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VOLUME 38

USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

VOLUME 38
C-130E IN-FLIGHT CREW NOISE

SEPTEMBER 1975

AEROSPACE MEDICAL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
Air Force Systems Command
Wright-Patterson Air Force Base, Ohio 45433

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FOR THE COMMANDER

HENNING E. VON GIER
Director
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The C-130E is a USAF tactical long-range combat transport aircraft. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for 9 locations in a wide variety of physical and psycho-acoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and with-

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out standard Air Force ear protectors. Refer to volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application," AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under Project/Task 72310418, Measurement of Noise and Vibration Environments of Air Force Operations. Col Justus F. Rose, Jr., conducted the field measurements and performed the data analysis; Capt Nick Farinacci prepared this report.

The authors acknowledge the efforts of Mr. John N. Cole who established the data analysis requirements and assisted in the preparation of this report, and Mr. Henry Mohlman and Mr. David Eilerman of the University of Dayton, who assisted in the mechanics of data processing.

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INTRODUCTION

The C-130E is a USAF tactical long-range combat transport aircraft manufactured by the Lockheed Aircraft Corporation, Lockheed-Georgia Company. Power is provided by four T56-A-7A turboprop engines rated at 4,050 eshp at 13,820 rpm maximum take-off power. Each engine drives a Hamilton Standard four-blade constant-speed. 4.1 m diameter propeller through a 0.074 gear reduction. The engines are manufactured by the General Motors Corporation, Allison Division

This volume provides measured data defining the bioacoustic environments produced inside the aircraft. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with operations of the C-130E aircraft.

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

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. *Refer to Volume 1* (reference 1) for such information because it is not repeated in other handbook volumes.

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

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1. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content and Application*, AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

IN-FLIGHT NOISE

MEASUREMENTS

All noise measurements were made on-board a standard-configured C-130E aircraft during typical speed, altitude, and flight maneuver conditions. These levels describe the standard C-130E environments, but may not be representative of those levels encountered if the aircraft has been configured differently (e.g., major equipment or structural changes).

Acoustic measurements were made at various flight crew and passenger locations. Table 1 lists the measurement locations and test conditions as numeric/alphabetic designators which are used on the data pages. The designator 1/A means measurement location 1 and test condition A.

The microphone position was at ear level external to headgear in a region 0.2-0.3 meter from the head when an individual was present. At unoccupied locations, measurements were made at ear level throughout a volume where the head would normally be located. In both cases, the microphone was randomly moved throughout a spherical volume approximately 0.3 meter in diameter and the resultant samples analyzed using a 4- or 8- second integration time to obtain a power-averaged level, which effectively smooths out short-duration fluctuations and best describes the exposure.

Although the presence of a crew member or passenger at a measurement location affects the resultant sound field, the magnitude of such effects is generally small and not significant in determining exposure limits or voice communication capabilities. Consequently, no distinction is made in this report between occupied and unoccupied measurement locations.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced inside the C-130E aircraft at the nine specified locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data, C-weighted and A-weighted sound levels, maximum permissible time for one exposure per day (AFR 161-35) with and without standard Air Force ear protectors, preferred speech interference level, and perceived noise level are calculated and presented in Table 3. These measures are widely used to assess the effects of noise on personnel and their performance.

TABLE 1

MEASUREMENT LOCATIONS AND TEST CONDITIONS

C-130E, Pope AFB, 21 Feb 1971
Serial # 64-0495

LOCATION	*POSITION*	*HEIGHT ABOVE DECK*
1	Crew compartment	Seated Head Level
2	FS 280, WL 200, BL 0	1.5 Meters
3	FS 280, WL 200, BL 61L	1.5 Meters
4	FS 380, WL 200, BL 0	1.5 Meters
5	FS 380, WL 200, BL 61L	1.5 Meters
6	FS 550, WL 200, BL 0	1.5 Meters
7	FS 550, WL 200, BL 61L	1.5 Meters
8	FS 700, WL 200, BL 0	1.5 Meters
9	FS 700, WL 200, BL 61L	1.5 Meters

CONDITION	*DESCRIPTION*
A	Four engines — taxi power
B	Initial climb — gear and flaps retracted. Torque — variable Engine RPM — 100% Turbine Inlet Temperature (TIT) — 900°C Indicated Airspeed (KIAS) — 180 knots
C	High Cruise Torque — 13500 in.-lbs. Engine RPM — 100% Turbine Inlet Temperature (TIT) — 920°C True Airspeed (TAS) — 300 knots Altitude — 10.5M PA
D	Maximum Endurance Cruise Torque — 12600 in.-lbs. Engine RPM — 100% Turbine Inlet Temperature (TIT) — 880°C True Airspeed (TAS) — 290 knots Altitude — 10.5M PA
E	Descent Torque — 4000 in.-lbs. Engine RPM — 100% Turbine Inlet Temperature (TIT) — 580°C Indicated Airspeed (KIAS) — 250 knots Altitude — variable

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB), 1/3 OCTAVE BAND

NOISE SOURCE/SUBJECT: C-130E AIRCRAFT, INFLIGHT NOISE LEVELS

OPERATION:

IDENTIFICATION: OMEGA 3.2, TEST 71-001-104, RUN 01, 02 JAN 75, PAGE F1

FREQ (HZ)	LOCATION/CONDITION 1/A	1/B	1/D	1/E	2/B	2/C	2/D	2/E	3/B	3/C	3/D	3/E	4/B	4/C
25	77	86	84	84	81	83	84	82	80	85	83	83	77	79
31.5	73	87	84	82	82	86	85	85	85	88	88	89	80	82
40	73	80	81	80	77	81	81	80	81	87	87	86	76	83
50	75	80	84	79	79	79	80	79	86	90	90	87	79	81
63	95	106	110	104	101	101	101	98	109	115	114	102	100	102
80	80	94	99	92	90	90	90	88	98	103	102	91	88	90
100	78	76	79	75	82	84	83	82	82	86	87	84	86	83
125	84	80	92	86	91	90	93	86	95	101	102	94	96	93
160	83	77	84	78	84	87	87	85	86	91	92	87	87	88
200	90	79	81	77	86	92	92	85	89	89	91	93	90	96
250	86	77	78	78	82	90	89	86	84	88	88	87	85	90
315	85	76	79	79	82	89	89	89	84	90	89	89	84	90
400	85	77	79	79	82	88	90	90	82	89	89	89	84	89
500	79	75	80	78	81	88	90	89	82	89	90	89	82	88
630	76	78	80	76	78	88	90	88	79	88	89	88	80	87
800	73	75	80	78	75	84	85	84	77	84	85	84	77	84
1000	71	74	79	77	73	82	83	81	75	83	83	82	76	82
1250	70	73	78	75	73	79	80	80	74	81	81	80	75	79
1600	69	72	77	73	74	79	80	78	75	81	80	79	76	80
2000	65	70	74	70	74	78	79	78	75	78	79	78	76	79
2500	62	68	72	68	74	77	79	77	75	76	77	76	76	77
3150	62	68	70	68	77	78	79	77	78	78	79	76	78	79
4000	59	66	68	66	77	76	78	76	78	77	77	75	77	79
5000	60	66	72	66	78	80	80	77	79	81	79	79	78	80
6300	59	63	66	64	75	77	78	73	76	75	76	74	75	76
8000	61	64	66	65	75	76	76	73	76	75	75	73	76	76
10000	58	60	64	61	72	73	74	70	73	73	74	71	73	73
OVERALL	98	106	111	104	102	103	104	101	109	115	115	105	102	104

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 71-001-104
RUN 02

02 JAN 75

NOISE SOURCE/SUBJECT:
C-130E AIRCRAFT
INFLIGHT NOISE LEVELS

OPERATION:

LOCATION/CONDITION

FREQ (HZ)	4/D	4/E	5/B	5/C	5/D	5/E	6/B	6/C	6/D	6/E	7/B	7/C	7/D	7/E
25	77	75	75	80	78	79	83	85	83	84	84	84	84	82
31.5	82	79	83	83	86	84	82	83	83	81	82	84	86	81
40	80	80	81	85	85	84	78	83	83	83	80	86	85	85
50	79	79	88	90	90	88	80	80	81	82	89	89	89	86
63	99	89	110	110	110	104	99	100	98	84	103	105	108	100
80	88	81	99	99	98	92	88	90	87	81	93	94	97	89
100	85	81	84	86	87	83	80	84	82	81	84	87	87	85
125	93	87	99	100	103	91	93	97	91	91	95	96	91	94
160	87	85	91	92	94	85	89	94	91	89	90	93	93	91
200	94	87	97	100	97	88	88	91	89	89	88	91	90	90
250	88	87	88	90	89	89	86	91	89	90	87	90	90	88
315	91	90	84	89	91	90	85	91	92	90	87	92	92	90
400	91	90	83	88	89	89	84	91	90	89	84	90	89	88
500	89	88	83	90	89	89	84	91	90	88	88	91	91	90
630	88	87	82	87	88	87	80	89	90	89	83	90	90	89
800	83	81	80	85	84	82	76	84	83	82	76	85	84	81
1000	82	81	79	83	82	80	74	83	82	81	74	83	83	80
1250	79	78	79	81	80	78	73	81	80	80	72	80	80	77
1600	79	76	80	83	82	77	74	79	79	78	74	80	80	77
2000	79	77	80	82	81	76	74	79	78	77	73	79	79	77
2500	77	76	79	80	79	75	73	78	77	77	73	77	77	76
3150	78	76	80	82	80	76	75	79	78	78	75	79	78	77
4000	77	75	79	80	79	74	75	78	77	76	75	78	77	75
5000	79	77	81	81	81	76	76	78	77	76	76	78	77	75
6300	75	73	77	78	76	73	73	75	74	72	73	75	74	72
8000	75	73	77	78	76	72	74	76	75	73	74	75	74	72
10000	74	72	75	75	74	70	71	73	72	70	72	72	72	70
OVERALL	103	98	111	111	111	105	102	104	102	99	105	107	109	103

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 71-001-104
RUN 03

02 JAN 75

PAGE F3

NOISE SOURCE/SUBJECT:
C-130E AIRCRAFT
INFLIGHT NOISE LEVELS

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 8/B	8/C	8/D	8/E	9/B	9/C	9/D	9/E
25	75	76	75	74	81	81	80	78
31.5	79	83	83	82	82	86	84	84
40	86	79	80	80	89	93	90	89
50	92	81	83	81	96	99	97	93
63	98	88	88	84	99	98	93	97
80	88	85	84	81	90	90	88	88
100	84	88	88	85	86	88	87	88
125	89	90	92	88	92	90	91	88
160	85	89	90	88	87	88	88	85
200	83	91	89	88	83	89	88	85
250	85	89	89	88	85	89	88	88
315	86	92	91	90	86	92	90	90
400	85	92	91	89	86	91	90	88
500	85	91	91	89	84	91	90	88
630	81	89	90	88	81	89	88	87
800	76	84	83	82	76	85	83	81
1000	74	83	82	80	75	84	82	80
1250	72	80	80	78	72	80	79	78
1600	74	79	79	78	73	80	78	77
2000	71	79	78	77	73	79	78	76
2500	70	76	76	76	72	76	75	75
3150	72	77	76	75	72	77	75	75
4000	71	75	74	73	72	75	73	72
5000	73	75	75	72	73	75	74	71
6300	70	72	70	69	69	71	70	68
8000	70	71	70	68	70	71	69	67
10000	67	69	67	66	67	69	67	64
OVERALL	101	101	101	99	103	104	102	101

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 71-001-104
RUN 01

02 JAN 75

PAGE J1

NOISE SOURCE/SUBJECT:
C-130E AIRCRAFT
INFLIGHT NOISE LEVELS

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 1/A	1/B	1/D	1/E	2/B	2/C	2/D	2/E	3/B	3/C	3/D	3/E	4/B	4/C
31.5	79	90	88	87	85	89	88	88	87	91	91	91	82	86
63	95	106	110	104	102	101	101	98	109	115	114	103	100	102
125	87	83	93	87	92	92	94	89	95	101	102	95	96	94
250	93	82	84	83	89	95	95	92	91	94	94	95	92	98
500	86	82	84	83	85	93	95	94	86	93	94	93	87	93
1000	76	79	84	81	79	87	88	87	80	87	88	87	81	87
2000	71	75	80	76	79	83	84	82	80	83	84	82	81	83
4000	65	71	75	72	82	84	84	81	83	84	83	82	82	84
8000	64	67	70	68	79	80	81	77	80	79	80	77	79	80
OVERALL	98	106	111	104	102	103	104	101	109	115	115	105	102	104

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

NOISE SOURCE/SUBJECT:
C-130E AIRCRAFT
INFLIGHT NOISE LEVELS

OPERATION:

IDENTIFICATION:
OMEGA 3.2
TEST 71-001-104
RUN 02

02 JAN 75

FREQ (HZ)	LOCATION/CONDITION 4/D	4/E	5/B	5/C	5/D	5/E	6/B	6/C	6/D	6/E	7/B	7/C	7/D	7/E
31.5	85	83	85	88	89	88	86	88	88	87	87	90	90	87
63	99	90	110	110	110	104	100	101	98	87	104	105	108	100
125	95	90	99	101	103	92	94	99	94	93	97	98	95	95
250	96	93	98	101	98	94	91	96	95	94	92	95	96	94
500	94	93	87	93	93	93	88	95	95	93	90	95	94	94
1000	87	85	84	88	87	85	79	87	86	85	79	88	87	84
2000	83	81	84	86	85	81	79	83	83	82	78	84	83	81
4000	83	81	85	86	85	80	80	83	82	81	80	83	82	81
8000	79	78	81	82	80	76	78	79	79	77	78	79	78	76
OVERALL	103	98	111	111	111	105	102	104	102	99	105	107	109	103

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB)
OCTAVE BAND

NOISE SOURCE/SUBJECT:
C-130E AIRCRAFT
INFLIGHT NOISE LEVELS

OPERATION:

IDENTIFICATION:
OMEGA 3.2
TEST 71-001-104
RUN 03

02 JAN 75

FREQ (HZ)	LOCATION/CONDITION 8/B	8/C	8/D	8/E	9/B	9/C	9/D	9/E
31.5	87	85	85	84	90	94	91	90
63	99	90	90	87	101	102	99	99
125	92	94	95	92	94	94	94	92
250	90	95	95	94	90	95	93	93
500	89	95	95	94	89	95	94	92
1000	79	87	87	85	79	88	86	84
2000	77	83	82	82	77	83	82	81
4000	77	81	80	78	77	80	79	78
8000	74	75	74	72	73	75	73	71
OVERALL	101	101	101	99	103	104	102	101

TABLE: MEASURES OF HUMAN NOISE EXPOSURE

3

IDENTIFICATION:

OMEGA 3.2
TEST 71-001-104
RUN 01

02 JAN 75

PAGE H1

NOISE SOURCE/SUBJECT:
C-130E AIRCRAFT
INFLIGHT NOISE LEVELS

OPERATION:

	LOCATION/CONDITION													
	1/A	1/B	1/D	1/E	2/B	2/C	2/D	2/E	3/B	3/C	3/D	3/E	4/B	4/C
HAZARD/PROTECTION														
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR														
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR														
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)														
NO PROTECTION														
OASLC	97	105	110	103	102	103	103	100	109	114	114	104	102	104
OASLA	87	85	90	86	89	94	95	94	91	96	96	94	90	94
T	285	404	170	339	202	85	71	85	143	60	60	85	170	85
MINIMUM QPL EAR MUFFS														
OASLA*	74	80	85	78	77	79	79	76	84	90	89	80	78	80
T	960	960	404	960	960	960	960	960	480	170	202	960	960	960
V-51R EAR PLUGS														
OASLA*	66	68	72	66	66	71	72	71	71	77	77	72	68	72
T	960	960	960	960	960	960	960	960	960	960	960	960	960	960
FLENTS EAR PLUGS														
OASLA*	67	69	74	68	68	72	73	71	73	79	78	72	69	73
T	960	960	960	960	960	960	960	960	960	960	960	960	960	960
H-157 IN-FLIGHT COMMUNICATION UNIT														
OASLA*	76	80	85	78	78	80	80	77	84	90	89	81	79	82
T	960	960	404	960	960	960	960	960	480	170	202	807	960	679
COMMUNICATION														
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)														
PSIL	78	79	83	80	81	87	89	88	82	88	88	87	83	88
ANNOYANCE														
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)														
TONE CORRECTION (C IN DB)														
PNLT	101	105	110	105	107	109	110	107	111	116	116	110	107	110
C	1	1	2	1	1	1	1	1	2	2	2	2	2	1

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST 71-001-104
RUN 02
02 JAN 75
PAGE H2

NOISE SOURCE/SUBJECT:
C-130E AIRCRAFT
INFLIGHT NOISE LEVELS

OPERATION:

	LOCATION/CONDITION													
	4/D	4/E	5/B	5/C	5/D	5/E	6/B	6/C	6/D	6/E	7/B	7/C	7/D	7/E
HAZARD/PROTECTION														
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR														
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR														
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)														
NO PROTECTION														
OASLC	102	98	110	111	110	105	101	104	102	99	104	106	108	103
OASLA	94	93	94	96	96	93	89	95	95	94	91	95	95	94
T	85	101	85	60	60	101	202	71	71	85	143	71	71	85
MINIMUM QPL EAR MUFFS														
OASLA*	79	75	86	87	87	80	77	81	78	76	80	82	84	79
T	960	960	339	285	285	960	960	807	960	960	960	679	480	960
V-51R EAR PLUGS														
OASLA*	72	70	73	75	75	72	67	73	72	71	70	73	74	71
T	960	960	960	960	960	960	960	960	960	960	960	960	960	960
FLENTS EAR PLUGS														
OASLA*	73	71	75	77	76	72	68	73	73	71	71	74	75	72
T	960	960	960	960	960	960	960	960	960	960	960	960	960	960
H-157 IN-FLIGHT COMMUNICATION UNIT														
OASLA*	80	77	86	87	87	81	78	82	80	78	81	83	84	80
T	960	960	339	285	285	807	960	679	960	960	807	571	480	960
COMMUNICATION														
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)														
PSIL	88	86	85	89	89	86	82	89	88	87	82	89	88	86
ANNOYANCE														
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)														
TONE CORRECTION (C IN DB)														
PNLT	109	107	113	115	115	109	106	110	109	108	108	111	111	108
C	1	1	2	2	2	1	1	1	1	1	1	1	0	1

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST 71-001-104
RUN 03
02 JAN 75
PAGE H3

NOISE SOURCE/SUBJECT:
C-130E AIRCRAFT
INFLIGHT NOISE LEVELS

OPERATION:

	LOCATION/CONDITION							
	8/B	8/C	8/D	8/E	9/B	9/C	9/D	9/E
HAZARD/PROTECTION								
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR								
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR								
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)								
NO PROTECTION								
OASLC	100	100	100	98	102	103	102	101
OASLA	89	95	95	93	89	95	94	92
T	202	71	71	101	202	71	85	120
MINIMUM QPL EAR MUFFS								
OASLA*	76	77	77	75	77	79	77	77
T	960	960	960	960	960	960	960	960
V-51R EAR PLUGS								
OASLA*	67	73	72	71	68	73	71	70
T	960	960	960	960	960	960	960	960
FLENTS EAR PLUGS								
OASLA*	68	73	73	71	69	73	72	71
T	960	960	960	960	960	960	960	960
H-157 IN-FLIGHT COMMUNICATION UNIT								
OASLA*	76	79	79	77	78	80	78	78
T	960	960	960	960	960	960	960	960
COMMUNICATION								
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)								
PSIL	82	89	88	87	82	89	87	86
ANNOYANCE								
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)								
TONE CORRECTION (C IN DB)								
PNLT	104	108	107	106	105	108	107	106
C	1	0	0	0	1	0	1	0

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.