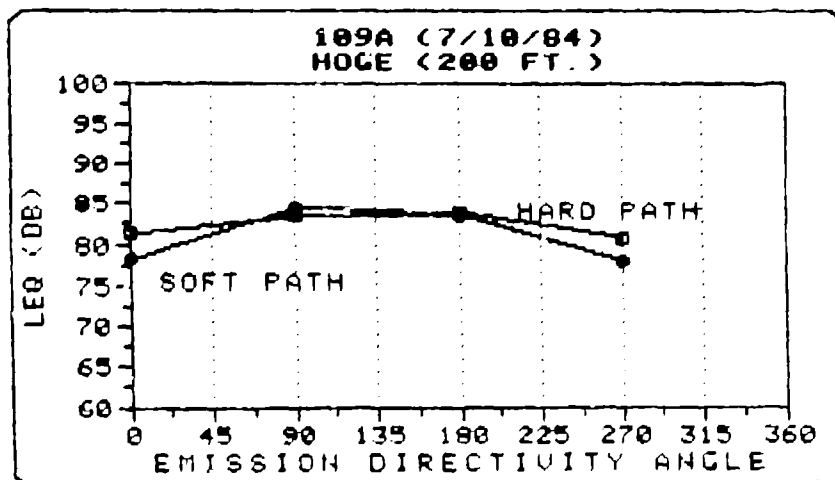
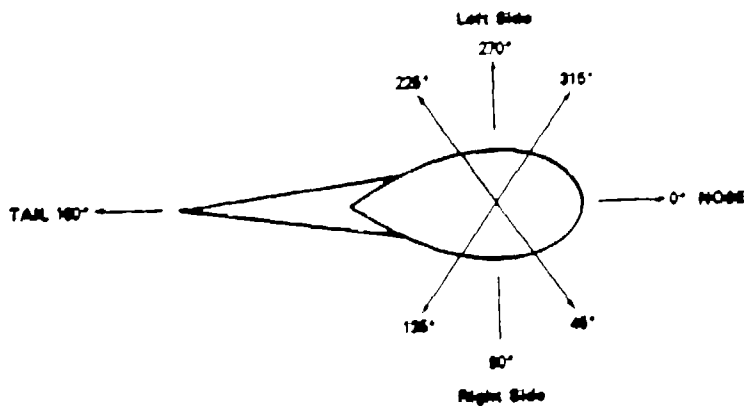
500 FT. FROM HOVER POINT



500 FT. FROM HOVER POINT



500 FT. FROM HOVER POINT

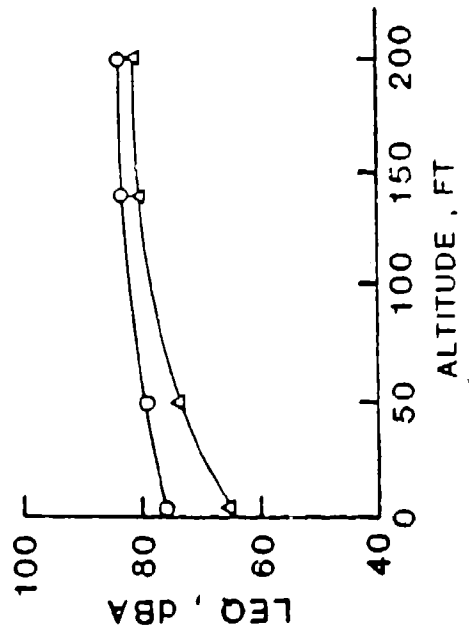
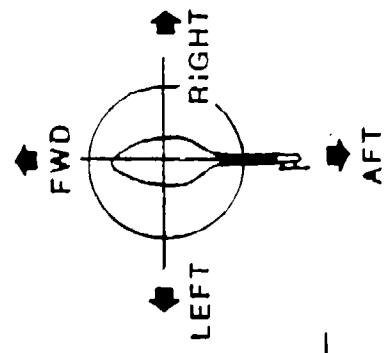
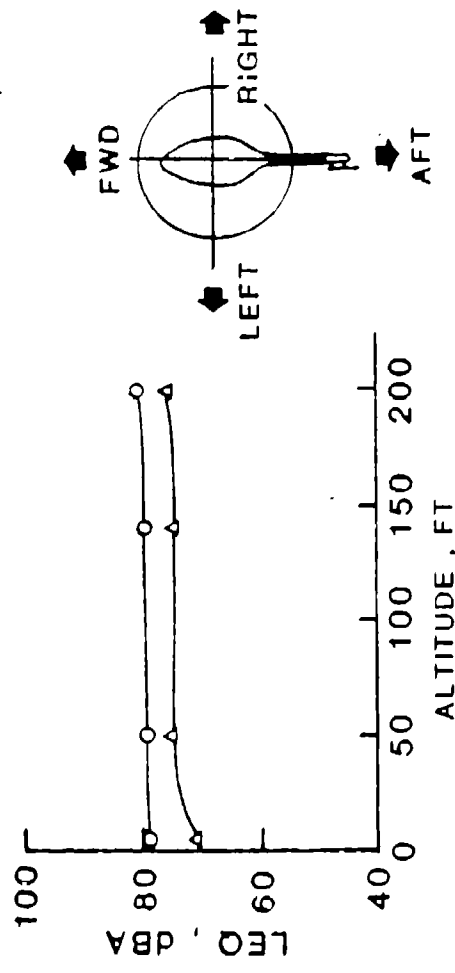
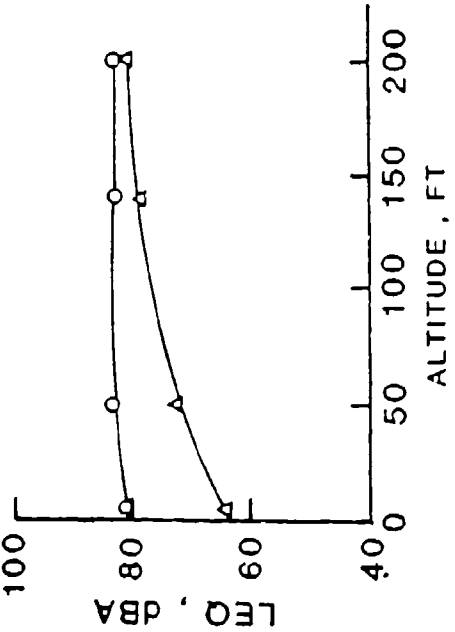
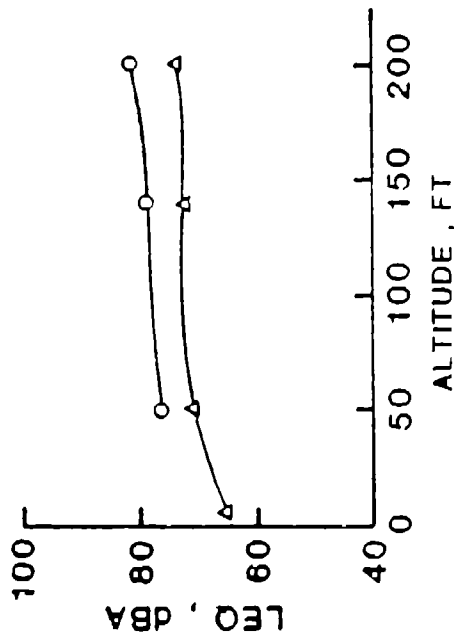


500 FT. FROM HOVER POINT

SOUND PROPAGATION :

△ OVER MOWED GRASS

○ OVER ASPHALT / CONCRETE



TEST HELICOPTER : 109A

LATERAL DISTANCE : 500 FT

HOVER DATA (LEQ)

HELICOPTER: AGUSTA 109A

DATE: 7/10-7/11/84

MICROPHONE: 500 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (SOFT PATH) | | (HARD PATH) | |
|---------------------------------|--------------------|---------------------|--------------------|---------------------|
| | HOVER 5 FT. AGL | HOVER 50 FT. AGL | HOVER 5 FT. AGL | HOVER 50 FT. AGL |
| (NOSE) 0 | 65.6 | 71.1 | -- | 76.6 |
| 45 | 71.3 | 75.1 | 75.5 | 82.1 |
| (LEFT) 90 | 64.3 | 72.4 | 80.8 | 83.1 |
| 135 | 71.8 | 81.2 | 78.5 | 83.6 |
| (TAIL) 180 | 65.3 | 73.6 | 76.0 | 79.0 |
| 225 | 67.2 | 75.0 | 81.2 | 84.2 |
| (RIGHT) 270 | 71.0 | 75.3 | 79.1 | 79.0 |
| 315 | 69.6 | 75.6 | 75.0 | 76.5 |

MICROPHONE: 1000 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (SOFT PATH) | | (HARD PATH) | |
|---------------------------------|--------------------|---------------------|--------------------|---------------------|
| | HOVER 5 FT. AGL | HOVER 50 FT. AGL | HOVER 5 FT. AGL | HOVER 50 FT. AGL |
| (NOSE) 0 | 51.5 | 63.4 | 67.6 | 70.6 |
| 45 | 57.8 | 67.7 | 68.0 | 77.5 |
| (LEFT) 90 | 52.0 | 64.3 | 73.2 | 78.8 |
| 135 | 58.9 | 70.9 | 71.1 | 78.0 |
| (TAIL) 180 | 52.7 | 64.1 | 68.2 | 74.2 |
| 225 | 53.9 | 67.8 | 73.9 | 78.9 |
| (RIGHT) 270 | 55.5 | 67.7 | 72.0 | 74.0 |
| 315 | 55.1 | 67.9 | 65.9 | 70.9 |

HOVER DATA (LEQ)

HELICOPTER: AGUSTA 109A

DATE: 7/10-7/11/84

MICROPHONE: 500 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (SOFT PATH) | | (HARD PATH) | |
|---------------------------------|-------------|----------|-------------|----------|
| | HOVER | HOVER | HOVER | HOVER |
| | 140' AGL | 200' AGL | 140' AGL | 200' AGL |
| (NOSE) 0 | 72.1 | 73.7 | 79.2 | 81.5 |
| 45 | -- | -- | -- | -- |
| (LEFT) 90 | 79.4 | 81.7 | 83.6 | 83.5 |
| 135 | -- | -- | -- | -- |
| (TAIL) 180 | 81.2 | 81.6 | 83.1 | 83.9 |
| 225 | -- | -- | -- | -- |
| (RIGHT) 270 | 74.4 | 75.4 | 79.9 | 80.7 |
| 315 | -- | -- | -- | -- |

MICROPHONE: 1000 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (SOFT PATH) | | (HARD PATH) | |
|---------------------------------|-------------|----------|-------------|----------|
| | HOVER | HOVER | HOVER | HOVER |
| | 140' AGL | 200' AGL | 140' AGL | 200' AGL |
| (NOSE) 0 | 65.5 | 67.3 | 69.9 | 73.2 |
| 45 | -- | -- | -- | -- |
| (LEFT) 90 | 72.1 | 72.4 | 82.0 | 77.5 |
| 135 | -- | -- | -- | -- |
| (TAIL) 180 | 74.1 | 73.5 | 75.1 | 75.8 |
| 225 | -- | -- | -- | -- |
| (RIGHT) 270 | 67.9 | 69.3 | 73.6 | 72.8 |
| 315 | -- | -- | -- | -- |

HOVER DATA (LEQ)

HELICOPTER: AGUSTA 109A

DATE: 7/10-7/11/84

MICROPHONE: 1500 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (SOFT PATH) | | (SOFT PATH) | |
|---------------------------------|-------------|---------|-------------|----------|
| | HOVER | HOVER | HOVER | HOVER |
| | 5' AGL | 50' AGL | 140' AGL | 200' AGL |
| (NOSE) 0 | -- | 55.3 | 59.9 | 62.0 |
| 45 | 47.7 | 54.5 | -- | -- |
| (LEFT) 90 | -- | 55.7 | 66.1 | 67.7 |
| 135 | 49.4 | 55.7 | -- | -- |
| (TAIL) 180 | -- | 58.5 | 68.9 | 68.4 |
| 225 | 45.8 | 59.0 | -- | -- |
| (RIGHT) 270 | 45.6 | 60.6 | 63.4 | 65.1 |
| 315 | -- | 60.3 | -- | -- |

MICROPHONE: 2000 FT. FROM HOVER POINT

| DIRECTIVITY ANGLES (DEGREES) | (HARD PATH) | | (HARD PATH) | |
|---------------------------------|-------------|---------|-------------|----------|
| | HOVER | HOVER | HOVER | HOVER |
| | 5' AGL | 50' AGL | 140' AGL | 200' AGL |
| (NOSE) 0 | 57.7 | 62.5 | 62.5 | 64.9 |
| 45 | 61.3 | 68.0 | -- | -- |
| (LEFT) 90 | 63.5 | 71.4 | 71.8 | 70.1 |
| 135 | 61.6 | 71.8 | -- | -- |
| (TAIL) 180 | 59.9 | 67.3 | 68.7 | 66.8 |
| 225 | 64.8 | 71.3 | -- | -- |
| (RIGHT) 270 | 62.7 | 66.1 | 68.3 | 66.1 |
| 315 | 59.5 | 64.1 | -- | -- |

RADAR TRACKING DATA

- THIS SECTION OF THE APPENDIX CONTAINS THE HELICOPTER -
- POSITION DATA AND TRACKING PLOTS DERIVED FROM THE PPHC -
- PORTABLE TRACKING RADAR SYSTEM. THE POSITION DATA LISTS -
- THE CLOSEST POINT OF APPROACH (CPA), TIME OF CPA, -
- ELEVATION ANGLE, RATE OF CLIMB OR DESCENT, THE CLIMB OR -
- DESCENT ANGLE, AND GROUND SPEED FOR ALL FLIGHT -
- CONDITIONS. TRACKING PLOTS OF THE ACTUAL FLIGHT PROFILE -
- PLUN ARE PROVIDED FOR EACH FLIGHT CONDITIONS.

AGUSTA 109A
POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE: 07/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|----------------------------------|--------|-------|----------|------------|--------|------|------|
| SIX DEG. APPROACH AT VM, 60 KTS. | | | | | | | |
| 1 | | ----- | NO DATA | ----- | | | |
| 2 | APP | 377.5 | 86.1 | 10:20:28.8 | -505.6 | -5.1 | 55.7 |
| 3 | APP | 391.0 | 77.7 | 10:25:30.0 | -536.6 | -5.6 | 54.1 |
| 4 | APP | 385.3 | 80.8 | 10:29:27.0 | -608.4 | -6.1 | 56.5 |
| 5 | APP | 391.4 | 86.9 | 10:34:07.8 | -381.0 | -3.0 | 54.5 |
| 6 | APP | 392.4 | 80.5 | 10:39:48.5 | -636.8 | -6.7 | 53.4 |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 7 | APP | 380.9 | 87.3 | 10:45:01.1 | -301.7 | -3.2 | 52.5 |
| 9 | | ----- | NO DATA | ----- | | | |
| 11 | APP | 395.1 | 75.1 | 10:13:29.3 | -763.5 | -5.7 | 75.9 |
| 13 | APP | 414.3 | 87.2 | 10:17:59.3 | -428.3 | -3.2 | 76.1 |
| 15 | APP | 428.0 | 80.0 | 10:22:34.4 | -601.7 | -4.4 | 77.8 |
| 17 | APP | 340.5 | 73.3 | 10:27:18.3 | -308.5 | -2.3 | 76.7 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 8 | DEP | 367.0 | 87.0 | 10:49:44.7 | -507.7 | -5.4 | 53.4 |
| 10 | | ----- | NO DATA | ----- | | | |
| 12 | DEP | 635.8 | 83.0 | 10:15:04.0 | 1610.2 | 10.5 | 85.9 |
| 14 | DEP | 629.0 | 73.4 | 10:19:39.5 | 1459.0 | 9.4 | 87.0 |
| 16 | DEP | 770.1 | 87.1 | 10:24:08.2 | 1441.0 | 9.8 | 82.2 |
| 18 | DEP | 676.2 | 86.2 | 10:29:03.4 | 1278.3 | 8.0 | 90.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 07/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|-------|---------------------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 19 | | | ----- NO DATA ----- | | | | |
| 20 | APP | 526.3 | 88.2 | 11:12:47.4 | -743.2 | -6.3 | 66.0 |
| 21 | APP | 583.1 | 77.3 | 11:17:00.8 | -1246.2 | -10.8 | 64.5 |
| 22 | APP | 573.0 | 79.6 | 11:21:01.9 | -1080.6 | -9.9 | 61.4 |
| 23 | APP | 547.2 | 75.1 | 11:25:02.5 | -1192.0 | -9.4 | 71.2 |
| 24 | APP | 562.0 | 79.3 | 11:29:53.9 | -1403.0 | -12.6 | 62.1 |
| 25 | APP | 585.2 | 84.8 | 11:33:53.6 | -1613.7 | -12.7 | 70.7 |
| 26 | APP | 633.7 | 81.4 | 11:38:18.8 | -1105.7 | -9.5 | 65.4 |

500 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|-------|
| 27 | APP | 544.9 | 85.1 | 11:42:19.9 | -999.1 | -8.6 | 65.5 |
| 28 | F/O | 373.1 | 73.9 | 11:47:41.6 | 151.3 | 0.6 | 134.0 |
| 29 | F/O | 388.0 | 78.8 | 11:49:42.4 | 68.2 | 0.2 | 157.0 |
| 30 | F/O | 409.7 | 77.0 | 11:52:40.0 | 412.5 | 1.7 | 136.3 |
| 31 | F/O | 412.6 | 80.0 | 11:54:56.8 | -34.1 | -0.1 | 158.3 |
| 32 | F/O | 463.1 | 82.8 | 11:57:51.5 | 201.1 | 1.2 | 135.3 |
| 33 | F/O | 398.4 | 85.6 | 12:00:21.3 | 124.7 | 0.4 | 164.3 |
| 34 | F/O | 422.7 | 81.6 | 12:03:22.3 | 422.9 | 1.8 | 132.0 |

1000 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | | |
|----|-----|--------|------|---------------------|--------|------|-------|
| 35 | | | | ----- NO DATA ----- | | | |
| 36 | F/O | 976.9 | 85.4 | 12:09:02.1 | 167.7 | 0.7 | 137.2 |
| 37 | F/O | 983.1 | 87.1 | 12:11:31.7 | -285.4 | -1.1 | 153.5 |
| 38 | F/O | 920.6 | 86.5 | 12:14:23.6 | -175.7 | -0.7 | 136.7 |
| 39 | F/O | 1022.7 | 83.5 | 12:17:14.2 | -102.3 | -0.7 | 152.0 |
| 40 | F/O | 1042.5 | 88.7 | 12:19:55.5 | 191.4 | 0.8 | 135.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 107/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|-----------|---------|------------|--------|-------|------|
| SIX DEG. APPROACH AT VY, 60 KTS. | | | | | | |
| 1 | | NO DATA | | | | |
| 2 | APP 616.8 | 37.9 | 10:20:28.8 | -595.8 | -5.1 | 55.7 |
| 3 | APP 629.6 | 39.1 | 10:24:59.4 | -551.0 | -5.0 | 53.1 |
| 4 | APP 626.4 | 38.6 | 10:29:25.8 | -428.0 | -4.4 | 55.0 |
| 5 | APP 643.4 | 37.7 | 10:34:07.6 | -405.0 | -4.2 | 54.5 |
| 6 | APP 632.8 | 37.9 | 10:39:45.5 | -637.3 | -6.7 | 53.4 |
| NORMAL APPROACH | | | | | | |
| 7 | APP 633.3 | 37.3 | 10:45:00.2 | -204.2 | -2.2 | 51.8 |
| 9 | | NO DATA | | | | |
| 11 | APP 628.4 | 39.9 | 10:13:28.6 | -813.0 | -5.9 | 77.2 |
| 13 | APP 647.6 | 40.0 | 10:17:58.8 | -334.2 | -2.4 | 78.8 |
| 15 | APP 700.5 | 37.6 | 10:22:34.3 | -603.2 | -4.4 | 77.8 |
| 17 | APP 674.8 | 30.2 | 10:27:17.2 | -357.1 | -2.8 | 71.9 |
| NORMAL TAKEOFF | | | | | | |
| 8 | DEP 622.4 | 37.2 | 10:49:44.5 | -499.5 | -5.4 | 52.6 |
| 10 | | NO DATA | | | | |
| 12 | DEP 813.3 | 50.1 | 10:15:03.3 | 1592.7 | 10.6 | 84.1 |
| 14 | DEP 784.4 | 50.5 | 10:19:39.5 | 1458.8 | 9.4 | 87.0 |
| 16 | DEP 898.0 | 58.8 | 10:24:08.0 | 1446.0 | 9.8 | 82.2 |
| 18 | DEP 822.5 | 55.4 | 10:29:03.4 | 1278.2 | 8.0 | 90.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
POSITION DATA
NOISE MEASUREMENT PROGRAM

DATE 107/11/84

500 FT. EAST

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|-----|---------------------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 19 | | ----- NO DATA ----- | | | | | |
| 20 | APP | 737.0 | 45.6 | 11:12:47.6 | -740.4 | -6.2 | 66.8 |
| 21 | APP | 704.2 | 54.1 | 11:17:00.8 | -1246.2 | -10.8 | 64.5 |
| 22 | APP | 744.8 | 40.8 | 11:21:01.8 | -1104.3 | -10.0 | 61.6 |
| 23 | APP | 744.7 | 45.5 | 11:25:02.5 | -1192.0 | -9.4 | 71.2 |
| 24 | APP | 733.3 | 49.1 | 11:29:54.0 | -1400.8 | -12.6 | 62.0 |
| 25 | APP | 779.0 | 47.8 | 11:33:54.1 | -1508.6 | -11.7 | 71.9 |
| 26 | APP | 771.7 | 54.5 | 11:38:18.8 | -1105.4 | -9.5 | 65.4 |

500 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|---------|------|-------|
| 27 | F/O | 760.6 | 46.0 | 11:42:19.7 | -1002.8 | -8.6 | 65.7 |
| 28 | F/O | 700.7 | 31.1 | 11:47:41.7 | 167.8 | 0.7 | 135.4 |
| 29 | F/O | 666.8 | 34.7 | 11:49:42.3 | 45.9 | 0.2 | 157.8 |
| 30 | F/O | 713.0 | 34.2 | 11:52:40.0 | 412.5 | -1.7 | 136.0 |
| 31 | F/O | 643.0 | 40.0 | 11:54:56.9 | -88.0 | -0.3 | 157.1 |
| 32 | F/O | 716.5 | 40.1 | 11:57:51.8 | 291.1 | 1.2 | 135.3 |
| 33 | F/O | 653.2 | 38.0 | 12:00:21.5 | 193.7 | 0.7 | 155.9 |
| 34 | F/O | 696.6 | 37.2 | 12:03:22.4 | 441.2 | 1.9 | 132.9 |

1000 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | | |
|----|-----|---------------------|------|------------|--------|------|-------|
| 35 | | ----- NO DATA ----- | | | | | |
| 36 | F/O | 1119.5 | 60.6 | 12:09:01.9 | 103.7 | 0.4 | 139.8 |
| 37 | F/O | 1103.7 | 62.4 | 12:11:32.3 | -270.2 | -1.0 | 153.2 |
| 38 | F/O | 1058.9 | 60.4 | 12:14:23.6 | -176.1 | -0.7 | 126.7 |
| 39 | F/O | 1095.5 | 68.3 | 12:17:14.2 | -192.2 | -0.7 | 152.0 |
| 40 | F/O | 1165.1 | 63.7 | 12:19:55.5 | 191.1 | 0.8 | 135.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

109A

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 07/11/84

FOA/AEE

EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

SIX DEG. APPROACH AT VY, 60 KTS.

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|-------|--------|-------|----------|------------|--------|------|------|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | APP | 629.5 | 36.4 | 10:20:29.4 | -537.7 | -5.5 | 55.4 |
| 4 | APP | 633.7 | 38.6 | 10:24:59.2 | -550.3 | -5.6 | 52.8 |
| 5 | APP | 613.8 | 36.7 | 10:29:28.1 | -739.6 | -7.4 | 56.0 |
| 6 | APP | 617.9 | 39.1 | 10:34:08.7 | -339.5 | -3.4 | 56.5 |
| 7 | APP | 639.2 | 37.1 | 10:39:45.6 | -637.5 | -6.7 | 53.4 |

NORMAL APPROACH

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|-------|--------|-------|----------|------------|--------|------|------|
| 7 | APP | 614.2 | 38.3 | 10:45:01.4 | -347.5 | -3.7 | 53.1 |
| 9 | | | | | | | |
| 11 | APP | 607.7 | 38.8 | 10:13:29.8 | -806.5 | -5.9 | 76.9 |
| 13 | APP | 623.6 | 41.3 | 10:17:59.7 | -466.3 | -3.5 | 75.2 |
| 15 | APP | 605.2 | 46.0 | 10:22:33.8 | -618.7 | -4.6 | 78.3 |
| 17 | APP | 527.0 | 38.2 | 10:27:18.3 | -308.9 | -2.3 | 76.7 |

NORMAL TAKEOFF

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|-------|--------|-------|----------|------------|--------|------|------|
| 8 | DEP | 607.2 | 37.1 | 10:48:44.7 | -507.6 | -5.4 | 53.4 |
| 10 | | | | | | | |
| 12 | DEP | 796.8 | 52.1 | 10:15:03.8 | 1631.5 | 10.8 | 84.7 |
| 14 | DEP | 822.3 | 46.6 | 10:19:39.3 | 1464.1 | 9.4 | 87.3 |
| 16 | DEP | 913.4 | 57.8 | 10:24:08.5 | 1457.3 | 10.0 | 81.2 |
| 18 | DEP | 848.5 | 52.8 | 10:29:03.1 | 1260.4 | 8.0 | 89.0 |

CPA-FT : CLOSEST POINT OF APPROACH
E-A : ELEVATION ANGLE
CPA-TIME : CLOSEST POINT OF APPROACH TIME
RC-FPM : RATE OF CLIMB
C/D-A : CLIMB OR DESCENT ANGLE
GS-K : GROUND SPEED

AGUSTA 109A

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 07/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|-------|---------|------------|---------|------------|
| 19 | | | NO DATA | | | |
| 20 | APP | 688.2 | 48.4 | 11:12:48.7 | -851.1 | -5.0 60.1 |
| 21 | APP | 795.7 | 42.5 | 11:17:02.2 | -1241.6 | -10.8 64.5 |
| 22 | APP | 759.3 | 47.0 | 11:21:02.4 | -932.4 | -8.3 63.0 |
| 23 | APP | 719.6 | 52.4 | 11:25:02.8 | -1046.2 | -8.3 70.0 |
| 24 | APP | 770.8 | 44.4 | 11:29:54.8 | -1231.0 | -10.0 63.1 |
| 25 | APP | 747.0 | 50.1 | 11:33:54.4 | -1491.0 | -11.6 71.8 |
| 26 | APP | 834.4 | 48.5 | 11:38:19.1 | -1000.6 | -9.0 64.7 |

500 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | |
|----|-----|-------|------|------------|---------|------------|
| 27 | F/O | 700.2 | 47.1 | 11:42:22.3 | -1306.3 | -11.4 68.2 |
| 28 | F/O | 520.2 | 42.6 | 11:47:41.3 | 40.0 | 0.2 134.0 |
| 29 | F/O | 574.3 | 41.8 | 11:49:43.0 | 204.0 | 0.7 155.5 |
| 30 | F/O | 568.4 | 44.0 | 11:50:39.8 | 374.2 | 1.6 135.0 |
| 31 | F/O | 653.6 | 39.1 | 11:54:55.0 | -33.6 | -0.1 158.3 |
| 32 | F/O | 622.4 | 48.2 | 11:57:52.1 | 335.4 | 1.4 137.6 |
| 33 | F/O | 621.8 | 39.7 | 12:00:21.3 | 124.0 | 0.4 164.3 |
| 34 | F/O | 626.1 | 44.2 | 12:03:22.7 | 500.1 | 2.1 131.6 |

1000 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|------------|
| 35 | | | NO DATA | | | |
| 36 | F/O | 1062.9 | 66.5 | 12:09:02.2 | 168.6 | 0.7 136.7 |
| 37 | F/O | 1100.6 | 63.1 | 12:11:31.7 | -285.5 | -1.1 153.5 |
| 38 | F/O | 1037.0 | 62.3 | 12:14:23.6 | -176.1 | -0.7 136.7 |
| 39 | F/O | 1165.2 | 51.5 | 12:17:14.5 | -157.2 | -0.6 151.2 |
| 40 | F/O | 1147.6 | 65.3 | 12:19:55.4 | 198.4 | 0.8 136.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 107/11/84

XXFAA/AEEXX

EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

SIX DEG. APPROACH AT VY, 60 KTS.

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|------------|------|------------|--------|-------|------|
| 1 | | | NO DATA | | | |
| 2 | APP 1055.2 | 21.5 | 10:20:28.0 | -473.2 | -4.8 | 56.0 |
| 3 | APP 1066.0 | 22.0 | 10:24:58.0 | -536.6 | -5.7 | 53.0 |
| 4 | APP 1052.8 | 21.7 | 10:29:25.0 | -428.0 | -4.4 | 55.0 |
| 5 | APP 1083.1 | 21.4 | 10:34:07.5 | -417.2 | -4.3 | 54.4 |
| 6 | APP 1060.6 | 22.0 | 10:39:44.0 | -625.3 | -6.5 | 54.2 |

NORMAL APPROACH

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|------------|------|------------|--------|-------|------|
| 7 | APP 1073.3 | 21.1 | 10:45:00.2 | -204.2 | -2.2 | 51.8 |
| 9 | | | NO DATA | | | |
| 11 | APP 1062.2 | 22.4 | 10:13:28.6 | -813.0 | -5.0 | 77.2 |
| 13 | APP 1079.3 | 22.8 | 10:17:58.8 | -334.2 | -2.4 | 78.8 |
| 15 | APP 1138.0 | 22.2 | 10:22:34.3 | -603.2 | -4.4 | 77.8 |
| 17 | APP 1134.0 | 17.5 | 10:27:17.2 | -357.1 | -2.8 | 71.0 |

NORMAL TAKEOFF

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|------------|------|------------|--------|-------|------|
| 8 | DEP 1065.1 | 20.8 | 10:49:44.5 | -499.5 | -5.4 | 52.6 |
| 10 | | | NO DATA | | | |
| 12 | DEP 1188.0 | 31.8 | 10:15:03.3 | 1592.7 | 10.6 | 84.1 |
| 14 | DEP 1155.5 | 31.7 | 10:19:30.5 | 1458.8 | 0.4 | 87.0 |
| 16 | DEP 1233.8 | 38.7 | 10:24:08.0 | 1446.0 | 0.8 | 82.2 |
| 18 | DEP 1181.4 | 35.1 | 10:29:03.4 | 1278.2 | 8.0 | 90.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 07/11/84

FAA/AEEX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|--------|---------------------|------------|---------|------------|
| 19 | | | ----- NO DATA ----- | | | |
| 20 | APP | 1141.2 | 25.8 | 11:12:40.8 | -993.4 | -8.5 65.8 |
| 21 | APP | 1073.2 | 32.3 | 11:17:00.8 | -1246.2 | -10.8 64.5 |
| 22 | APP | 1130.5 | 31.6 | 11:21:00.6 | -1382.0 | -12.4 61.0 |
| 23 | APP | 1144.4 | 27.7 | 11:25:02.5 | -1102.0 | -9.4 71.2 |
| 24 | APP | 1121.5 | 29.7 | 11:29:54.0 | -1400.8 | -12.6 62.0 |
| 25 | APP | 1170.4 | 29.7 | 11:33:54.1 | -1508.6 | -11.7 71.0 |
| 26 | APP | 1135.5 | 33.7 | 11:38:18.8 | -1165.4 | -9.5 66.4 |

500 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | |
|----|-----|--------|------|------------|---------|------------|
| 27 | F/O | 1164.2 | 28.2 | 11:42:19.7 | -1002.8 | -8.6 65.7 |
| 28 | F/O | 1157.7 | 18.1 | 11:47:40.7 | -107.1 | -0.5 133.4 |
| 29 | F/O | 1112.3 | 20.1 | 11:49:42.3 | 45.0 | 0.2 157.8 |
| 30 | F/O | 1162.5 | 20.3 | 11:52:40.0 | 412.5 | 1.7 136.3 |
| 31 | F/O | 1076.2 | 22.7 | 11:54:56.0 | -88.2 | -0.3 157.1 |
| 32 | F/O | 1145.6 | 23.0 | 11:57:51.8 | 291.1 | 1.2 135.3 |
| 33 | F/O | 1092.0 | 21.7 | 12:00:21.5 | 193.7 | 0.7 165.3 |
| 34 | F/O | 1136.5 | 21.8 | 12:03:22.4 | 441.2 | 1.9 132.9 |

1000 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | |
|----|-----|--------|---------------------|------------|--------|------------|
| 35 | | | ----- NO DATA ----- | | | |
| 36 | F/O | 1432.2 | 43.0 | 12:09:01.9 | 103.7 | 0.4 138.8 |
| 37 | F/O | 1402.1 | 44.5 | 12:11:32.4 | -278.4 | -1.0 153.5 |
| 38 | F/O | 1375.7 | 42.0 | 12:14:24.0 | -216.2 | -0.9 137.6 |
| 39 | F/O | 1361.5 | 48.3 | 12:17:14.0 | -130.8 | -0.5 152.1 |
| 40 | F/O | 1458.7 | 45.8 | 12:19:55.5 | 191.1 | 0.8 135.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE: 07/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|----------------------------------|------------|-------|------------|--------|-------|------|
| SIX DEG. APPROACH AT VY, 60 KTS. | | | | | | |
| 1 | | ----- | NO DATA | ----- | | |
| 2 | APP 1070.2 | 21.3 | 10:20:27.8 | -481.0 | -4.0 | 56.0 |
| 3 | APP 1071.4 | 21.8 | 10:24:59.2 | -550.3 | -5.0 | 52.8 |
| 4 | APP 1047.6 | 20.4 | 10:29:28.2 | -738.4 | -7.4 | 56.0 |
| 5 | APP 1053.8 | 21.8 | 10:34:08.7 | -939.5 | -3.4 | 56.5 |
| 6 | APP 1076.6 | 20.2 | 10:39:47.8 | -518.9 | -5.0 | 50.0 |

NORMAL APPROACH

| | | | | | | |
|----|------------|-------|------------|--------|------|------|
| 7 | APP 1053.0 | 21.3 | 10:45:01.4 | -347.5 | -3.7 | 53.1 |
| 9 | | ----- | NO DATA | ----- | | |
| 11 | | ----- | NO DATA | ----- | | |
| 13 | APP 1026.0 | 22.7 | 10:18:01.4 | -801.2 | -5.0 | 75.0 |
| 15 | APP 1016.3 | 24.4 | 10:22:35.5 | -757.6 | -5.7 | 75.0 |
| 17 | APP 065.3 | 20.0 | 10:27:19.0 | -258.0 | -1.0 | 76.6 |

NORMAL TAKEOFF

| | | | | | | |
|----|------------|-------|------------|--------|------|------|
| 8 | DEP 1043.1 | 20.1 | 10:49:46.7 | -412.0 | -4.4 | 52.3 |
| 10 | | ----- | NO DATA | ----- | | |
| 12 | DEP 1168.2 | 32.7 | 10:15:03.8 | 1631.5 | 10.8 | 84.7 |
| 14 | DEP 1204.2 | 29.9 | 10:19:39.2 | 1466.6 | 9.4 | 87.8 |
| 16 | DEP 1254.4 | 38.2 | 10:24:08.5 | 1457.3 | 10.0 | 81.2 |
| 18 | DEP 1217.0 | 33.9 | 10:29:03.1 | 1260.4 | 8.0 | 80.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE: 07/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|--------|----------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 19 | | ----- | NO DATA | ----- | | | |
| 20 | APP | 1073.3 | 28.8 | 11:12:48.7 | -851.1 | -6.9 | 69.1 |
| 21 | APP | 1101.2 | 27.0 | 11:17:02.2 | -1241.6 | -10.8 | 64.5 |
| 22 | APP | 1142.5 | 28.7 | 11:21:03.0 | -1065.5 | -10.0 | 59.8 |
| 23 | APP | 1097.4 | 31.4 | 11:25:00.8 | -1046.2 | -8.3 | 70.0 |
| 24 | APP | 1166.6 | 27.7 | 11:29:54.8 | -1231.0 | -10.0 | 63.1 |
| 25 | APP | 1123.9 | 30.8 | 11:33:54.4 | -1491.0 | -11.5 | 71.8 |
| 26 | APP | 1220.7 | 30.9 | 11:38:19.1 | -1039.6 | -9.0 | 64.7 |

500 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | | |
|----|-----|--------|------|------------|---------|-------|-------|
| 27 | F/O | 1079.3 | 28.5 | 11:42:22.3 | -1396.3 | -11.4 | 68.2 |
| 28 | F/O | 957.8 | 22.1 | 11:47:41.3 | 40.0 | 0.2 | 134.0 |
| 29 | F/O | 993.4 | 21.7 | 11:49:41.8 | -37.2 | -0.1 | 156.3 |
| 30 | F/O | 988.3 | 23.7 | 11:52:30.8 | 374.2 | 1.6 | 135.0 |
| 31 | F/O | 1085.6 | 22.8 | 11:54:56.3 | 104.5 | 0.4 | 158.2 |
| 32 | F/O | 1025.4 | 27.0 | 11:57:52.1 | 335.4 | 1.4 | 137.6 |
| 33 | F/O | 1053.2 | 22.4 | 12:00:20.8 | -140.4 | -0.5 | 168.6 |
| 34 | F/O | 1026.2 | 24.4 | 12:03:22.7 | 500.1 | 2.1 | 131.6 |

1000 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|-------|
| 35 | | ----- | NO DATA | ----- | | | |
| 36 | F/O | 1344.5 | 46.6 | 12:09:42.2 | 168.6 | 0.7 | 136.7 |
| 37 | F/O | 1400.0 | 44.6 | 12:11:31.7 | -285.5 | -1.1 | 153.5 |
| 38 | F/O | 1344.9 | 43.2 | 12:14:23.8 | -203.0 | -0.8 | 137.2 |
| 39 | F/O | 1471.5 | 44.3 | 12:17:14.5 | -157.2 | -0.6 | 161.2 |
| 40 | F/O | 1431.7 | 46.9 | 12:19:55.3 | 109.0 | 0.8 | 136.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 107/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

SIX DEG. APPROACH AT VY, 60 KTS.

| | | | | | | |
|---|-----|--------|---------|------------|--------|-----------|
| 1 | | ----- | NO DATA | ----- | | |
| 2 | APP | 2019.1 | 11.1 | 10:20:28.0 | -473.2 | -4.8 56.0 |
| 3 | APP | 2026.9 | 11.9 | 10:24:57.1 | -453.0 | -4.9 51.7 |
| 4 | APP | 2025.6 | 11.3 | 10:29:25.8 | -428.0 | -4.4 55.0 |
| 5 | APP | 2047.1 | 11.2 | 10:34:07.5 | -417.2 | -4.3 54.4 |
| 6 | APP | 2032.2 | 11.5 | 10:39:44.9 | -625.3 | -6.5 54.2 |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 7 | APP | 2038.0 | 11.0 | 10:45:00.2 | -204.2 | -2.2 51.8 |
| 9 | | ----- | NO DATA | ----- | | |
| 11 | APP | 2023.5 | 11.6 | 10:13:28.6 | -813.9 | -5.9 77.2 |
| 13 | APP | 2038.5 | 11.9 | 10:17:58.8 | -334.2 | -2.4 78.8 |
| 15 | APP | 2099.7 | 12.0 | 10:22:34.2 | -602.5 | -4.4 78.1 |
| 17 | APP | 2110.3 | 9.4 | 10:27:17.2 | -357.1 | -2.8 71.9 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 8 | DEP | 2031.8 | 10.8 | 10:49:44.5 | -499.5 | -5.4 52.6 |
| 10 | | ----- | NO DATA | ----- | | |
| 12 | DEP | 2100.2 | 17.4 | 10:15:03.3 | 1592.7 | 10.6 84.1 |
| 14 | DEP | 2063.2 | 18.8 | 10:19:41.5 | 1495.1 | 9.5 88.3 |
| 16 | DEP | 2109.4 | 21.5 | 10:24:08.0 | 1446.0 | 9.8 82.2 |
| 18 | DEP | 2081.8 | 19.1 | 10:29:03.4 | 1278.2 | 8.0 80.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 2000 FT. EAST

DATE 07/11/84

IXFAA/AEEX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

NOISE ABATEMENT APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|---------|------------|
| 19 | | ----- | NO DATA | ----- | | |
| 20 | APP | 2059.1 | 14.0 | 11:12:49.8 | -993.4 | -8.5 65.8 |
| 21 | APP | 1999.7 | 16.8 | 11:17:00.8 | -1246.8 | -10.8 64.5 |
| 22 | APP | 2050.8 | 16.9 | 11:21:00.5 | -1390.8 | -12.4 62.2 |
| 23 | APP | 2076.7 | 16.0 | 11:25:01.8 | -1114.1 | -8.8 70.0 |
| 24 | APP | 2048.7 | 15.9 | 11:29:54.0 | -1400.8 | -12.6 62.0 |
| 25 | APP | 2098.3 | 16.1 | 11:33:54.1 | -1508.8 | -11.7 71.0 |
| 26 | APP | 2043.8 | 18.1 | 11:38:18.8 | -1105.4 | -9.5 65.4 |

500 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | |
|----|-----|--------|------|------------|---------|------------|
| 27 | F/O | 2099.5 | 15.3 | 11:42:19.8 | -1010.0 | -8.6 66.0 |
| 28 | F/O | 2124.0 | 9.8 | 11:47:40.7 | -107.1 | -0.5 133.4 |
| 29 | F/O | 2079.0 | 10.7 | 11:49:42.3 | 45.9 | 0.8 157.8 |
| 30 | F/O | 2128.8 | 10.8 | 11:52:39.8 | 333.6 | 1.4 134.0 |
| 31 | F/O | 2031.8 | 12.1 | 11:54:56.1 | 204.7 | 0.7 158.6 |
| 32 | F/O | 2100.0 | 12.8 | 11:57:51.8 | 291.1 | 1.2 138.3 |
| 33 | F/O | 2055.1 | 11.4 | 12:00:21.5 | 193.7 | 0.7 165.3 |
| 34 | F/O | 2098.6 | 11.7 | 12:03:22.4 | 441.2 | 1.9 132.0 |

1000 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|------------|
| 35 | | ----- | NO DATA | ----- | | |
| 36 | F/O | 2267.5 | 25.6 | 12:09:01.7 | -12.5 | -0.1 140.5 |
| 37 | F/O | 2224.7 | 26.3 | 12:11:32.4 | -878.4 | -1.0 153.5 |
| 38 | F/O | 2218.6 | 24.6 | 12:14:24.0 | -210.2 | -0.9 137.6 |
| 39 | F/O | 2158.1 | 28.4 | 12:17:14.0 | -35.4 | -0.1 151.2 |
| 40 | F/O | 2271.2 | 27.5 | 12:19:55.0 | 188.2 | 0.8 136.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE 07/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

SIX DEG. APPROACH AT VY, 60 KTS.

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 1 | | ----- | NO DATA | ----- | | |
| XX | | ----- | NO DATA | ----- | | |
| 3 | APP | 2028.8 | 10.2 | 10:25:02.1 | -456.6 | -4.7 54.0 |
| 4 | APP | 2006.2 | 10.2 | 10:29:28.2 | -738.4 | -7.4 66.0 |
| 5 | APP | 2010.4 | 10.3 | 10:34:10.7 | -513.4 | -5.0 57.5 |
| 6 | APP | 2026.2 | 10.2 | 10:39:47.8 | -518.0 | -5.0 50.0 |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 7 | APP | 2014.0 | 10.6 | 10:45:01.4 | -347.5 | -3.7 53.1 |
| 9 | | ----- | NO DATA | ----- | | |
| 11 | APP | 1974.3 | 10.8 | 10:13:29.8 | -806.5 | -5.0 76.0 |
| 13 | APP | 1962.7 | 11.3 | 10:18:01.4 | -801.2 | -5.0 75.0 |
| 15 | APP | 1952.0 | 11.7 | 10:22:36.4 | -903.2 | -6.8 74.7 |
| 17 | APP | 1924.0 | 9.5 | 10:27:19.0 | -258.0 | -1.0 76.6 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|--------|---------|------------|--------|-----------|
| 8 | DEP | 2000.3 | 10.0 | 10:49:46.7 | -412.0 | -4.4 52.3 |
| 10 | | ----- | NO DATA | ----- | | |
| 12 | DEP | 2068.0 | 10.1 | 10:15:05.0 | 1736.7 | 11.2 86.7 |
| 14 | DEP | 2115.0 | 16.2 | 10:19:30.2 | 1466.6 | 9.4 87.8 |
| 16 | DEP | 2127.8 | 21.0 | 10:24:08.5 | 1457.3 | 10.0 81.2 |
| 18 | DEP | 2104.8 | 15.9 | 10:28:59.6 | 1404.8 | 8.0 88.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AGUSTA 109A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

DATE: 07/11/84

2000 FT. WEST

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|------------|------|---------------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 19 | | | ----- NO DATA ----- | | | |
| 20 | APP 1998.1 | 14.6 | 11:12:48.7 | -851.1 | -6.9 | 69.1 |
| 21 | APP 2115.1 | 14.5 | 11:17:02.2 | -1241.6 | -10.8 | 64.5 |
| 22 | APP 2045.5 | 15.2 | 11:21:03.9 | -1065.5 | -10.0 | 59.8 |
| 23 | APP 2014.7 | 16.1 | 11:25:00.8 | -1046.2 | -8.3 | 70.0 |
| 24 | APP 2002.3 | 14.7 | 11:29:54.8 | -1231.0 | -10.0 | 63.1 |
| 25 | APP 2038.2 | 16.1 | 11:33:54.4 | -1491.0 | -11.6 | 71.8 |
| 26 | APP 2129.3 | 14.8 | 11:38:22.8 | -1047.2 | -8.7 | 67.7 |

500 FT. LEVEL FLYOVER AT 145 KTS.

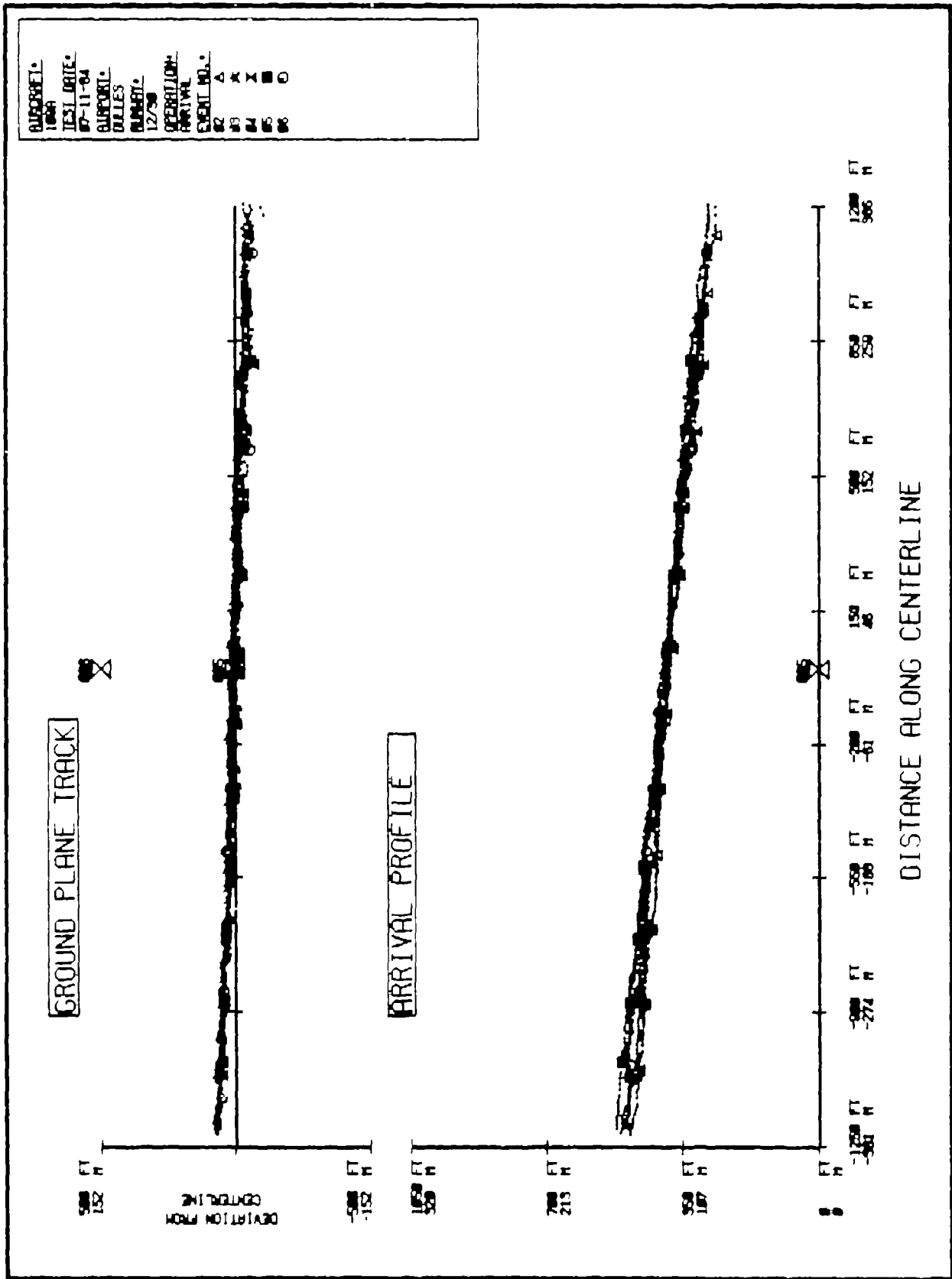
| | | | | | | |
|----|------------|------|------------|---------|-------|-------|
| 27 | F/O 1999.5 | 14.6 | 11:42:22.3 | -1396.3 | -11.4 | 68.2 |
| 28 | F/O 1909.7 | 10.7 | 11:47:42.8 | 204.2 | 0.8 | 139.8 |
| 29 | F/O 1945.9 | 10.5 | 11:49:41.8 | -37.2 | -0.1 | 156.3 |
| 30 | F/O 1914.2 | 12.3 | 11:52:41.8 | 98.0 | 0.4 | 140.4 |
| 31 | F/O 2038.6 | 11.6 | 11:54:56.3 | 104.5 | 0.4 | 158.2 |
| 32 | F/O 1957.1 | 13.4 | 11:57:52.9 | 338.8 | 1.3 | 142.0 |
| 33 | F/O 1998.2 | 11.5 | 12:00:20.6 | -224.2 | -0.8 | 162.2 |
| 34 | F/O 1974.6 | 12.0 | 12:03:23.4 | 618.5 | 2.6 | 135.7 |

1000 FT. LEVEL FLYOVER AT 145 KTS.

| | | | | | | |
|----|------------|------|---------------------|--------|------|-------|
| 35 | | | ----- NO DATA ----- | | | |
| 36 | F/O 2152.3 | 26.6 | 12:09:02.2 | 168.6 | 0.7 | 136.7 |
| 37 | F/O 2218.2 | 26.0 | 12:11:32.6 | -262.0 | -1.0 | 153.5 |
| 38 | F/O 2177.2 | 24.7 | 12:14:23.8 | -203.0 | -0.8 | 137.2 |
| 39 | F/O 2290.7 | 26.3 | 12:17:14.5 | -157.2 | -0.6 | 151.2 |
| 40 | F/O 2232.0 | 27.6 | 12:19:55.3 | 199.0 | 0.8 | 136.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

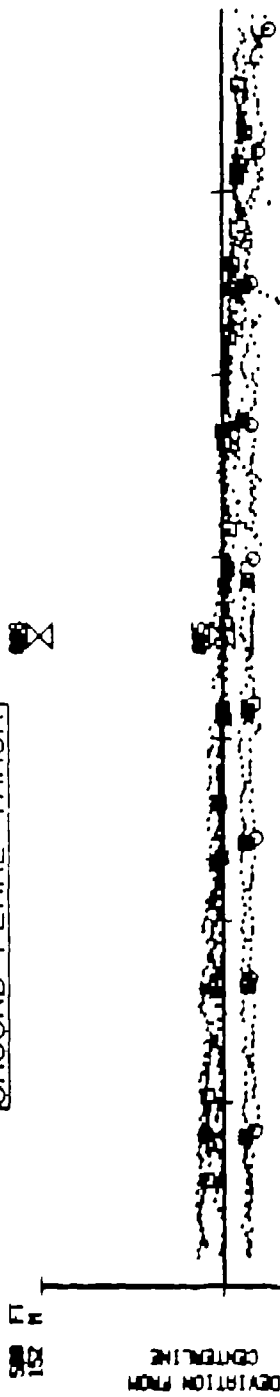
SIX° APPROACH at Vy, 60 Kts.



NORMAL APPROACH

| | |
|------------|----------|
| RUNCRBT: | 100A |
| TEST DATE: | 07-11-64 |
| AIRPORT: | DULLES |
| FLIGHT: | 12/30 |
| OPERATION: | ARRIVAL |
| EVENT NO.: | 07 |
| | 11 |
| | 13 |
| | 15 |
| | 17 |

GROUND PLANE TRACK



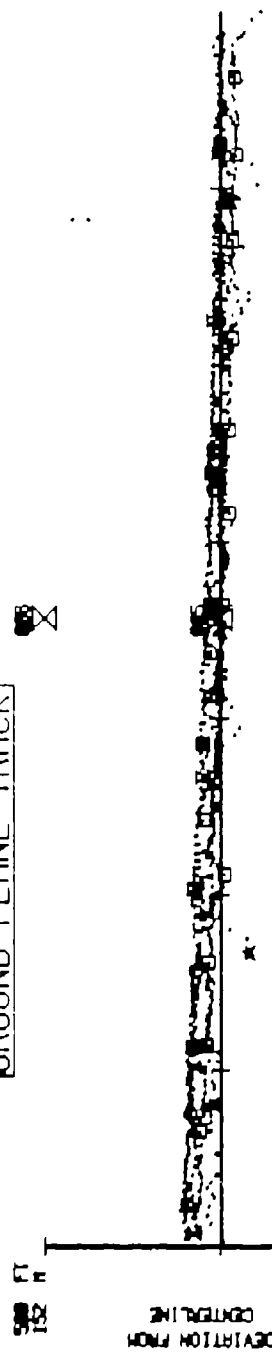
ARRIVAL PROFILE



NORMAL TAKEOFF

| | |
|----------------------|----------|
| RUNWAY: | 10A |
| TEST DATE: | 07-11-64 |
| RUNWY: | 0115 |
| QUILES: | 12/30 |
| OPERATION: | 16 |
| DEPARTURE: | 12 |
| EXERCISE NO.: | 14 |
| | 16 |
| | 18 |

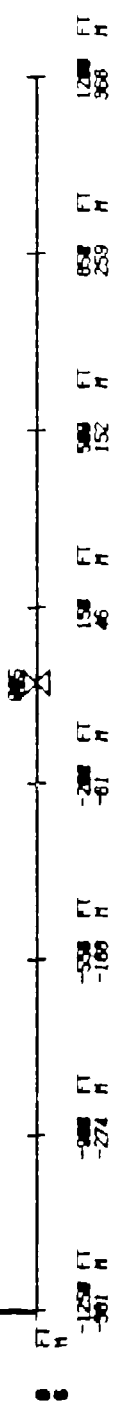
GROUND PLANE TRACK



DEPARTURE PROFILE



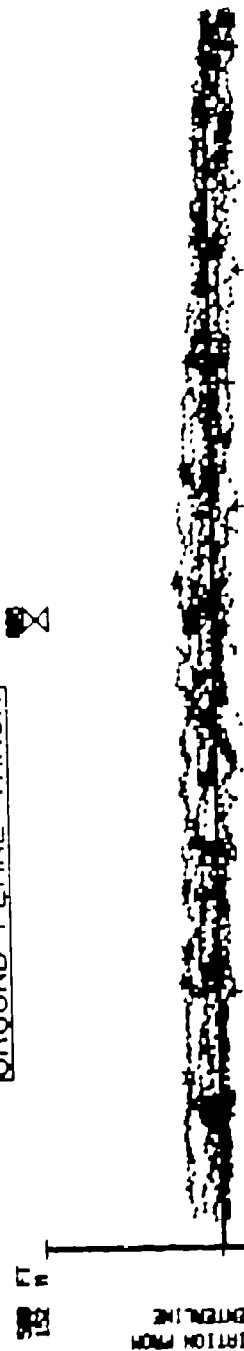
DISTANCE ALONG CENTERLINE



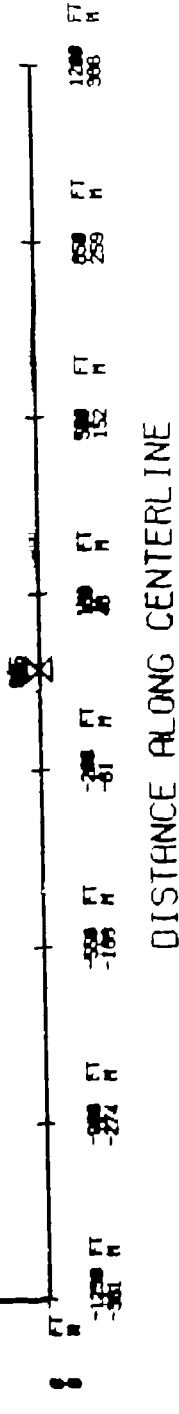
NOISE ABATEMENT APPROACH (Var. R/D & A/S)

| | |
|-----------|----------|
| BLDG. NO. | 1000 |
| TEST DATE | 07-11-64 |
| REPORT | DOLLES |
| BLDG. NO. | 12/30 |
| OPERATION | ARRIVAL |
| EVENT NO. | 19 |
| | 20 |
| | 21 |
| | 22 |
| | 23 |
| | 24 |
| | 25 |
| | 26 |
| | 27 |

GROUND PLANE TRACK



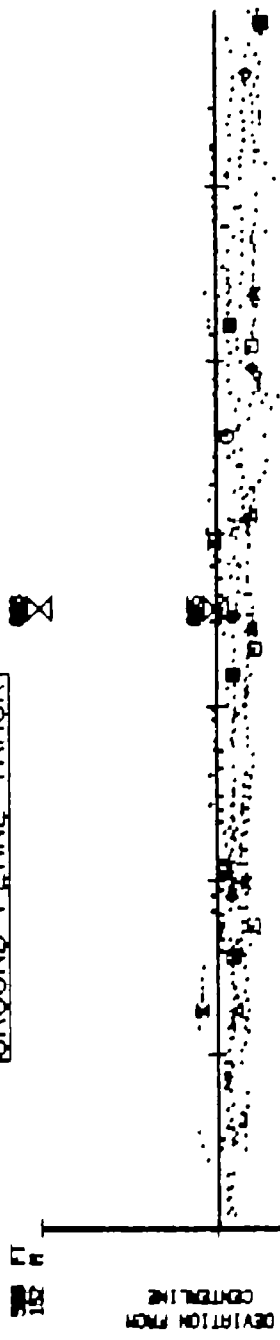
ARRIVAL PROFILE



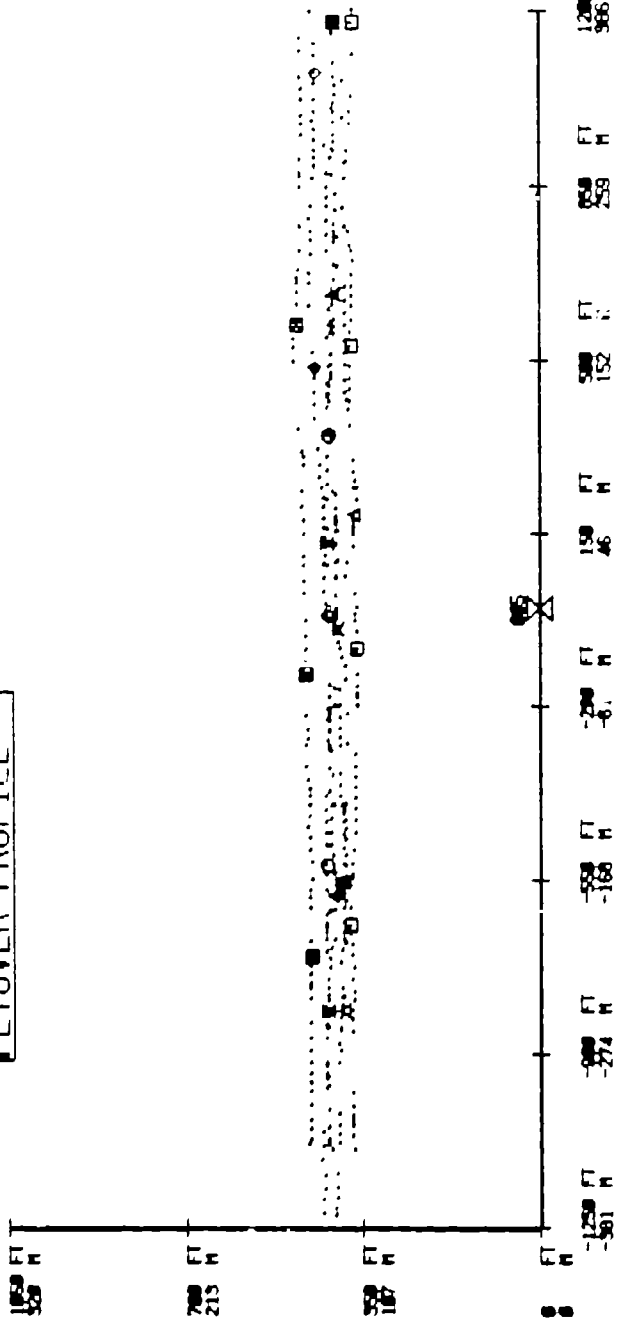
500 FT. LEVEL FLYOVER

SUBJECT: 100A
 TEST DATE: 07-11-04
 AIRCRAFT: DUKES
 ALTITUDE: 12750
 OPERATIONS: FLY-OVER
 EVENT NO.: 28 □ 29 ▲ 30 K 31 X 32 ■ 33 ○ 34 ◆

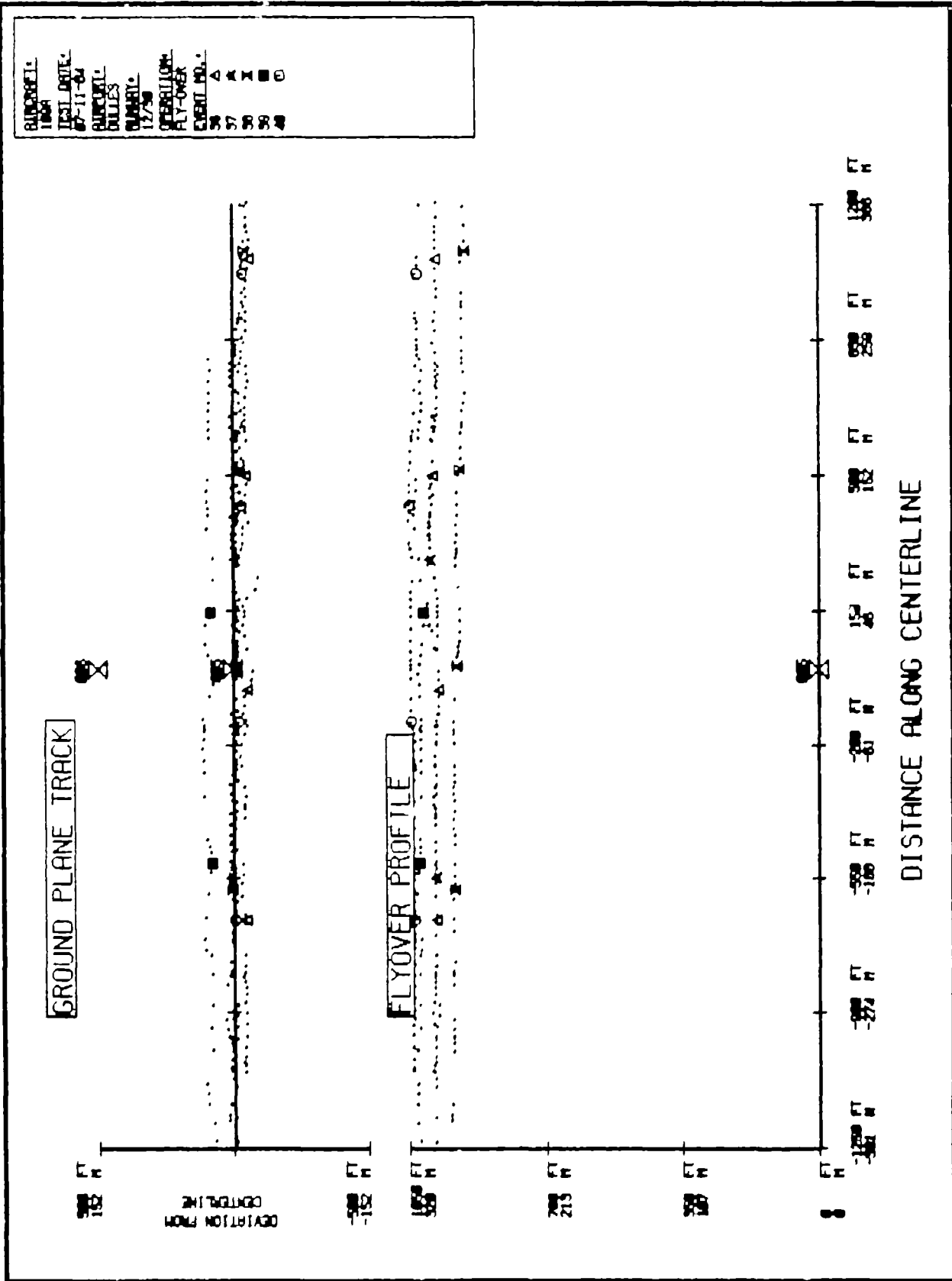
GROUND PLANE TRACK



FLYOVER PROFILE



1000 FT. LEVEL FLYOVER



METEOROLOGICAL DATA

THIS SECTION OF THE APPENDIX CONTAINS WEATHER DATA FROM SEVERAL TYPES OF METEOROLOGICAL EQUIPMENT: TERN-MOUNTED TOWER THERMISTOR, GROUND LEVEL PSYCHROMETER, AIRCRAFT DATA, AND PILLOT BALLOONS. DATA FROM THE TERN TOWER INCLUDE THE TEMPERATURE, RELATIVE HUMIDITY, WIND DIRECTION AND WIND SPEED MEASURED AT VARIOUS LEVELS DURING EACH FLIGHT EVENT. RECORDS ON A FAVORABLE OF THE MET TOWER DEW POINT TEMPERATURE, RELATIVE HUMIDITY WAS CALCULATED USING TEMPERATURE FROM THE MET TOWER AND DEW POINT FROM THE GROUND TERN TOWER WEATHER STATION. WINDS AT LEVELS OF FEET TO 10,000 FEET AND RELATIVE HUMIDITY ARE LISTED FOR DIFFERENT ALTITUDES AT 1000 FOOT INTERVALS AND MEASUREMENTS ARE TAKEN AT VARIOUS TIMES OF THE DAY. THE FLIGHT BALLOON WIND DATA, TAKEN SEVERAL TIMES DURING EACH FLIGHT DAY, INCLUDES THE WIND DIRECTION AND WIND SPEED AT VARIOUS ALTITUDES.

METEOROLOGICAL DATA
(MEASURED AT 30 FT. AGL)

HELICOPTER: AGUSTA 109A

DATE: 7/10/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

5, 50, 140 AND 200 FT. HOVER (SOFT PATH)

| | | | | | |
|------|----|----|-----|---|---|
| 8:00 | 65 | 78 | 040 | 1 | - |
| 8:15 | 65 | -- | -- | 1 | - |
| 8:30 | 66 | -- | -- | 2 | - |
| 8:45 | 66 | -- | -- | 2 | - |
| 9:00 | 66 | 81 | 330 | 3 | - |

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: AGUSTA 109A

DATE: 7/11/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

5, 50, 140 AND 200 FT. HOVER (HARD PATH)

| | | | | | |
|------|----|----|-----|---|---|
| 8:00 | 74 | 96 | 220 | 2 | - |
| 8:15 | 75 | -- | 220 | 4 | - |
| 8:30 | 75 | -- | 220 | 5 | - |
| 8:45 | 78 | -- | 220 | 5 | 7 |
| 9:00 | 79 | 85 | 220 | 5 | 7 |
| 9:15 | 80 | -- | 220 | 5 | - |

6 DEGREE APPROACH AT VY, 60 KTS.

| | | | | | |
|-------|----|----|-----|---|---|
| 9:30 | 80 | -- | 220 | 6 | - |
| 9:45 | 82 | -- | 220 | 5 | - |
| 10:00 | 83 | 82 | 220 | 5 | - |

NORMAL APPROACH AND TAKEOFF

| | | | | | |
|-------|----|----|-----|---|---|
| 10:00 | 83 | 82 | 220 | 5 | - |
| 10:15 | 84 | -- | 220 | 7 | - |
| 10:30 | 84 | -- | 220 | 7 | - |
| 10:45 | 85 | -- | 220 | 7 | - |
| 11:00 | 86 | 68 | 220 | 8 | - |

METEOROLOGICAL DATA
(MEASURED AT 30 FT. AGL)

HELICOPTER: AGUSTA 109A

DATE: 7/11/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | |
|-------|----|----|-----|---|----|
| 11:00 | 86 | 68 | 220 | 8 | - |
| 11:15 | 87 | -- | 220 | 8 | 12 |
| 11:30 | 88 | -- | 220 | 9 | 12 |
| 11:45 | 88 | -- | 220 | 8 | 13 |
| 12:00 | 88 | 64 | 220 | 8 | 12 |

500 AND 1000 FT. LEVEL FLYOVERS AT 145 KTS.

| | | | | | |
|-------|----|----|-----|----|----|
| 12:00 | 88 | 64 | 220 | 8 | 12 |
| 12:15 | 88 | -- | 220 | 10 | 13 |
| 12:30 | 89 | -- | 220 | 10 | 13 |
| 12:45 | 89 | -- | 220 | 10 | 13 |
| 1:00 | 90 | 58 | 220 | 10 | 14 |

METEOROLOGICAL DATA

HELICOPTER: AGUSTA 109A

DATE: 07/11/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS DAT BUAGE DATA

| TIME | TEMP. | R.H. |
|-------|-------|------|
| 08:20 | 83 F | 59% |
| 08:41 | 85 F | 60% |
| 09:09 | 86 F | 63% |
| 09:20 | 86 F | 60% |
| 09:44 | 86 F | 57% |
| 10:04 | 85 F | 60% |
| 10:22 | 86 F | 60% |
| 10:50 | 86 F | 57% |

| TIME | ALTITUDE | TEMP. |
|-------|----------|-------|
| 7:50 | 200' | 73 F |
| | 300' | 79 F |
| | 400' | 79 F |
| | 600' | 81 F |
| | 800' | 81 F |
| | 1000' | 79 F |
| 9:15 | 200' | 79 F |
| | 400' | 79 F |
| | 600' | 79 F |
| | 800' | 81 F |
| | 1000' | 81 F |
| 11:00 | 200' | 84 F |
| | 400' | 82 F |
| | 600' | 82 F |
| | 800' | 82 F |
| | 1000' | 82 F |

PILOT BALLOON WIND DATA

AGUSTA 109A

07/11/84

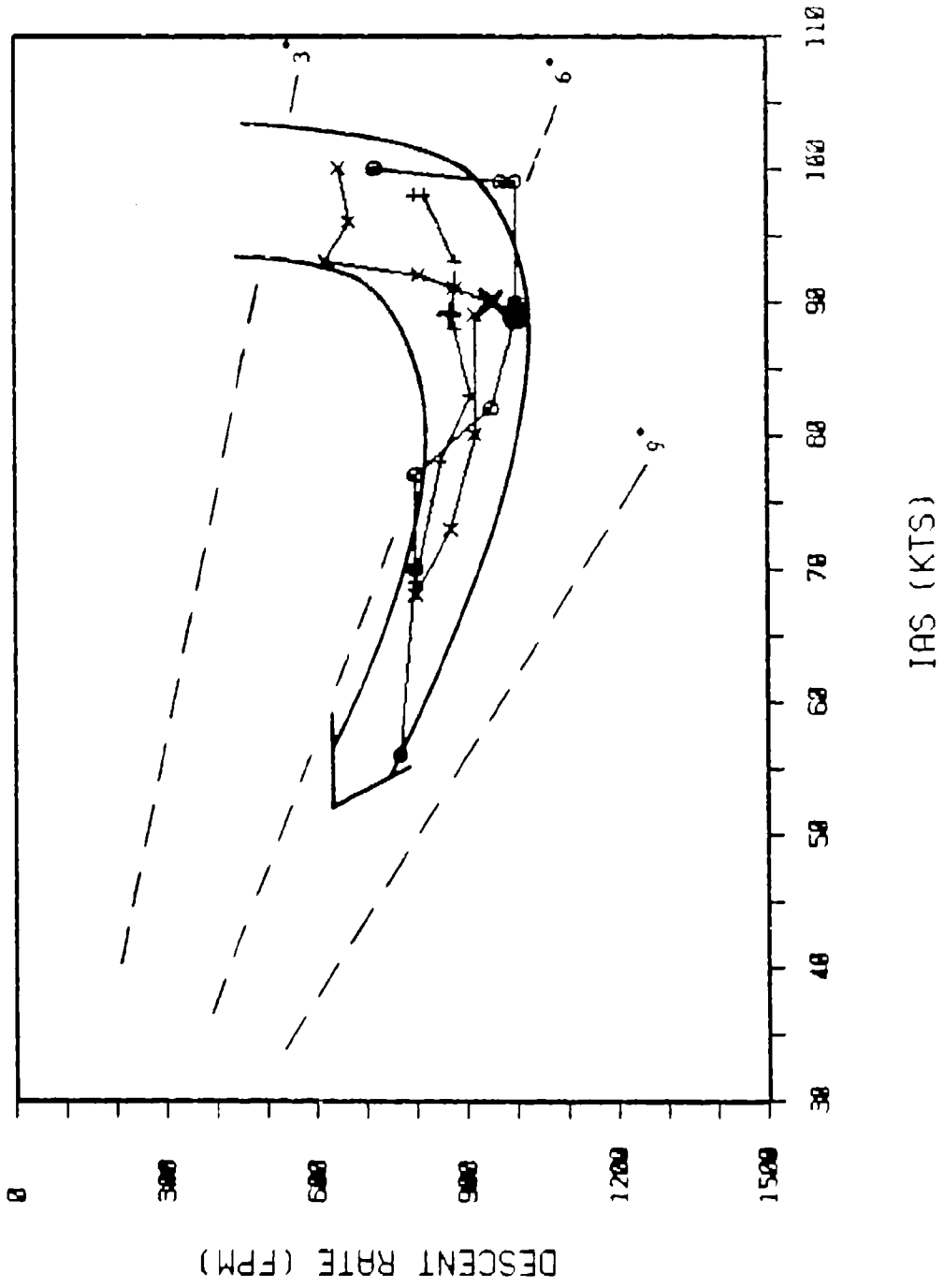
| FEET (AGL) | WIND DIR. (DEG.) | WIND SPD. (KTS) | WIND DIR. (DEG.) | WIND SPD. (KTS) |
|---------------|---------------------|--------------------|---------------------|--------------------|
| ----- | | | | |
| LAUNCH TIME: | 8:25 | | 8:55 | |
| 8FC | 210 | 5 | 190 | 8 |
| 354 | 232 | 10 | 217 | 9 |
| 708 | 237 | 10 | 228 | 10 |
| 1033 | 245 | 12 | 244 | 11 |
| 1358 | 254 | 13 | 253 | 12 |
| | 9:24 | | 10:05 | |
| 8FC | 230 | 8 | 200 | 9 |
| 354 | 217 | 12 | 212 | 14 |
| 708 | 221 | 13 | 215 | 13 |
| 1033 | 228 | 14 | 218 | 12 |
| 1358 | 239 | 13 | 225 | 11 |
| | 10:45 | | 11:08 | |
| 8FC | 220 | 12 | 210 | 12 |
| 354 | 240 | 11 | 232 | 14 |
| 708 | 241 | 11 | 235 | 13 |
| 1033 | 248 | 12 | 240 | 12 |
| 1358 | 252 | 14 | 246 | 13 |

COCKPIT VIDEO

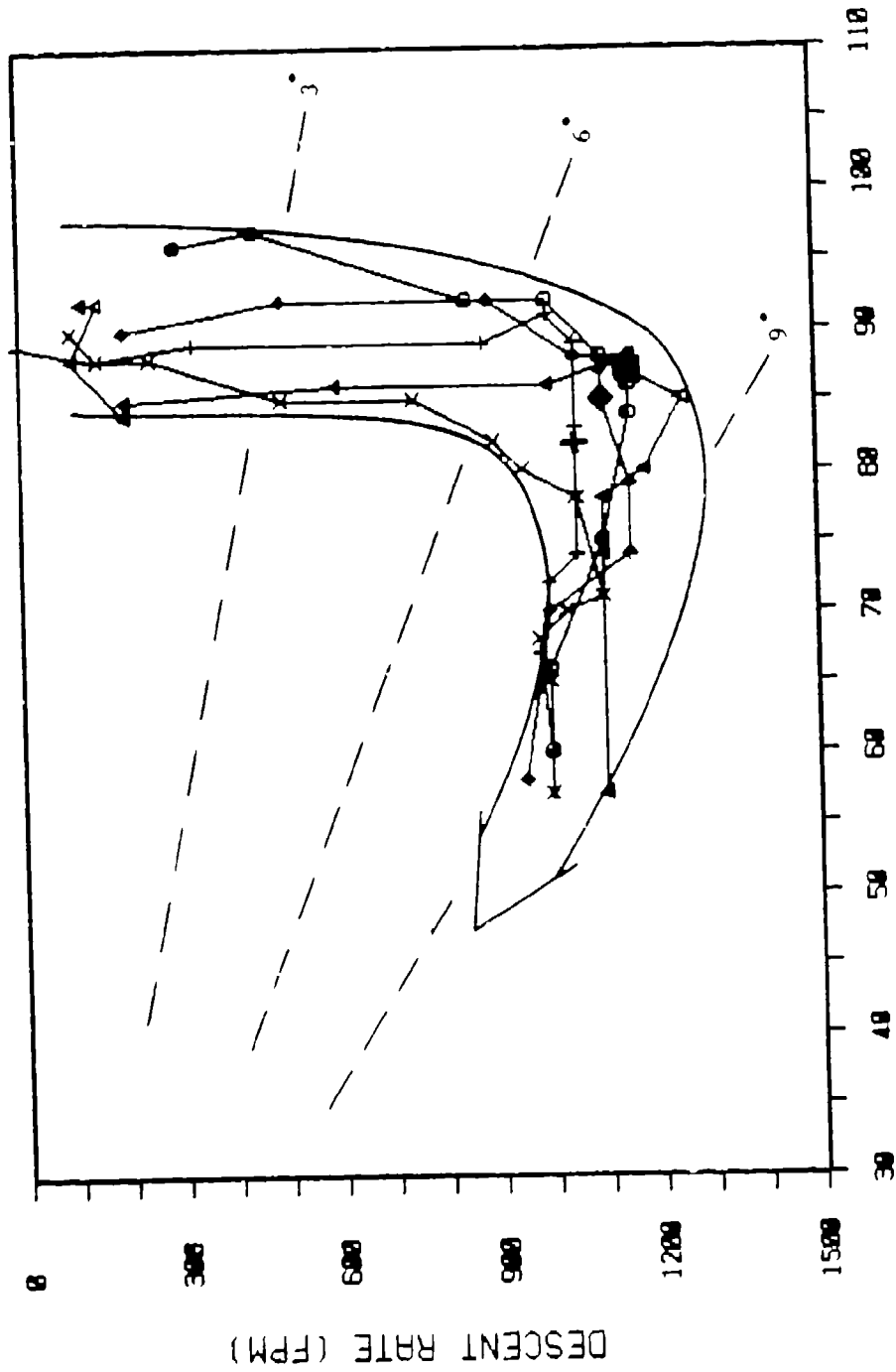
DATA

- THIS SECTION OF THE APPENDIX CONTAINS FLIGHT PROFILE
- PLOTS AND INDIVIDUAL EVENT DATA READ EVERY 5 SECONDS
- FROM PLAYBACK OF THE COCKPIT VIDEO RECORDINGS. IN THE
- PROFILE PLOTS, INDICATED AIRSPEED VS. DESCENT RATE
- ARE PLOTTED FOR THE NORMAL APPROACHES AND THE 'BEST'
- NOISE ABATEMENT APPROACH EVENTS. AN ARROW IS DRAWN
- WHICH BOUNDS THE DATA POINTS AND PORTRAYS THE
- SPEED/DESCENT RATE TREND WITH TIME. THE DARKER DATA
- POINTS INDICATE WHEN THE HELICOPTER PASSED OVER THE CLC
- POSITION. THE INDIVIDUAL EVENT DATA CONTAINS LISTINGS
- OF ALL THE COCKPIT INSTRUMENT READINGS OBTAINED FROM THE
- VIDEO PLAYBACK. THIS DATA ENCOMPASSES THE HELICOPTER'S
- FLIGHT PARAMETERS THROUGHOUT THE ENTIRE DATA RUN PLUS OR
- MINUS 15 SECONDS (MINIMUM) FROM CLC.

NORMAL APPROACH
109A



NOISE ABATEMENT APPROACH
109A



019 ○
020 +
022 ×
025 ▲
027 ◆

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: AGUSTA 109A

DATE: 07/11/84

EVENT: B9

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -51 | 960 | 720 | 105 | 3.88 |
| -46 | 900 | 850 | 106 | 4.54 |
| -41 | 840 | 800 | 106 | 4.27 |
| -36 | 800 | 800 | 106 | 4.27 |
| -31 | 740 | 800 | 103 | 4.40 |
| -26 | 660 | 830 | 98 | 4.60 |
| -21 | 620 | 850 | 96 | 5.02 |
| -16 | 560 | 800 | 95 | 4.77 |
| -11 | 520 | 800 | 92 | 4.93 |
| -6 | 470 | 730 | 93 | 4.45 |
| -1 | 430 | 770 | 91 | 4.79 |
| CLC 0 | --- | --- | -- | -- |
| 4 | 390 | 670 | 87 | 4.36 |
| 9 | 350 | 680 | 82 | 4.70 |
| 14 | 310 | 610 | 74 | 4.67 |
| 19 | 260 | 620 | 67 | 5.24 |
| 24 | 220 | 570 | 53 | 6.10 |

EVENT: B11

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -40 | 940 | 900 | 102 | 5.00 |
| -35 | 870 | 850 | 100 | 4.81 |
| -30 | 820 | 800 | 100 | 4.53 |
| -25 | 760 | 750 | 100 | 4.25 |
| -20 | 800 | 720 | 100 | 4.08 |
| -15 | 640 | 970 | 99 | 5.55 |
| -10 | 580 | 1000 | 99 | 5.72 |
| -5 | 505 | 1000 | 90 | 6.30 |
| CLC 0 | 450 | 100 | 89 | 0.64 |
| 5 | 380 | 950 | 82 | 6.57 |
| 10 | 330 | 800 | 77 | 5.89 |
| 15 | 280 | 800 | 70 | 6.48 |
| 20 | 250 | 770 | 56 | 7.80 |

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: AGUSTA 109A

DATE: 07/11/84

EVENT: B13

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -45 | 990 | 350 | 95 | 3.28 |
| -40 | 930 | 710 | 93 | 4.32 |
| -35 | 850 | 850 | 94 | 5.12 |
| -30 | 800 | 770 | 96 | 4.54 |
| -25 | 760 | 750 | 100 | 4.25 |
| -20 | 600 | 800 | 98 | 4.62 |
| -15 | 630 | 820 | 98 | 4.74 |
| -10 | 550 | 880 | 93 | 5.36 |
| -5 | 500 | 880 | 91 | 5.48 |
| CLC 0 | 480 | 870 | 89 | 5.54 |
| 5 | 460 | 880 | 88 | 5.67 |
| 10 | 380 | 910 | 83 | 6.22 |
| 15 | 330 | 850 | 78 | 6.18 |
| 20 | 280 | 800 | 69 | 6.57 |

EVENT: B15

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -47 | 950 | 670 | 98 | 3.87 |
| -42 | 920 | 660 | 101 | 3.70 |
| -37 | 900 | 580 | 100 | 3.28 |
| -32 | 860 | 620 | 100 | 3.51 |
| -27 | 810 | 700 | 101 | 3.92 |
| -22 | 750 | 650 | 100 | 3.88 |
| -17 | 700 | 670 | 96 | 3.95 |
| -12 | 640 | 620 | 93 | 3.77 |
| -7 | 600 | 810 | 92 | 4.99 |
| -2 | 530 | 880 | 91 | 5.48 |
| CLC 0 | 490 | 950 | 90 | 5.98 |
| 5 | 460 | 920 | 89 | 5.86 |
| 10 | 400 | 920 | 80 | 6.52 |
| 15 | 340 | 870 | 73 | 6.76 |
| 20 | 300 | 800 | 68 | 6.67 |

EVENT: B17

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -46 | 880 | 850 | 96 | 5.02 |
| -41 | 820 | 950 | 102 | 5.28 |
| -36 | 730 | 940 | 98 | 5.44 |
| -31 | 670 | 780 | 100 | 4.42 |
| -26 | 640 | 790 | 106 | 4.22 |
| -21 | 560 | 780 | 98 | 4.51 |
| -16 | 520 | 780 | 95 | 4.65 |
| -11 | 480 | 680 | 93 | 4.14 |
| -6 | 460 | 560 | 95 | 3.34 |
| CLC 0 | 400 | 510 | 90 | 3.21 |
| 5 | 380 | 470 | 88 | 3.02 |
| 10 | 370 | 480 | 82 | 3.31 |
| 15 | 330 | 500 | 74 | 3.83 |
| 20 | 280 | 610 | 68 | 5.08 |

E-449

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: AGUSTA 109A

DATE: 07/11/84

EVENT: D19

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (FTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -24 | 960 | 300 | 96 | 1.77 |
| -19 | 950 | 450 | 97 | 2.63 |
| -14 | 920 | 850 | 92 | 5.22 |
| -8 | 830 | 1000 | 92 | 6.16 |
| -4 | 740 | 1100 | 88 | 7.09 |
| CLC 0 | 830 | 1150 | 87 | 7.50 |
| 1 | 840 | 1150 | 86 | 7.59 |
| 6 | 540 | 1150 | 84 | 7.77 |
| 11 | 460 | 1100 | 75 | 8.33 |
| 16 | 370 | 1000 | 66 | 8.60 |
| 21 | 290 | 1000 | 60 | 9.47 |

EVENT: D20

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -31 | 940 | 0 | 89 | 0.00 |
| -26 | 950 | 140 | 88 | 0.90 |
| -21 | 940 | 330 | 89 | 2.10 |
| -16 | 870 | 880 | 89 | 5.60 |
| -11 | 790 | 1000 | 91 | 6.23 |
| -6 | 700 | 1050 | 89 | 6.69 |
| -1 | 610 | 1050 | 83 | 7.18 |
| CLC 0 | 600 | 1050 | 82 | 7.26 |
| 5 | 520 | 1050 | 74 | 8.05 |
| 10 | 460 | 1000 | 72 | 7.88 |
| 15 | 420 | 980 | 67 | 8.30 |
| 20 | 340 | 1000 | 60 | 9.47 |

EVENT: D22

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -34 | 960 | 100 | 90 | 0.63 |
| -29 | 960 | 150 | 88 | 0.96 |
| -24 | 960 | 250 | 88 | 1.61 |
| -19 | 920 | 500 | 85 | 3.33 |
| -14 | 890 | 750 | 85 | 5.00 |
| -9 | 810 | 900 | 82 | 6.22 |
| -4 | 750 | 950 | 80 | 6.73 |
| CLC 0 | --- | --- | --- | --- |
| 1 | 660 | 1050 | 78 | 7.64 |
| 6 | 530 | 1100 | 71 | 8.80 |
| 11 | 480 | 1030 | 70 | 8.31 |
| 16 | 410 | 980 | 68 | 8.18 |
| 21 | 350 | 1000 | 65 | 8.74 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (VAR. R/D AND A/S)

HELICOPTER: AGUSTA 109A

DATE: 07/11/84

EVENT: D25

EVENT: D27

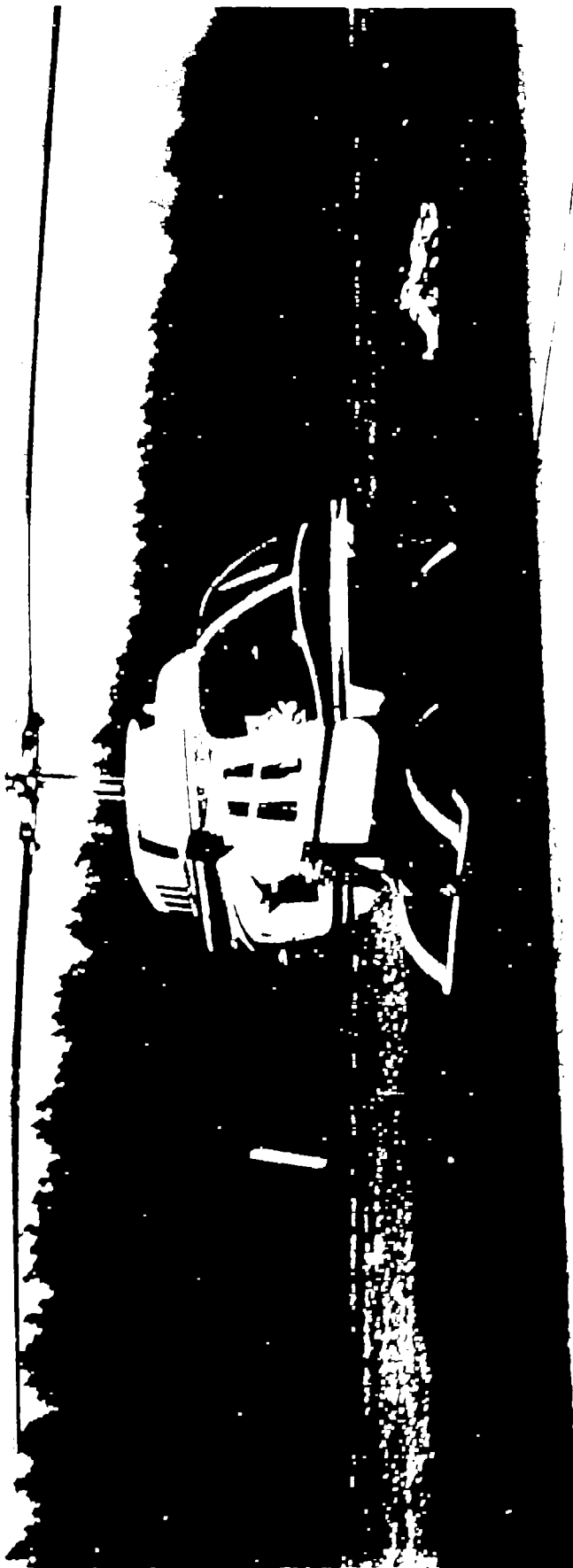
| TIME (SEC.) | ALT. (AGL) | R/D (FFM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -36 | 900 | 120 | 92 | 0.74 |
| -31 | 900 | 150 | 92 | 0.92 |
| -26 | 850 | 100 | 88 | 0.64 |
| -21 | 960 | 200 | 84 | 1.35 |
| -16 | 960 | 200 | 85 | 1.33 |
| -11 | 960 | 600 | 86 | 3.95 |
| -6 | 840 | 1000 | 86 | 6.59 |
| -1 | 730 | 1150 | 88 | 7.41 |
| CLC 0 | 720 | 1150 | 87 | 7.50 |
| 4 | 620 | 1250 | 85 | 8.35 |
| 9 | 510 | 1180 | 80 | 8.38 |
| 14 | 440 | 1100 | 78 | 8.01 |
| 19 | 360 | 1100 | 74 | 8.44 |
| 24 | 250 | 1100 | 57 | 10.99 |
| 29 | 170 | 900 | 34 | 15.15 |

| TIME (SEC.) | ALT. (AGL) | R/D (FFM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -27 | 990 | 200 | 90 | 5.02 |
| -22 | 960 | 500 | 92 | 5.18 |
| -17 | 890 | 800 | 92 | 5.44 |
| -12 | 900 | 1050 | 88 | 4.42 |
| -7 | 690 | 1150 | 88 | 4.22 |
| -2 | 600 | 1100 | 87 | 4.51 |
| CLC 0 | 780 | 1100 | 85 | 4.65 |
| 3 | 540 | 1150 | 79 | 4.14 |
| 8 | 430 | 1150 | 74 | 3.34 |
| 13 | 360 | 1000 | 70 | 3.21 |
| 18 | 280 | 950 | 58 | 3.02 |
| 23 | 220 | 1100 | 38 | 3.31 |

APPENDIX F

BELL 206L-1

| | <u>PAGE NUMBERS</u> |
|---|---------------------|
| <u>HELICOPTER CHARACTERISTICS</u> | F-454 |
| <u>NOISE LEVEL DATA</u> | |
| <u>SOUND EXPOSURE LEVEL</u> | |
| Bar Charts | |
| Approaches..... | F-458 |
| Takeoff..... | F-459 |
| Level Flavors..... | F-460 |
| Summary Tables..... | F-461 - F-462 |
| Individual Event Data..... | F-463 - F-469 |
| <u>A-WEIGHTED SOUND LEVEL</u> | |
| Bar Charts | |
| Approaches..... | F-472 |
| Takeoff..... | F-473 |
| Level Flavors..... | F-474 |
| Summary Tables..... | F-475 - F-476 |
| Individual Event Data..... | F-477 - F-483 |
| <u>RADAR TRACKING DATA</u> | |
| Position Data..... | F-486 - F-499 |
| Tracking Plots..... | F-500 - F-506 |
| <u>METEOROLOGICAL DATA</u> | |
| 10-meter Tower Data..... | F-508 |
| 4 ft. Data and Aircraft DAT Data..... | F-509 |
| Pilot Balloon Wind Data..... | F-510 |
| <u>COCHPELL VIDEO DATA</u> | |
| Normal Approach Plot..... | F-512 |
| Noise Abatement Approach Plot..... | F-513 |
| Individual Event Data..... | F-514 - F-518 |



HELICOPTER CHARACTERISTICS

HELICOPTER MANUFACTURER : BELL
HELICOPTER MODEL : 206L-1
TEST HELICOPTER N-NUMBER : N27694
MAX INTERNAL GROSS WEIGHT : 4050 LBS
NUMBER OF ENGINES : ONE
UNINSTALLED TAKEOFF POWER : 576 SHP
UNINSTALLED MAX CONTINUOUS PWR. : 489 SHP
NEVER EXCEED SPEED (VNE) : 130 KTS.
MAX SPEED IN LEVEL FLIGHT
WITH MAX CONTINUOUS POWER : 110 KTS.
SPEED FOR BEST RATE OF CLIMB (VY) : 57 KTS.
CRUISE SPEED FOR BEST RANGE (VCR) : 100 KTS.
BEST RATE OF CLIMB AT
TAKEOFF POWER (BRO) : 1520 FPM
"TOP OF GREEN ARC" ROTOR SPEED : 394 RPM 100%

MAIN AND TAIL ROTOR SPECIFICATIONS

| | MAIN | TAIL |
|------------------|--------|--------|
| DIAMETER (FT.) : | 37.0 | 5.42 |
| NO. OF BLADES : | 2 | 2 |
| TIPSPEED (FPS) : | 763 | 722 |
| TIP SHAPE : | SQUARE | SQUARE |

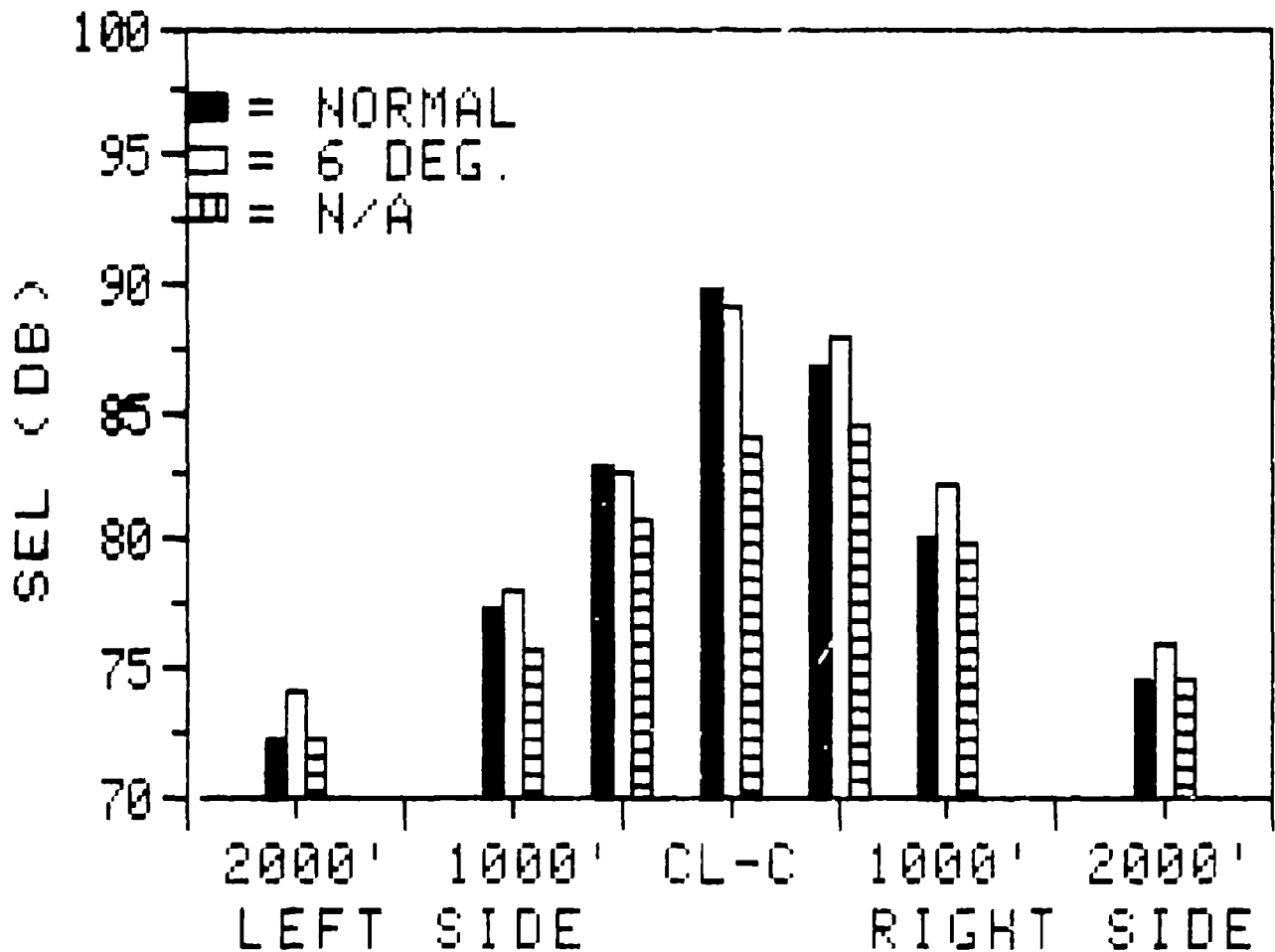
NOISE LEVEL DATA

'as-measured'

SOUND EXPOSURE LEVEL

THIS SECTION OF THE REPORT CONTAINS THE AS-MEASURED SOUND EXPOSURE LEVELS FOR ALL PROJECT EVENTS. THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, SUMMARY TABLES AND DISTRIBUTION CURVE PLOTS. THE BAR CHARTS SHOW THE LEVEL OF THE NOISE LEVELS MEASURED AT EACH DISTANCE AND DIRECTION. A DETAILED COMPARISON OF THE NOISE LEVELS WITH THE PRESENT HEALTH CRITERIA INFORMATION IS GIVEN IN THE NOISE INSTRUMENT PANEL VIDEO RECORDING IS AVAILABLE FROM EACH BAR CHART. THE SUMMARY TABLES PRESENT THE AVERAGE AND RANGE LEVELS, NUMBER OF SAMPLES, STANDARD DEVIATION AND THE PERCENTAGE CONFIDENCE INTERVAL FOR EACH HEIGHT CONDITION. INDIVIDUAL EVENT DATA FOR EACH CONDITION IS THEN GIVEN.

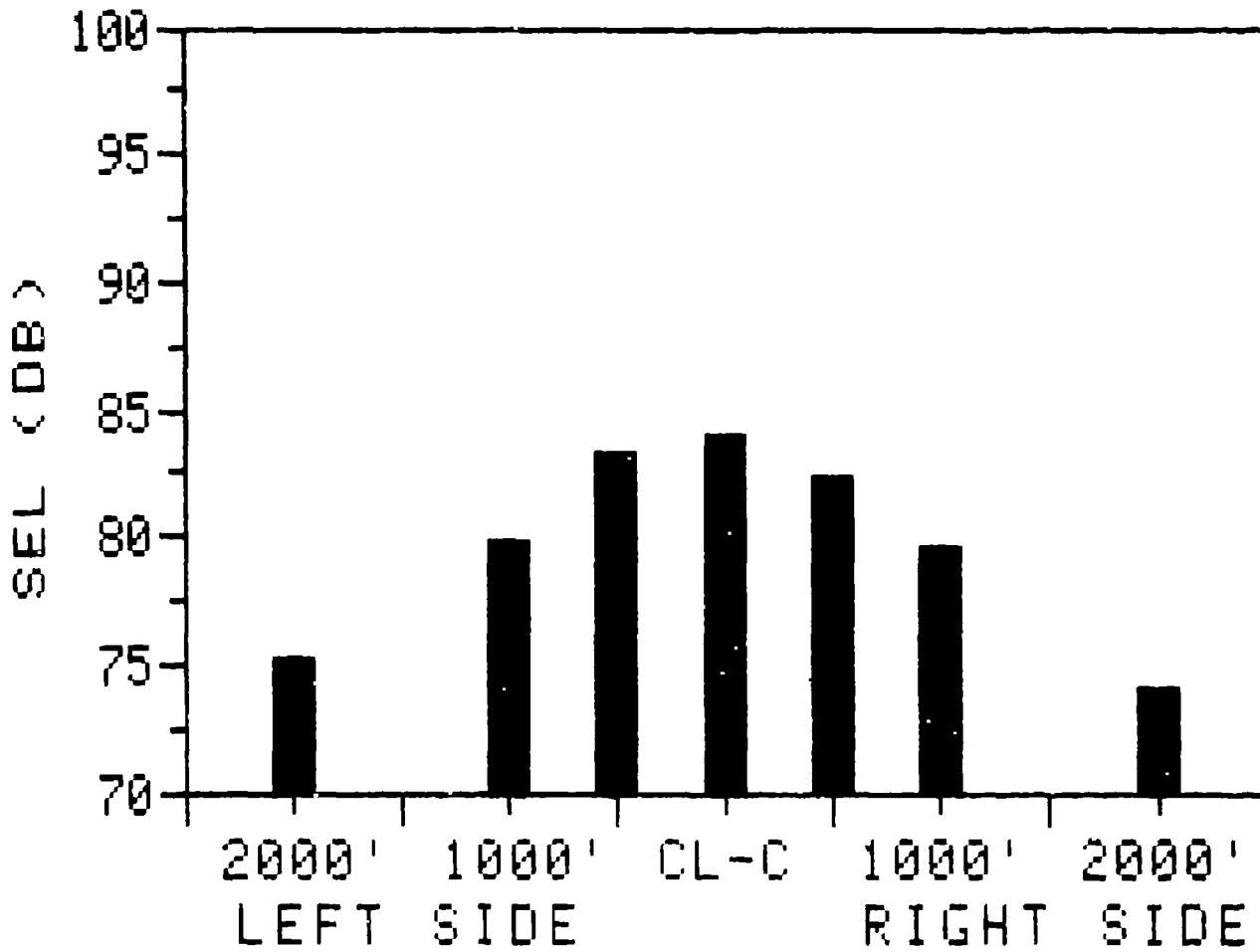
APPROACHES 206L-1



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|---------------------------------|-------------------------------|---------------------------|-------------------------|
| NORMAL APPROACH | 300 | 68-53 | 2.9-5.5 |
| 6 DEG. APPROACH | 380 | 60 | 6.0 |
| NOISE ABATEMENT APP. | 492 | 79-49 | 6.0-7.7 |
| VAR. R/D AND A/B EVENTS E30-E34 | | | |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEOTAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN 15 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF 206L-1

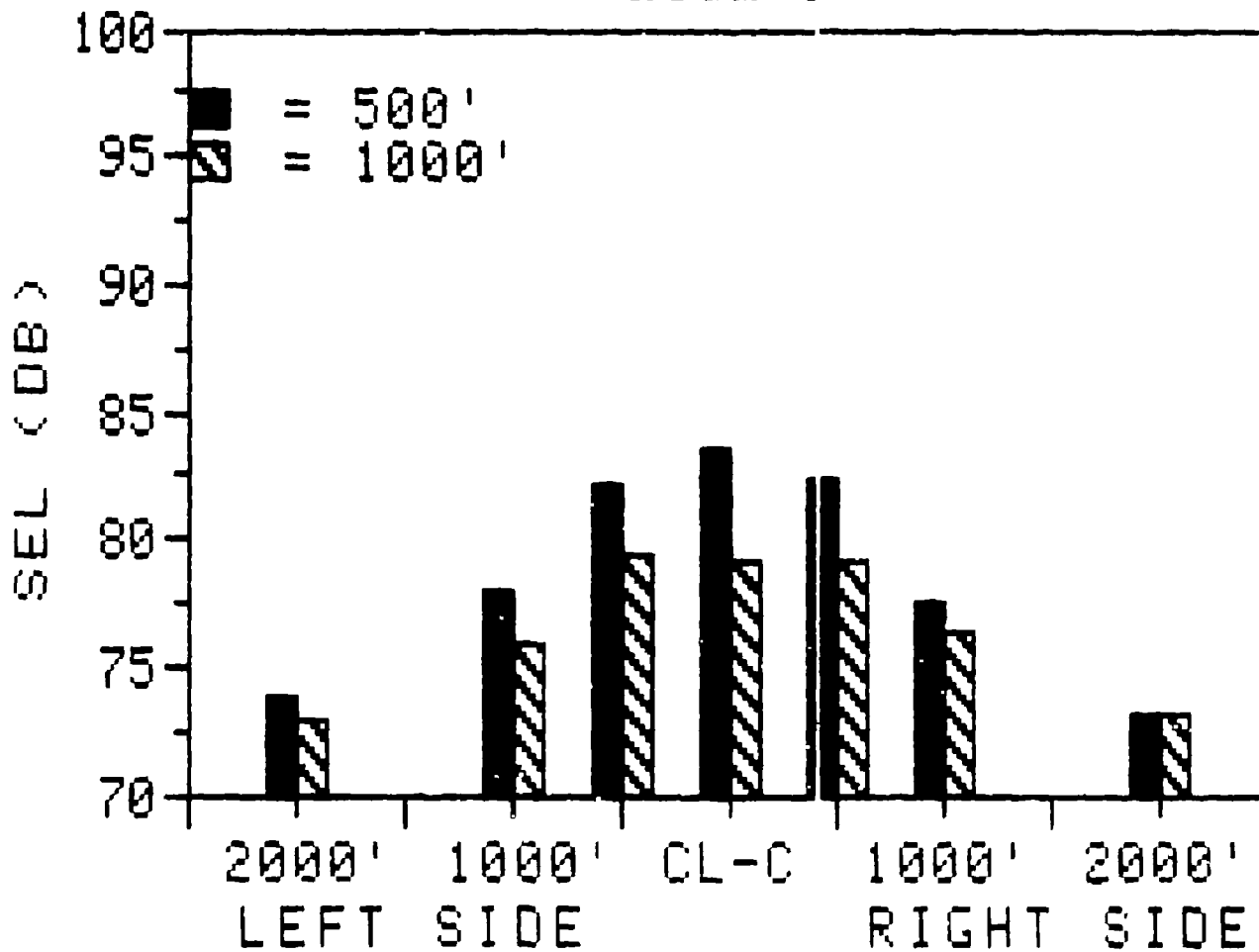


OPERATIONAL DATA FOR NORMAL TAKEOFF 206L-1
 1. OPERATIONAL DATA FOR NORMAL TAKEOFF 206L-1
 2. OPERATIONAL DATA FOR NORMAL TAKEOFF 206L-1
 3. OPERATIONAL DATA FOR NORMAL TAKEOFF 206L-1

WORKING TAKEOFF DATA FOR NORMAL TAKEOFF 206L-1

NOTE: OPERATIONAL DATA FOR NORMAL TAKEOFF 206L-1
 OPERATIONAL DATA FOR NORMAL TAKEOFF 206L-1

LEVEL FLYOVERS 206L-1



CONTINUED FROM PREVIOUS PAGE

206L-1 SUMMARY SHEET (8/26/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 57 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 74.0 | 77.9 | 82.6 | 89.1 | 87.8 | 82.1 | 76.0 |
| N | 5 | 7 | 7 | 7 | 7 | 7 | 7 |
| S.D. | .6 | .3 | .6 | .6 | .8 | .8 | 1.0 |
| 90% CI | .5 | .2 | .4 | .4 | .6 | .6 | .7 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 72.1 | 77.2 | 82.7 | 89.8 | 86.7 | 80.0 | 74.6 |
| N | 7 | 5 | 7 | 7 | 7 | 7 | 6 |
| S.D. | .6 | .5 | .6 | 1.1 | 1.1 | 1.1 | .6 |
| 90% CI | .5 | .5 | .5 | .8 | .8 | .8 | .5 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 72.2 | 76.6 | 82.0 | 85.6 | 85.4 | 79.8 | 74.5 |
| N | 8 | 8 | 8 | 8 | 8 | 5 | 8 |
| S.D. | .6 | 1.0 | .9 | 1.3 | .7 | .5 | .9 |
| 90% CI | .4 | .7 | .6 | .9 | .5 | .5 | .6 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 72.1 | 75.7 | 80.8 | 83.9 | 84.4 | 79.9 | 74.5 |
| N | 5 | 5 | 5 | 5 | 5 | 3 | 5 |
| S.D. | .3 | .6 | .4 | .8 | 1.1 | .6 | .6 |
| 90% CI | .3 | .6 | .4 | .7 | 1.0 | .6 | .6 |

206L-1 SUMMARY SHEET (8/26/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 75.1 | 79.7 | 83.2 | 83.9 | 82.4 | 79.6 | 74.0 |
| N | 7 | 7 | 6 | 7 | 6 | 7 | 7 |
| S.D. | .6 | .3 | .3 | .4 | .3 | .3 | .7 |
| 90% CI | .5 | .2 | .3 | .3 | .3 | .2 | .5 |

* 500 FT. LEVEL FLYOVER AT 100 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 73.9 | 78.0 | 82.2 | 83.5 | 82.3 | 77.5 | 73.2 |
| N | 4 | 8 | 8 | 7 | 7 | 8 | 4 |
| S.D. | .4 | .3 | .5 | .3 | .3 | .4 | .7 |
| 90% CI | .4 | .2 | .3 | .2 | .2 | .2 | .9 |

* 1000 FT. LEVEL FLYOVER AT 100 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 72.8 | 76.0 | 79.4 | 79.2 | 79.2 | 76.3 | 73.1 |
| N | 4 | 7 | 7 | 7 | 7 | 7 | 3 |
| S.D. | .7 | .4 | .5 | .6 | .5 | .6 | .8 |
| 90% CI | .9 | .3 | .3 | .5 | .4 | .5 | 1.4 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : 6 DEGREE APPROACH AT VY, 57 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A1 | -- | 77.80 | 82.80 | 88.40 | 86.50 | 81.50 | 75.30 |
| A2 | -- | 78.20 | 83.10 | 89.40 | 88.30 | 81.20 | 75.00 |
| A3 | 73.30 | 78.00 | 82.30 | 88.40 | 87.90 | 82.10 | 76.40 |
| A4 | 73.80 | 78.30 | 81.90 | 88.60 | 87.00 | 82.10 | 76.10 |
| A5 | 74.50 | 77.90 | 83.50 | 89.30 | 88.10 | 82.10 | 77.20 |
| A6 | 73.60 | 77.80 | 82.20 | 89.40 | 88.20 | 83.60 | 77.00 |
| A7 | 74.60 | 77.40 | 82.30 | 89.90 | 88.70 | 81.80 | 74.80 |
| AVERAGE | 73.96 | 77.91 | 82.59 | 89.06 | 87.81 | 82.06 | 75.97 |
| STD. DEV. | 0.57 | 0.30 | 0.57 | 0.59 | 0.78 | 0.76 | 0.96 |
| 90% C.I. | 0.54 | 0.22 | 0.42 | 0.43 | 0.57 | 0.56 | 0.70 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| C8 | 71.60 | -- | 82.20 | 90.20 | 87.50 | 81.20 | 75.30 |
| C10 | 72.70 | 76.70 | 83.50 | 91.40 | 87.20 | 80.20 | 74.90 |
| C12 | 72.10 | 76.60 | 81.90 | 88.10 | 86.90 | 81.30 | -- |
| C14 | 72.90 | -- | 82.20 | 89.90 | 84.30 | 78.10 | 73.90 |
| C16 | 71.60 | 77.70 | 82.90 | 89.70 | 87.10 | 79.80 | 74.50 |
| C18 | 72.30 | 77.20 | 83.50 | 90.20 | 86.20 | 79.60 | 74.00 |
| C20 | 71.20 | 77.60 | 82.50 | 88.90 | 87.40 | 79.80 | 75.00 |
| AVERAGE | 72.06 | 77.16 | 82.67 | 89.77 | 86.66 | 80.00 | 74.60 |
| STD. DEV. | 0.62 | 0.50 | 0.64 | 1.05 | 1.12 | 1.08 | 0.57 |
| 90% C. I. | 0.46 | 0.48 | 0.47 | 0.77 | 0.82 | 0.79 | 0.47 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : NORMAL TAKEOFF

(LEFT SIDE)

(RIGHT SIDE)

| EVENT NO. | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
|--------------|-------|-------|-------|-------|-------|-------|-------|
| | WEST | WEST | WEST | | EAST | EAST | EAST |
| D9 | 75.40 | 80.00 | 83.20 | 84.30 | 82.70 | 79.60 | 73.50 |
| D11 | 75.20 | 79.80 | -- | 84.20 | 82.70 | 80.00 | 74.50 |
| D13 | 74.90 | 79.20 | 83.40 | 84.40 | 82.60 | 79.70 | 74.40 |
| D15 | 76.10 | 79.90 | 83.60 | 83.40 | 82.50 | 79.70 | 74.70 |
| D17 | 75.30 | 79.70 | 83.10 | 83.50 | 82.10 | 79.80 | 73.40 |
| D19 | 74.80 | 79.70 | 83.20 | 83.50 | 82.00 | 79.30 | 73.00 |
| D21 | 74.10 | 79.40 | 82.70 | 83.90 | -- | 79.30 | 74.30 |
| AVERAGE | 75.11 | 79.67 | 83.20 | 83.89 | 82.43 | 79.63 | 73.97 |
| STD. DEV. | 0.61 | 0.28 | 0.30 | 0.42 | 0.31 | 0.26 | 0.66 |
| 90% C.I. | 0.45 | 0.21 | 0.25 | 0.31 | 0.25 | 0.19 | 0.48 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| E22 | 72.00 | 74.80 | 81.90 | 87.20 | 86.70 | 79.20 | 73.00 |
| E23 | 71.20 | 76.00 | 81.80 | 86.40 | 85.40 | 80.20 | 73.90 |
| E24 | 73.00 | 77.00 | 82.70 | 87.30 | 86.00 | 79.40 | 73.50 |
| E25 | 72.40 | 77.20 | 81.30 | 84.70 | 85.10 | 80.20 | 74.90 |
| E26 | 73.00 | 76.10 | 82.70 | 84.30 | 84.70 | 80.20 | 74.90 |
| E27 | 72.30 | 77.20 | 83.30 | 85.80 | 85.60 | -- | 75.20 |
| E28 | 71.60 | 78.00 | 81.40 | 84.20 | 85.30 | -- | 75.50 |
| E29 | 72.20 | 76.60 | 80.60 | 84.50 | 84.60 | -- | 74.70 |
| AVERAGE | 72.21 | 76.61 | 81.96 | 85.55 | 85.43 | 79.84 | 74.45 |
| STD. DEV. | 0.62 | 0.96 | 0.89 | 1.30 | 0.69 | 0.50 | 0.88 |
| 90% C.I. | 0.42 | 0.65 | 0.59 | 0.87 | 0.46 | 0.47 | 0.59 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| E30 | 72.50 | 76.30 | 80.20 | 82.60 | 83.00 | 80.20 | 74.40 |
| E31 | 72.10 | 75.90 | 80.90 | 84.50 | 83.90 | 79.20 | 74.90 |
| E32 | 72.00 | 76.10 | 81.10 | 84.30 | 84.20 | 80.30 | 73.60 |
| E33 | 71.80 | 75.00 | 80.80 | 84.10 | 85.80 | 79.30 | 74.70 |
| E34 | 72.00 | 75.10 | 80.70 | 83.90 | 85.00 | 80.50 | 75.10 |
| AVERAGE | 72.08 | 75.68 | 80.80 | 83.88 | 84.38 | 79.90 | 74.54 |
| STD. DEV. | 0.26 | 0.59 | 0.43 | 0.75 | 1.07 | 0.60 | 0.59 |
| 90% C.I. | 0.25 | 0.57 | 0.41 | 0.71 | 1.02 | 0.58 | 0.56 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : LEVEL FLYOVER (500 FT. @ 100 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| G35 | 74.40 | 78.10 | 82.90 | 83.30 | 81.90 | 77.40 | -- |
| G36 | -- | 78.50 | 83.00 | 83.30 | 82.40 | 77.40 | 74.00 |
| G37 | 73.90 | 77.80 | 81.90 | -- | -- | 77.50 | -- |
| G38 | -- | 78.20 | 82.30 | 83.70 | 82.30 | 77.80 | 72.50 |
| G39 | 73.60 | 77.90 | 81.80 | 83.40 | 81.90 | 77.20 | -- |
| G40 | -- | 78.20 | 81.80 | 83.80 | 82.60 | 78.00 | 73.60 |
| G41 | 73.70 | 77.50 | 81.90 | 83.10 | 82.50 | 76.90 | -- |
| G42 | -- | 78.00 | 81.90 | 84.00 | 82.30 | 77.80 | 72.60 |
| AVERAGE | 73.90 | 78.03 | 82.19 | 83.51 | 82.27 | 77.50 | 73.18 |
| STD. DEV. | 0.36 | 0.30 | 0.50 | 0.32 | 0.28 | 0.36 | 0.74 |
| 90% C. I. | 0.42 | 0.20 | 0.33 | 0.24 | 0.20 | 0.24 | 0.87 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : LEVEL FLYOVER (1000 FT. @ 100 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| F43 | 72.30 | 75.20 | 78.80 | 80.10 | 79.70 | 76.20 | -- |
| F44 | -- | 76.10 | 79.90 | 78.80 | 80.00 | 77.30 | 73.90 |
| F45 | 72.00 | 76.10 | 79.70 | 78.70 | 79.10 | 76.10 | -- |
| F46 | -- | 76.20 | 79.10 | 79.00 | 79.10 | 75.60 | 72.30 |
| F47 | 73.60 | 76.20 | 79.90 | 79.90 | 78.80 | 76.70 | -- |
| F48 | -- | 75.70 | 78.90 | 78.50 | 79.10 | 75.50 | 73.00 |
| F49 | 73.10 | 76.20 | 79.40 | 79.50 | 78.70 | 76.60 | -- |
| AVERAGE | 72.75 | 75.96 | 79.39 | 79.21 | 79.21 | 76.29 | 73.07 |
| STD. DEV. | 0.73 | 0.38 | 0.46 | 0.62 | 0.47 | 0.64 | 0.80 |
| 90% C. I. | 0.86 | 0.28 | 0.34 | 0.46 | 0.35 | 0.47 | 1.35 |

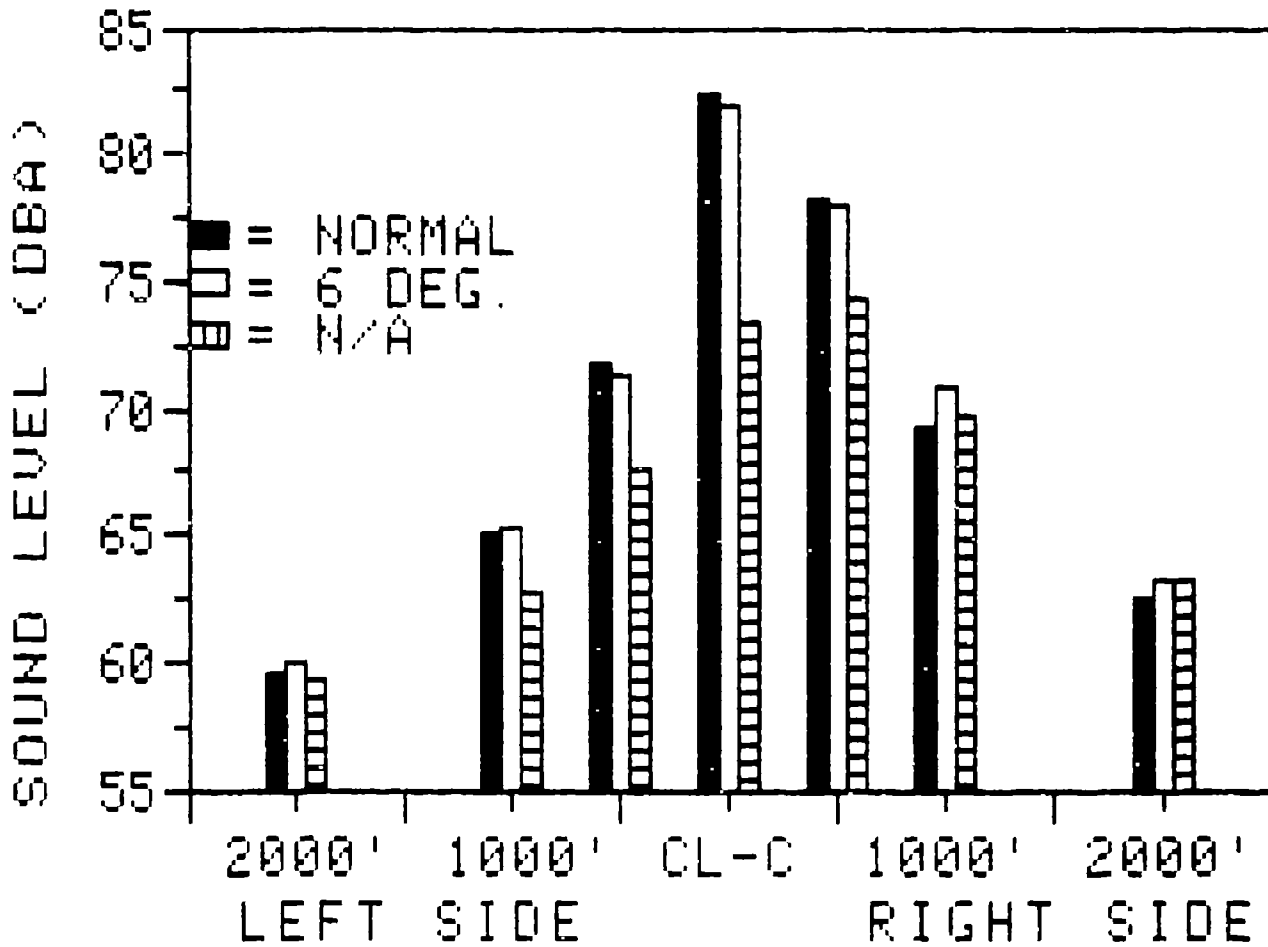
NOISE LEVEL DATA

'as-measured'

A-WEIGHTED SOUND LEVEL (dBA)

THIS SECTION OF THE REPORT CONTAINS THE 'AS-MEASURED' A-WEIGHTED SOUND LEVEL DATA FOR ALL FLIGHT EVENTS. THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS SHOW THE LEVEL OF A-WEIGHTED SOUND LEVEL OVER A SPECIFIC PERIOD AND PROVIDE A VISUAL COMPARISON OF THE NOISE LEVELS. PERIODIC FLIGHT PARAMETER INFORMATION READ FROM THE INSTRUMENT PANEL VIDEO RECORDINGS IS SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, STANDARD DEVIATION AND THE 95 PERCENT CONFIDENCE INTERVAL FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR EACH CONDITION IS PROVIDED.

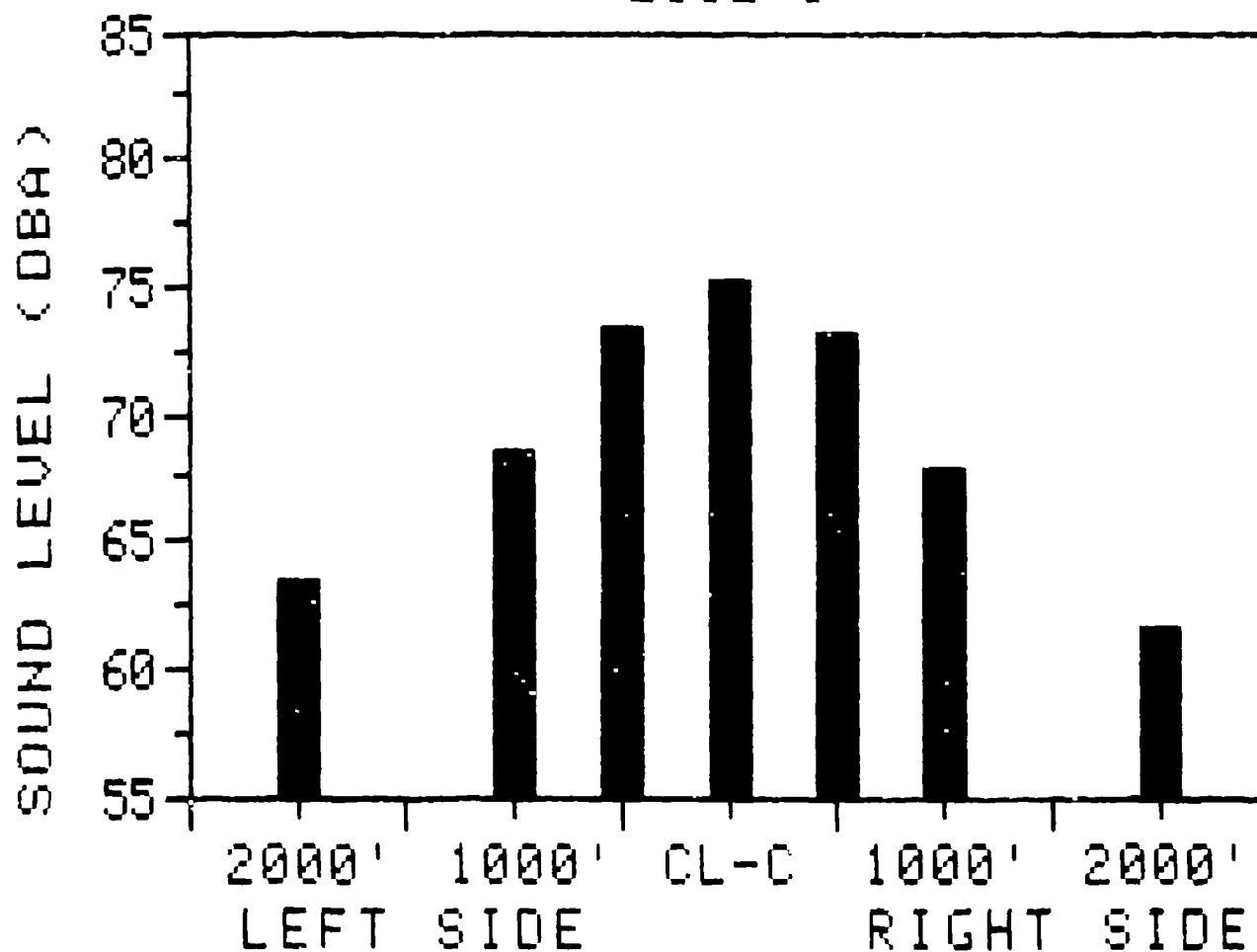
APPROACHES 206L-1



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 300 | 68-53 | 2.9-3.5 |
| SIX DEG. APPROACH | 380 | 60 | 6.0 |
| NOISE ABATEMENT APP. VAR. R/D AND A S (EVENTS E30-E34) | 492 | 79-49 | 6.0-7.7 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN ±15 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF 206L-1

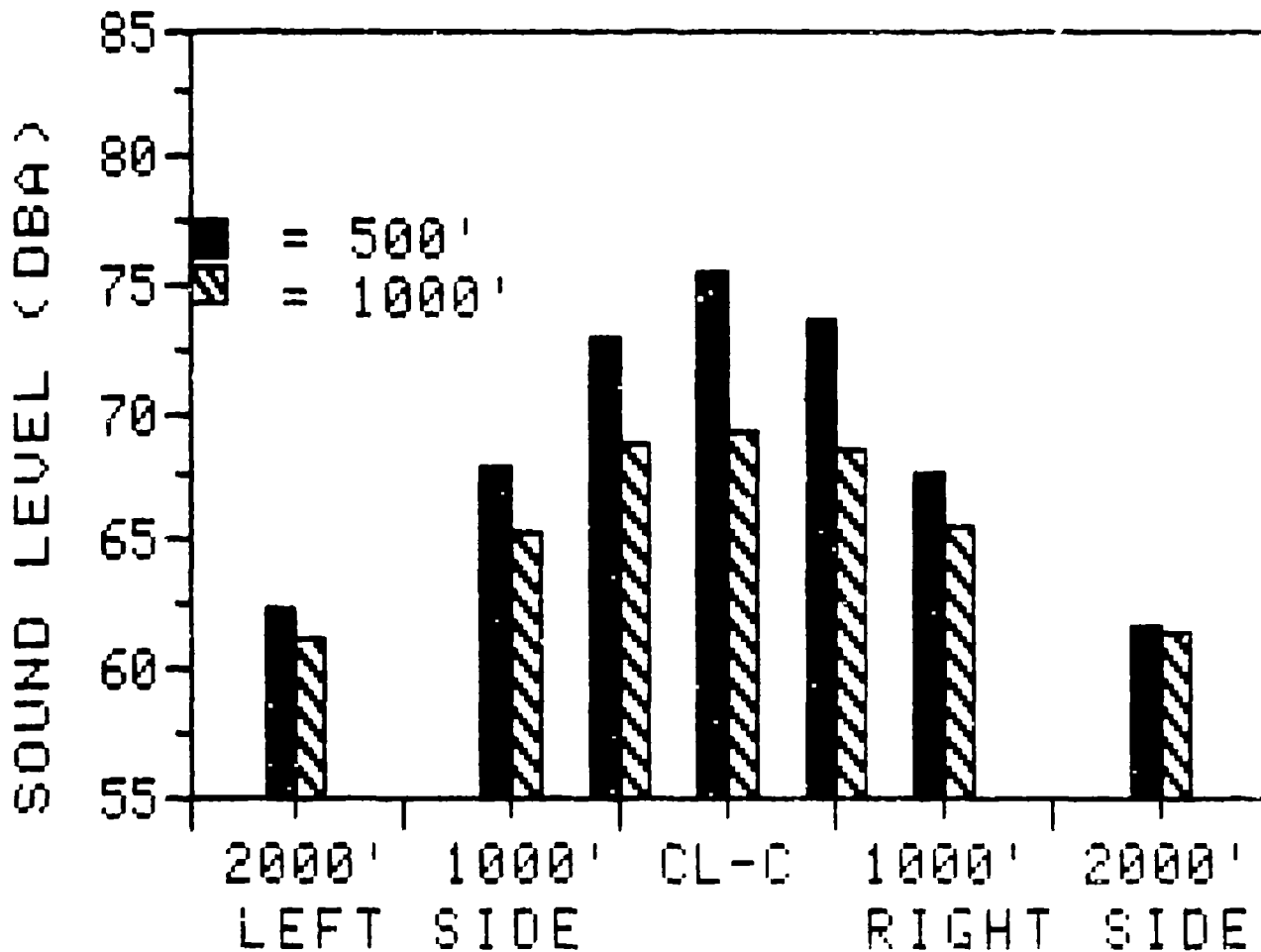


| | | |
|-----------|------------------|--------------------|
| OPERATION | AVG. ALT. (FEET) | INDICATED AIRSPEED |
| | (FEET/ASL) | (KTS) |

| | | |
|----------------|-----|----|
| NORMAL TAKEOFF | ASL | 84 |
|----------------|-----|----|

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN THE HELICOPTER WAS IN THE CL-C POSITION.

LEVEL FLYOVERS 206L-1



INDICATED UNIFORMITY ± 2.0 DBA

206L-1 SUMMARY SHEET (8/26/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 57 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 60.0 | 65.3 | 71.3 | 81.8 | 78.0 | 70.8 | 63.1 |
| N | 5 | 7 | 7 | 7 | 7 | 7 | 7 |
| S.D. | .9 | .9 | .7 | 1.1 | .8 | 1.1 | 1.0 |
| 90% CI | .9 | .7 | .5 | .8 | .6 | .8 | .7 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 59.5 | 65.0 | 71.7 | 82.3 | 78.1 | 69.2 | 62.5 |
| N | 7 | 5 | 7 | 7 | 7 | 7 | 6 |
| S.D. | 1.4 | .4 | 1.1 | 1.0 | 1.4 | 1.3 | 1.2 |
| 90% CI | 1.0 | .3 | .8 | .8 | 1.0 | .9 | 1.0 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|-----|------|------|------|------|------|
| AVERAGE | 58.2 | 64 | 69.4 | 76.5 | 76.2 | 68.6 | 63.2 |
| N | 8 | 8 | 8 | 8 | 8 | 4 | 8 |
| S.D. | 1.0 | 1.0 | .9 | 2.1 | .5 | .7 | .6 |
| 90% CI | .7 | .6 | .6 | 1.4 | .3 | .9 | .4 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 59.2 | 62.8 | 67.6 | 73.4 | 74.2 | 69.6 | 63.2 |
| N | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| S.D. | 1.1 | 1.1 | .9 | 1.2 | .8 | 1.8 | 1.2 |
| 90% CI | 1.0 | 1.0 | .9 | 1.1 | .8 | 1.7 | 1.1 |

206L-1 SUMMARY SHEET (8/26/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 63.5 | 68.6 | 73.4 | 75.1 | 73.1 | 67.8 | 61.6 |
| N | 7 | 7 | 7 | 7 | 6 | 7 | 7 |
| S.D. | .7 | .6 | .3 | .5 | .5 | .9 | 1.1 |
| 90% CI | .5 | .4 | .2 | .4 | .4 | .7 | .8 |

* 500 FT. LEVEL FLYOVER AT 100 KTS. *

| | | | | | | | |
|---------|------|------|----|------|------|------|------|
| AVERAGE | 62.3 | 67.9 | 73 | 75.5 | 73.6 | 67.5 | 61.6 |
| N | 4 | 8 | 8 | 8 | 8 | 8 | 4 |
| S.D. | .9 | .9 | .8 | .5 | .5 | .7 | 1.2 |
| 90% CI | 1.0 | .6 | .5 | .3 | .4 | .4 | 1.4 |

* 1000 FT. LEVEL FLYOVER AT 100 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 61.2 | 65.2 | 68.8 | 69.3 | 68.5 | 65.6 | 61.3 |
| N | 4 | 7 | 7 | 7 | 7 | 7 | 3 |
| S.D. | 1.2 | .6 | .8 | 2.0 | 1.6 | 1.2 | 1.1 |
| 90% CI | 1.4 | .4 | .6 | 1.5 | 1.2 | .8 | 1.8 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : 6 DEGREE APPROACH AT VY, 57 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A1 | -- | 64.30 | 70.50 | 80.40 | 76.90 | 70.20 | 61.90 |
| A2 | -- | 66.60 | 72.20 | 82.30 | 78.20 | 70.10 | 63.00 |
| A3 | 58.70 | 64.30 | 71.30 | 80.80 | 78.50 | 71.30 | 64.70 |
| A4 | 59.70 | 66.30 | 71.00 | 80.90 | 76.90 | 69.50 | 63.90 |
| A5 | 60.20 | 65.50 | 72.30 | 82.10 | 78.00 | 72.10 | 63.60 |
| A6 | 60.20 | 65.00 | 70.80 | 83.30 | 78.80 | 72.40 | 62.50 |
| A7 | 61.30 | 64.80 | 70.70 | 82.90 | 78.20 | 70.20 | 62.20 |
| AVERAGE | 60.02 | 65.26 | 71.26 | 81.81 | 77.99 | 70.83 | 63.11 |
| STD. DEV. | 0.94 | 0.92 | 0.72 | 1.12 | 0.79 | 1.11 | 1.01 |
| 90% C. I. | 0.90 | 0.47 | 0.53 | 0.82 | 0.58 | 0.81 | 0.74 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| C8 | 61.10 | -- | 73.00 | 82.30 | 78.90 | 70.50 | 63.80 |
| C10 | 59.00 | 64.50 | 73.00 | 82.70 | 79.50 | 69.70 | 62.30 |
| C12 | 59.30 | 65.00 | 70.80 | 80.30 | 78.10 | 70.50 | -- |
| C14 | 61.30 | -- | 72.20 | 83.60 | 75.60 | 67.00 | 63.50 |
| C16 | 59.50 | 65.50 | 71.30 | 82.70 | 77.80 | 69.60 | 61.30 |
| C18 | 58.80 | 65.10 | 71.40 | 82.70 | 77.30 | 68.30 | 60.80 |
| C20 | 57.20 | 65.00 | 70.10 | 82.10 | 79.50 | 68.80 | 63.00 |
| AVERAGE | 59.46 | 65.02 | 71.69 | 82.34 | 78.10 | 69.20 | 62.45 |
| STD. DEV. | 1.41 | 0.36 | 1.10 | 1.02 | 1.39 | 1.26 | 1.21 |
| 90% C.I. | 1.03 | 0.34 | 0.81 | 0.75 | 1.02 | 0.93 | 1.00 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| D9 | 64.60 | 69.20 | 73.50 | 75.60 | 73.40 | 66.80 | 61.30 |
| D11 | 64.10 | 68.70 | 73.30 | 75.80 | 73.60 | 68.50 | 61.10 |
| D13 | 63.00 | 68.70 | 73.70 | 75.20 | 73.40 | 67.40 | 62.20 |
| D15 | 63.90 | 69.00 | 73.70 | 74.30 | 73.00 | 67.50 | 62.20 |
| D17 | 63.10 | 68.90 | 73.70 | 74.90 | 72.70 | 69.20 | 60.20 |
| D19 | 63.10 | 67.90 | 73.00 | 74.60 | 72.30 | 66.80 | 60.90 |
| D21 | 62.50 | 67.70 | 73.00 | 75.20 | -- | 68.40 | 63.60 |
| AVERAGE | 63.47 | 68.59 | 73.41 | 75.11 | 73.07 | 67.80 | 61.64 |
| STD. DEV. | 0.74 | 0.57 | 0.32 | 0.50 | 0.50 | 0.92 | 1.12 |
| 90% C. I. | 0.54 | 0.42 | 0.23 | 0.37 | 0.41 | 0.67 | 0.82 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| E22 | 58.40 | 62.80 | 69.50 | 78.30 | 76.90 | 69.20 | 62.60 |
| E23 | 56.20 | 63.40 | 69.60 | 77.90 | 76.30 | 69.10 | 62.10 |
| E24 | 59.00 | 64.00 | 70.40 | 78.30 | 76.30 | 67.70 | 63.20 |
| E25 | 59.10 | 64.60 | 68.70 | 75.80 | 76.70 | -- | 63.60 |
| E26 | 58.40 | 63.90 | 70.10 | 74.90 | 75.60 | 68.20 | 62.80 |
| E27 | 57.80 | 63.50 | 70.20 | 75.90 | 75.80 | -- | 63.30 |
| E28 | 57.50 | 63.80 | 68.20 | 74.00 | 75.60 | -- | 63.70 |
| E29 | 59.10 | 66.00 | 68.30 | 75.20 | 76.00 | -- | 63.90 |
| AVERAGE | 58.19 | 64.00 | 69.38 | 76.54 | 76.15 | 68.55 | 63.15 |
| STD. DEV. | 1.00 | 0.96 | 0.87 | 2.05 | 0.49 | 0.72 | 0.61 |
| 90% C.I. | 0.67 | 0.64 | 0.58 | 1.37 | 0.33 | 0.85 | 0.41 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| E30 | 59.50 | 63.60 | 66.80 | 71.50 | 73.00 | 68.90 | 62.60 |
| E31 | 59.70 | 62.90 | 67.50 | 74.20 | 73.70 | 67.50 | 64.30 |
| E32 | 57.90 | 63.90 | 69.10 | 74.40 | 74.60 | 72.30 | 61.40 |
| E33 | 60.50 | 62.20 | 67.60 | 74.00 | 75.10 | 70.00 | 64.00 |
| E34 | 58.30 | 61.30 | 67.10 | 73.00 | 74.50 | 69.30 | 63.60 |
| AVERAGE | 59.18 | 62.78 | 67.62 | 73.42 | 74.18 | 69.60 | 63.18 |
| STD. DEV. | 1.06 | 1.06 | 0.89 | 1.20 | 0.83 | 1.76 | 1.18 |
| 90% C. I. | 1.01 | 1.01 | 0.85 | 1.14 | 0.79 | 1.68 | 1.13 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : LEVEL FLYOVER (500 FT. @ 100 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| G35 | 63.60 | 67.70 | 74.10 | 76.20 | 73.70 | 66.50 | -- |
| G36 | -- | 68.80 | 74.10 | 75.70 | 74.20 | 67.30 | 62.50 |
| G37 | 61.70 | 66.50 | 72.90 | 75.40 | 73.50 | 68.00 | -- |
| G38 | -- | 69.10 | 72.00 | 74.50 | 73.40 | 67.60 | 59.80 |
| G39 | 61.90 | 67.20 | 72.60 | 75.40 | 72.90 | 66.70 | -- |
| G40 | -- | 68.50 | 73.10 | 75.80 | 74.30 | 68.20 | 61.60 |
| G41 | 61.90 | 67.40 | 73.10 | 75.60 | 73.00 | 67.40 | -- |
| G42 | -- | 67.70 | 72.10 | 75.20 | 74.00 | 68.30 | 62.30 |
| AVERAGE | 62.28 | 67.86 | 73.00 | 75.48 | 73.63 | 67.50 | 61.55 |
| STD. DEV. | 0.89 | 0.88 | 0.79 | 0.50 | 0.52 | 0.66 | 1.23 |
| 90% C.I. | 1.04 | 0.59 | 0.53 | 0.33 | 0.35 | 0.44 | 1.44 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 206L-1

TEST DATE: 8/26/84

OPERATION : LEVEL FLYOVER (1000 FT. @ 100 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | WEST | WEST | WEST | | EAST | EAST | EAST |
| F43 | 60.60 | 65.00 | 68.40 | 73.60 | 68.50 | 65.20 | -- |
| F44 | -- | 64.50 | 68.90 | 67.80 | 70.40 | 66.90 | 62.40 |
| F45 | 59.80 | 65.30 | 68.50 | 67.50 | 66.90 | 63.80 | -- |
| F46 | -- | 64.80 | 67.60 | 68.90 | 70.70 | 64.80 | 60.30 |
| F47 | 61.90 | 65.30 | 69.50 | 69.30 | 67.70 | 67.00 | -- |
| F48 | -- | 65.50 | 68.90 | 68.70 | 66.60 | 65.80 | 61.10 |
| F49 | 62.50 | 66.30 | 70.00 | 69.00 | 68.60 | 66.00 | -- |
| AVERAGE | 61.20 | 65.24 | 68.83 | 69.26 | 68.49 | 65.64 | 61.27 |
| STD. DEV. | 1.22 | 0.58 | 0.78 | 2.02 | 1.60 | 1.15 | 1.06 |
| 90% C.I. | 1.44 | 0.42 | 0.57 | 1.48 | 1.17 | 0.81 | 1.79 |

RADAR TRACKING

DATA

- THIS SECTION OF THE APPENDIX CONTAINS THE HELICOPTER -
- POSITION DATA AND TRACKING PLOTS DERIVED FROM THE FAA'S -
- PORTABLE TRACKING RADAR SYSTEM. THE POSITION DATA LISTS -
- THE CLOSEST POINT OF APPROACH (CPA), TIME OF CPA, -
- ELEVATION ANGLE, RATE OF CLIMB OR DESCENT, THE CLIMB OR -
- DESCENT ANGLE, AND GROUND SPEED FOR ALL FLIGHT -
- CONDITIONS. TRACKING PLOTS OF THE ACTUAL FLIGHT PROFILE -
- PLOTTED ARE PROVIDED FOR EACH FLIGHT CONDITIONS. -

BELL 206L-1

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE: 08/26/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|------------------------------------|--------|-------|----------|-----------|--------|------|------|
| SIX DEGREE APPROACH AT VY, 57 KTS. | | | | | | | |
| 1 | APP | 386.7 | 78.7 | 8:51:57.8 | -520.2 | -4.7 | 62.8 |
| 2 | | ----- | NO DATA | ----- | | | |
| 3 | APP | 306.8 | 88.7 | 9:00:53.1 | -554.1 | -5.1 | 61.7 |
| 4 | APP | 389.3 | 79.9 | 9:05:16.8 | -603.3 | -5.3 | 64.6 |
| 5 | APP | 367.8 | 80.8 | 9:11:33.5 | -548.0 | -4.7 | 66.5 |
| 6 | APP | 359.2 | 82.4 | 9:18:59.0 | -697.3 | -6.2 | 63.3 |
| 7 | | ----- | NO DATA | ----- | | | |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 8 | APP | 321.5 | 84.4 | 9:38:26.7 | -500.0 | -4.3 | 67.2 |
| 10 | APP | 310.4 | 84.5 | 9:43:51.8 | -355.2 | -3.0 | 67.0 |
| 12 | APP | 386.4 | 84.3 | 9:48:28.6 | -600.5 | -5.4 | 69.4 |
| 14 | APP | 234.0 | 85.7 | 9:58:39.5 | -220.6 | -2.0 | 62.3 |
| 16 | APP | 298.6 | 84.8 | 10:11:15.3 | -286.5 | -2.6 | 62.0 |
| 18 | APP | 314.5 | 87.8 | 10:16:07.0 | -460.0 | -4.0 | 65.4 |
| 20 | APP | 310.7 | 82.7 | 10:22:05.3 | -280.0 | -2.4 | 66.4 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|------|------------|-------|-----|------|
| 9 | DEP | 419.0 | 84.0 | 9:40:13.0 | 735.0 | 5.6 | 74.4 |
| 11 | DEP | 428.7 | 82.0 | 9:45:40.0 | 218.4 | 1.5 | 79.7 |
| 13 | DEP | 424.4 | 81.0 | 9:51:58.4 | 554.4 | 4.1 | 76.7 |
| 15 | DEP | 480.0 | 80.6 | 10:05:04.4 | 607.5 | 4.6 | 74.0 |
| 17 | DEP | 462.4 | 75.7 | 10:13:02.6 | 805.3 | 6.5 | 70.3 |
| 19 | DEP | 407.8 | 78.8 | 10:18:27.1 | 795.3 | 6.3 | 70.8 |
| 21 | DEP | 446.2 | 85.0 | 10:24:09.7 | 694.0 | 5.2 | 74.8 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 22 | APP | 317.5 | 85.3 | 11:19:47.9 | -731.0 | -7.1 | 58.1 |
| 23 | APP | 418.1 | 87.1 | 11:23:50.1 | -306.7 | -2.0 | 59.8 |
| 24 | APP | 332.0 | 83.6 | 11:29:42.8 | -608.6 | -6.1 | 64.2 |
| 25 | APP | 433.2 | 87.4 | 11:33:51.5 | -824.2 | -6.6 | 70.7 |
| 26 | APP | 454.3 | 91.6 | 11:40:13.6 | -509.0 | -4.0 | 71.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 08/26/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|--------|-------|----------|------------|--------|-----------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 27 | APP | 391.5 | 84.3 | 11:44:27.3 | -553.5 | -4.9 63.4 |
| 28 | APP | 456.9 | 84.2 | 11:48:58.7 | -508.2 | -4.7 61.3 |
| 29 | APP | 420.3 | 82.5 | 11:53:16.6 | -484.5 | -4.0 60.1 |
| 30 | APP | 596.2 | 88.9 | 11:57:43.8 | -879.5 | -7.1 60.7 |

| | | | | | | |
|---|-----|-------|---------|------------|---------|------------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 31 | APP | 433.1 | 86.6 | 12:02:15.9 | -1144.3 | -10.4 61.5 |
| 32 | | ----- | NO DATA | ----- | | |
| 33 | APP | 471.8 | 79.7 | 12:17:19.7 | -944.2 | -8.4 62.0 |
| 34 | APP | 458.2 | 78.1 | 12:21:22.7 | -1155.1 | -12.1 53.4 |

| | | | | | | |
|-----------------------------------|-----|-------|---------|------------|--------|------------|
| 500 FT. LEVEL FLYOVER AT 100 KTS. | | | | | | |
| 35 | F/O | 405.3 | 86.7 | 12:25:28.9 | 192.5 | 1.1 102.5 |
| 36 | | ----- | NO DATA | ----- | | |
| 37 | | ----- | NO DATA | ----- | | |
| 37 | F/O | 430.6 | 87.4 | 12:30:25.2 | 447.2 | 2.6 98.8 |
| 38 | F/O | 452.4 | 82.5 | 12:32:51.6 | 76.6 | 0.4 90.0 |
| 39 | F/O | 434.9 | 85.3 | 12:36:12.2 | 140.5 | 0.8 98.6 |
| 40 | F/O | 444.8 | 82.2 | 12:38:48.5 | 219.4 | 1.2 104.4 |
| 41 | F/O | 443.6 | 81.7 | 12:44:07.4 | 195.0 | 1.1 100.8 |
| 42 | F/O | 444.8 | 83.5 | 12:49:25.1 | -302.2 | -1.7 103.5 |

| | | | | | | |
|------------------------------------|-----|-------|------|------------|-------|-----------|
| 1000 FT. LEVEL FLYOVER AT 100 KTS. | | | | | | |
| 43 | F/O | 965.7 | 83.3 | 12:53:19.0 | 81.1 | 0.4 102.6 |
| 44 | F/O | 954.2 | 84.2 | 12:56:01.8 | 140.2 | 0.8 101.4 |
| 45 | F/O | 944.9 | 88.0 | 12:59:22.9 | 23.4 | 0.1 100.1 |
| 46 | F/O | 978.3 | 87.5 | 13:02:49.1 | 41.0 | 0.2 104.7 |
| 47 | F/O | 938.1 | 87.0 | 13:06:07.1 | 502.0 | 2.8 102.1 |
| 48 | F/O | 953.1 | 83.9 | 13:09:05.6 | 70.3 | 0.4 100.5 |
| 49 | F/O | 938.0 | 89.0 | 13:13:35.8 | 267.0 | 1.5 99.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 08/26/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|------------------------------------|--------|-------|----------|-----------|--------|-------|------|
| SIX DEGREE APPROACH AT VY, 57 KTS. | | | | | | | |
| 1 | APP | 629.6 | 37.5 | 0:51:57.7 | -518.7 | -4.7 | 62.5 |
| 2 | APP | 780.4 | 38.6 | 0:56:33.3 | -414.4 | -27.5 | 7.0 |
| 3 | APP | 626.3 | 30.7 | 0:00:52.0 | -559.6 | -5.0 | 62.0 |
| 4 | APP | 591.7 | 41.6 | 0:05:16.1 | -728.4 | -6.4 | 64.5 |
| 5 | APP | 604.6 | 37.1 | 0:11:33.5 | -548.0 | -4.7 | 66.5 |
| 6 | APP | 605.0 | 36.3 | 0:18:50.0 | -697.3 | -6.2 | 63.3 |
| 7 | | ----- | NO DATA | ----- | | | |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 8 | APP | 598.0 | 33.0 | 0:38:26.4 | -493.7 | -4.0 | 66.0 |
| 10 | APP | 584.4 | 32.7 | 0:43:51.3 | -432.3 | -3.6 | 68.4 |
| 12 | APP | 620.0 | 38.4 | 0:48:28.1 | -585.1 | -4.7 | 60.0 |
| 14 | APP | 543.4 | 25.8 | 0:58:39.6 | -217.7 | -2.0 | 62.0 |
| 16 | APP | 601.1 | 29.9 | 10:11:15.3 | -286.5 | -2.6 | 62.0 |
| 18 | APP | 592.0 | 32.3 | 10:16:07.6 | -454.0 | -3.0 | 66.4 |
| 20 | APP | 622.3 | 30.8 | 10:22:24.0 | -247.6 | -2.1 | 66.1 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|------|------------|-------|-----|------|
| 9 | DEP | 611.8 | 43.1 | 0:40:12.8 | 766.0 | 5.0 | 73.5 |
| 11 | DEP | 600.1 | 45.5 | 0:45:41.1 | 102.0 | 1.3 | 82.4 |
| 13 | DEP | 595.0 | 44.8 | 0:51:58.6 | 518.0 | 3.3 | 77.3 |
| 15 | DEP | 664.5 | 46.1 | 10:05:04.5 | 622.0 | 4.7 | 74.0 |
| 17 | DEP | 662.8 | 45.4 | 10:13:03.9 | 788.7 | 5.8 | 76.2 |
| 19 | DEP | 683.0 | 47.2 | 10:18:28.0 | 580.0 | 4.4 | 73.0 |
| 21 | DEP | 655.2 | 43.0 | 10:24:00.7 | 694.0 | 5.2 | 74.8 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 22 | APP | 611.5 | 31.6 | 11:19:47.8 | -745.9 | -7.3 | 57.8 |
| 23 | APP | 643.0 | 40.8 | 11:23:49.4 | -328.3 | -2.8 | 66.2 |
| 24 | APP | 588.7 | 34.3 | 11:29:42.8 | -603.6 | -6.1 | 64.2 |
| 25 | APP | 640.6 | 42.8 | 11:33:51.2 | -761.8 | -6.2 | 69.7 |
| 26 | APP | 661.2 | 44.2 | 11:40:12.9 | -548.4 | -4.3 | 71.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 08/26/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|--------|-------|----------|------------|--------|-----------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 27 | APP | 619.7 | 39.2 | 11:44:27.4 | -534.0 | -4.8 60.1 |
| 28 | APP | 680.5 | 42.9 | 11:48:57.0 | -467.0 | -4.4 60.6 |
| 29 | APP | 686.1 | 38.1 | 11:53:16.2 | -537.4 | -4.5 67.7 |
| 30 | APP | 787.0 | 49.5 | 11:57:43.8 | -879.6 | -7.1 60.7 |

| | | | | | | |
|---|-----|-------|---------|------------|---------|------------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 31 | APP | 684.9 | 40.8 | 12:07:15.9 | -1144.3 | -10.4 61.5 |
| 32 | | ----- | NO DATA | ----- | | |
| 33 | APP | 702.9 | 40.4 | 12:11:20.7 | -985.7 | -8.4 60.2 |
| 34 | APP | 707.3 | 39.5 | 12:21:22.7 | -1155.1 | -12.1 53.4 |

| | | | | | | |
|-----------------------------------|-----|-------|---------|------------|--------|------------|
| 500 FT. LEVEL FLYOVER AT 100 KTS. | | | | | | |
| 35 | F/O | 657.6 | 38.6 | 12:25:27.3 | 220.8 | 1.2 102.5 |
| 36 | | ----- | NO DATA | ----- | | |
| 37 | F/O | 668.6 | 40.3 | 12:30:25.0 | 405.8 | 2.3 90.5 |
| 38 | F/O | 634.6 | 45.2 | 12:32:51.6 | 76.6 | 0.4 90.0 |
| 39 | F/O | 676.1 | 40.2 | 12:36:12.0 | 219.8 | 1.3 98.7 |
| 40 | F/O | 624.9 | 45.4 | 12:38:48.4 | 212.5 | 1.1 104.5 |
| 41 | F/O | 679.1 | 40.5 | 12:44:07.2 | 195.6 | 1.1 101.2 |
| 42 | F/O | 633.3 | 44.5 | 12:49:25.1 | -302.2 | -1.7 103.5 |

| | | | | | | |
|------------------------------------|-----|--------|------|------------|-------|-----------|
| 1000 FT. LEVEL FLYOVER AT 100 KTS. | | | | | | |
| 43 | F/O | 1136.5 | 57.8 | 12:53:18.5 | 74.0 | 0.4 105.1 |
| 44 | F/O | 1032.1 | 67.1 | 12:56:01.0 | 157.2 | 0.0 101.2 |
| 45 | F/O | 1355.9 | 63.7 | 12:59:22.9 | 23.4 | 0.1 100.1 |
| 46 | F/O | 1081.0 | 65.0 | 13:02:49.6 | 43.3 | 0.2 105.1 |
| 47 | F/O | 1082.0 | 60.2 | 13:06:07.1 | 502.0 | 2.8 102.1 |
| 48 | F/O | 1039.2 | 67.4 | 13:09:05.6 | 70.3 | 0.4 100.5 |
| 49 | F/O | 1072.0 | 61.3 | 13:13:35.8 | 267.0 | 1.5 90.2 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE: 08/26/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|--------|--------|----------|-----------|---------|------|
| SIX DEGREE APPROACH AT VY, 57 KTS. | | | | | | |
| 1 | APP | 632.3 | 37.6 | 0:51:57.3 | -546.6 | 62.6 |
| 2 | APP | 1137.0 | 24.1 | 0:56:24.1 | -1141.7 | 80.4 |
| 3 | APP | 606.3 | 41.1 | 0:00:53.7 | -556.0 | 59.8 |
| 4 | APP | 650.2 | 37.1 | 0:05:16.4 | -652.3 | 66.0 |
| 5 | APP | 632.8 | 35.8 | 0:11:33.8 | -497.4 | 65.5 |
| 6 | APP | 611.5 | 35.7 | 0:18:59.2 | -686.2 | 63.3 |
| 7 | | ----- | NO DATA | ----- | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|-------|------|------------|--------|------|
| 8 | APP | 571.4 | 34.1 | 0:38:26.7 | -500.0 | 67.2 |
| 10 | APP | 584.6 | 32.7 | 0:43:51.0 | -480.6 | 64.6 |
| 12 | APP | 603.8 | 36.5 | 0:48:30.5 | -547.6 | 60.9 |
| 14 | APP | 520.0 | 27.5 | 0:58:40.5 | -185.7 | 61.5 |
| 16 | APP | 525.7 | 34.6 | 10:11:15.0 | -270.7 | 62.1 |
| 18 | APP | 584.6 | 32.6 | 10:16:07.4 | -474.6 | 66.8 |
| 20 | APP | 553.0 | 35.1 | 10:22:25.2 | -277.3 | 66.2 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|-------|------|------------|-------|------|
| 9 | DEP | 674.8 | 38.2 | 0:40:12.2 | 801.2 | 72.0 |
| 11 | DEP | 667.7 | 39.7 | 0:45:39.8 | 493.3 | 72.1 |
| 13 | DEP | 698.9 | 36.9 | 0:51:58.4 | 554.4 | 76.7 |
| 15 | DEP | 719.7 | 41.1 | 10:05:04.4 | 607.5 | 74.0 |
| 17 | DEP | 680.9 | 40.9 | 10:13:02.4 | 800.8 | 69.5 |
| 19 | DEP | 714.7 | 42.8 | 10:18:27.0 | 814.6 | 71.5 |
| 21 | DEP | 675.7 | 41.2 | 10:24:09.4 | 712.6 | 75.3 |

NOISE ABATEMENT APPROACH (VAR. RND AND AFS)

| | | | | | | |
|----|-----|-------|---------|------------|--------|------|
| 22 | APP | 557.2 | 34.4 | 11:19:48.4 | -630.4 | 58.5 |
| 23 | APP | 614.0 | 43.0 | 11:23:50.7 | -440.0 | 58.6 |
| 24 | APP | 573.5 | 34.0 | 11:28:41.5 | -537.1 | 63.5 |
| 25 | | ----- | NO DATA | ----- | | |
| 26 | APP | 686.4 | 40.8 | 11:40:13.7 | -524.3 | 71.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 08/26/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 27 | APP | 603.5 | 39.0 | 11:44:28.8 | -637.7 | -6.0 | 60.1 |
| 28 | APP | 670.8 | 41.0 | 11:48:59.0 | -450.3 | -4.4 | 58.8 |
| 29 | APP | 614.4 | 42.0 | 11:53:16.5 | -496.4 | -4.1 | 68.6 |
| 30 | APP | 742.6 | 53.2 | 11:57:44.0 | -895.8 | -7.3 | 69.1 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|----|-----|-------|---------|------------|---------|-------|------|
| 31 | APP | 634.9 | 42.4 | 12:02:16.6 | -1036.0 | -9.7 | 59.9 |
| 32 | | ----- | NO DATA | ----- | | | |
| 33 | APP | 664.0 | 44.4 | 12:17:19.7 | -944.2 | -8.4 | 62.9 |
| 34 | APP | 647.9 | 44.4 | 12:21:22.6 | -1164.6 | -12.1 | 53.6 |

500 FT. LEVEL FLYOVER AT 100 KTS.

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|-------|
| 35 | F/O | 624.7 | 41.9 | 12:25:28.3 | 254.9 | 1.4 | 99.9 |
| 36 | | ----- | NO DATA | ----- | | | |
| 37 | F/O | 648.0 | 41.6 | 12:30:25.2 | 447.2 | 2.6 | 98.8 |
| 38 | F/O | 704.7 | 39.9 | 12:32:51.9 | 32.6 | 0.2 | 96.9 |
| 39 | F/O | 643.0 | 42.4 | 12:36:12.2 | 140.5 | 0.8 | 98.6 |
| 40 | F/O | 702.4 | 39.3 | 12:38:48.8 | 253.4 | 1.4 | 105.1 |
| 41 | F/O | 654.0 | 42.2 | 12:44:07.4 | 195.0 | 1.1 | 100.8 |
| 42 | F/O | 660.1 | 41.7 | 12:49:25.7 | -280.5 | -1.5 | 104.8 |

1000 FT. LEVEL FLYOVER AT 100 KTS.

| | | | | | | | |
|----|-----|--------|------|------------|-------|-----|-------|
| 43 | F/O | 1016.5 | 60.5 | 12:53:19.7 | 151.6 | 0.8 | 101.9 |
| 44 | F/O | 1113.2 | 58.8 | 12:56:01.7 | 140.3 | 0.8 | 101.6 |
| 45 | F/O | 1083.1 | 60.8 | 12:59:23.0 | 28.8 | 0.2 | 99.8 |
| 46 | F/O | 1109.3 | 62.4 | 13:02:48.3 | 6.9 | 0.0 | 101.9 |
| 47 | F/O | 1041.9 | 64.2 | 13:06:07.3 | 435.9 | 2.4 | 101.7 |
| 48 | F/O | 1129.4 | 58.2 | 13:09:05.7 | 65.8 | 0.4 | 100.8 |
| 49 | F/O | 1055.0 | 63.2 | 13:13:36.0 | 244.2 | 1.4 | 98.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

DATE: 08/26/84

1000 FT. EAST

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|--------|--------|----------|-----------|--------|------|
| SIX DEGREE APPROACH AT VY, 57 KTS. | | | | | | |
| 1 | APP | 749.0 | 29.8 | 8:51:51.7 | -563.1 | 78.9 |
| 2 | APP | 736.2 | 30.2 | 8:56:32.8 | -474.5 | 77.6 |
| 3 | APP | 1060.0 | 22.2 | 9:00:52.9 | -559.6 | 62.5 |
| 4 | APP | 1021.8 | 22.7 | 9:05:16.1 | -728.4 | 64.5 |
| 5 | APP | 1045.6 | 21.5 | 9:11:32.9 | -547.9 | 65.8 |
| 6 | APP | 1050.3 | 20.0 | 9:18:59.0 | -697.3 | 63.3 |
| 7 | | ----- | NO DATA | ----- | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|--------|-------|
| 8 | APP | 1054.6 | 18.1 | 9:38:26.4 | -493.7 | 66.0 |
| 10 | APP | 1041.4 | 17.8 | 9:43:51.3 | -432.3 | 68.4 |
| 12 | | ----- | NO DATA | ----- | | |
| 14 | APP | 628.5 | 7.0 | 9:58:46.6 | 5648.1 | 163.9 |
| 16 | APP | 1061.4 | 16.9 | 10:11:14.3 | -276.6 | 65.0 |
| 18 | APP | 1049.5 | 17.7 | 10:16:07.6 | -454.9 | 66.4 |
| 20 | APP | 1081.3 | 17.3 | 10:22:25.8 | -311.0 | 66.4 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|--------|------|------------|-------|------|
| 9 | DEP | 1035.5 | 23.9 | 9:40:12.8 | 766.0 | 73.5 |
| 11 | DEP | 1016.2 | 25.0 | 9:45:41.1 | 192.0 | 82.4 |
| 13 | DEP | 1012.1 | 24.4 | 9:51:57.6 | 629.7 | 74.4 |
| 15 | DEP | 1072.6 | 27.8 | 10:05:05.3 | 623.0 | 74.8 |
| 17 | DEP | 1075.5 | 26.1 | 10:13:03.9 | 789.7 | 76.2 |
| 19 | DEP | 1087.4 | 27.6 | 10:18:28.0 | 580.0 | 73.0 |
| 21 | DEP | 1076.3 | 25.0 | 10:24:09.8 | 689.4 | 75.1 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|--------|------|------------|--------|------|
| 22 | APP | 748.2 | 8.7 | 11:10:55.7 | 642.9 | 74.3 |
| 23 | APP | 1071.7 | 23.2 | 11:23:49.4 | -328.3 | 66.2 |
| 24 | APP | 658.5 | 6.4 | 11:29:50.8 | 1385.1 | 66.9 |
| 25 | APP | 1072.7 | 24.4 | 11:33:51.2 | -761.8 | 69.7 |
| 26 | APP | 1078.3 | 25.4 | 11:40:12.9 | -548.4 | 71.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 1000 FT. EAST

DATE: 08/26/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|--------|----------|------------|--------|------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 27 | APP | 1055.4 | 21.0 | 11:44:27.4 | -534.9 | -4.8 | 63.1 |
| 28 | APP | 1101.3 | 25.0 | 11:48:57.9 | -467.9 | -4.4 | 60.6 |
| 29 | APP | 1123.3 | 22.2 | 11:53:16.2 | -537.4 | -4.5 | 67.7 |
| 30 | APP | 1176.1 | 30.7 | 11:57:43.8 | -879.5 | -7.1 | 69.7 |

| | | | | | | | |
|---|-----|--------|---------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 31 | APP | 1093.8 | 23.5 | 12:02:15.9 | -1144.3 | -10.4 | 61.5 |
| 32 | | ----- | NO DATA | ----- | | | |
| 33 | APP | 1118.1 | 24.1 | 12:17:20.7 | -905.7 | -8.4 | 60.2 |
| 34 | APP | 1134.7 | 25.3 | 12:21:21.7 | -1177.8 | -11.7 | 56.1 |

| | | | | | | | |
|-----------------------------------|-----|--------|---------|------------|--------|------|-------|
| 500 FT. LEVEL FLYOVER AT 100 KTS. | | | | | | | |
| 35 | F/O | 1093.7 | 22.1 | 12:25:27.3 | 220.8 | 1.2 | 102.5 |
| 36 | | ----- | NO DATA | ----- | | | |
| 37 | F/O | 1098.8 | 23.3 | 12:30:25.0 | 405.8 | 2.3 | 99.5 |
| 38 | F/O | 1049.2 | 25.6 | 12:32:51.6 | 76.6 | 0.4 | 99.9 |
| 39 | F/O | 1105.0 | 23.8 | 12:36:13.1 | 166.1 | 0.9 | 99.6 |
| 40 | F/O | 1038.8 | 25.5 | 12:38:48.4 | 212.5 | 1.1 | 104.5 |
| 41 | F/O | 1106.4 | 23.6 | 12:44:07.2 | 195.6 | 1.1 | 101.2 |
| 42 | F/O | 1048.5 | 25.3 | 12:49:24.5 | -324.8 | -1.8 | 103.4 |

| | | | | | | | |
|------------------------------------|-----|--------|------|------------|-------|-----|-------|
| 1000 FT. LEVEL FLYOVER AT 100 KTS. | | | | | | | |
| 43 | F/O | 1463.1 | 41.2 | 12:53:18.3 | 136.4 | 0.7 | 106.2 |
| 44 | F/O | 1311.0 | 46.8 | 12:56:02.5 | 208.5 | 1.2 | 100.4 |
| 45 | F/O | 1355.1 | 44.5 | 12:59:22.7 | 9.2 | 0.1 | 100.5 |
| 46 | F/O | 1369.3 | 45.8 | 13:02:40.6 | 43.9 | 0.2 | 105.1 |
| 47 | F/O | 1400.5 | 42.2 | 13:06:07.1 | 502.9 | 2.8 | 102.1 |
| 48 | F/O | 1316.2 | 46.0 | 13:09:05.6 | 70.9 | 0.4 | 100.5 |
| 49 | F/O | 1384.1 | 43.0 | 13:13:35.4 | 140.7 | 0.8 | 99.1 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

DATE 08/26/84

1000 FT. WEST

***FAA/AEE**

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|------------------------------------|--------|--------|----------|-----------|---------|------|------|
| SIX DEGREE APPROACH AT VY, 57 KTS. | | | | | | | |
| 1 | APP | 1072.7 | 21.6 | 0:51:56.8 | -596.4 | -5.3 | 64.0 |
| 2 | APP | 1436.0 | 19.9 | 0:56:24.1 | -1141.7 | -8.0 | 80.4 |
| 3 | APP | 1035.0 | 22.8 | 0:00:53.7 | -556.0 | -5.2 | 59.8 |
| 4 | APP | 1091.9 | 21.2 | 0:05:15.4 | -652.0 | -5.6 | 66.0 |
| 5 | APP | 1073.1 | 20.2 | 0:11:33.8 | -497.4 | -4.3 | 65.5 |
| 6 | APP | 1057.1 | 19.8 | 0:18:59.2 | -686.2 | -6.1 | 63.3 |
| 7 | | ----- | NO DATA | ----- | | | |

NORMAL APPROACH

| | | | | | | | |
|----|-----|--------|------|-----------|--------|------|------|
| 8 | APP | 1025.2 | 18.3 | 0:38:26.7 | -509.9 | -4.3 | 67.2 |
| 10 | APP | 1041.2 | 17.1 | 0:43:53.6 | -276.5 | -2.3 | 69.3 |
| 10 | APP | 1013.5 | 20.9 | 0:48:30.5 | -547.0 | -4.4 | 69.0 |
| 14 | APP | 989.0 | 14.4 | 0:58:40.5 | -185.7 | -1.7 | 61.5 |
| 16 | APP | 978.2 | 17.0 | 1:11:15.0 | -270.7 | -2.5 | 62.1 |
| 18 | APP | 1028.3 | 16.0 | 1:16:10.0 | -266.6 | -2.4 | 63.0 |
| 20 | APP | 1004.9 | 18.5 | 1:22:25.2 | -277.3 | -2.4 | 66.2 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|--------|------|-----------|-------|-----|------|
| 9 | DEP | 1110.0 | 22.2 | 0:40:12.2 | 801.2 | 6.3 | 72.0 |
| 11 | DEP | 1088.9 | 23.2 | 0:45:39.3 | 493.3 | 3.5 | 72.1 |
| 13 | DEP | 1132.1 | 20.7 | 0:51:56.7 | 594.0 | 4.6 | 73.0 |
| 15 | DEP | 1143.4 | 24.6 | 1:05:04.4 | 607.5 | 4.6 | 74.0 |
| 17 | DEP | 1099.0 | 24.0 | 1:13:02.4 | 603.8 | 5.5 | 69.5 |
| 19 | DEP | 1129.3 | 25.6 | 1:18:27.0 | 814.6 | 6.4 | 71.5 |
| 21 | DEP | 1100.7 | 24.0 | 1:24:09.4 | 713.6 | 5.3 | 75.3 |

NOISE ABATEMENT APPROACH (VAR. RAD AND R/S)

| | | | | | | | |
|----|-----|--------|------|-----------|--------|------|------|
| 22 | APP | 1005.0 | 17.6 | 1:19:56.2 | -135.0 | -7.0 | 56.4 |
| 23 | APP | 1035.2 | 24.6 | 1:29:00.7 | -440.9 | -4.3 | 58.6 |
| 24 | APP | 1019.7 | 19.9 | 1:39:49.0 | -527.1 | -4.6 | 60.5 |
| 25 | APP | 1052.5 | 24.4 | 1:53:06.0 | -635.0 | -5.3 | 68.5 |
| 26 | APP | 1112.4 | 33.0 | 1:40:13.7 | -524.3 | -4.1 | 71.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE 108/26/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|--------|--------|----------|------------|--------|-----------|
| SIX DEGREE APPROACH AT VY, 57 KTS. | | | | | | |
| 27 | APP | 1023.0 | 21.9 | 11:44:28.8 | -637.7 | -6.0 60.1 |
| 28 | APP | 1083.3 | 24.5 | 11:48:59.9 | -459.3 | -4.4 58.8 |
| 29 | APP | 1038.9 | 23.8 | 11:53:16.5 | -406.4 | -4.1 58.6 |
| 30 | APP | 1117.2 | 32.3 | 11:57:44.0 | -895.8 | -7.3 69.1 |

NOISE ABATEMENT APPROACH

| | | | | | | |
|----|-----|--------|---------|------------|---------|------------|
| 31 | APP | 1053.7 | 24.1 | 12:02:16.6 | -1036.0 | -9.7 59.9 |
| 32 | | ----- | NO DATA | ----- | | |
| 33 | APP | 1071.8 | 25.4 | 12:17:20.4 | -874.1 | -7.0 62.5 |
| 34 | APP | 1061.6 | 25.4 | 12:21:22.6 | -1164.6 | -12.1 53.6 |

TEST

| | | | | | | |
|----|-----|--------|---------|------------|--------|------------|
| 35 | F/O | 1026.2 | 24.1 | 12:25:28.3 | 254.9 | 1.4 99.9 |
| 36 | | ----- | NO DATA | ----- | | |
| 37 | F/O | 1045.0 | 25.9 | 12:36:26.6 | 487.5 | 2.0 95.6 |
| 38 | F/O | 1135.0 | 23.3 | 12:32:51.9 | 32.6 | 0.2 96.0 |
| 39 | F/O | 1064.5 | 24.7 | 12:36:12.8 | 78.5 | 0.5 98.1 |
| 40 | F/O | 1126.7 | 23.4 | 12:38:46.8 | 10.5 | 0.1 102.1 |
| 41 | F/O | 1077.2 | 24.2 | 12:44:07.4 | -195.0 | -1.1 100.8 |
| 42 | F/O | 1082.9 | 24.0 | 12:49:25.7 | -280.5 | -1.5 104.8 |

TEST

| | | | | | | |
|----|-----|--------|------|------------|-------|-----------|
| 43 | F/O | 1267.2 | 48.8 | 12:53:19.7 | 151.6 | 0.8 101.0 |
| 44 | F/O | 1437.4 | 41.6 | 12:56:01.7 | 140.0 | 0.8 101.6 |
| 45 | F/O | 1307.9 | 42.7 | 12:59:23.1 | 38.1 | 0.2 99.6 |
| 46 | F/O | 1405.8 | 44.5 | 13:02:48.3 | 6.9 | 0.0 101.3 |
| 47 | F/O | 1333.1 | 45.9 | 13:06:07.6 | 33.0 | 1.0 102.0 |
| 48 | F/O | 1450.7 | 41.7 | 13:09:34.5 | 78.3 | 0.4 100.2 |
| 49 | F/O | 1356.6 | 44.1 | 13:13:36.0 | 244.2 | 1.4 98.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE: 08/26/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|--------|--------|----------|-----------|--------|------|
| SIX DEGREE APPROACH AT VY, 57 KTS. | | | | | | |
| 1 | APP | 1377.7 | 15.8 | 8:51:51.7 | -563.1 | 78.0 |
| 2 | APP | 1222.0 | 17.5 | 8:56:30.6 | -188.6 | 8.0 |
| 3 | APP | 2017.0 | 11.5 | 9:00:54.2 | -547.4 | 60.0 |
| 4 | APP | 1982.8 | 11.6 | 9:05:16.1 | -728.4 | 64.5 |
| 5 | APP | 2009.8 | 11.1 | 9:11:32.9 | -547.0 | 65.0 |
| 6 | APP | 2017.0 | 10.9 | 9:18:58.4 | -628.8 | 64.4 |
| 7 | | ----- | NO DATA | ----- | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|-------|------------|--------|-------|
| 8 | APP | 2020.5 | 9.4 | 9:38:26.4 | -403.7 | 66.0 |
| 10 | APP | 2017.4 | 9.20 | 9:43:51.3 | -432.3 | 68.4 |
| 12 | APP | 2032.0 | 11.20 | 9:48:28.1 | -585.1 | 69.0 |
| 14 | APP | 1323.8 | 4.4 | 9:58:46.7 | 5648.1 | 163.0 |
| 16 | APP | 2037.0 | 8.8 | 10:11:14.3 | -276.6 | 65.0 |
| 18 | APP | 2025.5 | 9.1 | 10:16:07.6 | -454.0 | 66.4 |
| 20 | APP | 2056.0 | 9.1 | 10:22:25.8 | -311.0 | 65.4 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|--------|------|------------|-------|------|
| 9 | DEP | 1991.0 | 12.3 | 9:40:12.8 | 766.0 | 73.5 |
| 11 | DEP | 1966.0 | 12.8 | 9:45:42.1 | 463.8 | 86.0 |
| 13 | DEP | 1962.7 | 12.4 | 9:51:57.6 | 629.7 | 74.4 |
| 15 | DEP | 2010.1 | 14.8 | 10:05:06.3 | 742.4 | 76.3 |
| 17 | DEP | 2022.7 | 13.6 | 10:13:03.0 | 788.7 | 76.2 |
| 19 | DEP | 2028.0 | 14.5 | 10:18:28.0 | 500.0 | 73.0 |
| 21 | DEP | 2027.0 | 13.4 | 10:24:10.3 | 717.7 | 78.0 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|--------|------|------------|--------|------|
| 22 | APP | 1503.3 | 4.5 | 11:19:55.7 | -642.0 | 74.3 |
| 23 | APP | 2029.3 | 12.1 | 11:23:49.4 | -329.3 | 66.2 |
| 24 | APP | 1364.0 | 4.8 | 11:29:50.0 | 2044.3 | 55.3 |
| 25 | APP | 2026.8 | 12.7 | 11:33:51.2 | -761.8 | 69.7 |
| 26 | APP | 2028.0 | 13.4 | 11:40:12.1 | -726.4 | 70.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 08/26/84

FAA/AEE

 EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|----|-----|--------|------|------------|--------|------|------|
| 27 | APP | 2018.2 | 11.3 | 11:44:27.4 | -534.9 | -4.8 | 63.1 |
| 28 | APP | 2052.3 | 13.2 | 11:48:57.9 | -467.9 | -4.4 | 60.6 |
| 29 | APP | 2084.1 | 11.9 | 11:53:16.2 | -537.4 | -4.5 | 67.7 |
| 30 | APP | 2100.2 | 16.7 | 11:57:43.8 | -879.5 | -7.1 | 69.7 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|----|-----|--------|---------|------------|---------|-------|------|
| 31 | APP | 2050.6 | 12.4 | 12:02:15.9 | -1144.3 | -10.4 | 61.5 |
| 32 | | ----- | NO DATA | ----- | | | |
| 33 | APP | 2064.5 | 12.9 | 12:17:20.7 | -905.7 | -8.4 | 60.2 |
| 34 | APP | 2084.0 | 13.5 | 12:21:21.7 | -1177.8 | -11.7 | 56.1 |

500 FT. LEVEL FLYOVER AT 100 KTS.

| | | | | | | | |
|----|-----|--------|---------|------------|--------|------|-------|
| 35 | F/O | 2055.1 | 11.7 | 12:25:27.3 | 220.8 | 1.2 | 102.5 |
| 36 | | ----- | NO DATA | ----- | | | |
| 37 | F/O | 2056.1 | 12.3 | 12:30:25.0 | 405.8 | 2.3 | 99.5 |
| 38 | F/O | 1999.2 | 13.2 | 12:32:51.6 | 76.6 | 0.4 | 99.9 |
| 39 | F/O | 2055.5 | 12.6 | 12:36:13.1 | 166.1 | 0.9 | 99.6 |
| 40 | F/O | 1988.9 | 13.1 | 12:38:48.4 | 212.5 | 1.1 | 104.5 |
| 41 | F/O | 2061.4 | 12.5 | 12:44:07.2 | 195.6 | 1.1 | 101.2 |
| 42 | F/O | 1994.9 | 13.1 | 12:40:24.5 | -324.8 | -1.8 | 103.4 |

1000 FT. LEVEL FLYOVER AT 100 KTS.

| | | | | | | | |
|----|-----|--------|------|------------|-------|------|-------|
| 43 | F/O | 2310.3 | 24.8 | 12:53:18.3 | 136.4 | 0.7 | 106.2 |
| 44 | F/O | 2124.8 | 26.8 | 12:56:02.5 | 209.5 | 1.2 | 100.4 |
| 45 | F/O | 2181.7 | 26.0 | 12:59:22.0 | -61.7 | -0.3 | 102.2 |
| 46 | F/O | 2187.9 | 26.8 | 13:02:49.0 | 43.3 | 0.2 | 105.1 |
| 47 | F/O | 2244.4 | 25.4 | 13:06:08.0 | 201.1 | 1.1 | 101.6 |
| 48 | F/O | 2128.2 | 27.1 | 13:09:06.0 | 62.2 | 0.3 | 100.5 |
| 49 | F/O | 2223.3 | 25.2 | 13:13:35.4 | 146.7 | 0.8 | 99.1 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE 08/26/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|--------|--------|----------|-----------|--------|-------|
| SIX DEGREE APPROACH AT VY, 57 KTS. | | | | | | |
| 1 | APP | 2032.9 | 10.9 | 9:51:56.3 | -610.6 | 63.9 |
| 2 | APP | 1188.5 | 8.7 | 9:56:51.4 | -196.0 | 173.2 |
| 3 | APP | 1991.4 | 11.3 | 9:00:53.7 | -556.0 | 50.8 |
| 4 | APP | 2053.0 | 10.7 | 9:05:16.4 | -652.3 | 66.0 |
| 5 | APP | 2043.1 | 10.2 | 9:11:33.8 | -497.4 | 65.5 |
| 6 | APP | 2023.1 | 9.5 | 9:19:01.0 | -330.5 | 57.5 |
| 7 | | ----- | NO DATA | ----- | | |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|------|------------|--------|------|
| 8 | APP | 1997.4 | 8.0 | 9:38:26.7 | -500.0 | 67.2 |
| 10 | APP | 1993.8 | 8.5 | 9:43:54.2 | -257.1 | 67.0 |
| 12 | APP | 1959.8 | 10.0 | 9:48:30.5 | -547.6 | 60.0 |
| 14 | APP | 1966.4 | 6.8 | 9:58:40.5 | -185.7 | 61.5 |
| 16 | APP | 1948.5 | 8.5 | 10:11:15.0 | -270.7 | 62.1 |
| 18 | APP | 1973.8 | 8.3 | 10:16:10.0 | -266.6 | 63.0 |
| 20 | APP | 1976.8 | 9.0 | 10:22:25.2 | -277.3 | 66.2 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|--------|------|------------|--------|------|
| 9 | DEP | 2058.6 | 10.6 | 9:40:10.5 | 1010.1 | 74.9 |
| 11 | DEP | 2037.6 | 11.8 | 9:45:39.8 | 493.3 | 72.1 |
| 13 | DEP | 2082.8 | 10.7 | 9:51:56.7 | 504.0 | 73.0 |
| 15 | DEP | 2088.8 | 12.7 | 10:05:03.3 | 670.3 | 74.3 |
| 17 | DEP | 2046.4 | 12.3 | 10:13:02.4 | 803.8 | 69.5 |
| 19 | DEP | 2071.0 | 13.9 | 10:18:27.0 | 814.6 | 71.5 |
| 21 | DEP | 2051.2 | 12.3 | 10:24:09.4 | 712.6 | 75.3 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|--------|------|------------|---------|------|
| 22 | APP | 1966.2 | 8.6 | 11:19:50.3 | -810.2 | 56.7 |
| 23 | APP | 1987.0 | 11.9 | 11:23:50.7 | -449.0 | 58.6 |
| 24 | APP | 1987.7 | 9.2 | 11:29:43.5 | -537.1 | 63.5 |
| 25 | APP | 2010.0 | 12.5 | 11:33:50.0 | -695.0 | 68.5 |
| 26 | APP | 2044.2 | 11.3 | 11:40:10.5 | -1000.3 | 64.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 206L-1
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 2000 FT. WEST

DATE 08/26/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|--------|--------|----------|------------|--------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 27 | APP | 1974.6 | 10.8 | 11:44:28.8 | -637.7 | 60.1 |
| 28 | APP | 2017.7 | 12.3 | 11:49:01.2 | -632.2 | 55.6 |
| 29 | APP | 1989.5 | 11.6 | 11:53:18.8 | -605.9 | 62.1 |
| 30 | APP | 2030.4 | 16.7 | 11:57:44.0 | -895.8 | 60.1 |

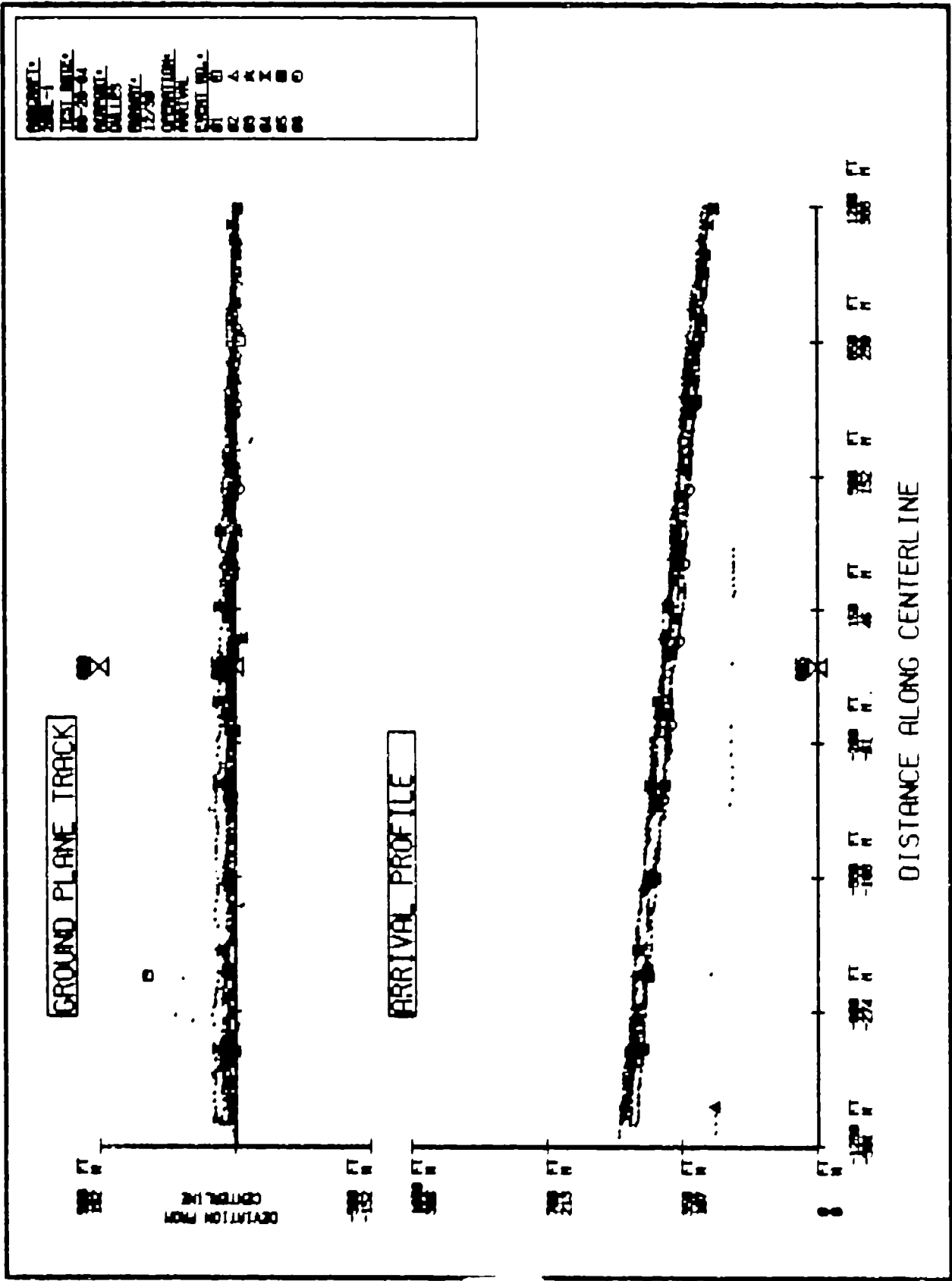
| | | | | | | |
|---|-----|--------|---------|------------|---------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 31 | APP | 2002.7 | 12.1 | 12:02:16.6 | -1036.0 | 59.9 |
| 32 | | ----- | NO DATA | ----- | | |
| 33 | APP | 2012.4 | 12.8 | 12:17:20.4 | -874.1 | 62.5 |
| 34 | APP | 1998.0 | 11.1 | 12:21:28.3 | -738.3 | 50.7 |

| | | | | | | |
|-----------------------------------|-----|--------|---------|------------|--------|-------|
| 500 FT. LEVEL FLYOVER AT 100 KTS. | | | | | | |
| 35 | F/O | 1966.2 | 12.0 | 12:25:28.3 | 254.9 | 90.9 |
| 36 | | ----- | NO DATA | ----- | | |
| 37 | F/O | 1976.6 | 13.0 | 12:30:26.6 | 487.5 | 95.6 |
| 38 | F/O | 2085.2 | 12.2 | 12:32:52.2 | 13.1 | 96.4 |
| 39 | F/O | 2014.0 | 12.4 | 12:36:12.5 | 78.5 | 98.1 |
| 40 | F/O | 2045.3 | 12.3 | 12:38:46.5 | 10.5 | 102.1 |
| 41 | F/O | 2006.8 | 13.0 | 12:44:10.7 | -228.2 | 101.4 |
| 42 | F/O | 2032.9 | 12.2 | 12:49:25.7 | -280.5 | 104.8 |

| | | | | | | |
|------------------------------------|-----|--------|------|------------|-------|-------|
| 1000 FT. LEVEL FLYOVER AT 100 KTS. | | | | | | |
| 43 | F/O | 2054.4 | 27.3 | 12:53:10.7 | 151.6 | 101.0 |
| 44 | F/O | 2278.0 | 24.4 | 12:58:01.7 | 140.3 | 101.6 |
| 45 | F/O | 2224.1 | 25.0 | 12:59:24.5 | 78.3 | 99.8 |
| 46 | F/O | 2221.8 | 26.0 | 13:02:48.3 | 6.0 | 101.3 |
| 47 | F/O | 2142.7 | 26.2 | 13:06:07.6 | 330.0 | 102.3 |
| 48 | F/O | 2283.7 | 24.7 | 13:09:04.5 | 78.2 | 100.2 |
| 49 | F/O | 2182.5 | 25.4 | 13:13:36.1 | 225.5 | 98.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

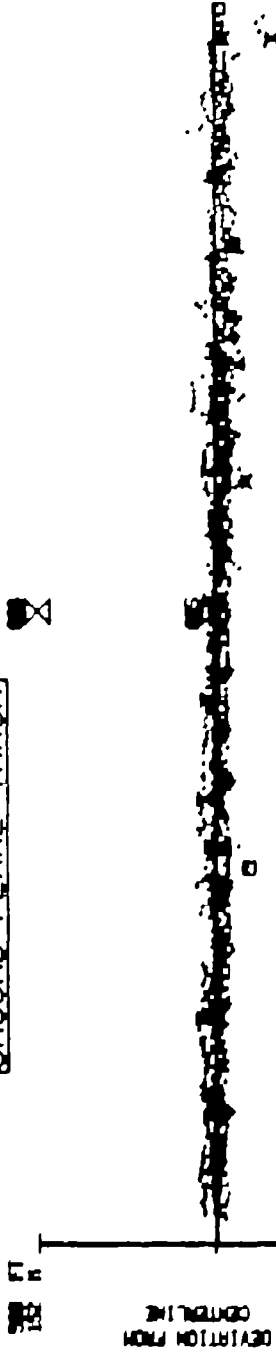
SIX° APPROACH at Vy, 57 Kts.



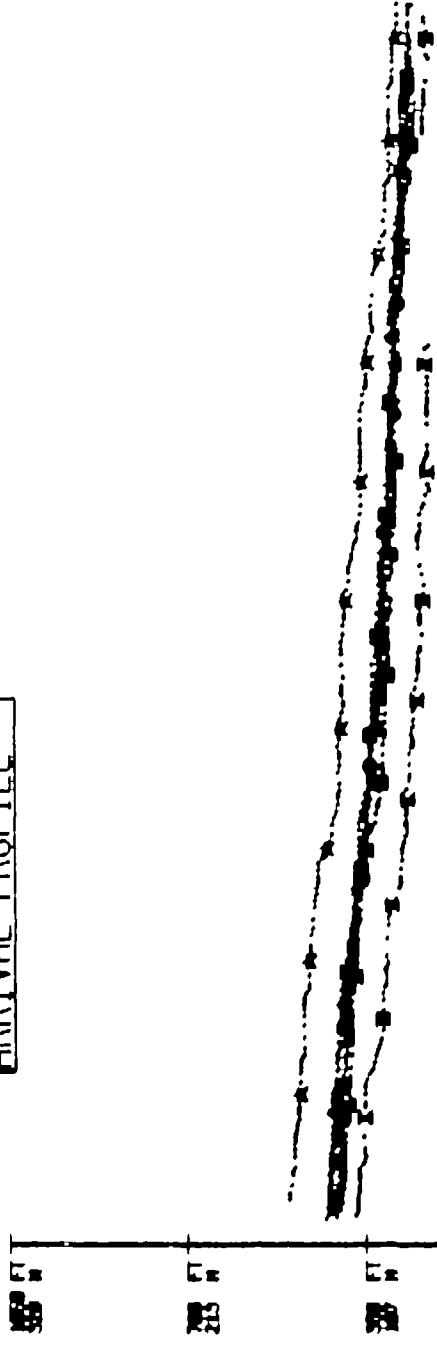
NORMAL APPROACH

| | |
|--------------|----------|
| SUPPORT: | 1 |
| TEST DATE: | 05-20-64 |
| GROUP: | 04125 |
| OPERATION: | 177-5 |
| ARRIVAL: | 18 |
| ENROUTE NO.: | 12 |
| | 14 |
| | 16 |
| | 18 |
| | 20 |

GROUND PLANE TRACK



ARRIVAL PROFILE

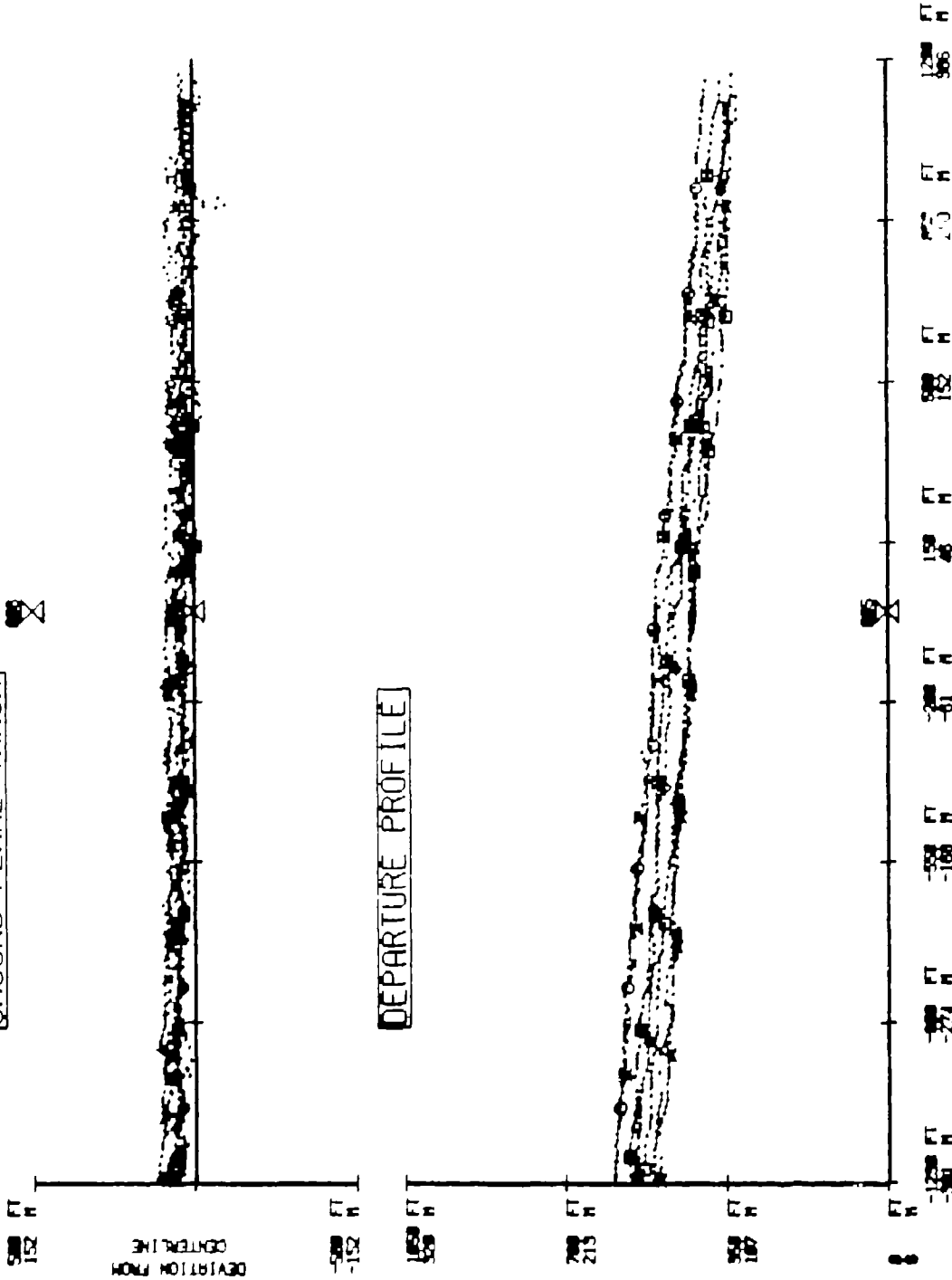


NORMAL TAKEOFF

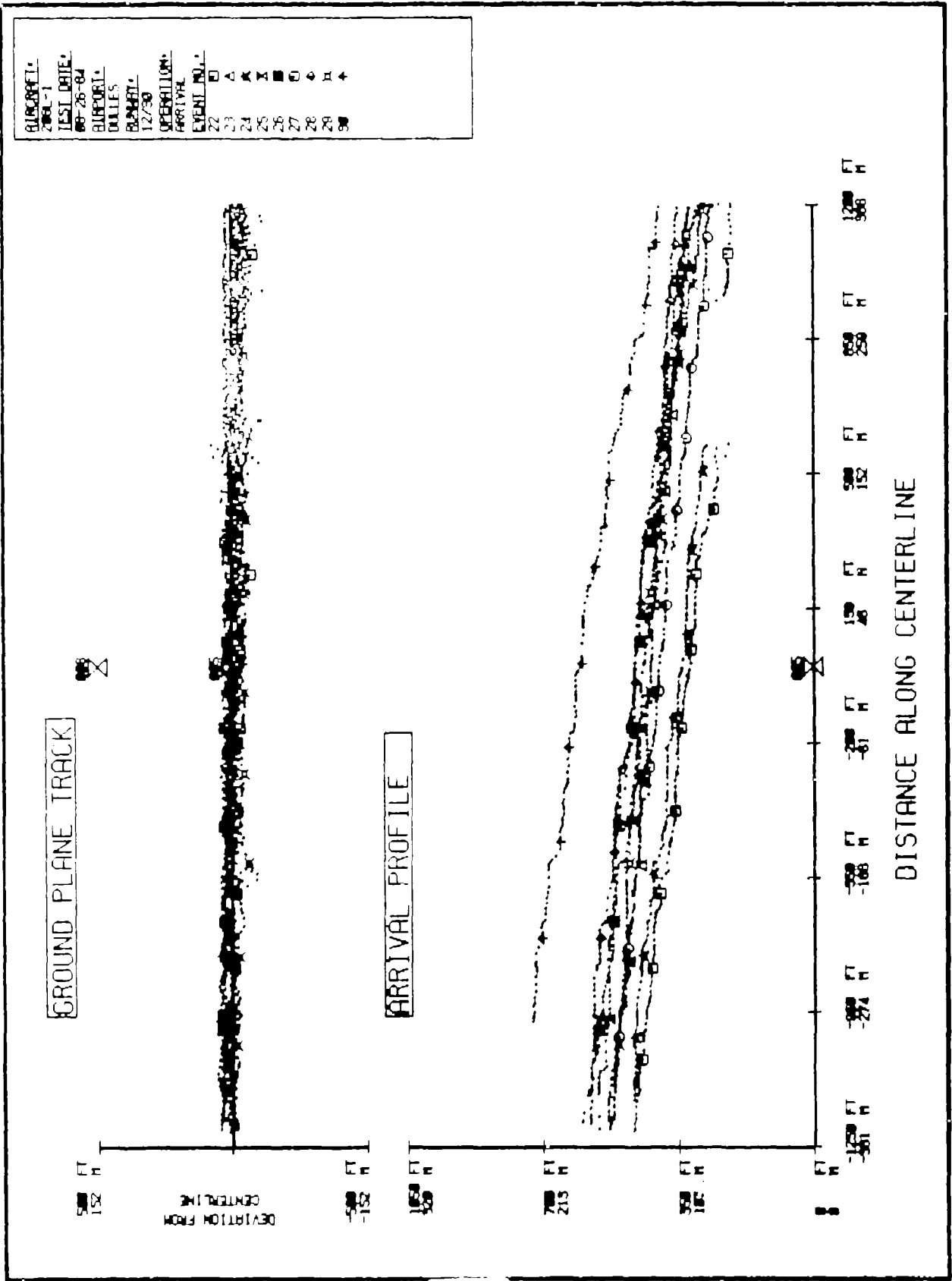
AIRCRAFT: ZW-1
 TEST DATE: 08-20-64
 AIRPORT: CALLES
 ALTITUDE: 12/30
 OPERATOR: DEPARTURE
 EVAL. NO.: 11 A
 13 X
 15 X
 17 X
 19 O
 21 O

GROUND PLANE TRACK

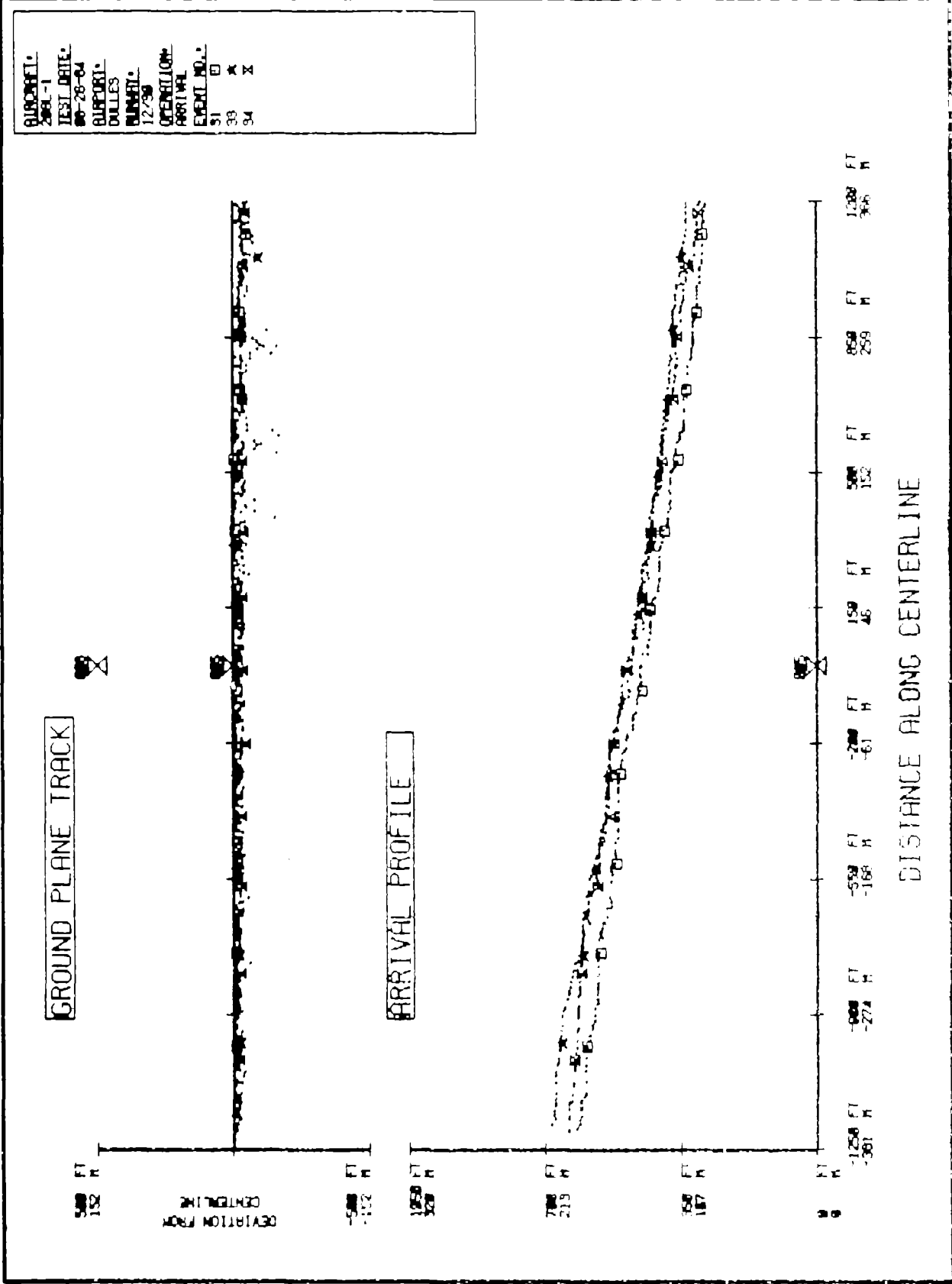
DEPARTURE PROFILE



NOISE ABATEMENT APPROACH (Var. R/D & A/S)

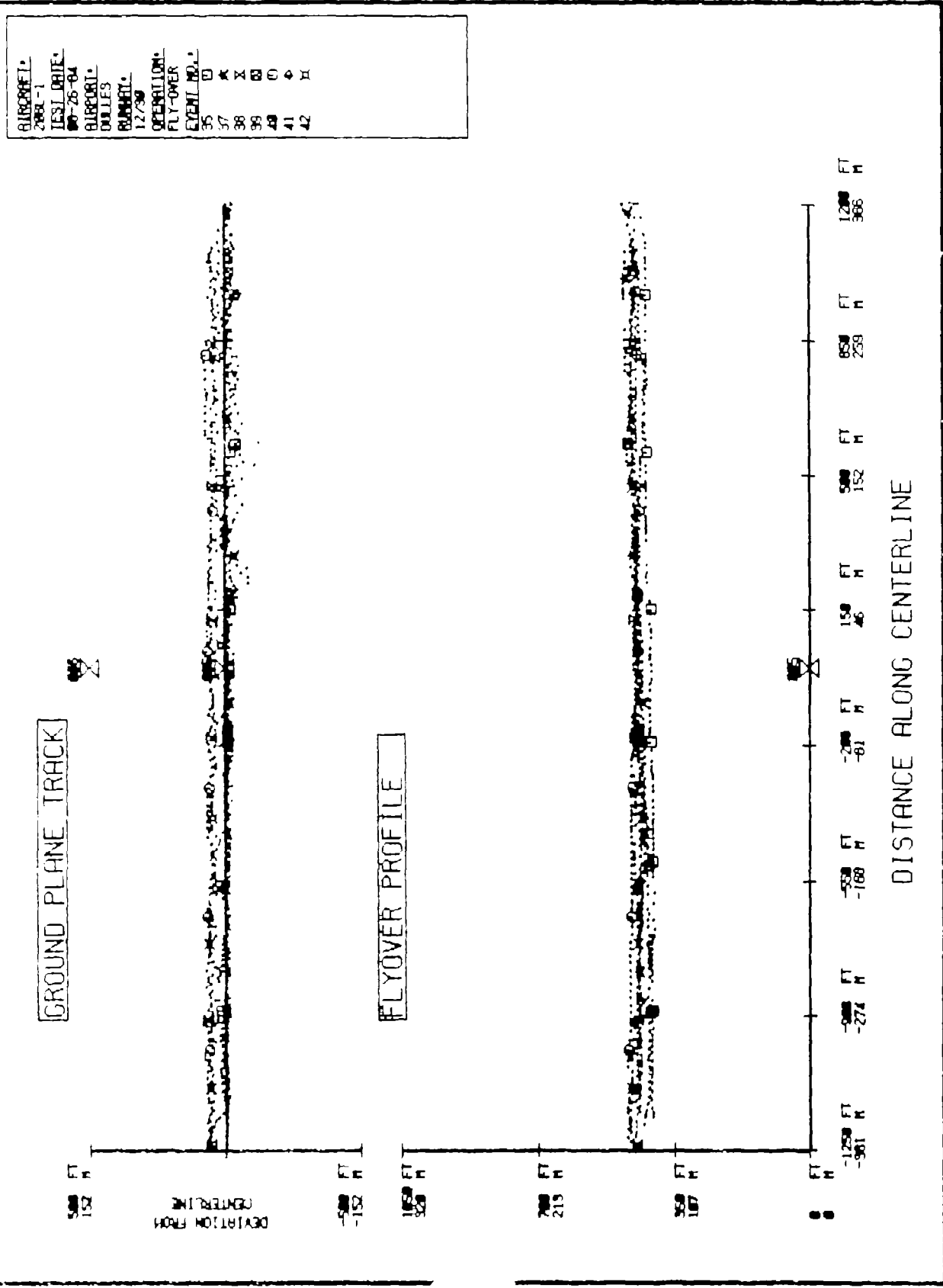


NOISE ABATEMENT APPROACH (Var. R/D & A/S)



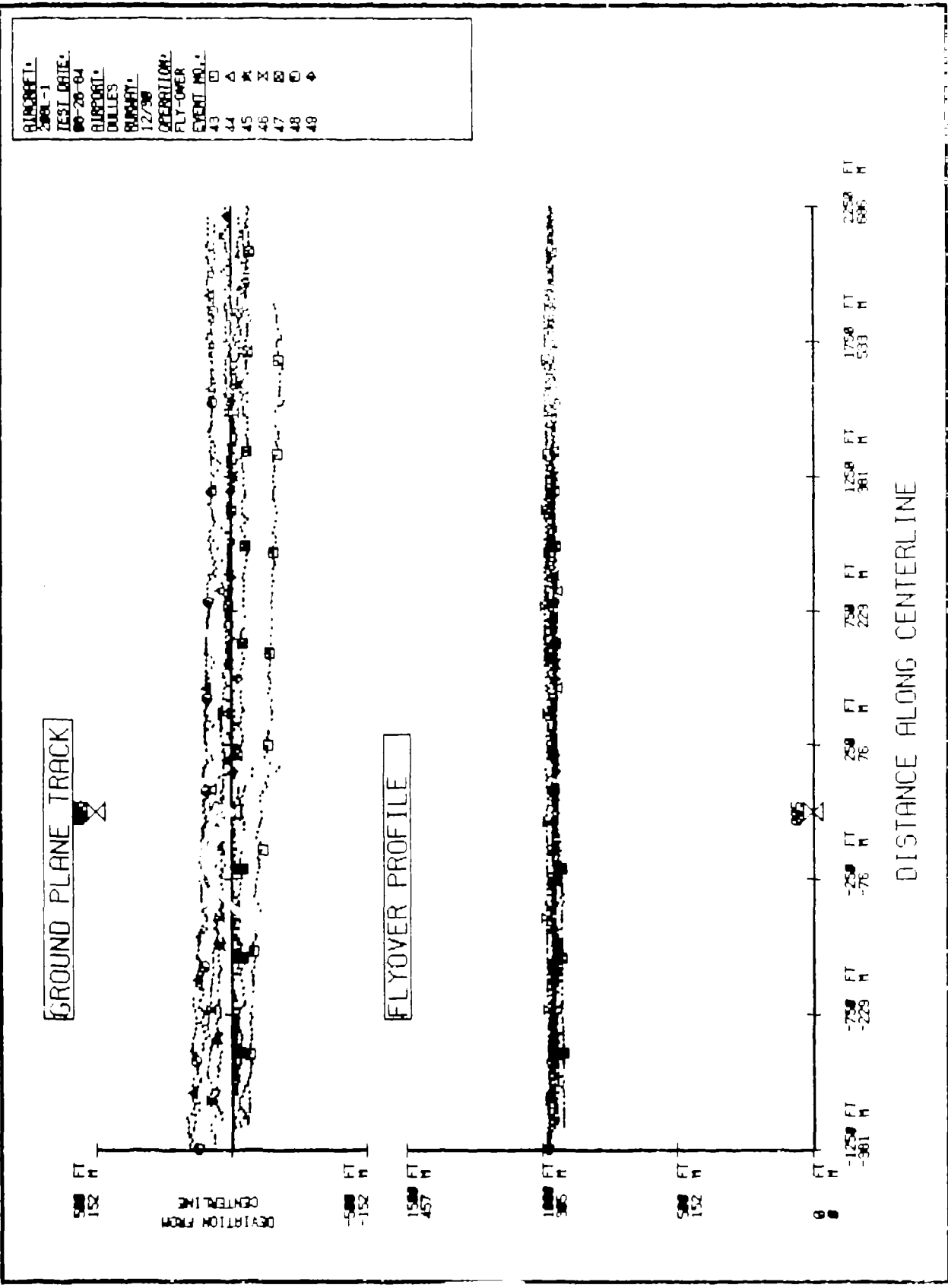
AIRCRAFT: 286L-1
 TEST DATE: 08-28-64
 AIRPORT: DULLES
 RUNWAY: 12/30
 OPERATION: ARRIVAL
 EVENT NO.: 51 39 94 X

500 FT. LEVEL FLYOVER



AIRPORT: 2000-1
 TEST DATE: 00-26-04
 AIRPORT: DULLES
 NUMBER: 12730
 OPERATION: FLY-OVER
 EVENT NO.: 35
 57 A X
 38 00
 39 00
 40 00
 41 00
 42 00

1000 FT. LEVEL FLYOVER



METEOROLOGICAL DATA

THIS SECTION OF THE APPENDIX CONTAINS WEATHER DATA FROM SEVERAL TYPES OF METEOROLOGICAL EQUIPMENT: TEN-METER TOWER (MCT), GROUND LEVEL PSYCHROMETER, AIRCRAFT OAT, AND PILOT BALLOONS. DATA FROM THE MET TOWER INCLUDE THE TEMPERATURE, RELATIVE HUMIDITY, WIND DIRECTION AND WIND SPEED MEASURED TYPICALLY EVERY 15 MINUTES DURING EACH FLIGHT EVENT. BECAUSE OF A FAILURE OF THE MET TOWER DEW POINT SENSOR, THE RELATIVE HUMIDITY WAS CALCULATED USING TEMPERATURE FROM THE MET TOWER AND DEW POINT FROM THE DOLLYS MID FIELD WEATHER STATION. GROUND LEVEL (A FEET) TEMPERATURE AND RELATIVE HUMIDITY ARE GIVEN FOR DIFFERENT TIMES OF EACH TEST DAY, AND THE HELICOPTER OAT READINGS ARE SHOWN FOR DIFFERENT FLIGHT ALTITUDES AT VARIOUS TIMES OF THE DAY. THE PILOT BALLOON WIND DATA, TAKEN PERIODICALLY DURING EACH TEST DAY, INCLUDES THE WIND DIRECTION AND WIND SPEED AT VARIOUS ALTITUDES.

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: BELL 206L-1

DATE: 8/26/84

| TIME | TEMP. (DEG. F) | R.H. % | WIND DIR. (DEG.) | WIND SPEED | |
|------|-------------------|-----------|---------------------|------------|-----|
| | | | | AVG. | MAX |
| | | | | (MPH) | |

SIX DEGREE APPROACH AT VY, 57 KTS.

| | | | | | |
|------|----|----|-----|---|---|
| 9:00 | 66 | 65 | 350 | 3 | - |
| 9:15 | 68 | 66 | 350 | 3 | 5 |
| 9:30 | 70 | 61 | 350 | 4 | - |

NORMAL APPROACH AND TAKEOFF 75 KTS.

| | | | | | |
|-------|----|----|-----|---|---|
| 9:30 | 70 | 61 | 350 | 4 | - |
| 9:45 | 70 | 61 | 350 | 5 | - |
| 10:00 | 72 | 62 | 350 | 5 | - |
| 10:15 | 74 | 57 | 350 | 4 | - |
| 10:30 | 74 | 57 | 350 | 4 | - |

NOI ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | |
|-------|----|----|-----|---|---|
| 11:30 | 76 | 54 | 200 | 4 | - |
| 11:45 | 78 | 50 | 200 | 3 | - |
| 12:00 | 78 | 47 | 200 | 6 | - |
| 12:15 | 78 | 43 | 200 | 5 | - |
| 12:30 | 78 | 43 | 200 | 3 | - |

500 AND 1000 FT. LEVEL FLYOVER AT 100 KTS.

| | | | | | |
|-------|----|----|-----|---|----|
| 12:45 | 80 | 41 | -- | 3 | - |
| 1:00 | 80 | 41 | 270 | 6 | 10 |
| 1:15 | 80 | 41 | 330 | 3 | 6 |

METEOROLOGICAL DATA

HELICOPTER: BELL 206L-1

DATE: 08/26/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS OUT GAUGE DATA

TIME TEMP. R.H.

TIME ALTITUDE TEMP.

N
O

D
A
T
A

| | | |
|-------|------|------|
| 8:37 | 200' | 64 F |
| | 400' | 66 F |
| | 600' | 70 F |
| | 800' | 70 F |
| 9:30 | 200' | 68 F |
| | 400' | 68 F |
| | 600' | 70 F |
| | 800' | 70 F |
| 10:25 | 200' | 72 F |
| | 400' | 72 F |
| | 600' | 72 F |
| | 800' | 72 F |
| 11:10 | 200' | 77 F |
| | 400' | 75 F |
| | 600' | 75 F |
| | 800' | 73 F |

PILOT BALLOON WIND DATA

BELL 206L-1

08/26/84

| FEEET | WIND DIR. | WIND SPD. | WIND DIR. | WIND SPD. |
|-------|-----------|-----------|-----------|-----------|
| (AGL) | (DEG.) | (KTS) | (DEG.) | (KTS) |

LAUNCH TIME:

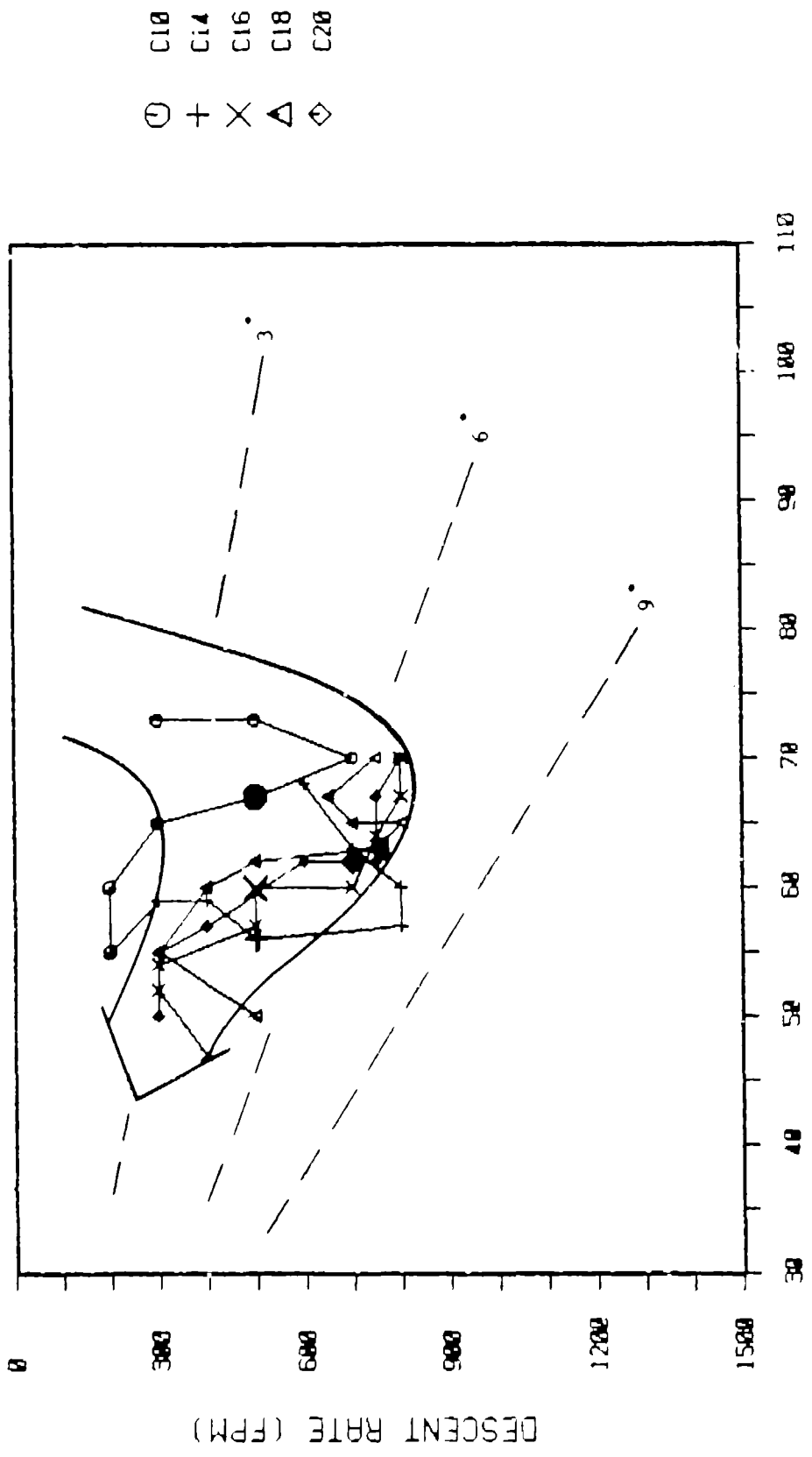
----- NO DATA -----

COCKPIT VIDEO

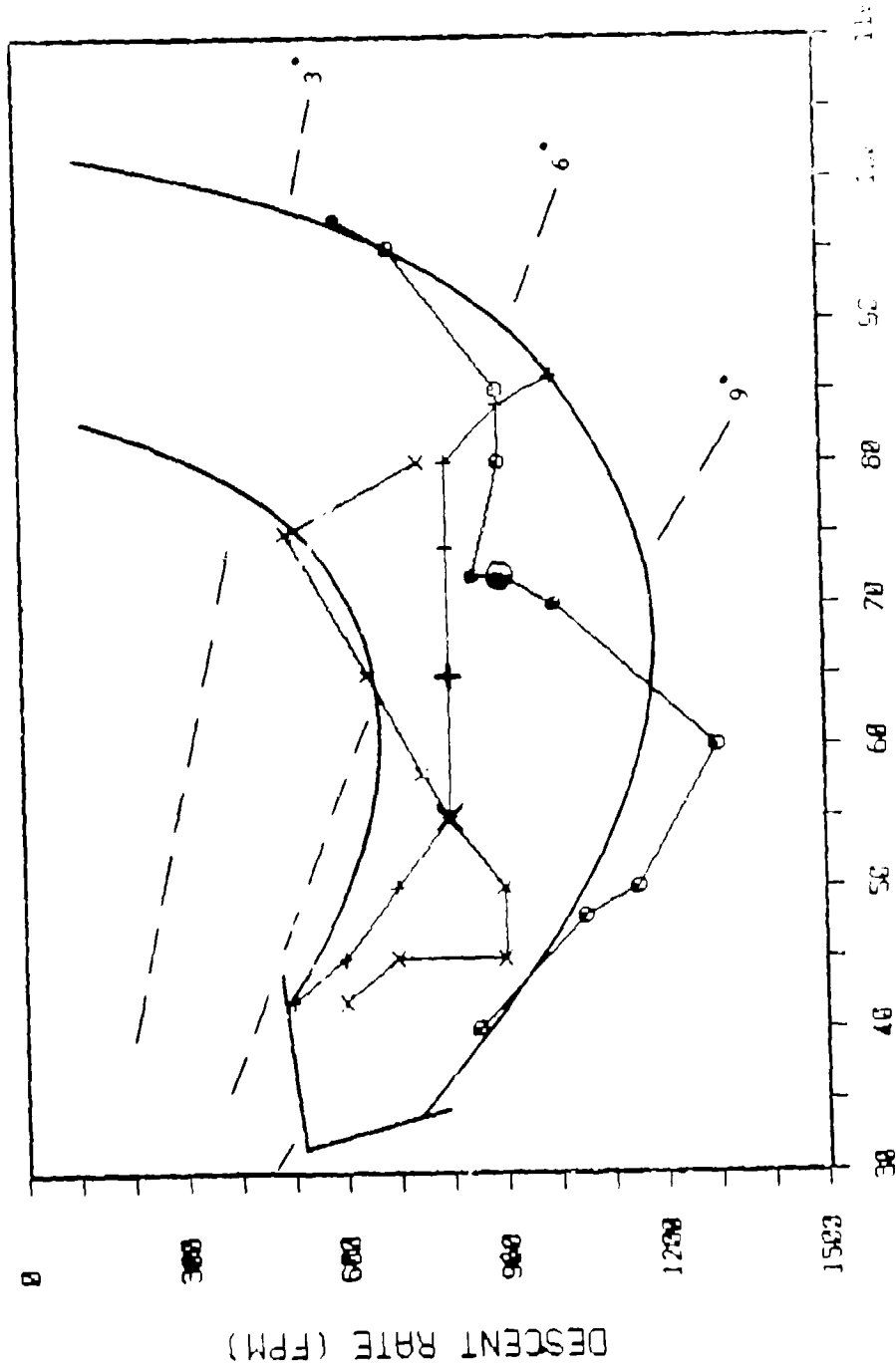
DATA

- THIS SECTION OF THE APPENDIX CONTAINS FLIGHT PROFILE -
- PLOTS AND INDIVIDUAL EVENT DATA READ EVERY 5 SECONDS -
- FROM PLAYBACK OF THE COCKPIT VIDEO RECORDINGS. IN THE -
- PROFILE PLOTS, INDICATED AIRSPEED VS. DESCENT RATE -
- ARE PLOTTED FOR THE NORMAL APPROACHES AND THE 'BEST' -
- NOISE ABATEMENT APPROACH EVENTS. AN ARROW IS DRAWN -
- WHICH BOUNDS THE DATA POINTS AND PORTRAYS THE -
- SPEED, DESCENT RATE TREND WITH TIME. THE DARKER DATA -
- POINTS INDICATE WHEN THE HELICOPTER PASSED OVER THE CLC -
- POSITION. THE INDIVIDUAL EVENT DATA CONTAINS LISTINGS -
- OF ALL THE COCKPIT INSTRUMENT READINGS OBTAINED FROM THE -
- VIDEO PLAYBACK. THIS DATA ENCOMPASSES THE HELICOPTER'S -
- FLIGHT PARAMETERS THROUGHOUT THE ENTIRE DATA RUN PLUS OR -
- MINUS 15 SECONDS (MINIMUM) FROM CLC.

NORMAL APPROACH
206L-1



NOISE ABATEMENT APPROACH
206L-1



IAS (KTS)

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: BELL 206L-1

DATE: 08/26/84

EVENT: C8

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -35 | 600 | 700 | 77 | 5.15 |
| -30 | 620 | 700 | 77 | 5.15 |
| -25 | 580 | 900 | 74 | 6.90 |
| -20 | --- | --- | 72 | -- |
| -15 | 450 | 450 | 70 | 3.64 |
| -10 | 400 | 400 | 66 | 3.43 |
| -5 | 350 | 350 | 63 | 3.14 |
| CLC 0 | 300 | 300 | 62 | 2.74 |
| 5 | 260 | 260 | 62 | 2.37 |
| 10 | 250 | 250 | 58 | 2.44 |
| 15 | 220 | 220 | 51 | 2.44 |

EVENT: C14

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -37 | 600 | 400 | 72 | 3.14 |
| -32 | 550 | 500 | 68 | 4.16 |
| -27 | 520 | 500 | 68 | 4.16 |
| -22 | 460 | 600 | 68 | -- |
| -17 | 420 | 700 | 63 | 6.30 |
| -12 | 360 | 800 | 60 | 7.57 |
| -7 | 300 | 800 | 57 | 7.97 |
| -2 | 260 | 500 | 56 | 5.06 |
| CLC 0 | 250 | 500 | 56 | 5.06 |
| 3 | 240 | 400 | 59 | 3.84 |
| 8 | 230 | 300 | 59 | 2.88 |
| 13 | 220 | 200 | 55 | 2.06 |

EVENT: C10

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -34 | 580 | 300 | 77 | 2.20 |
| -29 | 550 | 400 | 76 | 2.98 |
| -24 | 520 | 400 | 75 | 3.02 |
| -19 | 500 | 300 | 73 | 2.33 |
| -14 | 440 | 500 | 73 | 3.88 |
| -9 | 360 | 500 | 73 | 3.88 |
| -4 | 330 | 700 | 70 | 5.67 |
| CLC 0 | --- | 500 | 67 | 4.23 |
| 6 | 260 | 300 | 65 | 2.61 |
| 11 | 250 | 200 | 60 | 1.89 |
| 16 | 230 | 200 | 55 | 2.06 |

EVENT: C16

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -23 | 550 | 700 | 72 | 5.51 |
| -18 | 480 | 800 | 70 | 6.48 |
| -13 | 420 | 800 | 67 | 6.77 |
| -8 | 360 | 750 | 64 | 6.65 |
| -3 | 320 | 700 | 60 | 6.62 |
| CLC 0 | 300 | 500 | 60 | 4.72 |
| 2 | 280 | 500 | 57 | 4.97 |
| 7 | 260 | 500 | 57 | 4.97 |
| 12 | 250 | 300 | 54 | 3.14 |
| 17 | 240 | 300 | 52 | 3.27 |
| 22 | 220 | 400 | 47 | 4.82 |

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: BELL 206L-1

DATE: 08/26/84

EVENT: C18

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -26 | 580 | 700 | 70 | 5.67 |
| -21 | 510 | 750 | 70 | 6.07 |
| -16 | 480 | 650 | 67 | 5.50 |
| -11 | 420 | 700 | 65 | -- |
| -6 | 390 | 800 | 65 | 6.98 |
| CLC 0 | 300 | 750 | 63 | 6.75 |
| 4 | 280 | 500 | 62 | 4.57 |
| 9 | 260 | 400 | 60 | 3.77 |
| 14 | 250 | 300 | 55 | 3.09 |
| 19 | 220 | 500 | 50 | 5.67 |

EVENT: C20

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -23 | 550 | 600 | 73 | 4.66 |
| -18 | 500 | 800 | 70 | 6.48 |
| -13 | 440 | 750 | 67 | 6.35 |
| -8 | 400 | 750 | 63 | 6.75 |
| -3 | 340 | 750 | 62 | 6.86 |
| CLC 0 | 310 | 700 | 62 | 6.40 |
| 2 | 300 | 600 | 62 | 5.48 |
| 7 | 280 | 400 | 57 | 3.97 |
| 12 | 250 | 300 | 55 | 3.09 |
| 17 | 240 | 300 | 50 | 3.40 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: BELL 206L-1

DATE: 08/26/84

EVENT: E22

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -30 | 650 | 1000 | 82 | 6.92 |
| -25 | 600 | 800 | 74 | 6.13 |
| -20 | 540 | 700 | 68 | 5.83 |
| -15 | 500 | 650 | 68 | 5.42 |
| -10 | 450 | 600 | 65 | 6.98 |
| -5 | 420 | 650 | 60 | 8.04 |
| CLC 0 | 320 | 900 | 57 | 8.97 |
| 5 | 280 | 900 | 52 | 9.84 |
| 10 | 250 | 500 | 48 | 5.90 |
| 15 | 220 | 400 | 47 | 4.82 |
| 20 | 210 | 400 | 45 | 5.04 |
| 25 | 200 | 300 | 42 | 4.04 |

EVENT: E24

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -25 | 700 | 850 | 75 | 6.92 |
| -20 | 600 | 850 | 70 | 6.13 |
| -15 | 550 | 900 | 65 | 5.83 |
| -10 | 500 | 1000 | 60 | 5.42 |
| -5 | 450 | 900 | 55 | 6.98 |
| CLC 0 | 400 | 900 | 55 | 8.04 |
| 5 | 360 | 700 | 55 | 8.97 |
| 10 | 250 | 700 | 54 | 9.84 |
| 15 | 220 | 600 | 52 | 5.90 |
| 20 | 200 | 500 | 45 | 4.82 |

EVENT: E23

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -28 | 700 | 900 | 82 | 6.22 |
| -23 | 650 | 800 | 74 | 6.13 |
| -18 | 600 | 900 | 70 | 7.29 |
| -13 | 540 | 900 | 66 | 7.74 |
| -8 | 500 | 750 | 65 | 6.54 |
| -3 | 460 | 850 | 58 | 8.32 |
| CLC 0 | 380 | 700 | 60 | 6.62 |
| 2 | 380 | 800 | 60 | 7.57 |
| 7 | 340 | 600 | 58 | 5.86 |
| 12 | 300 | 650 | 50 | 7.38 |
| 17 | 250 | 600 | 43 | 7.92 |
| 22 | 220 | 500 | 40 | 7.09 |

EVENT: E25

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -24 | 750 | 900 | 92 | 6.22 |
| -19 | 720 | 900 | 92 | 6.13 |
| -14 | 640 | 1000 | 85 | 7.29 |
| -9 | 550 | 900 | 78 | 7.74 |
| -4 | 460 | 1000 | 75 | 6.54 |
| CLC 0 | 420 | 900 | 68 | 8.32 |
| 6 | 350 | 800 | 60 | 6.62 |
| 11 | 300 | 700 | 55 | 7.57 |
| 16 | 260 | 650 | 50 | 5.86 |
| 21 | 240 | 600 | 48 | 7.38 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (VAR. R/D AND A/S)

DATE: 08/26/84

HELICOPTER: BELL 206L-1

EVENT: E26

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -26 | 800 | 650 | 95 | 3.87 |
| -21 | 760 | 700 | 90 | 4.40 |
| -16 | 680 | 1000 | 88 | 6.44 |
| -11 | 600 | 900 | 84 | 6.07 |
| -6 | 540 | 900 | 80 | 6.38 |
| CLC 0 | 480 | 900 | 70 | 7.29 |
| 4 | 400 | 900 | 65 | 7.86 |
| 9 | 350 | 800 | 55 | 8.26 |
| 14 | 300 | 700 | 50 | 7.95 |
| 19 | 240 | 750 | 40 | 10.67 |

EVENT: E27

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -25 | 700 | 600 | 85 | 4.00 |
| -20 | 650 | 600 | 80 | 4.25 |
| -15 | 600 | 800 | 80 | 5.67 |
| -10 | 540 | 800 | 75 | 6.05 |
| -5 | 480 | 900 | 72 | 7.09 |
| CLC 0 | 420 | 900 | 65 | 7.86 |
| 5 | 350 | 750 | 60 | 7.09 |
| 10 | 280 | 600 | 55 | 6.18 |
| 15 | 240 | 600 | 50 | 6.81 |
| 20 | 220 | 500 | 46 | 6.16 |

EVENT: E28

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -26 | 800 | 650 | 90 | 4.09 |
| -21 | 750 | 700 | 88 | 4.51 |
| -16 | 700 | 700 | 82 | 4.84 |
| -11 | 580 | 900 | 78 | 6.54 |
| -6 | 520 | 900 | 75 | 6.81 |
| CLC 0 | 440 | 850 | 64 | 7.54 |
| 4 | 400 | 750 | 58 | 7.34 |
| 9 | 350 | 600 | 50 | 6.81 |
| 14 | 320 | 500 | 48 | 5.90 |
| 19 | 260 | 600 | 45 | 7.57 |
| 24 | 240 | 600 | 45 | 7.57 |

EVENT: E29

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -20 | 750 | 750 | 90 | 4.72 |
| -15 | 650 | 650 | 85 | 4.33 |
| -10 | 580 | 900 | 82 | 4.22 |
| -5 | 500 | 750 | 78 | 5.45 |
| CLC 0 | 420 | 600 | 70 | 4.86 |
| 5 | 400 | 500 | 70 | 4.04 |
| 10 | 360 | 600 | 64 | 5.31 |
| 15 | 300 | 700 | 60 | 6.62 |
| 20 | 260 | 600 | 50 | 6.81 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR, R/D AND A/S)

HELICOPTER: BELL 206L-1

DATE: 08/26/84

EVENT: E30

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -27 | 900 | 250 | 100 | 1.41 |
| -22 | 880 | 600 | 97 | 3.50 |
| -17 | 830 | 700 | 95 | 4.17 |
| -12 | 770 | 900 | 85 | 6.00 |
| -7 | 700 | 900 | 80 | 6.38 |
| -2 | 600 | 850 | 72 | 6.69 |
| CLC 0 | 550 | 900 | 72 | 7.09 |
| 3 | 520 | 1000 | 70 | 8.11 |
| 8 | 440 | 1300 | 60 | 12.35 |
| 13 | 380 | 1150 | 50 | 13.13 |
| 18 | 350 | 1050 | 48 | 12.48 |
| 23 | 240 | 850 | 40 | 12.11 |

EVENT: E32

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -24 | 700 | 1000 | 94 | 6.03 |
| -19 | 650 | 1000 | 86 | 6.59 |
| -14 | 580 | 900 | 84 | 6.07 |
| -9 | 520 | 800 | 80 | 5.67 |
| -4 | 480 | 800 | 74 | 6.13 |
| CLC 0 | 440 | 800 | 65 | 6.98 |
| 6 | 360 | 800 | 55 | 8.26 |
| 11 | 300 | 700 | 50 | 7.95 |
| 16 | 260 | 600 | 45 | 7.57 |
| 21 | 240 | 500 | 42 | 6.75 |

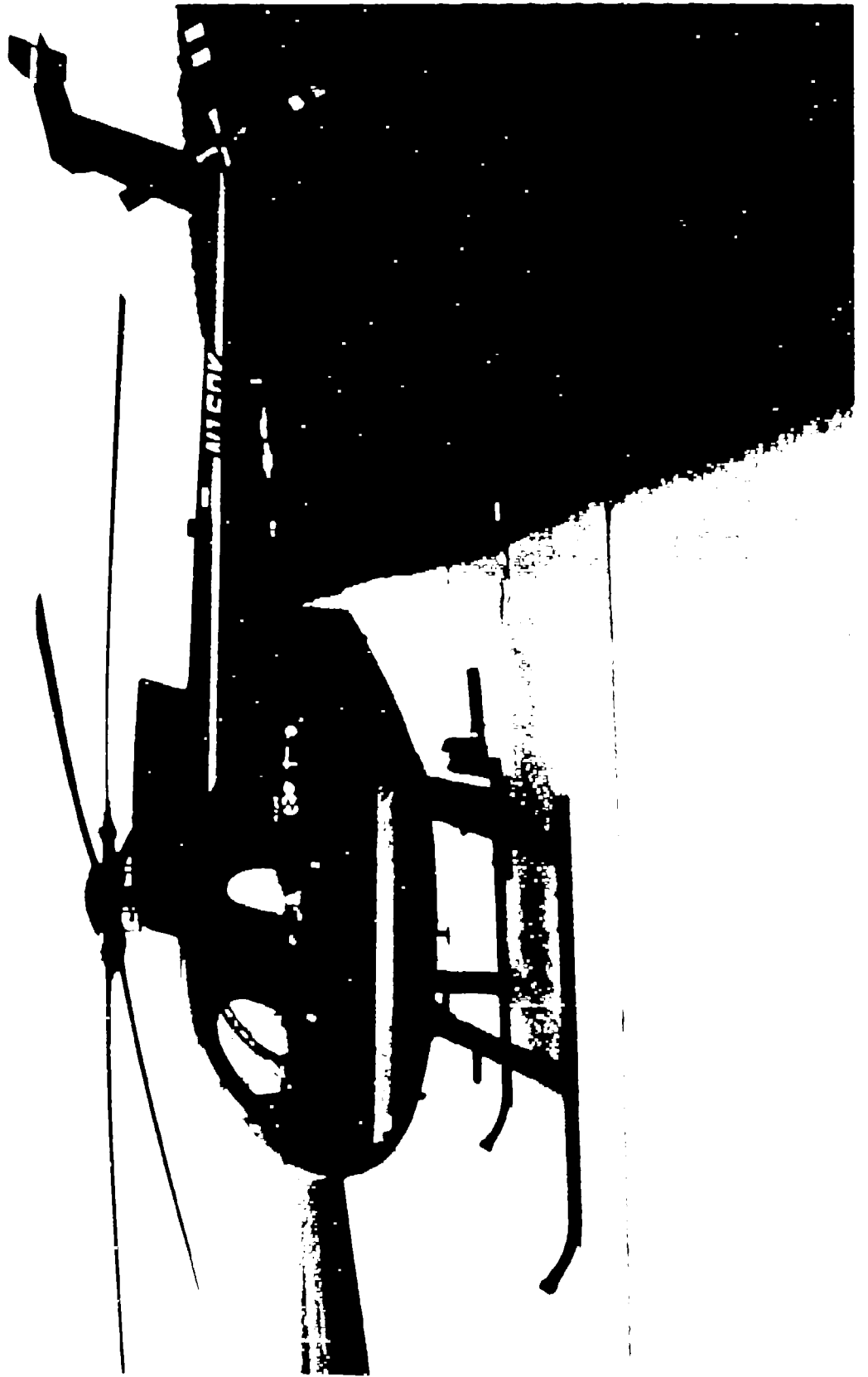
EVENT: E34

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -24 | 750 | 650 | 84 | 4.38 |
| -19 | 700 | 750 | 80 | 5.31 |
| -14 | 640 | 500 | 75 | 3.77 |
| -9 | 600 | 650 | 65 | 5.67 |
| -4 | 540 | 750 | 58 | 7.34 |
| CLC 0 | 500 | 800 | 55 | 8.26 |
| 6 | 400 | 900 | 50 | 10.24 |
| 11 | 350 | 900 | 45 | 11.39 |
| 16 | 300 | 700 | 45 | 8.84 |
| 21 | 250 | 600 | 42 | 8.11 |

APPENDIX G

HUGHES 500D

| | <u>PAGE NUMBERS</u> |
|---|---------------------|
| <u>HELICOPTER CHARACTERISTICS</u> | G-521 |
| <u>NOISE LEVEL DATA</u> | |
| <u>SOUND EXPOSURE LEVEL</u> | |
| Bar Charts | |
| Approaches..... | G-524 |
| Takeoff..... | G-525 |
| Summary Tables..... | G-526 - G-527 |
| Individual Event Data..... | G-528 - G-533 |
| <u>A-WEIGHTED SOUND LEVEL</u> | |
| Bar Charts | |
| Approaches..... | G-536 |
| Takeoff..... | G-537 |
| Summary Tables..... | G-538 - G-539 |
| Individual Event Data..... | G-540 - G-545 |
| <u>RADAR TRACKING DATA</u> | |
| Position Data..... | G-548 - G-561 |
| Tracking Plots..... | G-562 - G-567 |
| <u>METEOROLOGICAL DATA</u> | |
| 10 meter Tower Data..... | G-570 |
| 4 ft. Data and Aircraft DAT Data..... | G-571 |
| Pilot Balloon Wind Data..... | G-572 |
| <u>COCKPIT VIDEO DATA</u> | |
| Normal Approach Plot..... | G-574 |
| Individual Event Data..... | G-575 - G-578 |



HELICOPTER CHARACTERISTICS

| | |
|--|--------------|
| HELICOPTER MAKE/TYPE : | HUGHES |
| HELICOPTER MODEL : | 500D |
| TSS - HELICOPTER NUMBER : | 1160F |
| MAX INTERNAL GROSS WEIGHT : | 3000 LBS |
| NUMBER OF MAINS : | ONE |
| UNINSTALLED TAKEOFF POWER : | 420 SHP |
| UNINSTALLED MAX CONTINUOUS POWER : | 370 SHP |
| HELICOPTER MAX CLIMB RATE : | 150 FTS. |
| MAX SPEED IN LEVEL FLIGHT | |
| WITH MAXIMUM GROSS WEIGHT : | 105 FTS. |
| HEADWIND MAX CLIMB RATE : | 50 FTS. |
| CROSSWIND MAX CLIMB RATE RANGE (MAX) : | 118 FTS. |
| BELOW 5000 FT CLIMB AT | |
| TAKEOFF POWER (MAX) : | 1700 RPM |
| RANGE OF BEST APPROACH SPEED : | 520 RPM 105% |

MAIN AND TAIL ROTOR SPECIFICATIONS

| | MAIN | TAIL |
|-------------------------|-------------|-------------|
| DIAMETER (FT) : | 25.41 | 4.59 |
| NO. OF BLADES : | 5 | 4 |
| DIAMETER (FEET) (MAX) : | 580 | 530 |
| TYPE BLADES : | RECTANGULAR | RECTANGULAR |

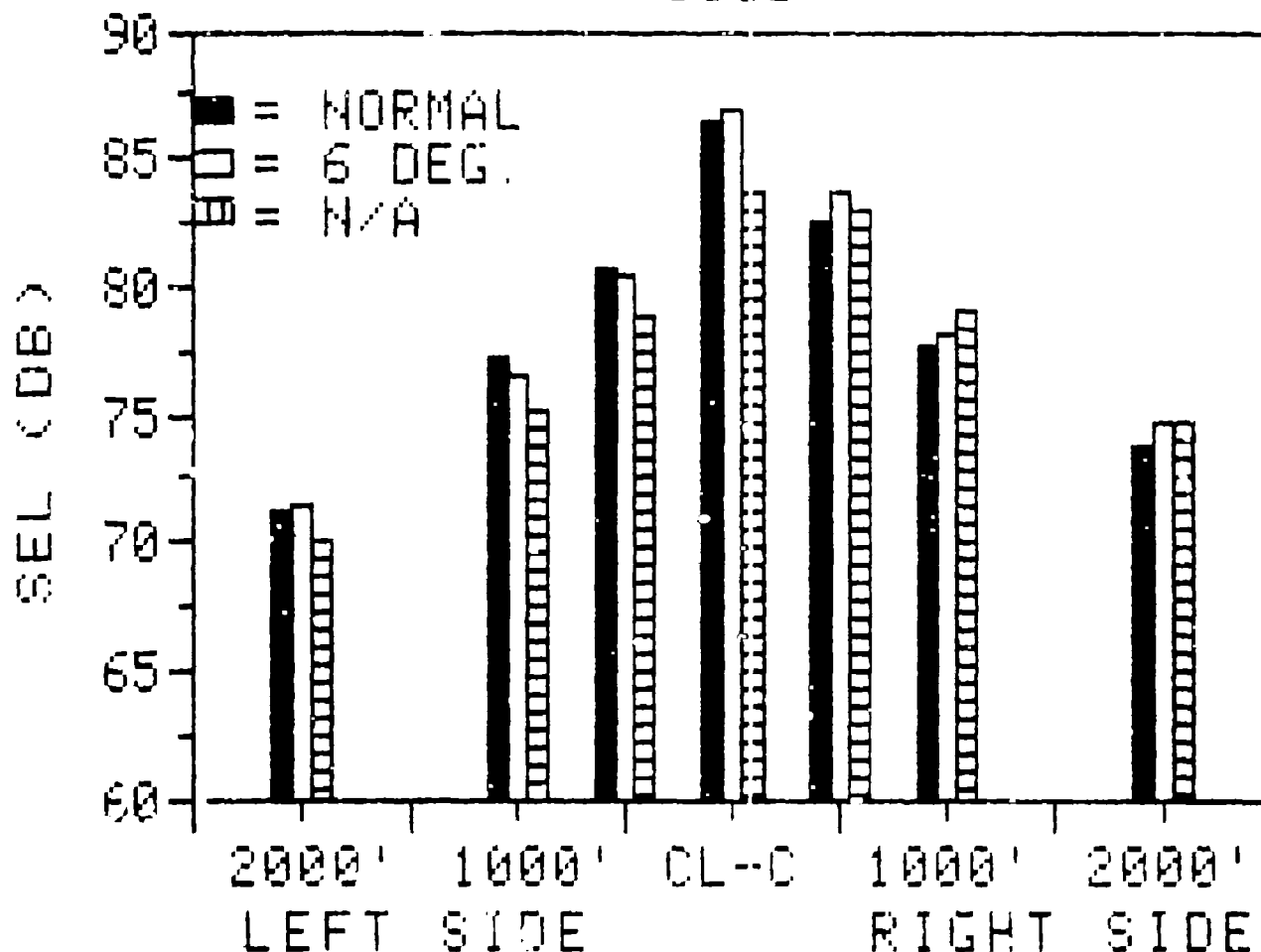
NOISE LEVEL DATA

'as-measured'

SOUND EXPOSURE LEVEL

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- SOUND EXPOSURE LEVELS (SEL) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SILENCE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN.

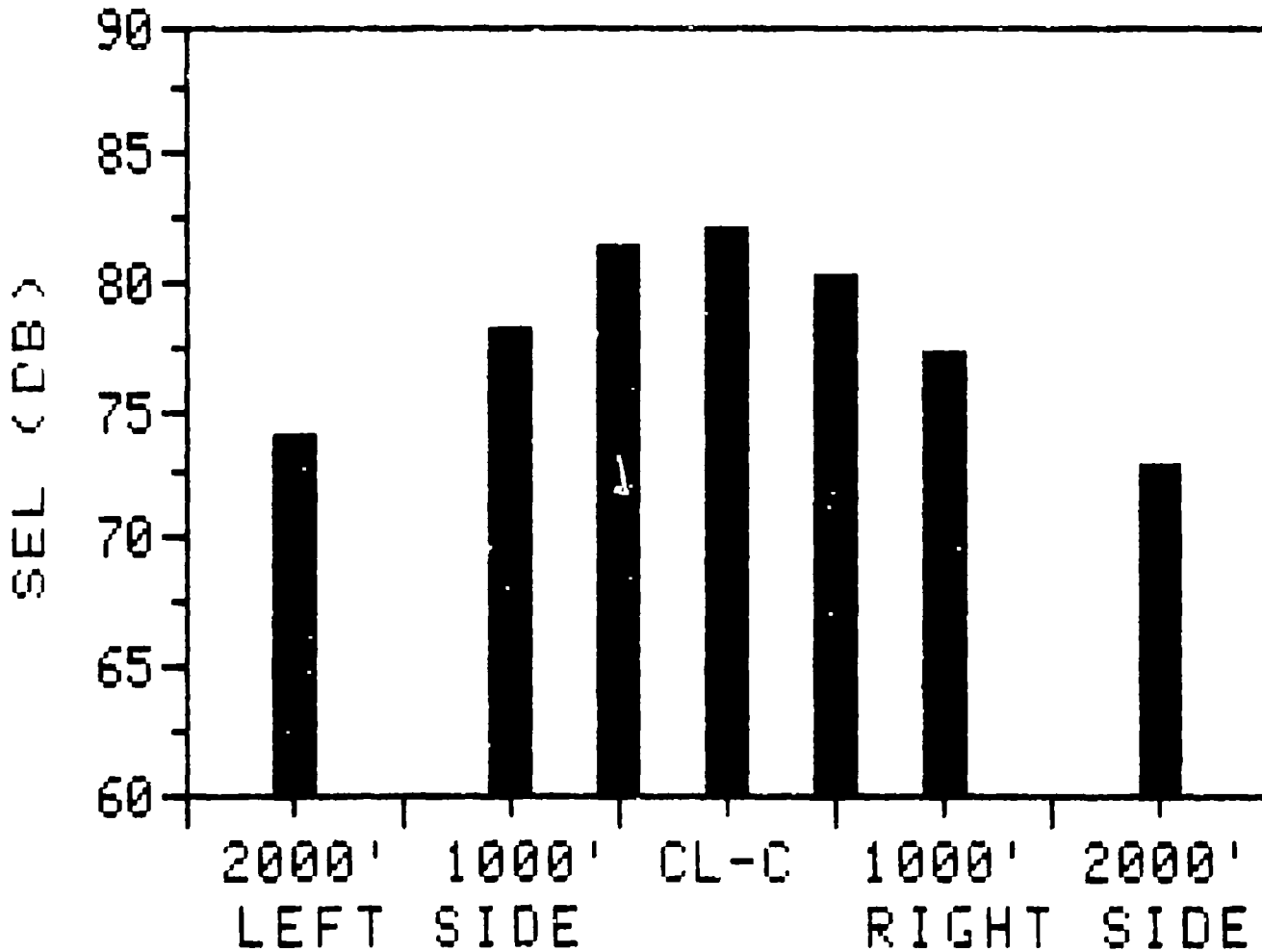
APPROACHES 5000



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 360 | 80-80 | 2.5-4.3 |
| SIX DEG. APPROACH | 430 | 65 | 6.0 |
| NOISE ABATEMENT APP. 9 TARGET, VAR. A/B (EVENTS D64-D67) | 320 | 70-59 | 7.2-8.2 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDED TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN 115 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF 5000



| | | |
|-----------|----------------|--------------------|
| OPERATION | AVG. ALT. OVER | INDICATED AIRSPEED |
| | CLC (FT. AGL) | (KTS.) |

| | | |
|----------------|-----|----|
| NORMAL TAKEOFF | 400 | 36 |
|----------------|-----|----|

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN THE HELICOPTER PASSED OVER CLC MICROPHONE POSITION.

NOISE SUMMARY SHEET (9/10/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEGREE APPROACH AT VY, 65 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 71.4 | 76.5 | 80.5 | 86.8 | 83.7 | 78.2 | 74.7 |
| N | 6 | 5 | 7 | 7 | 7 | 7 | 7 |
| S.D. | .4 | .3 | .6 | 1.2 | 1.2 | .9 | .8 |
| 90% CI | .3 | .2 | .5 | .9 | .9 | .7 | .6 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 71.3 | 77.1 | 80.7 | 86.4 | 82.6 | 77.6 | 73.8 |
| N | 5 | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | .3 | .6 | .6 | 1.7 | 1.0 | .5 | .8 |
| 90% CI | .3 | .5 | .5 | 1.4 | .8 | .4 | .7 |

* NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 71.1 | 76.0 | 79.3 | 83.6 | 79.2 | 74.7 | 85.2 |
| N | 6 | 6 | 5 | 6 | 6 | 6 | 6 |
| S.D. | 1.0 | .7 | .7 | .7 | .7 | .6 | 1.1 |
| 90% CI | .8 | .6 | .6 | .6 | .6 | .5 | .9 |

* NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 70.0 | 75.1 | 78.8 | 83.6 | 83.0 | 79.1 | 74.6 |
| N | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| S.D. | .5 | .7 | .1 | .8 | .5 | .5 | .4 |
| 90% CI | .6 | .8 | .1 | 1.0 | .6 | .6 | .5 |

500D SUMMARY SHEET (9/10/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 70.7 | 75.1 | 78.7 | 83.0 | 82.5 | 79.3 | 75.3 |
| N | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| S.D. | 1.1 | 1.0 | .1 | .5 | .5 | .5 | .5 |
| 90% CI | 1.0 | .9 | .1 | .5 | .5 | .5 | .5 |

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 74.0 | 78.2 | 81.3 | 82.1 | 80.3 | 77.3 | 72.9 |
| N | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | 1.1 | .4 | .6 | .6 | .4 | .5 | 1.1 |
| 90% CI | .9 | .3 | .5 | .5 | .3 | .4 | .9 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : 6 DEGREE APPROACH AT VY, 65 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A39 | 71.60 | -- | 81.10 | 88.20 | 82.90 | 77.50 | 73.90 |
| A40 | 71.40 | 76.10 | 80.50 | 87.10 | 83.70 | 78.50 | 73.90 |
| A41 | -- | -- | 80.80 | 87.40 | 83.90 | 78.40 | 75.10 |
| A42 | 71.30 | 76.80 | 81.50 | 87.90 | 83.80 | 78.20 | 75.80 |
| A43 | 72.00 | 76.40 | 79.80 | 85.70 | 85.40 | 80.00 | 75.40 |
| A44 | 70.80 | 76.50 | 80.00 | 85.70 | 84.60 | 77.90 | 74.20 |
| A45 | 71.10 | 76.50 | 80.10 | 85.30 | 81.50 | 77.10 | 74.30 |
| AVERAGE | 71.37 | 76.46 | 80.54 | 86.76 | 83.69 | 78.23 | 74.66 |
| STD. DEV. | 0.41 | 0.25 | 0.62 | 1.17 | 1.24 | 0.93 | 0.77 |
| 90% C.I. | 0.34 | 0.24 | 0.46 | 0.86 | 0.91 | 0.68 | 0.56 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B46 | 71.50 | 76.50 | 79.80 | 83.00 | 80.80 | 77.00 | 73.60 |
| B48 | 71.70 | 76.80 | 81.10 | 87.40 | 82.60 | 77.40 | 73.90 |
| B50 | 71.00 | 76.90 | 80.20 | 87.40 | 82.40 | 77.70 | 72.90 |
| B52 | 71.20 | 77.20 | 81.00 | 86.80 | 83.70 | 77.80 | 73.60 |
| B54 | -- | 78.20 | 81.20 | 86.40 | 83.40 | 78.40 | 75.30 |
| B56 | 71.10 | 76.80 | 80.70 | 87.40 | 82.60 | 77.50 | 73.50 |
| AVERAGE | 71.30 | 77.07 | 80.67 | 86.40 | 82.58 | 77.63 | 73.80 |
| STD. DEV. | 0.29 | 0.60 | 0.56 | 1.72 | 1.01 | 0.47 | 0.80 |
| 90% C.I. | 0.28 | 0.49 | 0.46 | 1.41 | 0.84 | 0.39 | 0.66 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER; HUGHES 500D

TEST DATE: 9/10/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| C47 | 73.60 | 77.50 | 80.30 | 81.40 | 79.90 | 78.10 | 72.50 |
| C49 | 74.50 | 78.40 | 81.50 | 82.20 | 80.00 | 76.90 | 73.00 |
| C51 | 73.90 | 78.00 | 81.20 | 81.60 | 80.40 | 76.80 | 72.10 |
| C53 | 74.30 | 78.10 | 81.90 | 82.20 | 80.90 | 77.10 | 74.00 |
| C55 | 75.50 | 78.20 | 81.60 | 82.90 | 80.50 | 77.70 | 74.30 |
| C57 | 72.30 | 78.70 | 81.30 | 82.50 | 80.30 | 76.90 | 71.60 |
| AVERAGE | 74.02 | 78.15 | 81.30 | 82.13 | 80.33 | 77.25 | 72.92 |
| STD. DEV. | 1.06 | 0.40 | 0.55 | 0.56 | 0.36 | 0.53 | 1.06 |
| 90% C.I. | 0.88 | 0.33 | 0.45 | 0.46 | 0.30 | 0.44 | 0.88 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | (RIGHT SIDE) | | | CL-C |
|--------------|---------------|---------------|--------------|--------------|---------------|---------------|-------|
| | 2000' EAST | 1000' EAST | 500' EAST | 500' WEST | 1000' WEST | 2000' WEST | |
| D58 | 71.50 | 76.30 | 79.40 | 83.90 | 78.40 | 74.20 | 86.00 |
| D59 | 70.80 | 75.20 | 78.30 | 83.90 | 80.00 | 75.30 | 83.50 |
| D60 | 70.20 | 75.60 | -- | 83.10 | 78.40 | 73.80 | 85.20 |
| D61 | 70.90 | 76.20 | 80.00 | 84.20 | 79.60 | 74.90 | 84.60 |
| D62 | 70.10 | 75.60 | 79.20 | 82.30 | 78.90 | 74.50 | 86.40 |
| D63 | 72.80 | 77.10 | 79.80 | 84.10 | 79.60 | 75.20 | 85.70 |
| AVERAGE | 71.05 | 76.00 | 79.34 | 83.58 | 79.15 | 74.65 | 85.23 |
| STD. DEV. | 1.00 | 0.68 | 0.66 | 0.74 | 0.68 | 0.59 | 1.06 |
| 90% C.I. | 0.82 | 0.56 | 0.63 | 0.61 | 0.56 | 0.49 | 0.87 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : NOISE ABATEMENT APPROACH (9 DEC. TARGET, VAR. A/8)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D64 | 69.80 | 74.70 | 78.70 | 82.50 | 83.30 | 79.50 | 74.40 |
| D65 | 70.10 | 74.80 | 78.80 | 83.60 | 83.40 | 79.60 | 75.00 |
| D66 | 69.50 | 74.60 | 78.80 | 84.10 | 82.40 | 78.60 | 74.10 |
| D67 | 70.60 | 76.10 | 78.70 | 84.30 | 82.70 | 78.70 | 74.80 |
| AVERAGE | 70.00 | 75.05 | 78.75 | 83.63 | 82.95 | 79.10 | 74.58 |
| STD. DEV. | 0.47 | 0.70 | 0.06 | 0.81 | 0.48 | 0.52 | 0.40 |
| 90% C. I. | 0.55 | 0.83 | 0.07 | 0.95 | 0.56 | 0.61 | 0.47 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | | 500' | 1000' | 2000' |
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| D68 | 71.50 | 76.80 | 78.90 | 83.50 | 81.60 | 78.90 | 74.70 |
| D69 | 72.10 | 75.10 | 78.60 | 82.40 | 82.50 | 79.40 | 75.90 |
| D70 | 70.00 | 74.60 | 78.60 | 83.50 | 82.70 | 79.90 | 74.90 |
| D71 | 70.30 | 74.40 | 78.60 | 82.50 | 82.90 | 79.60 | 75.70 |
| D72 | 69.50 | 74.70 | 78.70 | 83.20 | 82.90 | 78.70 | 75.30 |
| AVERAGE | 70.68 | 75.12 | 78.68 | 83.02 | 82.52 | 79.30 | 75.30 |
| STD. DEV. | 1.08 | 0.97 | 0.13 | 0.54 | 0.54 | 0.49 | 0.51 |
| 90% C.I. | 1.03 | 0.93 | 0.12 | 0.51 | 0.51 | 0.47 | 0.49 |

NOISE LEVEL DATA

'as-measured'

A-WEIGHTED SOUND LEVEL (dBA)

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' A-WEIGHTED SOUND LEVEL (dBA) FOR ALL FLIGHT EVENTS. -

- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -

- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -

- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -

- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -

- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -

- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -

- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -

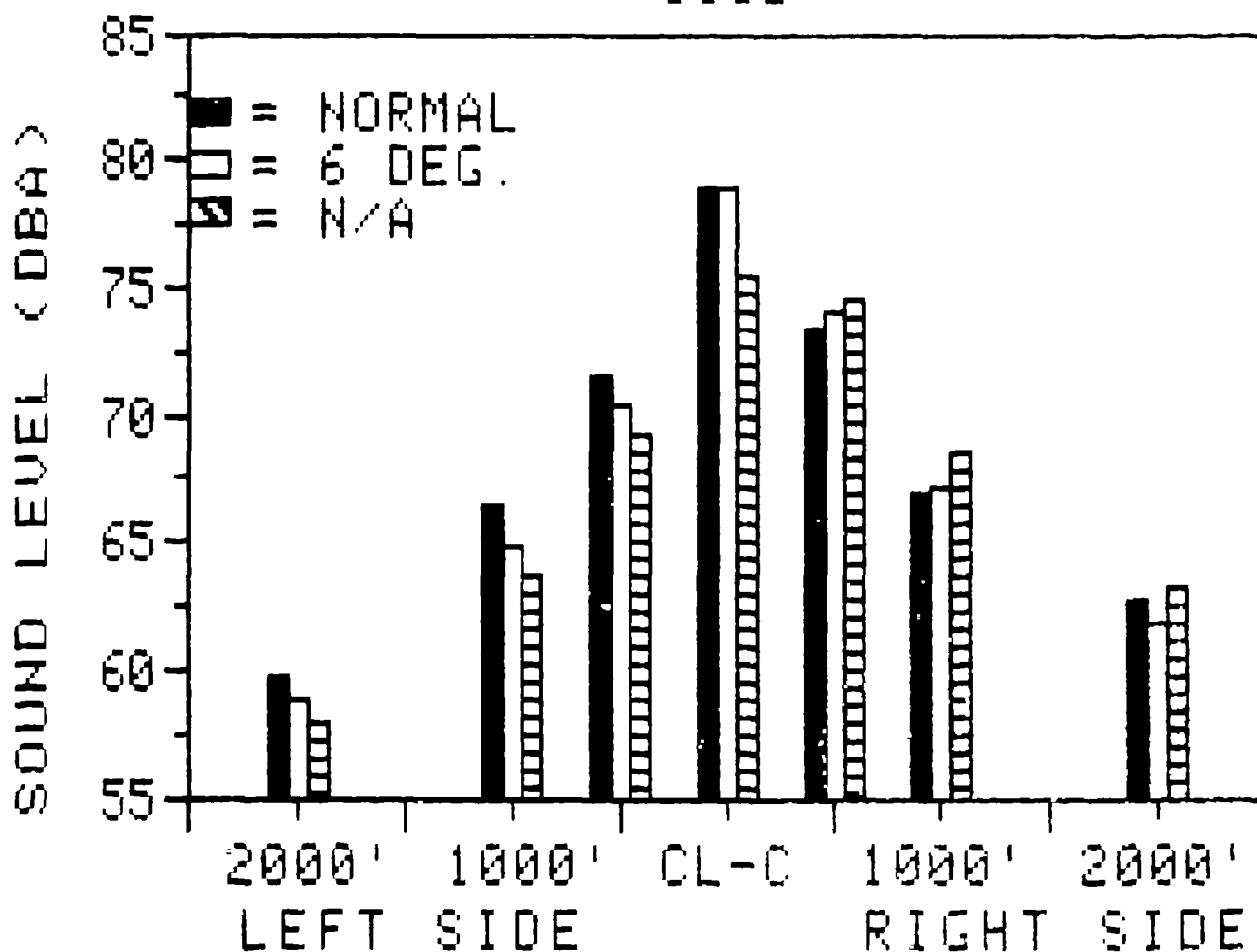
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -

- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -

- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -

- EACH CONDITION IS THEN GIVEN. -

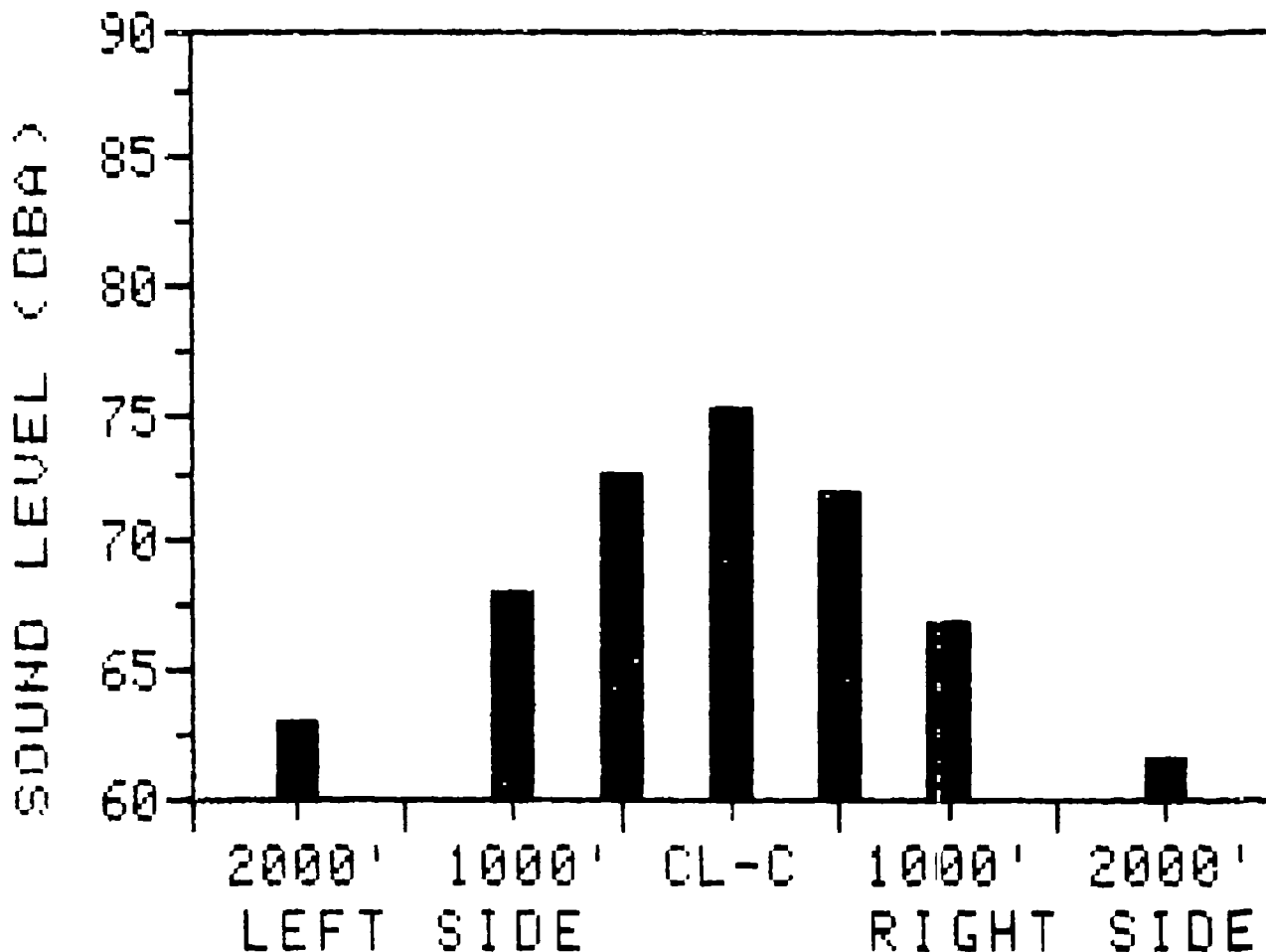
APPROACHES 5000



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 360 | 80-60 | 2.5-4.3 |
| SIX DEG. APPROACH | 430 | 65 | 6.0 |
| NOISE ABATEMENT APP. 9 TARGET, VAR. A/B (EVENTS D64-D67) | 520 | 70-59 | 7.2-8.2 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN ±15 SEC OF THE CL-C MICROPHONE POSITION.

NORMAL TAKEOFF 5000



| | | |
|-----------|-------------------|--------------------|
| OPERATION | OVER. ALT. (FEET) | INDICATED AIRSPEED |
| | (FEET) | (KTS.) |

| | | |
|----------------|------|----|
| NORMAL TAKEOFF | 5000 | 86 |
|----------------|------|----|

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN THE HELICOPTER WAS OVER GND MICROPHONE POSITION

NOISE SUMMARY SHEET (9/10/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEGREE APPROACH AT VY, 65 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 58.7 | 64.7 | 70.4 | 78.8 | 74.1 | 67.2 | 61.8 |
| N | 7 | 5 | 7 | 7 | 7 | 7 | 7 |
| S.D. | .8 | .6 | 1.0 | 1.7 | 1.5 | 1.3 | 1.0 |
| 90% CI | .6 | .6 | .7 | 1.2 | 1.1 | .9 | .7 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 59.7 | 66.4 | 71.6 | 79.0 | 73.4 | 66.9 | 62.8 |
| N | 5 | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | .9 | 1.1 | .3 | 1.9 | 1.0 | .6 | .9 |
| 90% CI | .3 | .9 | .2 | 1.6 | .8 | .5 | .7 |

* NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 58.5 | 64.2 | 69.3 | 77.1 | 75.1 | 68.6 | 63.6 |
| N | 6 | 6 | 5 | 6 | 6 | 6 | 6 |
| S.D. | .8 | 1.0 | .9 | 1.5 | .7 | 1.4 | 1.7 |
| 90% CI | .6 | .8 | .8 | 1.2 | .6 | 1.1 | 1.4 |

* NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 58.0 | 63.6 | 69.1 | 75.5 | 74.4 | 68.6 | 63.1 |
| N | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| S.D. | .4 | 1.1 | .9 | 1.1 | .3 | .6 | .4 |
| 90% CI | .4 | 1.3 | 1.0 | 1.3 | .3 | .8 | .4 |

NOISE SUMMARY SHEET (9/10/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 58.0 | 63.3 | 69.0 | 74.5 | 73.6 | 68.8 | 63.6 |
| N | 5 | 5 | 5 | 5 | 5 | 4 | 5 |
| S.D. | 1.3 | .4 | .2 | .7 | 1.1 | 1.2 | .5 |
| 90% CI | 1.2 | .4 | .2 | .7 | 1.1 | 1.4 | .4 |

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 63.3 | 67.9 | 72.6 | 75.1 | 71.8 | 66.7 | 61.5 |
| N | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| S.D. | 1.2 | .7 | .6 | 1.1 | .6 | .4 | 1.2 |
| 90% CI | 1.0 | .6 | .5 | .9 | .5 | .3 | 1.0 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : 6 DEGREE APPROACH AT VY, 65 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A39 | 58.80 | -- | 71.40 | 81.20 | 73.20 | 66.90 | 61.00 |
| A40 | 58.00 | 64.00 | 69.70 | 79.20 | 73.50 | 66.90 | 62.10 |
| A41 | 59.60 | -- | 70.50 | 79.70 | 75.00 | 68.20 | 62.90 |
| A42 | 57.50 | 65.20 | 71.90 | 80.00 | 73.60 | 66.40 | 62.70 |
| A43 | 58.40 | 64.60 | 69.50 | 76.70 | 76.30 | 68.90 | 62.70 |
| A44 | 58.80 | 65.40 | 69.40 | 77.10 | 75.30 | 68.20 | 60.70 |
| A45 | 59.60 | 64.40 | 70.50 | 77.90 | 71.70 | 65.20 | 60.80 |
| AVERAGE | 58.67 | 64.72 | 70.41 | 78.83 | 74.09 | 67.24 | 61.84 |
| STD. DEV. | 0.78 | 0.58 | 0.96 | 1.65 | 1.54 | 1.27 | 0.98 |
| 90% C.I. | 0.57 | 0.55 | 0.71 | 1.21 | 1.13 | 0.93 | 0.72 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER; HUGHES 500D

TEST DATE: 9/10/84

OPERATION ; NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B46 | 59.40 | 66.40 | 71.20 | 75.60 | 72.20 | 66.40 | 62.10 |
| B48 | 59.50 | 65.90 | 72.00 | 80.20 | 73.30 | 66.30 | 62.30 |
| B50 | 60.30 | 66.70 | 71.40 | 80.70 | 74.90 | 68.00 | 63.00 |
| B52 | 58.60 | 65.50 | 71.70 | 79.10 | 74.30 | 67.10 | 62.70 |
| B54 | -- | 68.30 | 71.70 | 78.20 | 72.80 | 66.50 | 64.40 |
| B56 | 60.80 | 65.50 | 71.50 | 80.40 | 73.00 | 67.10 | 62.00 |
| AVERAGE | 59.72 | 66.38 | 71.58 | 79.03 | 73.42 | 66.90 | 62.75 |
| STD. DEV. | 0.85 | 1.06 | 0.28 | 1.92 | 1.00 | 0.64 | 0.89 |
| 90% C.I. | 0.28 | 0.87 | 0.23 | 1.59 | 0.83 | 0.53 | 0.74 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| C47 | 62.00 | 66.90 | 71.90 | 73.50 | 70.80 | 66.70 | 60.70 |
| C49 | 63.80 | 68.30 | 73.00 | 75.50 | 72.20 | 67.40 | 62.20 |
| C51 | 63.50 | 67.90 | 72.50 | 74.10 | 71.40 | 66.20 | 60.60 |
| C53 | 64.30 | 68.80 | 73.50 | 75.20 | 72.50 | 66.40 | 63.20 |
| C55 | 64.00 | 67.20 | 72.60 | 76.60 | 71.90 | 66.80 | 62.20 |
| C57 | 62.10 | 68.30 | 72.20 | 75.80 | 72.00 | 66.60 | 60.10 |
| AVERAGE | 63.28 | 67.90 | 72.62 | 75.12 | 71.80 | 66.68 | 61.50 |
| STD. DEV. | 1.17 | 0.72 | 0.57 | 1.14 | 0.61 | 0.41 | 1.21 |
| 90% C. I. | 0.96 | 0.60 | 0.47 | 0.94 | 0.50 | 0.34 | 1.00 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D58 | 58.20 | 64.70 | 69.70 | 77.60 | 75.80 | 68.10 | 63.60 |
| D59 | 58.50 | 62.80 | 67.90 | 74.50 | 75.50 | 69.90 | 66.80 |
| D60 | 57.40 | 64.00 | -- | 77.30 | 74.40 | 66.20 | 61.90 |
| D61 | 59.80 | 65.40 | 70.40 | 76.60 | 75.70 | 69.80 | 63.80 |
| D62 | 58.30 | 63.60 | 69.40 | 78.90 | 74.10 | 69.20 | 63.30 |
| D63 | 58.90 | 64.90 | 69.20 | 77.70 | 74.90 | 68.40 | 62.30 |
| AVERAGE | 58.52 | 64.23 | 69.32 | 77.10 | 75.07 | 68.60 | 63.62 |
| STD. DEV. | 0.80 | 0.95 | 0.91 | 1.48 | 0.71 | 1.38 | 1.73 |
| 90% C.I. | 0.63 | 0.75 | 0.83 | 1.17 | 0.56 | 1.09 | 1.37 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|----------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D64 | 57.80 | 62.50 | 68.40 | 74.10 | 74.60 | 68.90 | 63.00 |
| D65 | 58.40 | 62.70 | 68.30 | 75.20 | 74.50 | 69.30 | 63.30 |
| D66 | 58.20 | 64.70 | 69.90 | 76.60 | 74.30 | 68.20 | 62.60 |
| D67 | 57.60 | 64.40 | 69.80 | 76.00 | 74.00 | 67.90 | 63.40 |
| AVERAGE | 58.00 | 63.58 | 69.10 | 75.48 | 74.35 | 68.58 | 63.08 |
| STD. DEV. | 0.37 | 1.14 | 0.87 | 1.08 | 0.26 | 0.64 | 0.36 |
| 90% C. I. | 0.43 | 1.33 | 1.02 | 1.27 | 0.31 | 0.75 | 0.42 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: HUGHES 500D

TEST DATE: 9/10/84

OPERATION : NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/8)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D68 | 60.00 | 63.30 | 69.00 | 74.60 | 71.70 | 67.20 | 62.80 |
| D69 | 58.10 | 63.70 | 68.70 | 73.80 | 73.60 | 69.70 | 64.00 |
| D70 | 56.70 | 62.90 | 69.00 | 75.40 | 73.70 | -- | 63.80 |
| D71 | 57.80 | 63.00 | 69.10 | 73.70 | 74.40 | 69.80 | 63.70 |
| D72 | 57.30 | 63.80 | 69.10 | 75.00 | 74.50 | 68.40 | 63.50 |
| AVERAGE | 57.98 | 63.34 | 68.98 | 74.50 | 73.58 | 68.78 | 63.56 |
| STD. DEV. | 1.25 | 0.40 | 0.16 | 0.74 | 1.13 | 1.23 | 0.46 |
| 90% C.I. | 1.19 | 0.38 | 0.16 | 0.71 | 1.07 | 1.44 | 0.44 |

RADAR TRACKING DATA

THIS SECTION OF THE APPENDIX CONTAINS THE HELICOPTER POSITION DATA AND TRACKING PLOTS DERIVED FROM THE FAH'S PORTABLE TRACKING RADAR SYSTEM. THE POSITION DATA LISTS THE CLOSEST POINT OF APPROACH (CPA), TIME OF CPA, ELEVATION ANGLE, RATE OF CLIMB OR DESCENT, THE CLIMB OR DESCENT ANGLE, AND GROUND SPEED FOR ALL FLIGHT CONDITIONS. TRACKING PLOTS OF THE ACTUAL FLIGHT PROFILE FLOWN ARE PROVIDED FOR EACH FLIGHT CONDITIONS.

HUGHES 500D
POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 109/10/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

SIX DEGREE APPROACH AT VY, 65 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 30 | APP | 398.4 | 77.8 | 12:14:53.3 | -884.2 | -7.5 | 65.0 |
| 40 | APP | 411.0 | 86.3 | 12:19:17.0 | -881.8 | -7.3 | 67.7 |
| 41 | APP | 398.7 | 84.3 | 12:23:47.9 | -708.1 | -5.0 | 67.8 |
| 42 | APP | 372.2 | 86.4 | 12:28:18.8 | -631.3 | -5.5 | 65.1 |
| 43 | APP | 389.7 | 84.6 | 12:33:15.9 | -788.1 | -6.8 | 65.1 |
| 44 | APP | 405.9 | 79.8 | 12:36:37.7 | -736.2 | -6.0 | 69.5 |
| 45 | APP | 385.8 | 85.2 | 12:40:17.1 | -477.0 | -3.7 | 73.3 |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 46 | APP | 340.6 | 88.1 | 12:43:25.5 | -251.3 | -1.7 | 84.6 |
| 48 | APP | 275.9 | 87.9 | 12:47:27.3 | -260.4 | -1.0 | 76.3 |
| 50 | APP | 364.2 | 88.6 | 12:51:07.5 | -459.5 | -3.2 | 78.8 |
| 52 | APP | 353.7 | 88.2 | 12:58:11.3 | -585.3 | -4.2 | 76.3 |
| 54 | APP | 331.2 | 88.1 | 12:59:55.2 | -601.3 | -4.4 | 77.6 |
| 56 | APP | 328.0 | 87.0 | 13:03:47.4 | -603.8 | -4.6 | 73.3 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|---------------------|------------|---------|-------|-------|
| 47 | DEP | 398.7 | 88.9 | 12:44:57.2 | 1009.2 | 6.1 | 98.8 |
| 49 | DEP | 316.7 | 86.2 | 12:48:51.3 | 548.8 | 3.3 | 93.5 |
| 51 | DEP | 344.3 | 78.3 | 12:53:49.0 | 1010.8 | 6.7 | 85.1 |
| 53 | DEP | 299.7 | 81.3 | 12:57:35.1 | 1108.9 | 6.7 | 92.8 |
| 55 | DEP | 785.7 | 16.3 | 13:01:14.9 | -6470.3 | -16.5 | 216.0 |
| 57 | | | ----- NO DATA ----- | | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|-------|------|------------|---------|------|------|
| 58 | APP | 423.3 | 83.9 | 13:15:35.8 | -583.3 | -4.5 | 73.8 |
| 59 | APP | 511.6 | 76.0 | 13:18:50.8 | -1141.6 | -9.2 | 69.7 |
| 60 | APP | 480.6 | 88.6 | 13:22:00.8 | -881.7 | -6.0 | 70.7 |
| 61 | APP | 480.8 | 84.9 | 13:25:30.5 | -695.8 | -4.9 | 80.8 |
| 62 | APP | 362.2 | 86.9 | 13:29:01.6 | -456.9 | -3.7 | 68.9 |
| 63 | APP | 485.2 | 78.7 | 13:38:07.9 | -735.6 | -6.1 | 68.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 09/10/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|-------|----------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S) | | | | | | | |
| 64 | APP | 487.7 | 78.1 | 13:39:00.5 | -1132.1 | -9.6 | 66.3 |
| 65 | APP | 478.7 | 80.2 | 13:41:48.2 | -1078.1 | -8.8 | 68.8 |
| 66 | APP | 416.5 | 78.8 | 13:44:34.7 | -789.3 | -8.1 | 72.0 |
| 67 | APP | 426.1 | 84.5 | 13:47:19.1 | -914.3 | -7.8 | 65.6 |
| NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S) | | | | | | | |
| 68 | APP | 534.4 | 80.8 | 13:50:49.1 | -1110.7 | -9.7 | 64.3 |
| 69 | APP | 628.3 | 86.5 | 13:53:44.1 | -1270.7 | -10.2 | 60.5 |
| 70 | APP | 461.7 | 78.9 | 13:58:48.1 | -859.7 | -7.2 | 66.0 |
| 71 | APP | 605.7 | 81.2 | 14:01:57.6 | -972.9 | -7.1 | 70.0 |
| 72 | APP | 482.1 | 77.0 | 14:05:12.3 | -1121.6 | -9.0 | 70.2 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 500 FT. EAST

DATE 109/10/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|------------------------------------|--------|-------|----------|------------|--------|------|------|
| SIX DEGREE APPROACH AT VY, 65 KTS. | | | | | | | |
| 39 | APP | 646.4 | 37.6 | 12:14:52.9 | -976.4 | -8.7 | 63.3 |
| 40 | APP | 663.8 | 37.6 | 12:19:18.5 | -858.4 | -7.1 | 67.0 |
| 41 | APP | 667.6 | 36.5 | 12:23:47.9 | -708.0 | -5.0 | 67.8 |
| 42 | APP | 623.9 | 36.8 | 12:28:18.7 | -648.8 | -5.6 | 65.2 |
| 43 | APP | 659.8 | 36.2 | 12:33:15.9 | -788.1 | -6.8 | 65.1 |
| 44 | APP | 655.4 | 37.8 | 12:36:37.7 | -736.2 | -6.0 | 69.5 |
| 45 | APP | 605.1 | 40.1 | 12:40:16.9 | -495.9 | -3.8 | 73.0 |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|---------|------------|--------|------|------|
| 46 | | | NO DATA | | | | |
| 48 | APP | 574.0 | 29.1 | 12:47:26.6 | -341.3 | -2.5 | 78.1 |
| 50 | APP | 592.4 | 31.1 | 12:51:07.5 | -450.4 | -3.2 | 78.6 |
| 52 | APP | 620.9 | 34.9 | 12:56:11.2 | -556.8 | -4.1 | 76.3 |
| 54 | APP | 601.5 | 33.6 | 12:59:55.8 | -601.3 | -4.4 | 77.6 |
| 56 | APP | 593.9 | 33.8 | 13:03:47.3 | -595.5 | -4.6 | 73.3 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|---------|------------|--------|-----|-------|
| 47 | DEP | 627.7 | 38.6 | 12:44:57.2 | 1008.7 | 6.1 | 92.8 |
| 49 | DEP | 588.7 | 32.8 | 12:48:51.4 | 542.4 | 3.3 | 93.7 |
| 51 | DEP | 636.2 | 33.3 | 12:53:49.5 | 896.0 | 5.7 | 88.3 |
| 53 | DEP | 614.5 | 30.1 | 12:57:35.3 | 1083.1 | 6.5 | 93.5 |
| 55 | DEP | 629.9 | -1.4 | 13:01:26.3 | 2552.0 | 8.0 | 178.2 |
| 57 | | | NO DATA | | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|-------|------|------------|---------|------|------|
| 58 | APP | 670.6 | 39.0 | 13:15:35.8 | -583.1 | -4.5 | 73.8 |
| 59 | APP | 737.3 | 41.7 | 13:18:51.5 | -1076.7 | -8.6 | 70.3 |
| 60 | APP | 694.1 | 44.1 | 13:22:09.5 | -868.8 | -6.9 | 70.3 |
| 61 | APP | 673.4 | 43.2 | 13:25:30.5 | -695.4 | -4.9 | 80.8 |
| 62 | APP | 627.4 | 35.4 | 13:29:01.6 | -456.8 | -3.7 | 68.9 |
| 63 | APP | 646.8 | 41.6 | 13:36:07.1 | -823.9 | -6.8 | 67.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE: 09/10/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|--|--------|-------|----------|------------|---------|------|------|
| NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S) | | | | | | | |
| 64 | APP | 702.5 | 42.5 | 13:39:00.7 | -1147.7 | -9.4 | 67.0 |
| 65 | APP | 686.0 | 42.8 | 13:41:48.6 | -981.7 | -8.1 | 68.0 |
| 66 | APP | 636.5 | 40.0 | 13:44:34.8 | -783.4 | -6.0 | 73.0 |
| 67 | APP | 659.7 | 40.1 | 13:47:19.4 | -933.7 | -7.9 | 66.6 |

NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|------|
| 68 | APP | 694.5 | 50.8 | 13:50:48.7 | -1091.8 | -9.5 | 64.5 |
| 69 | APP | 804.1 | 51.5 | 13:53:44.1 | -1270.9 | -10.0 | 60.5 |
| 70 | APP | 666.7 | 43.0 | 13:58:48.1 | -859.2 | -7.2 | 66.0 |
| 71 | APP | 779.2 | 51.4 | 14:01:57.1 | -859.0 | -6.5 | 75.0 |
| 72 | APP | 690.4 | 43.1 | 14:05:12.3 | -1121.6 | -9.0 | 70.2 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 09/10/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

SIX DEGREE APPROACH AT VY, 65 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 39 | APP | 623.2 | 38.0 | 12:14:53.3 | -884.3 | -7.5 | 65.0 |
| 40 | APP | 609.1 | 40.1 | 12:19:18.2 | -878.7 | -7.3 | 68.0 |
| 41 | APP | 600.0 | 40.2 | 12:23:48.6 | -671.3 | -5.6 | 67.1 |
| 42 | APP | 612.5 | 37.7 | 12:28:18.5 | -690.7 | -6.6 | 65.0 |
| 43 | APP | 604.0 | 39.7 | 12:33:16.5 | -715.8 | -6.3 | 64.5 |
| 44 | APP | 624.5 | 38.8 | 12:36:37.0 | -770.6 | -6.0 | 69.0 |
| 45 | APP | 645.1 | 35.6 | 12:40:18.4 | -486.3 | -3.7 | 75.0 |

NORMAL APPROACH

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 46 | APP | 594.0 | 34.0 | 12:43:25.6 | -241.3 | -1.6 | 84.8 |
| 48 | APP | 561.2 | 29.5 | 12:47:27.1 | -272.3 | -1.0 | 77.5 |
| 50 | APP | 576.0 | 31.9 | 12:51:07.3 | -474.6 | -3.4 | 78.7 |
| 52 | APP | 603.5 | 35.5 | 12:56:11.0 | -565.2 | -4.2 | 76.0 |
| 54 | APP | 598.8 | 34.3 | 12:59:55.5 | -634.2 | -4.7 | 76.7 |
| 56 | APP | 596.0 | 33.0 | 13:03:46.0 | -577.0 | -4.5 | 73.0 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|---------|------------|---------|-------|-------|
| 47 | DEP | 592.6 | 41.4 | 12:44:56.0 | 973.6 | 5.0 | 90.7 |
| 49 | DEP | 575.3 | 32.0 | 12:48:50.3 | 505.6 | 3.0 | 94.3 |
| 51 | DEP | 576.1 | 35.8 | 12:53:40.0 | 1010.4 | 6.7 | 85.1 |
| 53 | DEP | 527.8 | 33.7 | 12:57:34.8 | 1122.0 | 6.8 | 90.7 |
| 55 | DEP | 917.7 | 14.0 | 13:01:14.8 | -6596.6 | -16.5 | 200.0 |
| 57 | | | NO DATA | | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|-------|------|------------|---------|------|------|
| 58 | APP | 619.8 | 42.6 | 13:15:37.1 | -524.8 | -4.1 | 71.0 |
| 59 | APP | 688.3 | 46.2 | 13:18:50.8 | -1141.6 | -9.2 | 69.7 |
| 60 | APP | 685.0 | 44.2 | 13:22:09.9 | -844.8 | -6.6 | 70.0 |
| 61 | APP | 686.0 | 42.1 | 13:25:30.4 | -791.7 | -4.9 | 80.0 |
| 62 | APP | 597.1 | 36.8 | 13:29:02.5 | -645.7 | -5.3 | 68.2 |
| 63 | APP | 663.5 | 40.2 | 13:36:07.4 | -811.7 | -5.7 | 67.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM
 500 FT. WEST

DATE 109/10/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--|-----|--------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S) | | | | | | | |
| 64 | APP | 694.3 | 43.4 | 13:39:00.5 | -1132.0 | -9.6 | 66.3 |
| 65 | APP | 698.0 | 42.4 | 13:41:48.3 | -1052.0 | -8.6 | 68.8 |
| 66 | APP | 661.6 | 38.7 | 13:44:34.5 | -814.0 | -6.3 | 72.3 |
| 67 | APP | 652.3 | 41.3 | 13:47:18.8 | -885.4 | -7.5 | 66.3 |

| | | | | | | | |
|---|-----|-------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S) | | | | | | | |
| 68 | APP | 730.0 | 46.2 | 13:50:49.6 | -1134.5 | -9.8 | 65.0 |
| 69 | APP | 803.4 | 51.3 | 13:53:44.1 | -1270.0 | -10.2 | 60.5 |
| 70 | APP | 695.3 | 40.5 | 13:58:48.2 | -846.0 | -7.1 | 68.8 |
| 71 | APP | 771.6 | 51.2 | 14:01:58.1 | -1106.8 | -8.0 | 77.6 |
| 72 | APP | 695.9 | 45.0 | 14:05:11.6 | -1146.2 | -9.1 | 70.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE: 09/10/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|--------|------|------------|--------|-------|------|
| SIX DEGREE APPROACH AT VY, 65 KTS. | | | | | | |
| 39 APP | 975.4 | 23.8 | 12:14:47.8 | -787.0 | -19.0 | 82.6 |
| 40 APP | 1100.2 | 21.7 | 12:19:18.5 | -858.4 | -7.1 | 67.0 |
| 41 APP | 1110.8 | 21.0 | 12:23:47.9 | -708.0 | -8.0 | 67.8 |
| 42 APP | 1067.6 | 20.6 | 12:28:18.7 | -648.8 | -8.6 | 65.0 |
| 43 APP | 1103.9 | 21.1 | 12:33:15.7 | -808.1 | -7.0 | 64.0 |
| 44 APP | 1092.0 | 21.7 | 12:36:37.7 | -736.0 | -6.0 | 60.5 |
| 45 APP | 1039.4 | 22.1 | 12:40:16.0 | -495.0 | -3.8 | 73.0 |

NORMAL APPROACH

| | | | | | | |
|--------|--------|------|------------|--------|------|------|
| 46 APP | 1055.7 | 19.2 | 12:43:25.0 | -630.4 | -7.2 | 85.5 |
| 48 APP | 1036.7 | 15.7 | 12:47:26.6 | -341.3 | -2.5 | 70.1 |
| 50 APP | 1051.2 | 17.0 | 12:51:07.0 | -512.0 | -3.6 | 70.5 |
| 52 APP | 1070.3 | 19.5 | 12:56:11.2 | -556.8 | -4.1 | 76.4 |
| 54 APP | 1054.5 | 18.5 | 12:59:56.4 | -571.3 | -3.8 | 76.5 |
| 56 APP | 1047.5 | 18.5 | 13:03:47.3 | -675.5 | -4.6 | 73.0 |

NORMAL TAKEOFF

| | | | | | | |
|--------|---------------------|------|------------|--------|-----|-------|
| 47 DEP | 1064.8 | 21.7 | 12:44:57.2 | 1008.7 | 9.1 | 80.8 |
| 49 DEP | 1043.5 | 18.3 | 12:48:51.0 | 546.3 | 3.2 | 85.1 |
| 51 DEP | 1087.8 | 19.1 | 12:53:49.6 | 800.3 | 5.2 | 80.0 |
| 53 DEP | 1066.6 | 13.2 | 12:57:31.2 | 805.7 | 5.2 | 97.0 |
| 55 DEP | 594.0 | -1.3 | 13:01:26.3 | 2552.0 | 9.0 | 178.2 |
| 57 | ----- NO DATA ----- | | | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. AFS)

| | | | | | | |
|--------|--------|------|------------|---------|------|------|
| 58 APP | 1103.4 | 23.0 | 13:15:35.5 | -604.7 | -4.6 | 74.0 |
| 59 APP | 1147.5 | 25.4 | 13:18:51.5 | -1076.7 | -8.0 | 70.0 |
| 60 APP | 1110.2 | 25.9 | 13:22:09.5 | -868.8 | -5.0 | 70.5 |
| 61 APP | 1091.2 | 25.4 | 13:25:29.0 | -708.0 | -5.1 | 80.0 |
| 62 APP | 1075.2 | 19.9 | 13:29:01.6 | -456.9 | -3.7 | 68.0 |
| 63 APP | 1074.3 | 23.7 | 13:36:07.1 | -803.0 | -6.3 | 67.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE: 09/10/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--|-----|--------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S) | | | | | | | |
| 64 | APP | 1116.9 | 25.2 | 13:39:00.7 | -1117.7 | -9.4 | 67.0 |
| 65 | APP | 1099.1 | 25.2 | 13:41:48.6 | -981.7 | -8.1 | 68.0 |
| 66 | APP | 1065.8 | 22.7 | 13:44:34.8 | -783.4 | -6.0 | 73.0 |
| 67 | APP | 1089.2 | 23.1 | 13:47:19.4 | -933.7 | -7.0 | 66.6 |

NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|------|------------|---------|-------|------|
| 68 | APP | 1082.7 | 30.3 | 13:50:48.5 | -1061.9 | -9.3 | 64.1 |
| 69 | APP | 1182.5 | 32.3 | 13:53:44.1 | -1270.9 | -10.2 | 69.5 |
| 70 | APP | 1084.4 | 24.9 | 13:58:48.1 | -859.2 | -7.2 | 66.0 |
| 71 | APP | 1159.8 | 31.8 | 14:01:57.1 | -859.0 | -6.5 | 75.0 |
| 72 | APP | 1105.0 | 25.4 | 14:05:12.3 | -1121.6 | -9.0 | 70.2 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE 09/10/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|--------|--------|----------|------------|--------|------------|
| SIX DEGREE APPROACH AT VY, 65 KTS. | | | | | | |
| 39 | APP | 1057.3 | 23.2 | 12:14:51.0 | -282.9 | -1.3 120.5 |
| 40 | APP | 1035.4 | 23.3 | 12:19:18.2 | -878.7 | -7.0 88.0 |
| 41 | APP | 1005.2 | 24.7 | 12:23:46.2 | -778.3 | -6.5 87.3 |
| 42 | APP | 1054.3 | 20.9 | 12:28:18.5 | -690.7 | -6.0 85.2 |
| 43 | APP | 1036.8 | 21.9 | 12:33:16.5 | -715.8 | -6.3 84.5 |
| 44 | APP | 1054.8 | 22.3 | 12:36:38.0 | -786.5 | -6.4 80.7 |
| 45 | APP | 1075.7 | 20.6 | 12:40:18.5 | -487.7 | -3.7 75.0 |

NORMAL APPROACH

| | | | | | | |
|----|-----|--------|------|------------|--------|-----------|
| 46 | APP | 1040.5 | 18.8 | 12:43:27.2 | -341.9 | -2.2 86.5 |
| 48 | APP | 1026.5 | 15.7 | 12:47:27.1 | -272.0 | -2.0 77.5 |
| 50 | APP | 1035.1 | 17.2 | 12:51:07.3 | -474.6 | -3.4 78.7 |
| 52 | APP | 1049.3 | 19.4 | 12:56:12.0 | -645.2 | -4.8 75.6 |
| 54 | APP | 1059.7 | 18.8 | 12:59:55.5 | -634.2 | -4.7 76.7 |
| 56 | APP | 1048.2 | 18.6 | 13:03:46.9 | -577.0 | -4.5 73.0 |

NORMAL TAKEOFF

| | | | | | | |
|----|-----|--------|------|------------|---------|-------------|
| 47 | DEP | 1016.1 | 22.8 | 12:44:56.0 | 873.6 | 5.0 92.7 |
| 49 | DEP | 1018.6 | 17.5 | 12:48:50.3 | 505.6 | 3.0 94.3 |
| 51 | DEP | 1023.0 | 20.4 | 12:53:50.1 | 733.3 | 4.7 88.1 |
| 53 | DEP | 982.4 | 17.5 | 12:57:34.8 | 1182.0 | 6.8 92.7 |
| 55 | DEP | 1252.0 | 10.3 | 13:01:14.7 | -6687.4 | -16.5 223.3 |
| 57 | | | | NO DATA | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|--------|------|------------|---------|-----------|
| 58 | APP | 1024.1 | 24.3 | 13:15:37.1 | -524.8 | -4.1 71.0 |
| 59 | APP | 1089.8 | 27.2 | 13:18:50.8 | -1141.6 | -9.2 69.7 |
| 60 | APP | 1100.0 | 25.8 | 13:22:09.0 | -844.8 | -6.6 72.0 |
| 61 | APP | 1100.4 | 24.6 | 13:25:30.4 | -701.7 | -4.0 80.0 |
| 62 | APP | 1033.2 | 20.9 | 13:29:02.5 | -645.7 | -5.3 88.0 |
| 63 | APP | 1093.7 | 23.1 | 13:36:07.4 | -811.7 | -6.7 67.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. UEST

DATE 09/10/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|--------|--------|----------|------------|---------|-----------|
| NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S) | | | | | | |
| 64 | APP | 1107.1 | 26.0 | 13:38:59.5 | -1063.3 | -8.8 67.6 |
| 65 | APP | 1116.2 | 24.6 | 13:41:48.8 | -981.9 | -7.9 68.0 |
| 66 | APP | 1091.0 | 21.3 | 13:44:38.3 | -848.5 | -5.8 70.0 |
| 67 | APP | 1080.5 | 23.6 | 13:47:18.8 | -888.4 | -7.6 66.3 |
| NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S) | | | | | | |
| 68 | APP | 1130.4 | 27.0 | 13:50:49.6 | -1134.8 | -9.8 65.0 |
| 69 | APP | 1182.5 | 32.1 | 13:53:44.4 | -1223.2 | -9.8 70.0 |
| 70 | APP | 1120.1 | 23.8 | 13:58:48.8 | -775.1 | -6.5 67.1 |
| 71 | APP | 1142.8 | 31.0 | 14:01:58.1 | -1106.8 | -8.0 77.6 |
| 72 | APP | 1107.0 | 26.5 | 14:05:11.8 | -1146.2 | -9.1 70.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 109/10/84

XXFAA/AEEXX

EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

SIX DEGREE APPROACH AT VY, 65 KTS.

| | | | | | | | |
|----|-----|--------|------|------------|--------|-------|------|
| 30 | APP | 1782.7 | 12.0 | 12:14:47.8 | -787.0 | -10.0 | 82.0 |
| 40 | APP | 2061.5 | 11.5 | 12:19:18.5 | -858.4 | -7.1 | 87.0 |
| 41 | APP | 2076.1 | 11.2 | 12:23:47.0 | -788.0 | -5.0 | 87.0 |
| 42 | APP | 2034.8 | 10.7 | 12:28:18.7 | -648.3 | -5.0 | 85.2 |
| 43 | APP | 2050.5 | 11.2 | 12:33:15.7 | -858.1 | -7.0 | 84.0 |
| 44 | APP | 2055.2 | 11.4 | 12:36:37.7 | -736.2 | -5.0 | 69.0 |
| 45 | APP | 2022.1 | 11.4 | 12:40:16.0 | -495.0 | -3.0 | 73.0 |

NORMAL APPROACH

| | | | | | | | |
|----|-----|--------|------|------------|--------|------|------|
| 46 | APP | 2026.0 | 10.0 | 12:43:25.0 | -330.4 | -1.0 | 85.0 |
| 48 | APP | 2016.2 | 8.1 | 12:47:26.6 | -341.3 | -2.0 | 78.1 |
| 50 | APP | 2028.0 | 8.0 | 12:51:07.0 | -512.0 | -3.0 | 70.5 |
| 52 | APP | 2040.6 | 10.4 | 12:56:10.5 | -501.3 | -3.0 | 75.5 |
| 54 | APP | 2027.0 | 9.6 | 12:59:56.4 | -521.0 | -3.0 | 76.5 |
| 56 | APP | 2021.5 | 9.6 | 13:03:47.3 | -595.5 | -4.0 | 73.3 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|--------|------|------------|--------|-----|-------|
| 47 | DEP | 2028.0 | 11.3 | 12:44:57.2 | 1008.7 | 3.1 | 82.8 |
| 49 | DEP | 2017.0 | 9.4 | 12:49:51.0 | 540.0 | 3.0 | 85.1 |
| 51 | DEP | 2035.8 | 7.4 | 12:53:45.6 | 904.7 | 3.0 | 86.4 |
| 53 | DEP | 1972.3 | 7.2 | 12:57:31.2 | 895.7 | 3.0 | 87.0 |
| 55 | DEP | 1329.3 | -0.4 | 13:01:26.3 | 2552.0 | 0.0 | 178.0 |
| 57 | | | | NO DATA | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|------|------------|---------|------|------|
| 58 | APP | 2061.8 | 12.2 | 13:15:35.5 | -604.7 | -4.6 | 74.0 |
| 59 | APP | 2088.6 | 13.7 | 13:18:51.5 | -1076.7 | -6.6 | 70.3 |
| 60 | APP | 2057.5 | 12.7 | 13:22:00.5 | -860.0 | -5.0 | 70.5 |
| 61 | APP | 2039.8 | 13.4 | 13:25:20.7 | -744.7 | -5.0 | 69.5 |
| 62 | APP | 2044.0 | 10.6 | 13:29:00.7 | -384.2 | -1.1 | 70.5 |
| 63 | APP | 2031.0 | 12.4 | 13:36:07.1 | -823.0 | -6.0 | 67.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. EAST

XXFAA/AEEX

DATE 09/10/84

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|-----|--------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. P/S) | | | | | | | |
| 64 | APP | 2061.1 | 14.2 | 13:38:59.7 | -1072.0 | -3.9 | 67.4 |
| 65 | APP | 2045.1 | 13.3 | 13:41:48.6 | -981.7 | -4.1 | 68.0 |
| 66 | APP | 2024.2 | 11.8 | 13:44:34.8 | -783.4 | -6.0 | 73.0 |
| 67 | APP | 2045.0 | 11.6 | 13:47:20.6 | -863.4 | -7.4 | 65.4 |
| NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. P/S) | | | | | | | |
| 68 | APP | 2011.5 | 15.8 | 13:50:48.5 | -1041.0 | -6.3 | 64.1 |
| 69 | APP | 2005.2 | 16.8 | 13:53:46.0 | -1149.0 | -8.0 | 60.7 |
| 70 | APP | 2032.7 | 13.7 | 13:58:47.5 | -1005.5 | -5.4 | 77.0 |
| 71 | APP | 2078.6 | 17.2 | 14:01:57.1 | -850.0 | -6.5 | 75.0 |
| 72 | APP | 2051.6 | 13.5 | 14:05:12.0 | -1121.0 | -6.0 | 70.2 |

- CPA-FT : CLOSEST POINT OF APPROACH
- E-A : ELEVATION ANGLE
- CPA-TIME : CLOSEST POINT OF APPROACH TIME
- RC-FPM : RATE OF CLIMB
- C/D-A : CLIMB OR DESCENT ANGLE
- GS-K : GROUND SPEED

HUGHES 500D
POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE 109/10/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

SIX DEGREE APPROACH AT VV, 65 KTS.

| | | | | | | | |
|----|-----|--------|------|------------|--------|------|-------|
| 39 | APP | 2013.0 | 11.6 | 12:14:51.0 | -282.0 | -1.3 | 120.5 |
| 40 | APP | 1990.3 | 11.5 | 12:19:18.2 | -878.7 | -7.0 | 68.0 |
| 41 | APP | 1946.0 | 12.1 | 12:23:46.2 | -778.3 | -6.5 | 67.3 |
| 42 | APP | 2005.0 | 10.0 | 12:28:21.7 | -434.4 | -3.7 | 65.0 |
| 43 | APP | 1995.7 | 10.8 | 12:33:16.5 | -715.8 | -6.9 | 64.5 |
| 44 | APP | 2011.0 | 11.1 | 12:36:38.0 | -786.5 | -6.4 | 60.7 |
| 45 | APP | 2029.8 | 10.4 | 12:40:18.5 | -497.7 | -3.7 | 75.0 |

NORMAL APPROACH

| | | | | | | | |
|----|-----|--------|-----|------------|--------|------|------|
| 46 | APP | 1996.0 | 8.3 | 12:43:27.2 | -341.0 | -2.2 | 86.5 |
| 48 | APP | 2005.7 | 7.6 | 12:47:27.1 | -272.3 | -2.0 | 77.5 |
| 50 | APP | 2010.2 | 8.4 | 12:51:07.3 | -474.6 | -3.4 | 78.7 |
| 52 | APP | 2014.1 | 9.6 | 12:56:12.0 | -645.2 | -4.8 | 75.6 |
| 54 | APP | 2021.0 | 9.3 | 12:59:59.5 | -634.2 | -4.7 | 76.7 |
| 56 | APP | 2013.4 | 8.3 | 13:03:50.6 | -370.6 | -2.0 | 74.1 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|--------|------|------------|---------|-------|-------|
| 47 | DEP | 1970.3 | 11.2 | 12:44:56.0 | 973.6 | 5.0 | 82.7 |
| 49 | DEP | 1979.1 | 8.4 | 12:48:49.4 | 417.4 | 2.9 | 95.8 |
| 51 | DEP | 1986.1 | 10.0 | 12:53:50.1 | 733.3 | 4.7 | 88.1 |
| 53 | DEP | 1956.8 | 8.3 | 12:57:34.8 | 1122.0 | 6.8 | 92.7 |
| 55 | DEP | 2121.0 | 5.7 | 13:01:14.7 | -6687.4 | -16.5 | 223.3 |
| 57 | | | | NO DATA | | | |

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|------|------------|---------|------|------|
| 58 | APP | 1965.0 | 12.0 | 13:15:37.1 | -524.8 | -4.1 | 71.0 |
| 59 | APP | 2024.5 | 13.0 | 13:18:51.0 | -1112.2 | -8.0 | 70.2 |
| 60 | APP | 2043.4 | 13.4 | 13:22:09.2 | -898.2 | -7.1 | 70.6 |
| 62 | APP | 2045.1 | 12.1 | 13:25:32.4 | -662.0 | -4.0 | 78.0 |
| 61 | APP | 1994.6 | 10.0 | 13:29:02.5 | -645.7 | -5.3 | 68.2 |
| 63 | APP | 2048.1 | 11.8 | 13:36:07.4 | -811.7 | -6.7 | 67.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

HUGHES 500D
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE 109/10/84

FAA/AEE

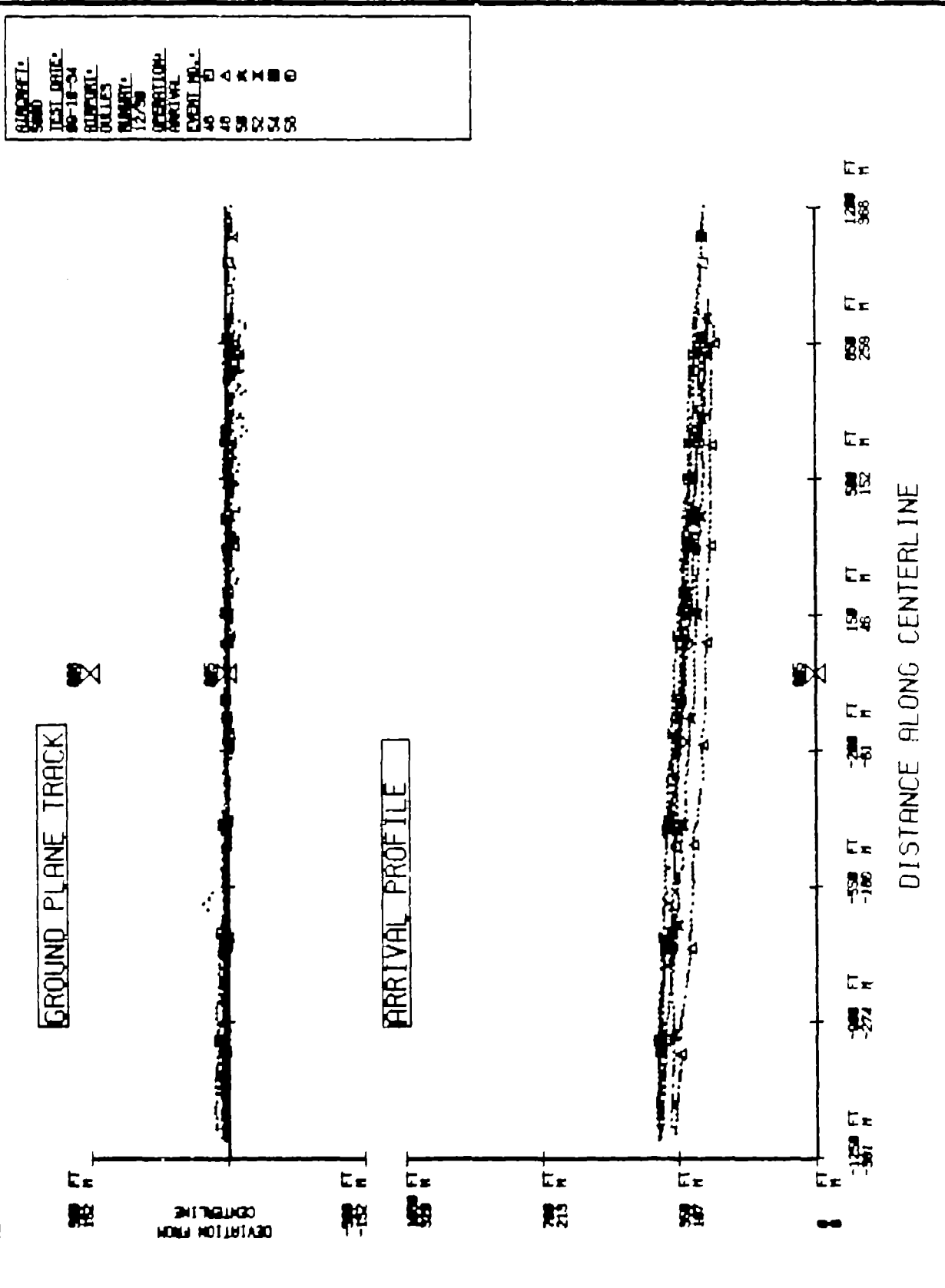
| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|--|-----|--------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S) | | | | | | | |
| 64 | APP | 2046.7 | 13.8 | 13:38:59.5 | -1063.3 | -8.8 | 67.6 |
| 65 | APP | 2044.6 | 12.0 | 13:41:51.4 | -911.7 | -7.6 | 67.9 |
| 66 | APP | 2034.5 | 10.9 | 13:44:36.3 | -645.5 | -5.2 | 70.0 |
| 67 | APP | 2034.2 | 11.9 | 13:47:18.8 | -885.4 | -7.5 | 65.3 |

NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S)

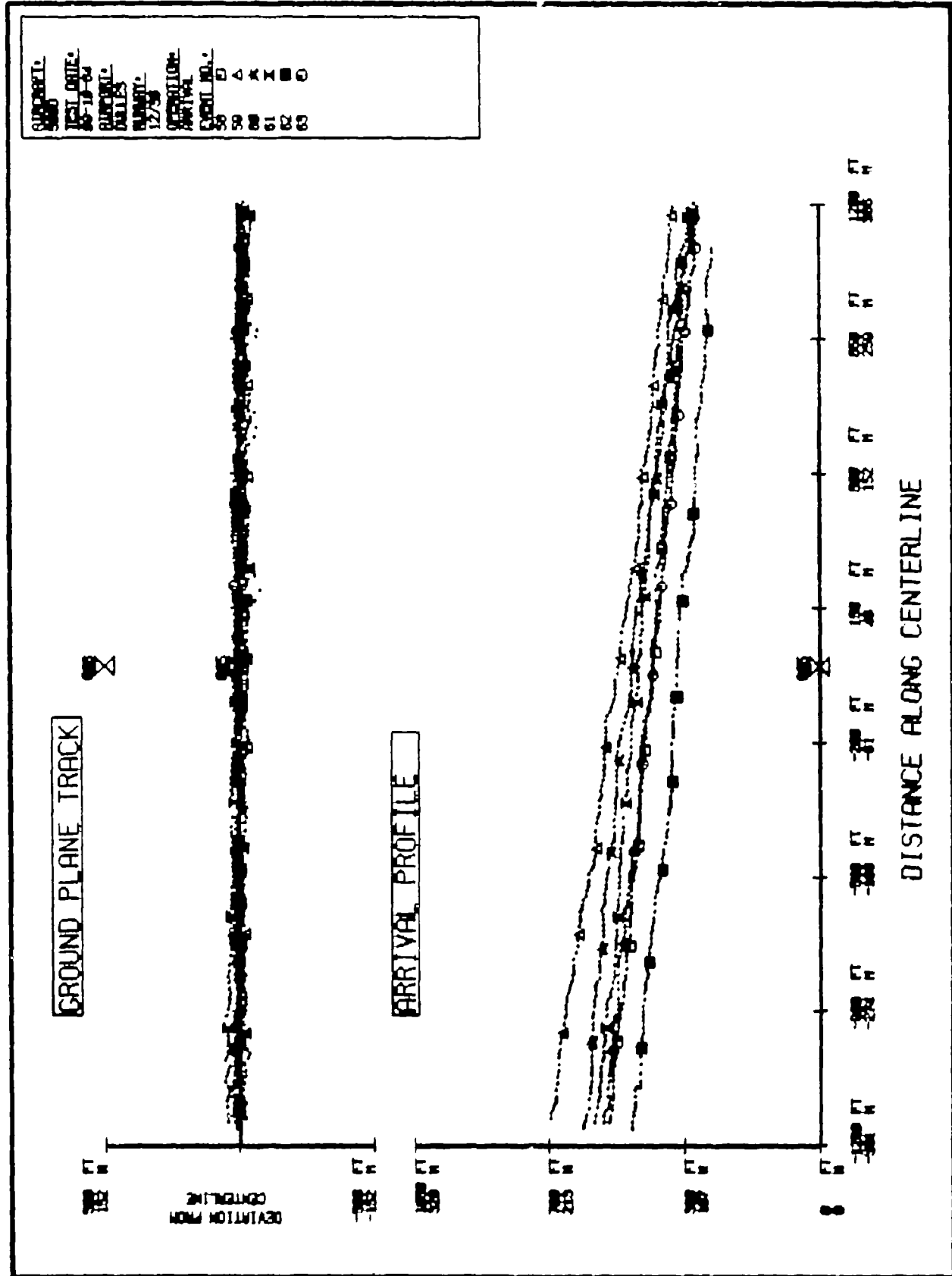
| | | | | | | | |
|----|-----|--------|------|------------|---------|------|------|
| 68 | APP | 2061.7 | 14.5 | 13:50:49.6 | -1134.5 | -9.8 | 65.0 |
| 69 | APP | 2091.8 | 17.1 | 13:53:44.9 | -1146.9 | -9.1 | 70.6 |
| 70 | APP | 2053.5 | 11.8 | 13:58:50.5 | -891.3 | -7.6 | 66.1 |
| 71 | APP | 2051.3 | 16.8 | 14:01:58.1 | -1106.8 | -8.0 | 77.6 |
| 72 | APP | 2048.9 | 13.6 | 14:05:11.6 | -1146.2 | -9.1 | 70.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

NORMAL APPROACH



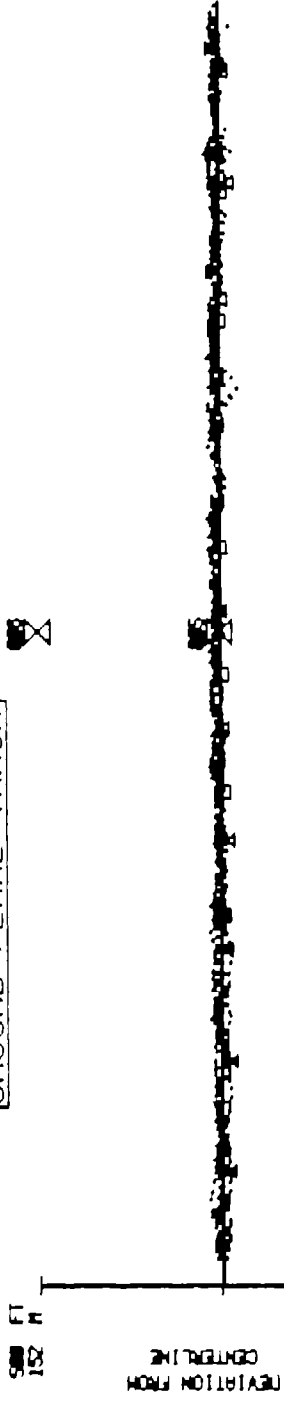
NOISE ABATEMENT APPROACH (6° Target, Var. A/S)



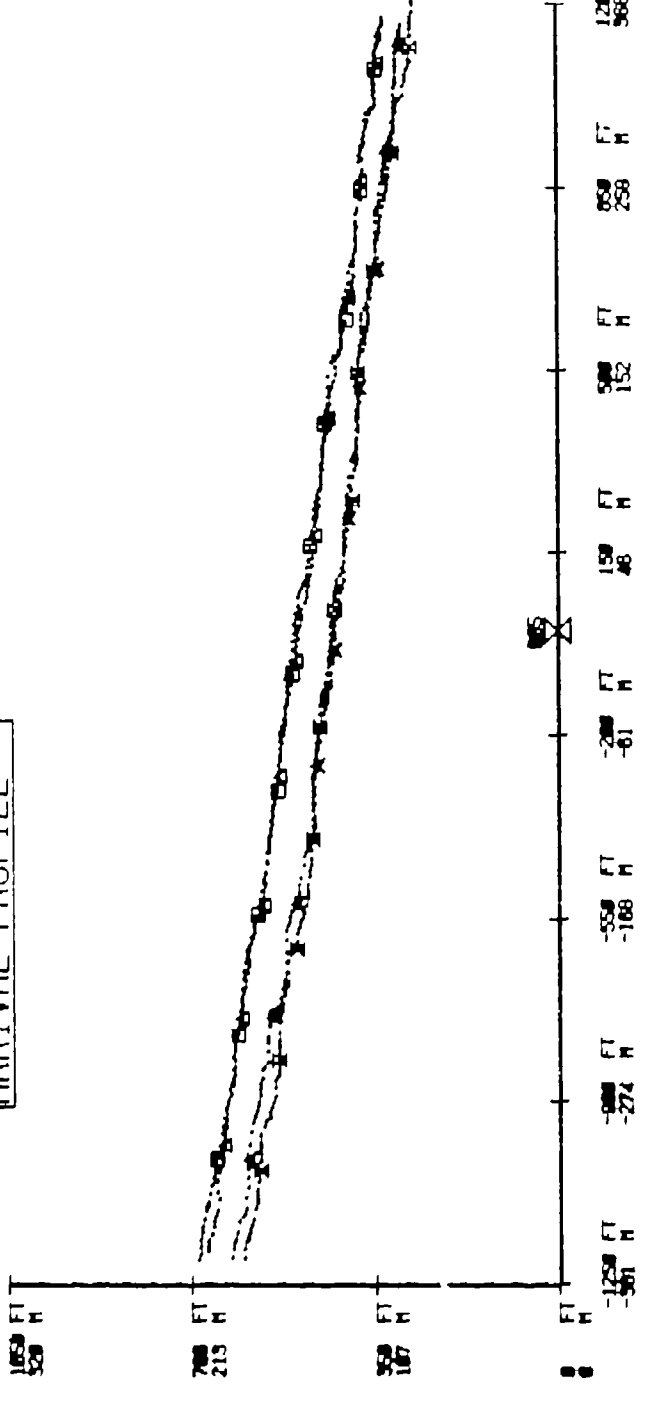
NOISE ABATEMENT APPROACH (9° Target, Var. A/S)

REPORT NO. 9400
 TEST DATE: 09-18-64
 SUPPORT: DULLES
 REPORT NO. 12/58
 OPERATION: ARRIVAL
 EVENT NO.: 64 B, 65 A, 66 K, 67 X

GROUND PLANE TRACK



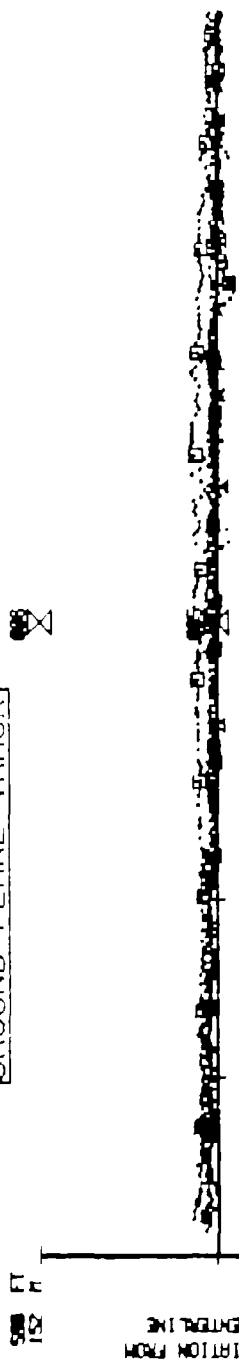
ARRIVAL PROFILE



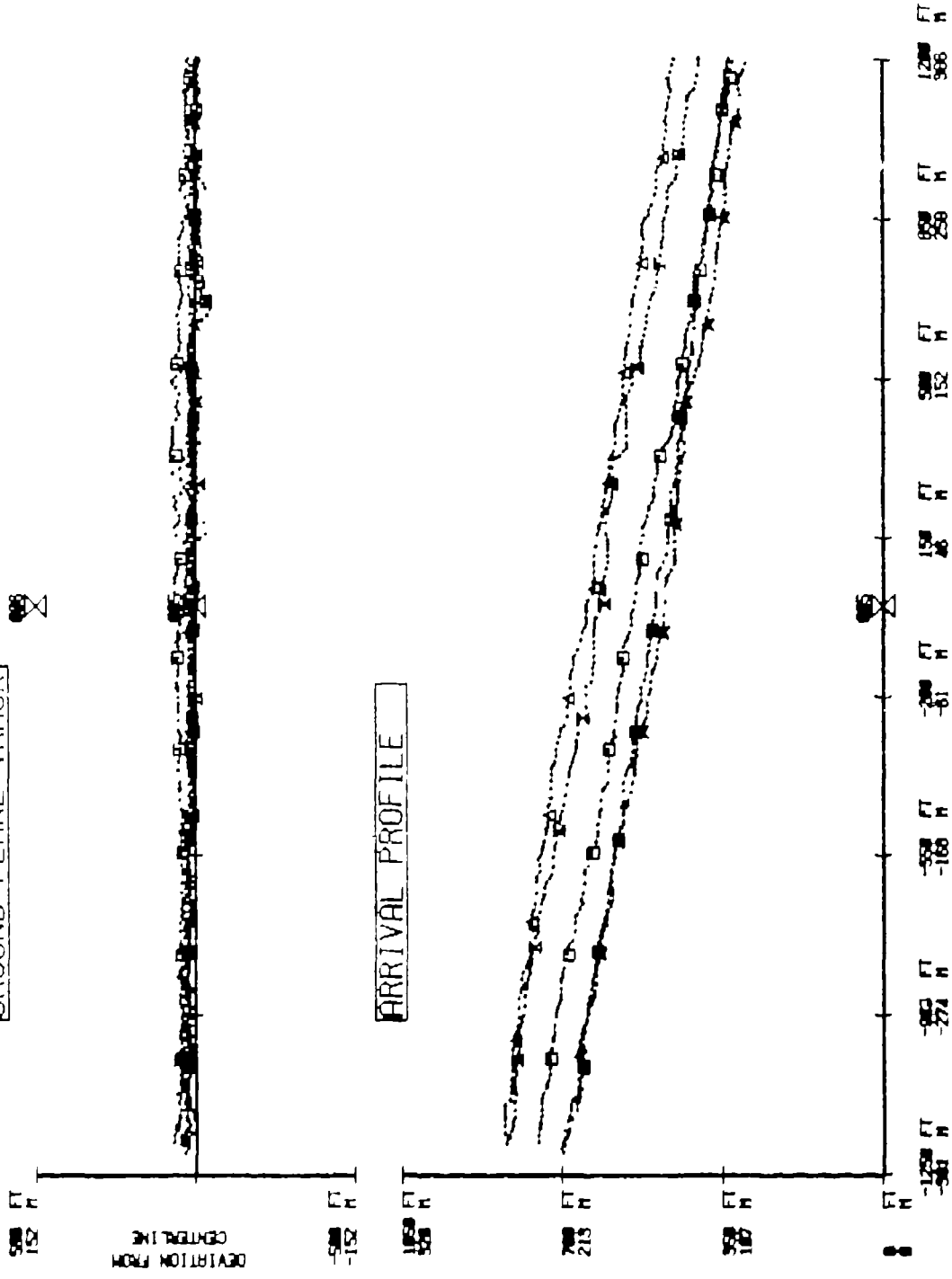
NOISE ABATEMENT APPROACH (12° Target, Var. A/S)

AIRCRAFT: 5400
 TEST DATE: 09-16-84
 AIRPORT: DULLES
 RUNWAY: 12/30
 OPERATION: ARRIVAL
 EVENT NO.: 68 0
 69 A
 70 K
 71 X
 72 0

GROUND PLANE TRACK



ARRIVAL PROFILE



METEOROLOGICAL DATA

- THIS SECTION OF THE APPENDIX CONTAINS WEATHER DATA FROM -
- SEVERAL TYPES OF METEOROLOGICAL EQUIPMENT: TEN-METER -
- TOWER (MET), GROUND LEVEL PSYCHROMETER, AIRCRAFT OAT, AND -
- PILOT BALLOONS. DATA FROM THE MET TOWER INCLUDE THE -
- TEMPERATURE, RELATIVE HUMIDITY, WIND DIRECTION AND WIND -
- SPEED MEASURED TYPICALLY EVERY 15 MINUTES DURING EACH -
- FLIGHT EVENT. BECAUSE OF A FAILURE OF THE MET TOWER DEW -
- POINT SENSOR, THE RELATIVE HUMIDITY WAS CALCULATED USING -
- TEMPERATURE FROM THE MET TOWER AND DEW POINT FROM THE -
- DULLES MID FIELD WEATHER STATION. GROUND LEVEL (4 FEET) -
- TEMPERATURE AND RELATIVE HUMIDITY ARE GIVEN FOR DIFFERENT -
- TIMES OF EACH TEST DAY, AND THE HELICOPTER'S OAT READINGS -
- ARE SHOWN FOR DIFFERENT FLIGHT ALTITUDES AT VARIOUS TIMES -
- OF THE DAY. THE PILOT BALLOON WIND DATA, TAKEN -
- PERIODICALLY DURING EACH TEST DAY, INCLUDES THE WIND -
- DIRECTION AND WIND SPEED AT VARIOUS ALTITUDES. -

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: HUGHES 500 D

DATE: 9/10/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |
| | | | | (MPH) | |

SIX DEGREE APPROACH AT 65 KTS.

| | | | | | |
|-------|----|----|-----|----|----|
| 12:15 | 74 | 58 | 270 | 10 | 14 |
| 12:30 | 74 | 58 | 270 | 8 | 13 |
| 12:45 | 75 | 58 | 270 | 8 | 11 |

NORMAL APPROACH AND TAKEOFF

| | | | | | |
|------|----|----|-----|---|----|
| 1:00 | 75 | 58 | 270 | 8 | 13 |
|------|----|----|-----|---|----|

NOISE ABATEMENT APPROACH (6 DEG. TARGET, VAR. A/S)

| | | | | | |
|------|----|----|-----|---|----|
| 1:15 | 76 | 56 | 270 | 8 | 12 |
| 1:30 | 76 | 54 | 270 | 8 | 12 |

NOISE ABATEMENT APPROACH (9 DEG. TARGET, VAR. A/S)

| | | | | | |
|------|----|----|-----|---|----|
| 1:45 | 76 | 56 | 270 | 8 | 12 |
|------|----|----|-----|---|----|

NOISE ABATEMENT APPROACH (12 DEG. TARGET, VAR. A/S)

| | | | | | |
|------|----|----|-----|---|----|
| 2:00 | 76 | 56 | 270 | 8 | 12 |
|------|----|----|-----|---|----|

METEOROLOGICAL DATA

HELICOPTER: HUGHES 500D

DATE: 09/10/84

TEMPERATURE AND RELATIVE HUMIDITY DATA

(MEASURED AT 4 FT. AGL)

HELICOPTERS DAT GAUGE DATA

TIME TEMP. R.H.

TIME ALTITUDE TEMP.

N

O

D

A

T

A

1:10

200'

79 F

400'

79 F

600'

75 F

800'

72 F

1:48

400'

79 F

600'

75 F

800'

75 F

PILOT BALLOON WIND DATA

HUGHES 500D

09/10/84

| FEET | WIND DIR. | WIND SPD. | WIND DIR. | WIND SPD. |
|-------|-----------|-----------|-----------|-----------|
| (AGL) | (DEG.) | (KTS) | (DEG.) | (KTS) |

LAUNCH TIME:

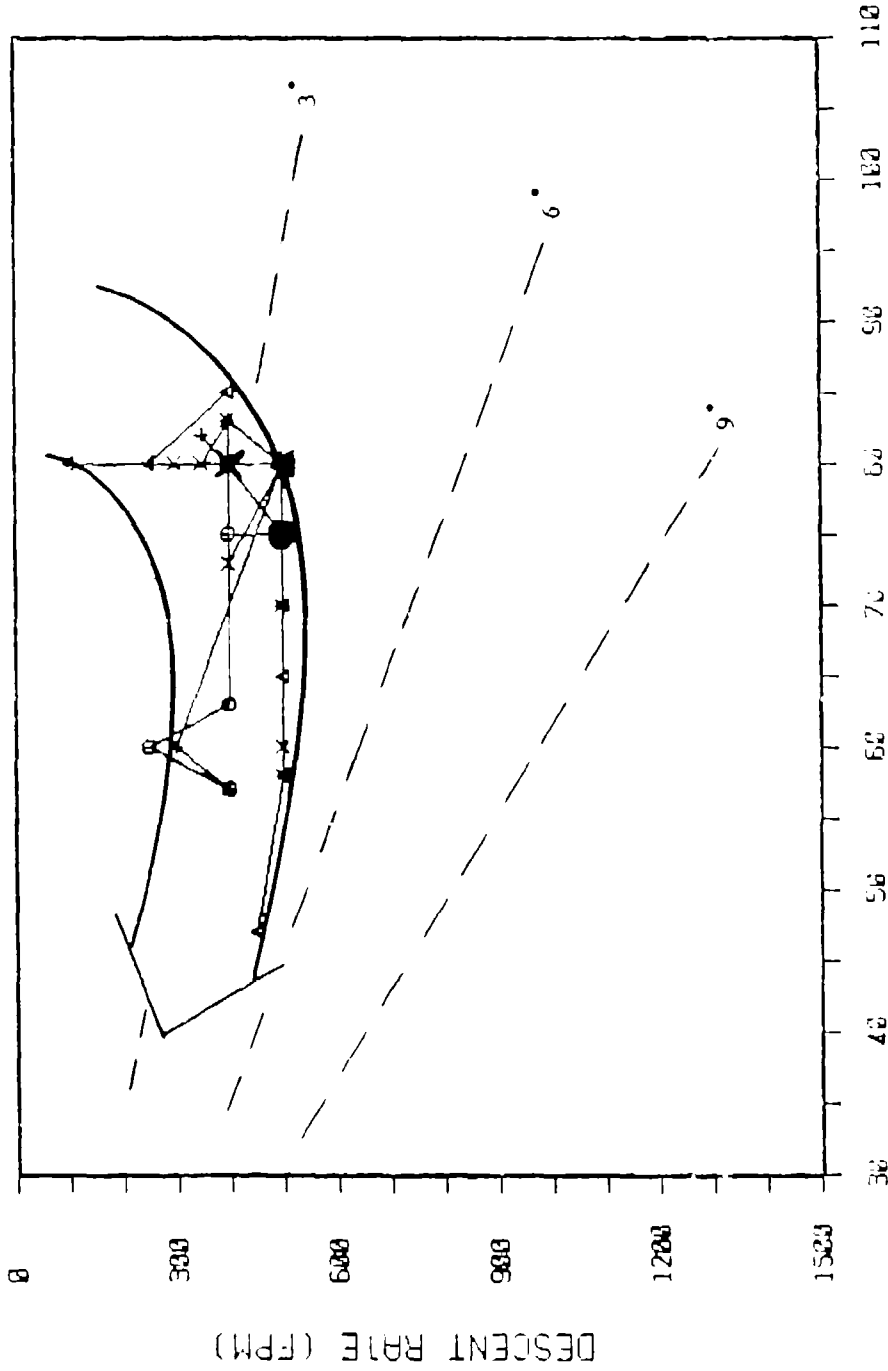
----- NO DATA -----

COCKPIT VIDEO

DATA

- THIS SECTION OF THE APPENDIX CONTAINS FLIGHT PROFILE -
- PLOTS AND INDIVIDUAL EVENT DATA READ EVERY 5 SECONDS -
- FROM PLAYBACK OF THE COCKPIT VIDEO RECORDINGS. IN THE -
- PROFILE PLOTS, INDICATED AIRSPEED VS. DESCENT RATE -
- ARE PLOTTED FOR THE NORMAL APPROACHES. AN ARROW IS -
- DRAWN WHICH BOUNDS THE DATA POINTS AND PORTRAYS THE -
- SPEED/DESCENT RATE TREND WITH TIME. THE DARKER DATA -
- POINTS INDICATE WHEN THE HELICOPTER PASSED OVER THE CLC -
- POSITION. THE INDIVIDUAL EVENT DATA CONTAINS LISTINGS -
- OF ALL THE COCKPIT INSTRUMENT READINGS OBTAINED FROM THE -
- VIDEO PLAYBACK. THIS DATA ENCOMPASSES THE HELICOPTER'S -
- FLIGHT PARAMETERS THROUGHOUT THE ENTIRE DATA RUN PLUS OR -
- MINUS 15 SECONDS (MINIMUM) FROM CLC. -

NORMAL RPPAJACH
5000J



○ B43
+ B50
X B54
△ B56

IAS (KTS)

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: HUGHES 500D

DATE: 09/10/84

EVENT: B46

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -34 | 530 | 30 | 400 | 62 | 3.65 |
| -29 | 490 | 30 | 450 | 62 | 4.11 |
| -24 | 480 | 38 | 250 | -- | -- |
| -19 | --- | 45 | 200 | -- | -- |
| -14 | 450 | 43 | 250 | 60 | 2.36 |
| -9 | 420 | 40 | 400 | 60 | 3.77 |
| -4 | 400 | 42 | 400 | 62 | 3.65 |
| CLC 0 | 370 | 38 | 450 | 63 | 4.04 |
| 6 | 340 | 22 | 450 | 62 | 4.11 |
| 11 | 280 | 15 | 500 | 54 | 5.25 |
| 16 | 200 | 12 | 550 | 45 | 6.93 |
| 21 | 160 | 20 | 500 | 40 | 7.09 |

EVENT: B48

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 490 | 40 | 100 | 80 | 0.71 |
| -25 | 490 | 30 | 250 | 80 | 1.77 |
| -20 | 460 | 30 | 400 | 80 | 2.83 |
| -15 | 440 | 30 | 400 | 80 | 2.83 |
| -10 | 410 | 30 | 400 | 80 | 2.83 |
| -5 | 360 | 30 | 500 | 80 | 3.54 |
| CLC 0 | 300 | 28 | 500 | 75 | 3.77 |
| 5 | 280 | 25 | 400 | 75 | 3.02 |
| 10 | 260 | 30 | 400 | 63 | 3.59 |
| 15 | 240 | 30 | 250 | 60 | 2.36 |
| 20 | 200 | 17 | 400 | 57 | 3.97 |

EVENT: B54

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -31 | 550 | 34 | 400 | 77 | 2.94 |
| -26 | 340 | 45 | 300 | 80 | 2.12 |
| -21 | 520 | 43 | 300 | 80 | 2.12 |
| -16 | 510 | 40 | 350 | 80 | 2.48 |
| -11 | 480 | 30 | 400 | 83 | 2.73 |
| -6 | 440 | 28 | 500 | 80 | 3.54 |
| -1 | 410 | 25 | 400 | 73 | 3.10 |
| CLC 0 | 400 | 25 | 400 | 80 | 2.83 |
| 4 | 370 | 25 | 500 | 75 | 3.77 |
| 9 | 340 | 20 | 500 | 70 | 4.04 |
| 14 | 300 | 20 | 500 | 60 | 4.72 |
| 19 | 250 | 25 | 500 | 58 | 4.88 |

EVENT: B56

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 500 | 35 | 500 | 85 | 3.33 |
| -25 | 490 | 35 | 300 | 85 | 2.00 |
| -20 | 460 | 35 | 400 | 85 | 2.66 |
| -15 | 440 | 40 | 250 | 80 | 1.77 |
| -10 | 440 | 40 | 100 | 80 | 0.71 |
| -5 | 420 | 30 | 400 | 80 | 2.83 |
| CLC 0 | 360 | 25 | 500 | 80 | 3.54 |
| 5 | 340 | 25 | 500 | 70 | 4.04 |
| 10 | 300 | 25 | 500 | 65 | 4.36 |
| 15 | 240 | 25 | 500 | 58 | 4.68 |
| 20 | 200 | 20 | 450 | 47 | 5.43 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (6 DEG. TARGET, VAR. A/S)

HELICOPTER: HUGHES 500D

DATE: 09/10/84

EVENT: D59

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -28 | 880 | 35 | 400 | 80 | 2.83 |
| -23 | 840 | 35 | 400 | 80 | 2.83 |
| -18 | 800 | 28 | 500 | 80 | 3.54 |
| -13 | 750 | 26 | 500 | 80 | 3.54 |
| -8 | 700 | 22 | 700 | 80 | 4.96 |
| -3 | 600 | 18 | 900 | 76 | 6.72 |
| CLC 0 | 550 | -- | --- | 72 | -- |
| 2 | 520 | 17 | 900 | 66 | 7.74 |
| 7 | 460 | 18 | 800 | 58 | 7.83 |
| 12 | 400 | 18 | 800 | 60 | 7.57 |
| 17 | 300 | 15 | 800 | 54 | 8.41 |
| 22 | 240 | 15 | 900 | 40 | 12.84 |

EVENT: D50

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -33 | 880 | 30 | 250 | 75 | 1.89 |
| -28 | 840 | 35 | 500 | 80 | 3.54 |
| -23 | 780 | 30 | 600 | 80 | 4.25 |
| -18 | 730 | 32 | 600 | 82 | 4.14 |
| -13 | 670 | 25 | 700 | 77 | 5.15 |
| -8 | 620 | 25 | 700 | 73 | 5.43 |
| -3 | 560 | 25 | 650 | 70 | 5.26 |
| CLC 0 | 530 | -- | --- | -- | -- |
| 2 | 500 | 20 | 800 | 70 | 6.48 |
| 7 | 400 | 15 | 900 | 60 | 8.52 |
| 12 | 340 | 15 | 900 | 60 | 8.52 |
| 17 | 240 | 15 | 900 | 52 | 9.84 |
| 22 | 200 | 15 | 700 | 47 | 8.46 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (6 DEG. TARGET, VAR. A/S)

HELICOPTER: HUGHES 500D

DATE: 09/10/84

EVENT: D61

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -29 | 870 | 40 | 100 | 79 | 0.72 |
| -24 | 850 | 33 | 450 | 75 | 3.40 |
| -19 | 780 | 32 | 600 | 77 | 4.41 |
| -14 | 690 | 30 | 850 | 83 | 5.80 |
| -9 | 620 | 30 | 900 | 85 | 6.00 |
| -4 | 540 | 30 | 800 | 85 | 5.33 |
| CLC 0 | 490 | 20 | 800 | 80 | -- |
| 6 | 420 | 15 | 800 | 74 | 6.13 |
| 11 | 340 | 15 | 800 | 65 | 6.98 |
| 16 | 260 | 15 | 800 | 52 | 8.74 |
| 21 | 200 | 10 | 700 | 38 | 10.48 |

EVENT: D62

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -33 | 820 | 35 | 350 | 70 | 2.83 |
| -28 | 780 | 28 | 500 | 70 | 4.04 |
| -23 | 690 | 28 | 700 | 72 | 5.51 |
| -18 | 630 | 25 | 700 | 72 | 5.51 |
| -13 | 580 | 23 | 650 | 77 | 4.78 |
| -8 | 530 | 17 | 700 | 70 | 5.67 |
| -3 | 460 | 17 | 700 | 70 | 5.67 |
| CLC 0 | 420 | 20 | 700 | 64 | 6.20 |
| 2 | 400 | 25 | 700 | 68 | 5.83 |
| 7 | 350 | 30 | 600 | 63 | 5.40 |
| 12 | 300 | 25 | 550 | 64 | 4.87 |
| 17 | 250 | 22 | 500 | 60 | 5.67 |

D63

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -40 | 820 | 45 | 0 | 77 | 0.00 |
| -35 | 800 | 40 | 400 | 78 | 2.90 |
| -30 | 790 | 30 | 350 | 77 | 2.57 |
| -25 | 760 | 30 | 400 | 75 | 3.02 |
| -20 | 700 | 22 | 550 | 77 | 4.04 |
| -15 | 650 | 27 | 600 | 78 | 4.36 |
| -10 | 600 | 20 | 600 | 78 | 4.36 |
| -5 | 550 | 17 | 650 | 72 | 5.11 |
| CLC 0 | 480 | 20 | 650 | 70 | 5.26 |
| 3 | 420 | 20 | 700 | 60 | 6.62 |
| 10 | 360 | 20 | 600 | 60 | 5.67 |
| 15 | 300 | 25 | 600 | 60 | 5.67 |
| 20 | 250 | 23 | 600 | 58 | 5.86 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (9 DEG. TARGET, VAR. A/S)

HELICOPTER: HUGHES 500D

DATE: 09/10/84

EVENT: D64

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 940 | 35 | 0 | 75 | 0.00 |
| -22 | 940 | 28 | 500 | 80 | 3.54 |
| -17 | 840 | 18 | 800 | 78 | 5.81 |
| -12 | 770 | 16 | 1000 | 74 | 7.67 |
| -7 | 670 | 13 | 1100 | 70 | 8.93 |
| -2 | 580 | 20 | 1000 | 65 | 8.74 |
| CLC 0 | 550 | 20 | 1000 | 60 | 9.47 |
| 3 | 510 | 20 | 900 | 60 | 8.52 |
| 8 | 420 | 15 | 900 | 60 | 8.52 |
| 13 | 340 | -- | 900 | 59 | 8.66 |
| 18 | 250 | 15 | 700 | 56 | 7.09 |

EVENT: D65

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -15 | 820 | 17 | 1000 | 70 | 8.11 |
| -10 | 730 | 16 | 1100 | 65 | 9.62 |
| -5 | 640 | 16 | 1000 | 65 | 8.74 |
| CLC 0 | 560 | 20 | 1000 | 60 | 9.47 |
| 5 | 480 | 18 | 1000 | 60 | 9.47 |
| 10 | 400 | 20 | 800 | 60 | 7.57 |
| 15 | 320 | 20 | 800 | 62 | 7.32 |
| 20 | 240 | 15 | 800 | 58 | 7.83 |

EVENT: D66

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -32 | 1000 | 35 | 400 | 80 | 2.83 |
| -27 | 980 | 24 | 600 | 73 | 4.66 |
| -22 | 910 | 19 | 800 | 70 | 6.48 |
| -17 | 800 | 12 | 1000 | 70 | 8.11 |
| -12 | 720 | 13 | 1100 | 70 | 8.93 |
| -7 | 620 | 14 | 1100 | 70 | 8.93 |
| -2 | 520 | 15 | 1150 | 70 | 9.34 |
| CLC 0 | 480 | 15 | 1000 | 70 | 8.11 |
| 3 | 440 | 15 | 900 | 67 | 7.62 |
| 8 | 340 | 15 | 800 | 70 | 6.48 |
| 13 | 300 | 18 | 800 | 70 | 6.48 |
| 18 | 250 | 28 | 700 | 55 | 7.22 |

EVENT: D67

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 920 | 15 | 700 | 72 | 5.51 |
| -22 | 850 | 15 | 850 | 60 | 8.04 |
| -17 | 750 | 13 | 1000 | 60 | 9.47 |
| -12 | 660 | 13 | 1000 | 60 | 9.47 |
| -7 | 570 | 13 | 1000 | 58 | 9.80 |
| -2 | 510 | 15 | 800 | 60 | 7.57 |
| CLC 0 | 490 | 17 | 800 | 60 | 7.57 |
| 3 | 440 | 17 | 800 | 60 | 7.57 |
| 8 | 380 | 20 | 800 | 60 | 7.57 |
| 13 | 300 | 20 | 700 | 60 | 6.62 |
| 18 | 250 | 26 | 650 | 60 | 6.14 |
| 23 | --- | 20 | 550 | 55 | 5.67 |

APPENDIX H

AEROSPATIALE 365N

PAGE NUMBERS

| | |
|---|---------------|
| <u>HELICOPTER CHARACTERISTICS</u> | H-581 |
| <u>NOISE LEVEL DATA</u> | |
| SOUND EXPOSURE LEVEL | |
| Bar Charts | |
| Approaches..... | H-584 |
| Takeoff..... | H-585 |
| Level Flyovers..... | H-586 |
| Summary Tables..... | H-587 - H-588 |
| Individual Event Data..... | H-589 - H-595 |
| A-WEIGHTED SOUND LEVEL | |
| Bar Charts | |
| Approaches..... | H-598 |
| Takeoff..... | H-599 |
| Level Flyovers..... | H-600 |
| Summary Tables..... | H-601 - H-602 |
| Individual Event Data..... | H-603 - H-609 |
| <u>RADAR TRACKING DATA</u> | |
| Position Data..... | H-612 - H-625 |
| Tracking Plots..... | H-626 - H-632 |
| <u>METEOROLOGICAL DATA</u> | |
| 10-meter Tower Data..... | H-634 |
| 4 ft. Data and Aircraft OAT Data..... | H-635 |
| Pilot Balloon Wind Data..... | H-636 |
| <u>COCKPIT VIDEO DATA</u> | |
| Normal Approach Plot..... | H-638 |
| Noise Abatement Approach Plot..... | H-639 |
| Individual Event Data..... | H-640 - H-644 |



HELICOPTER CHARACTERISTICS

| | |
|--|----------------------|
| HELICOPTER MANUFACTURER : | AEROSPATIALE |
| HELICOPTER MODEL : | SA 365N |
| TEST HELICOPTER N-NUMBER : | N5870K |
| MAX INTERNAL GROSS WEIGHT : | 8818 LBS |
| NUMBER OF ENGINES : | TWO |
| UNINSTALLED TAKEOFF POWER : | 660 SHP (PER ENGINE) |
| UNINSTALLED MAX CONTINUOUS PWR. : | 586 SHP (PER ENGINE) |
| NEVER EXCEED SPEED (VNE) : | 175 KTS. |
| MAX SPEED IN LEVEL FLIGHT WITH MAX CONTINUOUS POWER : | 150 KTS. |
| SPEED FOR BEST RATE OF CLIMB (VY) : | 75 KTS. |
| CRUISE SPEED FOR BEST RANGE (VCR) : | 135 KTS. |
| BEST RATE OF CLIMB AT TAKEOFF POWER (BRC) : | 1460 FPM |
| "TOP OF GREEN ARC" ROTOR SPEED : | 350 RPM 100% |

MAIN AND TAIL ROTOR SPECIFICATIONS

| | MAIN | TAIL |
|------------------|-------|--------|
| DIAMETER (FT.) : | 39.1 | 3.0 |
| NO. OF BLADES : | 4 | 13 |
| TIPSPEED (FPS) : | 717 | 727 |
| TIP SHAPE : | SWEPT | SQUARE |

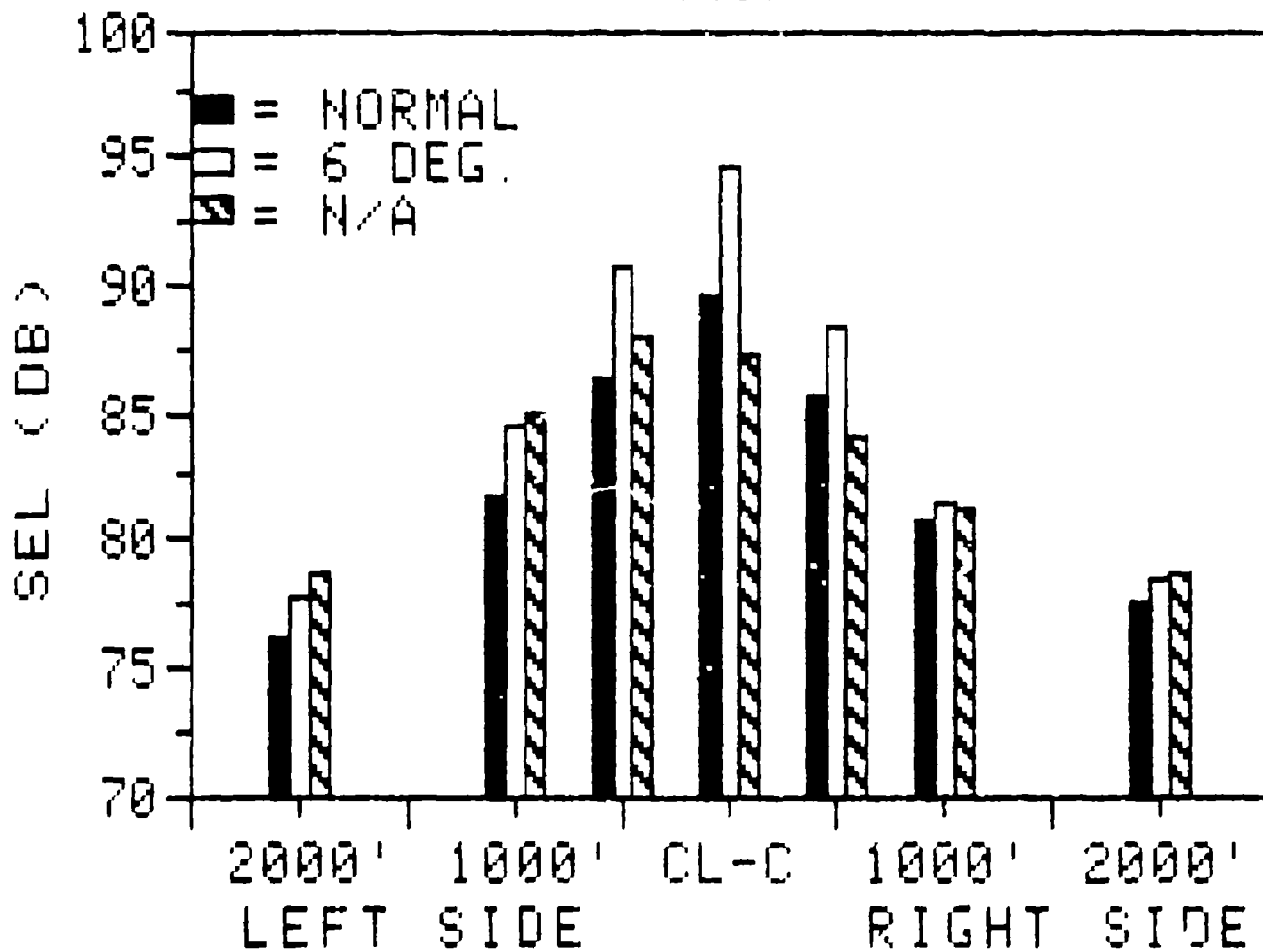
NOISE LEVEL DATA

'as-measured'

SOUND EXPOSURE LEVEL

THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' SOUND EXPOSURE LEVELS (SEL) FOR ALL FLIGHT EVENTS. THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR EACH CONDITION IS THEN GIVEN.

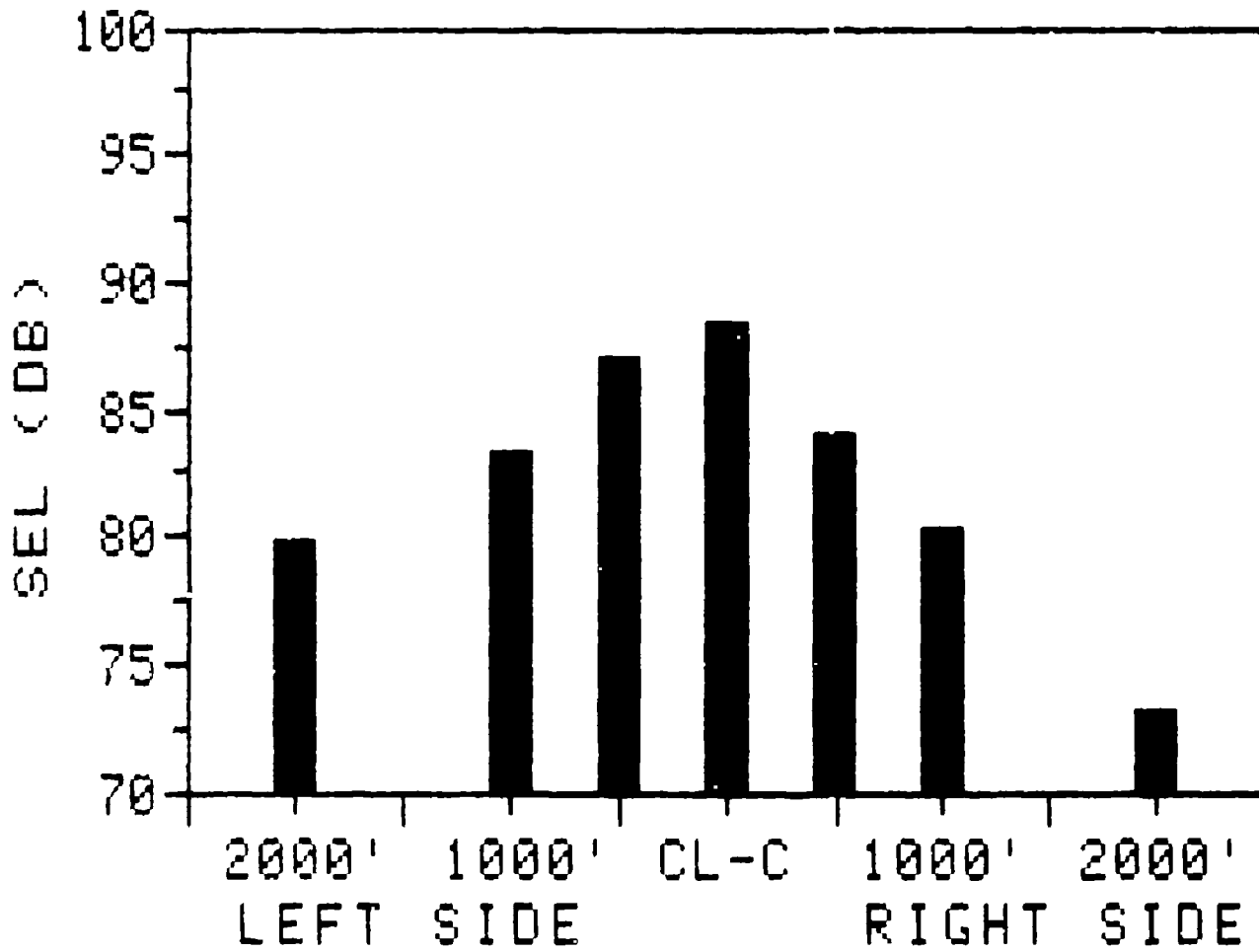
APPROACHES 365N



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 400 | 75-83 | 0.2-5.7 |
| SIX DEG. APPROACH | 380 | 80 | 6.0 |
| NOISE ABATEMENT APP. VAR. R/D AND A/S (EVENTS D21-D27) | 650 | 92-60 | 2.9-11.4 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEOTAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN 315 SEC OF THE CL-C MICROPHONE POSITION

NORMAL TAKEOFF 365N

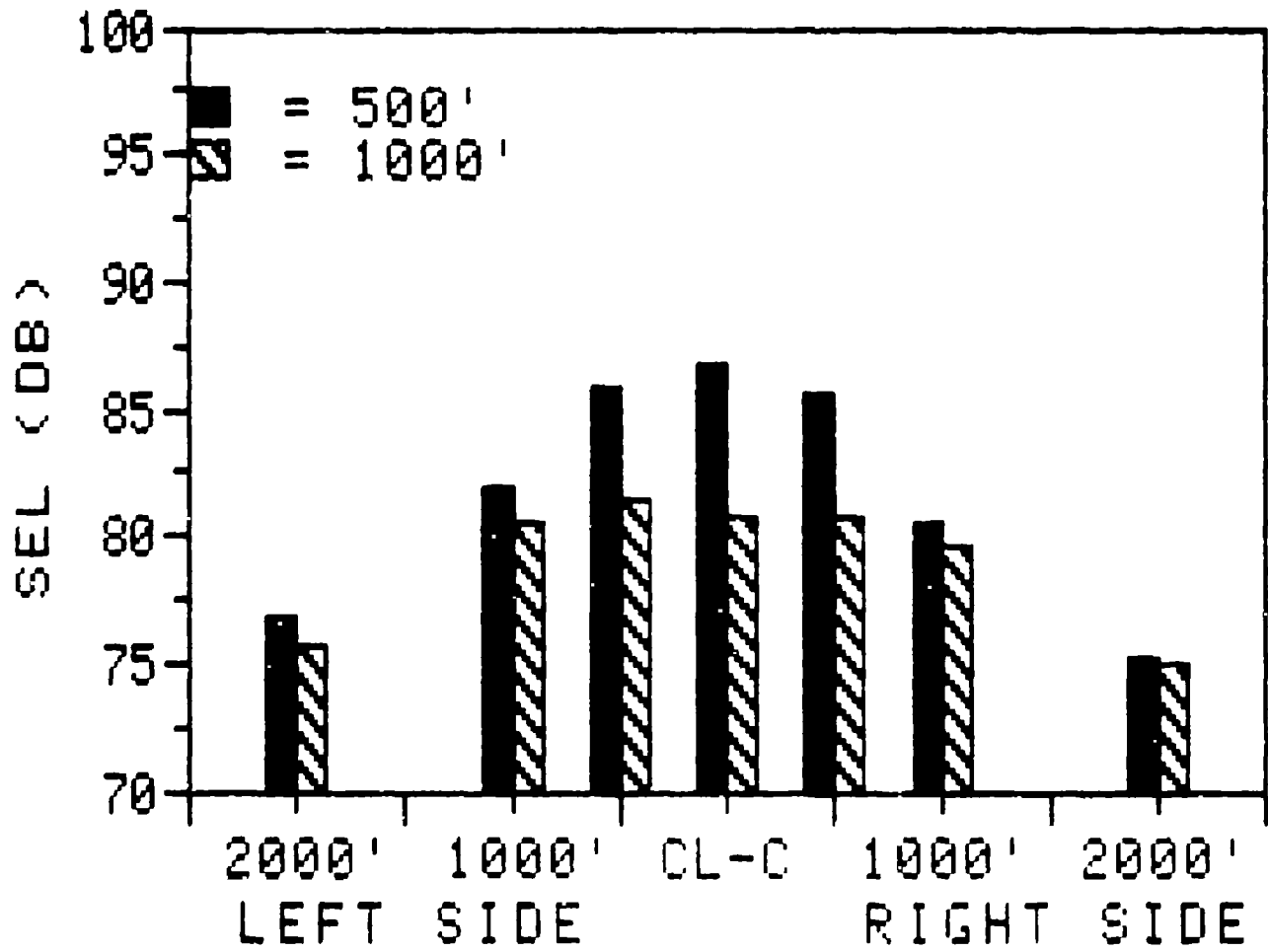


| OPERATION | AVG. ALT. OVER CLC (FT. AGL) | INDICATED AIRSPEED (KTS.) |
|-----------|---------------------------------|------------------------------|
|-----------|---------------------------------|------------------------------|

| | | |
|----------------|-----|----|
| NORMAL TAKEOFF | 418 | 86 |
|----------------|-----|----|

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN
THE HELICOPTER PASSED OVER CLC MICROPHONE POSITION

LEVEL FLYOVERS 365N



INDICATED AIRSPEED = 175 KTS.

365N SUMMARY SHEET (9/10/84)

SOUND EXPOSURE LEVEL (DE)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 79.9 | 83.2 | 86.9 | 88.3 | 84.0 | 80.2 | 73.2 |
| N | 10 | 10 | 10 | 10 | 10 | 10 | 3 |
| S.D. | 1.0 | .7 | 1.2 | .8 | .9 | 1.1 | .3 |
| 90% CI | .6 | .4 | .7 | .5 | .5 | .6 | .5 |

* 500 FT. LEVEL FLYOVER AT 135 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 76.7 | 82.0 | 85.9 | 86.7 | 85.5 | 80.5 | 75.2 |
| N | 2 | 4 | 4 | 4 | 4 | 4 | 2 |
| S.D. | .6 | .4 | .5 | .2 | .9 | .8 | .1 |
| 90% CI | -- | .5 | .6 | .3 | 1.1 | .9 | -- |

* 1000 FT. LEVEL FLYOVER AT 135 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|----|
| AVERAGE | 75.7 | 80.5 | 81.5 | 80.7 | 80.7 | 79.6 | 75 |
| N | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| S.D. | -- | .4 | .9 | .3 | .2 | 1.0 | -- |
| 90% CI | -- | -- | -- | -- | -- | -- | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : 6 DEGREE APPROACH AT VY, 75 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A13 | -- | 83.70 | 90.60 | 94.20 | 88.70 | 81.30 | 78.10 |
| A14 | -- | 83.50 | 89.40 | 94.30 | 89.10 | 80.70 | 78.10 |
| A15 | -- | 84.30 | 90.90 | 92.90 | 88.40 | 81.30 | 78.70 |
| A16 | -- | 84.40 | 89.90 | 97.30 | 88.80 | 82.20 | 78.60 |
| A17 | -- | 84.70 | 90.80 | 95.30 | 88.40 | 81.50 | 78.60 |
| A18 | -- | 84.90 | 91.30 | 94.00 | 88.10 | 81.10 | 78.60 |
| A19 | 77.90 | 85.40 | 91.20 | 93.50 | 88.10 | 81.30 | 77.60 |
| A20 | 77.70 | 85.40 | 91.20 | 95.00 | 87.70 | 81.70 | 78.70 |
| AVERAGE | 77.80 | 84.54 | 90.66 | 94.56 | 88.41 | 81.39 | 78.38 |
| STD. DEV. | 0.14 | 0.71 | 0.68 | 1.34 | 0.45 | 0.44 | 0.40 |
| 90% C.I. | -- | 0.47 | 0.45 | 0.90 | 0.30 | 0.29 | 0.27 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|-----------|-------------|------------|-----------|-------|--------------|------------|------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| B1 | -- | 82.20 | 86.80 | 89.30 | 86.10 | -- | 77.50 |
| B3 | -- | 82.00 | 86.10 | 88.70 | 85.70 | 80.70 | 77.70 |
| B5 | -- | 82.00 | 86.90 | 89.30 | 86.10 | 81.50 | 77.80 |
| B7 | -- | 81.90 | 86.10 | 88.10 | 85.40 | 80.80 | 77.90 |
| B9 | -- | 81.50 | 85.80 | 86.20 | 84.10 | 79.70 | 77.50 |
| B11 | -- | 82.20 | 87.80 | 90.90 | 87.20 | 80.60 | 78.80 |
| B35 | 76.30 | -- | 85.90 | 89.50 | 84.60 | 81.50 | 78.40 |
| B37 | 76.30 | 82.10 | 85.10 | 88.70 | 83.10 | -- | 78.60 |
| B73 | 76.20 | 80.60 | 86.80 | 92.90 | 86.00 | 80.60 | 75.60 |
| B75 | 75.60 | 81.10 | 86.20 | 92.20 | 87.00 | 81.20 | 76.80 |
| B77 | 76.00 | 80.50 | 85.10 | 87.60 | 84.70 | 80.30 | 76.80 |
| AVERAGE | 76.08 | 81.61 | 86.24 | 89.40 | 85.45 | 80.77 | 77.58 |
| STD. DEV. | 0.29 | 0.65 | 0.80 | 1.96 | 1.24 | 0.58 | 0.92 |
| 90% C.I. | 0.28 | 0.38 | 0.44 | 1.07 | 0.68 | 0.36 | 0.50 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : NORMAL TAKEOFF

| EVENT | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|-----------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | | 500' | 1000' | 2000' |
| NO. | WEST | WEST | WEST | | EAST | EAST | EAST |
| C2 | 80.20 | 82.90 | 87.80 | 87.80 | 84.50 | 80.50 | -- |
| C4 | 80.40 | 83.80 | 87.90 | 88.90 | 84.50 | 81.00 | -- |
| C6 | 79.90 | 83.90 | 88.00 | 88.80 | 84.80 | 81.40 | -- |
| C8 | 79.90 | 82.70 | 87.10 | 88.10 | 84.20 | 80.30 | -- |
| C10 | 80.50 | 83.10 | 87.80 | 88.20 | 84.70 | 81.00 | -- |
| C12 | 80.40 | 83.60 | 88.10 | 87.80 | 84.50 | 81.20 | -- |
| C36 | 80.40 | 82.70 | 85.20 | 87.10 | 82.70 | 79.30 | 72.90 |
| C38 | 80.80 | 84.30 | 86.00 | 88.60 | 84.50 | 80.30 | -- |
| C74 | 78.60 | 82.50 | 85.90 | 89.90 | 83.40 | 78.30 | 73.50 |
| C76 | 77.70 | 82.20 | 85.50 | 87.70 | 82.40 | 78.70 | 73.10 |
| AVERAGE | 79.88 | 83.17 | 86.93 | 88.29 | 84.02 | 80.20 | 73.17 |
| STD. DEV. | 0.97 | 0.69 | 1.15 | 0.79 | 0.87 | 1.08 | 0.31 |
| 90% C.I. | 0.56 | 0.40 | 0.67 | 0.46 | 0.50 | 0.63 | 0.52 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D21 | 77.90 | -- | 87.50 | 87.90 | 83.10 | 80.00 | -- |
| D22 | 78.80 | 84.20 | 88.40 | 86.80 | 83.00 | 80.80 | 78.10 |
| D23 | 78.70 | 84.80 | 88.20 | 87.80 | 84.80 | 81.60 | 78.70 |
| D24 | 79.30 | 85.70 | 88.30 | 86.70 | 85.30 | 82.30 | 79.20 |
| D25 | 78.80 | 84.50 | 87.80 | 86.90 | 83.90 | 81.80 | 79.10 |
| D26 | 79.00 | 84.80 | 88.10 | 87.30 | 83.20 | 81.80 | 79.10 |
| D27 | 79.40 | 84.80 | 87.40 | 86.40 | 84.10 | 80.70 | 78.10 |
| AVERAGE | 78.84 | 84.80 | 87.96 | 87.11 | 83.91 | 81.29 | 78.72 |
| STD. DEV. | 0.49 | 0.50 | 0.40 | 0.57 | 0.89 | 0.81 | 0.51 |
| 90% C. I. | 0.36 | 0.41 | 0.29 | 0.42 | 0.65 | 0.59 | 0.42 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 09/10/84

OPERATION : NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | CL-C | 500' WEST | 1000' WEST | 2000' WEST |
| D28 | 78.00 | 85.00 | 86.80 | 84.70 | 82.60 | 81.20 | 78.40 |
| D29 | 78.50 | 84.80 | 88.10 | 86.10 | 82.70 | 81.40 | 78.20 |
| D30 | 79.50 | 85.00 | 88.10 | 87.30 | 82.40 | 79.40 | 77.10 |
| D31 | 78.70 | 84.50 | 87.40 | 86.20 | 82.20 | 79.80 | 77.80 |
| D32 | 79.10 | 84.10 | 86.80 | 86.60 | 82.20 | 80.10 | 77.90 |
| D33 | 78.50 | 84.80 | 87.90 | 87.40 | 82.50 | 80.60 | 78.00 |
| D34 | 78.80 | 84.40 | 87.60 | 87.20 | 82.30 | 80.20 | 78.10 |
| AVERAGE | 78.73 | 84.66 | 87.53 | 86.50 | 82.41 | 80.39 | 77.93 |
| STD. DEV. | 0.48 | 0.34 | 0.56 | 0.95 | 0.20 | 0.73 | 0.42 |
| 90% C.I. | 0.35 | 0.25 | 0.41 | 0.70 | 0.14 | 0.53 | 0.30 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N "DAUPHIN"

TEST DATE: 9/10/84

OPERATION : LEVEL FLYOVER (500' @135 KTS)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| F78 | -- | 81.60 | 85.50 | 86.60 | 84.80 | 79.70 | 75.20 |
| F79 | 77.10 | 82.10 | 85.80 | 86.70 | 85.80 | 81.00 | -- |
| F80 | -- | 82.50 | 85.70 | 87.00 | 84.70 | 79.90 | 75.10 |
| F81 | 76.20 | 81.70 | 86.70 | 86.50 | 86.70 | 81.30 | -- |
| AVERAGE | 76.65 | 81.98 | 85.93 | 86.70 | 85.50 | 80.48 | 75.15 |
| STD. DEV. | 0.64 | 0.41 | 0.53 | 0.22 | 0.94 | 0.79 | 0.07 |
| 90% C.I. | -- | 0.48 | 0.62 | 0.25 | 1.11 | 0.93 | -- |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : LEVEL FLYOVER (1000' @ 135 KTS)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | CL-C | 500' EAST | 1000' EAST | 2000' EAST |
| EB2 | -- | 80.70 | 80.90 | 80.90 | 80.50 | 78.90 | 75.00 |
| EB3 | 75.70 | 80.20 | 82.10 | 80.50 | 80.80 | 80.30 | -- |
| AVERAGE | 75.70 | 80.45 | 81.50 | 80.70 | 80.65 | 79.50 | 75.00 |
| STD. DEV. | -- | 0.35 | 0.85 | 0.28 | 0.21 | 0.99 | -- |
| 90% C.I. | -- | -- | -- | -- | -- | -- | -- |

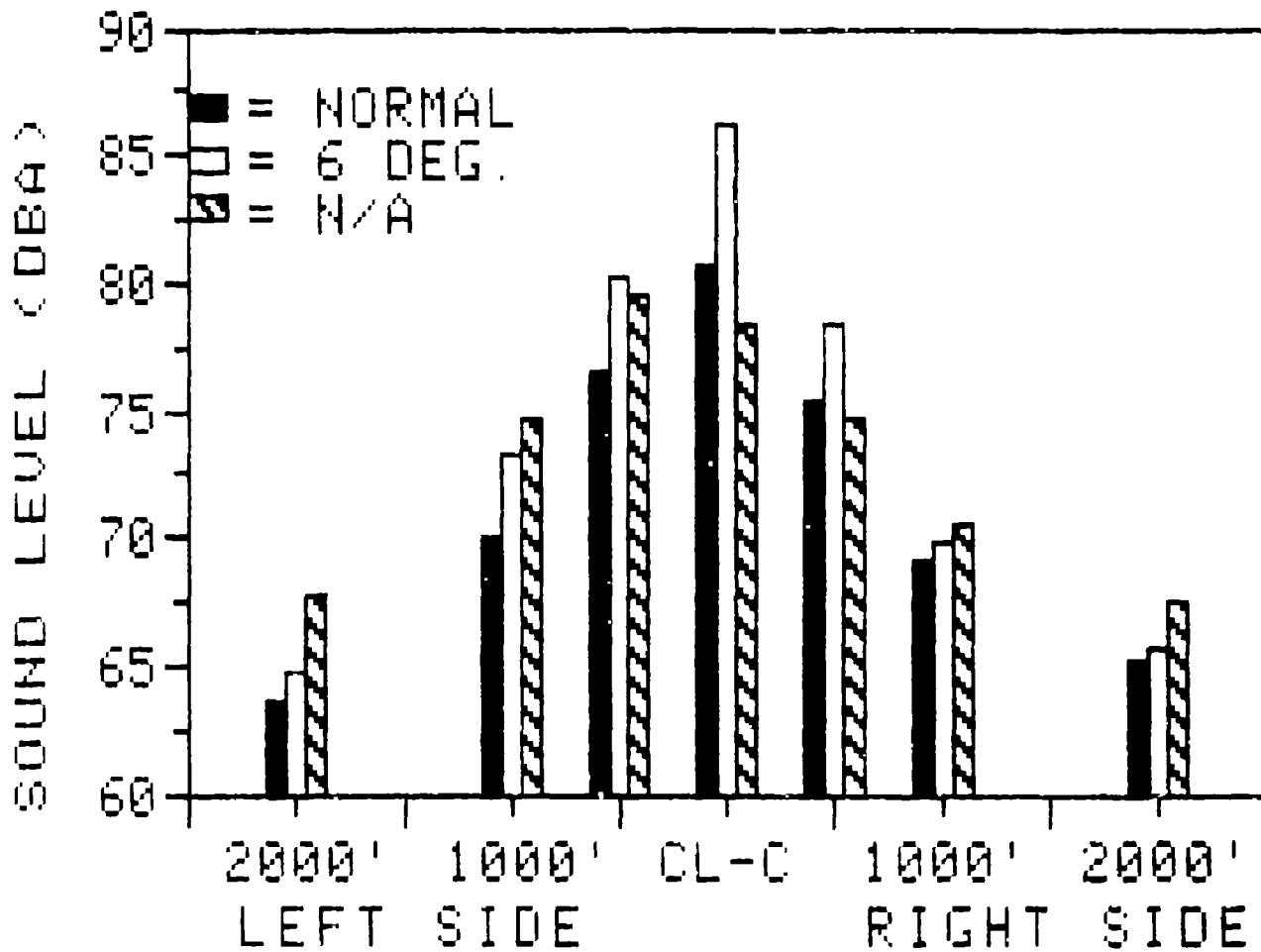
NOISE LEVEL DATA

'as-measured'

A-WEIGHTED SOUND LEVEL (dBA)

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- A-WEIGHTED SOUND LEVEL (dBA) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN. -

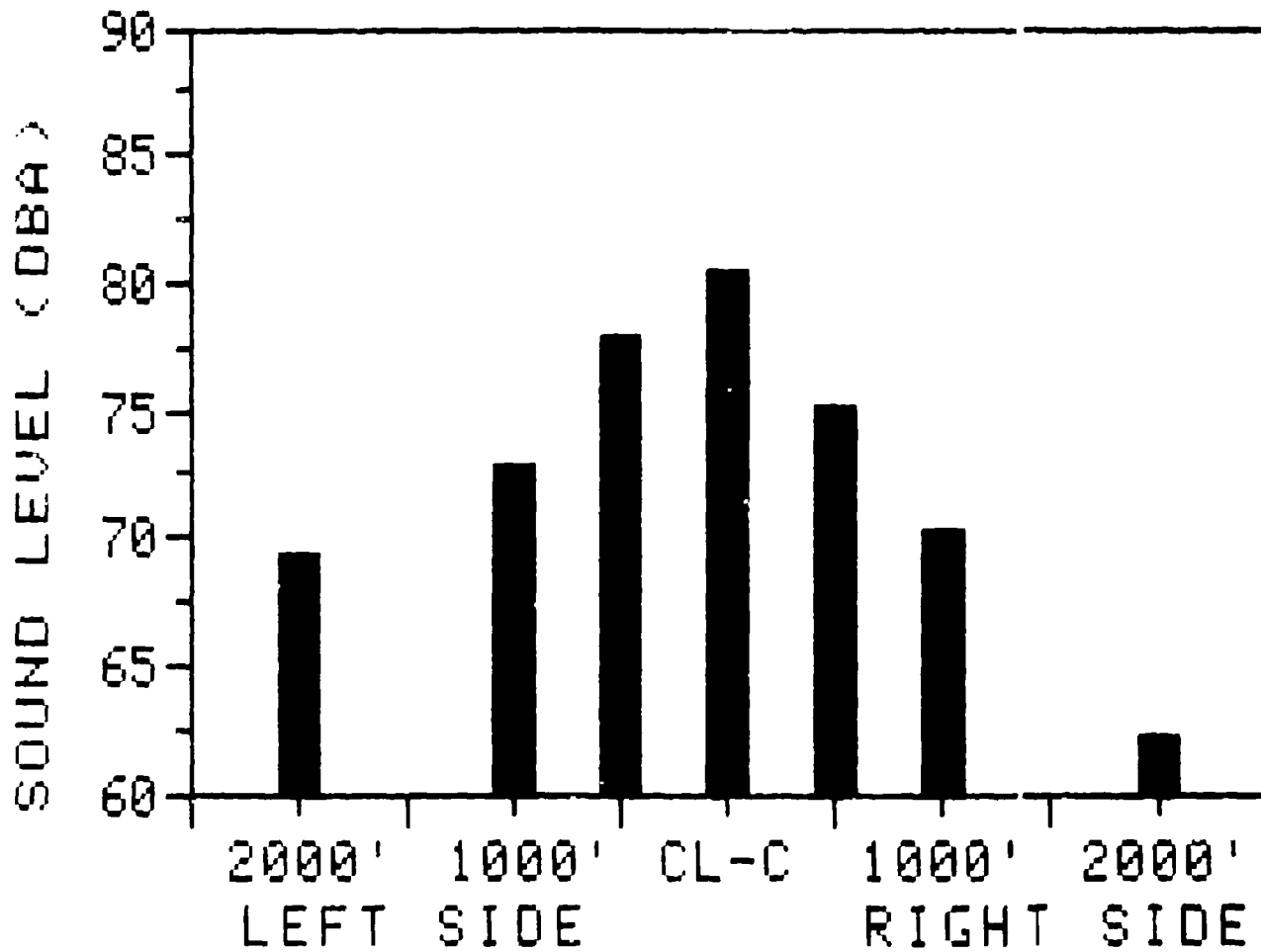
APPROACHES 365N



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| NORMAL APPROACH | 400 | 75-53 | 0.2-5.7 |
| SIX DEG. APPROACH | 380 | 80 | 6.0 |
| NOISE ABATEMENT APP. VAR. R/D AND A/S (EVENTS D21-D27) | 650 | 72-60 | 2.9-11.4 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN ±15 SEC OF THE CL-C MICROPHONE POSITION

NORMAL TAKEOFF 365N

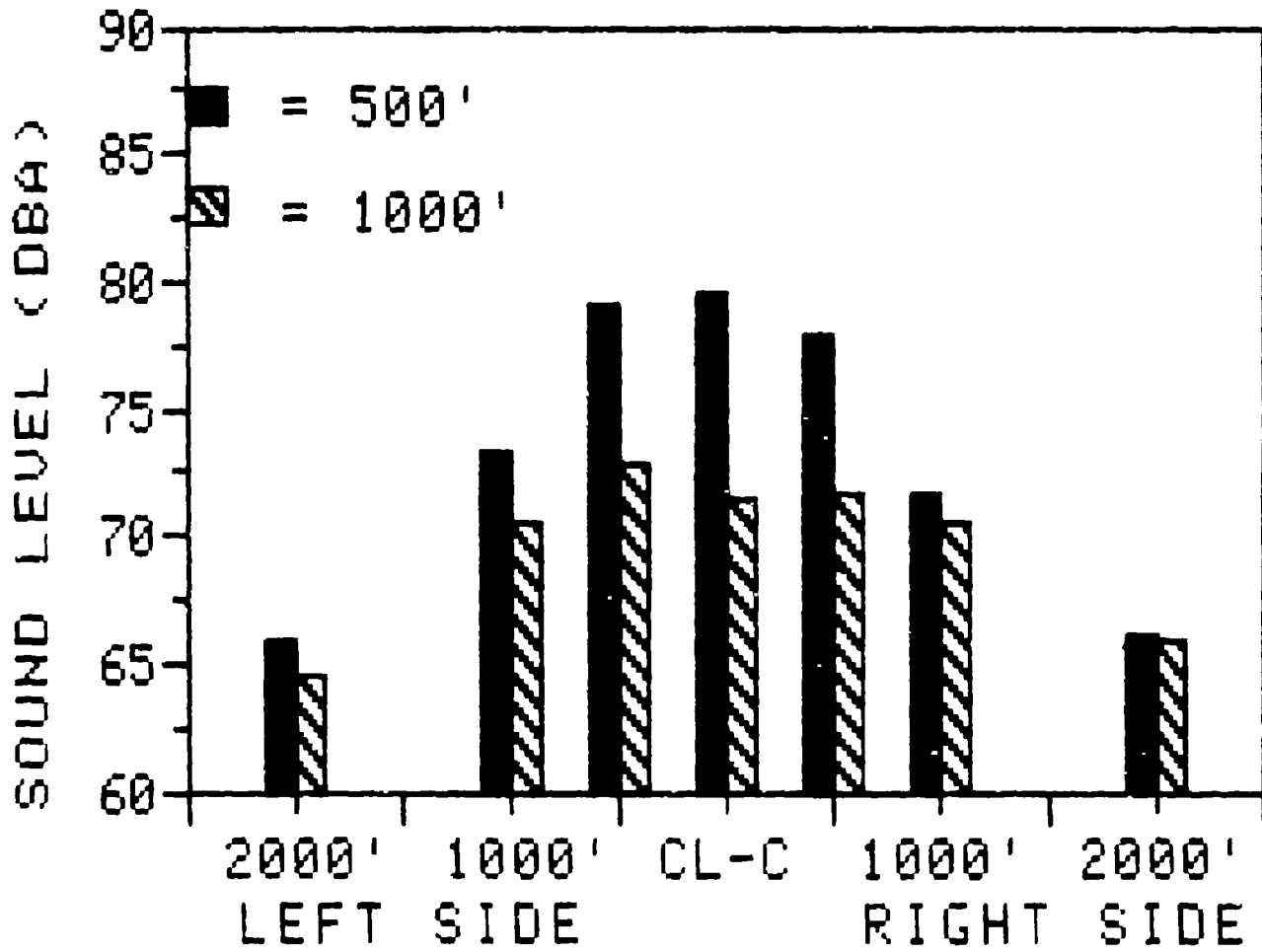


| OPERATION | AVG. ALT. OVER CLC (FT. ABL) | INDICATED AIRSPEED (KTS.) |
|-----------|---------------------------------|------------------------------|
|-----------|---------------------------------|------------------------------|

| | | |
|----------------|-----|----|
| NORMAL TAKEOFF | 418 | 86 |
|----------------|-----|----|

NOTE: ALTIMETER AND INDICATED AIRSPEED READINGS MADE WHEN
THE HELICOPTER PASSED OVER CLC MICROPHONE POSITION

LEVEL FLYOVERS 365N



INDICATED AIRSPEED = 105 KTS.

365N SUMMARY SHEET (9/10/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 75 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 64.8 | 73.2 | 80.3 | 86.3 | 78.3 | 69.7 | 65.6 |
| N | 2 | 8 | 8 | 8 | 8 | 8 | 8 |
| S.D. | .8 | 1.6 | 1.6 | 1.5 | .6 | .5 | .7 |
| 90% CI | -- | 1.1 | 1.1 | 1.0 | .4 | .3 | .5 |

* NORMAL APPROACH *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 63.5 | 70.0 | 76.4 | 80.7 | 75.3 | 69.2 | 65.2 |
| N | 5 | 10 | 11 | 11 | 11 | 9 | 11 |
| S.D. | 1.0 | .8 | .9 | 2.4 | 1.4 | .5 | .9 |
| 90% CI | .9 | .5 | .5 | 1.3 | .8 | .3 | .5 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 67.7 | 74.6 | 79.5 | 78.4 | 74.7 | 70.6 | 67.5 |
| N | 7 | 6 | 7 | 7 | 7 | 7 | 6 |
| S.D. | .7 | .5 | .9 | .7 | 1.2 | .9 | 1.2 |
| 90% CI | .5 | .4 | .7 | .5 | .9 | .7 | 1.0 |

* NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S) *

| | | | | | | | |
|---------|------|-----|------|------|------|------|------|
| AVERAGE | 67.4 | 74 | 78.2 | 76.7 | 72.3 | 69.1 | 65.2 |
| N | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| S.D. | 1.1 | 1.0 | .9 | 1.0 | .4 | .8 | .8 |
| 90% CI | .8 | .7 | .7 | .7 | .3 | .6 | .6 |

365N SUMMARY SHEET (9/10/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* NORMAL TAKEOFF *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 69.3 | 72.9 | 77.8 | 80.4 | 75.2 | 70.2 | 62.1 |
| N | 10 | 10 | 10 | 10 | 10 | 10 | 3 |
| S.D. | .8 | .6 | 1.2 | 1.3 | .9 | .9 | .2 |
| 90% CI | .5 | .3 | .7 | .8 | .5 | .5 | .4 |

* 500 FT. LEVEL FLYOVER AT 135 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 65.8 | 73.3 | 79.1 | 79.5 | 77.9 | 71.6 | 66.1 |
| N | 2 | 4 | 4 | 4 | 4 | 4 | 2 |
| S.D. | .1 | .8 | .6 | .2 | .5 | .9 | 1.4 |
| 90% CI | -- | 1.0 | .7 | .3 | .6 | 1.1 | -- |

* 1000 FT. LEVEL FLYOVER AT 135 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 64.4 | 70.6 | 72.7 | 71.5 | 71.7 | 70.5 | 65.9 |
| N | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| S.D. | -- | .7 | .7 | .5 | .4 | 1.1 | -- |
| 90% CI | -- | -- | -- | -- | -- | -- | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : 6 DEGREE APPROACH AT VY, 75 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A13 | -- | 72.60 | 81.00 | 86.00 | 78.50 | 70.00 | 65.90 |
| A14 | -- | 71.50 | 78.80 | 87.30 | 78.40 | 69.20 | 65.90 |
| A15 | -- | 74.60 | 82.40 | 84.90 | 79.00 | 69.80 | 65.80 |
| A16 | -- | 72.50 | 79.10 | 87.50 | 78.50 | 70.00 | 65.20 |
| A17 | -- | 72.60 | 79.80 | 86.60 | 78.10 | 70.00 | 65.70 |
| A18 | -- | 73.10 | 80.40 | 85.20 | 78.40 | 70.00 | 65.30 |
| A19 | 65.20 | 74.80 | 80.90 | 85.20 | 78.10 | 69.20 | 64.70 |
| A20 | 64.40 | 73.90 | 80.30 | 87.30 | 77.60 | 69.60 | 66.30 |
| AVERAGE | 64.80 | 73.20 | 80.34 | 86.25 | 78.33 | 69.73 | 65.60 |
| STD. DEV. | 0.80 | 1.61 | 1.62 | 1.51 | 0.57 | 0.50 | 0.71 |
| 90% C.I. | NA | 1.08 | 1.08 | 1.01 | 0.38 | 0.33 | 0.48 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 09/10/84

OPERATION : NORMAL APPROACH

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | CL-C | 500' WEST | 1000' WEST | 2000' WEST |
| B1 | -- | 70.00 | 76.10 | 80.60 | 75.50 | -- | 64.50 |
| B3 | -- | 70.60 | 75.90 | 79.60 | 75.30 | 68.70 | 65.90 |
| B5 | -- | 70.70 | 76.60 | 80.20 | 75.30 | 69.30 | 65.10 |
| B7 | -- | 70.00 | 75.90 | 79.50 | 75.10 | 69.00 | 65.20 |
| B9 | -- | 69.80 | 75.90 | 76.70 | 73.60 | 68.80 | 65.30 |
| B11 | -- | 71.10 | 77.30 | 81.90 | 77.70 | 69.00 | 65.90 |
| B35 | 63.60 | -- | 76.80 | 80.90 | 74.60 | 69.40 | 66.40 |
| B37 | 63.70 | 70.80 | 75.10 | 79.90 | 73.20 | -- | 65.90 |
| B73 | 63.90 | 69.40 | 78.40 | 85.00 | 77.30 | 70.30 | 63.20 |
| B75 | 61.90 | 69.50 | 76.30 | 84.60 | 76.80 | 69.20 | 64.50 |
| B77 | 64.40 | 68.40 | 75.60 | 78.70 | 74.30 | 69.20 | 64.80 |
| AVERAGE | 63.50 | 70.03 | 76.35 | 80.69 | 75.34 | 69.21 | 65.15 |
| STD. DEV. | 0.95 | 0.81 | 0.90 | 2.42 | 1.44 | 0.47 | 0.90 |
| 90% C. I. | 0.90 | 0.47 | 0.49 | 1.32 | 0.79 | 0.29 | 0.49 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : NORMAL TAKEOFF

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' WEST | 1000' WEST | 500' WEST | | 500' EAST | 1000' EAST | 2000' EAST |
| C2 | 68.60 | 73.00 | 78.60 | 79.40 | 75.40 | 69.30 | -- |
| C4 | 70.80 | 73.50 | 79.10 | 81.20 | 75.00 | 70.30 | -- |
| C6 | 68.30 | 72.80 | 78.30 | 81.30 | 74.80 | 70.50 | -- |
| C8 | 70.00 | 72.00 | 77.60 | 80.30 | 75.30 | 71.00 | -- |
| C10 | 69.60 | 73.00 | 78.80 | 80.40 | 75.80 | 70.30 | -- |
| C12 | 68.50 | 73.20 | 78.60 | 79.30 | 75.70 | 70.40 | -- |
| C36 | 69.30 | 72.00 | 75.50 | 78.80 | 73.40 | 69.60 | 62.20 |
| C38 | 70.20 | 73.00 | 76.40 | 80.00 | 76.40 | 71.90 | -- |
| C74 | 69.10 | 73.80 | 78.20 | 83.50 | 75.70 | 68.90 | 62.30 |
| C76 | 68.80 | 73.00 | 76.90 | 79.90 | 74.30 | 69.50 | 61.90 |
| AVERAGE | 69.32 | 72.93 | 77.80 | 80.41 | 75.18 | 70.17 | 62.13 |
| STD. DEV. | 0.82 | 0.57 | 1.18 | 1.34 | 0.86 | 0.88 | 0.21 |
| 90% C. I. | 0.47 | 0.33 | 0.68 | 0.78 | 0.50 | 0.51 | 0.35 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D21 | 67.00 | -- | 78.50 | 79.10 | 73.50 | 69.70 | -- |
| D22 | 66.80 | 74.10 | 80.80 | 78.10 | 73.50 | 69.60 | 66.30 |
| D23 | 67.30 | 74.70 | 80.10 | 79.40 | 75.50 | 70.80 | 67.00 |
| D24 | 68.40 | 75.30 | 79.90 | 77.70 | 76.40 | 72.10 | 68.90 |
| D25 | 68.70 | 74.10 | 78.70 | 78.40 | 75.00 | 71.10 | 67.40 |
| D26 | 67.70 | 74.80 | 79.90 | 78.30 | 73.40 | 71.20 | 68.90 |
| D27 | 67.90 | 74.60 | 78.40 | 77.50 | 75.30 | 69.90 | 66.20 |
| AVERAGE | 67.69 | 74.60 | 79.47 | 78.36 | 74.66 | 70.63 | 67.45 |
| STD. DEV. | 0.71 | 0.46 | 0.93 | 0.69 | 1.19 | 0.93 | 1.21 |
| 90% C.I. | 0.52 | 0.38 | 0.68 | 0.51 | 0.87 | 0.68 | 1.00 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D28 | 67.20 | 75.70 | 76.90 | 75.00 | 72.10 | 70.20 | 66.00 |
| D29 | 66.80 | 74.90 | 79.60 | 75.80 | 72.80 | 69.80 | 64.90 |
| D30 | 68.50 | 74.10 | 78.70 | 77.40 | 72.40 | 68.20 | 63.70 |
| D31 | 66.00 | 73.90 | 78.20 | 76.60 | 72.50 | 68.90 | 65.80 |
| D32 | 69.20 | 73.30 | 77.20 | 77.20 | 71.60 | 69.00 | 65.90 |
| D33 | 67.10 | 73.30 | 78.80 | 77.90 | 72.50 | 69.30 | 65.20 |
| D34 | 67.00 | 72.80 | 78.00 | 77.00 | 71.90 | 68.00 | 64.70 |
| AVERAGE | 67.40 | 74.00 | 78.20 | 76.70 | 72.26 | 69.06 | 65.17 |
| STD. DEV. | 1.08 | 1.01 | 0.94 | 1.00 | 0.41 | 0.80 | 0.82 |
| 90% C.I. | 0.80 | 0.74 | 0.69 | 0.73 | 0.30 | 0.58 | 0.60 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : LEVEL FLYOVER (500 FT. AT 135 KTS.)

(LEFT SIDE)

(RIGHT SIDE)

| EVENT NO. | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
|--------------|-------|-------|-------|-------|-------|-------|-------|
| | WEST | WEST | WEST | | EAST | EAST | EAST |
| F78 | -- | 73.20 | 78.80 | 79.80 | 77.80 | 70.40 | 67.10 |
| F79 | 65.70 | 72.40 | 78.40 | 79.40 | 78.60 | 72.30 | -- |
| F80 | -- | 74.40 | 79.20 | 79.30 | 77.60 | 71.30 | 65.10 |
| F81 | 65.90 | 73.30 | 79.80 | 79.30 | 77.60 | 72.40 | -- |
| AVERAGE | 65.80 | 73.33 | 79.05 | 79.45 | 77.90 | 71.60 | 66.10 |
| STD. DEV. | 0.14 | 0.82 | 0.60 | 0.24 | 0.48 | 0.94 | 1.41 |
| 90% C. I. | -- | 0.97 | 0.70 | 0.28 | 0.56 | 1.11 | -- |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: AEROSPATIALE 365N DAUPHIN

TEST DATE: 9/10/84

OPERATION : LEVEL FLYOVER (1000 FT. AT 135 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | WEST | WEST | WEST | | EAST | EAST | EAST |
| E82 | -- | 71.10 | 72.20 | 71.80 | 71.40 | 69.70 | 65.90 |
| E83 | 64.40 | 70.10 | 73.20 | 71.10 | 71.90 | 71.20 | -- |
| AVERAGE | 64.40 | 70.60 | 72.70 | 71.45 | 71.65 | 70.45 | 65.90 |
| STD. DEV. | -- | 0.71 | 0.71 | 0.49 | 0.35 | 1.06 | -- |
| 90% C.I. | -- | -- | -- | -- | -- | -- | -- |

RADAR TRACKING

DATA

- THIS SECTION OF THE APPENDIX CONTAINS THE HELICOPTER -
- POSITION DATA AND TRACKING PLOTS DERIVED FROM THE FFA'S -
- PORTABLE TRACKING RADAR SYSTEM. THE POSITION DATA LISTS -
- THE CLOSEST POINT OF APPROACH (CPA), TIME OF CPA, -
- ELEVATION ANGLE, RATE OF CLIMB OR DESCENT, THE CLIMB OR -
- DESCENT ANGLE, AND GROUND SPEED FOR ALL FLIGHT -
- CONDITIONS. TRACKING PLOTS OF THE ACTUAL FLIGHT PROFILE -
- PLOTTED ARE PROVIDED FOR EACH FLIGHT CONDITIONS. -

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE 09/10/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------|-----|--------|------|------------|--------|-------|------|
| NORMAL APPROACH | | | | | | | |
| 1 | APP | 388.7 | 87.7 | 0:52:55.0 | 21.4 | -0.2 | 73.2 |
| 3 | APP | 394.7 | 87.3 | 0:57:40.3 | -59.2 | -0.5 | 73.6 |
| 5 | APP | 395.0 | 88.8 | 0:02:26.4 | -70.7 | -0.5 | 73.0 |
| 7 | APP | 401.5 | 81.7 | 0:06:50.0 | 173.2 | 1.4 | 72.1 |
| 9 | APP | 415.2 | 88.1 | 0:11:48.0 | -16.2 | -0.2 | 73.4 |
| 11 | APP | 395.0 | 85.6 | 0:16:02.8 | -418.4 | -0.0 | 70.6 |
| 35 | APP | 401.0 | 87.7 | 11:28:01.3 | -167.4 | -1.4 | 70.0 |
| 37 | APP | 421.1 | 86.1 | 11:31:10.2 | 57.1 | -0.4 | 72.3 |
| 73 | APP | 363.9 | 79.1 | 14:12:00.2 | -464.0 | -0.8 | 68.7 |
| 75 | APP | 343.6 | 80.9 | 14:15:12.3 | -286.2 | -1.0 | 67.6 |
| 77 | APP | 348.8 | 79.9 | 14:18:51.5 | -92.0 | -0.8 | 68.2 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|-------|
| 2 | DEP | 409.4 | 86.0 | 0:54:36.2 | 500.0 | 3.6 | 80.0 |
| 4 | DEP | 390.6 | 88.6 | 0:59:26.0 | 208.6 | 1.4 | 37.2 |
| 6 | DEP | 396.0 | 81.5 | 0:03:51.7 | 1044.7 | 7.2 | 31.1 |
| 8 | DEP | 409.0 | 83.0 | 0:08:25.7 | 897.4 | 5.7 | 80.4 |
| 10 | DEP | 394.5 | 68.3 | 0:13:17.0 | 1328.5 | 0.1 | 81.5 |
| 12 | DEP | 420.0 | 79.5 | 0:18:03.5 | 404.5 | 0.3 | 84.2 |
| 36 | DEP | 403.3 | 86.3 | 11:29:23.8 | 1192.4 | 0.3 | 80.6 |
| 38 | DEP | 432.7 | 87.3 | 11:32:30.7 | 570.7 | 4.0 | 81.4 |
| 74 | DEP | 304.8 | 69.3 | 14:13:29.0 | -532.0 | -0.6 | 116.4 |
| 76 | DEP | 400.2 | 88.4 | 14:16:33.8 | 954.5 | 6.3 | 85.5 |

SIX DEGREE APPROACH AT VY, 75 KTS.

| | | | | | | | |
|----|-----|-------|------|-----------|--------|------|------|
| 13 | APP | 390.0 | 89.7 | 0:21:11.0 | -634.1 | -5.4 | 66.5 |
| 14 | APP | 390.8 | 81.4 | 0:26:24.4 | -610.1 | -5.0 | 70.1 |
| 15 | APP | 371.3 | 85.6 | 0:29:56.0 | -365.2 | -2.0 | 70.4 |
| 16 | APP | 374.5 | 74.6 | 0:33:24.1 | -484.6 | -4.2 | 65.6 |
| 17 | APP | 350.1 | 81.8 | 0:36:57.6 | -688.0 | -6.1 | 63.0 |
| 18 | APP | 393.2 | 85.3 | 0:40:08.4 | -628.1 | -5.5 | 64.3 |
| 19 | APP | 362.0 | 82.5 | 0:42:47.2 | -714.6 | -5.8 | 60.3 |
| 20 | APP | 352.8 | 83.6 | 0:45:48.8 | -694.6 | -5.0 | 68.0 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

***FAA/AEE**

DATE: 09/10/84

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|-------|----------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 21 | APP | 548.1 | 86.2 | 10:33:29.1 | -1122.7 | -7.8 | 81.2 |
| 22 | APP | 552.0 | 86.6 | 10:37:01.9 | -1205.4 | -8.6 | 78.8 |
| 23 | APP | 529.9 | 72.2 | 10:40:16.9 | -1423.7 | -0.4 | 85.2 |
| 24 | APP | 570.7 | 84.9 | 10:43:45.7 | -1515.2 | -0.8 | 86.5 |
| 25 | APP | 593.3 | 71.5 | 10:47:19.6 | -1632.7 | -10.0 | 91.1 |
| 26 | APP | 604.0 | 84.2 | 10:51:01.5 | -1346.8 | -8.6 | 87.4 |
| 27 | APP | 640.5 | 75.5 | 10:54:39.2 | -1213.7 | -7.8 | 87.0 |

NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|------|
| 28 | APP | 776.9 | 87.5 | 10:57:31.1 | -1308.5 | -0.0 | 81.8 |
| 29 | APP | 655.4 | 73.7 | 11:01:25.3 | -1111.5 | -8.3 | 75.3 |
| 30 | APP | 613.8 | 88.3 | 11:05:03.8 | -702.5 | -5.1 | 77.5 |
| 31 | APP | 577.4 | 73.7 | 11:08:29.6 | -1662.6 | -13.2 | 69.8 |
| 32 | APP | 661.9 | 77.8 | 11:11:57.1 | -1327.5 | -10.0 | 74.3 |
| 33 | APP | 590.6 | 77.0 | 11:17:10.9 | -1217.6 | -8.8 | 77.4 |
| 34 | APP | 556.3 | 71.7 | 11:22:29.8 | -1086.5 | -8.7 | 70.2 |

500 FT. LEVEL FLYOVER AT 135 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|-------|
| 78 | F/O | 316.5 | 86.8 | 14:20:55.6 | -136.2 | -0.6 | 138.2 |
| 79 | F/O | 350.5 | 86.0 | 14:23:07.1 | 96.8 | 0.4 | 133.3 |
| 80 | F/O | 362.1 | 89.4 | 14:24:53.3 | 224.4 | 0.0 | 142.8 |
| 81 | F/O | 380.0 | 86.9 | 14:26:56.2 | 15.0 | 0.1 | 133.6 |

1000 FT. LEVEL FLYOVER AT 135 KTS.

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|-------|
| 82 | F/O | 896.8 | 85.7 | 14:29:13.4 | -6.7 | -0.9 | 142.0 |
| 83 | F/O | 856.8 | 88.6 | 14:31:17.7 | -104.2 | -0.4 | 133.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 366N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 109/10/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------|-----|--------|------|------------|--------|-------|------|
| NORMAL APPROACH | | | | | | | |
| 1 | APP | 620.8 | 38.0 | 8:52:55.4 | -23.1 | -0.00 | 73.4 |
| 3 | APP | 624.3 | 39.4 | 8:57:40.3 | -50.4 | -0.00 | 73.0 |
| 5 | APP | 636.4 | 38.6 | 9:02:26.4 | -71.3 | -0.00 | 73.0 |
| 7 | APP | 637.7 | 38.0 | 9:06:58.0 | 165.0 | -1.30 | 72.1 |
| 9 | APP | 640.8 | 40.6 | 9:11:48.0 | -26.2 | -0.00 | 73.4 |
| 11 | APP | 621.2 | 39.7 | 9:16:02.7 | -408.0 | -0.00 | 70.0 |
| 35 | APP | 628.3 | 39.8 | 11:28:01.7 | -221.3 | -1.00 | 70.4 |
| 37 | APP | 660.5 | 39.1 | 11:31:10.3 | -52.8 | -0.4 | 72.6 |
| 73 | APP | 630.0 | 35.2 | 14:12:09.1 | -46.3 | -0.0 | 69.3 |
| 75 | APP | 633.0 | 32.7 | 14:15:12.5 | -22.2 | -0.0 | 67.7 |
| 77 | APP | 623.5 | 34.1 | 14:18:51.5 | -22.3 | -0.0 | 68.2 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|-------|
| 2 | DEP | 630.0 | 40.7 | 8:54:36.2 | 509.7 | 3.6 | 80.3 |
| 4 | DEP | 633.8 | 39.3 | 8:59:26.3 | 208.3 | 1.4 | 87.2 |
| 6 | DEP | 622.3 | 39.0 | 9:03:51.6 | 1089.1 | 7.6 | 80.3 |
| 8 | DEP | 621.0 | 41.2 | 9:08:25.7 | 807.5 | 5.7 | 80.4 |
| 10 | DEP | 612.5 | 37.0 | 9:13:17.1 | 1308.4 | 8.0 | 82.4 |
| 12 | DEP | 647.5 | 40.1 | 9:18:03.4 | 507.0 | 3.4 | 84.0 |
| 36 | DEP | 651.6 | 38.5 | 11:29:23.0 | 1183.8 | 8.2 | 80.0 |
| 38 | DEP | 658.8 | 41.4 | 11:32:31.1 | 521.1 | 3.6 | 81.0 |
| 74 | DEP | 433.6 | 51.8 | 14:13:27.0 | 5241.1 | 14.2 | 204.2 |
| 76 | DEP | 640.1 | 38.6 | 14:16:33.2 | 1114.6 | 7.4 | 84.8 |

SIX DEGREE APPROACH AT VY, 75 KTS.

| | | | | | | | |
|----|-----|-------|------|-----------|--------|------|------|
| 13 | APP | 610.2 | 39.4 | 9:21:10.0 | -636.3 | -5.4 | 66.0 |
| 14 | APP | 587.3 | 41.4 | 9:26:24.3 | -600.0 | -4.8 | 70.0 |
| 15 | APP | 581.7 | 38.4 | 9:29:57.7 | -515.6 | -4.2 | 60.0 |
| 16 | APP | 568.4 | 40.8 | 9:33:23.4 | -467.0 | -4.0 | 66.7 |
| 17 | APP | 590.0 | 36.2 | 9:36:57.7 | -659.2 | -5.0 | 63.6 |
| 18 | APP | 613.4 | 40.1 | 9:40:07.0 | -579.7 | -5.0 | 65.6 |
| 19 | APP | 595.8 | 37.4 | 9:42:47.2 | -714.4 | -5.8 | 60.3 |
| 20 | APP | 597.0 | 36.7 | 9:45:48.5 | -704.3 | -6.1 | 65.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 09/10/84

***FAA/AEE**

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|--------|-------|----------|------------|---------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 21 | APP | 765.7 | 45.0 | 10:33:29.0 | -1116.4 | 81.0 |
| 22 | APP | 752.3 | 47.3 | 10:37:01.0 | -1205.6 | 78.0 |
| 23 | APP | 751.8 | 42.4 | 10:40:16.0 | -1424.0 | 85.0 |
| 24 | APP | 775.4 | 48.7 | 10:43:45.5 | -1506.0 | 87.0 |
| 25 | APP | 807.0 | 44.5 | 10:47:19.5 | -1647.2 | 91.0 |
| 26 | APP | 793.8 | 49.4 | 10:51:01.5 | -1348.6 | 87.4 |
| 27 | APP | 806.5 | 51.4 | 10:54:39.0 | -1136.0 | 85.0 |

| | | | | | | |
|--|-----|-------|------|------------|---------|------|
| NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S) | | | | | | |
| 28 | APP | 914.2 | 57.6 | 10:57:31.8 | -1300.5 | 80.2 |
| 29 | APP | 818.7 | 53.8 | 11:01:24.5 | -1166.5 | 78.8 |
| 30 | APP | 781.2 | 52.9 | 11:05:03.4 | -740.2 | 76.0 |
| 31 | APP | 767.5 | 46.4 | 11:08:29.6 | -1662.3 | 69.0 |
| 32 | APP | 839.8 | 52.6 | 11:11:56.5 | -1258.5 | 75.1 |
| 33 | APP | 768.5 | 48.3 | 11:17:11.0 | -1220.0 | 77.0 |
| 34 | APP | 745.0 | 48.0 | 11:22:28.0 | -1022.5 | 72.4 |

500 FT. LEVEL FLYOVER AT 135 KTS.

| | | | | | | |
|----|-----|-------|------|------------|--------|-------|
| 78 | F/O | 577.9 | 33.3 | 14:20:55.8 | -171.7 | 135.5 |
| 79 | F/O | 630.2 | 33.9 | 14:23:07.0 | 132.8 | 133.3 |
| 80 | F/O | 601.7 | 37.1 | 14:24:53.0 | 224.4 | 142.8 |
| 81 | F/O | 626.3 | 37.4 | 14:26:56.5 | 11.0 | 132.5 |

1000 FT. LEVEL FLYOVER AT 135 KTS.

| | | | | | | |
|----|-----|--------|------|------------|--------|-------|
| 82 | F/O | 907.4 | 64.0 | 14:29:13.4 | -233.0 | 142.0 |
| 83 | F/O | 1003.8 | 58.8 | 14:31:17.7 | -103.8 | 133.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE 09/10/84

FAA/AEE

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------|-----|--------|------|------------|--------|-------|------|
| NORMAL APPROACH | | | | | | | |
| 1 | APP | 644.4 | 37.1 | 0:52:55.1 | 0.6 | 0.1 | 73.4 |
| 3 | APP | 610.4 | 40.4 | 0:57:50.7 | -01.2 | -0.7 | 76.6 |
| 5 | APP | 633.3 | 38.6 | 0:02:27.3 | -105.5 | -0.8 | 74.7 |
| 7 | APP | 612.5 | 41.7 | 0:07:00.0 | 195.9 | 1.5 | 74.5 |
| 9 | APP | 641.6 | 40.6 | 0:11:49.3 | -3.1 | 0.0 | 74.4 |
| 11 | APP | 638.8 | 38.3 | 0:16:03.3 | -414.3 | -0.4 | 68.6 |
| 35 | APP | 634.3 | 39.7 | 11:28:00.8 | -140.7 | -1.2 | 70.7 |
| 37 | APP | 624.8 | 42.4 | 11:31:10.0 | 63.4 | 0.5 | 71.0 |
| 73 | APP | 557.8 | 39.9 | 14:12:10.0 | -448.6 | -3.0 | 65.7 |
| 75 | APP | 557.8 | 38.9 | 14:15:11.8 | -161.0 | -1.0 | 67.0 |
| 77 | APP | 582.5 | 36.7 | 14:18:51.7 | -92.0 | 0.8 | 68.5 |

| | | | | | | | |
|----------------|-----|-------|------|------------|--------|------|-------|
| NORMAL TAKEOFF | | | | | | | |
| 2 | DEP | 643.2 | 38.3 | 0:54:34.0 | 800.0 | 5.6 | 81.0 |
| 4 | DEP | 631.4 | 39.0 | 0:59:27.0 | 212.3 | 1.4 | 87.1 |
| 6 | DEP | 643.5 | 36.9 | 0:03:51.3 | 1181.3 | 8.6 | 77.5 |
| 8 | DEP | 671.7 | 37.3 | 0:08:25.7 | 807.5 | 5.7 | 80.4 |
| 10 | DEP | 655.8 | 36.5 | 0:13:17.4 | 1271.0 | 8.5 | 83.0 |
| 12 | DEP | 651.8 | 41.2 | 0:18:04.4 | 343.5 | 2.2 | 87.7 |
| 36 | DEP | 620.4 | 39.8 | 11:29:23.8 | 1192.2 | 8.3 | 80.5 |
| 38 | DEP | 610.6 | 40.6 | 11:32:28.0 | 1164.0 | 8.2 | 80.1 |
| 74 | DEP | 533.6 | 32.4 | 14:13:28.8 | -656.6 | -3.0 | 121.0 |
| 76 | DEP | 608.6 | 41.2 | 14:16:33.5 | 961.0 | 6.3 | 85.7 |

| | | | | | | | |
|------------------------------------|-----|-------|------|-----------|--------|------|------|
| SIX DEGREE APPROACH AT VY, 75 KTS. | | | | | | | |
| 13 | APP | 633.7 | 38.1 | 0:21:11.1 | -634.0 | -5.0 | 66.9 |
| 14 | APP | 660.1 | 35.4 | 0:26:25.8 | -556.0 | -4.8 | 65.2 |
| 15 | APP | 609.5 | 38.2 | 0:29:56.3 | -263.2 | -2.1 | 69.2 |
| 16 | APP | 651.5 | 34.7 | 0:33:29.0 | -407.0 | -4.2 | 67.7 |
| 17 | APP | 598.3 | 35.1 | 0:36:50.4 | -402.0 | -4.3 | 64.0 |
| 18 | APP | 618.0 | 38.3 | 0:40:09.3 | -700.0 | -6.0 | 65.5 |
| 19 | APP | 592.0 | 39.8 | 0:42:46.5 | -654.8 | -5.5 | 66.8 |
| 20 | APP | 603.0 | 37.2 | 0:45:48.0 | -689.7 | -6.0 | 64.3 |

- CPA-FT : CLOSEST POINT OF APPROACH
- E-A : ELEVATION ANGLE
- CPA-TIME : CLOSEST POINT OF APPROACH TIME
- RC-FPM : RATE OF CLIMB
- C/D-A : CLIMB OR DESCENT ANGLE
- GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE: 09/10/84

***FAA/AEE**

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|-----|--------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 21 | APP | 638.2 | 57.3 | 10:33:89.8 | -1228.0 | -0.1 | 75.7 |
| 22 | APP | 733.2 | 48.4 | 10:37:02.6 | -1225.2 | -8.7 | 79.3 |
| 23 | APP | 693.1 | 50.9 | 10:40:16.4 | -1481.7 | -10.0 | 83.3 |
| 24 | APP | 746.1 | 50.7 | 10:43:45.7 | -1515.1 | -0.8 | 86.5 |
| 25 | APP | 737.8 | 50.6 | 10:47:19.4 | -1653.3 | -10.2 | 90.8 |
| 26 | APP | 761.7 | 53.0 | 10:51:01.2 | -1332.0 | -8.6 | 87.3 |
| 27 | APP | 797.1 | 54.2 | 10:54:38.3 | -971.1 | -6.5 | 84.6 |

| | | | | | | | |
|--|-----|-------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S) | | | | | | | |
| 28 | APP | 929.4 | 56.8 | 10:57:31.5 | -1356.7 | -0.4 | 81.3 |
| 29 | APP | 812.1 | 51.3 | 11:01:25.2 | -1114.2 | -8.2 | 75.0 |
| 30 | APP | 760.6 | 55.4 | 11:05:03.0 | -792.5 | -5.0 | 75.3 |
| 31 | APP | 759.7 | 49.6 | 11:08:29.1 | -1615.4 | -12.5 | 71.7 |
| 32 | APP | 810.9 | 53.5 | 11:11:58.8 | -1303.5 | -0.7 | 75.1 |
| 33 | APP | 764.4 | 50.9 | 11:17:10.4 | -1206.7 | -8.0 | 76.4 |
| 34 | APP | 736.2 | 45.8 | 11:22:29.8 | -1086.6 | -8.7 | 70.2 |

| | | | | | | | |
|-----------------------------------|-----|-------|------|------------|--------|------|-------|
| 500 FT. LEVEL FLYOVER AT 135 KTS. | | | | | | | |
| 78 | F/O | 602.2 | 31.6 | 14:20:55.5 | -133.4 | -0.5 | 130.0 |
| 79 | F/O | 588.1 | 36.5 | 14:23:06.5 | -0.0 | 0.0 | 135.3 |
| 80 | F/O | 615.4 | 36.1 | 14:24:53.4 | 220.8 | 0.0 | 142.0 |
| 81 | F/O | 611.5 | 38.4 | 14:26:56.3 | 17.3 | 0.1 | 133.5 |

| | | | | | | | |
|------------------------------------|-----|--------|------|------------|--------|------|-------|
| 1000 FT. LEVEL FLYOVER AT 135 KTS. | | | | | | | |
| 82 | F/O | 1056.9 | 57.8 | 14:29:13.4 | -233.0 | -0.0 | 142.0 |
| 83 | F/O | 971.4 | 62.3 | 14:31:17.4 | -127.5 | -0.5 | 134.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 109/10/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|-----------------|--------|--------|----------|------------|--------|------|------|
| NORMAL APPROACH | | | | | | | |
| 1 | APP | 1053.8 | 22.4 | 8:52:56.0 | -83.0 | -0.6 | 74.2 |
| 3 | APP | 1060.1 | 22.1 | 8:57:49.3 | -59.4 | -0.5 | 73.6 |
| 5 | APP | 1074.2 | 21.8 | 9:02:26.4 | -71.3 | -0.5 | 73.0 |
| 7 | APP | 1072.7 | 22.3 | 9:06:59.6 | 202.9 | 1.5 | 74.3 |
| 9 | APP | 1071.0 | 23.0 | 9:11:48.0 | -26.2 | -0.2 | 73.4 |
| 11 | APP | 1055.1 | 21.7 | 9:16:03.7 | -373.6 | -3.1 | 67.4 |
| 35 | APP | 1061.4 | 22.4 | 11:28:01.7 | -221.0 | -1.8 | 70.4 |
| 37 | APP | 1104.0 | 22.6 | 11:31:10.3 | 52.8 | 0.4 | 72.6 |
| 73 | APP | 1077.5 | 19.8 | 14:12:09.1 | -464.3 | -3.8 | 69.3 |
| 75 | APP | 1086.8 | 18.5 | 14:15:12.5 | -242.2 | -2.0 | 67.7 |
| 77 | APP | 1073.3 | 18.9 | 14:18:52.4 | -96.7 | -0.8 | 68.6 |

NORMAL TAKEOFF

| | | | | | | | |
|----|-----|--------|------|------------|--------|------|-------|
| 2 | DEP | 1061.2 | 22.0 | 8:54:36.2 | 500.7 | 3.6 | 80.3 |
| 4 | DEP | 1069.4 | 22.2 | 8:59:26.3 | 268.3 | 1.4 | 87.3 |
| 6 | DEP | 1056.5 | 21.9 | 9:03:51.6 | 1089.1 | 7.6 | 80.2 |
| 8 | DEP | 1049.7 | 22.7 | 9:08:25.4 | 834.8 | 5.8 | 80.6 |
| 10 | DEP | 1042.1 | 23.2 | 9:13:18.6 | 874.3 | 5.5 | 80.8 |
| 12 | DEP | 1074.2 | 22.8 | 9:18:02.4 | 651.4 | 4.8 | 80.0 |
| 37 | DEP | 1087.3 | 21.6 | 11:29:23.4 | 1243.2 | 8.8 | 79.4 |
| 38 | DEP | 1085.6 | 23.8 | 11:32:31.2 | 545.0 | 3.8 | 82.0 |
| 74 | DEP | 569.0 | 12.1 | 14:13:26.4 | 4675.6 | 20.4 | 124.3 |
| 76 | DEP | 1073.6 | 22.0 | 14:16:32.2 | 1114.8 | 7.4 | 84.8 |

SIX DEGREE APPROACH AT VY, 75 KTS.

| | | | | | | | |
|----|-----|--------|------|-----------|--------|------|------|
| 13 | APP | 1054.1 | 22.2 | 9:21:10.8 | -643.3 | -5.6 | 66.3 |
| 14 | APP | 1018.2 | 22.6 | 9:26:24.3 | -620.5 | -4.8 | 70.2 |
| 15 | APP | 1013.0 | 21.0 | 9:30:57.3 | -521.8 | -4.0 | 69.8 |
| 16 | APP | 1001.8 | 21.9 | 9:33:23.4 | -467.8 | -4.0 | 66.7 |
| 17 | APP | 1037.1 | 19.8 | 9:36:57.7 | -850.2 | -5.8 | 63.6 |
| 18 | APP | 1046.4 | 22.3 | 9:40:07.0 | -579.7 | -5.0 | 65.6 |
| 19 | APP | 1038.4 | 20.5 | 9:42:47.0 | -714.4 | -5.8 | 69.3 |
| 20 | APP | 1042.2 | 20.2 | 9:45:48.6 | -704.3 | -6.1 | 65.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE: 09/10/84

XXFAA/AEEXX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|-----|--------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 21 | APP | 1171.1 | 28.1 | 10:33:29.6 | -1116.4 | -7.7 | 81.0 |
| 22 | APP | 1152.1 | 28.8 | 10:37:01.9 | -1205.6 | -8.6 | 78.8 |
| 23 | APP | 1161.7 | 26.0 | 10:40:16.9 | -1424.0 | -9.4 | 85.2 |
| 24 | APP | 1167.6 | 29.0 | 10:43:46.6 | -1503.0 | -10.2 | 82.8 |
| 25 | APP | 1204.3 | 28.1 | 10:47:19.5 | -1647.2 | -10.1 | 91.0 |
| 26 | APP | 1181.2 | 30.8 | 10:51:01.5 | -1245.6 | -8.6 | 87.4 |
| 27 | APP | 1178.0 | 32.5 | 10:54:39.0 | -1136.0 | -7.4 | 85.8 |

| | | | | | | | |
|--|-----|--------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S) | | | | | | | |
| 28 | APP | 1248.8 | 38.3 | 10:57:31.8 | -1393.5 | -9.7 | 80.2 |
| 29 | APP | 1183.8 | 34.0 | 11:01:24.5 | -1166.5 | -8.3 | 78.8 |
| 30 | APP | 1155.1 | 32.7 | 11:05:03.4 | -743.2 | -5.5 | 78.6 |
| 31 | APP | 1156.0 | 28.5 | 11:08:00.3 | -1517.2 | -12.4 | 68.3 |
| 32 | APP | 1209.5 | 33.6 | 11:11:56.5 | -1258.5 | -9.4 | 75.1 |
| 33 | APP | 1153.3 | 29.9 | 11:17:11.0 | -1220.9 | -8.8 | 77.9 |
| 34 | APP | 1135.7 | 30.4 | 11:22:28.4 | -1308.8 | -10.2 | 71.9 |

| | | | | | | | |
|-----------------------------------|-----|--------|------|------------|--------|------|-------|
| 500 FT. LEVEL FLYOVER AT 135 KTS. | | | | | | | |
| 78 | F/O | 1031.7 | 18.0 | 14:20:55.8 | -171.7 | -0.7 | 135.5 |
| 79 | F/O | 1080.7 | 19.1 | 14:23:07.4 | 167.7 | 0.7 | 133.4 |
| 80 | F/O | 1045.3 | 20.4 | 14:24:53.2 | 224.4 | 0.9 | 142.8 |
| 81 | F/O | 1066.0 | 21.0 | 14:26:56.5 | 11.9 | 0.1 | 132.5 |

| | | | | | | | |
|------------------------------------|-----|--------|------|------------|--------|------|-------|
| 1000 FT. LEVEL FLYOVER AT 135 KTS. | | | | | | | |
| 82 | F/O | 1297.9 | 43.9 | 14:29:13.3 | -214.1 | -0.9 | 141.9 |
| 83 | F/O | 1334.6 | 46.1 | 14:31:17.7 | -103.8 | -0.4 | 133.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE 109/10/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------|--------|------|------------|--------|-------|------|
| NORMAL APPROACH | | | | | | |
| 1 APP | 1085.8 | 21.2 | 8:52:55.6 | -45.1 | -0.3 | 74.0 |
| 3 APP | 1025.7 | 22.8 | 8:57:50.7 | -91.2 | -0.7 | 76.6 |
| 5 APP | 1066.7 | 21.0 | 9:02:27.3 | -105.5 | -0.8 | 74.7 |
| 7 APP | 1038.7 | 23.2 | 9:07:00.0 | 105.0 | 1.5 | 74.5 |
| 9 APP | 1061.0 | 23.3 | 9:11:40.3 | -3.1 | 0.0 | 74.4 |
| 11 APP | 1074.9 | 21.7 | 9:16:03.3 | -414.3 | -3.4 | 68.6 |
| 35 APP | 1067.7 | 22.4 | 11:28:00.8 | -149.7 | -1.2 | 70.7 |
| 37 APP | 1050.5 | 23.7 | 11:31:10.0 | 63.4 | 0.5 | 71.0 |
| 73 APP | 981.7 | 21.2 | 14:12:10.0 | -448.6 | -3.0 | 65.7 |
| 75 APP | 998.1 | 20.7 | 14:15:11.8 | -161.3 | -1.3 | 67.0 |
| 77 APP | 1026.5 | 19.8 | 14:18:52.6 | -102.1 | -0.8 | 68.1 |

NORMAL TAKEOFF

| | | | | | | |
|--------|--------|------|------------|--------|------|-------|
| 2 DEP | 1070.4 | 22.0 | 8:54:34.0 | 800.0 | 5.6 | 81.0 |
| 4 DEP | 1059.2 | 22.8 | 8:59:25.0 | 205.0 | 1.3 | 88.2 |
| 6 DEP | 1081.7 | 21.0 | 9:03:51.3 | 1181.3 | 8.6 | 77.5 |
| 8 DEP | 1110.6 | 22.4 | 9:08:26.4 | 731.0 | 5.0 | 82.5 |
| 10 DEP | 1079.5 | 22.5 | 9:13:10.4 | 646.8 | 4.1 | 80.3 |
| 12 DEP | 1070.5 | 23.5 | 9:18:04.4 | 343.5 | 2.2 | 87.7 |
| 36 DEP | 1061.7 | 22.0 | 11:29:23.1 | 1271.4 | 8.0 | 80.5 |
| 38 DEP | 1001.5 | 23.5 | 11:32:28.0 | 1164.3 | 8.2 | 80.1 |
| 74 DEP | 986.5 | 17.0 | 14:13:28.8 | -656.6 | -3.0 | 121.0 |
| 76 DEP | 1018.0 | 26.4 | 14:16:34.8 | 968.2 | 6.2 | 87.6 |

SIX DEGREE APPROACH AT VY, 75 KTS.

| | | | | | | |
|--------|--------|------|-----------|--------|------|------|
| 13 APP | 1073.3 | 21.5 | 9:21:11.1 | -634.0 | -5.3 | 66.0 |
| 14 APP | 1096.1 | 20.6 | 9:26:25.8 | -556.0 | -4.8 | 65.2 |
| 15 APP | 1049.3 | 21.2 | 9:30:56.0 | -263.2 | -2.1 | 69.2 |
| 16 APP | 1090.6 | 19.8 | 9:33:23.0 | -407.0 | -4.2 | 67.5 |
| 17 APP | 1038.8 | 19.5 | 9:38:58.4 | -492.0 | -4.3 | 64.0 |
| 18 APP | 1050.6 | 21.5 | 9:40:00.3 | -790.0 | -6.0 | 65.5 |
| 19 APP | 1028.1 | 21.8 | 9:42:46.5 | -654.8 | -5.5 | 66.8 |
| 20 APP | 1043.7 | 20.7 | 9:45:47.0 | -670.5 | -6.0 | 64.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE: 09/10/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|--------|--------|----------|------------|---------|------------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | |
| 21 | APP | 994.4 | 32.8 | 10:33:29.8 | -1228.0 | -9.1 75.7 |
| 22 | APP | 1119.8 | 28.2 | 10:37:03.2 | -1296.8 | -9.2 79.1 |
| 23 | APP | 1077.1 | 30.1 | 10:40:16.4 | -1481.7 | -10.0 83.3 |
| 24 | APP | 1131.2 | 30.8 | 10:43:45.7 | -1515.1 | -9.8 86.6 |
| 25 | APP | 1112.2 | 32.3 | 10:47:19.1 | -1624.1 | -9.9 91.8 |
| 26 | APP | 1136.2 | 32.5 | 10:51:01.2 | -1332.0 | -8.0 87.3 |
| 27 | APP | 1162.8 | 33.9 | 10:54:38.3 | -971.1 | -6.5 84.6 |

NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S)

| | | | | | | |
|----|-----|--------|------|------------|---------|------------|
| 28 | APP | 1268.8 | 35.3 | 10:57:33.4 | -1676.6 | -12.0 78.0 |
| 29 | APP | 1178.7 | 32.6 | 11:01:25.2 | -1114.2 | -8.2 75.0 |
| 30 | APP | 1119.8 | 34.1 | 11:05:03.0 | -792.5 | -5.0 75.3 |
| 31 | APP | 1146.4 | 30.4 | 11:08:29.1 | -1615.4 | -12.5 71.7 |
| 32 | APP | 1164.0 | 35.8 | 11:11:56.1 | -1273.3 | -9.5 74.7 |
| 33 | APP | 1146.1 | 29.5 | 11:17:11.5 | -1181.8 | -8.6 77.1 |
| 34 | APP | 1124.7 | 28.9 | 11:22:29.6 | -1092.7 | -8.6 71.7 |

500 FT. LEVEL FLYOVER AT 135 KTS.

| | | | | | | |
|----|-----|--------|------|------------|-------|------------|
| 78 | APP | 1059.6 | 17.4 | 14:20:53.2 | -93.6 | -0.4 140.0 |
| 79 | F/O | 1023.7 | 20.1 | 14:23:06.5 | -0.0 | 0.0 135.3 |
| 80 | F/O | 1061.5 | 20.1 | 14:24:53.4 | 220.8 | 0.0 142.0 |
| 81 | F/O | 1050.0 | 21.3 | 14:26:56.3 | 17.3 | 0.1 133.5 |

1000 FT. LEVEL FLYOVER AT 135 KTS.

| | | | | | | |
|----|-----|--------|------|------------|--------|------------|
| 82 | F/O | 1390.3 | 40.4 | 14:29:13.7 | -262.0 | -1.0 142.3 |
| 83 | F/O | 1282.0 | 42.3 | 14:31:17.4 | -127.6 | -0.5 134.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 09/10/84

XXFAA/AEEXX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------|--------|--------|----------|------------|--------|------|
| NORMAL APPROACH | | | | | | |
| 1 | APP | 2010.4 | 11.6 | 8:52:56.0 | -83.0 | 74.2 |
| 3 | APP | 2022.7 | 11.5 | 8:57:49.3 | -59.4 | 73.0 |
| 5 | APP | 2037.5 | 11.4 | 9:02:26.4 | -71.3 | 73.0 |
| 7 | APP | 2032.7 | 11.5 | 9:06:58.0 | -52.0 | 72.2 |
| 9 | APP | 2031.0 | 12.0 | 9:11:48.0 | -26.2 | 73.4 |
| 11 | APP | 2014.7 | 11.0 | 9:16:03.7 | -73.0 | 67.4 |
| 35 | APP | 2022.3 | 11.6 | 11:28:01.7 | -221.3 | 70.4 |
| 37 | APP | 2063.0 | 11.0 | 11:31:10.3 | -52.0 | 72.0 |
| 73 | APP | 2046.7 | 10.4 | 14:12:09.1 | -464.3 | 69.3 |
| 75 | APP | 2059.5 | 9.7 | 14:15:12.5 | -242.2 | 67.7 |
| 77 | APP | 2043.6 | 9.0 | 14:18:52.4 | -96.7 | 68.6 |

| | | | | | | |
|----------------|-----|--------|------|------------|--------|-------|
| NORMAL TAKEOFF | | | | | | |
| 2 | DEP | 2019.5 | 11.7 | 8:54:35.2 | 728.0 | 81.0 |
| 4 | DEP | 2030.4 | 11.7 | 8:59:25.5 | 2044.6 | 85.2 |
| 6 | DEP | 2015.0 | 11.3 | 9:03:51.0 | 1239.4 | 75.8 |
| 8 | DEP | 2008.1 | 11.7 | 9:08:25.4 | 834.8 | 80.6 |
| 10 | DEP | 2000.3 | 11.0 | 9:13:18.6 | 874.3 | 80.8 |
| 12 | DEP | 2027.4 | 11.0 | 9:18:02.8 | 651.4 | 80.0 |
| 36 | DEP | 2048.5 | 11.4 | 11:29:23.4 | 1243.2 | 79.4 |
| 38 | DEP | 2040.2 | 12.5 | 11:32:31.7 | 582.4 | 81.2 |
| 74 | DEP | 1343.5 | 5.2 | 14:13:26.4 | 4675.6 | 124.3 |
| 76 | DEP | 2034.2 | 11.5 | 14:16:33.2 | 1114.8 | 84.8 |

SIX DEGREE APPROACH AT VY, 75 KTS.

| | | | | | | |
|----|-----|--------|------|-----------|--------|------|
| 13 | APP | 2016.2 | 11.5 | 9:21:10.8 | -643.3 | 66.3 |
| 14 | APP | 1978.8 | 11.4 | 9:26:25.0 | -645.0 | 66.7 |
| 15 | APP | 1976.0 | 10.7 | 9:29:57.8 | -524.0 | 69.8 |
| 16 | APP | 1965.7 | 11.1 | 9:33:23.4 | -467.8 | 66.7 |
| 17 | APP | 2004.5 | 10.0 | 9:36:56.4 | -841.0 | 67.1 |
| 18 | APP | 2008.0 | 11.5 | 9:40:07.9 | -579.7 | 65.6 |
| 19 | APP | 2006.1 | 10.6 | 9:42:47.2 | -714.4 | 69.3 |
| 20 | APP | 2011.3 | 10.4 | 9:45:48.5 | -764.6 | 65.4 |

- CPA-FT : CLOSEST POINT OF APPROACH
- E-A : ELEVATION ANGLE
- CPA-TIME : CLOSEST POINT OF APPROACH TIME
- RC-FPM : RATE OF CLIMB
- C/D-A : CLIMB OR DESCENT ANGLE
- GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 09/10/84

XXFAA/AEEIX

| EVENT | | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|---|-----|--------|------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 21 | APP | 2107.4 | 15.3 | 10:33:29.0 | -1116.4 | -7.7 | 81.0 |
| 22 | APP | 2083.2 | 15.8 | 10:37:01.3 | -1273.7 | -9.2 | 77.0 |
| 23 | APP | 2101.4 | 14.0 | 10:40:17.2 | -1384.3 | -9.1 | 85.4 |
| 24 | APP | 2094.1 | 15.8 | 10:43:46.6 | -1503.0 | -10.2 | 82.8 |
| 25 | APP | 2131.4 | 15.5 | 10:47:19.0 | -1572.3 | -9.8 | 80.5 |
| 26 | APP | 2101.6 | 16.4 | 10:51:02.3 | -1380.2 | -9.0 | 86.7 |
| 27 | APP | 2087.1 | 17.4 | 10:54:39.5 | -1319.0 | -8.3 | 80.0 |

NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S)

| | | | | | | | |
|----|-----|--------|------|------------|---------|-------|------|
| 28 | APP | 2122.0 | 21.5 | 10:57:31.8 | -1303.5 | -9.7 | 80.2 |
| 29 | APP | 2088.8 | 18.6 | 11:01:24.5 | -1166.5 | -8.3 | 78.8 |
| 30 | APP | 2060.2 | 17.7 | 11:05:03.4 | -743.2 | -5.5 | 76.6 |
| 31 | APP | 2070.4 | 15.5 | 11:08:30.3 | -1517.2 | -12.4 | 68.3 |
| 32 | APP | 2115.5 | 10.3 | 11:11:55.5 | -1278.2 | -9.4 | 78.6 |
| 33 | APP | 2075.6 | 16.2 | 11:17:11.0 | -1220.0 | -8.8 | 77.0 |
| 34 | APP | 2061.8 | 16.4 | 11:22:27.9 | -1210.4 | -9.5 | 71.7 |

500 FT. LEVEL FLYOVER AT 135 KTS.

| | | | | | | | |
|----|-----|--------|------|------------|--------|------|-------|
| 78 | F/O | 2006.3 | 9.3 | 14:20:55.8 | -171.7 | -0.7 | 135.5 |
| 79 | F/O | 2050.0 | 10.0 | 14:23:07.4 | 167.7 | 0.7 | 133.4 |
| 80 | F/O | 2012.6 | 10.6 | 14:24:53.6 | 215.8 | 0.0 | 142.0 |
| 81 | F/O | 2030.8 | 10.0 | 14:26:56.5 | 11.0 | 0.1 | 132.5 |

1000 FT. LEVEL FLYOVER AT 135 KTS.

| | | | | | | | |
|----|-----|--------|------|------------|--------|------|-------|
| 82 | F/O | 2135.3 | 25.0 | 14:29:13.3 | -214.1 | -0.9 | 141.9 |
| 83 | F/O | 2107.2 | 23.2 | 14:31:17.7 | -103.8 | -0.4 | 133.4 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE 109/10/84

***FAA/AEE**

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-----------------|--------|------|------------|--------|-------|------|
| NORMAL APPROACH | | | | | | |
| 1 APP | 2046.6 | 10.7 | 8:52:55.6 | -45.1 | -0.3 | 74.0 |
| 3 APP | 1974.4 | 11.3 | 8:57:50.7 | -91.2 | -0.7 | 76.6 |
| 5 APP | 2024.6 | 11.0 | 9:02:27.3 | -105.5 | -0.8 | 74.7 |
| 7 APP | 1993.2 | 11.6 | 9:07:00.1 | 189.3 | 1.4 | 74.6 |
| 9 APP | 2011.6 | 11.7 | 9:11:49.3 | -3.1 | 0.0 | 74.4 |
| 11 APP | 2034.1 | 10.9 | 9:16:03.3 | -414.3 | -3.4 | 68.6 |
| 35 APP | 2025.5 | 11.2 | 11:28:00.8 | -149.7 | -1.2 | 70.7 |
| 37 APP | 2004.2 | 11.8 | 11:31:10.0 | 63.4 | 0.5 | 71.0 |
| 73 APP | 1938.5 | 10.2 | 14:12:10.0 | -448.6 | -3.0 | 65.7 |
| 75 APP | 1963.5 | 10.0 | 14:15:11.8 | -161.3 | -1.3 | 67.0 |
| 77 APP | 1990.6 | 9.7 | 14:18:52.6 | -102.1 | -0.8 | 66.1 |

NORMAL TAKEOFF

| | | | | | | |
|--------|--------|------|------------|--------|------|-------|
| 2 DEP | 2024.2 | 11.1 | 8:54:34.9 | 800.0 | 5.6 | 81.0 |
| 4 DEP | 2013.7 | 11.4 | 8:59:25.0 | 205.0 | 1.3 | 88.2 |
| 6 DEP | 2042.0 | 10.6 | 9:03:51.3 | 1181.3 | 8.6 | 77.5 |
| 8 DEP | 2062.2 | 11.7 | 9:08:27.0 | 679.8 | 4.7 | 81.6 |
| 10 DEP | 2021.2 | 11.7 | 9:13:20.9 | 525.3 | 3.4 | 88.1 |
| 12 DEP | 2019.6 | 12.0 | 9:18:05.8 | 225.8 | 1.4 | 92.6 |
| 36 DEP | 2017.0 | 11.0 | 11:20:23.1 | 1271.4 | 8.9 | 80.5 |
| 38 DEP | 1936.6 | 11.5 | 11:32:28.9 | 1164.3 | 8.2 | 80.1 |
| 74 DEP | 1959.0 | 8.1 | 14:13:28.8 | -656.6 | -3.0 | 121.0 |
| 76 DEP | 1957.0 | 13.0 | 14:16:34.8 | 968.2 | 6.2 | 87.6 |

SIX DEGREE APPROACH AT VY, 75 KTS.

| | | | | | | |
|--------|--------|------|-----------|--------|------|------|
| 12 APP | 2034.8 | 10.8 | 9:21:11.1 | -634.0 | -5.3 | 66.0 |
| 14 APP | 2054.5 | 10.5 | 9:26:25.8 | -556.6 | -4.0 | 65.2 |
| 15 APP | 2011.7 | 10.4 | 9:29:56.2 | -270.2 | -2.2 | 69.2 |
| 16 APP | 2055.7 | 10.1 | 9:33:23.0 | -497.0 | -4.2 | 67.5 |
| 17 APP | 2002.6 | 9.6 | 9:36:58.4 | -492.0 | -4.3 | 64.0 |
| 18 APP | 2008.2 | 10.7 | 9:40:09.3 | -799.0 | -6.0 | 65.5 |
| 19 APP | 1988.0 | 10.7 | 9:43:46.5 | -654.8 | -5.5 | 66.8 |
| 20 APP | 2007.3 | 10.3 | 9:45:47.9 | -679.5 | -6.0 | 64.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

AEROSPATIALE 365N DAUPHIN

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE: 09/10/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|---|--------|--------|----------|------------|---------|-------|------|
| NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) | | | | | | | |
| 21 | APP | 1906.5 | 16.0 | 10:33:29.8 | -1228.9 | -9.1 | 75.7 |
| 22 | APP | 2040.0 | 14.7 | 10:37:03.2 | -1296.8 | -9.2 | 79.1 |
| 23 | APP | 2000.7 | 15.3 | 10:40:16.4 | -1481.7 | -10.0 | 83.3 |
| 24 | APP | 2048.8 | 15.1 | 10:43:47.3 | -1465.0 | -10.0 | 81.7 |
| 25 | APP | 2021.9 | 16.7 | 10:47:19.1 | -1624.1 | -9.9 | 91.8 |
| 26 | APP | 2047.7 | 17.0 | 10:51:01.2 | -1332.9 | -8.6 | 87.3 |
| 27 | APP | 2065.3 | 18.0 | 10:54:38.3 | -971.1 | -6.5 | 84.6 |

NOISE ABATEMENT APPROACH (8-9 TARGET, VAR. A/S)

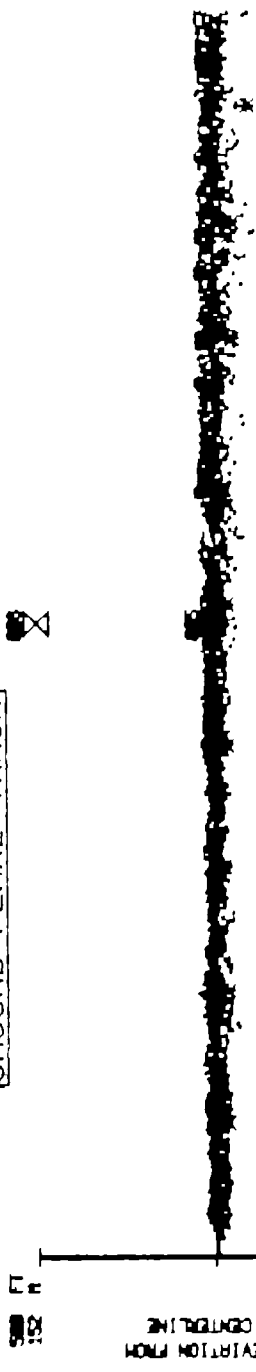
| | | | | | | | |
|----|-----|--------|------|------------|---------|-------|------|
| 28 | APP | 2131.1 | 19.8 | 10:57:33.4 | -1676.6 | -12.0 | 78.0 |
| 29 | APP | 2089.5 | 17.4 | 11:01:25.2 | -1114.2 | -8.2 | 75.0 |
| 30 | APP | 2021.1 | 17.7 | 11:05:03.0 | -792.5 | -5.4 | 75.0 |
| 31 | APP | 2052.7 | 13.8 | 11:08:32.7 | -918.3 | -8.4 | 61.3 |
| 32 | APP | 2055.8 | 19.0 | 11:11:56.1 | -1279.3 | -9.5 | 74.7 |
| 33 | APP | 2058.7 | 14.7 | 11:17:13.4 | -1106.9 | -8.9 | 69.5 |
| 34 | APP | 2046.9 | 15.1 | 11:22:29.6 | -1092.7 | -8.6 | 71.7 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

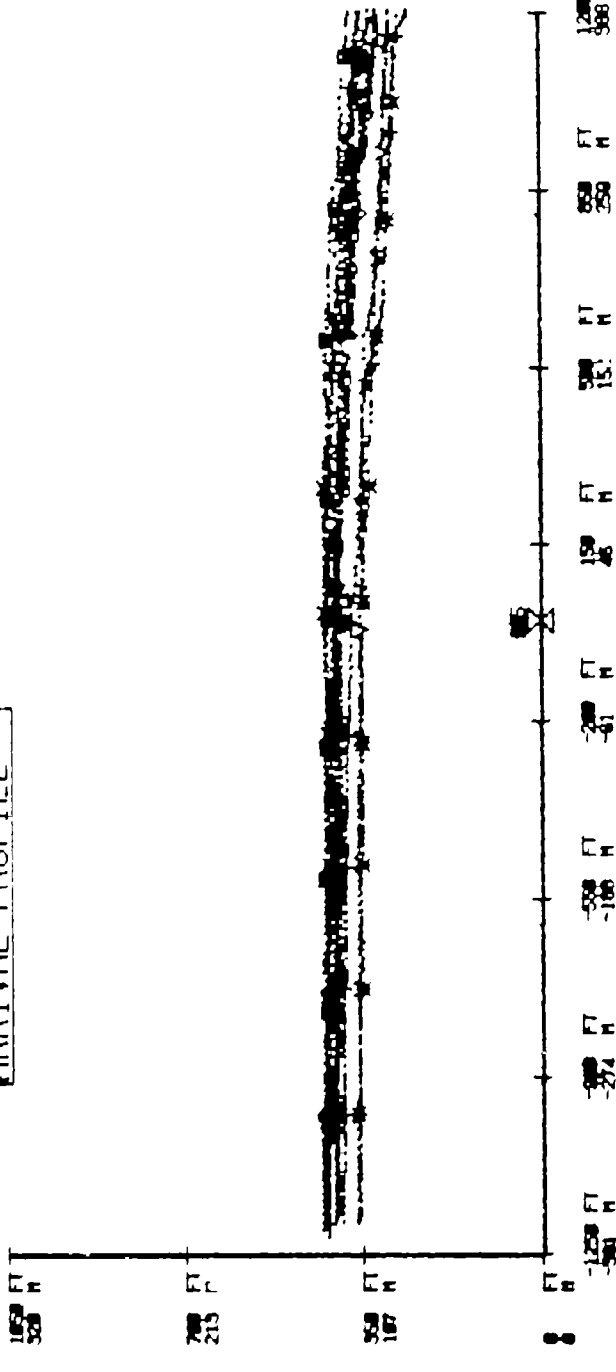
NORMAL APPROACH

AIRCRAFT: 5858
 TEST DATE: 04-18-68
 AIRPORT: DALLAS
 BURST: 12/30
 OPERATIONAL ARRIVAL:
 EVENT NO.:
 01 □ 03 △ 05 × 07 ⊠ 08 ○ 11 ◆ 36 ✦ 73 ✦ 75 ✦ 77 ✦

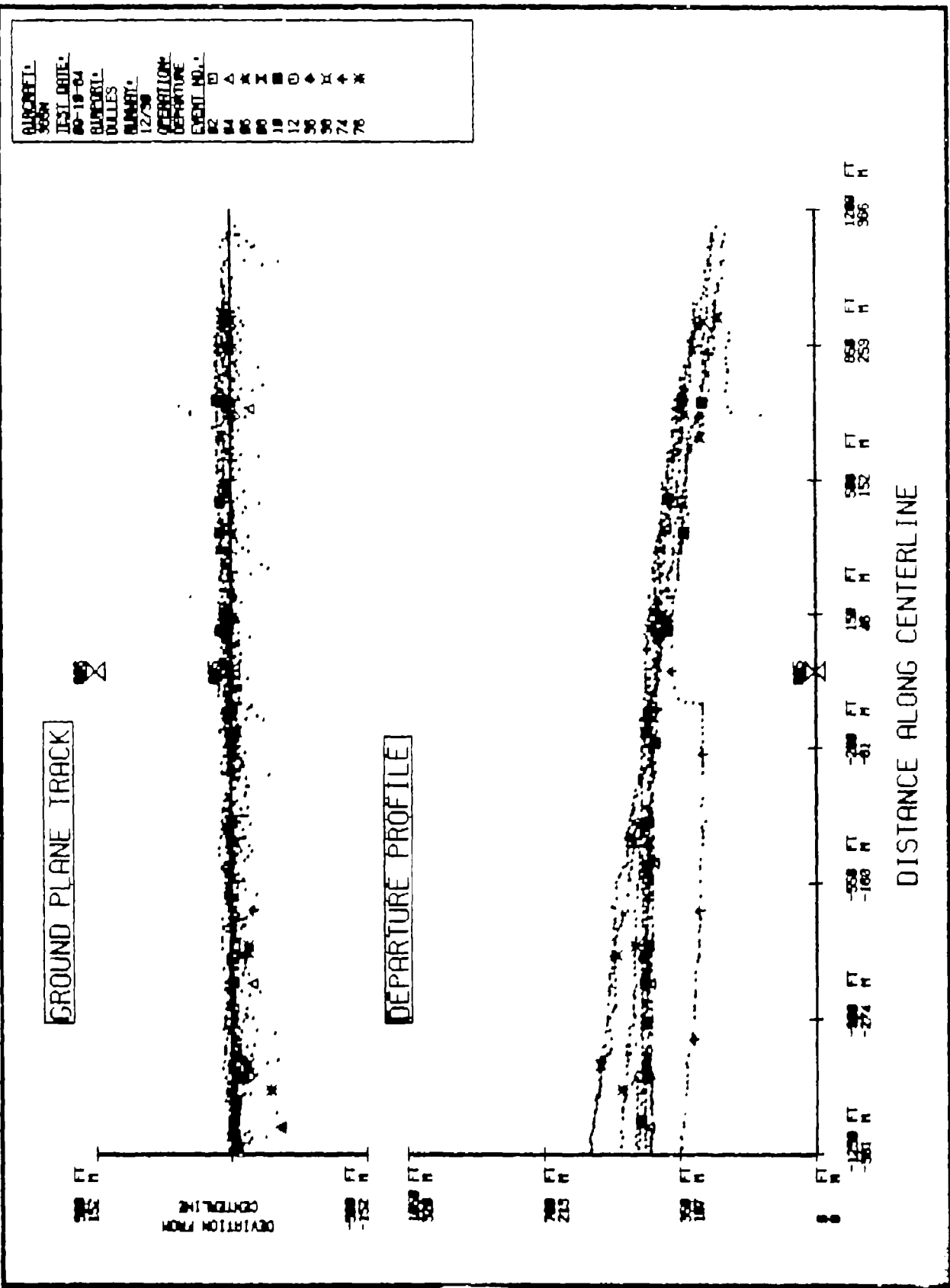
GROUND PLANE TRACK



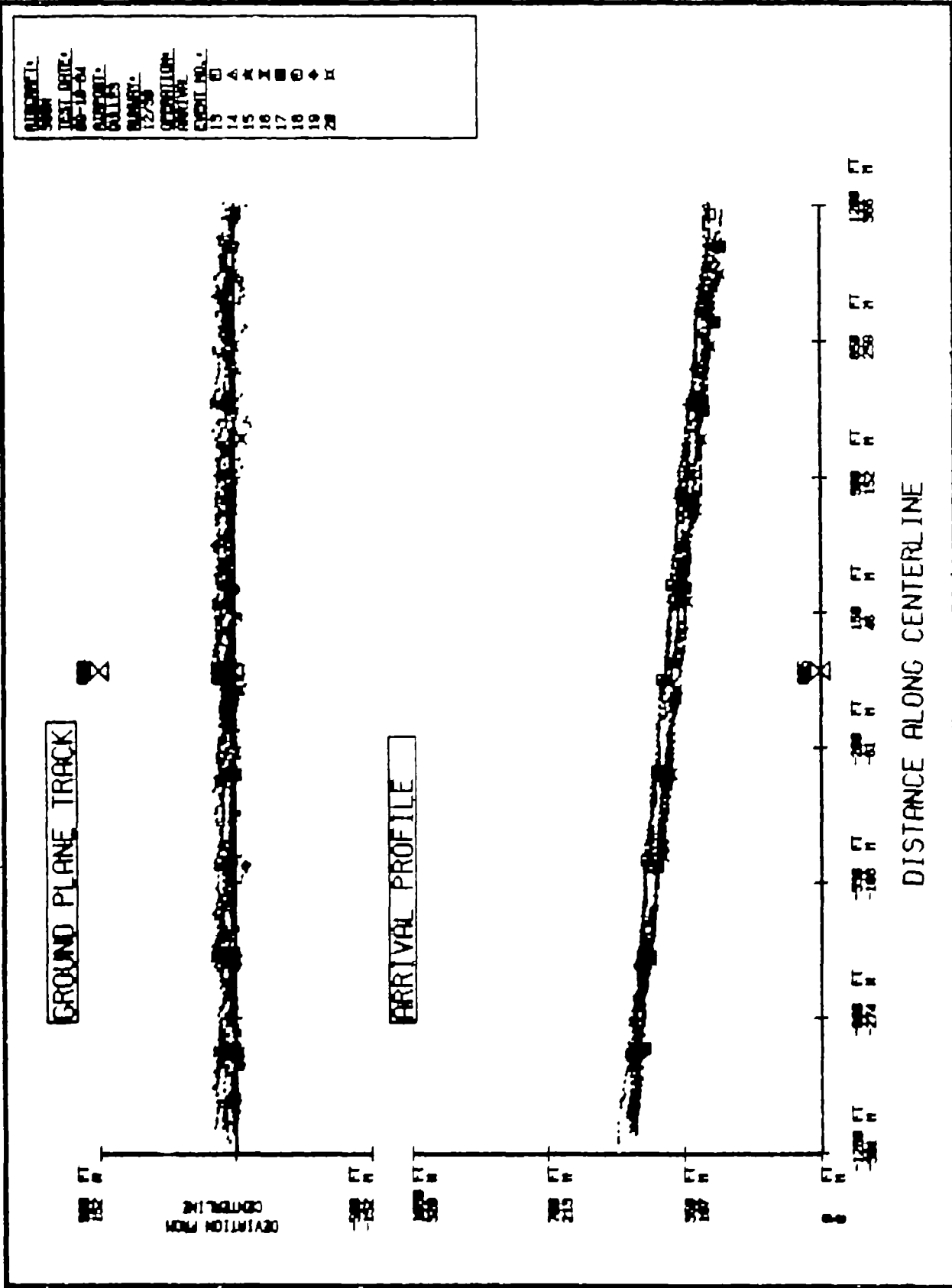
ARRIVAL PROFILE



NORMAL TAKEOFF



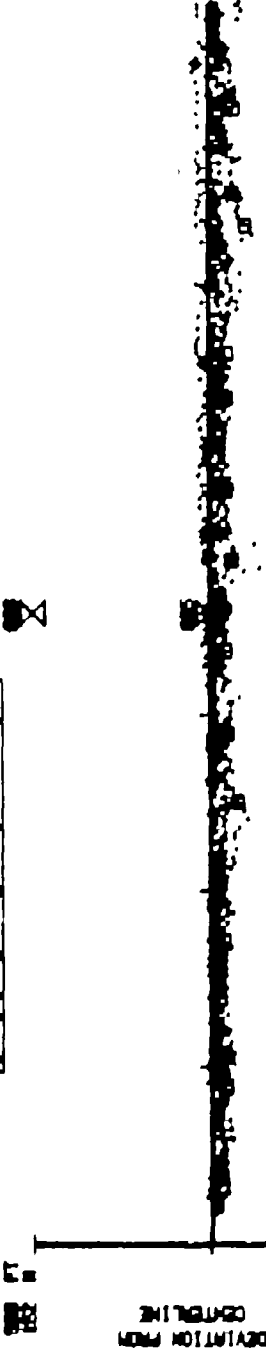
SIX° APPROACH at Vy, 75 Kts.



NOISE ABATEMENT APPROACH (Var. R/D & A/S)

| | |
|-------------|----------|
| SUBJECT: | 3004 |
| TEST DATE: | 10-10-64 |
| OPERATOR: | DALLIES |
| WINDSPEED: | 12/30 |
| OPERATION: | ARRIVAL |
| FLIGHT NO.: | 21 |
| | 22 |
| | 23 |
| | 24 |
| | 25 |
| | 26 |
| | 27 |

GROUND PLANE TRACK

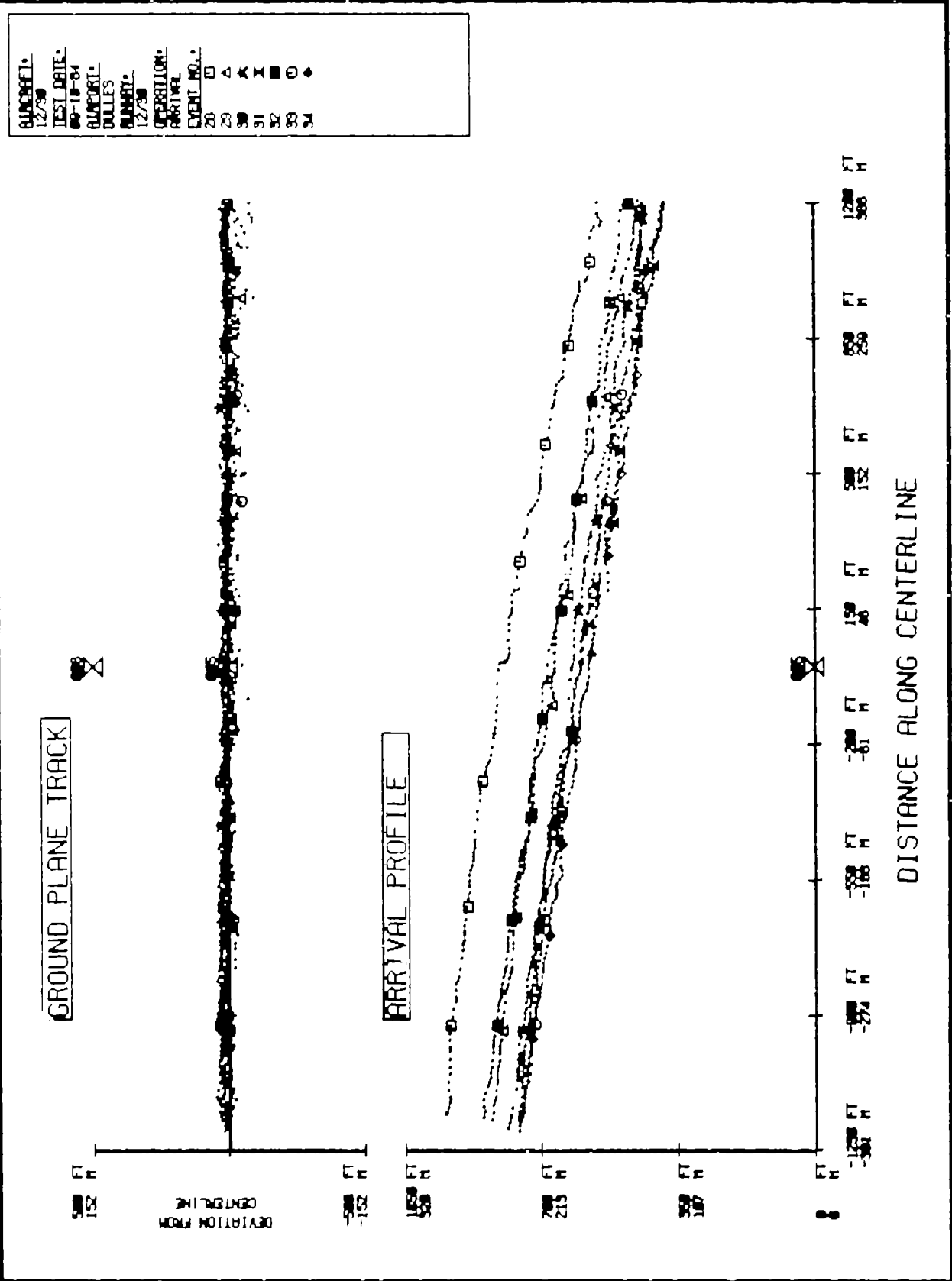


ARRIVAL PROFILE



DISTANCE ALONG CENTERLINE

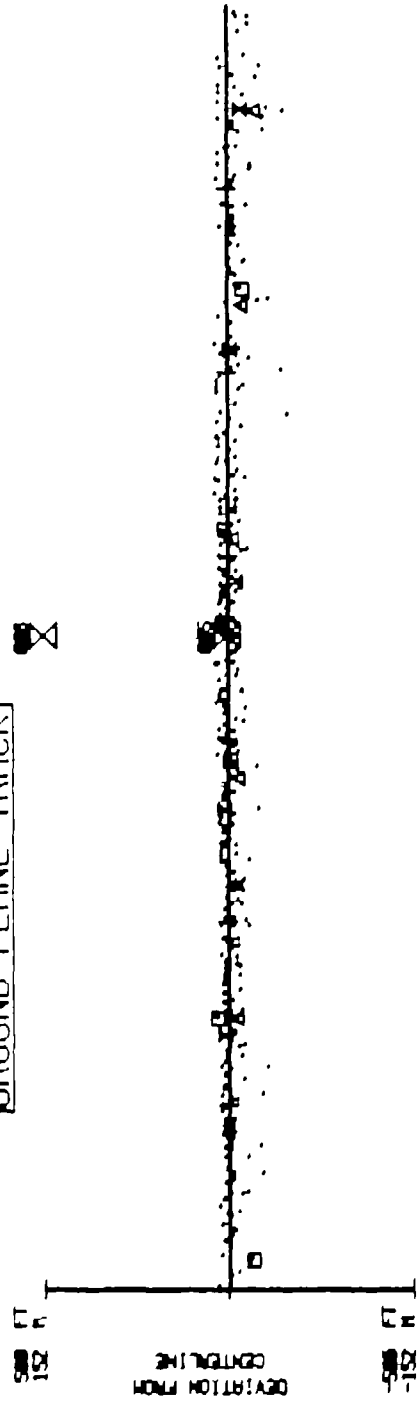
NOISE ABATEMENT APPROACH (8-9° Target, Var. A/S)



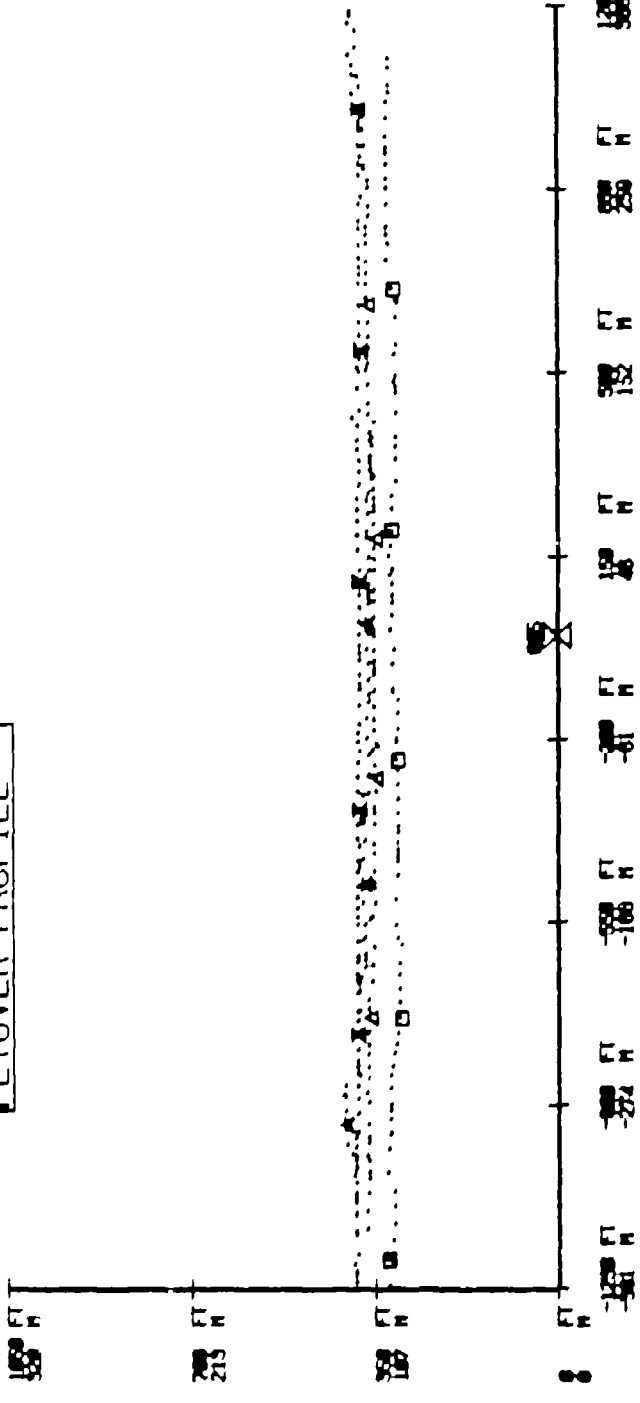
500 FT. LEVEL FLYOVER

REPORT NO. 5055
 TEST DATE: 09-18-64
 REPORT: GURDITL
 DATES: 12/58
 OPERATIONS: FLY-OVER
 EVENT NO.: 76 □ 79 △ 80 ✕ 81 ✕

GROUND PLANE TRACK



FLYOVER PROFILE



METEOROLOGICAL

DATA

- THIS SECTION OF THE APPENDIX CONTAINS WEATHER DATA FROM -
- SEVERAL TYPES OF METEOROLOGICAL EQUIPMENT: TEN-METER -
- TOWER (MET), GROUND LEVEL PSYCHROMETER, AIRCRAFT OAT, AND -
- PILOT BALLOONS. DATA FROM THE MET TOWER INCLUDE THE -
- TEMPERATURE, RELATIVE HUMIDITY, WIND DIRECTION AND WIND -
- SPEED MEASURED TYPICALLY EVERY 15 MINUTES DURING EACH -
- FLIGHT EVENT. BECAUSE OF A FAILURE OF THE MET TOWER DEW -
- POINT SENSOR, THE RELATIVE HUMIDITY WAS CALCULATED USING -
- TEMPERATURE FROM THE MET TOWER AND DEW POINT FROM THE -
- DULLES MID FIELD WEATHER STATION. GROUND LEVEL (4 FEET) -
- TEMPERATURE AND RELATIVE HUMIDITY ARE GIVEN FOR DIFFERENT -
- TIMES OF EACH TEST DAY, AND THE HELICOPTER'S OAT READINGS -
- ARE SHOWN FOR DIFFERENT FLIGHT ALTITUDES AT VARIOUS TIMES -
- OF THE DAY. THE PILOT BALLOON WIND DATA, TAKEN -
- PERIODICALLY DURING EACH TEST DAY, INCLUDES THE WIND -
- DIRECTION AND WIND SPEED AT VARIOUS ALTITUDES. -

METEOROLOGICAL DATA
 (MEASURED AT 30 FT. AGL)

HELICOPTER: AEROSPATIALE 365N DAUPHIN DATE: 9/10/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

(MPH)

NORMAL APPROACH AND TAKEOFF

| | | | | | |
|-------|----|----|-----|---|----|
| 8:30 | 66 | 76 | 270 | 5 | - |
| 8:45 | 67 | 70 | 270 | 5 | - |
| 9:00 | 67 | 70 | 270 | 8 | - |
| 9:15 | 69 | 70 | 270 | 7 | - |
| 11:45 | 74 | 58 | 270 | 8 | 12 |
| 2:15 | 76 | 56 | 270 | 8 | - |

SIX DEGREE APPROACH AT VY, 75 KTS.

| | | | | | |
|-------|----|----|-----|---|----|
| 9:30 | 70 | 68 | 270 | 8 | - |
| 9:45 | 70 | 66 | 270 | 8 | 12 |
| 10:00 | 70 | 66 | 270 | 7 | 11 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | |
|-------|----|----|-----|---|----|
| 10:30 | 72 | 62 | 270 | 7 | 10 |
| 10:45 | 72 | 64 | 270 | 8 | 12 |
| 11:00 | 72 | 64 | 270 | 8 | 10 |

NOISE ABATEMENT APPROACH (8-9 DEG. TARGET, VAR. A/S)

| | | | | | |
|-------|----|----|-----|---|----|
| 11:15 | 73 | 62 | 270 | 8 | - |
| 11:30 | 74 | 58 | 270 | 8 | 14 |

500 AND 1000 FT. LEVEL FLYOVER AT 100 KTS.

| | | | | | |
|------|----|----|-----|---|---|
| 2:30 | 78 | 54 | 270 | 6 | 9 |
|------|----|----|-----|---|---|

H-634

METEOROLOGICAL DATA

HELICOPTER: AEROSPATIALE 365N DAUPHIN

DATE: 09/10/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS OAT GAUGE DATA

TIME TEMP. R.H.

TIME ALTITUDE TEMP.

N
D

D
A
T
A

10:30 200' 63 F
 400' 61 F
 600' 61 F

12:24 200' 75 F
 400' 75 F
 600' 72 F

PILOT BALLOON WIND DATA

AEROSPATIALE 365N

09/10/84

| FEET | WIND DIR. | WIND SPD. | WIND DIR. | WIND SPD. |
|-------|-----------|-----------|-----------|-----------|
| (AGL) | (DEG.) | (KTS) | (DEG.) | (KTS) |

LAUNCH TIME:

----- NO DATA -----

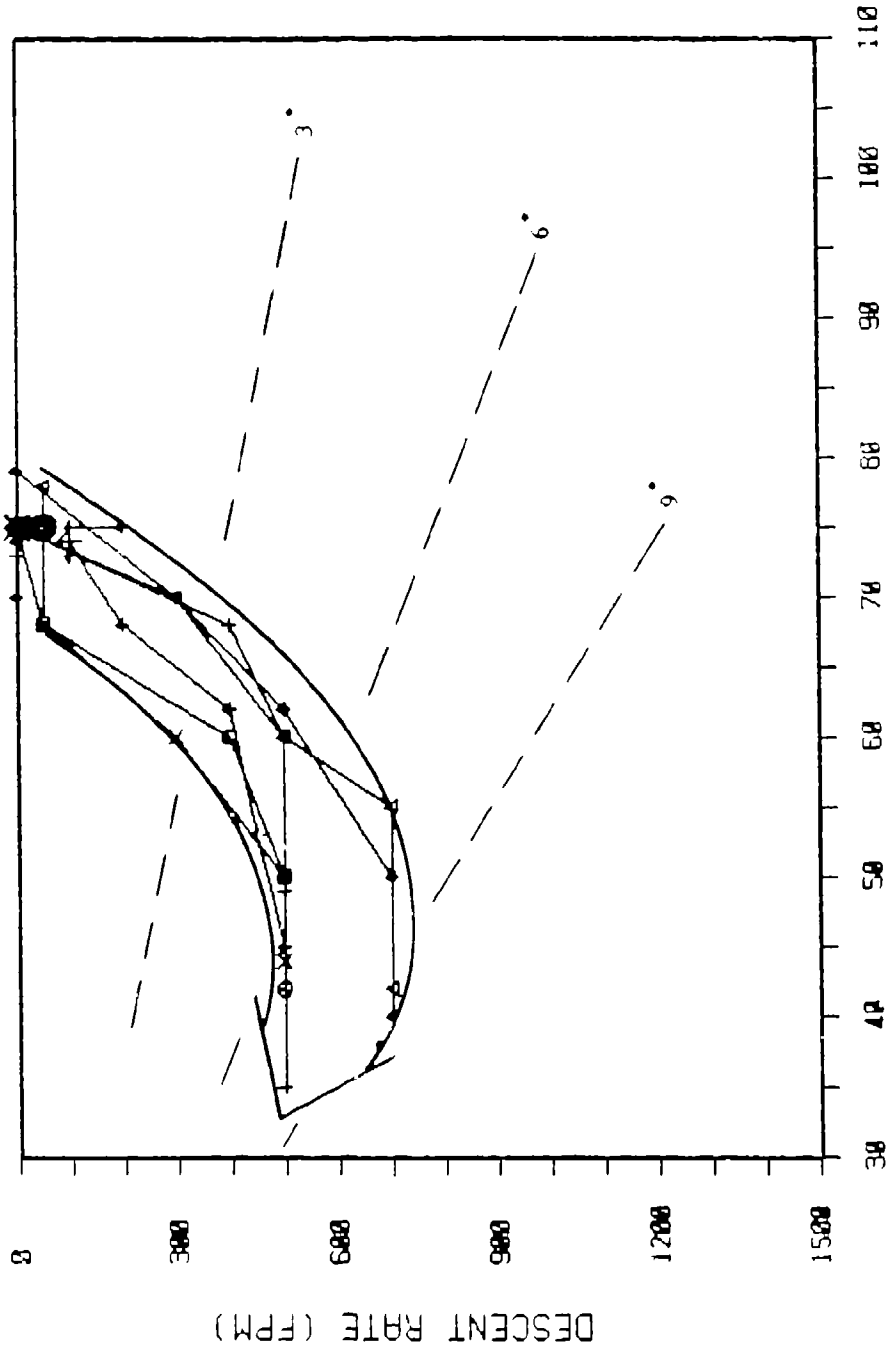
COCKPIT VIDEO

DATA

- THIS SECTION OF THE APPENDIX CONTAINS FLIGHT PROFILE
- PLOTS AND INDIVIDUAL EVENT DATA READ EVERY 5 SECONDS
- FROM PLAYBACK OF THE COCKPIT VIDEO RECORDINGS. IN THE
- PROFILE PLOTS, INDICATED AIRSPEED VS. DESCENT RATE
- ARE PLOTTED FOR THE NORMAL APPROACHES AND THE 'BEST'
- NOISE ABATEMENT APPROACH EVENTS. AN ARROW IS DRAWN
- WHICH BOUNDS THE DATA POINTS AND PORTRAYS THE
- SPEED/DESCENT RATE TREND WITH TIME. THE DARKER DATA
- POINTS INDICATE WHEN THE HELICOPTER PASSED OVER THE CLC
- POSITION. THE INDIVIDUAL EVENT DATA CONTAINS LISTINGS
- OF ALL THE COCKPIT INSTRUMENT READINGS OBTAINED FROM THE
- VIDEO PLAYBACK. THIS DATA ENCOMPASSES THE HELICOPTERS'S
- FLIGHT PARAMETERS THROUGHOUT THE ENTIRE DATA RUN PLUS OR
- MINUS 15 SECONDS (MINIMUM) FROM CLC.

NORMAL APPROACH

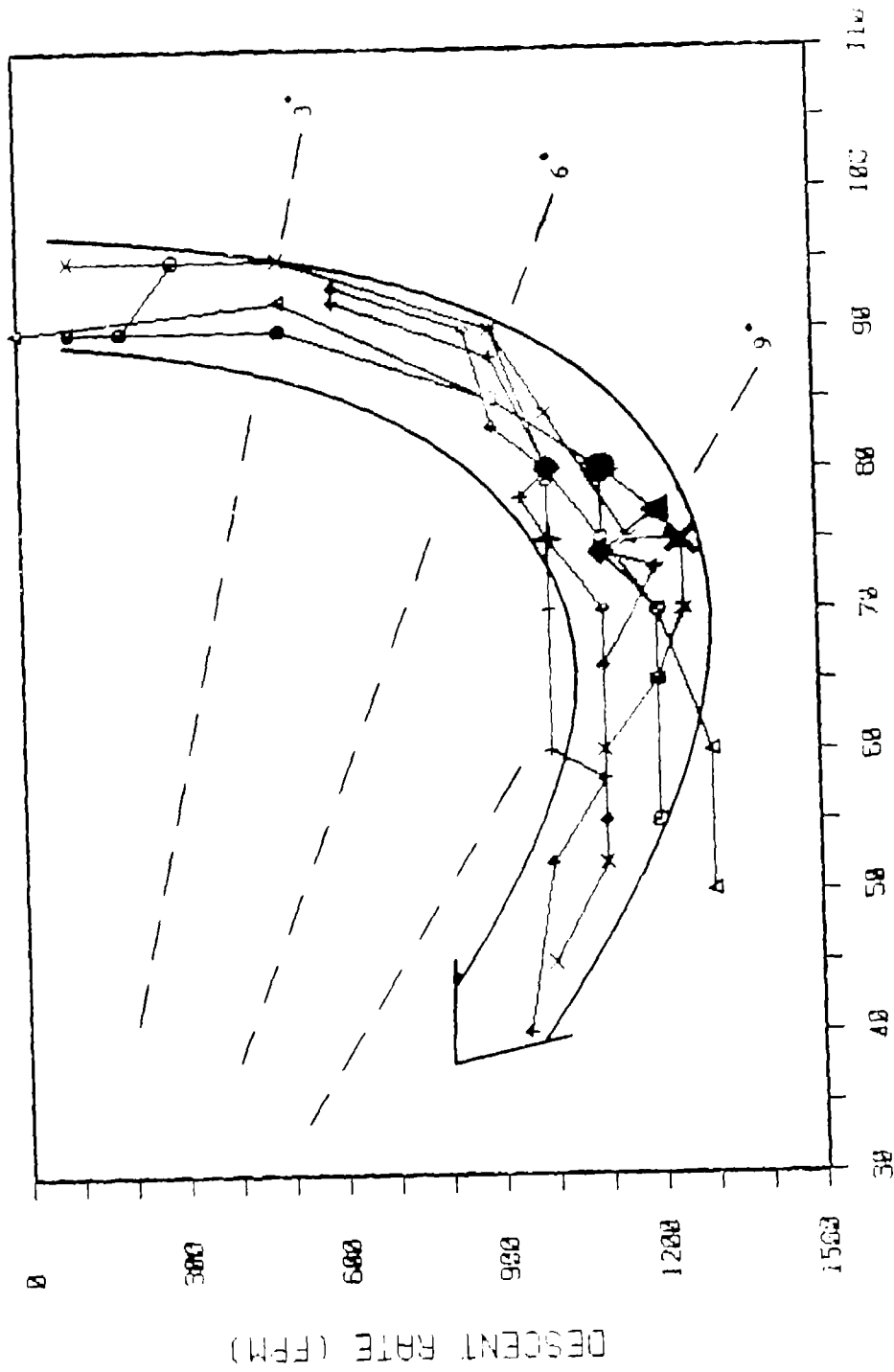
365N



IAS (KTS)

DESCENT RATE (FPM)

NOISE ABATEMENT APPROACH
356N



- 029
- + 030
- × 031
- △ 032
- ◇ 033
- ↑ 034

IAS (KTS)

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: AEROSPATIALE 365N

DATE: 09/10/84

EVENT: 01

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -17 | 420 | 0 | 75 | 0.00 |
| -12 | 420 | 0 | 75 | 0.00 |
| -7 | 410 | 50 | 75 | 0.38 |
| -2 | 400 | 50 | 75 | 0.38 |
| CLC 0 | 380 | 50 | 75 | 0.37 |
| 3 | 380 | 50 | 68 | 0.41 |
| 8 | 340 | 400 | 60 | 3.77 |
| 13 | 300 | 500 | 50 | 5.67 |
| 18 | 250 | 500 | 42 | 6.75 |

EVENT: 05

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -25 | 420 | 0 | 75 | 0.00 |
| -20 | 420 | 0 | 75 | 0.00 |
| -15 | 420 | 0 | 75 | 0.00 |
| -10 | 420 | 0 | 75 | 0.00 |
| -5 | 400 | 0 | 75 | 0.00 |
| CLC 0 | 400 | 0 | 75 | 0.00 |
| 5 | 380 | 50 | 68 | 0.42 |
| 10 | 350 | 300 | 60 | 2.83 |
| 15 | 280 | 500 | 50 | 5.67 |
| 20 | 220 | 500 | 44 | 6.44 |
| 25 | 180 | 500 | 40 | 7.09 |

EVENT: 03

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -28 | 400 | 0 | 75 | 0.00 |
| -23 | 400 | 0 | 75 | 0.00 |
| -18 | 400 | 0 | 73 | 0.00 |
| -13 | 400 | 0 | 75 | 0.00 |
| -8 | 400 | 0 | 75 | 0.00 |
| -3 | 400 | 0 | 75 | 0.00 |
| CLC 0 | 400 | 0 | 75 | 0.00 |
| 2 | 390 | 0 | 75 | 0.00 |
| 7 | 350 | 400 | 68 | 3.33 |
| 12 | 300 | 500 | 60 | 4.72 |
| 17 | 250 | 500 | 49 | 5.78 |
| 22 | 210 | 500 | 35 | 8.11 |

EVENT: 07

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -28 | 440 | 0 | 80 | 0.00 |
| -23 | 440 | 0 | 80 | 0.00 |
| -18 | 430 | 50 | 78 | 0.34 |
| -13 | 420 | 50 | 75 | 0.38 |
| -8 | 410 | 0 | 75 | 0.00 |
| -3 | 400 | 0 | 75 | 0.00 |
| CLC 0 | 400 | 0 | 75 | 0.00 |
| 2 | 400 | 0 | 75 | 0.00 |
| 7 | 380 | 300 | 70 | 2.43 |
| 12 | 300 | 500 | 60 | 4.72 |
| 17 | 250 | 700 | 55 | 7.22 |
| 22 | 200 | 700 | 42 | 9.47 |

COCKPIT VIDEO DATA

NORMAL APPROACH

HELICOPTER: AEROSPATIALE 365N

DATE: 09/10/84

EVENT: B9

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -27 | 440 | 0 | 70 | 0.00 |
| -22 | 430 | 0 | 75 | 0.00 |
| -15 | 430 | 0 | 74 | 0.00 |
| -12 | 420 | 0 | 70 | 0.00 |
| -7 | 420 | 0 | 74 | 0.00 |
| CLC 0 | 420 | 0 | 75 | 0.00 |
| 3 | 420 | 0 | 79 | 0.00 |
| 8 | 380 | 300 | 70 | 2.43 |
| 13 | 300 | 500 | 62 | 4.57 |
| 18 | 250 | 700 | 50 | 7.95 |
| 23 | 200 | 700 | 40 | 9.95 |

EVENT: B11

| TIME (SEC.) | ALT. (AGL) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|--------------|--------------|--------------|
| -30 | 500 | 100 | 80 | 0.71 |
| -25 | 470 | 200 | 78 | 1.45 |
| -20 | 440 | 200 | 75 | 1.51 |
| -15 | 440 | 100 | 75 | 0.75 |
| -10 | 430 | 100 | 73 | 0.78 |
| -5 | 420 | 100 | 75 | 0.75 |
| CLC 0 | 400 | 100 | 74 | 0.76 |
| 5 | 380 | 200 | 68 | 1.66 |
| 10 | 340 | 400 | 62 | 3.65 |
| 15 | 300 | 450 | 53 | 4.81 |
| 20 | 250 | 500 | 45 | 6.30 |
| 25 | 210 | 500 | 36 | 7.88 |
| 30 | 140 | 500 | 30 | 9.47 |

EVENT: B35

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 480 | 38 | 100 | 79 | 0.72 |
| -15 | 450 | 40 | 100 | 75 | 0.75 |
| -10 | 420 | 45 | 100 | 73 | 0.78 |
| -5 | 400 | 48 | 50 | 75 | 0.38 |
| CLC 0 | 400 | 32 | 50 | 72 | 0.39 |
| 5 | 390 | 28 | 300 | 68 | 2.50 |
| 10 | 340 | 25 | 400 | 62 | 3.65 |
| 15 | 270 | 26 | 400 | 55 | 4.12 |
| 20 | 250 | 26 | 500 | 48 | 5.90 |
| 25 | 200 | 20 | 500 | 40 | 7.09 |

EVENT: B37

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -14 | 480 | 44 | 200 | 78 | 1.45 |
| -9 | 440 | 52 | 100 | 78 | 0.75 |
| -4 | 450 | 50 | 0 | 80 | 0.00 |
| CLC 0 | 420 | 34 | 0 | 78 | 0.00 |
| 6 | 400 | 25 | 300 | 72 | 2.36 |
| 11 | 340 | 25 | 500 | 62 | 4.57 |
| 16 | 290 | 20 | 500 | 57 | 4.97 |
| 21 | 250 | 15 | 600 | 48 | 7.09 |
| 26 | 180 | 28 | 600 | 38 | 8.97 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: AEROSPATIALE 365N

DATE: 09/10/84

EVENT: D22

| TIME (SEC.) | ALT. (ASL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -23 | 890 | 22 | 100 | 118 | 0.48 |
| -18 | 830 | 18 | 800 | 110 | 2.57 |
| -13 | --- | 15 | --- | 98 | 0.00 |
| -8 | 690 | 16 | 800 | 90 | 5.04 |
| -3 | 600 | 18 | 800 | 83 | 5.46 |
| CLC 0 | 890 | -- | 800 | 80 | 5.67 |
| 2 | 520 | 20 | 1000 | 78 | 7.57 |
| 7 | 420 | 18 | 1000 | 72 | 7.88 |
| 12 | 380 | 18 | 1000 | 62 | 9.16 |
| 17 | 260 | 16 | 900 | 57 | 8.97 |
| 22 | 200 | 18 | 900 | 50 | 10.24 |

EVENT: D23

| TIME (SEC.) | ALT. (ASL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -25 | 1020 | 28 | 200 | 120 | 0.94 |
| -20 | 1000 | 18 | 400 | 115 | 1.97 |
| -15 | 900 | 14 | 850 | 107 | 4.50 |
| -10 | 800 | 8 | 1050 | 98 | 6.07 |
| -5 | 700 | 11 | 1100 | 90 | 6.93 |
| CLC 0 | 600 | 12 | 1250 | 85 | 8.35 |
| 5 | 490 | 11 | 1300 | 78 | 9.47 |
| 10 | 380 | 12 | 1200 | 70 | 9.75 |
| 15 | 280 | 12 | 1100 | 65 | 9.62 |
| 20 | 200 | 15 | 1100 | 57 | 10.99 |
| 25 | 130 | 23 | 1000 | 45 | 12.68 |

EVENT: D25

| TIME (SEC.) | ALT. (ASL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -22 | 1000 | 78 | 0 | 125 | 0.00 |
| -17 | 990 | 36 | 100 | 125 | 0.48 |
| -12 | 900 | 12 | 700 | 115 | 3.45 |
| -7 | 800 | 10 | 1000 | 110 | 5.15 |
| -2 | 700 | 8 | 1300 | 100 | 7.38 |
| CLC 0 | 630 | - | 1300 | 95 | 7.77 |
| 3 | 500 | 8 | 1200 | 90 | 7.57 |
| 8 | 420 | 8 | 1400 | 80 | 9.95 |
| 13 | 340 | 8 | 1400 | 70 | 11.39 |
| 18 | 250 | 11 | 1200 | 58 | 11.79 |
| 23 | 180 | 15 | 1000 | 40 | 14.29 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: AEROSPATIALE 365N

DATE: 09/10/84

EVENT: D26

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 1000 | 30 | 100 | 115 | 0.49 |
| -15 | 900 | 21 | 800 | 110 | 4.12 |
| -10 | 820 | 15 | 1000 | 100 | 5.67 |
| -5 | 750 | 12 | 1000 | 98 | 5.78 |
| CLC 0 | 640 | 12 | 1100 | 95 | 6.57 |
| 5 | 500 | 8 | 1250 | 85 | 8.35 |
| 10 | 400 | 8 | 1300 | 75 | 9.86 |
| 15 | 300 | 10 | 1350 | 65 | 11.84 |
| 20 | 220 | 15 | 1300 | 55 | 13.50 |
| 25 | 120 | 42 | 900 | 43 | 11.93 |

EVENT: D27

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 1000 | 75 | 0 | 120 | 0.00 |
| -22 | 1000 | 75 | 0 | 120 | 0.00 |
| -17 | 990 | 32 | 50 | 120 | 0.24 |
| -12 | 920 | 11 | 700 | 115 | 3.45 |
| -7 | 800 | 11 | 1100 | 105 | 5.94 |
| -2 | 720 | 10 | 1100 | 97 | 6.43 |
| CLC 0 | 680 | 8 | 1100 | 95 | 6.57 |
| 3 | 600 | 8 | 1300 | 85 | 8.69 |
| 8 | 480 | 8 | 1500 | 80 | 10.67 |
| 13 | 350 | 9 | 1450 | 70 | 11.80 |
| 18 | 250 | 15 | 1400 | 55 | 14.56 |
| 23 | 180 | 58 | 1200 | 42 | 16.39 |
| 28 | 100 | 70 | 600 | 30 | 11.39 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (0-9 DEG. TARGET, VAR. A/S)

HELICOPTER: AEROSPATIALE 365N

DATE: 09/10/84

EVENT: D28

| TIME (SEC.) | ALT. (ABL) | Q (%) | R/D (PPH) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -15 | 1000 | 44 | 0 | 95 | 0.00 |
| 10 | 980 | 30 | 50 | 95 | 0.30 |
| -5 | 910 | 16 | 500 | 90 | 3.14 |
| CLC 0 | 800 | 8 | 550 | 85 | 3.64 |
| 5 | 686 | 8 | 1500 | 80 | 10.67 |
| 10 | 520 | 8 | 1550 | 70 | 12.63 |
| 15 | 400 | 8 | 1550 | 60 | 14.78 |
| 20 | --- | - | --- | --- | --- |
| 25 | 200 | 22 | 1300 | 50 | 14.88 |
| 30 | 120 | 65 | 900 | 50 | 10.24 |

EVENT: D30

| TIME (SEC.) | ALT. (ABL) | Q (%) | R/D (PPH) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -12 | 810 | 22 | 900 | 90 | 5.67 |
| -7 | 740 | 29 | 1000 | 80 | 7.09 |
| -2 | 680 | 18 | 950 | 78 | 6.91 |
| CLC 0 | 600 | 18 | 1000 | 75 | 7.87 |
| 3 | --- | 14 | --- | --- | --- |
| 8 | 480 | 14 | 1000 | 70 | 8.11 |
| 13 | 380 | 10 | 1000 | 60 | 9.47 |
| 18 | 260 | 10 | 1100 | 50 | --- |
| 23 | 200 | 16 | 1100 | 45 | 13.97 |
| 28 | 130 | 18 | 750 | 30 | 14.29 |

EVENT: D29

| TIME (SEC.) | ALT. (ABL) | Q (%) | R/D (PPH) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -37 | 990 | 45 | 500 | 95 | 2.98 |
| -32 | 980 | 50 | 300 | 90 | 1.89 |
| -27 | 940 | 48 | 350 | 95 | 2.08 |
| -22 | 920 | 47 | 300 | 95 | 1.79 |
| -17 | 900 | 48 | 200 | 90 | 1.26 |
| -12 | 900 | 28 | 100 | 90 | 0.63 |
| -7 | 840 | 18 | 500 | 90 | 3.14 |
| -2 | 740 | 13 | 900 | 85 | 6.00 |
| CLC 0 | 700 | 11 | 1100 | 80 | 7.80 |
| 3 | 640 | 10 | 1100 | 75 | 8.33 |
| 8 | 510 | 11 | 1200 | 70 | 9.78 |
| 13 | 420 | 10 | 1200 | 65 | 10.50 |
| 18 | 300 | 12 | 1200 | 55 | 12.44 |

EVENT: D31

| TIME (SEC.) | ALT. (ABL) | Q (%) | R/D (PPH) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -27 | 980 | 48 | 0 | 95 | 0.00 |
| -22 | 970 | 44 | 100 | 95 | 0.60 |
| -17 | 950 | 25 | 500 | 95 | 2.98 |
| -12 | 840 | 12 | 900 | 90 | 5.67 |
| -7 | 800 | 11 | 1000 | 84 | 6.75 |
| -2 | 640 | 10 | 1150 | 75 | 8.71 |
| CLC 0 | 620 | 12 | 1250 | 75 | 9.47 |
| 3 | 570 | 11 | 1250 | 70 | 10.16 |
| 8 | 450 | 12 | 1200 | 65 | 10.50 |
| 13 | 360 | 14 | 1100 | 60 | 10.43 |
| 18 | 370 | 20 | 1100 | 52 | 12.06 |

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (B-9 DEG. TARGET, VAR. A/B)

HELICOPTER: AEROSPATIALE 365N

DATE: 09/10/84

EVENT: D32

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 1100 | 32 | 0 | 90 | 0.00 |
| -15 | 990 | 20 | 500 | 92 | 3.08 |
| -10 | 900 | 13 | 900 | 85 | 6.00 |
| -5 | 790 | 12 | 1100 | 80 | 7.80 |
| CLC 0 | 700 | 15 | 1200 | 77 | -- |
| 5 | 600 | 12 | 1100 | 74 | 8.44 |
| 10 | 480 | 8 | 1200 | 70 | 9.75 |
| 15 | 370 | 8 | 1300 | 60 | -- |
| 20 | 250 | 10 | 1300 | 50 | 14.88 |
| 25 | 200 | 22 | 1100 | 35 | 18.08 |

EVENT: D33

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -18 | 900 | 28 | 600 | 93 | 3.68 |
| -13 | 850 | 25 | 850 | 90 | 5.35 |
| -8 | 760 | 22 | 900 | 83 | 6.15 |
| -3 | 700 | 20 | 900 | 83 | 6.15 |
| CLC 0 | 640 | 15 | 1000 | 80 | 7.09 |
| 2 | 600 | 15 | 1000 | 79 | 7.18 |
| 7 | 500 | 20 | 1000 | 75 | 7.57 |
| 12 | 400 | 14 | 1100 | 70 | 8.93 |
| 17 | 300 | 14 | 1100 | 66 | 9.47 |
| 22 | 220 | 15 | 1100 | 55 | 11.39 |
| 27 | 150 | 18 | 900 | 40 | 12.84 |

EVENT: D34

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -22 | 950 | 35 | 0 | 93 | 0.00 |
| -17 | 900 | 23 | 600 | 92 | 3.69 |
| -12 | 820 | 20 | 900 | 88 | 5.80 |
| -7 | 750 | 17 | 1000 | 80 | 7.09 |
| -2 | 640 | 13 | 1100 | 75 | 8.33 |
| CLC 0 | 600 | 13 | 1100 | 74 | 8.44 |
| 3 | 540 | 13 | 1200 | 73 | 9.34 |
| 8 | 450 | 14 | 1100 | 66 | 9.47 |
| 13 | 350 | 18 | 1100 | 58 | 10.79 |
| 18 | 280 | 15 | 1000 | 52 | 10.95 |
| 23 | 300 | 25 | 950 | 40 | 13.56 |

APPENDIX I

BELL 222A (REPEAT)

PAGE NUMBERS

NOISE LEVEL DATA

SOUND EXPOSURE LEVEL

Bar Charts

Approaches.....

I-650

Summary Tables.....

I-651

Individual Event Data.....

I-652 - I-655

A-WEIGHTED SOUND LEVEL

Bar Charts

Approaches.....

I-658

Summary Tables.....

I-659

Individual Event Data.....

I-660 - I-663

RADAR TRACKING DATA

Position Data.....

I-666 - I-672

Tracking Plots.....

I-673 - I-677

METEOROLOGICAL DATA

10-meter Tower Data.....

I-680

4 ft. Data and Aircraft OAT Data.....

I-681

Pilot Balloon Wind Data.....

I-682

COCKPIT VIDEO DATA

Individual Event Data.....

I-684 - I-688

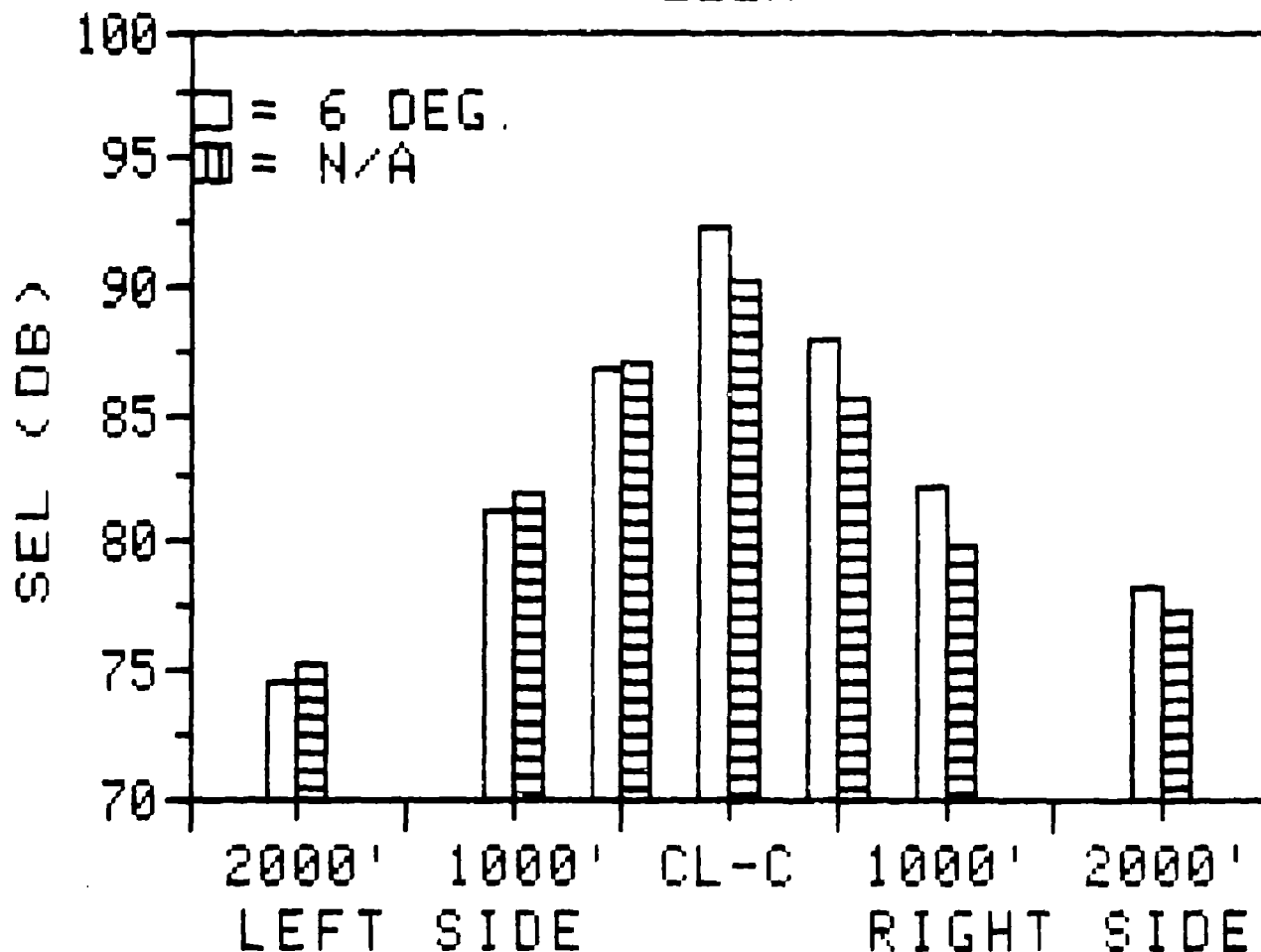
NOISE LEVEL DATA

'as-measured'

SOUND EXPOSURE LEVEL

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- SOUND EXPOSURE LEVELS (SEL) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN. -

APPROACHES 222A



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| SIX DEG. APPROACH | 440 | 65 | 6.0 |
| NOISE ABATEMENT APP. 6 DEGREE AT 45 KTS. (EVENTS 88-811) | 425 | 57-53 | 6.5-8.4 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN ±15 SEC OF THE CL-C MICROPHONE POSITION.

222A SUMMARY SHEET (9/11/84)

SOUND EXPOSURE LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 65 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 74.5 | 81.1 | 86.7 | 92.3 | 88.0 | 82.1 | 78.2 |
| N | 6 | 6 | 7 | 6 | 7 | 7 | 7 |
| S.D. | .7 | 1.0 | .9 | .5 | .7 | .6 | .6 |
| 90% CI | .5 | .9 | .7 | .4 | .5 | .4 | .4 |

* NOISE ABATEMENT APPROACH (6 DEG. 45 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 75.2 | 82.0 | 87.0 | 90.2 | 85.6 | 79.9 | 77.3 |
| N | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| S.D. | .5 | 1.3 | 1.5 | 1.4 | 1.0 | .5 | .3 |
| 90% CI | .6 | 1.6 | 1.7 | 1.7 | 1.2 | .6 | .4 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 75.1 | 80.1 | 83.6 | 88.1 | 87.8 | 83.1 | 79.3 |
| N | 9 | 7 | 8 | 8 | 9 | 9 | 9 |
| S.D. | .5 | .7 | .8 | 1.5 | .9 | .5 | .7 |
| 90% CI | .3 | .5 | .6 | 1.0 | .5 | .3 | .4 |

* NOISE ABATEMENT APPROACH (10 DEG. 65 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 74.8 | 78.7 | 83.7 | 88.6 | 87.8 | 83.6 | 79.3 |
| N | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| S.D. | .9 | .4 | 1.3 | 1.0 | .6 | .7 | .6 |
| 90% CI | 1.6 | .6 | 2.1 | 1.7 | 1.0 | .3 | 1.1 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 9/11/84

OPERATION : 6 DEGREE APPROACH AT VY, 65 KTS.

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| A1 | 74.60 | 81.00 | 87.40 | 92.80 | 87.40 | 81.20 | 77.40 |
| A2 | 74.30 | 81.40 | 86.10 | 91.60 | 88.20 | 82.90 | 78.70 |
| A3 | 73.60 | 79.50 | 85.30 | 92.30 | 88.50 | 82.20 | 79.00 |
| A4 | 74.40 | 80.90 | 87.20 | 92.90 | 88.30 | 82.40 | 78.50 |
| A5 | -- | 82.70 | 86.60 | 92.20 | 88.40 | 82.40 | 78.30 |
| A6 | 75.60 | -- | 86.00 | -- | 86.60 | 81.80 | 77.90 |
| A7 | 74.40 | 81.20 | 88.00 | 91.80 | 88.30 | 81.60 | 77.60 |
| AVERAGE | 74.48 | 81.12 | 86.66 | 92.27 | 87.96 | 82.07 | 78.20 |
| STD. DEV. | 0.65 | 1.03 | 0.93 | 0.52 | 0.70 | 0.57 | 0.59 |
| 90% C.I. | 0.53 | 0.85 | 0.69 | 0.43 | 0.51 | 0.42 | 0.43 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 9/11/84

OPERATION : NOISE ABATEMENT APPROACH (6 DEG. 45 KTS.)

| EVENT NO. | (LEFT SIDE) | | | | (RIGHT SIDE) | | |
|--------------|-------------|-------|-------|-------|--------------|-------|-------|
| | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| B8 | 76.00 | 82.90 | 88.40 | 89.90 | 84.90 | 80.10 | 77.50 |
| B9 | 75.00 | 80.90 | 86.70 | 91.80 | 86.80 | 80.20 | 76.90 |
| B10 | 74.90 | 83.30 | 87.80 | 90.80 | 86.10 | 80.10 | 77.50 |
| B11 | 75.00 | 80.70 | 85.10 | 88.40 | 84.70 | 79.10 | 77.10 |
| AVERAGE | 75.23 | 81.95 | 87.00 | 90.23 | 85.63 | 79.88 | 77.25 |
| STD. DEV. | 0.52 | 1.34 | 1.45 | 1.44 | 1.00 | 0.52 | 0.30 |
| 90% C. I. | 0.61 | 1.57 | 1.70 | 1.70 | 1.17 | 0.61 | 0.35 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 9/11/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D12 | 75.10 | 80.00 | 84.90 | 91.30 | 89.60 | 82.00 | 79.00 |
| D13 | 75.80 | 80.50 | 82.90 | 86.10 | 86.50 | 83.60 | 80.60 |
| D14 | 75.00 | -- | 82.60 | 87.50 | 87.60 | 83.50 | 78.90 |
| D15 | 75.50 | 79.70 | 83.40 | 88.20 | 88.00 | 83.10 | 78.10 |
| D16 | 74.40 | 80.90 | -- | 88.50 | 87.10 | 82.90 | 79.80 |
| D17 | 75.30 | -- | 84.00 | 88.30 | 88.20 | 83.50 | 79.80 |
| D18 | 75.50 | 79.50 | 83.30 | 87.60 | 87.20 | 82.70 | 79.50 |
| D19 | 74.90 | 80.90 | 84.60 | -- | 88.10 | 83.20 | 79.10 |
| D20 | 74.40 | 79.10 | 83.00 | 87.10 | 87.80 | 83.20 | 79.00 |
| AVERAGE | 75.10 | 80.09 | 83.59 | 88.08 | 87.79 | 83.08 | 79.31 |
| STD. DEV. | 0.48 | 0.70 | 0.83 | 1.51 | 0.87 | 0.50 | 0.71 |
| 90% C.I. | 0.30 | 0.52 | 0.55 | 1.01 | 0.54 | 0.31 | 0.44 |

SOUND EXPOSURE LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 9/11/84

OPERATION : NOISE ABATEMENT APPROACH (10 DEG. 65 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| C21 | 75.30 | 78.80 | 83.60 | 88.20 | 87.50 | 83.70 | 79.00 |
| C22 | 73.70 | 78.30 | 82.50 | 87.90 | 87.50 | 83.70 | 80.00 |
| C23 | 75.30 | 79.00 | 85.00 | 89.80 | 88.50 | 83.40 | 78.80 |
| AVERAGE | 74.77 | 78.70 | 83.70 | 88.63 | 87.83 | 83.60 | 79.27 |
| STD. DEV. | 0.92 | 0.36 | 1.25 | 1.02 | 0.58 | 0.17 | 0.64 |
| 90% C.I. | 1.56 | 0.61 | 2.11 | 1.72 | 0.97 | 0.29 | 1.00 |

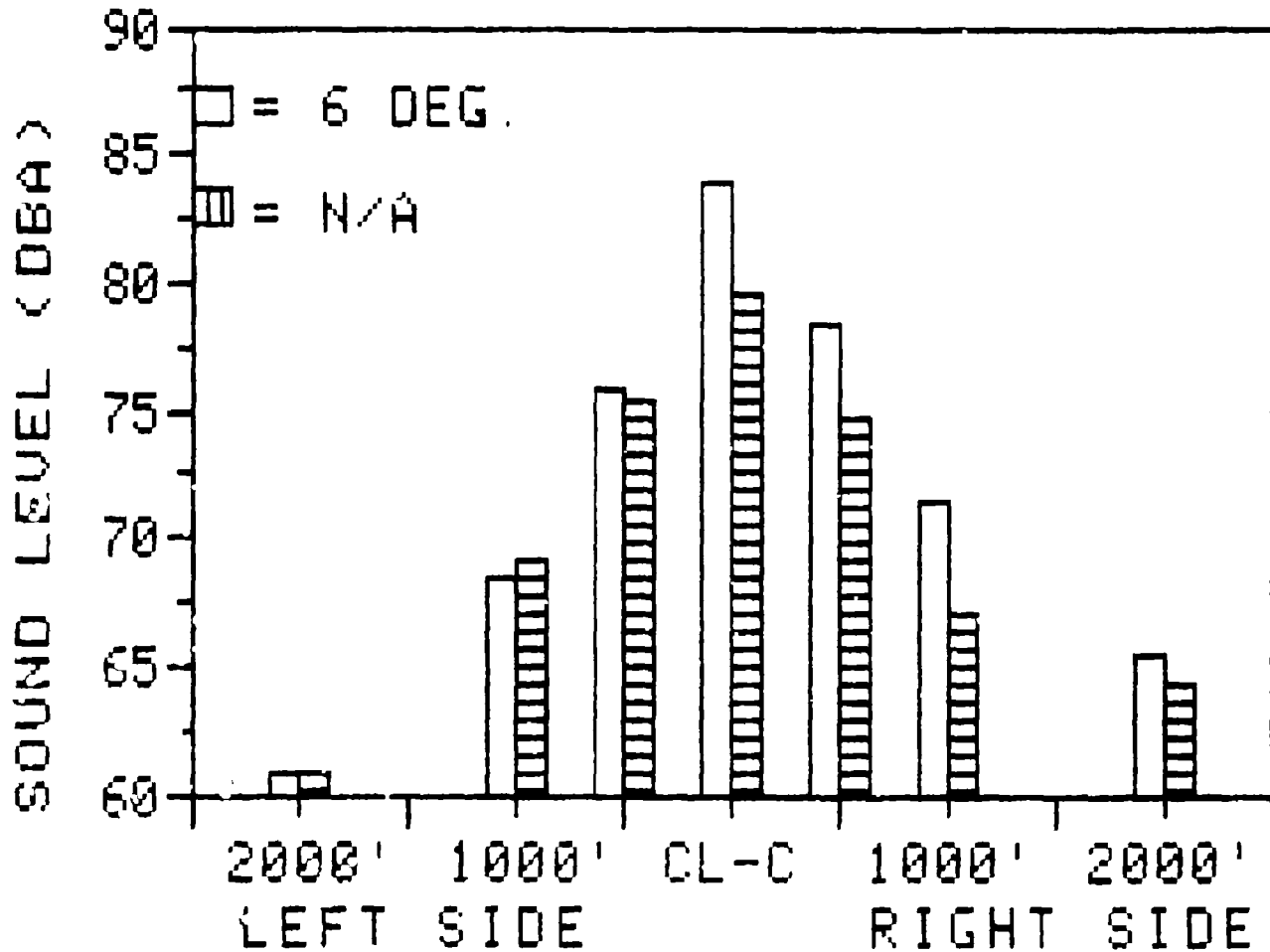
NOISE LEVEL DATA

'as-measured'

A-WEIGHTED SOUND LEVEL (dBA)

- THIS SECTION OF THE APPENDIX CONTAINS THE 'AS-MEASURED' -
- A-WEIGHTED SOUND LEVEL (dBA) FOR ALL FLIGHT EVENTS. -
- THESE DATA ARE PRESENTED IN THE FORM OF BAR CHARTS, -
- SUMMARY TABLES AND INDIVIDUAL EVENT DATA. THE BAR CHARTS -
- SHOW THE FALL OFF IN NOISE LEVEL VERSUS SIDELINE -
- DISTANCE, AND PROVIDE A QUICK LOOK COMPARISON OF THE -
- NOISE LEVELS. PERTINENT FLIGHT PARAMETER INFORMATION -
- READ FROM THE COCKPIT INSTRUMENT PANEL VIDEO RECORDINGS -
- IS ALSO SHOWN BELOW EACH BAR CHART. THE SUMMARY TABLES -
- PRESENT THE AVERAGE NOISE LEVEL, NUMBER OF SAMPLES, -
- STANDARD DEVIATION AND THE 90 PERCENT CONFIDENCE INTERVAL -
- FOR EACH FLIGHT CONDITION. INDIVIDUAL EVENT DATA FOR -
- EACH CONDITION IS THEN GIVEN. -

APPROACHES 222A



| OPERATION | AVG. ALT. OVER CL-C (FT. AGL) | INDICATED AIRSPEED (KTS.) | GLIDESLOPE RANGE (DEG.) |
|--|----------------------------------|------------------------------|----------------------------|
| SIX DEG. APPROACH | 440 | 65 | 6.0 |
| NOISE ABATEMENT APP. 6 DEGREE AT 45 KTS. (EVENTS 20-211) | 423 | 57-53 | 6.5-6.4 |

NOTE: ALTITUDE, AIRSPEED AND VERTICAL SPEED DATA READ FROM VIDEO TAPES OF THE INSTRUMENT PANEL. THE GLIDESLOPE RANGE WAS CALCULATED WITHIN ±15 SEC OF THE CL-C MICROPHONE POSITION.

222A SUMMARY SHEET (9/11/84)

A-WEIGHTED SOUND LEVEL (DB)

(LEFT SIDE)

(RIGHT SIDE)

2000' 1000' 500' CL-C 500' 1000' 2000'

* SIX DEG. APPROACH AT VY, 65 KTS. *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 60.8 | 68.5 | 75.9 | 83.8 | 78.3 | 71.5 | 65.4 |
| N | 6 | 6 | 7 | 6 | 7 | 7 | 7 |
| S.D. | .9 | .9 | 1.7 | .7 | 1.0 | .7 | .7 |
| 90% CI | .7 | .7 | 1.3 | .6 | .7 | .5 | .5 |

* NOISE ABATEMENT APPROACH (6 DEG. 45 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 60.7 | 69.2 | 75.3 | 79.6 | 74.7 | 67.1 | 64.3 |
| N | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| S.D. | .5 | 1.2 | 1.9 | 1.6 | 1.3 | 1.3 | 1.9 |
| 90% CI | .7 | 1.5 | 2.4 | 2.1 | 1.6 | 1.6 | 2.4 |

* NOISE ABATEMENT APPROACH (VAR. R/D AND A/S) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 62.4 | 67.6 | 72.6 | 78.3 | 78.0 | 72.1 | 66.9 |
| N | 9 | 7 | 9 | 9 | 9 | 9 | 9 |
| S.D. | 1.3 | .6 | .7 | 1.8 | 1.3 | .6 | 1.1 |
| 90% CI | .8 | .5 | .4 | 1.1 | .8 | .4 | .7 |

* NOISE ABATEMENT APPROACH (10 DEG. 65 KTS.) *

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| AVERAGE | 62.1 | 65.6 | 72.0 | 78.2 | 78.1 | 71.2 | 67.2 |
| N | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| S.D. | 1.2 | .6 | 2.2 | 1.3 | .7 | .6 | 1.3 |
| 90% CI | 2.0 | .9 | 3.6 | 2.1 | 1.2 | 1.0 | 2.2 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 9/11/84

OPERATION : 6 DEGREE APPROACH AT VY, 65 KTS.

(LEFT SIDE)

(RIGHT SIDE)

| EVENT NO. | 2000' | 1000' | 500' | CL-C | 500' | 1000' | 2000' |
|--------------|-------|-------|-------|-------|-------|-------|-------|
| | EAST | EAST | EAST | | WEST | WEST | WEST |
| A1 | 59.90 | 68.70 | 78.00 | 83.70 | 78.60 | 71.80 | 64.00 |
| A2 | 59.90 | 68.90 | 74.20 | 82.70 | 78.60 | 72.00 | 66.00 |
| A3 | 60.20 | 66.90 | 73.60 | 83.90 | 78.80 | 72.30 | 65.40 |
| A4 | 61.30 | 68.70 | 76.40 | 84.70 | 78.20 | 71.40 | 65.70 |
| A5 | -- | 69.40 | 75.90 | 84.40 | 78.70 | 71.80 | 66.00 |
| A6 | 62.10 | -- | 75.20 | -- | 76.20 | 70.70 | 65.40 |
| A7 | 61.20 | 68.40 | 77.90 | 83.30 | 79.20 | 70.50 | 65.00 |
| AVERAGE | 60.77 | 68.50 | 75.89 | 83.78 | 78.33 | 71.50 | 65.36 |
| STD. DEV. | 0.90 | 0.85 | 1.70 | 0.73 | 0.98 | 0.67 | 0.70 |
| 90% C. I. | 0.74 | 0.70 | 1.25 | 0.60 | 0.72 | 0.49 | 0.51 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 9/11/84

OPERATION : NOISE ABATEMENT APPROACH (6 DEG. 45 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| BB | 61.10 | 69.90 | 77.80 | 79.30 | 74.50 | 67.10 | 61.90 |
| B9 | 59.90 | 67.80 | 75.60 | 81.80 | 76.50 | 68.80 | 65.30 |
| B10 | 60.70 | 70.40 | 79.40 | 79.40 | 74.10 | 66.20 | 63.90 |
| B11 | 61.00 | 68.60 | 73.50 | 77.90 | 73.50 | 66.10 | 66.20 |
| AVERAGE | 60.68 | 69.18 | 75.33 | 79.60 | 74.65 | 67.05 | 64.33 |
| STD. DEV. | 0.54 | 1.19 | 1.86 | 1.62 | 1.30 | 1.25 | 1.87 |
| 90% C. I. | 0.69 | 1.51 | 2.35 | 2.05 | 1.64 | 1.58 | 2.37 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 9/11/84

OPERATION : NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| D12 | 62.90 | 66.90 | 73.40 | 82.40 | 80.70 | 71.30 | 66.00 |
| D13 | 64.40 | 68.20 | 71.90 | 76.10 | 76.60 | 72.20 | 69.10 |
| D14 | 62.00 | -- | 71.50 | 77.30 | 78.20 | 72.40 | 65.60 |
| D15 | 64.30 | 67.60 | 72.90 | 78.60 | 79.00 | 72.80 | 65.70 |
| D16 | 62.00 | 68.60 | 73.70 | 79.50 | 77.20 | 72.70 | 67.70 |
| D17 | 62.00 | -- | 72.10 | 78.00 | 78.10 | 72.20 | 67.40 |
| D18 | 61.30 | 67.60 | 73.00 | 77.80 | 77.30 | 72.10 | 67.00 |
| D19 | 60.70 | 67.00 | 72.50 | 78.20 | 76.80 | 71.10 | 66.80 |
| D20 | 61.80 | 67.20 | 72.80 | 76.90 | 77.70 | 72.10 | 66.70 |
| AVERAGE | 62.38 | 67.59 | 72.64 | 78.31 | 77.96 | 72.10 | 66.89 |
| STD. DEV. | 1.26 | 0.63 | 0.71 | 1.82 | 1.27 | 0.57 | 1.10 |
| 90% C.I. | 0.78 | 0.46 | 0.44 | 1.13 | 0.79 | 0.35 | 0.68 |

A-WEIGHTED SOUND LEVEL (DB)

HELICOPTER: BELL 222A

TEST DATE: 9/11/84

OPERATION : NOISE ABATEMENT APPROACH (10 DEG. 65 KTS.)

| EVENT NO. | (LEFT SIDE) | | | CL-C | (RIGHT SIDE) | | |
|--------------|---------------|---------------|--------------|-------|--------------|---------------|---------------|
| | 2000' EAST | 1000' EAST | 500' EAST | | 500' WEST | 1000' WEST | 2000' WEST |
| C21 | 63.40 | 66.20 | 72.00 | 77.80 | 77.50 | 70.70 | 65.70 |
| C22 | 61.10 | 65.10 | 69.90 | 77.20 | 77.80 | 71.90 | 68.20 |
| C23 | 61.70 | 65.60 | 74.20 | 79.60 | 78.90 | 71.10 | 67.60 |
| AVERAGE | 62.07 | 65.63 | 72.03 | 78.20 | 78.07 | 71.23 | 67.17 |
| STD. DEV. | 1.19 | 0.55 | 2.15 | 1.25 | 0.74 | 0.61 | 1.31 |
| 90% C. I. | 2.01 | 0.93 | 3.62 | 2.11 | 1.24 | 1.03 | 2.20 |

RADAR TRACKING DATA

- THIS SECTION OF THE APPENDIX CONTAINS THE HELICOPTER -
- POSITION DATA AND TRACKING PLOTS DERIVED FROM THE FAA'S -
- PORTABLE TRACKING RADAR SYSTEM. THE POSITION DATA LISTS -
- THE CLOSEST POINT OF APPROACH (CPA), TIME OF CPA, -
- ELEVATION ANGLE, RATE OF CLIMB OR DESCENT, THE CLIMB OR -
- DESCENT ANGLE, AND GROUND SPEED FOR ALL FLIGHT -
- CONDITIONS. TRACKING PLOTS OF THE ACTUAL FLIGHT PROFILE -
- FLOWN ARE PROVIDED FOR EACH FLIGHT CONDITIONS. -

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

CENTERLINE CENTER

DATE: 09/11/84

FAA/AEEX

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|-----------|-------|------------|--------|-------|------|
| SIX DEGREE APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | ----- | NO DATA | ----- | | |
| 2 | APP 431.3 | 81.9 | 13:04:10.1 | -770.2 | -6.7 | 64.0 |
| 3 | APP 393.3 | 79.3 | 13:07:54.6 | -690.6 | -6.7 | 58.4 |
| 4 | APP 396.1 | 79.0 | 13:12:34.2 | -836.8 | -6.0 | 68.1 |
| 5 | APP 384.1 | 83.1 | 13:16:56.0 | -687.5 | -6.1 | 63.7 |
| 6 | APP 364.9 | 81.5 | 13:19:30.9 | -234.0 | -2.1 | 63.0 |
| 7 | APP 356.4 | 84.1 | 13:22:36.2 | -664.3 | -5.0 | 63.5 |

NOISE ABATEMENT APPROACH (SIX DEGREE AT 45 KTS.)

| | | | | | | |
|----|-----------|------|------------|--------|------|------|
| 8 | APP 365.8 | 79.4 | 13:26:24.1 | -247.0 | -3.2 | 44.0 |
| 9 | APP 353.1 | 79.2 | 13:30:05.9 | -683.3 | -7.8 | 40.3 |
| 10 | APP 389.2 | 85.2 | 13:33:14.6 | -315.8 | -3.7 | 48.3 |
| 11 | APP 384.7 | 86.9 | 13:36:31.8 | -370.7 | -4.7 | 44.6 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----------|------|------------|---------|-------|------|
| 12 | APP 361.9 | 87.8 | 13:30:59.0 | -512.0 | -4.6 | 62.4 |
| 13 | APP 599.8 | 79.3 | 13:42:54.7 | -1340.7 | -10.2 | 74.1 |
| 14 | APP 581.5 | 76.3 | 13:46:09.2 | -944.5 | -9.4 | 56.6 |
| 15 | APP 452.6 | 74.0 | 13:49:30.0 | -988.0 | -8.4 | 65.8 |
| 16 | APP 490.7 | 72.2 | 13:52:48.2 | -1439.8 | -12.0 | 67.0 |
| 17 | APP 466.3 | 82.3 | 13:56:42.0 | -1336.4 | -11.4 | 65.4 |
| 18 | APP 664.7 | 81.8 | 13:59:02.6 | -267.2 | -2.2 | 68.4 |
| 19 | APP 524.8 | 76.2 | 14:03:22.7 | -1111.2 | -13.6 | 45.0 |
| 20 | APP 443.6 | 88.7 | 14:05:57.9 | -899.3 | -8.0 | 56.5 |

NOISE ABATEMENT APPROACH (TEN DEGREE AT 65 KTS.)

| | | | | | | |
|----|-----------|------|------------|---------|-------|------|
| 21 | APP 614.7 | 78.5 | 14:17:13.0 | -991.1 | -9.8 | 56.5 |
| 22 | APP 586.9 | 80.7 | 14:20:23.4 | -1207.9 | -12.2 | 55.0 |
| 23 | APP 545.9 | 70.4 | 14:23:31.8 | -730.4 | -6.4 | 64.5 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

500 FT. EAST

DATE 09/11/84

***FAA/AEE**

EVENT CPA-FT E-A CPA-TIME RC-FPM C/D-A GS-K

SIX DEGREE APPROACH AT VY, 65 KTS.

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K | |
|-------|--------|-------|----------|------------|--------|------|------|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | APP | 602.5 | 45.6 | 13:04:00.0 | -790.7 | -6.6 | 67.1 |
| 4 | APP | 597.6 | 41.5 | 13:07:53.7 | -553.2 | -5.4 | 58.1 |
| 5 | APP | 570.7 | 44.3 | 13:12:33.6 | -694.4 | -5.0 | 65.8 |
| 6 | APP | 586.8 | 40.8 | 13:15:56.6 | -615.6 | -5.5 | 63.6 |
| 7 | APP | 597.3 | 37.8 | 13:19:30.3 | -315.1 | -2.5 | 60.3 |
| 7 | APP | 563.8 | 39.3 | 13:22:36.0 | -662.8 | -5.8 | 64.0 |

NOISE ABATEMENT APPROACH (SIX DEGREE AT 45 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|--------|------|------|
| 8 | APP | 593.2 | 37.6 | 13:26:24.0 | -158.0 | -1.0 | 46.1 |
| 9 | APP | 575.3 | 37.3 | 13:30:06.3 | -766.5 | -9.1 | 47.0 |
| 10 | APP | 597.5 | 41.5 | 13:33:14.4 | -367.3 | -4.2 | 49.1 |
| 11 | APP | 618.6 | 38.3 | 13:36:32.6 | -487.1 | -6.2 | 44.5 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|------|
| 12 | APP | 591.8 | 37.8 | 13:39:58.0 | -490.7 | -4.4 | 62.7 |
| 13 | APP | 726.8 | 53.8 | 13:42:54.0 | -1382.9 | -10.5 | 73.0 |
| 14 | APP | 713.6 | 50.0 | 13:46:08.5 | -707.3 | -6.6 | 60.0 |
| 15 | APP | 612.6 | 46.0 | 13:49:20.9 | -981.6 | -8.4 | 65.7 |
| 16 | APP | 593.7 | 50.6 | 13:52:48.0 | -1443.2 | -11.0 | 67.4 |
| 17 | APP | 647.5 | 45.8 | 13:55:42.0 | -1336.2 | -11.4 | 65.4 |
| 18 | APP | 750.8 | 61.8 | 13:59:01.0 | -411.0 | -3.4 | 68.3 |
| 19 | APP | 632.4 | 52.2 | 14:03:23.6 | -1079.6 | -12.4 | 48.6 |
| 20 | APP | 647.7 | 43.4 | 14:05:57.8 | -914.1 | -9.0 | 57.1 |

NOISE ABATEMENT APPROACH (TEN DEGREE AT 65 KTS.)

| | | | | | | | |
|----|-----|-------|------|------------|---------|-------|------|
| 21 | APP | 710.8 | 58.2 | 14:17:12.0 | -1004.5 | -10.1 | 55.0 |
| 22 | APP | 728.5 | 50.6 | 14:20:23.3 | -1215.8 | -12.4 | 54.5 |
| 23 | APP | 687.1 | 52.8 | 14:23:30.2 | -967.4 | -8.5 | 64.2 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
POSITION DATA
NOISE MEASUREMENT PROGRAM

500 FT. WEST

DATE: 09/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|-------|--------|-----|----------|--------|-------|------|
|-------|--------|-----|----------|--------|-------|------|

SIX DEGREE APPROACH AT VY, 65 KTS.

| | | | | | | |
|---|-----|-------|---------------------|------------|--------|-----------|
| 1 | | | ----- NO DATA ----- | | | |
| 2 | APP | 600.2 | 37.6 | 13:04:10.1 | -777.7 | -6.4 68.4 |
| 3 | APP | 664.7 | 35.4 | 13:07:54.7 | -714.4 | -6.8 59.4 |
| 4 | APP | 683.5 | 34.0 | 13:12:34.1 | -819.4 | -6.7 68.4 |
| 5 | APP | 658.1 | 35.3 | 13:15:57.1 | -529.8 | -4.7 64.1 |
| 6 | APP | 628.5 | 35.0 | 13:19:31.0 | -132.0 | -1.2 64.3 |
| 7 | APP | 643.1 | 33.5 | 13:22:36.2 | -664.4 | -5.0 63.5 |

NOISE ABATEMENT APPROACH (SIX DEGREE AT 45 KTS.)

| | | | | | | |
|----|-----|-------|------|------------|--------|-----------|
| 8 | APP | 630.3 | 34.8 | 13:26:24.2 | -151.5 | -1.0 45.7 |
| 9 | APP | 625.4 | 32.3 | 13:30:07.3 | -663.0 | -8.0 46.5 |
| 10 | APP | 657.3 | 36.3 | 13:33:14.7 | -366.7 | -4.2 49.8 |
| 11 | APP | 631.3 | 37.3 | 13:36:32.2 | -455.0 | -5.8 44.3 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|-----|-------|------|------------|---------|------------|
| 12 | APP | 586.0 | 38.3 | 13:39:59.3 | -567.7 | -5.1 62.3 |
| 13 | APP | 816.0 | 46.6 | 13:42:54.6 | -1329.7 | -10.0 74.5 |
| 14 | APP | 772.2 | 45.0 | 13:46:09.7 | -967.6 | -9.5 57.0 |
| 15 | APP | 724.1 | 36.0 | 13:49:30.1 | -974.9 | -8.3 66.2 |
| 16 | APP | 785.3 | 36.5 | 13:52:48.2 | -1440.0 | -12.0 67.0 |
| 17 | APP | 687.0 | 40.7 | 13:55:43.4 | -1222.6 | -11.1 61.7 |
| 18 | APP | 875.7 | 49.0 | 13:59:02.8 | -252.0 | -2.1 68.0 |
| 19 | APP | 797.6 | 39.7 | 14:03:22.7 | -1111.1 | -13.6 45.2 |
| 20 | APP | 664.3 | 42.0 | 14:05:58.0 | -887.7 | -8.9 56.1 |

NOISE ABATEMENT APPROACH (TEN DEGREE AT 65 KTS.)

| | | | | | | |
|----|-----|-------|------|------------|---------|------------|
| 21 | APP | 850.4 | 45.1 | 14:17:13.4 | -948.2 | -9.9 59.3 |
| 22 | APP | 779.0 | 44.0 | 14:20:24.5 | -1253.4 | -12.8 54.5 |
| 23 | APP | 781.7 | 41.1 | 14:23:31.9 | -696.7 | -6.1 64.3 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

1000 FT. EAST

DATE 10/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|------------|------|------------|--------|-------|------|
| SIX DEGREE APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | | NO DATA | | | |
| 2 | APP 1017.7 | 25.2 | 13:04:09.9 | -790.7 | -6.6 | 67.1 |
| 3 | APP 1027.3 | 20.3 | 13:07:56.9 | -849.3 | -7.0 | 68.6 |
| 4 | APP 992.2 | 23.8 | 13:12:33.6 | -694.4 | -5.0 | 65.8 |
| 5 | APP 1018.2 | 22.3 | 13:15:56.6 | -615.6 | -5.5 | 63.6 |
| 6 | APP 1039.3 | 20.7 | 13:19:30.3 | -315.1 | -2.0 | 62.0 |
| 7 | APP 1002.8 | 21.0 | 13:22:36.0 | -662.8 | -5.8 | 64.0 |

NOISE ABATEMENT APPROACH (SIX DEGREE AT 45 KTS.)

| | | | | | | |
|----|------------|------|------------|--------|------|------|
| 8 | APP 1024.3 | 20.6 | 13:26:24.0 | -158.6 | -1.9 | 46.1 |
| 9 | APP 1016.4 | 20.2 | 13:30:06.3 | -766.5 | -9.1 | 47.3 |
| 10 | APP 1027.7 | 22.8 | 13:33:14.4 | -367.3 | -4.2 | 49.1 |
| 11 | APP 1055.4 | 21.4 | 13:36:32.6 | -487.1 | -6.2 | 44.5 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|------------|------|------------|---------|-------|------|
| 12 | APP 1031.8 | 20.6 | 13:39:59.7 | -644.3 | -5.8 | 62.1 |
| 13 | APP 1092.5 | 32.6 | 13:42:54.9 | -1382.9 | -10.5 | 73.9 |
| 14 | APP 1091.3 | 31.9 | 13:46:08.0 | -627.6 | -5.6 | 62.6 |
| 15 | APP 1017.3 | 27.0 | 13:49:29.0 | -1057.0 | -9.9 | 63.6 |
| 16 | APP 723.2 | 31.0 | 13:52:55.1 | 87.7 | 0.7 | 72.8 |
| 17 | APP 1053.8 | 26.1 | 13:55:42.0 | -1336.2 | -11.4 | 65.4 |
| 18 | APP 1080.2 | 37.9 | 13:59:01.9 | -411.0 | -3.4 | 68.3 |
| 19 | APP 1045.0 | 27.9 | 14:03:25.0 | -996.3 | -11.9 | 46.5 |
| 20 | APP 1068.4 | 24.7 | 14:05:57.8 | -914.1 | -9.0 | 57.1 |

NOISE ABATEMENT APPROACH (TEN DEGREE AT 65 KTS.)

| | | | | | | |
|----|------------|------|------------|---------|-------|------|
| 21 | APP 1063.7 | 34.7 | 14:17:13.1 | -983.7 | -9.7 | 56.9 |
| 22 | APP 1113.2 | 30.5 | 14:20:23.3 | -1215.8 | -12.4 | 64.5 |
| 23 | APP 1067.1 | 31.0 | 14:23:30.2 | -967.4 | -8.5 | 64.2 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

1000 FT. WEST

DATE: 09/11/84

***FAA/AEE**

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|------------|------|---------------------|--------|-------|------|
| SIX DEGREE APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | | ----- NO DATA ----- | | | |
| 2 | APP 1137.1 | 22.2 | 13:04:10.2 | -767.0 | -6.3 | 68.8 |
| 3 | APP 1109.3 | 20.4 | 13:07:54.7 | -714.4 | -6.8 | 59.4 |
| 4 | APP 1130.9 | 20.3 | 13:12:34.1 | -819.4 | -6.7 | 68.4 |
| 5 | APP 1099.8 | 20.4 | 13:15:57.1 | -529.8 | -4.7 | 64.1 |
| 6 | APP 1066.5 | 19.9 | 13:19:31.9 | -132.0 | -1.2 | 64.3 |
| 7 | APP 1093.8 | 17.3 | 13:22:38.4 | -816.4 | -7.3 | 63.2 |

NOISE ABATEMENT APPROACH (SIX DEGREE AT 45 KTS.)

| | | | | | | |
|----|------------|------|------------|--------|------|------|
| 8 | APP 1077.5 | 19.6 | 13:26:24.2 | -151.5 | -1.9 | 45.7 |
| 9 | APP 1071.6 | 18.3 | 13:30:07.3 | -663.0 | -8.0 | 46.5 |
| 10 | APP 1095.5 | 20.2 | 13:33:17.8 | -420.2 | -5.1 | 46.2 |
| 11 | APP 1072.5 | 21.0 | 13:36:32.2 | -455.9 | -5.8 | 44.3 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|------------|------|------------|---------|-------|------|
| 12 | APP 1027.5 | 20.9 | 13:39:59.3 | -567.7 | -5.1 | 62.9 |
| 13 | APP 1207.3 | 28.9 | 13:42:55.5 | -1474.1 | -11.6 | 71.1 |
| 14 | APP 1169.4 | 27.9 | 13:46:09.7 | -967.6 | -9.5 | 67.0 |
| 15 | APP 1159.4 | 22.1 | 13:49:30.1 | -974.9 | -8.3 | 66.2 |
| 16 | APP 1222.5 | 22.6 | 13:52:48.2 | -1440.0 | -12.0 | 67.0 |
| 17 | APP 1099.4 | 24.2 | 13:55:43.4 | -1222.6 | -11.1 | 61.7 |
| 18 | APP 1261.7 | 31.7 | 13:59:02.8 | -252.9 | -2.1 | 68.9 |
| 19 | APP 1222.2 | 23.4 | 14:03:24.3 | -1044.5 | -12.1 | 48.1 |
| 20 | APP 1089.1 | 24.2 | 14:05:58.0 | -887.7 | -8.9 | 56.1 |

NOISE ABATEMENT APPROACH (TEN DEGREE AT 65 KTS.)

| | | | | | | |
|----|------------|------|------------|---------|-------|------|
| 21 | APP 1252.5 | 28.9 | 14:17:13.4 | -948.2 | -9.0 | 59.3 |
| 22 | APP 1175.1 | 27.6 | 14:20:24.6 | -1262.2 | -12.8 | 54.6 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A

POSITION DATA
NOISE MEASUREMENT PROGRAM

2000 FT. EAST

DATE 109/11/84

FAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|------------|------|------------|--------|-------|------|
| SIX DEGREE APPROACH AT YY, 65 KTS. | | | | | | |
| 1 | | | NO DATA | | | |
| 2 | APP 1970.0 | 12.8 | 13:04:00.0 | -790.7 | -6.6 | 67.1 |
| 3 | APP 1966.8 | 10.6 | 13:07:56.0 | -849.3 | -7.3 | 66.6 |
| 4 | APP 1949.3 | 10.7 | 13:12:36.0 | -807.3 | -6.9 | 65.6 |
| 5 | APP 1980.1 | 11.3 | 13:15:56.6 | -615.6 | -5.5 | 63.6 |
| 6 | APP 2006.7 | 10.7 | 13:19:00.3 | -315.1 | -5.0 | 62.3 |
| 7 | APP 1969.5 | 10.8 | 13:22:34.8 | -662.8 | -5.7 | 65.8 |

NOISE ABATEMENT APPROACH (SIX DEGREE AT 45 KTS.)

| | | | | | | |
|----|------------|------|------------|--------|------|------|
| 8 | APP 2001.3 | 10.6 | 13:26:24.0 | -158.0 | -1.0 | 46.1 |
| 9 | APP 1984.1 | 10.3 | 13:30:06.3 | -766.5 | -0.1 | 47.3 |
| 10 | APP 1988.4 | 11.6 | 13:33:14.4 | -367.3 | -4.2 | 49.1 |
| 11 | APP 2018.9 | 11.1 | 13:36:32.6 | -487.1 | -6.2 | 44.5 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | | |
|----|------------|------|------------|---------|-------|------|
| 12 | APP 1997.8 | 10.6 | 13:39:59.7 | -644.3 | -5.8 | 62.1 |
| 13 | APP 2005.8 | 17.2 | 13:42:54.0 | -1382.0 | -10.5 | 73.0 |
| 14 | APP 2012.1 | 16.7 | 13:46:06.0 | -627.6 | -5.6 | 62.6 |
| 15 | APP 1962.5 | 13.7 | 13:49:29.0 | -1057.0 | -0.2 | 63.6 |
| 16 | APP 1372.0 | 16.0 | 13:52:55.2 | 82.0 | 0.7 | 60.2 |
| 17 | APP 2003.5 | 13.3 | 13:55:43.1 | -1185.0 | -10.8 | 61.4 |
| 18 | APP 1967.0 | 10.8 | 13:59:01.0 | -411.0 | -3.4 | 68.3 |
| 19 | APP 1923.8 | 14.1 | 14:03:25.8 | -764.0 | -10.3 | 41.6 |
| 20 | APP 2020.1 | 12.9 | 14:06:59.0 | -745.2 | -7.3 | 57.5 |

NOISE ABATEMENT APPROACH (TEN DEGREE AT 65 KTS.)

| | | | | | | |
|----|------------|------|------------|---------|-------|------|
| 21 | APP 1970.2 | 18.0 | 14:17:13.1 | -983.7 | -0.7 | 56.0 |
| 22 | APP 2033.6 | 17.0 | 14:20:21.0 | -1294.5 | -13.2 | 54.5 |
| 23 | APP 1992.0 | 16.1 | 14:23:30.2 | -967.4 | -0.5 | 64.8 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

BELL 222A
 POSITION DATA
 NOISE MEASUREMENT PROGRAM

2000 FT. WEST

DATE 09/11/84

XXFAA/AEE

| EVENT | CPA-FT | E-A | CPA-TIME | RC-FPM | C/D-A | GS-K |
|------------------------------------|------------|------|------------|--------|-------|------|
| SIX DEGREE APPROACH AT VY, 65 KTS. | | | | | | |
| 1 | | | NO DATA | | | |
| 2 | APP 2079.3 | 10.8 | 13:04:13.0 | -790.0 | -7.1 | 62.7 |
| 3 | APP 2072.7 | 10.4 | 13:07:54.7 | -714.4 | -6.8 | 59.4 |
| 4 | APP 2095.3 | 10.5 | 13:12:34.1 | -819.4 | -6.7 | 68.4 |
| 5 | APP 2061.6 | 10.4 | 13:15:57.1 | -529.8 | -4.7 | 64.1 |
| 6 | APP 2027.5 | 10.0 | 13:19:31.0 | -132.0 | -1.2 | 64.3 |
| 7 | APP 2057.4 | 8.8 | 13:22:38.4 | -816.4 | -7.3 | 63.2 |

NOISE ABATEMENT APPROACH (SIX DEGREE AT 45 KTS.)

| | | | | | | |
|----|------------|------|------------|--------|------|------|
| 8 | APP 2043.8 | 9.9 | 13:26:24.2 | -151.5 | -1.9 | 45.7 |
| 9 | APP 2037.7 | 9.1 | 13:30:07.3 | -663.0 | -8.0 | 46.5 |
| 10 | APP 2044.5 | 10.3 | 13:33:17.9 | -428.5 | -5.3 | 45.8 |
| 11 | APP 2035.1 | 10.5 | 13:36:32.2 | -455.0 | -5.8 | 44.3 |

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

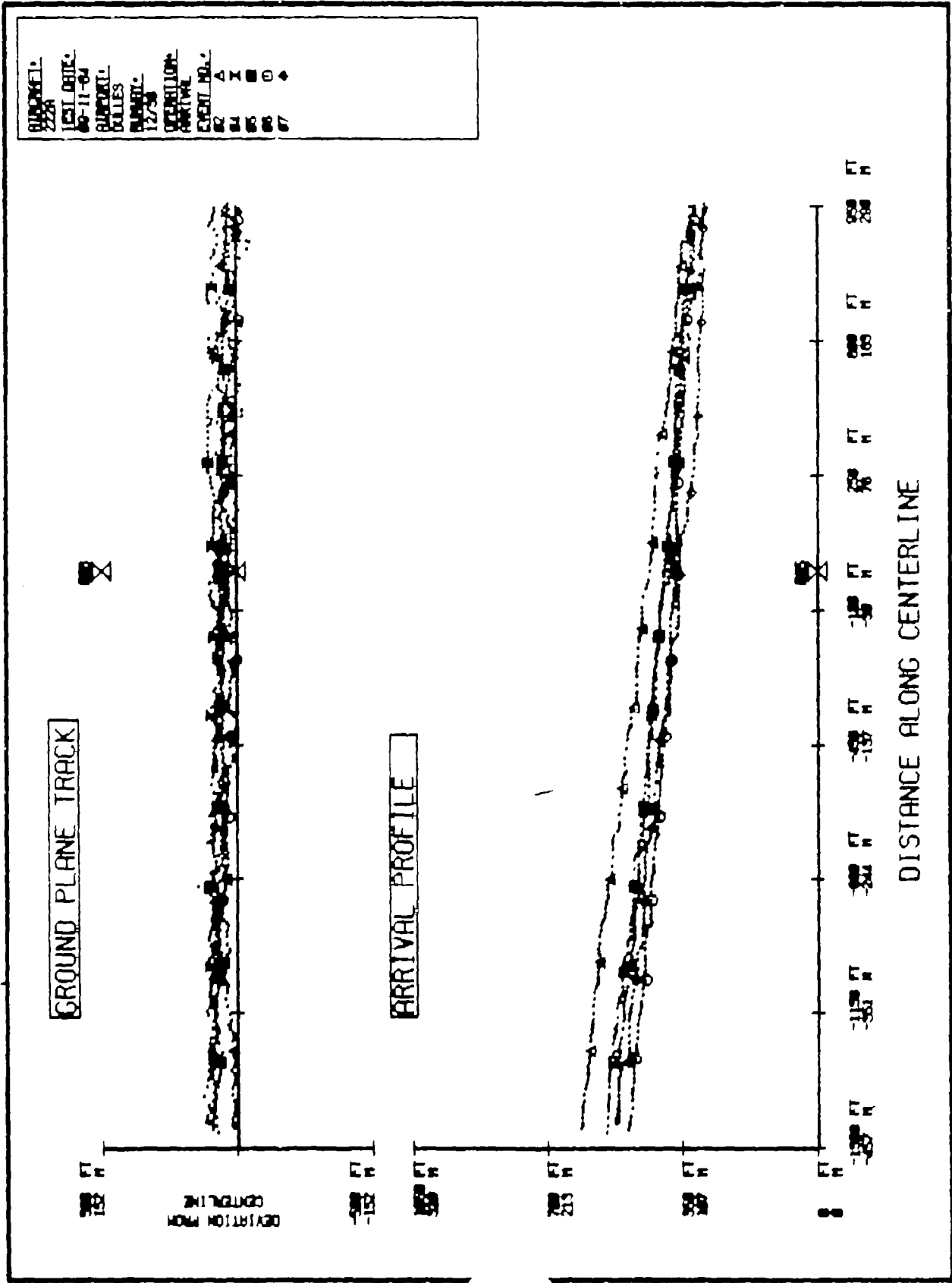
| | | | | | | |
|----|-------------|------|------------|---------|-------|------|
| 12 | APP 2091.6 | 10.2 | 13:39:59.3 | -567.7 | -5.1 | 62.3 |
| 13 | APP 20125.0 | 15.6 | 13:42:55.5 | -1474.1 | -11.0 | 71.1 |
| 14 | APP 20995.0 | 14.8 | 13:46:09.7 | -967.6 | -9.5 | 57.0 |
| 15 | APP 2104.0 | 11.0 | 13:49:32.1 | -1052.3 | -9.6 | 62.2 |
| 16 | APP 2176.0 | 12.1 | 13:52:48.2 | -1440.0 | -12.0 | 67.0 |
| 17 | APP 2041.0 | 12.4 | 13:55:43.4 | -1222.6 | -11.1 | 61.7 |
| 18 | APP 20172.8 | 17.4 | 13:59:02.8 | -252.0 | -2.1 | 68.9 |
| 19 | APP 20165.2 | 12.7 | 14:03:24.3 | -1044.5 | -12.1 | 48.1 |
| 20 | APP 2040.1 | 12.3 | 14:05:58.0 | -887.7 | -8.9 | 56.1 |

NOISE ABATEMENT APPROACH (TEN DEGREE AT 65 KTS.)

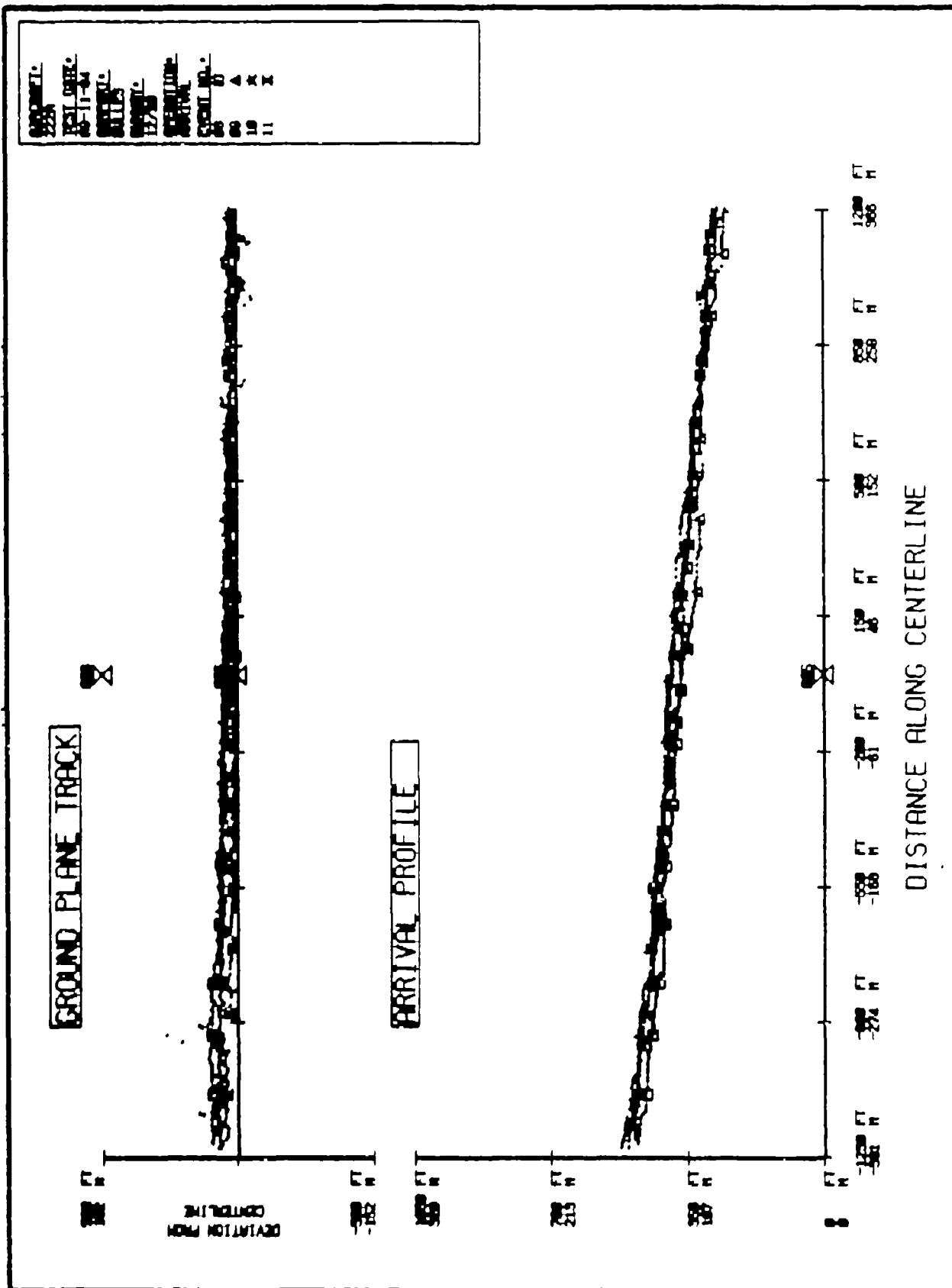
| | | | | | | |
|----|------------|------|------------|---------|-------|------|
| 21 | APP 2176.4 | 15.0 | 14:17:15.0 | -1103.2 | -10.5 | 58.8 |
| 22 | APP 2099.9 | 14.7 | 14:20:24.6 | -1262.2 | -12.0 | 54.6 |
| 23 | APP 2115.4 | 13.7 | 14:23:33.6 | -351.0 | -3.2 | 61.2 |

CPA-FT : CLOSEST POINT OF APPROACH
 E-A : ELEVATION ANGLE
 CPA-TIME : CLOSEST POINT OF APPROACH TIME
 RC-FPM : RATE OF CLIMB
 C/D-A : CLIMB OR DESCENT ANGLE
 GS-K : GROUND SPEED

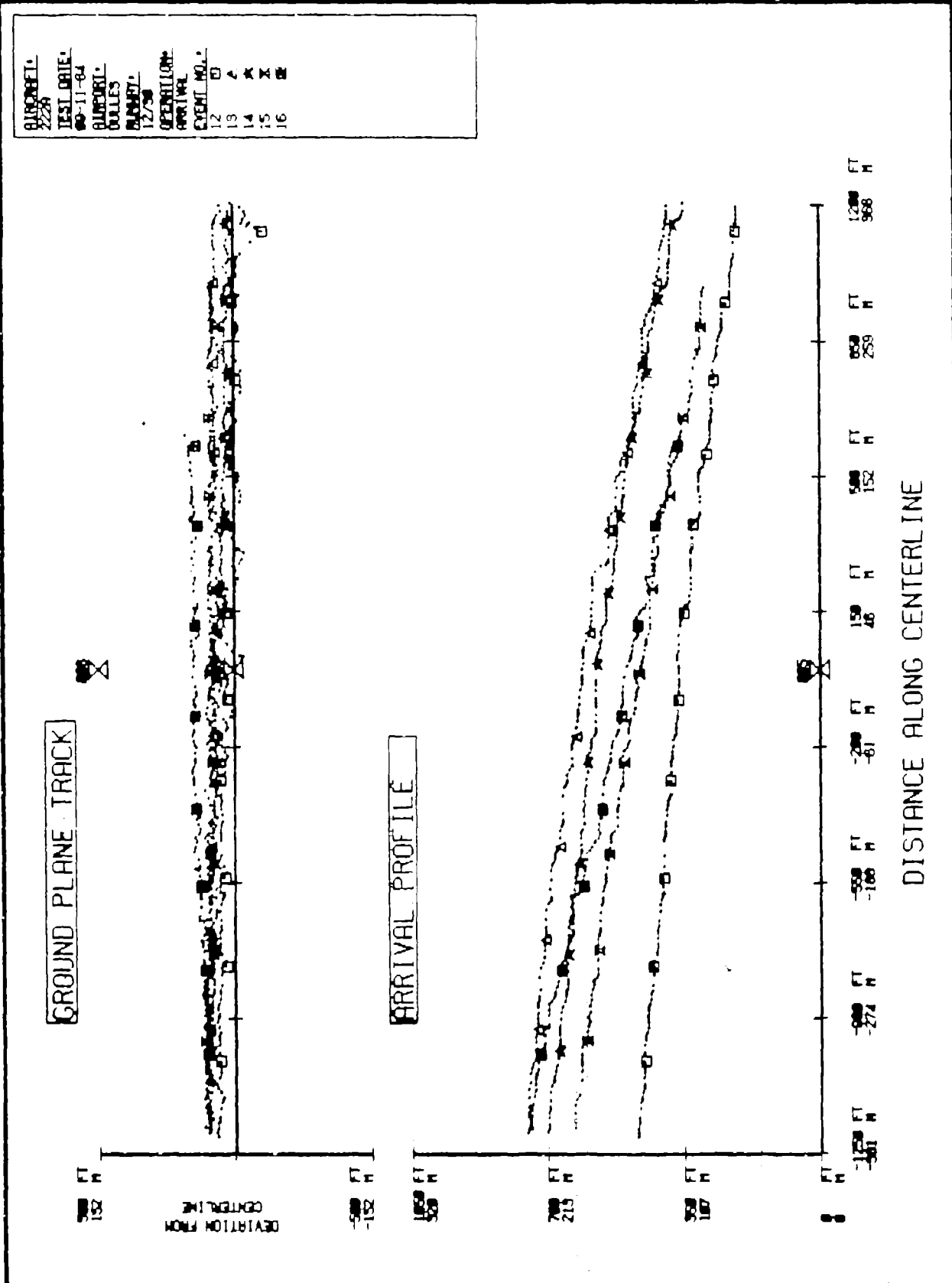
SIX DEG. APPROACH at Vy, 65 Kts.



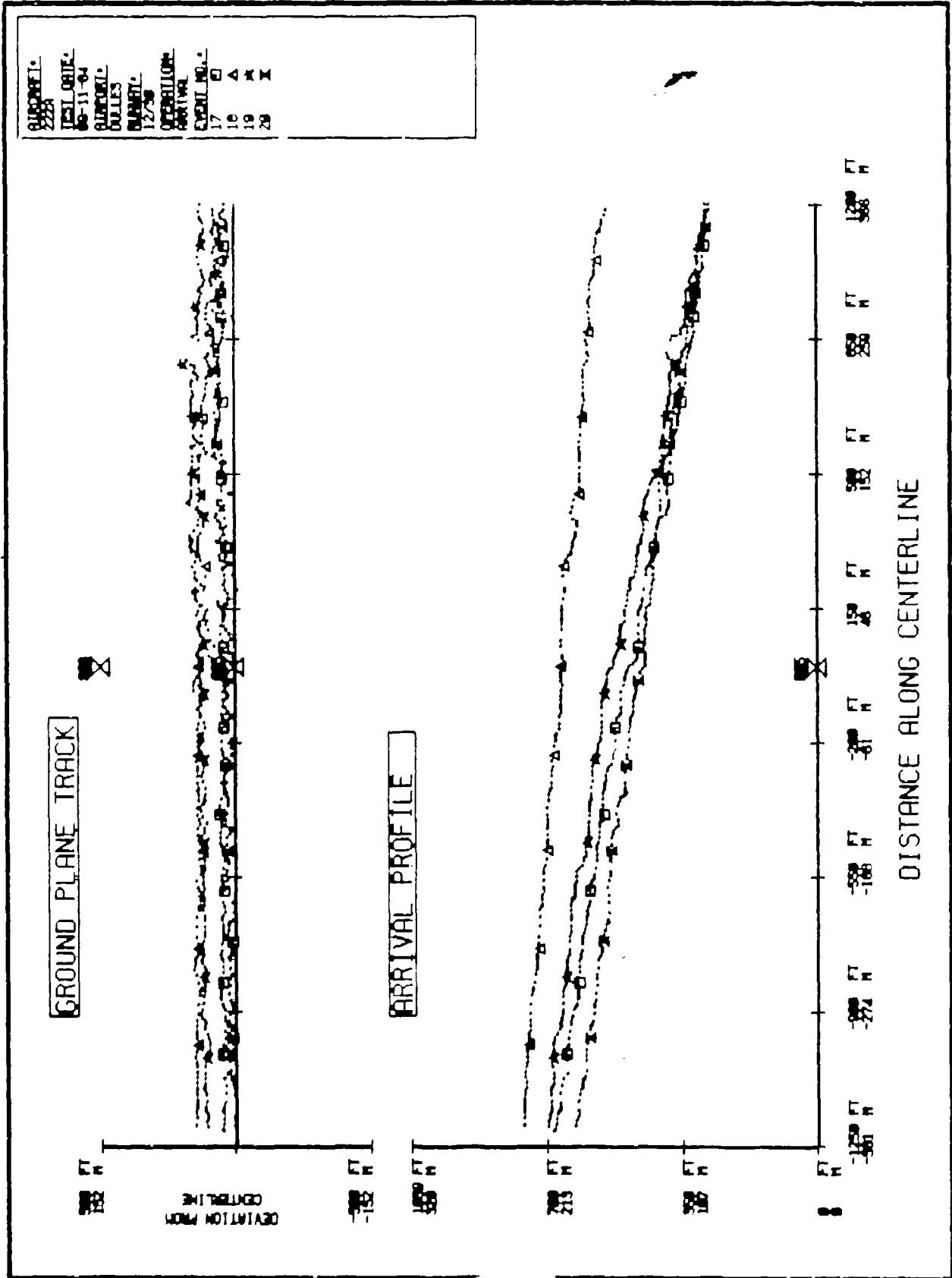
NOISE ABATEMENT APPROACH (6° at 45 Kts.)



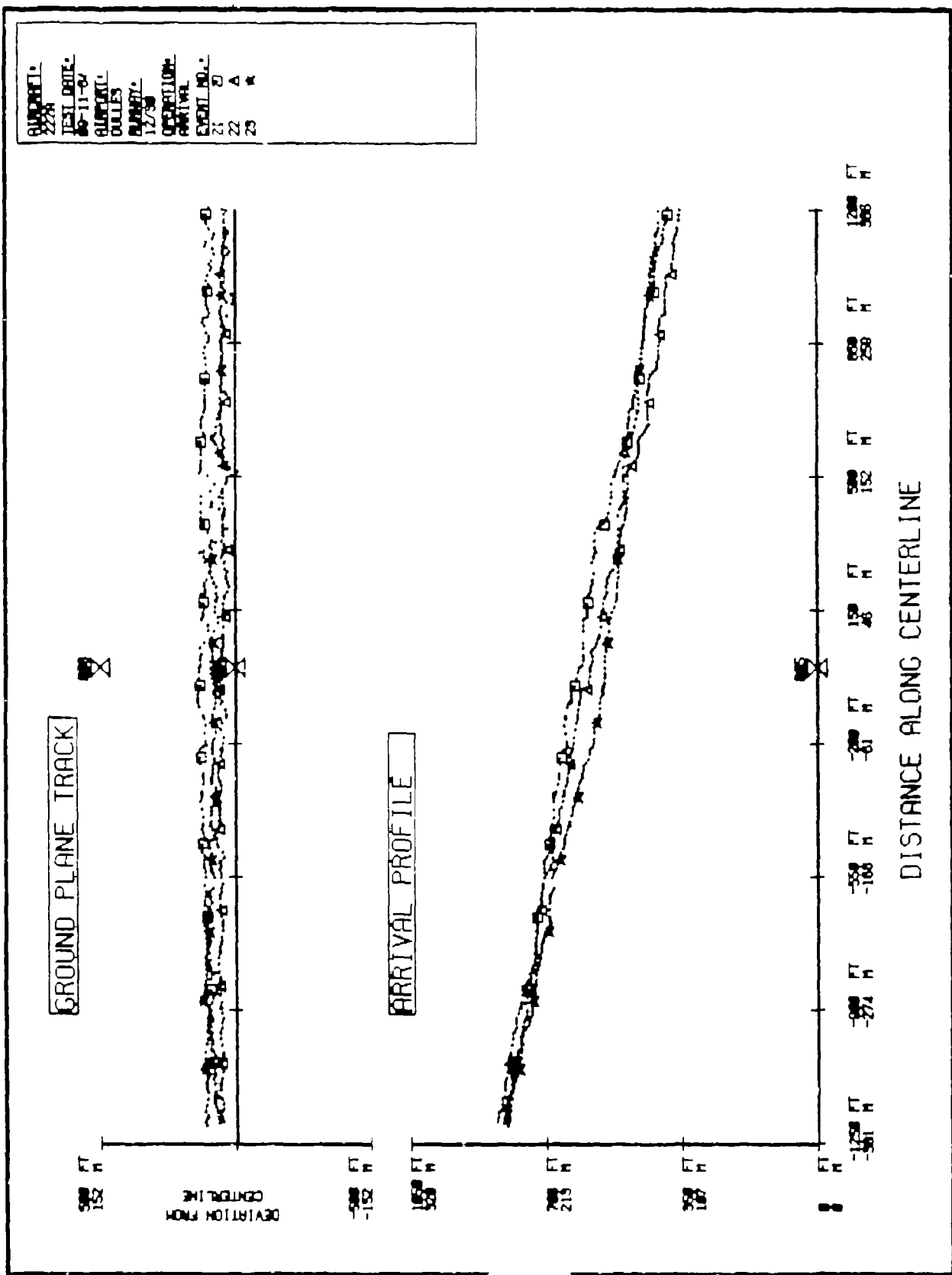
NOISE ABATEMENT APPROACH (Var. R/D & A/S)



NOISE ABATEMENT APPROACH (Var. R/D & A/S)



NOISE ABATEMENT APPROACH (10 Deg. at 65 Kts.)



METEOROLOGICAL DATA

- THIS SECTION OF THE APPENDIX CONTAINS WEATHER DATA FROM -
- SEVERAL TYPES OF METEOROLOGICAL EQUIPMENT: TEN-METER -
- TOWER (MET), GROUND LEVEL PSYCHROMETER, AIRCRAFT OAT, AND -
- PILOT BALLOONS. DATA FROM THE MET TOWER INCLUDE THE -
- TEMPERATURE, RELATIVE HUMIDITY, WIND DIRECTION AND WIND -
- SPEED MEASURED TYPICALLY EVERY 15 MINUTES DURING EACH -
- FLIGHT EVENT. BECAUSE OF A FAILURE OF THE MET TOWER DEW -
- POINT SENSOR, THE RELATIVE HUMIDITY WAS CALCULATED USING -
- TEMPERATURE FROM THE MET TOWER AND DEW POINT FROM THE -
- DULLES MID FIELD WEATHER STATION. GROUND LEVEL (4 FEET) -
- TEMPERATURE AND RELATIVE HUMIDITY ARE GIVEN FOR DIFFERENT -
- TIMES OF EACH TEST DAY, AND THE HELICOPTER'S OAT READINGS -
- ARE SHOWN FOR DIFFERENT FLIGHT ALTITUDES AT VARIOUS TIMES -
- OF THE DAY. THE PILOT BALLOON WIND DATA, TAKEN -
- PERIODICALLY DURING EACH TEST DAY, INCLUDES THE WIND -
- DIRECTION AND WIND SPEED AT VARIOUS ALTITUDES. -

METEOROLOGICAL DATA
(MEASURED AT 30 FT. AGL)

HELICOPTER: BELL 222A

DATE: 9/11/84

| TIME | TEMP. | R.H. | WIND DIR. | WIND SPEED | |
|------|----------|------|-----------|------------|-----|
| | (DEG. F) | % | (DEG.) | AVG. | MAX |

SIX DEGREE APPROACH AT VY, 65 KTS.

| | | | | | |
|------|----|----|-----|---|---|
| 1:00 | 69 | 84 | 180 | 5 | - |
| 1:15 | 70 | 81 | 180 | 4 | 7 |
| 1:30 | 70 | 81 | 180 | 5 | - |

NOISE ABATEMENT APPROACH (6 DEG., 45 KTS.)

| | | | | | |
|------|----|----|-----|---|---|
| 1:45 | 71 | 82 | 180 | 5 | - |
|------|----|----|-----|---|---|

NOISE ABATEMENT APPROACH (VAR. R/D AND A/S)

| | | | | | |
|------|----|----|-----|---|---|
| 2:00 | 72 | 79 | 180 | 5 | - |
| 2:15 | 72 | 79 | 180 | 5 | - |

NOISE ABATEMENT APPROACH (10 DEG., 65 KTS.)

| | | | | | |
|------|----|----|-----|---|---|
| 2:30 | 74 | 76 | 180 | 6 | 9 |
|------|----|----|-----|---|---|

METEOROLOGICAL DATA

HELICOPTER: BELL 222A

DATE: 09/11/84

TEMPERATURE AND RELATIVE HUMIDITY DATA
(MEASURED AT 4 FT. AGL)

HELICOPTERS DAT GAUGE DATA

TIME TEMP. R.H.

TIME ALTITUDE TEMP.

N
O

D
A
T
A

2:10 200' 73 F
 400' 73 F
 600' 72 F
 800' 72 F
 1000' 70 F

PILOT BALLOON WIND DATA

BELL 222A

09/11/84

| FEET | WIND DIR. | WIND SPD. | WIND DIR. | WIND SPD. |
|-------|-----------|-----------|-----------|-----------|
| (AGL) | (DEG.) | (KTS) | (DEG.) | (KTS) |

LAUNCH TIME:

----- NO DATA -----

COCKPIT VIDEO

DATA

- - - - -
- THIS SECTION OF THE APPENDIX CONTAINS INDIVIDUAL EVENT -
- LISTINGS OF THE COCKPIT INSTRUMENT READINGS READ EVERY 5 -
- SECONDS FROM PLAYBACK OF THE COCKPIT VIDEO RECORDINGS. -
- THIS DATA ENCOMPASSES THE HELICOPTERS'S FLIGHT -
- PARAMETERS THROUGHOUT THE ENTIRE DATA RUN PLUS OR MINUS -
- 15 SECONDS (MINIMUM) FROM CLC. -
- - - - -

COCKPIT VIDEO DATA
 NOISE ABATEMENT APPROACH
 (6 DEGREE, 45 KTS.)

HELICOPTER: BELL 222A

DATE: 09/11/84

EVENT: B9

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -30 | 640 | 40 | 100 | 45 | 1.26 |
| -25 | 600 | 25 | 300 | 45 | 3.77 |
| -20 | 570 | 20 | 700 | 45 | 8.64 |
| -15 | 520 | 30 | 700 | 43 | 9.25 |
| -10 | --- | -- | --- | -- | -- |
| -5 | 440 | 30 | 500 | 45 | 6.30 |
| CLC 0 | 400 | 30 | 500 | 47 | 6.03 |
| 5 | 390 | 30 | 500 | 45 | 6.30 |
| 10 | 350 | 35 | 500 | 45 | 6.30 |
| 15 | 330 | 30 | 500 | 47 | 6.03 |
| 20 | 300 | 25 | 550 | 45 | 6.93 |

EVENT: B11

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -38 | 700 | 48 | 100 | 47 | 1.20 |
| -33 | 680 | 30 | 100 | 45 | 1.26 |
| -28 | 660 | 25 | 500 | 44 | 6.44 |
| -23 | 600 | 30 | 600 | 43 | 7.92 |
| -18 | 560 | 35 | 600 | 43 | 7.92 |
| -13 | 520 | 40 | 500 | 47 | 6.03 |
| -8 | 500 | 40 | 500 | 48 | 5.90 |
| -3 | 460 | 34 | 500 | 47 | 6.03 |
| CLC 0 | 430 | 33 | 500 | 47 | 6.03 |
| 2 | 420 | 30 | 500 | 47 | 6.03 |
| 7 | 370 | 32 | 500 | 47 | 6.03 |
| 12 | 350 | 30 | 500 | 45 | 6.30 |
| 17 | 320 | 22 | 500 | 42 | 6.75 |
| 22 | 270 | 28 | 600 | 42 | 8.11 |

EVENT: B10

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -31 | 660 | 30 | 400 | 45 | 5.04 |
| -26 | 620 | 30 | 500 | 45 | 6.30 |
| -21 | 580 | 30 | 500 | 45 | 6.30 |
| -16 | 540 | 20 | 500 | 45 | 6.30 |
| -11 | 520 | 22 | 600 | 48 | 7.09 |
| -6 | 460 | 30 | 550 | 45 | 6.93 |
| CLC 0 | 440 | 30 | 400 | 48 | 4.72 |
| 5 | 400 | 22 | 500 | 48 | 5.90 |
| 9 | 360 | 28 | 600 | 47 | 7.24 |
| 14 | 320 | 25 | 600 | 46 | 7.40 |
| 19 | 300 | 22 | 600 | 47 | 7.24 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: BELL 222A

DATE: 09/11/84

EVENT: D12

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -31 | 640 | 28 | 450 | 88 | 2.89 |
| -26 | 610 | 22 | 500 | 63 | 3.41 |
| -21 | 580 | 42 | 300 | 80 | 2.12 |
| -16 | 560 | 25 | 500 | 78 | 3.63 |
| -11 | 540 | 22 | 600 | 75 | 4.53 |
| -6 | 480 | 19 | 800 | 72 | 6.30 |
| CLC 0 | 400 | 15 | 800 | 65 | 6.98 |
| 4 | 360 | 12 | 800 | 60 | 7.57 |
| 9 | 320 | 18 | 800 | 50 | 9.09 |
| 14 | 260 | 25 | 700 | 50 | 7.95 |
| 19 | 240 | 40 | 400 | 50 | 4.53 |

EVENT: D13

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 870 | 32 | 500 | 95 | 2.98 |
| -15 | 840 | 28 | 600 | 94 | 3.61 |
| -10 | 760 | 12 | 800 | 87 | 5.21 |
| -5 | 720 | 8 | 900 | 78 | 6.54 |
| CLC 0 | 680 | 4 | 900 | 74 | 6.90 |
| 5 | 580 | 3 | 1000 | 70 | 8.11 |
| 10 | 480 | 5 | 1200 | 67 | 10.19 |
| 15 | 380 | 5 | 1150 | 70 | 9.34 |
| 20 | 300 | 5 | 1000 | 48 | 11.87 |
| 25 | 250 | 10 | 900 | 39 | 13.17 |
| 30 | 200 | 42 | 700 | 40 | 9.95 |

EVENT: D14

| TIME (SEC.) | ALT. (AGL) | Q (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -20 | 870 | 20 | 800 | 83 | 0.62 |
| -15 | 800 | 12 | 950 | 78 | 3.41 |
| -10 | 720 | 12 | 1000 | 75 | 2.12 |
| -5 | 660 | 10 | 900 | 72 | 3.63 |
| CLC 0 | 610 | 12 | 900 | 64 | 4.53 |
| 5 | 560 | 10 | 900 | 60 | 6.30 |
| 10 | 470 | 12 | 1000 | 54 | 6.98 |
| 15 | 370 | 12 | 1050 | 51 | 7.57 |
| 20 | 300 | 18 | 950 | 50 | 9.09 |
| 25 | 250 | 20 | 900 | 48 | 7.95 |
| 30 | 200 | 65 | 700 | 52 | 4.53 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: BELL 222A

DATE: 09/11/84

EVENT: D15

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTB) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -26 | 800 | 26 | 400 | 90 | 2.98 |
| -21 | 760 | 20 | 650 | 87 | 3.61 |
| -16 | 720 | 17 | 800 | 83 | 5.21 |
| -11 | 670 | 12 | 900 | 78 | 6.54 |
| -6 | 610 | 8 | 900 | 72 | 6.90 |
| -1 | 530 | 8 | 900 | 69 | 8.11 |
| CLC 0 | --- | - | --- | -- | 10.19 |
| 4 | 440 | 8 | 1000 | 67 | 9.34 |
| 9 | 340 | 15 | 1000 | 66 | 11.87 |
| 14 | 300 | 23 | 900 | 65 | 13.17 |
| 19 | 240 | 18 | 800 | 58 | 9.95 |
| 24 | 200 | 24 | 700 | 55 | 7.22 |

EVENT: D16

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTB) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -29 | 1020 | 20 | 500 | 83 | 3.41 |
| -24 | 970 | 18 | 600 | 80 | 4.25 |
| -19 | 920 | 12 | 850 | 75 | 6.43 |
| -14 | 840 | 11 | 900 | 70 | 7.29 |
| -9 | 760 | 10 | 1000 | 68 | 8.35 |
| -4 | 670 | 7 | 1300 | 68 | 10.88 |
| CLC 0 | 570 | 2 | 1500 | 65 | 13.17 |
| 6 | 430 | 8 | 1400 | 68 | 11.73 |
| 11 | 320 | 8 | 1400 | 62 | 12.88 |
| 16 | 240 | 20 | 1000 | 60 | 9.47 |
| 21 | 200 | 58 | 600 | 75 | 4.53 |

EVENT: D17

| TIME (SEC.) | ALT. (AGL) | Ø (%) | R/D (FPM) | IAS (KTB) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -28 | 750 | 47 | 200 | 77 | 1.47 |
| -23 | 750 | 52 | 100 | 77 | 0.73 |
| -18 | 750 | 41 | 100 | 78 | 0.73 |
| -13 | 720 | 17 | 700 | 74 | 5.36 |
| -8 | 680 | 15 | 900 | 71 | 7.19 |
| -3 | 620 | 10 | 900 | 65 | 7.86 |
| CLC 0 | 570 | 10 | 1000 | 54 | 10.54 |
| 2 | 530 | 10 | 1200 | 53 | 12.92 |
| 7 | 420 | 9 | 1100 | 50 | 12.55 |
| 12 | 330 | 19 | 900 | 60 | 8.52 |
| 17 | 300 | 10 | 800 | 60 | 7.57 |
| 22 | 260 | 30 | 800 | 57 | 7.97 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(VAR. R/D AND A/S)

HELICOPTER: BELL 222A

DATE: 09/11/84

EVENT: D18

| TIME (SEC.) | ALT. (ASL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -19 | 900 | 18 | 800 | 90 | 5.04 |
| -14 | 840 | 18 | 800 | 84 | 5.40 |
| -9 | 800 | 12 | 800 | 80 | 5.67 |
| -4 | 750 | 18 | 800 | 75 | 6.05 |
| CLC 0 | 690 | 15 | 800 | 70 | 6.48 |
| 6 | 660 | 12 | 600 | 60 | 5.67 |
| 11 | 610 | 12 | 800 | 60 | 7.57 |
| 16 | 540 | 10 | 800 | 58 | 7.83 |
| 21 | 490 | 10 | 800 | 50 | 9.09 |
| 26 | 450 | 60 | 300 | 60 | 2.83 |

EVENT: D20

| TIME (SEC.) | ALT. (ASL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -7 | 650 | 10 | 1000 | 78 | 7.27 |
| -4 | 580 | 5 | 1000 | 75 | 7.57 |
| CLC 0 | 540 | 3 | 900 | 70 | 7.29 |
| 4 | 450 | 5 | 1000 | 60 | 9.47 |
| 9 | 360 | 15 | 900 | 50 | 10.24 |
| 12 | 320 | 22 | 900 | 48 | 10.67 |
| 19 | 280 | 22 | 750 | 48 | 8.88 |
| 24 | 250 | 40 | 700 | 48 | 8.28 |

EVENT: D19

| TIME (SEC.) | ALT. (ASL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -28 | 900 | 22 | 700 | 90 | 4.40 |
| -23 | 850 | 15 | 800 | 80 | 5.67 |
| -18 | 790 | 10 | 800 | 75 | 6.05 |
| -13 | 740 | 10 | 700 | 68 | 5.83 |
| -8 | 700 | 10 | 700 | 63 | 6.30 |
| -3 | 650 | 8 | 800 | 58 | 7.83 |
| CLC 0 | 610 | 8 | 900 | 58 | 9.30 |
| 2 | 580 | 8 | 900 | 50 | 10.24 |
| 7 | 480 | 12 | 1000 | 48 | 12.68 |
| 12 | 400 | 23 | 900 | 43 | 11.93 |
| 17 | 340 | 32 | 800 | 48 | 10.11 |
| 22 | 320 | 38 | 700 | 50 | 7.98 |

COCKPIT VIDEO DATA
NOISE ABATEMENT APPROACH
(10 DEG., 65 KTS.)

HELICOPTER: BELL 222A

DATE: 09/11/84

EVENT: C21

| TIME (SEC.) | ALT. (ASL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -15 | 890 | 15 | 900 | 50 | 10.24 |
| -10 | 810 | 12 | 900 | 60 | 8.52 |
| -5 | 740 | 12 | 1000 | 60 | 9.47 |
| CLC 0 | 680 | 12 | 1000 | 60 | 9.47 |
| 5 | 590 | 12 | 1000 | 50 | 11.39 |
| 10 | 480 | 12 | 1100 | 50 | 12.85 |
| 15 | 380 | 12 | 1100 | 60 | 10.43 |
| 20 | 300 | 13 | 1100 | 60 | 10.43 |
| 25 | 220 | 15 | 900 | 60 | 8.52 |

EVENT: C22

| TIME (SEC.) | ALT. (ASL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -23 | 1000 | 32 | 0 | 65 | 0.00 |
| -18 | 990 | 16 | 600 | 57 | 5.97 |
| -13 | 920 | 10 | 900 | 58 | 8.81 |
| -8 | 840 | 10 | 1100 | 60 | 10.43 |
| -3 | 720 | 8 | 1200 | 60 | 11.39 |
| CLC 0 | 680 | 8 | 1200 | 60 | 11.39 |
| 2 | 650 | 10 | 1200 | 60 | 11.39 |
| 7 | 580 | 10 | 1200 | 58 | 11.79 |
| 12 | 460 | 21 | 1000 | 58 | 9.80 |
| 17 | 380 | 25 | 900 | 60 | 8.52 |
| 22 | 320 | 20 | 900 | 57 | 8.97 |
| 27 | 280 | 19 | 900 | 52 | 9.84 |
| 32 | 250 | 70 | 600 | 65 | 3.23 |

EVENT: C23

| TIME (SEC.) | ALT. (ASL) | Ø (%) | R/D (FPM) | IAS (KTS) | R/D (DEG) |
|----------------|---------------|----------|--------------|--------------|--------------|
| -21 | 1000 | 20 | 700 | 60 | 6.62 |
| -16 | 920 | 18 | 900 | 60 | 8.52 |
| -11 | 840 | 15 | 1100 | 58 | 10.79 |
| -6 | 760 | 12 | 1100 | 58 | 10.79 |
| -1 | 680 | 15 | 1100 | 60 | 10.43 |
| CLC 0 | 640 | 16 | 1100 | 55 | 11.39 |
| 4 | 580 | 20 | 1100 | 60 | 10.43 |
| 9 | 530 | 22 | 900 | 65 | 7.86 |
| 14 | 460 | 20 | 900 | 55 | 9.30 |
| 19 | 360 | 15 | 900 | 60 | 8.52 |
| 24 | 320 | 11 | 900 | 60 | 8.52 |
| 29 | 250 | 15 | 900 | 50 | 10.24 |