NOISE CONTROL AND LAND USE COMPATIBILITY STUDY

PHASE THREE REPORT

VOLUME III

Los Angeles Internationational Airport

Participants:

Los Angeles County AIRPORT LAND USE COMMISSION

City of Los Angeles DEPARTMENT OF AIRPORTS

County of Los Angeles
City of El Segundo
City of Hawthorne

City of Inglewood
City of Los Angeles
Federal Aviation Administration

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LOS ANGELES INTERNATIONAL AIRPORT

NOISE CONTROL/LAND USE COMPATIBILITY STUDY

PHASE THREE REPORT

VOLUME III

SINGLE EVENT AND GROUND NOISE ANALYSIS

MARCH 1984

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VOLUME III

SINGLE EVENT AND GROUND NOISE ANALYSIS

SECTION I

INTRODUCTION

The contents of this Volume III a part of the LAX-ANCLUC Phase Three Report is an assemblage of eight separate technical reports prepared by the LAX-ANCLUC Joint Technical Committee (JTC). These reports provide an analysis of specific issues identified by the JTC and concerned individuals during the public issue identification workshops held in December 1981 and January 1982.

The technical reports contained in this volume address issues related to both single event and ground noise impacts. The technical reports include the following:

- an assessment of the airport noise regulation with the associated variance process,
- an analysis of the proposed access regulation with a presentation of alternative techniques,
- an assessment of premature turns and drifts over-flying adjacent communities,
- a discussion of current and proposed helicopter activity with potential control strategies,
- analysis of Imperial Terminal operations,
- a description of auxiliary power unit utilization including a discussion of technological innovations,
- an assessment of nighttime engine runup practices,
- a discussion of the airport northside development project.

The technical reports include conclusions and recommendations identifying potential actions which could reduce or eliminate these sources of noise impact. The recommendations have been incorporated into the Noise Control/Mitigation Program (NC/MP).

These reports were prepared using a general format and outline to facilitate compilation of this volume and expedite the publication process. These reports have been included in the form approved by the Joint Technical Committee. Individual table of contents and bibliographies have been retained to maintain the continuity of each report, allowing the reader to focus on the specific issue of interest.

SECTION II

DEPARTMENT OF AIRPORTS NOISE REGULATION

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I. INTRODUCTION

A. Purpose

The purpose of this report is to examine the Department of Airports LAX Noise Regulation and variance procedures contained therein. The intent of this Regulation is to reduce aircraft noise in communities surrounding the airport by:

1. Limiting the noise of new types and classes of aircraft. Before the Board approves the operation of an aircraft not in operation at LAX before June 1978, the prospective operator must show that their aircraft will not exceed Federal noise limitations.

2. Establishing a three-part program to comply with Part 36.

   a) Since January 1, 1981 at least 25 percent of 4-engine, low bypass ratio aircraft must have met Federal noise regulations, and at least 50 percent of remaining aircraft types must have complied with Part 36.

   b) Since January 1, 1983 at least 50 percent of 4-engine, low bypass ratio aircraft, and 100 percent of all others, must have complied with Part 36.

   c) By January 1, 1985 all aircraft must comply with Part 36.

3. To demonstrate compliance, all operators must submit quarterly aircraft noise reports to the Department. All operators are currently submitting these reports, examples of which are shown in Attachments 1-A and 1-B.

FAR Part 36 was the first comprehensive Federal regulation prohibiting further increases in aircraft noise. At the same time it required new aircraft types to be quieter than those developed in 1956-1964. The regulation dealt separately with approach and take off noise test conditions, and the specific noise limitations for all newer and older aircraft types. These aircraft were divided into stages based upon their noise emission. Stage 1 aircraft are the earliest turbojets which must be retired or retrofitted by January 1, 1985. Stage 2 aircraft are those certified or retrofitted between January 1, 1967 and November 5, 1975. All aircraft operating in the United States except for those exempted until 1988 must be Stage 2 by January 1, 1985.

Applications to certify aircraft produced after November 5, 1975 must meet Stage 3 noise limits. Aircraft in this category include the DC-9-80, B757, B767, and the retrofitted DC-8-73. The average difference between Stage 2 and Stage 3 noise levels is 3-8 dBA. For example the noise emissions between a Stage 3, DC-9-80 and Stage 2, B727-200 serving the Los Angeles-San Francisco market would have an average difference between 5 and 10 dB on takeoff. The noise levels for these three stages are described in Appendix C of FAR Part 36 and provided here as Attachment 2.

The Board may grant a variance from the Regulation if a satisfactory alternative program is provided. Variances for foreign carriers and domestically owned aircraft for which the operator has a Federally approved noise reduction plan are granted upon request. However, no variances will be granted after 1984. Operators failing to comply with the Regulation are subject to loss of their LAX Operating Agreements. Attachment No. 3 provides a list of Airlines with Variances as of February 1983. Subsection 91.308 entitled Compliance Plans and Status describes the compliance plan requirements, an example of an approved compliance plan and the FAA letter of approval are provided as Attachments 4-A, 4-B, and 4-C.

II. ISSUES

A. Current Procedures

1. Department of Airports Noise Regulation. (see Attachment No. 3 Ordinance No. 152,455)

2. Federal Aviation Regulation (FAR), Part 36. Part 36 (FAA Noise Standards: Aircraft Type and Airworthiness Certification, November, 1969) is the first comprehensive Federal regulation prohibiting further increases in aircraft noise. The regulation contains criteria for aircraft noise certification and reflects noise levels which are judged to be technically and economically feasible. Approach, sideline and takeoff noise limits are all dealt with separately, as noise limitations for newer and older aircraft types.

In December of 1976, an amendment to FAR Part 91 required all affected aircraft to comply with regulation noise levels, according to a specified time schedule. In October 1977, another amendment made provisions for three stages of aircraft noise limitations. All domestic aircraft of 75,000 pounds or more are classified under each stage. FAR Part 91 sets forth the ending dates that Stage I (non-certificated) aircraft may operate in the U.S. All aircraft must be certified as Stage II or III by January 1, 1985, except 2-engine jet aircraft with 100 seats or less, which may operate as Stage I until January 1, 1988, under the provision for small community service by the Airport Safety and Noise Abatement Act of December 1979. However, the LAX Noise Regulation does not recognize this exception.

B. Level of Part 36 Compliance

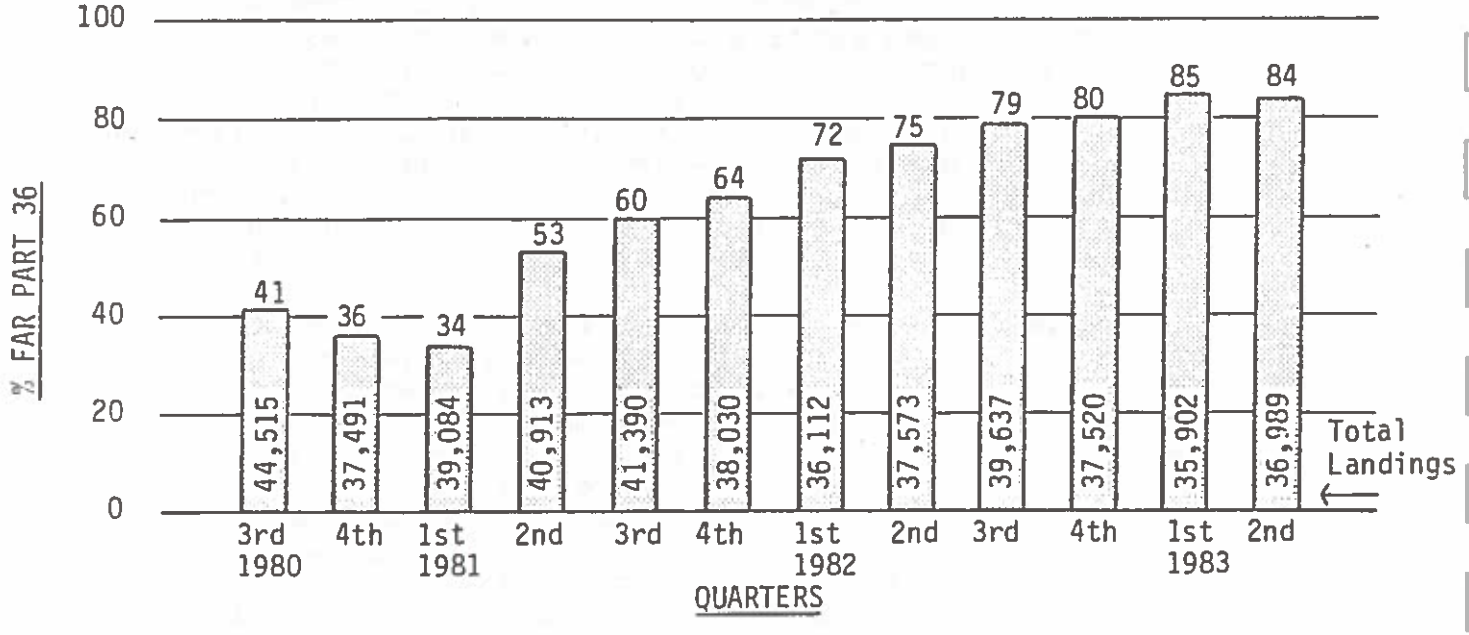
As can be seen from the graph on the following page, the level of compliance with FAR Part 36 at LAX has increased from 41 percent in 1980 (3rd Quarter) to 84 percent in 1983 (2nd Quarter).

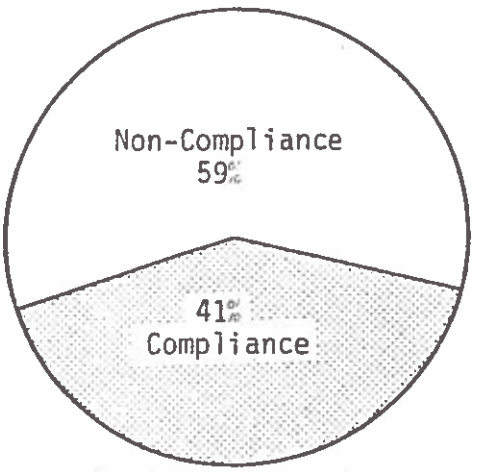
C. LAX State Noise Compliance Trends

The California Noise Regulation (Administrative Code, Noise Standards, Title 4, Chapter 9, Subchapter 6, June 1979) is meant to cause representatives of the airline industry and affected government agencies to cooperate in reducing aircraft noise in communities near airports.

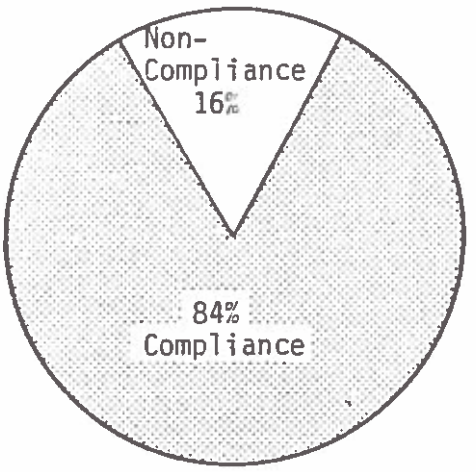
The State regulation establishes mandatory standards and procedures applicable to all existing and future California airports. The standards are calculated in terms of a noise metric called the Community Noise Equivalent

COMPARISON of FAR PART 36 and
TOTAL AIR CARRIER LANDINGS at LAX
(Aircraft weighing 75,000 lbs. or more)





JULY 1980 LANDINGS



JUNE 1983 LANDINGS

Level (CNEL). The standard specifies that no incompatible land use shall exist within the 65 CNEL contour after December 31, 1985, unless an air avigation easement or a variance has been granted to the Airport proprietor.

The Department of Airports was a driving force in the ten year effort to have the Federal Government develop and implement an aircraft noise reduction (FAR Part 36). The LAX Noise Regulation was adopted to parallel and strengthen the intent of FAR Part 36. The Board of Airport Commissioners took this action in response to the possibility that the Federal regulation compliance schedule might be relaxed due to pressure from the ecnomically depressed airline industry and also to emphasize their genuine concern regarding aircraft noise. The LAX Noise Regulation is more stringent than FAR Part 91 in that the exemption allowed for aircraft involved in small community service until 1988 was not provided. Therefore, all air carrier aircraft in service at LAX must be in compliance by January 1, 1985. The airline industry opposed the adoption of the Noise Regulation without the above referenced exemption, since that exemption was created by congressional mandate to ensure continued service to small communities. The airlines are of the opinion that the LAX-Noise Regulation without the exemption is a preemption of a congressional mandate and therefore not legal. A legal challenge from the airlines, the FAA, or both could occur prior to January 1, 1985. There is a strong possibility that the regulation could result in litigation brought by FAA or ATA concerning the legality of the regulation. Should such litigation be instituted it is reasonable to expect a more detailed allocation of noise liability among the Federal government, the airlines, and airport proprietors.

In direct response to the LAX Noise Regulation the airlines initially adjusted their equipment schedules to increase the compliance levels among the portion of their fleet's serving LAX. Currently the fleet compliance leveles (84%) for the major air carriers exceeds the level required by FAR Part 91. This is due primarily to equipment replacement (aircraft retirement) an extensive retrofit program, and a shift to larger aircraft due to a more efficient and quieter generation of aircraft engines. This shift makes it possible for more passengers to fly on fewer aircraft. The fact that the LAX Noise Regulation will require 100 percent compliance by January 1, 1985 and the uncertainty regarding whether the industry or FAA will mount a serious legal challenge is a contributing factor to the high level of compliance at LAX. The level of compliance with the LAX Noise Regulation and FAR Part 91 has a direct

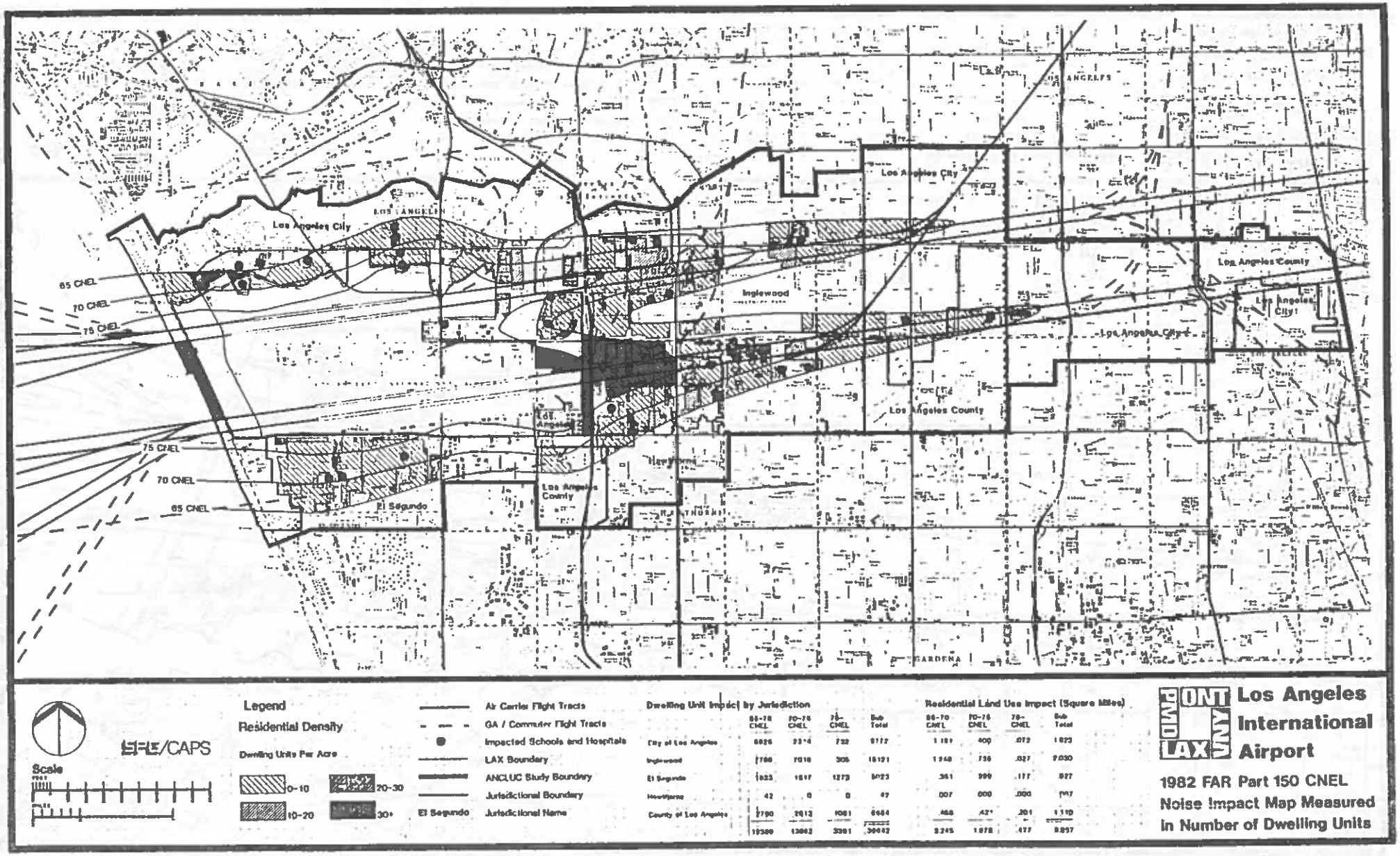
correlation to the decrease in the noise impact as illustrated by the CNEL contours and additional information provided in later sections of this report.

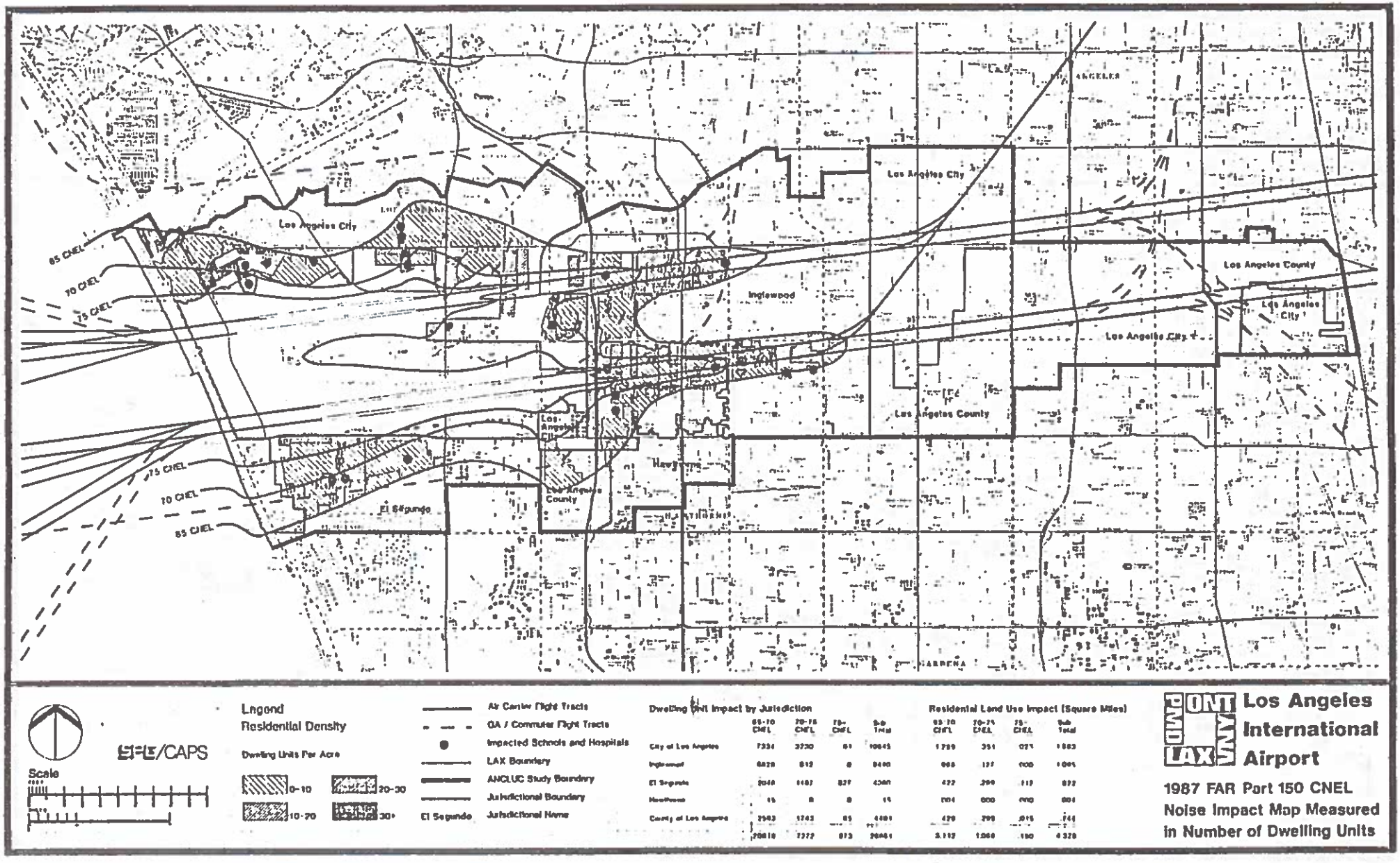
The projected impact of noise reduction efforts between 1982 and 1987 in terms of dwelling units is 7,781 or an improvement of 21.2 percent, as shown on the LAX Noise Impact Maps on the next pages. In terms of square miles of residential land use within the 65 CNEL contour, the reduction is 1.3 square miles or 23.5 percent.

Between 1972 and 1982, the total number of square miles within the 65 CNEL contour has decreased from 19.8 to 16.3, a 17.7 percent reduction. The area is forecasted to shrink to 13.6 square miles by 1987, a 31.3 percent reduction from 1972. The reduction of dwelling units from 1972 to 1982 has been 29,800 or 44.9 percent. By 1987, it is estimated that 28,800 dwelling units will be contained within the 65 CNEL contour. This is a 56.6 percent reduction from 1972.

Further, if noise reduction efforts are examined in terms of the number of annual passengers using the Airport verses the number of people impacted by noise or contained within the 65 CNEL contour, the noise reduction progress is even more dramatic. In 1972, the Airport served 22 Million Annual Passengers (MAP) and impacted over 165,000 people. In 1982, this relationship improved, the Airport served 33 MAP and impacted 92,000 people. In 1987, when the operating level of the Airport is projected to be 40 MAP, the number of impacted people is estimated to be 70,000, a 58% reduction from 1972 (See Figure No. 1).

The LAX 65 CNEL contour will not likely be a zero impact contour by January 1986. However, the current LAX ANCLUC study will be instrumental in providing followup strategies to further reduce the contour, and to reduce the incompatible land uses contained within it.


65 CNEL
70 CNEL
75 CNEL
75 CNEL
70 CNEL
65 CNEL
Los Angeles City
Los Angeles City
Inglewood
Los Angeles County
Los Angeles City
Los Angeles City
Los Angeles County
Los Angeles County
El Segundo
Hawthorne
Los Angeles County
GARDENA
Legend
Residential Density
Dwelling Units Per Acre
0-10
10-20
20-30
30+
Air Carrier Flight Tracts
GA / Commuter Flight Tracts
Impacted Schools and Hospitals
LAX Boundary
ANCLUC Study Boundary
Jurisdictional Boundary
El Segundo
Jurisdictional Name
Scale
ERE/CAPS
Dwelling Unit Impact by Jurisdiction
Residential Land Use Impact (Square Miles)
Los Angeles International Airport
1982 FAR Part 150 CNEL Noise Impact Map Measured in Number of Dwelling Units


65 CNEL
70 CNEL
75 CNEL
Los Angeles City
Inglewood
Los Angeles County
El Segundo
Hawthorne
Legend
Residential Density
Dwelling Units Per Acre
0-10
10-20
20-30
30+
Air Carrier Flight Tracts
GA / Commuter Flight Tracts
Impacted Schools and Hospitals
LAX Boundary
ANCLUC Study Boundary
Jurisdictional Boundary
Jurisdictional Name
Scale
Dwelling Unit Impact by Jurisdiction
Residential Land Use Impact (Square Miles)
Los Angeles International Airport
1987 FAR Part 150 CNEL
Noise Impact Map Measured
in Number of Dwelling Units

Level of Airport Passengers by Number of Persons within 65 CNEL, 1972-1987.

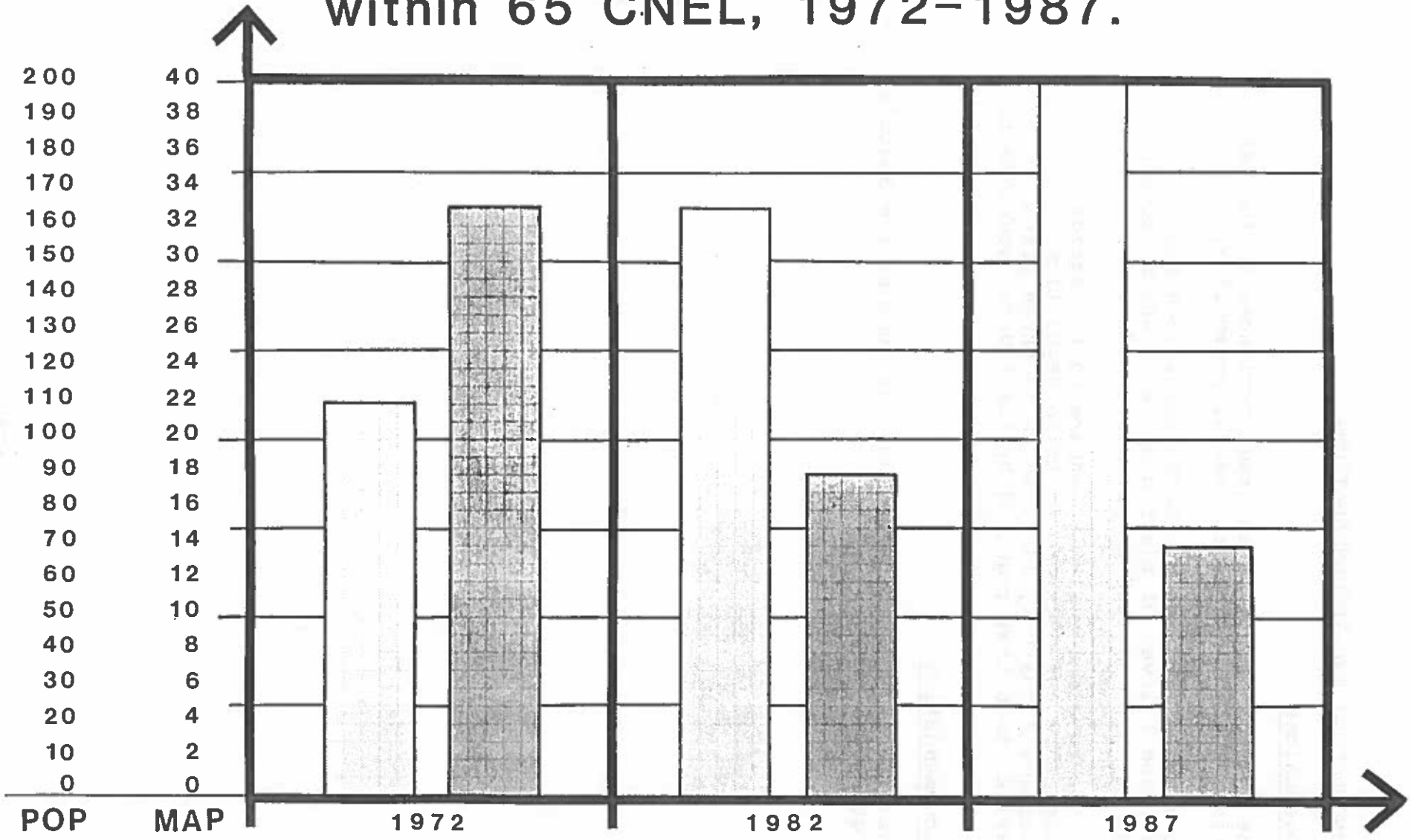


Figure No.1

SOURCE: ENVIRONMENTAL MANAGEMENT BUREAU, L.A. DEPARTMENT OF AIRPORTS

III. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. The Board is required to grant variances to the LAX Noise Regulation, due to Federal preemption.

2. Compliance with the LAX Noise Regulation has achieved a level of fleet compliance which exceeds the Part 36 mandated compliance schedule.

3. The Board has resolved to adhere to the strict compliance schedule of the Noise Regulation deadline January 1, 1985, which is three years earlier than that required by the Federal government.

B. Recommendation

That the ANCLUC Steering Committee support the Board's Regulation.

IV. ATTACHMENTS

Attachment No. 1-A

QUARTERLY REPORT OF OPERATING AIRCRAFT AT LOS ANGELES INTERNATIONAL AIRPORT

(Due within 20 days after each Quarter)

Los Angeles Department of Airports
Noise Abatement Division
#1 World Way
Los Angeles, CA 90009
(213) 646-9410

This quarterly report shall be submitted by each aircraft operator of affected aircraft (75,000 lbs. or greater) that operated at the airport in order to demonstrate compliance with Parts 2 and 3 of Airport Commissioners' Resolution #11650 and Los Angeles City Ordinance #152455. This report shall be submitted within 20 days after each calendar quarter on this form.

TYPE/CLASS	REGISTRATION NUMBER	PART 36/ICAO ANNEX 16		LOS ANGELES DEPARTMENT OF AIRPORTS USE ONLY
		YES (X)	NO (X)	
THIS QUARTERLY REPORT CERTIFIES THAT ALL AIRCRAFT OPERATED AT LOS ANGELES INTERNATIONAL AIRPORT DURING THE BELOW CALENDAR QUARTER WERE CERTIFICATED UNDER FAR PART-36 OR ICAO ANNEX-16.				

I CERTIFY THE ABOVE TO BE CORRECT.

FROM _____ ENDING _____
QUARTERLY REPORTING PERIOD

_____
SIGNATURE

_____
AIRLINE

_____
TITLE

Attachment No. 1-B

QUARTERLY REPORT OF
OPERATING AIRCRAFT AT
LOS ANGELES INTERNATIONAL AIRPORT

(Due within 20 days after each Quarter)

Los Angeles Dept. of Airports
Noise Abatement Division
#1 World Way
Los Angeles, CA 90009
(213) 646-9410

This quarterly report shall be submitted by each aircraft operator of affected aircraft (75000 lbs. or greater) that operated at the airport in order to demonstrate compliance with Parts 2 and 3 of Airport Commissioners Resolution #11650 and Los Angeles City Ordinance #152455. This report shall be submitted within 20 days after each calendar quarter on this form.

TYPE/CLASS	REGISTRATION NUMBER	PART 36/ICAO ANNEX 16 YES(X)	PART 36/ICAO ANNEX 16 NO(X)
B727-200	N12301	X	
B727-200	N12302	X	
B727-200	N12303	X	
B727-200	N12304	X	
B727-200	N12305	X	
B727-200	N12306	X	
B727-200	N12307	X	
B727-200	N12308	X	
B727-200	N52309	X	
B727-200	N52310	X	
B727-200	N52311	X	
B727-200	N52312	X	
B727-200	N52313	X	
B727-200	N94314	X	
B727-200	N64315	X	
B727-200	N44316	X	
B727-200	N74317	X	
B727-200	N74318	X	
B727-200	N64319	X	
B727-200	N64320	X	
B727-200	N64321	X	
B727-200	N64322	X	
B727-200	N64323	X	
B727-200	N64324	X	
B727-200	N54325	X	
B727-200	N54326	X	
B727-200	N54327	X	
B727-200	N54329	X	
B727-200	N54330	X	

LOS ANGELES DEPT. OF AIRPORTS USE ONLY

I.

4-Eng. Type A/C	No.	FAR 36	Non FAR 36	FAR 36 %
B707/720	18	0	18	0%
DC8				
4 Eng. Total	18	0	18	0 %

II.

Other Type A/C	No.	FAR 36	Non FAR 36	FAR 36 %
A300				
B727	75	75	0	100%
B737				
B747	18	18	0	100%
B757				
B767	6	6	0	100%
DC8				
DC9				
DC10				
L188				
L1011	35	35	0	100%
Other Type TOTAL	134	134	0	100 %

III.

Fleet TOTAL	152	134	18	88 %

I CERTIFY THE ABOVE TO BE CORRECT.

FROM 04/01/83 ENDING 06/30/83
QUARTERLY REPORTING PERIOD

SIGNATURE

AIRLINE

TITLE

Attachment No. 2

Appendix C

[Noise Levels for Transport Category and Turbojet Powered Airplanes Under Section 36.201]

§ C36.1 Noise measurement and evaluation. Compliance with this Appendix must be shown with noise levels measured and evaluated as prescribed, respectively, by Appendix A and Appendix B of this Part, or under approved equivalent procedures.

§ C36.3 Noise measuring points. Compliance with the noise level standards of § C36.5 must be shown—

(a) For takeoff, at a point 21,325 feet (6,500 meters) from the start of the takeoff roll on the extended centerline of the runway;

(b) For approach, at a point 6,562 feet (2,000 meters) from the threshold on the extended centerline of the runway; and

(c) For the sideline, at the point, on a line parallel to and 1,476 feet (450 meters) from the extended centerline of the runway, where the noise level after liftoff is greatest, except that, for an airplane powered by more than three turbojet engines this distance must be 0.35 nautical miles for the purpose of showing compliance with Stage 1 or Stage 2 noise limits (as applicable).

§ C36.5 Noise levels.

(a) *Limits.* Except as provided in paragraphs (b) and (c) of this section, it must be shown by flight test that the noise levels of the airplane, at the measuring points described in § C36.3, do not exceed the following (with appropriate interpolation between weights):

(1) *Stage 1* noise limits for acoustical changes for airplanes regardless of the number of engines are those noise levels prescribed under § 36.7(c) of this Part.

(2) *Stage 2* noise limits for airplanes regardless of the number of engines are as follows:

(i) *For takeoff*—108 EPNdB for maximum weights of 600,000 pounds or more, reduced by 5 EPNdB per halving of the 600,000 pounds maximum weight down to 93 EPNdB for maximum weights of 75,000 pounds and less.

(ii) *For sideline and approach*—108 EPNdB for maximum weights of 600,000 pounds or more, reduced by 2 EPNdB per halving of the 600,000 pounds maximum weight down to 102 EPNdB for maximum weights of 75,000 pounds and less.

(3) *Stage 3* noise limits are as follows:

(i) *For takeoff*—

(A) *For airplanes with more than 3 engines*—106 EPNDB for maximum weights of 850,000 pounds or more, reduced by 4 EPNdB per halving of the 850,000 pounds maximum weight down to 89 EPNdB for maximum weights of 44,673 pounds or less;

(B) *For airplanes with 3 engines*—104 EPNdB for maximum weights of 850,000 pounds or more, reduced by 4 EPNdB per halving of the 850,000 pounds maximum weight down to 89 EPNdB for maximum weights of 63,177 pounds or less; and

(C) *For airplanes with fewer than 3 engines*—101 EPNdB for maximum weights of 850,000 pounds or more, reduced by 4 EPNdB per halving of the 850,000 pounds maximum weight down

to 89 EPNdB for maximum weights of 106,250 pounds or less.

(ii) *For sideline*, regardless of the number of engines—103 EPNdB for maximum weights of 882,000 pounds or more, reduced by 2.56 EPNdB per halving of the 882,000 pounds maximum weight down to 94 EPNdB for maximum weights of 77,200 pounds or less.

(iii) *For approach*, regardless of the number of engines—105 EPNdB for maximum weights of 617,300 pounds or more, reduced by 2.33 EPNdB per halving of the 617,300 pounds weight down to 98 EPNdB for maximum weights of 77,200 pounds or less.

(b) *Tradeoffs.* Except to the extent limited under §§ 36.7(c)(1) of this Part, the noise level limits prescribed in paragraph (a) of this section may be exceeded at one or two of the measuring points specified in § C36.3 of this appendix, if—

(1) The sum of the exceedance is not greater than 3 EPNdB;

(2) No exceedance is greater than 2 EPNdB; and

(3) The exceedances are completely offset by reductions at other required measuring points.

(c) *Prior applications.* For applications made before December 1, 1969, for airplanes powered by more than three turbojet engines with bypass ratios of two or more, the value prescribed in paragraph (b)(1) of this section may not exceed 5 EPNdB and the value prescribed in paragraph (b)(2) of this section may not exceed 3 EPNdB.

§ C36.7 Takeoff test conditions.

(a) This section applies to all takeoff noise tests conducted under this appendix in showing compliance with this Part.

(b) Takeoff power or thrust must be used from the start of takeoff roll to at least the following altitude above the runway:

[(1) *For Stage 1 airplanes and for Stage 2 airplanes that do not have turbojet engines with a bypass ratio of 2 or more*, the following apply:]

(i) For airplanes with more than three turbojet engines—700 feet (214 meters).

(ii) For all other airplanes—1000 feet (305 meters).

[(2) *For Stage 2 airplanes that have turbojet engines with a bypass ratio of 2 or more and for Stage 3 airplanes*, the following apply:]

(i) For airplanes with more than three turbojet engines—689 feet (210 meters).

(ii) For airplanes with three turbojet engines—853 feet (260 meters).

(iii) For airplanes with fewer than three turbojet engines—984 feet (300 (meters).

(iv) For airplanes not powered by turbojet engines—1000 feet (305 meters).

(c) Upon reaching the altitude specified in paragraph (b) of this section, the power or thrust may not be reduced below that needed to maintain level flight with one engine inoperative, or to maintain a four percent climb gradient, whichever power or thrust is greater.

(d) Except as provided in paragraph (f) of this section, a speed of at least V_2+10 knots must be attained as soon as practicable after liftoff, and must be maintained throughout the takeoff noise test.

(e) A constant takeoff configuration, selected by the applicant, must be maintained throughout the takeoff noise test, except that the landing gear may be retracted.

(f) For applications made for subsonic airplanes after September 17, 1971, and for Concorde airplanes, the following apply:

(1) For subsonic airplanes the test day speeds and the acoustic day reference speed must be the minimum approved value of V_2+10 knots, or the all-engines-operating speed at 35 feet (for turbine engine powered airplanes) or 50 feet (for reciprocating engine powered airplanes), whichever speed is greater as determined under the regulations constituting the type certification basis of the airplane. These tests must be conducted at the test day speeds ±3 knots. Noise values measured at the test day speeds must be corrected to the acoustic day reference speed.

[(2) For Concorde airplanes, the test day speeds and the acoustic day reference speed must be the minimum approved of V_2+35 knots, or the all-engines-operating speed at 35 feet, whichever speed is greater as determined under the regulations constituting the type certification basis of the airplane, except that the reference speed may not exceed 250 knots. These tests must be conducted at the test day speeds ±3 knots. Noise values measured at the test day speeds must be corrected to the acoustic day reference speed.]

[(3)] If a negative runway gradient exists in the direction of takeoff, performance and acoustic data must be corrected to the zero slope condition.

§ C36.9 Approach test conditions.

(a) This section applies to all approaches conducted in showing compliance with this Part.

(b) The airplane's configuration must be that used in showing compliance with the landing requirements in the airworthiness regulations constituting the type certification basis of the airplane. If more than one configuration is used in showing compliance with the landing requirements in the airworthiness regulations constituting the type certification basis of the airplane, the configuration that is most critical from a noise standpoint must be used.

(c) The approaches must be conducted with a steady glide angle of 3°±0.5° and must be continued to a normal touchdown with no airframe configuration change.

(d) Except as provided in paragraph (f) of this section, a steady approach speed of not less than 1.30 V_s+10 knots must be established and maintained over the approach measuring point.

(e) All engines must be operating at approximately the same power or thrust.

[(f) For applications made for subsonic airplanes after September 17, 1971, and for Concorde airplanes, the following apply:]

(1) [For subsonic airplanes a steady approach speed, that is either 1.30 V_s+10 knots or the speed used in establishing the approved landing distance under the airworthiness regulations constituting the type certification basis of the airplane, whichever speed is greatest, must be established and maintained over the approach measuring point.]

[(2) For Concorde airplanes a steady approach speed, that is either the landing reference speed +10 knots or the speed used in establishing the approved landing distance under the airworthiness regulations constituting the type certification basis of the airplane, whichever speed is greater, must be established and maintained over the approach measuring point.]

[(3)] A tolerance of ±3 knots may be used throughout the approach noise testing.

Attachment No.3

Airlines with Variances as of February 1983

Air New Zealand

British Airtours

Canadian Pacific Air

Aeromexico

Japan Airlines

Air Canada

Balair

Korean Airlines

Varig

Orion International

Capitol Air

Delta

Flying Tigers

Pacific East Air

Rosenbalm Aviation

TWA

Transamerica

Airborne Express

Emerald Air

Western Airlines

Air California

Frontier Airlines

Ozark Airlines

Republic Airlines

United

Evergreen International

Continental

INAIR

Attachment No. 4-A

(b) For replacement of an airplane powered by three engines, until January 1, 1985, but not after the date specified in the plan, if the contract is entered into by January 1, 1983, and specifies delivery before January 1, 1985, of a replacement airplane which has been shown to comply with Stage 3 noise levels under Part 36 of this chapter.

(c) For replacement of any other airplane, until January 1, 1985, but not after the date specified in the plan, if the contract specifies delivery before January 1, 1985, of a replacement airplane which—

(1) Has been shown to comply with Stage 2 or Stage 3 noise levels under Part 36 of this chapter prior to issuance of an original standard airworthines certificate; or

(2) Has been shown to comply with Stage 3 noise levels under Part 36 of this chapter prior to issuance of a standard airworthiness certificate other than original issue.

(d) Each operator of a Stage 1 airplane for which approval of a replacement plan is requested under this section shall submit to the FAA Director of the Office of Environement and Energy an application constituting the proposed replacement plan (or revised plan) that contains the information specified under this paragraph and which is certified (under penalty of 18 U.S.C. § 1001) as true and correct. Each application for approval must provide information corresponding to that specified in the contract, upon which the FAA may rely in considering its approval, as follows:

(1) Name and address of the applicant.

(2) Aircraft type and model and registration number for each airplane to be replaced under the plan.

(3) Aircraft type and model of each replacement airplane.

(4) Scheduled dates of delivery and introduction into service of each replacement airplane.

(5) Name and address of the parties to the contract and any other persons who may effectively cancel the contract or otherwise control the performance of any party.

(6) Information specifying the anticipated disposition of the airplanes to be replaced.

(7) A statement that the contract represents a legally enforceable, mutual agreement for delivery of an eligible replacement airplane.

(8) Any other information or documentation requested by the Director, Office of Environment and Energy reasonably necessary to determine whether the plan should be approved.

§ 91.307 Service to small communities exemption: two-engine, subsonic airplanes.

(a) A Stage 1 airplane powered by two engines may be operated after the compliance dates prescribed under §§ 91.303, 91.305, and 91.306, when, with respect to that airplane, the Administrator issues an exemption to the operator from the noise level requirements under this subpart. Each exemption issued under this section terminates on the earlier of the following dates—

(1) For an exempted airplane sold, or otherwise disposed of, to another person on or after January 1, 1983—on the date of delivery to that person;

(2) For an exempted airplane with a seating configuration of 100 passenger seats or less—on January 1, 1988; or

(3) For an exempted airplane with a seating configuration of more than 100 passenger seats—on January 1, 1985.

(b) For purposes of this section, the seating configuration of an airplane is governed by that shown to exist on December 1, 1979, or an earlier date established for that airplane by the Administrator.

§ 91.308 Compliance plans and status: U.S. operators of subsonic airplanes.

(a) Each U.S. operator of a civil subsonic airplane covered by this subpart (regardless of the State of registry) shall submit to the FAA, Director of the Office of Environment and Energy, in accordance with this section, the operator's current compliance status and plan for achieving and maintaining compliance with the applicable noise level requirements of this subpart. If appropriate, an operator may substitute for the required plan a notice, certified as true (under penalty of 18 U.S.C. § 1001) by that operator, that no change in the plan or status of any airplane affected by the

plan has occurred since the date of the plan most recently submitted under this section.

(b) Each compliance plan, including any revised plans, must contain the information specified under paragraph (c) of this section for each airplane covered by this section that is operated by the operator. Unless otherwise approved by the Administrator, compliance plans must provide the required plan and status information as it exists on the date 30 days before the date specified for submission of the plan. Plans must be certified by the operator as true and complete (under penalty of 18 U.S.C. § 1001) and be submitted for each airplane covered by this section on or before the following dates—

(1) May 1, 1980 or 90 days after initially commencing operation of airplanes covered by this section, whichever is later, and thereafter—

(2) Thirty days after any change in the operator's fleet or compliance planning decisions that has a separate or cumulative effect on 10 percent or more of the airplanes in either class of airplanes covered by § 91.305(b); and

(3) Thirty days after each compliance date applicable to that airplane type under this subpart and annually thereafter through 1985 or until any later compliance date for that airplane prescribed under this subpart, on the anniversary of that submission date, to show continuous compliance with this subpart.

(c) Each compliance plan submitted under this section must identify the operator and include information regarding the compliance plan and status for each airplane covered by the plan as follows:

(1) Name and address of the airplane operator.

(2) Name and telephone number of the person designated by the operator to be responsible for the preparation of the compliance plan and its submission.

(3) The total number of airplanes covered by this section and in each of the following classes and subclasses:

(i) Airplanes engaged in domestic air commerce.

(A) Airplanes powered by four turbojet engines with no bypass ratio or with a bypass ratio less than two.

(B) Airplanes powered by engines with any other bypass ratio or by another number of engines.

(C) Airplanes covered by an exemption issued under § 91.307 of this subpart.

(ii) Airplanes engaged in foreign air commerce under an approved apportionment plan.

(A) Airplanes powered by four turbojet engines with no bypass ratio or with a bypass ratio less than two.

(B) Airplanes powered by engines with any other bypass ratio or by another number of engines.

(C) Airplanes covered by an exemption issued under § 91.307 of this subpart.

(4) For each airplane covered by this section—

(i) Aircraft type and model;

(ii) Aircraft registration number;

(iii) Aircraft manufacturer serial number;

(iv) Aircraft power plant make and model;

(v) Aircraft year of manufacture;

(vi) Whether Part 36 noise level compliance has been shown: Yes/No;

(vii) [Reserved];

(viii) The appropriate code prescribed under paragraph (c)(5) of this section which indicates the acoustical technology installed, or to be installed, on the airplane;

(ix) For airplanes on which acoustical technology has been or will be applied, following the appropriate code entry, the actual or scheduled month and year of installation on the airplane;

(x) For DC-8 and B-707 airplanes operated in domestic U.S. air commerce which have been or will be retired from service in the United States without replacement between January 24, 1977, and January 1, 1985, the appropriate code prescribed under paragraph (c)(5) of this section followed by the actual or scheduled month and year of retirement of the airplane from service;

(xi) For DC-8 and B-707 airplanes operated in foreign air commerce in the United States, which have been or will be retired from service in the United States without replacement between April 14, 1980, and January 1, 1985, the appropriate code prescribed under paragraph (c)(5) of this section followed by the actual or scheduled month and year of retirement of the airplane from service;

(xii) For airplanes covered by an approved replacement plan under § 91.305(c) of this subpart, the appropriate code prescribed under paragraph (c)(5) of this section followed by the scheduled month and year for replacement of the airplane;

(xiii) For airplanes designated as "engaged in foreign commerce" in accordance with an approved method of apportionment under § 91.305(c) of this subpart, the appropriate code prescribed under paragraph (c)(5) of this section;

(xiv) For airplanes covered by an exemption issued to the operator granting relief from noise level requirements of this subpart, the appropriate code prescribed under paragraph (c)(5) of this section followed by the actual or scheduled month and year of expiration of the exemption and the appropriate code and applicable dates which indicate the compliance strategy planned or implemented for the airplane.

(xv) For all airplanes covered by this section, the number of spare shipsets of acoustical components need for continuous compliance and the number available on demand to the operator in support of those airplanes; and

(xvi) For airplanes for which none of the other codes prescribed under paragraph (c)(5) of this section describes either the technology applied, or to be applied to the airplane in accordance with the certification requirements under Parts 21 and 36 of this chapter, or the compliance strategy or methodology, following the code "OTH" enter the date of any certificate action and attach an addendum to the plan explaining the nature and extent of the certificated technology, strategy, or methodology employed, with reference to the type certificate documentation.

(5) TABLE OF ACOUSTICAL TECHNOLOGY/ STRATEGY CODES

Code	*Airplane Type/ Model*	*Certificated Technology*
A	B-707-120B B-707-320B/C B-720B	Quiet Nacelles + 1-Ring
B	B-727-100	Double Wall Fan Duct Treatment
C	B-727-200	Double Wall Fan Duct Treatment (Pre-January 1977 Installations and Amended Type Certificate)
D	B-727-200 B-737-100 B-737-200	Quiet Nacelles + Double Wall Fan Duct Treatment
E	B-747-100 (pre-December 1971) B-747-200 (pre-December 1971)	Fixed Lip Inlets + Sound Absorbing Material Treatment
F	DC-8	New Extended Inlet and Bullet with Treatment + Fan Duct Treatment Areas
G	DC-9	P-36 Sound Absorbing Material Treatment Kit
H	BAC-111-200	Silencer Kit (BAC Acoustic Report 522)
I	BAC-111-400	(To be identified later if certificated)
J	B-707 DC-8	Reengined with High Bypass Ratio Turbojet Engines + Quiet Nacelles (if certificated under Stage 3 noise level requirements)

REP—For airplanes covered by an approved replacement under § 91.305(c) of this subpart.

EFC—For airplanes designated as "engaged in foreign commerce" in accordance with an approved method of apportionment under § 91.307 of this subpart.

RET—For DC-8 and B-707 airplanes operated in domestic U.S. air commerce and retired from service in the United States without replacement between January 24, 1977, and January 1, 1985.

RFC—For DC-8 and B-707 airplanes operated by U.S. operators in foreign air commerce in the United States and retired from service in the United States without replacement between April 14, 1980, and January 1, 1985.

EXD—For airplanes exempted from showing compliance with the noise level requirements of this subpart.

OTH—For airplanes for which no other prescribed code describes either the certificated technology applied, or to be applied to the airplane, or the compliance strategy or methodology. (An addendum must explain the nature and extent of technology, strategy or methodology and reference the type certificate documentation.

§ 91.309 Civil supersonic airplanes that do not comply with Part 36.

(a) *Applicability.* This section applies to civil supersonic airplanes that have not been shown to comply with the Stage 2 noise limits of Part 36 in effect on October 13, 1977, using

Attachment No. 4-B

COMPLIANCE REPORT - FAR 91.308

This report fulfills the requirements of FAR 91.308 requiring submission of the status and plan for compliance with the noise level requirements of FAR 91 Subpart E. The information contained in this report reflects the status as it existed on January 1, 1982.

308(C)(1) - Name and address of operator:

UNITED AIR LINES, INC.
P. O. Box 66100
Chicago, IL 60666

308(C)(2) - Person responsible for preparation and submission:

William J. Ritchie,II - Vice President, Technical Services
United Airlines
San Francisco International Airport
San Francisco, CA 94128
Telephone (415) 876-4600

308(C)(3) - Total number of airplanes

(i) Airplanes in domestic air commerce

		Reported	Operating
(A)	DC-8's	101	44
(B)	DC-10's	0	46
	727's	150	158
	747's	12	18
(C)	737's	59	49

(ii) Airplanes in foreign air commerce - NONE

On January 24, 1977, United Airlines had 364 aircraft on its roster, consisting of 100 4-engine no- or low-bypass ratio DC-8's and 264 others. Since that time, United has disposed of all 30 straight jet JT4A-powered DC-8's, and has removed 25 low-bypass ratio JT3D-powered DC-8's from service. United has also disposed of 68 non-complying 727-100 series aircraft and 10 non-complying 737-200 series aircraft. An additional 4 non-complying 727-100 series aircraft are to be removed from service in 1982. At the date of this report, 139 airplanes in category (B) and 10 airplanes in category (C) were in full compliance with FAR 36 Appendix C.

United Air Lines, Inc.

PATRICIA A. [illegible]ENGER, N.P.

Nov 3, 1982

The following aircraft are not included in the specific listings in this report, but are included in the active fleet total.

6	747-122	N4723U, N4727U, N4728U, N4729U, N4732U, N4735U
46	DC-10-10	N1801U through N1847U, except N1840U
76	727-222	N7251U through N7299U, N4471U through N7467U

The configuration of each of these aircraft was in full compliance with the noise levels of FAR 36 Appendix C upon the issuance of its original Airworthiness Certificate, and no additional compliance strategy is required by FAR 91 Subpart E.

308(C)(4) - Airplane specific data

The required data is tabulated on subsequent pages. Aircraft listings contained on each page consist of those airplanes that were in operation on January 24, 1977 (or subsequently acquired) that were not then in compliance with FAR 36 Appendix C. Aircraft that are leased to others are included. Entries in the tabulations have the following meanings:

Pt 36.

Yes - Means the airplane meets the provisions of Federal Aviation Regulation Part 36 Appendix C.

No - Means the airplane does not meet Appendix C.

308(C)(4) (xv) - Spare Shipsets of Acoustical Components

	Needed	Available
DC8-61 (re-engined)	1	1
727-022	0	0
727-222	0	0
737-222	1	1
747-122	1	2

* * *

I hereby certify that the foregoing compliance report was prepared under my direction and accurately reflects the current status of United Airlines aircraft and further, that the report, subject to the limitations contained therein, is an accurate statement as of January 1, 1982, of United's future plans for achieving compliance.

_____

W. J. Ritchie, II
Vice President
Technical Services

(i) AIRCRAFT DC8-21/31 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT4A-3 COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)----(xiv) TECH CODE	ACTION MO/YR	ADDENDUM
N8001U	45278	1960					SCRP
N8002U	45279	1961					SCRP
N8003U	45280	1960					SOLD
N8004U	45281						SCRP
N8005U	45282						SCRP
N8006U	45283						SCRP
N8012U	45289	1959					SOLD
N8014U	45588						SCRP
N8015U	45589						SOLD
N8016U	45590						SCRP
N8017U	45591						SOLD
N8018U	45291	1960					SCRP
N8019U	45592	1959					SCRP
N8020U	45593						SCRP
N8021U	45594					SEE	SOLD
N8022U	45595		NO		RET	NOTE	SOLD
N8023U	45292						SCRP
N8024U	45293						SOLD
N8025U	45294						SCRP
N8026U	45295						SOLD
N8027U	45296						SOLD
N8028U	45297	1960					SCRP
N8029U	45298						SOLD
N8030U	45596						SCRP
N8031U	45299						SOLD
N8032U	45597						SCRP
N8033U	45300						SOLD
N8037U	45304						SOLD
N8038U	45305	1961					SCRP
N8039U	45306						SCRP

NOTE: ALL AIRPLANES IN THIS LISTING REMOVED FROM SERVICE JAN 78 OR BEFORE.

NOTE: SOME DC8-21'S WERE ORGINALLY MANUFACTURED AS DC8-11 AND DC8-12.

SCRP: SCRAPPED

(i) AIRCRAFT DC8-50 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT3D-3B COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)----(xiv) TECH CODE	ACTION MO/YR	ADDENDUM
N8007U	45284						SCRP
N8008U	45285						
N8009U	45286	1959					
N8010U	45287						SCRP
N8011U	45288						
N8035U	45302	1961					
N8060U	45693		NO		RET	1/80	SOLD
N8061U	45694						SOLD
N8062U	45757	1965					
N8063U	45758						
N8064U	45759						
N8065U	45756						
N8066U	45850						
N8067U	45851	1966					
N8068U	45852						
N8069U	45853						

ALL AIRPLANES IN THIS LISTING WERE GROUNDED JAN 1980 (TO BE SOLD OR SCRAPPED).

N8007U-N8011U; DC8-51, ORIGINALLY MANUFACTURED AS DC8-11.
N8035U, N8060U-N8069U: DC8-52.

SCRP: SCRAPPED

(i) AIRCRAFT DC8-54F — FAR 91 SUBPART E — UNITED AIRLINES
(iv) ENGINE JT3D-3 — COMPLIANCE REPORT — DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii) TECH CODE	(xiv) ACTION MO/YR	ADDENDUM
N8041U	45675					*	
N8042U	45676	1964				*	
N8043U	45677					*	
N8044U	45800					*	
N8045U	45801	1965				*	
N8046U	45802					*	
N8047U	45880					12/77	DESTROYED
N8048U	45881	1966	NO		RET	*	
N8049U	45886					*	
N8050U	45884					*	
N8051U	45885					*	
N8052U	46009	1968				*	
N8053U	46010					*	
N8054U	46011					*	
N8055U	46012					*	

* ALL AIRPLANES IN THIS LISTING PLANNED FOR RETIREMENT BEFORE 1985. SPECIFIC DATES HAVE NOT YET BEEN DESIGNATED.

(i) AIRCRAFT DC8-61 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT3D-3B COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)----(xiv) TECH CODE	ACTION MO/YR	ADDENDUM
N8070U	45810	1967				9/83	
N8071U	45811	1967				12/83	
N8072U	45812	1968				3/84	
N8073U	45813					10/82	
N8074U	45849	1967				2/83	
N8075U	45940					4/84	
N8076U	45941				J	10/83	
N8077U	45945					11/83	
N8078U	45946					1/82	
N8079U	45947					1/84	
N8080U	45970					2/84	
N8081U	45971					2/84	
N8082U	45972				RET	12/78	DESTROYED
N8083U	45973					2/82	
N8084U	45974					4/82	
N8085U	45975	1968	NO			5/82	
N8086U	45976					6/82	
N8087U	45977					6/83	
N8088U	45978					4/83	
N8089U	45993					5/83	
N8090U	45994				J	12/83	
N8091U	45995					2/84	
N8092U	45996					9/81	
N8093U	45997					10/80	
N8094U	45998					7/82	
N8095U	46039					9/82	
N8096U	46040					6/83	
N8097U	46064	1969				7/83	
N8098U	46065					3/84	
N8099U	46066					12/82	
N8177U	45983	1968				4/83	ACQUIRED 4/77

J: RE-ENGINED WITH CFM56-23-C1 HIGH BYPASS RATIO TURBOFAN ENGINES.

N8093U IS PROTOTYPE FOR CERTIFICATION.

ACTION DATES REFLECT BEGINNING OF RE-ENGINE MODIFICATION IN TULSA.

(i) AIRCRAFT DC8-62 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT3D-7 COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)---(xiv) TECH CODE	ACTION MO/YR	ADDENDUM
N8966U	46067					4/80	
N8967U	46068					4/80	
N8968U	46069					3/80	
N8969U	46070					4/80	
N8970U	46071	1969	NO		RET	3/80	
N8971U	46081					4/80	SOLD
N8973U	46085					4/80	
N8974U	46110					4/80	
N8975U	46111					4/80	

ALL AIRPLANES IN THIS LISTING GROUNDED (TO BE SOLD, LEASED OUT OR RETURNED TO LESSORS).

(i) AIRCRAFT 727-022 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT8D-7 COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)----(xiv) TECH CODE	ACTION MO/YR	ADDENDUM
N7001U	18293	1964			B	*	
N7002U	18294	1964			B	*	
N7003U	18791	1965			OTH	8/78	RTL
N7004U	18296						
N7005U	18297						
N7006U	18298	1963					
N7007U	18299						
N7008U	18300						
N7009U	18301						
N7010U	18302						
N7011U	18303						
N7012U	18304						
N7013U	18305						
N7014U	18306				B	*	
N7015U	18307						
N7016U	18308	1964					
N7017U	18309						
N7018U	18310						
N7019U	18311						
N7020U	18312						
N7021U	18313		NO				
N7022U	18314						
N7023U	18315						
N7024U	18316						
N7025U	18317						
N7026U	18318						
N7027U	18319						
N7028U	18320					5/78	
N7029U	18321					3/78	
N7031U	18323	1965			OTH	4/78	RTL
N7032U	18324					4/78	
N7033U	18325					5/78	
N7034U	18326					5/78	
N7035U	18327					5/78	

(cont'd.)

B - DOUBLE WALL FAN DUCT TREATMENT BOEING MC2515-6K (1977)
* - SEE ADDENDUM PAGE 12
RTL - RETURNED TO LESSOR

(i) AIRCRAFT 727-022 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT8D-7 COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)----(xiv) TECH CODE	ACTION MO/YR	ADDENDUM
N7037U	18329					6/78	
N7038U	18330					7/78	
N7039U	18331					7/78	
N7040U	18332					8/78	
N7041U	18848					9/78	
N7042U	18849					9/78	
N7044U	18851					9/78	
N7045U	18852	1965			OTH	10/78	RTL
N7046U	18853					10/78	
N7047U	18854					10/78	
N7048U	18855					11/78	
N7049U	18856					12/78	
N7050U	18857					11/78	
N7052U	18859					12/78	
N7053U	18860					12/78	
N7054U	18861						
N7055U	18862						
N7056U	18863						
N7057U	18864		NO				
N7058U	18865				B	*	
N7059U	18866						
N7060U	18867						
N7061U	18868						
N7062U	18869						
N7063U	18870	1966					
N7064U	18871						
N7065U	18872						
N7066U	18879						
N7067U	19080				OTH	5/81	RTL
N7068U	19081						
N7069U	19082						
N7070U	19083				B	*	
N7071U	19084						
N7072U	19085						
N7073U	19086	1967			OTH	7/81	RTL
N7074U	19087	1967			OTH	9/81	RTL

(cont'd.)

B - DOUBLE WALL FAN DUCT TREATMENT BOEING MC2515-6K (1977)
* - SEE ADDENDUM PAGE 12
RTL - RETURNED TO LESSOR

(i) AIRCRAFT 727-022 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT8D-7 COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)----(xiv) TECH CODE	ACTION MO/YR	ADDENDUM
N7075U	19088					9/81	
N7076U	19140				OTH	9/81	RTL
N7077U	19141					10/81	
N7078U	19142						
N7079U	19143						
N7080U	19144				B	*	
N7081U	19145						
N7082U	19146	1967	NO				
N7083U	19147					5/81	RTL
N7084U	19148					11/80	RTL
N7085U	19149					5/81	RTL
N7086U	19150				OTH	12/82	
N7087U	19151					12/82	LEXP
N7088U	19152					12/82	
N7089U	19153					12/82	
N7090U	19154				B	*	

B - DOUBLE WALL FAN DUCT TREATMENT BOEING MC2515-6K (1977)
* - SEE ADDENDUM PAGE 12
RTL - RETURNED TO LESSOR
LEXP - TO BE RETURNED TO LESSOR

ADDENDUM

ENGINE MODIFICATION FOR 727-022's, 727-222's, and 737-222's

Double wall fan duct treatment has been installed on engines passing through the engine re-build shop on a continuing basis. Recently, procedures have been devised for accomplishing the modification without returning an engine to the shop. The number of engines modified to date now stands at 220. The total number planned for modification is 356, as shown in the following table:

AIRPLANES		ENGINES	TOTAL ENGINES
50	727-022 (x3)	150 + 15 spares	249
28	727-222 (x3)	84	
49	737-222 (x2)	98 + 9 spares	107
			356

Although 737-222's are exempt until January 1, 1988, based on service to small communities, sixteen of these airplanes have modified engines installed. All seventy-eight 727's will be equipped with modified engines by January 1, 1983.

(i) AIRCRAFT 727-22C FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT8D-7 COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii) TECH CODE	(xiv) ACTION MO/YR	ADDENDUM
N7401U	19089					11/80	
N7402U	19090					11/80	
N7403U	19091					11/80	
N7404U	19092					1/81	
N7405U	19093					12/80	
N7406U	19094					12/80	
N7407U	19095					10/80	
N7408U	19096	1966				12/80	
N7409U	19097					11/80	
N7410U	19098					12/80	
N7411U	19099					1/81	
N7412U	19100					1/81	
N7413U	19101					1/81	
N7414U	19102					1/81	
N7415U	19103					5/81	
N7416U	19191					9/78	
N7417U	19192		NO		OTH	1/79	
N7418U	19193					3/78	
N7419U	19194					6/78	
N7420U	19195					2/79	
N7421U	19196					1/81	
N7422U	19197					1/78	
N7423U	19198					4/78	
N7424U	19199	1967				4/78	
N7426U	19201					7/78	
N7427U	19202					8/78	
N7428U	19203					8/78	
N7429U	19204					9/78	
N7430U	19205					10/78	
N7431U	19805					4/79	
N7432U	19806					2/79	
N7433U	19890					8/79	
N7435U	19892	1968				7/81	
N7436U	19893					12/80	
N7437U	19894					9/79	
N7438U	19895					7/81	

ALL AIRPLANES IN THIS LISTING HAVE BEEN SOLD OR RETURNED TO LESSORS.

(i) AIRCRAFT 727-222 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT8D-7 COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)---(xiv) TECH CODE	ACTION MO/YR	ADDENDUM
N7620U	19537						
N7621U	19538						
N7622U	19539						
N7623U	19540						
N7624U	19541						
N7625U	19542						
N7626U	19899						
N7627U	19900						
N7628U	19901						
N7629U	19902						
N7630U	19903	1968					
N7631U	19904						
N7632U	19905						
N7633U	19906		NO		C	*	
N7634U	19907						
N7635U	19908						
N7636U	19909						
N7637U	19910						
N7638U	19911						
N7639U	19912						
N7640U	19913						
N7641U	19914						
N7642U	19915						
N7643U	20037						
N7644U	20038	1969					
N7645U	20039						
N7646U	20040						
N7647U	20041						

C - DOUBLE WALL FAN DUCT TREATMENT BOEING MC 2515-18K

* - SEE ADDENDUM FOLLOWING 727-022

(i) AIRCRAFT 737-222 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT8D-7 COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)----(xiv) TECH CODE		ACTION MO/YR	ADDENDUM
N9001U	19039	1969						
N9002U	19040	1967						
N9003U	19041							
N9004U	19042							
N9006U	19044							
N9007U	19045							
N9008U	19046							
N9009U	19047							
N9010U	19048							
N9011U	19049				D	EXD	*	
N9012U	19050							
N9013U	19051	1968						
N9014U	19052							
N9015U	19053							
N9016U	19054							
N9017U	19055							
N9018U	19056							
N9019U	19057							
N9020U	19058				OTH		3/80	SOLD
N9021U	19059		NO		OTH		2/80	SOLD
N9022U	19060							
N9023U	19061							
N9024U	19062				D	EXD	*	
N9025U	19063							
N9026U	19064				OTH		2/80	SOLD
N9027U	19065		YES		D	EXD	9/81	
N9028U	19066				OTH		4/80	SOLD
N9029U	19067				OTH		1/80	SOLD
N9030U	19068		NO					
N9032U	19070						*	
N9033U	19071				D	EXD		
N9038U	19076		YES				10/81	
N9039U	19077		YES				10/81	
N9040U	19078		NO				*	

(cont'd)

D - DOUBLE WALL FAN DUCT TREATMENT AND QUIET NACELLES BOEING MC 3461-7K
* - SEE ADDENDUM FOLLOWING 727-022. NACELLE SCHEDULE UNDETERMINED.
EXD - EXEMPTED UNDER 91.307 UNTIL JANUARY 1, 1985.

(i) AIRCRAFT 737-222 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT8D-7 COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii) TECH CODE		(xiv) ACTION MO/YR	ADDENDUM
N9043U	19549				OTH		10/80	SOLD
N9044U	19550				D	EXD	*	
N9045U	19551				D	EXD	*	
N9046U	19552						7/80	SOLD
N9047U	19553						9/80	SOLD
N9048U	19554		NO		OTH		10/80	SOLD
N9050U	19556						7/80	SOLD
N9051U	19932						*	
N9052U	19933							
N9053U	19934							
N9054U	19935							
N9057U	19938	1969	YES				8/81	
N9060U	19941		NO				*	
N9061U	19942		YES				12/81	
N9062U	19943		YES		D	EXD	12/81	
N9063U	19944		YES				11/81	
N9065U	19946		YES				10/81	
N9066U	19947							
N9067U	19948						*	
N9068U	19949		NO					
N9069U	19950							
N9070U	19951							
N9071U	19952							
N9072U	19953		YES				11/81	
N9075U	19956		YES				10/81	

D - DOUBLE WALL FAN DUCT TREATMENT AND QUIET NACELLES BOEING MC 3461-7K
* - SEE ADDENDUM FOLLOWING 727-022. NACELLE SCHEDULE UNDETERMINED
EXD - EXEMPTED UNDER 91.307 UNTIL JANUARY 1, 1985.

(i) AIRCRAFT 747-122 FAR 91 SUBPART E UNITED AIRLINES
(iv) ENGINE JT9D-3A COMPLIANCE REPORT DATE Jan 1, 1982

REGIS. NUMBER	(iii) SERIAL NUMBER	YR OF MFR.	(iv) PT 36	(vii) RSVD.	(viii)----(xiv) TECH CODE	ACTION MO/YR	ADDENDUM
N4703	19753		YES			11/80	
N4704	19754		YES			3/81	
N4710	19755		YES			9/81	
N4711	19756		YES			12/80	
N4712	19757	1970	NO			2/82	
N4713	19875		YES		E	5/81	
N4714	19876		YES			12/81	
N4716	19877		YES			1/81	
N4717	19878		YES			1/80	
N4718	19879		YES			7/81	
N4719	19880	1971	YES			10/80	
N4720	19881		YES			11/80	

FIXED LIP INLETS AND SOUND-ABSORBING MATERIAL TREATMENT.

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20591

In the matter of the petition of UNITED AIRLINES for a service to small communities exemption under Section 91.307 of the Federal Aviation Regulations	Regulatory Docket No. 21224

GRANT OF EXEMPTION

By letter dated July 7, 1982, Mr. W. J. Ritchie, II on behalf of United Airlines, San Francisco International Airport, San Francisco, California 94128, petitioned the Federal Aviation Administration to extend the existing date of exemption for their 49 B-737 airplanes for relief from the noise level requirements for civil, subsonic planes under Subpart E of Part 91 as authorized under Section 91.307 of the Federal Aviation Regulations.

Based on a review of the petition in light of Section 91.307, petitioner operates 49 eligible airplanes with a seating configuration of 100 passenger seats or less. Pursuant to Section 304 of the Aviation Safety and Noise Abatement Act, the Administrator approved the date of January 24, 1977, in lieu of December 1, 1979, for determining seating configuration. Thus, unless sold, or otherwise disposed of, to another person, these airplanes may be operated by the petitioner as "Stage 1 airplanes" until January 1, 1988, under an exemption authorized by Section 91.307. However, the exemption terminates without further FAA action for each exempted airplane sold, or otherwise disposed of, to another person (on or after January 1, 1983) on the date of delivery to that person.

Accordingly, pursuant to the authority of Section 304 of the Aviation Safety and Noise Abatement Act of 1979 (49 U.S.C. Section 2124), as delegated to me under 49 CRF 1.47(m) through 14 CFR 11.53, and as provided under Section 91.307 of the Federal Aviation Regulations, the petition of United Airlines for a service to small communities exemption covering the airplanes specified below is hereby granted, in the public interest, subject to the following terms and conditions:

Walter K. Eglee
GEE, N.P.
Nov 3, 1982

1. This exemption supersedes Exemption No. 3104 dated December 24, 1980.

2. This service to small communities exemption is effective immediately and continues, except as provided under paragraph 3 of this exemption, until the expiration of the last authorization to operate an airplane under this exemption or until this exemption is superseded or rescinded by the Federal Aviation Administrator, whichever occurs first.

3. This exemption permits the operation of the specified airplanes by United Airlines as "Stage 1 airplanes" under Section 91.307 (notwithstanding the otherwise applicable noise level requirements of Section 91.303, 91.305, and 91.306 of the Federal Aviation Regulations). The authorization may be exercised until the date specified for the airplane unless the airplane is sold, or otherwise disposed of, to another person (on or after January 1, 1983), in which case the exemption for that airplane terminates on the date of delivery to that person.

4. The following Stage 1 airplanes are covered and may be operated in the United States under this exemption until no later than January 1, 1988.

B-737-222:	N9001U	N9017U	N9044U	N9068U
	N9002U	N9018U	N9045U	N9069U
	N9003U	N9019U	N9051U	N9070U
	N9004U	N9022U	N9052U	N9071U
	N9006U	N9023U	N9053U	N9072U
	N9007U	N9024U	N9054U	N9075U
	N9008U	N9025U	N9057U	
	N9009U	N9027U	N9060U	
	N9010U	N9030U	N9061U	
	N9011U	N9032U	N9062U	
	N9012U	N9033U	N9063U	
	N9013U	N9038U	N9065U	
	N9014U	N9039U	N9066U	
	N9015U	N9040U	N9067U	
	N9016U			

5. United Airlines shall immediately notify, in writing, the FAA's Director of Environment and Energy whenever it no longer operates an airplane covered by this exemption, including any airplane sold, or otherwise disposed of, to another person (on or after January 1, 1983).

6. A copy of this exemption must be carried aboard each exempted airplane and be available for examination upon request of the Administrator or the Administrator's designee.

7. This exemption is not transferable and does not affect the applicable noise certification requirements of Part 36 of the Federal Aviation Regulations.

Issued in Washington, D.C., on July 26, 1982

John E. Wesler
Director of Environment and Energy

Attachment No. 4-C

U.S Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

FEB 12 1982

Mr. W. J. Ritchie, III
Vice President Technical Services
United Airlines
San Francisco International Airport
San Francisco, California 94128

Dear Mr. Ritchie:

We have reviewed and approve your replacement plan for 30 Stage 1 727-022 airplanes. Under FAR 91.306(b), these airplanes may be operated without compliance with FAR 36 until the dates specified in the replacement plan.

We have reviewed your noise compliance plan and it is acceptable to the Federal Aviation Administration under 14CFR91 Subpart E.

Sincerely,

John E. Wesler
Director of Environment and Energy

EXHIBIT D-ATT

Attachment No. 5

Ordinance No. 152,455

An Ordinance approving a Regulation adopted by Resolution No. 11650 of the Board of Airport Commissioners of the City of Los Angeles, which Resolution established a noise control regulation for air carriers having operating agreements at Los Angeles International Airport.

THE PEOPLE OF THE CITY OF LOS ANGELES DO ORDAIN AS FOLLOWS:

Sec. 1. The Regulation adopted by Resolution No. 11650 of the Board of Airport Commissioners on May 7, 1979, is hereby approved. Said Regulation contained in said resolution provides for the establishment of a noise control regulation for air carriers having operating agreements at Los Angeles International Airport and is in words and figures as follows:

SECTION 1. PURPOSE—The purpose of this Regulation is to reduce aircraft noise in the communities surrounding Los Angeles International Airport by (a) the establishment of an aircraft noise limitation for new types and classes of aircraft which seek to commence operations at Los Angeles International Airport; (b) the implementation of a three-phase compliance program with FAR Part 36 noise criteria to be completed by January 1, 1985; and (c) the assurance that all affected aircraft shall conform to FAR Part 36 noise criteria by January 1, 1985.

SECTION 2. EFFECTIVE DATE—This Regulation shall take effect on the date it becomes effective as an ordinance and shall remain in full force and effect until amended, modified or rescinded.

SECTION 3. DEFINITIONS—

(a) Affected Aircraft—All revenue aircraft operating at Los Angeles International Airport weighing 75,000 pounds or more, excepting therefrom military aircraft.

(b) Affected Aircraft Operation—A revenue landing or revenue takeoff of an affected aircraft at Los Angeles International Airport.

(c) Aircraft Operator—That organizational entity responsible for an affected aircraft operation at Los Angeles International Airport of an affected aircraft in interstate and/or foreign commerce pursuant to the terms of the Federal Aviation Act of 1958, as amended, and/or in intrastate commerce pursuant to the provisions of the California Public Utilities Code.

(d) Airport—Los Angeles International Airport.

(e) Board—The Board of Airport Commissioners, City of Los Angeles, as described and defined in Article VI, Section 70, et seq. and Article XXIV, Section 238, et seq. of the Charter of the City of Los Angeles.

(f) FAA—Federal Aviation Administration.

(g) Federal Aviation Regulation Part 36 (FAR Part 36) Noise Criteria—The noise criteria for issuance of type certificates for affected transport category aircraft are as defined in Title 14, Code of Federal Regulations, Chapter 1, Part 36, as in effect on December 1, 1969. For purposes of this Regulation, those affected aircraft which are certificated and comply with the International Standards and Recommended Practices—Aircraft Noise, in effect on December 1, 1969, pursuant to Annex 16, Part II, of the International Civil Aviation Organization (ICAO), shall be deemed to meet FAR Part 36 criteria except that aircraft which require runway length of 450 meters or less at maximum certificated weights for airworthiness shall be presumed to meet such criteria. V570c

(h) Foreign Aircraft Operator—A foreign air carrier engaged in foreign air commerce as both of said terms are defined in Federal Aviation Regulation Part 1.

(i) General Manager—General Manager of the Department of Airports, as described and defined in Article VI, Section 70, et seq. and Article XXIV, Section 238, et seq. of the Charter of the City of Los Angeles.

(j) Noise Value Limitations—The noise value limitations for each monitoring station based on aircraft noise measurements during the first 180 days of 1978 at Airport. These prescribed noise values were determined by a systematic adjustment of the dBA sound pressure levels at each of the twelve noise monitoring stations in the vicinity of Airport until no more than 2% of the daily operations at each of the stations exceed the resultant established noise values. The noise value limitations are shown on Exhibit A, attached hereto and dated July 24, 1978.

(k) Program Period—The program period of this Regulation shall be defined as the period commencing with the effective date of the ordinance approving this Regulation and continuing thereafter until otherwise modified.

SECTION 4. APPLICABILITY—This Regulation shall be applicable in all respects to each and every affected aircraft that now operates or in the future may operate at Airport. It shall further be applicable to each aircraft operator that seeks to operate a type or class of aircraft at Airport, as provided in Part 1 of this Regulation, weighing 75,000 pounds or more.

SECTION 5. REGULATION—

Part 1—To achieve the purpose of this Regulation as stated in paragraph 1(a), an aircraft operator that seeks to commence affected aircraft operations at the Airport with a type or class or aircraft that was not utilized in regularly scheduled passenger or cargo service by any aircraft operator at Airport during the first 180 days of 1978 shall obtain Board approval prior to commencing operations. The General Manager shall administratively furnish a list of aircraft utilized in regularly scheduled passenger or cargo services by any aircraft operated at Airport during the first 180 days of 1978. In order to obtain Board approval, the aircraft operator as a part of the entire criteria must furnish evidence that the operation of said aircraft will not exceed any of the established noise value limitations at any one or more of the noise monitoring locations, as shown on Exhibit A, by more than 2% of said aircraft's total operations on either a takeoff or landing at the Airport, during the first 90-day period of proposed operations.

When furnishing evidence to the Board that an affected aircraft has the ability to comply with this Part of the Regulation, an aircraft operator shall be required to provide appropriate environmental assessment information to validate conclusions and compliance ability by reference to established noise levels for that particular type or class of aircraft as prescribed by the FAA. The Board reserves the right to validate the affected aircraft's compliance ability through the utilization of actual flight noise measurements for the initial 90-day period of operations. In the event such actual flight noise measurements exceed the established noise value limitations as shown on Exhibit A, by more than 2% of said aircraft's total operations on either a takeoff or landing at the Airport, the Board shall rescind its previously granted approval and said aircraft shall no longer engage in affected aircraft operations at Airport. An aircraft which has been certificated by the FAA to be in compliance with the noise criteria of FAR Part 36, as defined herein, prior to commencement of operations, shall be presume to meet the requirements of Part 1 of this Regulation.

Except as specifically approved and authorized by the FAA, no affected aircraft, including those engaged in the initial 90-day period of operation, shall utilize revised operational flight techniques at the Airport which would increase the established noise levels as shown on Exhibit A. However, this requirement does not apply to missed approaches, easterly departures, safety considerations, or other affected aircraft operations due to weather phenomena.

Part 2—To achieve the purpose of this Regulation as found in paragraph 1(b), a three-phase program to achieve compliance with FAR Part 36 noise criteria is required to be completed by 1985 in order to reduce jet aircraft noise in the communities surrounding the Airport.

Aircraft operators shall not conduct affected aircraft operations at the Airport unless such aircraft conform to the criteria of FAR Part 36, consistent with the following compliance schedule:

(a) By January 1, 1981 and continuing thereafter:

(1) At least 25% of the aircraft operated into the Airport in all affected aircraft types or classes that have four engines with no bypass ratio or with a bypass ratio less than two.

(2) At least 50% of the aircraft operated into the Airport in all other affected aircraft types or classes.

(b) By January 1, 1983 and continuing thereafter:

(1) At least an additional 25% of the aircraft operated into the Airport in all affected aircraft types or classes that have four engines with no bypass ratio or with a bypass ratio less than two.

(2) 100% of all other affected aircraft operated into the Airport.

(c) By January 1, 1985 and continuing thereafter: 100% of the aircraft operated into the Airport in all affected aircraft types or classes that have four engines with no bypass ratio or with a bypass ratio less than two.

Part 3—Notwithstanding the provisions of Parts 1 and 2 of this Regulation and to achieve the purpose of the Regulation as found in paragraph 1(c), by January 1, 1985 all affected aircraft operating at the Airport must be certificated to the noise criteria of FAR Part 36.

SECTION 6. COMPLIANCE—In order to demonstrate compliance with Parts 1 and 3 of this Regulation, commencing with the first calendar quarter after January 1, 1981, and each quarter thereafter, each aircraft operator shall submit a quarterly report to the Department of Airports that identifies all affected aircraft that have operated at the Airport during the preceding quarter by: (1) type or class, (2) registration number, and (3) compliance with Part 36 noise criteria. Each aircraft operator's required quarterly report shall be submitted to the Department of Airports within 20 days after completion of each calendar quarter.

The General Manager shall provide those administrative procedures necessary for reporting compliance with this Regulation.

SECTION 7. VARIANCES—The Board may grant a variance from Part 2(a) and/or (b) of this Regulation upon written application made no later than 90 days prior to the initial compliance dates provided therein. The request for a variance must be accompanied by a proposed alternative program that achieves the objectives contained in this Regulation. In the consideration of the variance request, the Board or its designated officer shall give notice and hold a public hearing to receive all information relevant to the request.

Upon application, the Board shall grant a variance from Part 2(a) and/or (b) of this Regulation as follows:

(a) To a foreign aircraft operator.

(b) To that portion of an aircraft operator's fleet for which the aircraft operator has an FAA approved plan in accordance with Federal Regulation Section 91.305.

(c) To that portion of the fleet of a United States flag aircraft operator that has an approved FAA apportionment plan as provided in Federal Regulation Section 91.307.

In all other circumstances, the Board shall grant a variance if the public interest would be satisfied by such a variance. The weighing the public interest, the Board shall consider the following:

(a) The ability of the aircraft operator to effectuate new aircraft delivery or the retrofitting of existing aircraft in a timely manner.

(b) The economic feasibility of complying with the Regulation.

(c) The noise impact should the variance be granted.

(d) The value to the public of the services for which the variance is sought.

(e) Whether the aircraft operator is taking measures which achieve the objectives of this Regulation.

The burden of proof shall be upon the applicant for a variance. The Board shall make finnings on the merits of said request based on the aforementioned criteria and either grant or deny the request.

In no event shall a variance be granted herein for a period beyond December 31, 1984.

SECTION 8. ENFORCEMENT AND PENALTIES—Any aircraft operator that fails to comply with any part of this Regulation shall be subject to loss of its operating rights at the Airport.

Prior to initiating enforcement proceedings, the subject aircraft operator shall be notified in writing of the violation and shall be afforded the opportunity to respond thereto at a public hearing.

SECTION 9. SEVERABILITY OF REGULATION—If any provision of this Regulation or the application thereof is held unconstitutional or otherwise unlawful, the remainder of the Regulation and the application of same shall not be affected thereby.

Sec. 2. The City Clerk shall certify to the passage of this ordinance and cause the same to be published in some daily newspaper printed and published in the City of Los Angeles.

I hereby certify that the foregoing ordinance was passed by the Council of the City of Los Angeles at its meeting of May 29, 1979.

REX E. LAYTON, City Clerk
By Irvin Walder, Deputy

Approved May 31, 1979.

TOM BRADLEY, Mayor

File No. 76-1869

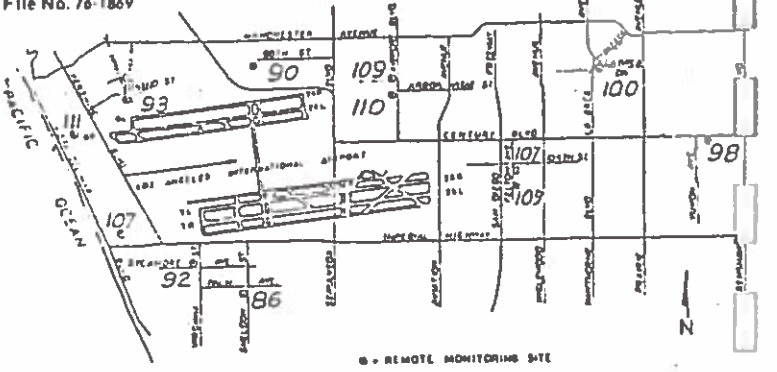


EXHIBIT "A"
Maximum Noise Limitations in dBA for each Monitoring Station at LAX. The State of California has certified the LAX Noise Monitoring System to be accurate within plus or minus 1.5 dBA

July 24, 1978

(JN2690) Jun 6

SECTION III

LAX-DRAFT CAPACITY CONTROL REGULATION

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I. INTRODUCTION

Airport capacity control, i.e., limiting the total number of passengers served annually, has long been viewed as an effective means of curbing noise impacts and traffic congestion in communities adjacent to LAX. The concept has been debated since the late-1960s, and has for nearly a decade been adopted as an official policy of the City of Los Angeles. More recently, the Department of Airports developed a draft access regulation designed to implement the capacity control policy for LAX, and circulated this draft among interested parties for review and comment. To date, no official action has been taken to effecutate the regulation.

The following sections of this report will provide: 1) an overview of the City's policy to limit passenger volumes at LAX: 2) a summary of the current draft access regulation together with review comments thus far submitted; 3) a description of the federal policies and guidelines enabling airport proprietors to enact rules and regulations to mitigate the adverse impacts of aircraft operations, and examples of such measures currently being implemented at airports within the United States and abroad; 4) a review of noise mitigation policies now in effect at LAX, along with an identification of additional actions which may potentially be warranted; and finally, 5) a series of conclusions and recommendations with regard to the City's current capacity control policy and draft regulation.

II. LAX CAPACITY CONTROL

At present, it is the adopted policy of the City of Los Angeles that passenger volumes at LAX will be limited to 40 million annual passengers (MAP). This capacity limit was initially viewed as a planning constraint during the formulation of the LAX Development Plan in the late 1960s and early 1970s, and was subsequently reflected in the Plan and accompanying EIR and EIS adopted in January of 1974. The 40 MAP capacity control policy was further included in the Citywide General Plan prepared in the early 1970s, as well as in the Westchester/Playa Del Rey District Plan adopted by the City Council on March 20, 1974.

In recognition of the City's 40 MAP policy, the Southern California Association of Governments (SCAG) employed this capacity constraint as an assumption in the Aviation Element of the Regional Transportation Plan, formally adopted by the SCAG Executive Committee in September 1972. This policy was not only viewed as a capacity constraint for LAX, but also influenced SCAG's forecasts for service demands at other existing and new airports throughout the region.

Most recently, the 40 MAP policy has been incorporated as an underlying assumption in the noise impact analysis conducted as part of the LAX Airport Noise Control/Land Use Compatibility (ANCLUC) Study. Each of the nineteen operational scenarios, computer modeled to estimate potential noise reduction benefits associated with adjustments in airport operating practices, is based upon an assumed maximum traffic volume of 40 million annual passengers and 500,000 annual aircraft operations (365,000 air carrier/air taxi operations).

III. DRAFT ACCESS REGULATION

In early 1980, the Department of Airports recognized that despite adopted City policy, there existed no mechanism to implement the LAX 40 MAP capacity limitation. In the spring of that year, the Department developed a capacity control concept, designed to limit aircraft operations based upon automotive traffic congestion in the central terminal area. Employing this concept, Airport legal staff subsequently prepared a draft document entitled Access Regulation for LAX, and presented it to the Board of Airport Commissioners for consideration.

The stated purpose of the draft regulation is, "... to provide the Board of Airport Commissioners with a method for regulating and controlling the number of air carrier operations at Los Angeles International Airport in order to alleviate and/or diminish environmental impacts, including but not limited to traffic congestion and resultant air pollution." Although the draft regulation does not directly address the City's 40 MAP policy, it was felt that the same objectives could be achieved by controlling the number of air carrier operations. Legal staff believed the most defensible rationale was to relate the need for such control to traffic congestion on roadways for which the airport had direct responsibility and authority.

Essentially, the regulation would authorize a maximum total number of annual air carrier operations (MTAO) for a given level of automotive traffic service in the terminal area (CTA). The congestion formula would relate the amount of traffic congestion during a given time period to limits on air carrier operations for a future time period. The basic criterion was to maintain at least the level of ground access convenience to air passengers as existed in 1977.

The regulation, as drafted, would not apply to: 1) all cargo operations; 2) aircraft weighing 12,500 pounds or less; 3) carriers with two or less operations per day; and 4) aircraft operations at Imperial Terminal.

IV. DRAFT REGULATION REVIEW COMMENTS

The review process included presentations to the Airport Advisory Committees and SCAG's Aviation Work Program Committee, as well as to other groups and organizations. Comments on the preliminary draft regulation were submitted by the airline industry, federal and state agencies, local jurisdictions, and the general public. All comments received were analyzed and addressed in a staff report submitted to the Board of Airport Commissioners in January 1982. The general thrust of the comments submitted to date is briefly summarized below.

A. Airline Industry

Comments received from airline industry representatives as well as individual domestic and foriegn air carriers indicated general opposition to airport capacity lmitations of any type, and more specifically to the concept and specific provisions of the draft regulation. Many suggested that action on the proposed regulation be deferred until alternative groundside remedies for automotive traffic congestion were more thoroughly explored. Others maintained that the proposed limitation on aircraft operations would conflict with international airline operating agreements, federal deregulation policies, and existing lease/operating agreements between LAX and the individual airlines.

B. Federal Agencies

Responding federal agencies generally acknowledged the airport's effort to address local environmental issues. However, a range of concerns were expressed regarding increasing constraints on airport capacity, the potential for discriminatory application of local regulations, undue burdening of interstate and foreign commerce, and the potential effects of the regulation on international aviation agreements and policy implementation. Additional comments were offered with regard to the specific provisions of the draft regulation, and its general workability in achieving the intended objectives.

C. State Agencies

CALTRANS indicated general support for local efforts to mitigate adverse environmental impacts associated with airport operations. The state did express concern that due to the proposed regulation's focus on traffic congestion, other environmental concerns such as aircraft noise were not adequately addressed. Further exploration as to how

such other concerns might be integrated with the draft LAX regulation was encouraged.

D. SCAG

Noting concerns similar to those expressed by CALTRANS, SCAG indicated its favor of an integrated program, designed to address a broader range of environmental concerns including noise and air quality. It was suggested that traffic congestion could best be dealt with through a cooperative process involving the various local jurisdictions surrounding LAX.

E. Local Cities

Cities adjacent to LAX opposed the draft noise regulation on the basis that it did not address the airport noise issue, and that it might be employed to undermine Los Angeles City's policy to limit the capacity of LAX to 40 MAP.

F. Airport Advisory Committees

Both the Citywide and Airport Area Advisory Committees opposed the draft regulation, noting that it might provide for the expansion of airport capacity beyond the current 40 MAP policy.

G. ANCLUC Steering Committee

In August of 1982, the airport Environmental Management Bureau requested that all agencies represented in the LAX Airport Noise Control/Land Use Compatibility (ANCLUC) Study submit their reactions to a revised draft of the LAX Acces Regulation. The ANCLUC Steering Committee responded in September by adopting a resolution generally supporting the concept of a regulation which would address noise and traffic concerns, while maintaining the 40 MAP capacity limitation.

The full range of comments submitted in response to the proposed LAX Access Regulation is on file with the Los Angeles City Department of Airports.

V. EXISTING CAPACITY RELATED NOISE POLICIES AND REGULATIONS

A. Aviation Noise Abatement Policy of 1976

The Aviation Noise Abatement Policy of 1976 establishes the general federal policy on airport noise control plans and proprietary use restrictions. This policy places the responsibility for initiating such controls with the airport

proprietor, but reserves the FAA's authority to review and disapprove local programs when it is found that:

1. There is a potential and significant adverse impact on national and/or international air commerce;

2. Application of the program is unjustly discriminatory;

3. The program would create unsafe conditions; and/or,

4. The program is incompatible with air navigation system management.

B. Noise Control and Land Use Compatibility Guidelines

A recently published FAA Advisory Circular entitled Noise Control and Compatibility Planning for Airports*, reflects several federal initiatives including the 1976 policy, the Federal Air Regulation, the FAR Part 150 Program, and the Airport Safety and Noise Abatement Act of 1979. The Circular provides guidance for local noise control and compatibility planning, with the goal being that the airport proprietor, in conjunction with state and local planners, aviation interests and local citizen groups, develop a balanced and cost-effective program to minimize and/or mitigate airport noise impacts on adjacent local communities.

Of particular interest is Chapter 3, Section 2 which identifies an airport proprietor's options with respect to possible noise control actions. This material is reproduced in full as Appendix A of this report, and is briefly outlined below. Identified options include the following.

320 - Denial of use by aircraft not meeting federal noise standards.

321 - Capacity limits based on noise:
(a) Restrictions based on cummulative impact.
(b) Restrictions based on certified noise levels.
(c) Restrictions based on estimated single-event noise levels.

326 - Complete or partial curfews.

A more complete overview of the range of noise control actions noted by the FAA is set forth in matrix form in Appendix B.

*AC 150/5020-1, August 5, 1983

C. Application of Capacity Control Techniques

A number of the actions identified in the FAA Circular are currently employed to mitigate the noise impacts of airports both within the United States and abroad. Capacity controls have been used for a number of purposes in the U.S. Starting in the early 1960s, the FAA employed slotting to avoid safety problems associated with peak hour air traffic congestion at certain large hub airports. This procedure was also used extensively during the air traffic controllers strike, and is still in effect at LAX during certain peak air traffic hours.

Most other forms of regulation have dealt with noise and/or terminal related issues. Examples are provided below.

1. U.S. Airports

- Washington National Airport
  - limit on the number of operations per hour
  - limit on the maximum single event noise level by time of day
  - limit on the maximum arrival passenger level (MAP) through slot allocations
  - limit non-stop flight distance
  - type of aircraft to be operated subject to airport proprietor's approval

- Orange County - John Wayne Airport
  - limit on average daily airline departures
  - gross weight limit
  - limit on single event noise levels
  - limit on hours of operations for large aircraft

- Boston Airport
  - restrictions on aircraft type
  - Part 36 compliance requirement
  - restrictions on late night operations

- Burbank-Glendale-Pasadena Airport
  - limit on noise levels by time of day

- San Diego Airport
  - limit on departures by time of day and aircraft noise characteristics.

2. Foreign Airports

° France

- With the exception of the Charles De Gaulle Airport, there are curfews, or slot limits for jet aircraft operations.

- Single noise events above the average level for a given aircraft type, trigger a written notice of the incident.

° United Kingdom

- Both Heathrow and Gatwick have a quota on nighttime operations of "noisy" aircraft with a distinction drawn between summer and winter months.

- Maximum single event limits are regulated, monitored, and enforced by notice of violation.

° Switzerland

- Aircraft exceeding certain single event noise levels are subject to curfew. Some airports are closed on Sundays and holidays.

- An elaborate monitoring and reporting process at Zurich results in airline notification when an operation exceeds an average of the lowest noise levels by 4 dB.

° Germany

- There are curfews on certain aircraft types, but exceptions are granted based upon the overall noise performance of an individual airline.

- Noise monitoring results by airline and aircraft type are published. Inquiries are made when a monitored noise level exceeds by 4 dB an average noise level for the involved aircraft type.

° Netherlands

- Curfews are employed and are related to aircraft type, type of operation (take-off/landing), and the specific runway used.

° Japan

- Restrictions on the number of operations are in effect, together with a nighttime curfew on jet aircraft operations.

° Australia

- Eighty percent of the domestic fleet must have met Annex 16 requirements by January 1981. All foreign and domestic air carriers must meet the requirments by 1985.

VI. OVERVIEW OF CURRENT AND POTENTIAL NOISE REGULATIONS AT LAX

A. Current Policies and Regulations

There are presently a variety of noise control policies and regulations in effect at LAX. In addition to the 40 MAP policy described previously, the City of Los Angeles has adopted an LAX Noise Regulation requiring all air carriers to comply with FAR Part 36 aircraft noise standards by January 1, 1985.* Other noise control programs include an automated noise monitoring and complaint response system, restrictions on nighttime jet engine maintenance runups, and policies pertaining to preferrential runway use, nighttime over-ocean operations, scheduled commuter helicopter operations, and premature drifts and turns over noise sensitive residential areas associated with westerly departues.

B. Potential Policies and Regulations

The FAA's matrix attached as Appendix B provides a summary of noise control actions to be applied to solve specific problems. The summary also provides insight into those areas where new or additional actions might be considered. The key areas for potential additional action are identified and briefly discussed below.

1. Aircraft Not Meeting Federal Noise Standards

The Department of Airports's current regulation regarding FAR Part 36 compliance advances compliance dates for two engine commercial jet aircraft to coincide with the January 1, 1986 date for other aircraft and is therefore in conflict with the FAA's established compliance schedule, which exempts these aircraft until 1988. Variances to the Department of Airports's current regulation will not be granted to these aircraft types after January 1, 1986, even though Federal regulations consider them exempt until 1988.

*Ordinance No. 152,455

2. Cumulative Noise Impact

Present compliance with FAR Part 36 has reduced the area within the airport's 65, 70, and 75 dB CNEL contours. The State Noise Regulation and accompanying EIS anticipated this result. However, because the FAR Part 36 compliance rate at LAX is now quite high (80%), future benefits to be gained from additional State II compliance are limited. Amending FAR Part 36 to include a Stage III compliance schedule would have significant additional benefits.

3. Capacity Constraints

The only remaining control is the 40 MAP capacity constraint, although as noted previously, no mechanism for implementation presently exists. Further, it is not clear that constraints on the total number of passengers served annually addresses the problem of airport noise as well as other actions might.

4. Restrictions on Noise Levels

The single-event noise charactersitics of various aircraft are presently defined and reflected in FAR Part 91 and Part 36 standards. However, even within the cateogry of "Part 36 compliant aircraft", there is a wide range of single-event noise levels. Also, Part 36 noise standards do not differentiate between levels which may be acceptable during different day and nighttime periods.

The Department of Airports currently restricts the use of the SST at LAX. This is, in effect, a maximum, single event noise limitation. (FAA Advisory Circular 36.3c indicates that the Concord exceeds 112 EPNDB on take off). Further, the Part 36, Stage II fleet compliance schedules, and the current DOA noise regulation will effectively reduce maximum single event noise levels to approximately 95 dBa by 1985.

5. Rescheduling Aircraft Operations

The avoidance of severe noise exposure during certain noise sensitive hours is an important action to be considered. While curfews are often cited as a potential mitigation technique, the present DOA/FAA "over-ocean" approach procedure during late night hours is an example of an alternative response to the problem. Rescheduling operations or use of alternative airports might also be considered.

C. Impact of Capacity Constraints

As a final note, it should be recognized that constraints placed upon airline operations do have associated costs, both to the airline industry and to the community. While some such costs have been analyzed in greater detail during Phase III of the ANCLUC effort, the following points are important to note at this time.

- The airline fleets presently engaged in interstate and international service are diverse, and the ability to reschedule existing aircraft or acquire new aircraft soley to meet local requirements at LAX is limited. This of course is further complicated when local requirements differ from one airport to the next.

- Limits on hours of operations, curfews and restrictions at other foreign and domestic airports, together with time zone differences, can narrow the "window of operations" at LAX and restrict service for local passengers and shippers.

- Controls can impose significant constraints on operations and can be very costly. Because of this, such controls should be clearly related to the mitigation of recognized and real noise problems, and should have direct and measurable noise reduction benefits.

VII. CONCLUSION AND RECOMMENDATIONS

Based upon an analysis of the Draft Access Regulation for LAX and the information presented herein the following conclusions and recommendations are offered.

A. Conclusions

1. It is the policy of the City of Los Angeles to maintain a 40 MAP capacity at LAX as a means of limiting potential adverse environmental impacts associated with trffic congestion, air pollution and noise.

2. The 40 MAP limitation at LAX has significant implications in terms of both local environmental considerations and regional airport planning.

3. The draft Access Regulation for LAX is cumbersome and does not adequately address key environmental issues (i.e., aircraft noise impacts, traffic congestion, and air pollution) in a coordinated and integrated fashion. Further, it has not been clearly demonstrated that the

regulation as drafted would achieve its stated objective of reducing traffic congestion on the CTA roadway system, nor is it clear that complex provisions comprising the regulation would effectively implement the objectives of the 40 MAP policy.

4. Resolution of issues involving surface traffic congestion can more effectively be achieved through cooperative, interjurisdictional transportation planning processes such as the SCAG/LAX Transportation System Management program now in progress.

5. Airport capacity regulations are presently employed at various airports as means of achieving environmental objectives.

6. There are a range of mechanisms employed nationally and abroad as alternatives to capacity controls, which might also be employed at LAX to achieve environmental objectives.

7. Notwithstanding the draft LAX Access Regulation, a workable program must yet be formulated to implement the objectives of the LAX 40 MAP policy. Such a program should establish clear objectives and criteria, and should incorporate a systematic monitoring process to measure overall program effectiveness.

B. Recommendations

1. Los Angeles City should maintain its environmental performance policy of limiting the capacity of LAX to 40 MAP.

2. The Board of Airport Commissioners should receive and file the draft Access Regulation for LAX without further action.

3. The issue of traffic congestion is beyond the scope of the present ANCLUC Study, and should be dealt with in the context of an ongoing planning/traffic systems management program, involving all affected local and state agencies, designed to evaluate the full range of alternative measures to improve traffic flow in and adjacent to the airport.

4. The LAX capacity policy should be periodically reassessed within the context of ongoing regional airport planning efforts.

5. The FAA should be encouraged to develop a regulation establishing a phased schedule for the elimination of non-Stage III (FAR Part 36) aircraft operations at LAX.

6. The Board of Airport Commissioners should adopt a performance based noise control program (NCP) designed and structured to include the folloing components.

- A target noise contour reflecting the following operational factors:

  - 40 MAP
  - 100% Part 36 (Stage II) compliance
  - A specified level of Part 36 (Stage III) compliance
  - Specified hours of nighttime over ocean operations
  - Specified runway configurations and thresholds
  - A specified preferential runway utilization policy
  - A projected daily percentage of operations by aircraft type during daytime, evening and nighttime hours

- A computerized monitoring system to measure NCP performance in terms of achieving and maintaining the target contour and reducing the number of dwelling units impacted by airport noise.

- Additional noise mitigation actions to be effectuated if necessary to achieve established noise reduction objectives and/or prevent future increases in noise exposure, which may include the following:

  - A regulation establishing maximum single event noise levels for aircraft operations at LAX,

  - A slotting program for regulating aircraft operations LAX in order to achieve noise reduction and other environmental objectives, and

  - restrictions on nighttime jet operations.

- Actions to prevent the development of new incompatible land uses within the target contour, and to mitigate the impact of airport noise on existing incompatible uses

- On-airport actions to mitigate identified "ground activity" and "single event" noise impacts

- Adequate noise control/mitigation funding mechanisms

- An ongoing, interjurisdictional forum to monitor implementation of the approved noise control/ mitigation program

VIII. APPENDICES

SECTION 2. AIRPORT PROPRIETOR OPTIONS

320. DENIAL OF USE TO AIRCRAFT NOT MEETING FEDERAL NOISE STANDARDS. This strategy may be implemented by limiting access to the airport to aircraft that conform with certain FAR Part 36 standards. Most turbojets and other large aircraft produced after 1974 already meet those standards; so do most propeller-driven light airplanes. In addition, older turbojets over 75,000 lbs. maximum gross weight must (under FAR Part.91) be either retrofitted with quiet engines or be replaced by certain specific dates. The ASNA Act also directs that certain classes of aircraft be exempt from compliance with FAA noise standards until certain dates. Denial of the use of an airport to such aircraft prior to the Part 91 or ASNA Act prescribed retirement dates might force some owners to retrofit or replace the aircraft to meet Part 36 standards in order to continue to operate at the airport during the interim period. To this extent, such local rules are in conflict with the Federal scheme and should be avoided.

321. CAPACITY LIMITS BASED ON NOISE. Airport use restrictions are sometimes based upon noise limits. However, such restrictions often have uneven economic consequences and should be employed only after careful consideration of other alternatives and after thorough consultation with the affected parties. Some of the forms that such restrictions might take are as follows:

a. Restrictions based on cumulative impact. Under this strategy, a maximum cumulative impact (such as the total area within the L_{dn} 75 contour) is established and then the airport's operations are adjusted or limited so as to not exceed that maximum. This is done through "capacity limitations," e.g., limiting either the aircraft types based upon their noisiness, or the numbers and mix of aircraft so as to respect the established cumulative noise exposure restriction.

b. Restrictions based upon certificated noise levels. Most aircraft types in general service today have been certificated for noise by the FAA. Consequently, it possible to devise limitations based upon those certificated data. Such limitations might take the form of threshold noise levels for the airport or different levels for day and night at the airport.

c. Restrictions based upon estimated single event noise levels. Since aircraft noise levels vary widely with changes in operational procedures, it may be possible to set limits on estimated single event noise levels. However, it should be noted that this does not mean that the airport operator or community can set up a microphone and a noise level limit and challenge the pilots to "beat the box." The FAA considers this to be unsafe and has never approved such a scheme. Instead, a target noise level limit or threshold is discussed in advance with the FAA and the aircraft operators and an appropriate level is selected, balancing the needs of aviation and the noise impacts on the community. FAA Advisory Circular 36-3B, Estimated Airplane Noise Levels in A-Weighted Decibels is useful with this option.

Source: AC 150/5020-1

326. COMPLETE OR PARTIAL CURFEWS. Curfews are an effective though costly method of controlling noise intrusion into areas adjacent or in proximity to an airport. They should be reserved as a strategy of last resort, however, when all other options have been shown to be clearly inadequate, because of their drastic negative impacts upon both aviation and the community's benefit from aviation. They can take various forms, from restrictions upon some or all flights during certain periods of the day through restrictions based upon noise threshold and certificated aircraft noise levels (see AC 36-3B). Since unwanted noise intrusions are most pronounced in the late evening or early morning hours, curfews are usually implemented to restrict operations that occur during those periods. The period of 2200 hours to 0700 hours is when most people are resting and are most sensitive to noise intrusions. However, it should be pointed out that curfews have economic impacts upon airport users, upon those providing airport-related services, and upon the community as a whole. Other communities may also be impacted through curtailment of service. Thus undue burden on interstate or foreign commerce is a specific concern of the ASNA Act. Therefore, curfews should only be considered after careful consideration of other alternatives and after thorough consultation with the affected parties.

MATRIX OF NOISE CONTROL ACTIONS

CONSIDER THESE ACTIONS ▼ / IF YOU HAVE THIS PROBLEM ▶			NOISE FROM TAXIING	DEPARTURE	APPROACH	LANDING ROLL	TRAINING FLIGHTS	MAINTENANCE	GROUND EQUIPMENT
AIRPORT PLAN	Changes in Runway Location, Length or Strength	1	●	●	●	●	●		
	Displaced Thresholds	2			●		●		
	High-Speed Exit Taxiways	3	●			●			
	Relocated Terminals	4	●					●	●
	Isolating Maintenance Runups or Use of Test Stand Noise Suppressors and Barriers	5	●					●	●
AIRPORT AND AIRSPACE USE	Preferential or Rotational Runway Use *	6	●	●	●	●	●		
	Preferential Flight Track Use or Modification to Approach and Departure Procedures *	7		●	●		●		
	Restrictions on Ground Movement of Aircraft *	8	●						
	Restrictions on Engine Runups or Use of Ground Equipment	9						●	●
	Limitations on Number or Types of Operations or Types of Aircraft	10	●	●	●	●	●	●	●
	Use Restrictions Rescheduling Move Flights to Another Airport	11	●	●	●	●	●	●	●
	Raise Glide Slope Angle or Intercept *	12			●		●		
AIRCRAFT OPERATION	Power and Flap Management *	13		●	●		●		
	Limited Use of Reverse Thrust *	14				●			
LAND USE	Land or Easement Acquisition	15	●	●	●	●	●	●	●
	Joint Development of Airport Property	16	●	●	●	●	●	●	●
	Compatible Use Zoning	17	●	●	●	●	●	●	●
	Building Code Provisions and Sound Insulation of Buildings	18	●	●	●	●	●	●	●
	Real Property Noise Notices	19		●	●	●	●	●	●
	Purchase Assurance	20		●	●	●	●	●	●
NOISE PROGRAM MANAGEMENT	Noise-Related Landing Fees	21	●	●	●	●	●		
	Noise Monitoring	22		●	●		●	●	
	Establish Citizen Complaint Mechanism Establish Community Participation Program	23	●	●	●	●	●	●	●

* These are examples of restrictions that involve FAA's responsibility for safe implementation. They should not be accomplished unilaterly by the airport operator.

Source: AC 150/5020-1

SECTION IV

PREMATURE TURNS/DRIFTS

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I. INTRODUCTION

The Los Angeles International Airport Noise Control/Land Use Compatibility (LAX-ANCLUC) Study identified a number of issues related to the noise impact of LAX. The analysis of these issues will lead to the development of recommended alternative mitigation programs as the product of Phase Three. These issues involve airport operations, land use adjustments, or a combination of both.

A majority of the issues related to noise from airport operations have been analyzed through the Integrated Noise Model (INM). This model enables the user to measure the impact of noise using the Community Noise Equivalent Level (CNEL) metric to generate noise contour maps and to quantify the effect of an operational adjustment on the CNEL contour.

However, a few of the identified issues do not lend themselves to computer analysis and would not affect the CNEL contour if modeled. These issues relate to aspects of the airport operations which generate intermittent or single event noise impacts. The issue of premature turns and drifts by aircraft departing LAX falls within this category.

A. Purpose

Premature turns and aircraft drift are an intermittent source of noise impacts to communities located adjacent to the airport. El Segundo to the south and Playa del Rey on the north are the communities specifically exposed to this impact. This technical report contains a detailed assessment of this issue and suggested appropriate mitigation measures.

B. Scope

Premature turns and aircraft drift are evaluated by quantifying the recent level of occurrence through empirical observation, noise complaint records, and air traffic control control procedures. Existing control measures and enforcement have been examined for level of effectiveness. A discussion of additional feasible control measures has been included. Conclusions and suggested recommendations to further reduce this intermittent impact are provided.

II. PROBLEM DESCRIPTION

Premature turns and drifts result in the overflight of many noise sensitive land uses due to many highly variable factors. A premature turn may result from an action taken by the pilot for a number of reasons ranging from, air traffic controller instructions to emergency actions. On the other hand a drift

is the result of the departing aircraft being affected by a crosswind which moves it from the assigned flight track while maintaining the proper compass heading. The difference between early turns and drifts can can usually be observed. In a turn the aircraft's wing will be tilted down into the turn. During a drift the aircraft's wing will remain parallel to the ground and the nose parallel to the runway.

Premature turns and aircraft drifts generate a "single event" type of noise impact, which occurs on an intermittent basis. In relation to total aircraft operations the number of reported incidents appears limited; they do however represent a significant source of single event noise complaints. Residents of El Segundo offered testimony regarding this problem at the (October 1982) State of California Hearing for renewal of the LAX Variance from the State Noise Law. Testimony was given that overflights of the northwest quadrant of El Segundo were occuring on a daily basis, often more than once a day. However, residents were unable to distinguish whether these overflights were the result of premature turns or drifts. The resultant noise impact from either event is similar to receivers on the ground.

A. Empirical Observations

The fact that premature turns and drifts do occur is not arguable. However, based upon available documentation the frequency of these events is open for question. The Department of Airports Community Relations Office and Operations Bureau as well as the FAA Control Tower have received noise complaints from neighboring residents in the past. Currently, due to a recent reorganization, all complaints are now tabulated by Community Relations office of the Department of Airports. Initial review of this problem in January 1982 indicated that of the 13 total complaints received, two complaints related to premature turns or drifts were received from El Segundo and one complaint from Playa del Rey.

Residents of El Segundo, during a survey of soundproofed homes and the State Noise Law Variance hearings, have indicated that overflights of their community occur on a regular basis. One resident stated that, "the noise from the airport could be tolerated if it wasn't for the cheating," (e.g., overflights). This resident lives on Acacia Street, west of Main Street, five blocks south of the LAX boundary. Another resident of Hillcrest Street in El Segundo testified at the Variance hearings that approximately ten overflights had occurred in one day.

In order to quantify the frequency of overflights, the Department of Airports Noise Abatement Office initiated an overflight observation program. Noise Abatement personnel conducted a separate five-day survey for each runway complex at LAX. All 10 surveys were eight hours in duration (from 9:00 a.m. until 4:00 p.m.). The purpose of these observations was to estimate how many departing aircraft were turning early or drifting in violation of the LAX Aircraft Noise Abatement Procedures. The findings of the survey are summarized in Table One.

Based upon results of the survey the frequency of early turning and/or drifting aircraft is quite low. In 40 hours of observations in which 572 aircraft departed from Runway 24 complex, three drifts were observed which equates to 0.5 percent. Two of the three turns observed were intentional due to air traffic control procedures. (See Table One.) Forty hours and 802 observed departures from Runway 25 complex yielded five early turns of which all were general aviation aircraft. It is interesting to note that three of the five were general aviation jet aircraft.

B. Air Traffic Control Procedures

The FAA's Standard Instrument Departures (SID) Procedures of Los Angeles International Airport instructs pilots to, "Climb on a 250 degree heading for Vector". The Air Transport Association periodically reminds its member air carriers "of the continuing requirement at Los Angeles for adherence to the Runway Heading or 250 Degree Heading when departing Runways 24/25, with no turns prior to the shoreline or LAX VORTAC, unless cleared to do so by ATC, or dictated by an amergency situation, such as collision avoidance. A recent survey by the DOA-Noise Abatement Office indicated that the air traffic controllers include a reminder of these instructions to about 60 percent of the departing operations.

Examples of SIDs which became effective February 1983 for departures from runways 24/25 are provided on Figures One and Two.

TABLE ONE

OVERFLIGHT OBSERVATION PROGRAM RESULTS

Runway 24 Complex (north pair of runways)

	Date Surveyed	Aircraft Observed		Overflights	Airline and/or Type
1.	11/3/82	Jet - 82		-0-	--
		Prop - 20		-0-	--
2.	11/5/82	Jet - 85		1	Western B-727(*)
		Prop - 33		-0-	
3.	11/12/82	Jet - 98		1	Pacific Express BAC-111 (**)
		Prop - 35		-0-	--
4.	11/15/82	Jet - 86		-0-	--
		Prop - 38		-0-	--
5.	11/16/82	Jet - 60		-0-	--
		Prop - 35		1	Golden West Twin Otter
		Jet - 411			
		Prop - 161			
	Totals		572	3	

(*) Turned to avoid a low flying General Aviation aircraft traversing the shoreline area.

(**) Directed by Air Traffic Control to make an immediate right turn in order to execute a go-around.

Runway 25 Complex (south pair of runways)

	Date Surveyed	Aircraft Observed		Overflights	Airline and/or Type
1.	10/22/82	Jet - 118		-0-	--
		Prop - 40		-0-	--
2.	10/25/82	Jet - 158		-0-	--
		Prop - 38		1	Unidentified twin engine
3.	10/28/82	Jet - 111		3	All 3 general aviation
		Prop - 37		1	Unidentified general aviation
4.	11/4/82	Jet - 105		-0-	--
		Prop - 35		-0-	--
5.	11/5/82	Jet - 120		-0-	--
		Prop - 40		-0-	--
		Jet - 612			
		Prop - 190			
	Totals		802	5	

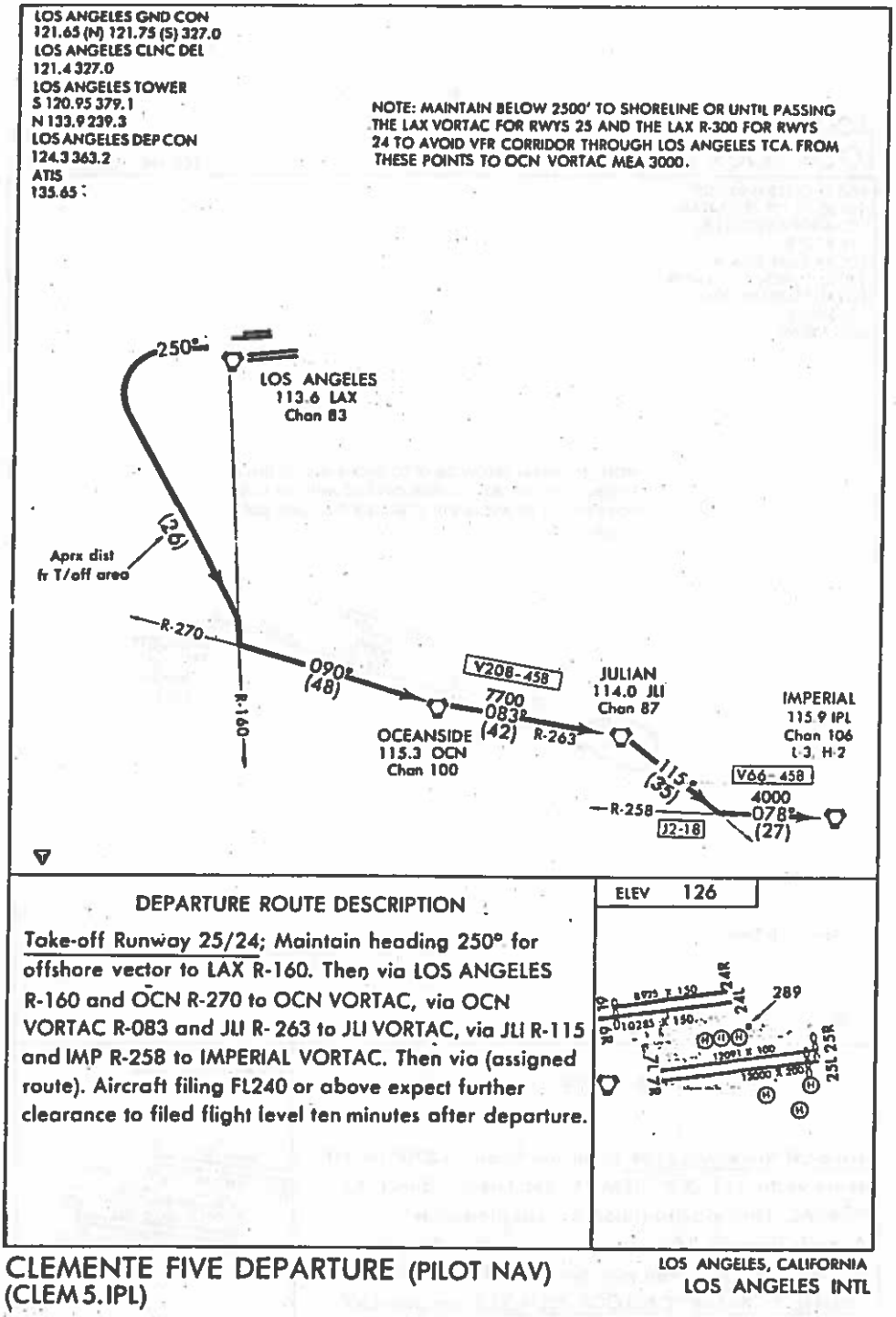


FIGURE ONE: CLEMENTE FIVE SID

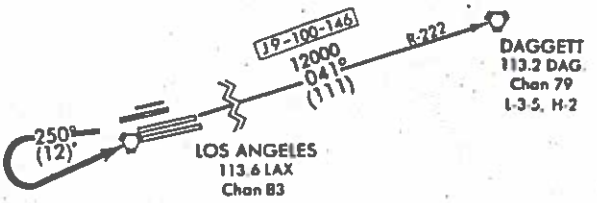
(LOOP4.LAX)

LOOP FOUR DEPARTURE (PILOT NAV)

LOS ANGELES INTL
LOS ANGELES, CALIFORNIA

LOS ANGELES GND CON
121.65 (N) 121.75 (S) 327.0
LOS ANGELES CLNC DEL
121.4 327.0
LOS ANGELES TOWER
(N)133.9 239.3 (S)120.95 379.1
LOS ANGELES DEP CON
124.3 385.4
ATIS 135.65

NOTE: MAINTAIN BELOW 2500' TO SHORELINE OR UNTIL PASSING THE LAX VORTAC FOR RWYS 25 AND LAX R-300 FOR RWYS 24 TO AVOID VFR CORRIDOR THROUGH LOS ANGELES TCA.



*Aprx dist fr T/off area

NOTE: USE THE OCEAN OR ORANGE DEPARTURE DURING THE PERIOD 2100-0700 LOCAL TIME IN LIEU OF THIS SID.

DEPARTURE ROUTE DESCRIPTION

Take-off Runway 25/24: Climb via heading 250° for off-shore vector to LAX VORTAC. Expect left turn direct LAX VORTAC. Then via (transition) or (assigned route).
Aircraft filing FL 240 and above expect further clearance to filed flight level ten minutes after departure.
DAGGETT TRANSITION (LOOP 4. DAG): From over LAX VORTAC via LAX R-041 and DAG R-222 to DAG VORTAC.

ELEV 126

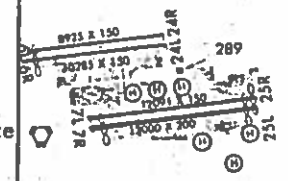


FIGURE TWO: LOOP FOUR SID

C. Noise Complaints

Complaints related to aircraft noise are received by the FAA Control Tower, the DOA Operations Bureau, and the DOA Community Relations Office which compiles a cumulative monthly noise complaint summary. Recently, the El Segundo Noise Abatement Committee has been submitting complaints received from their residents for inclusion in this monthly summary.

According to noise complaints summaries for the months of September, 1982 to January, 1983, the frequency of complaints regarding premature turns are extremely variable. The number of monthly premature turn complaints are summarized below in Table Two.

TABLE TWO

Summary of Premature Turn Complaints

	9/82	10/82	11/82	12/82	1/83
El Segundo	0	16	1	1	2
Playa del Rey	0	0	0	0	1

One El Segundo resident filed eleven complaints on October 7, 1982. Eight of these complaints were received during a one hour period from 2:30 p.m. to 3:30 p.m.

The Noise Complaint Summary Reports for the five month period referenced above is provided in Appendix B. During this period three residents of El Segundo filed 55 of the 72 complaints received or approximately 76 percent of the total. Twenty of the complaints related to premature turns or drifts. The other complaints were related to increases in takeoff noise and noise related to ground operation.

The incidents of premature turns from Runways 24L/R occur less frequently than those on the south according to the complaint records. This may be partially related to runway utilization patterns employed by the air traffic controllers as discussed below.

D. Airfield Operational Conditions

LAX has been involved in an extensive redevelopment program which included the reconstruction of the south runways 25L/R. The closure of runway 25R increased the departures on runway 25L. This operational adjustment which lasted over 12 months from October 1981 until October 1982 placed departing aircraft 750 feet further south, closer to El Segundo. That reduced distance also gave departing aircraft less space to drift before overflying El Segundo.

The complaint records in the preceding sections reflect a decrease in premature turn complaints after October, 1982. The air traffic controllers began utilizing runway 25R, the inboard south runway for a higher percentage of departures and the outboard runways, for arrivals in keeping with the established preferential runway utilization program developed to reduce noise impacts.

III. EXISTING CONTROL MEASURES

A. LAX Noise Abatement Procedures

The Board of Airport Commissioners on May 13, 1975 adopted the Los Angeles International Airport-Aircraft Noise Abatement Procedures. Section II--Traffic and Flight Procedures Part B(1)a, contains the following:

> "Takeoffs in a westerly direction due to the prevailing wind, is customary at Los Angeles International Airport. Except in an unusual situation or specific direction of ATC, pilots will be requested to:
>
> - Maintain runway heading until past the shoreline and reading 4,000 feet before making a right turn and 3,000 feet before making a left turn".

while the altitude provisions are advisory only and not reflected in the official FAA SID's. They do reflect and highlight the concern and sensitivity of the BOAC to the drift/premature turn issue.

B. Enforcement Procedures

The LAX Noise Abatement Procedures are a set of policies established by the Board of Airport Commissioners, which are administered by the General Manager with the support

of the Noise Abatement Office and City Attorney. Once a violation occurs, the Noise Abatement Officer contacts the chief pilot of the airline identified as violating the procedure. Implicit in this action is the availability of substantial evidence of the violation such as; eyewitness accounts including the air carrier name, aircraft type, aircraft tail number, etc. To date the chief pilots have been very cooperative once a letter of this type is received.

A chief pilot has a number of optional actions available to him. These include but are not limited to; a reminder of the existing procedures, a stern reprimand either verbal, written or both, and placement of a warning in the pilot's personnel file. Stronger actions are available should flagrant violations occur.

The Department of Airports does not have the authority to take punitive actions against a pilot of an aircraft once it is airborne. The sections of the State Noise Law covering single event impact penalties were struck down by court decision (Crotti vs. ATA). The authority to take punitive actions rests with the FAA. Through a lengthy process including public hearings it is possible for either the FAA's, Air Carrier, or General Aviation District Office to reprimand pilots who violate any part of Federal Aviation Regulation (FAR) or disregard a verbal instruction from the air traffic controller.

IV. ADDITIONAL FEASIBLE CONTROL MEASURES

A. Use of Existing Electronic Aids

The Department of Airports Noise Abatement Office, FAA, and Air Transport Association have held meetings to investigate the possible use of existing electronic navigational aids to help pilots maintain the course until the shoreline, and thereby reduce the chance for drifts to occur. The potential to utilize the localizers (LOC) at both ends of the same runways was the focus of this investigation. The LOC emits a radiation beam to guide aircraft along the centerline of the runway. Using the LOC on departure as well as arrival could aid the pilot in maintaining his assigned runway heading.

The FAA will not embrace this concept for the following reasons:

- Simultaneous opposite end ILS electronic emission on the same runway is contrary to ICAO and U.S. Regulations. The potential to waive these regulations is remote.
- Frequency overlap interference is created by simultaneous ILS transmissions with other aircraft.
- Interuption of radiation patterns due to aircraft holding short of the same runway cause de-coupling of the ILS.
- No additional frequencies are available in the Los Angeles Basin area for other additional electronic navigation aids.
- FAA Flight Standards representative had serious doubts that pilots could be required to employ electronic navigational references because of required attention to cockpit duties during takeoff and early climb phase until at least 200 above ground level.

The FAA concluded that there was no technically reliable procedure to electronically assist pilots to fly straight ahead with the reasonable accuracy required to avoid drifting during takeoff.

B. Photographic Surveillance

The photographic equipment to monitor departing aircraft on a 24-hour basis is currently available. A video recorder with a 24-hour tape would probably be sufficient. When a premature turn complaint is logged the tape could be reviewed to identify the violator.

C. Radar Monitoring

The radar system currently used in the control tower picks up departing aircraft at about 50 feet above the runway which coincides with the height of the antenna. Aircraft attain this height immediately upon liftoff which normally occurs approximately 7,500 to 8,500 feet from the east end of the runway for aicraft departing to the west.

However, by the time the air traffic controller can detect a premature turn on the radar screen, it cannot be prevented. The controller may however inform the pilot that he has deviated from his course and instruct him to correct. The controller will also inform the FAA Air Carrier or General Aviation District Offices, if in his judgement it is necessary.

D. Pilot Education Programs

An effective control measure may be a program to heighten the awareness of pilots operating at LAX regarding the sensitivity of the communities to premature turns. A program involving the distribution of advisory letters explaining the existing regulations and their importance could be initiated. The ATA, DOA-Noise Abatement and DOA-Public Relations Bureau should be involved in the development of this program.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

The assessment of premature turns and drifts has led to the following conclusions:

1. Overflights resulting from premature turns or drifts do occur, although the frequency of such events is quite variable.

2. Observed overlfights were predominantly general aviation aircraft departures.

3. The existing airport policies and air traffic control procedures to minimize premature turns are adequate.

4. Enforcement of both airport procedures and air traffic control procedures is needed on a continual basis to maintain heightened pilot awareness of this problem.

5. The closure and reconstruction of Runway 25R-7L (inboard south runway), forced increased usage of Runawy 25L-7R (outboard south runway) for departures putting aircraft 750 feet closer to residents on the south. An increase in premature turns and drifts related complaints coincided with the closure of 25R-7L.

6. The closure and reconstruction of Runway 25L-7R (outboard south runway) scheduled for April 1983 should temporarily reduce the potential for premature turns and drifts to the south.

7. A balanced preferential runway utilization system which would use the inboard runways predominantly for departures and outboard runways predominantly for arriving aircraft would appear to have the greatest potential to reduce this problem in the future. Once, the reconstruction of the south runway complex is complete this runway utilization system can be employed.

8. Premature turns, unless so instructed, are a violation of the airport noise abatement procedures and Federal Aviation Regulations, with enforcement procedures available. Drifts are less controllable and under existing operating parameters will continue to occur.

B. Recommendations

The following recommendations are divided into two levels of intensity. Recommendations 1 through 3 should prove adequate to mitigate this problem. If however aircraft overflights continue to be a problem Recommendations 4 through 6 could be implemented.

1. Review of current noise abatement departure procedures should be initiated to explore the potential to modify these procedures to minimize premature turns and drifts. FAA Flight Standards and the Air Transport Association participation would be required to adequately address the effect of any suggested modification on safety, airspace utilization and noise generation.

2. The FAA air traffic controllers should be requested to continue reminding departing pilots of the SID requirements.

3. Communications with chief pilots regarding violations by aircraft of their company should continue on an as needed basis. Airlines with good and/or improving records should also be informed. The ATA may be the proper conduit for this acitivity.

4. Periodic overflight observation programs designed and coordinated with community participation should be initiated. The DOA Public Relations Bureau along with ALPA and the ATA should participate in this type of program.

5. Develop a Pilot Information Program using advisory letters to establish an ongoing dialogue to heighten pilot awareness of the noise impact problem. The DOA Public Relations Bureau and Noise Abatement office along with the ATA, ALPA and general aviation pilots associations should all participate in this program.

6. The need to increase monitoring in the communities exposed to premature turns and drifts should be evaluated. The monitoring equipment to be considered could include video recorders or some other type of automated monitoring equipment which would immediately alert the FAA that a premature turn or drift event was in progress.

VI. APPENDIX A - BIBLIOGRAPHY

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Federal Aviation Administration, Advisory Circular 91-53 Pilot Guidelines for Reduced Noise Takeoffs October, 1978

Personal Communications:

Walter V. Collins - DOA Noise Abatement Officer
Ivan Hunt - FAA-LAX Tower Chief
Jim Partridge - FAA-LAX Tower
George Carver - ATA Regional Office

VII. APPENDIX B - NOISE COMPLAINT SUMMARY REPORTS

LOS ANGELES INTERNATIONAL AIRPORT

NOISE COMPLAINTS

September 1982

CITY	NUMBER OF COMPLAINTS
El Segundo	5
Inglewood	3
Ladera Heights	4
Playa del Rey	1
San Pedro	1
Westchester	6
TOTAL NOISE COMPLAINTS	20

BREAKDOWN OF NOISE COMPLAINTS

NAME AND ADDRESS	DATE AND TIME	NATURE OF COMPLAINT
EL SEGUNDO		
[redacted]	9/2 - 1018	Noisy Takeoff
	9/13 - 2012	Low Flying Aircraft
	9/14 - 1036	Low Flying Aircraft
[redacted]	9/8 - 1300	Noisy Takeoff, Increase in Noise on 25L
[redacted]	9/3 - 1235	Increase in Noise
INGLEWOOD		
[redacted]	9/22	Increase in Noise
[redacted]	9/20 - 0100	Engine Run-Up on North Side
[redacted]	9/22 - 1630	Low-Flying and Very Loud Aircraft - continuous

NAME AND ADDRESS	DATE AND TIME	NATURE OF COMPLAINT
LADERA HEIGHTS		
[redacted]	9/1 - 1522	Increase in Noise
[redacted]	9/1	Increase in Noise
[redacted]	9/1 -1430	Increase in Noise on North Runway
[redacted]	9/1	Increase in Noise
PLAYA DEL REY		
[redacted]	9/1 - 1055	Engine Runups
SAN PEDRO		
[redacted]	9/29 - 0955	More Jets Overhead - See and hear more frequently
WESTCHESTER		
[redacted]	9/7 - 1430	Increase in Noise for Past 4 - 6 Weeks
[redacted]	9/27 - 1530	*Low Flying Helicopter
[redacted]	9/27 - 1550	*Low Flying Helicopter
[redacted]	9/17 - 1550	*Low Flying Helicopter
[redacted]	9/27 - 1555	*Low Flying Helicopter

* Same incident
Photo mission - Hughes

LOS ANGELES INTERNATIONAL AIRPORT

NOISE COMPLAINTS

October 1982

CITY	NUMBER OF COMPLAINTS
El Segundo	46
Hawthorne	1
Inglewood	1
Playa del Rey	3
Westchester	2
TOTAL NOISE COMPLAINTS	53

BREAKDOWN OF NOISE COMPLAINTS

NAME AND ADDRESS	DATE AND TIME	NATURE OF COMPLAINT
EL SEGUNDO		
[redacted]	10/04 - 2315	Noisy Takeoff
	10/04 - 2317	Loud Noise
	10/05 - 1430	Loud Noise, Vibration
	10/05 - 1440	Loud Noise
	10/05 - 1508	Loud Noise
	10/06 - 0723	Noisy Takeoff
	10/06 - 1158	Noisy Takeoff, Short Turn
	10/06 - 1450	Noisy Takeoff
	10/07 - 0850	Noisy Takeoff
	10/07 - 0919	Noisy Takeoff, Short Turn
	10/07 - 0940	Noisy Takeoff, Short Turn
	10/07 - 1430	Loud Noise, Vibration
	10/07 - 1436	Noisy Takeoff
	10/07 - 1444	Noisy Takeoff - Short Turn
	10/07 - 1452	Noisy Takeoff

NAME AND ADDRESS	DATE AND TIME	NATURE OF COMPLAINT
EL SEGUNDO, cont.		
[redacted]	10/07 - 1500	Loud Noise, Vibration
	10/07 - 1503	Noisy Takeoff
	10/07 - 1515	Loud Noise, Vibration
	10/07 - 1522	Noisy Takeoff
	10/07 - 1536	Noisy Takeoff
	10/07 - 1717	Loud Noise, Vibration
	10/07 - 1744	Loud Noise, Vibration
	10/08 - 0904	Noisy Takeoff
	10/08 - 0930	Noisy Takeoff
	10/08 - 1045	Noisy Takeoff
	10/08 - 1046	Noisy Takeoff
	10/08 - 1051	Noisy Takeoff
	10/08 - 1150	Noisy Takeoff
[redacted]	10/23 - 1011	Noisy Takeoff - Short Turn
	10/04 - 1107	Increased Noise - Short Turns
	10/04 - 1430	Loud Noise, Vibration
	10/04 - 1909	Noisy Takeoff
	10/04 - 2317	Noisy Takeoff
	10/06 - 0812	Noisy Takeoff
	10/06 - 1524	Noisy Takeoff
	10/07 - 1114	Increased Noise - Short Turns
[redacted]	10/01 - 0940	Noisy Takeoff
	10/08 - 2300	Loud Noise
	10/12 - 0200	Loud Noise

NAME AND ADDRESS	DATE AND TIME	NATURE OF COMPLAINT
El Segundo, cont.		
[redacted]	10/08 -1130	Low Flying Aircraft
[redacted]	10/08 - 2015	Engine Runups
[redacted]	10/08 - 2145	Engine Runups
[redacted]	10/13 - 1630	Low Flying Aircraft
[redacted]	10/28 - 1925	Loud Noise
[redacted]	10/28 - 1930	Noisy Takeoff
[redacted]	10/28 - 1930	Noisy Takeoff
HAWTHORNE		
[redacted]	10/22 - 0905	Increase in Noise
INGLEWOOD		
[redacted]	10/1 - 0900	Low Flying Aircraft
PLAYA DEL REY		
[redacted]	10/05 - 1435	Engine Runup
[redacted]	10/13 - 0400 - 0930	Heavy Use on North Runways
[redacted]	10/22 - 1528 - 1530	Loud Noise
WESTCHESTER		
[redacted]	10/04 - 1930 - 2130	Helicopter Noise
[redacted]	10/13 - 0200	Loud Noise

LOS ANGELES INTERNATIONAL AIRPORT

NOISE COMPLAINTS

November 1982

CITY	NUMBER OF COMPLAINTS
El Segundo	3
Inglewood	1
TOTAL NOISE COMPLAINTS	4

BREAKDOWN OF NOISE COMPLAINTS

NAME AND AOORESS	DATE AND TIME	NATURE OF COMPLAINT
EL SEGUNDO		
[redacted]	11/11 - 1026	Short Turns
	11/28 - 1923	Loud Noise
[redacted]	11/15 - 0920	Low-Flying Aircraft
INGLEWOOD		
[redacted]	11/1 - 0815	Loud Noise

LOS ANGELES INTERNATIONAL AIRPORT

NOISE COMPLAINTS

December 1982

CITY	NUMBER OF COMPLAINTS
El Segundo	13
Inglewood	1
Westchester	1
TOTAL NOISE COMPLAINTS	15

BREAKDOWN OF NOISE COMPLAINTS

NAME AND ADDRESS	DATE AND TIME	NATURE OF COMPLAINT
[redacted]	12/1 - 2255 to 2340	Loud Noise from Imperial Terminal
	12/17 - 0130	Loud Noise
	12/17 - 0441	Loud Noise
	12/17 - 0505	Run Ups
	12/18 - 2240	Run Ups
	12/23 - 0145	Noisy Takeoff
	12/26 - 2300 to 12/27 - 0210	Loud Noise
	12/28 - 0000 to 0200	Loud Noise, Run Ups
[redacted]	12/1 - 2340	Loud Noise from Imperial Terminal called on behalf of Mr. [redacted]
[redacted]	12/06 - 0840	Low Flying Aircraft
[redacted]	12/10 - 0600 to 0700	Run Ups
[redacted]	12/13 - 1053	Eary Turn
[redacted]	12/13 - 2450	Loud Noise

SECTION V

HELICOPTER ACTIVITY

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I. INTRODUCTION

Helicopter noise is considered to be the most important characteristic influencing where and how rotorcraft may be used, especially in urban areas. Helicopters fly low and are almost always within the audible range of people. Further, the helicopter is the only type of aircraft that can take off and land within a city environment. Therefore, even if the noise is at a relatively low level, it can take place in proximity to where people live and work. This creates the paradox in the features that make the helicopter uniquely useful, that is, brings the helicopter close to people, and this closeness accentuates the problems associated with helicopter noise. Yet, helicopter noise must be controlled so that it is acceptable to the communities in which it operates.

The noise footprint of a helicopter during approach, landing, take off, and departure is considerably less intense than that of a fixed wing airplane. The smaller region associated with the helicopter can be attributed to two causes, first, the helicopter emits less noise than the airplane, and second, it can approach and depart its landing area at higher angles. However, the airplane noise footprint is normally associated with an airport which is typically, but not always, at substantial distances from population centers, whereas the helicopter noise frequently is within the community.

While helicopter noise is considerably less intense than aircraft noise, it has a unique signature that readily identifies its source. The dominant feature of this noise in many helicopters is a pulsating sound called blade slap. This sound is generated by the main rotor, and normally pulsates rhythmically at a frequency somewhat higher than one cycle per second. The reduction of blade slap noise has been the subject of considerable study and research, directed at both rotor design and establishing flight profiles that minimize this particular noise. Regarding rotor design, the increasing trend to shift from 2 to 4 blade rotors will tend to reduce this type of noise. The 4 blade rotors can be shorter to provide equivalent lift, and the resulting lower tip speeds will reduce the compressibility contribution to blade slap. New blade shapes will also tend to reduce these pulsations. Furthermore, since blade slap caused by the strong interaction of the rotor blades with wake vortices is related to flight conditions, helicopter flight procedures and routings that avoid populated areas during approach and departure can be used to substantially reduce the effect of this phenomena.

A. Purpose and Scope

The purpose of this report is to examine the reality and perception of helicopter operations, answer questions that were raised by local citizens at public meetings and discuss the capability, technology, opportunities and benefits associated with helicopter operations.

B. History and Future

The civilian use of helicopters has increased significantly since 1960 and is expected to continue to increase in response to new and growing transportation needs. These needs have already resulted in strong growth rates in helicopter fleets, in heliports (mainly privately owned), and in operators, with some years seeing growth rates of 10 to 18 percent in the helicopter fleet. For those applications where the helicopter is uniquely qualified, it has made and will continue to make, important contributions to society. The public service roles of fire rescue, medical evacuation and sea rescue are paramount examples.

Present helicopter designs have incorporated new improvements in performance, realiability, quietness, and vibration reduction over previous designs. For the first time, helicopters have been specifically designed for the civil markets and for civil environments and there will be increased near-term use of these rotorcraft for various transportation purposes. Rotorcraft capabilities should grow significantly during the next decade as continued improvements are made in performance, cost of operations and noise reduction.

Over the past decade, a number of commercial applications have also grown remarkably. The transportation of crews and cargo to offshore oil rigs is a primary example. Based almost entirely on the offshore transportation role, one company has grown to be one of the largest aircraft operators in the entire aviation field including the airlines.

Since 1980, helicopter growth in the United States has been growing about 15 percent per year. While much of this has come from the growth in the use of helicopters to support offshore oil operations, there have been definite increases in most of the modes of air transportation, such as business/corporate, public service, construction, and forestry.

Perhaps the primary reason for the overall rapid growth is the technical and operational improvements in helicopters. The reduction in noise and vibration, the increase in

performance (speed, comfort and safety), and the vastly improved instrument flying capability are all important contributors. In essence, the helicopter is rapidly becoming a viable and important means of transportation.

Additionally, some trends have been taking place in air transportation that may significantly improve the opportunity for the helicopter to be used for public transportation. It has been recognized for some time that there will be few if any new airports to service large urban centers. The real estate to build such airports is simply not available or the land costs are prohibitive. Furthermore, many of the present major hub airports are nearing their maximum air traffic capacity. Thus there are very few solutions for handling any dramatic increases in demand for air transportation using conventional fixed wing airplanes. Some of this demand may be accommodated by helicopters through the use of heliports within the communities themselves and dedicated heliports at conventional airports. In essence, the technology has improved to the point that the helicopter offers realistic alternatives for public transportation that can relieve some of the load at major airports.

One significant barrier to the achievement of this helicopter transportation solution is the lack of public use heliports. In other forms of transportation (aircraft and cars), the needed services and facilities (airports and roads) were built in anticipation of increased traffic. This has not been the case for helicopters. It is possible, however, that if community planners, and the public in general, became more aware of the current and future improved capabilities and characteristics of helicopters, this situation may change. This could produce an environment leading to more public use heliports and that, in turn, would enable the helicopter to fulfill some of the increased demand for transportation that is forecast.

II. DESCRIPTION OF MAJOR ISSUES

A. Community Perceptions

The following is a list of community comments that were told to staff members at public hearings regarding the scope of work of the ANCLUC study as it relates to helicopters.

- Nighttime helicopter operations and heavily loaded helicopters should be prohibited.

- What are the regular flight corridors for helicopters?
- Helicopter flight tracks should not be over residential areas.
- There should be noise limits for helicopters like there are for airplanes.
- There should be no increase in the number of helicopter operations and both helicopters and general aviation aircraft should be discouraged at LAX.
- There appears to be no apparent routes or altitude regulations for helicopters.

B. Helicopter Facilities and Operations at LAX

Los Angeles International Airport is the only public-use heliport within the ANCLUC Study area. The term "public use heliport" is applied to any heliport that is open to the general public and does not require prior permission of the owner to land. However, the extent of facilities provided may limit operations to helicopters of a specific size or weight. A public use heliport may be owned by a public agency, an individual, or a corporation so long as it is open for public use.

Helicopters operate around the Los Angeles area on a regular basis using Visual Flight Rules (VFR), maintaining visual contact with the ground. Normally the operators overfly freeways and major roadways for both ease of navigation and for noise considerations. To avoid conflict with other helicopters, pilots usually fly to the right side of the roadway.

A common helicopter radio frequency is used in uncontrolled airspace so the pilots may advise others of their position and intentions. When approaching controlled airspace, pilots will use the published frequency for the facility responsible for that area.

Helicopters normally operate under Visual Flights Rules (VFR). When operating at or near an airport with an operating control tower, VFR separation is provided by the control tower within the Airport Traffic Area (ATA).

When weather at the airport is less than basic VFR (ceiling less than 1,000 feet and/or visibility less than three miles) the airport's Control Zone becomes effective and Special VFR

rules then apply. Routes are specifically designated and additional separation rules are applied.

Around Los Angeles International Airport, positive control procedures are applied when helicopters operate within the Terminal Control Area (TCA). VFR and SVFR are applied depending on the weather at the airport. Additional separation with fixed wing aircraft operating within the TCA is provided for the helicopters. Helicopters operating outside of designated areas are required to operate under Federal Air Regulations and are not provided specific Air Traffic Control Service.

Routes in and around Los Angeles International are handled in several ways. First, recommended routes are published in the VFR HELICOPTER CHART, Los Angeles and Vicinity dated August 7, 1980. These routes are for use in VFR conditions. All routes are used by Air Traffic Control for helicopter operations in controlled airspace. From time to time, nonstandard routes may be designated by Air Traffic Controllers for use into and out of the Airport Traffic Area. The following is a list of commonly used nonstandard routes.

- Imperial Highway between the San Diego Freeway and the Harbor Freeway.
- Manchester Boulevard between Sepulveda and the shoreline at Ballona Creek.
- Along the shoreline between Imperial Highway and Marina del Rey.

Some helicopters in the Los Angeles Area are capable of operating under Instrument Flight Rules (IFR). These helicopters are handled the same as fixed wing aircraft. The arrival and departure routes follow the same path as the fixed wing flights. These procedures are normally used when the weather prohibits VFR or Special VFR operations.

Currently there are about 50-56 helicopter operations per day at LAX. This number includes both commercial and private operations. The majority of helicopter operations at LAX are private passenger operations.

Within the past year, several helicopter firms have approached the airport to initiate regularly scheduled passenger operations. The two companies that seem to be the farthest along in the process of starting operations are Airspur and Calex. Airspur is proposing scheduled helicopter passenger service between LAX and Orange County. Airspur will operate Westland 30 helicopters, a twin engine helicopter manufactured

in the United Kingdom. The Westland 30 features the Rolls Royce GEM 41 engine and is configured for a 16 passenger standard airline interior.

Airspur is planning to start service with 32 operations per day. The flight path between Orange County and LAX will follow existing helicopter transportation corridors at an altitude of 1500 feet. Helicopters will approach LAX from the south along Sepulveda Boulevard veering to the heliport site after crossing the Airport boundary. Market forecasts predict that load factors should about 65 percent or about 10 passengers per flight.

Calex is also proposing scheduled passenger service. Calex will operate Bell 206L-1 helicopters between Burbank and LAX. The 206L is a jet engine helicopter manufactured in Fort Worth, Texas by Bell Helicopter Textron. The helicopter will be configured for seven passengers in a standard executive type interior.

Calex will conduct 22 operations per day with a load factor of about three or four persons. Flight paths will be along existing transportation corridors with helicopters approaching LAX from the north along Sepulveda Boulevard, then veering to the heliport site after crossing the Airport boundary.

In each case, the Department will require the applicant to show that their proposed operations will not increase the existing noise contours of LAX.

C. Heliports within the Study Area

There are approximately nine heliports within the ANCLUC Study Area. (See Figure 1.) Eight of the nine are private and only the heliport at LAX is open for public use. The term "private use heliport" is applied to any heliport that restricts usage to the owner or to persons authorized by the owner. Most private use heliports are owned by individuals, companies, or corporations. However, a heliport designated as "private use" may be owned by a public body. In this case, the private use classification is applicable because the facility is restricted to a specific type of user, such as the police department, or because the owner requires prior permission to land. Hospital heliports are considered private use facilities since operations are normally restricted to medical related activities. The Regulation of heliports varies with the local jurisdiction. However, private use heliports may be restricted as to the size and type of helicopters utilizing the facility, hours of operation, and total number of operations.

Los Angeles International Airport

NOISE CONTROL AND LAND USE COMPATIBILITY STUDY

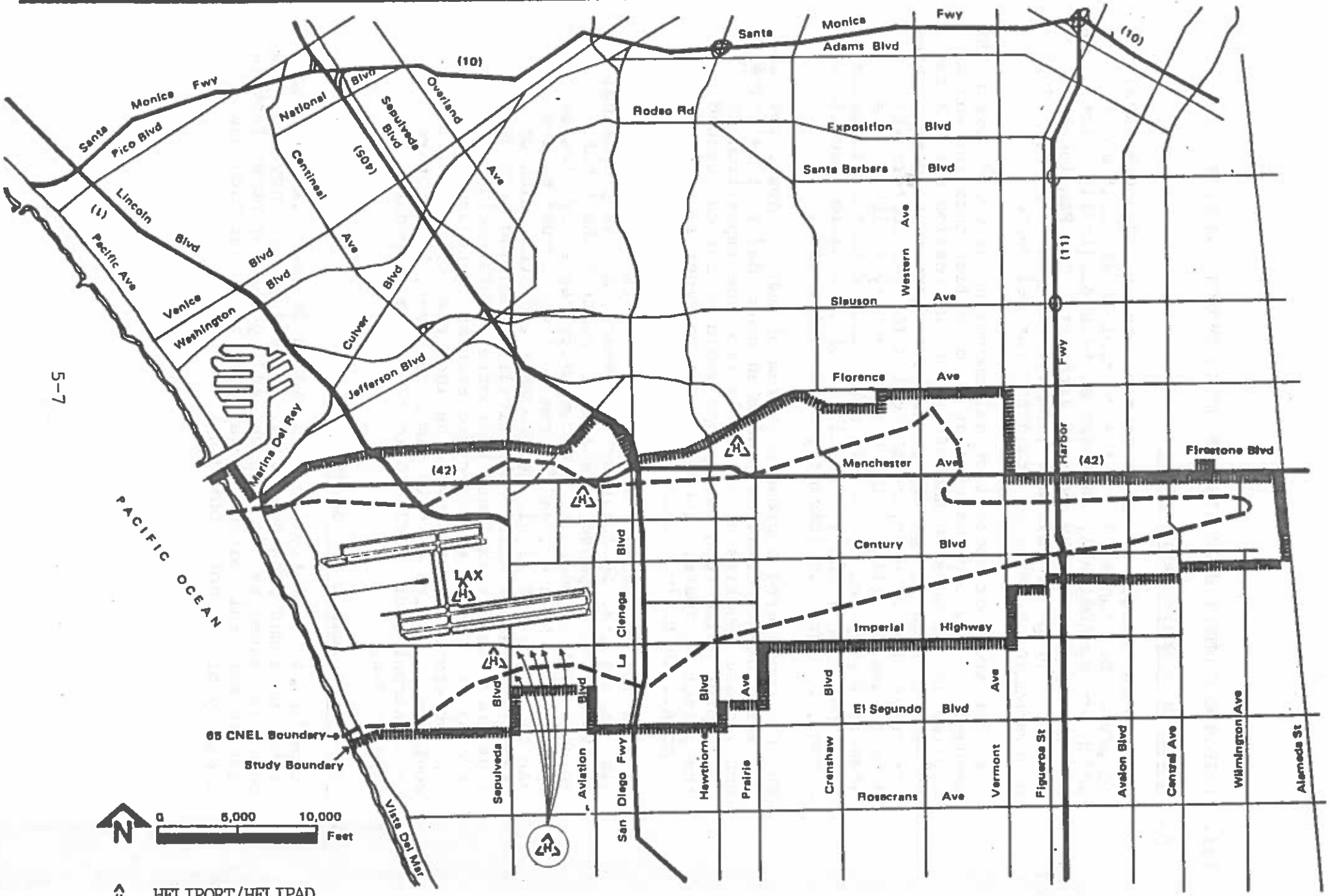


Figure 1

III. EXISTING CONTROL MEASURES AND NOISE IMPACT ANALYSIS

A. Helicopter Noise Regulations

The FAA is charged by Noise Control Act of 1972 (PL92-574) to prescribe standards for the control of aircraft noise which are economically reasonable, technologically practicable, and appropriate to the type of aircraft. The FAA issued a Notice of Proposed Rulemaking (No. 79-13) on July 19, 1979, proposing noise emission standards for helicopters.

The standards for control of helicopter noise would govern the issuance of new type certificates for helicopters for which application is made on and after the publication date of the above notice and original, standard airworthiness certificates for restricted category certificates for helicopters which do not have any flight time before January 1, 1985. The standards proposed by the FAA were similar to the standards developed within the International Civil Aviation Organizataion (ICAO), but are significantly more restrictive.

The FAA considered a broad spectrum of public input, reviewed all available information, and then concluded that relatively small noise benefits would result from the imposition of helicopter noise regulations and would be far outweighed by the potential costs. Therefore, on December 17, 1981 the proposals in Notice 79-13 were withdrawn.

In addition to aircraft noise emission standards, the FAA also is required by Congress to prepare, and is preparing, environmental response standards to control the total noise energy exposure to the community caused by aircraft operations. However, an interim rule was issued by the FAA on January 26, 1981, Development and Submission of Airport Operators Noise Compatibility Planning Programs that specifically excluded heliports. This exclusion was made by the FAA at the specific request of helicopter manufacturers, who believed the inclusion of heliports would be premature at this time. However, helicopters using airports are included in the noise response regulations.

1. Noise Measurement Standards

Sound levels normally are measured in decibels relative to a reference sound pressure level. However, the annoyance of a sound is caused by its pressure and by several other factors such as spectral content, tonal qualities, duration and rapidity of the noise build-up.

The spectral content probably is the most significant contributor to noise annoyance. For example, the ear is considerably more sensitive to sounds centered near a frequency of 1000 cycles per second, than to sounds of equivalent pressures at lower frequencies. The tonal qualities also affect annoyance, since pure tones such as tail rotor whine are more disturbing than wide band noise of equivalent pressure centered on the pure tone frequency. The duration of the tone also affects annoyance, the longer the tone the greater the annoyance. The rise time of the noise is another annoyance factor, since a rapid rise in sound pressure causes a greater annoyance than a gradual rise.

There is a unique noise identified as blade slap, emitted by some helicopters under particular flight conditions. It causes an increased annoyance that is partially, but not fully, accommodated by current measurement standards. This noise can occur during descent or hover from the strong interaction between the main rotor blades and the wake vortices. It also can be caused by compressibility effects from high tip speeds of the advancing blade.

Two measurement standards have merged from a maze of candidates as the standards for helicopter noise measurement. These are the effective perceived noise (EPNdB) for vehicle noise emission, and the noise level corrected for daytime/nighttime noise events (L_{dn}) for environmental response. The L_{dn} is the A-weighted values of the noise spectrum emitted by the helicopter, identified as dBA, corrected for the numbers and times of noise events occurances.

Helicopter noise certification using EPNdB test instruments is an extensive and costly process. The quantities of these instruments that would be required for noise measurements at small airports and heliports throughout the United States would make the use of EPNdB instrumentation for that purpose economically prohibitive. Furthermore, communities have measured noise from various transportation and other sources for many years using the dBA unit. Therefore, helicopter noise measured in this unit can be more easily compared to noise associated with other transportation vehicles. The noise metric EPNdB has been selected by the FAA as the helicopter noise emission standard, and L_{dn} which is computed from dBA measurements has been selected as the environmental response standard. California has adopted the Community Noise Equivalent Level (CNEL) as the official noise metric. The CNEL is almost the same as the L_{dn} except the L_{dn} adjusts noise for two time periods--7:00 a.m. to 10:00 p.m. and 10:00 p.m. to 7:00 a.m. while the CNEL uses three time periods--7:00 a.m. to 7:00 p.m., 7:00 p.m.to 10:00 p.m., and 10:00 p.m. to 7:00 a.m.

2. Helicopter Noise Sources

Helicopter acoustic technology is considerably more complex than that of fixed wing aircraft, since there are more noise sources.

(a) Main rotor

The primary source of helicopter noise is the main rotor and is caused by variable loads, both periodic and random, on the rotor lifting surfaces. Blade interaction also provides a substantial noise contribution, when a blade moves through the atmospheric disturbance caused by the preceding blade. The main rotor also can generate the annoying blade slap noise, from interaction effects at lower speeds and compressibility effects at high top speeds.

(b) Tail rotor

The tail rotor, required for single main rotor helicopters, is a substantial noise generator. Its spectrum includes annoying narrow band tones, and also fluctuating noises caused by the interaction of the tail rotor and main rotor flow fields.

(c) Power Plant

Helicopter noise normally is dominated by main tail and rotor sources. However, piston engines, and gas turbines that produce strong compressor tones or exhaust noises, can be substantial noise sources.

(d) Others

Other helicopter noise sources, such as gear trains and structural vibration, normally are lesser and non-interactive noise contributors, and can be treated on a component basis.

3. Helicopter Noise Reduction

In an urban environment there are four approaches to the reduction of the environmental impact of helicopter noise annoyance. These are heliport location, scheduling, flight patterns, and acoustic technology. These approaches are not mutually exclusive, and all should be applied to achieve the desired results.

The scheduling should emphasize, where feasible, daytime operations, particularly when other environmental noise are high such as at maximum ground traffic times. The subjective aspects of noise annoyance are lowest during daytime activities,

and relate to the difference in level between the particular sound and the prevailing ambient level.

The flight tracks should be directed, where feasible, over ground regions having a high noise ambient level such as major highways. For example, passengers in a car among diesel truck traffic probably would not be annoyed by, and possibly not even aware of, helicopter overflights. Flight procedures should be used that minimize blade slap.

Main rotors are the most significant contribution to helicopter noise annoyance. Design features now being examined to decrease this noise are rotor radius, blade chord, blade numbers, and rotor speed. Turbo engine noise is dominated by exhaust radiated components, and cost effective mufflers are being designed to reduce this annoyance. The operational implementation of noise reduction technology is gradual, since each improvement is weighed against performance requirements and life cycle costs.

B. LAX Helicopter Noise

Currently most helicopter noise as it relates to the Airport's CNEL contours, is masked by the large number of jet air carrier operations. The standard helicopter routes around LAX are shown on Figure 2.

The CNEL impacts associated with the additional helicopter operations proposed by Airspur and Calex are shown in Figures 3 and 4.

The Community Noise Equivalency Level (CNEL) although a good measure of the average amount of noise received at a particular location over a 24-hour period, does not adequately address the unique and disturbing characteristics of helicopter noise. The Federal Aviation Administration (FAA) is currently developing helicopter noise measurement techniques and related community noise level responses.

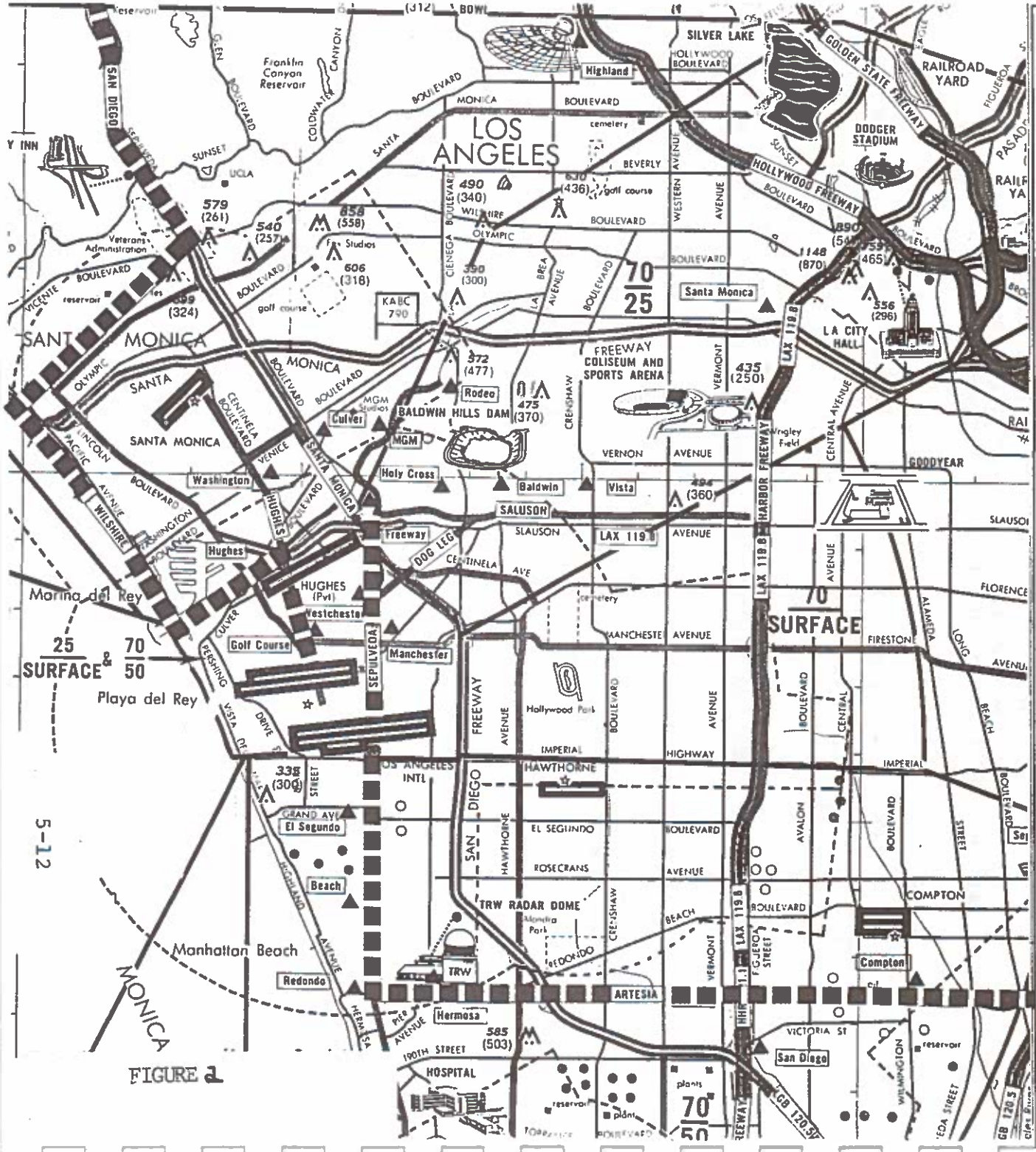


FIGURE 2

VFR HELICOPTER AERONAUTICAL CHART

LOS ANGELES AND VICINITY

SCALE 1"=2 NM

5TH EDITION August 7, 1980

This chart will become OBSOLETE FOR USE IN NAVIGATION upon publication of the next edition. Consult Dates of Latest Editions

Airport

Heliport

Obstructions
(250 feet AGL and above)

450 (360) Elevation of the top above mean sea level (Height of the structure above ground)

KABC 790 — Commercial Broadcast Stations

Willowick — Intersecting & Reporting Points

Principal Routes

Route Name — Control Tower Frequency

GARDEN GROVE — SLI 123.85

Secondary & Military Routes

Concrete Banked River

Terminal Control Area

70 — Ceiling of TCA in hundreds of feet MSL

60 — Floor of TCA in hundreds of feet MSL

Control Zone

Pictorial Graphic

LA CITY HALL

● Dot Indicates Geographic Location of Pictorial Graphic

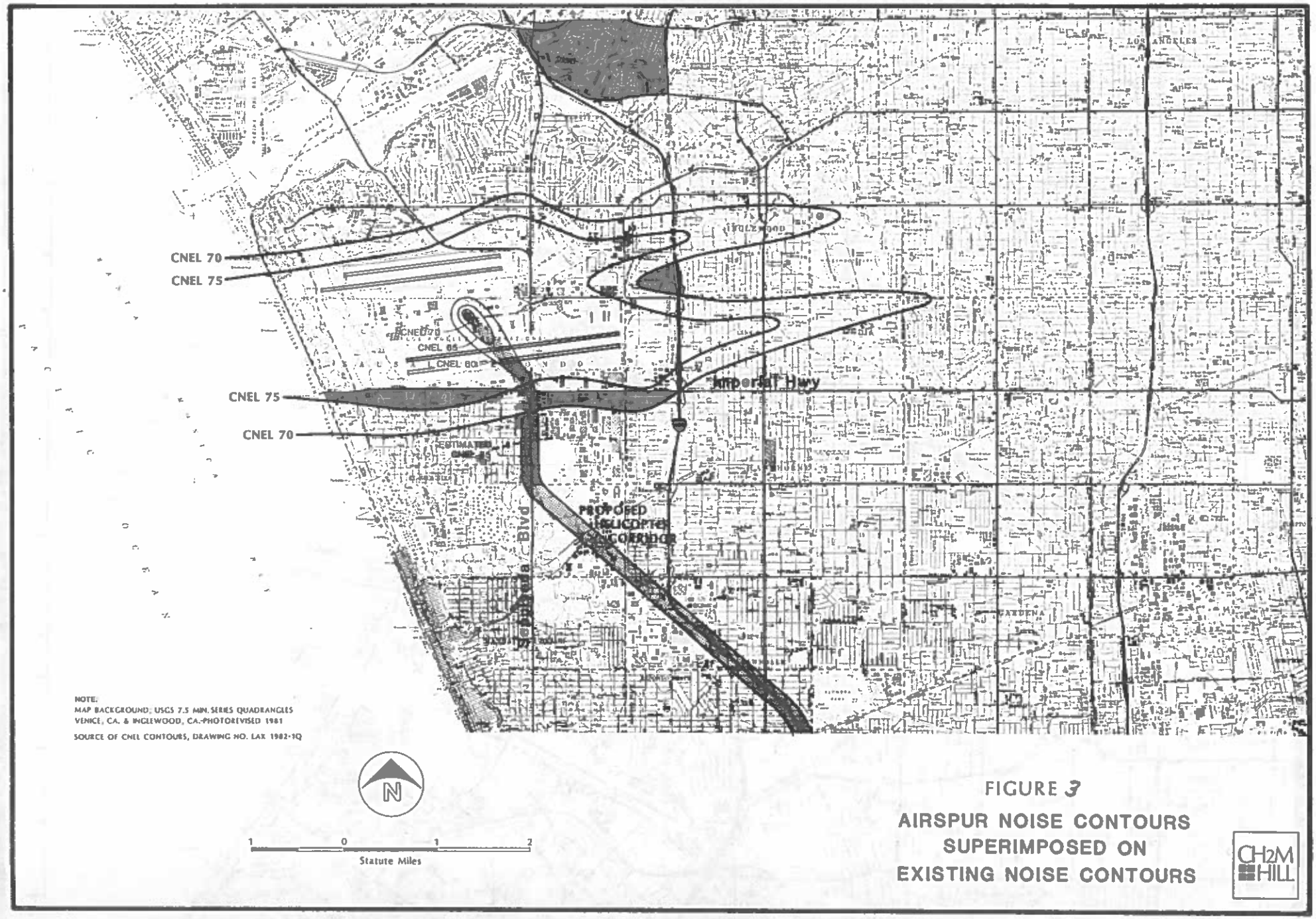


FIGURE 3

AIRSPUR NOISE CONTOURS SUPERIMPOSED ON EXISTING NOISE CONTOURS

CH2M HILL

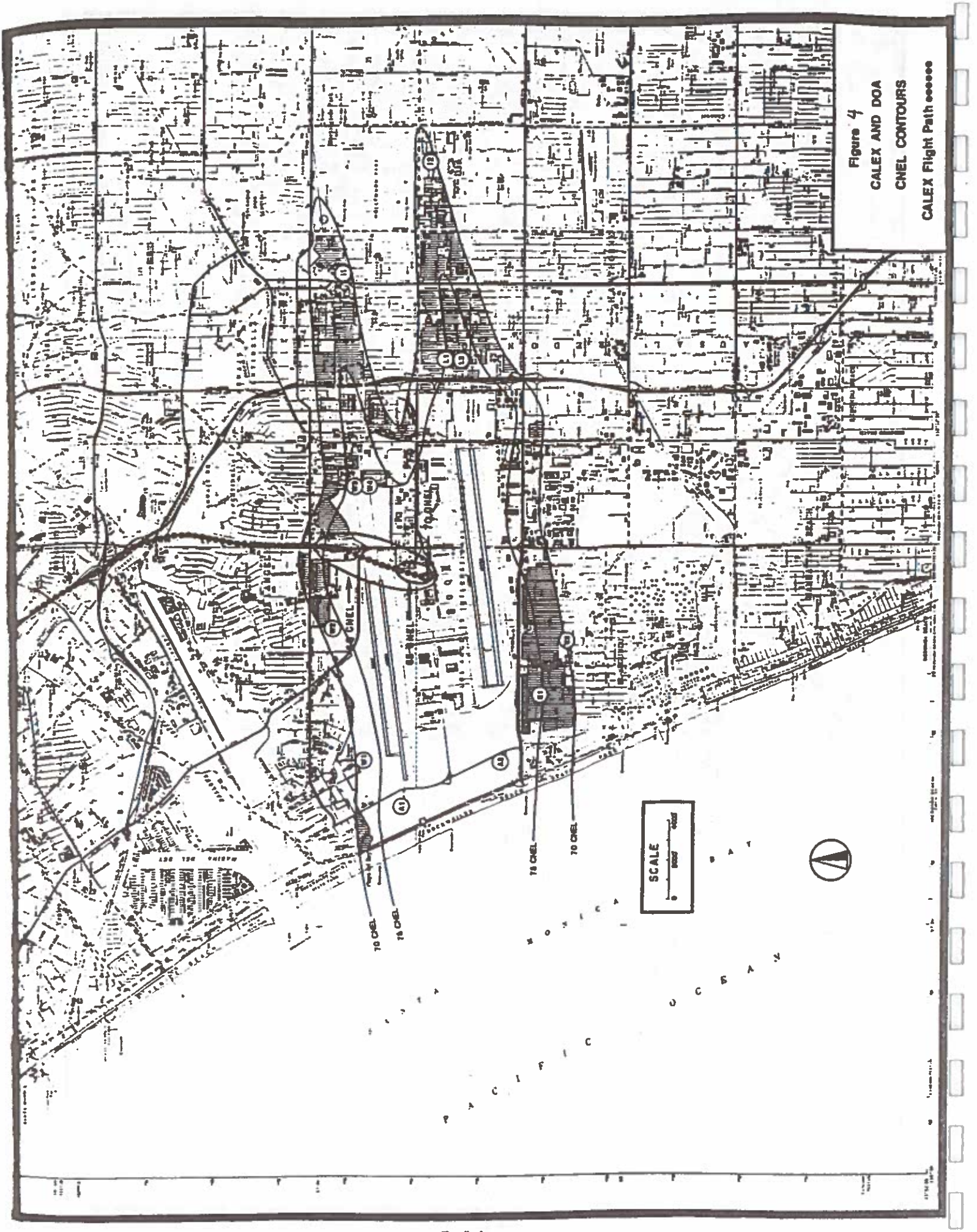


Figure 4
CALEX AND DOA
CNEL CONTOURS
CALEX Flight Paths
70 CNEL
70 CNEL
70 CNEL
70 CNEL
SCALE
PACIFIC OCEAN

IV. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. Helicopter Use at LAX

a. There is the real potential for a significant increase in the number of regularly scheduled helicopter operations at LAX.

b. As of September 1, 1983, the BOAC had not adopted a helicopter operating policy.

c. Current and projected helicopter operations do not influence the CNEL contours of the Airport.

d. Helicopter noise characteristics significantly differ from those of fixed wing aircraft. Accordingly, the level of intrusion is not adequately measured by the CNEL noise metric.

2. Helicopter Impact on Surrounding Communities

a. Private use helistops within the LAX ANCLUC study area have been significantly increasing.

b. Uniform policies or regulations do not exist for control and operation of private use helistops within communities surrounding LAX.

c. Helicopter overflight is a significant source of intrusion in the communities adjacent to LAX.

d. Helicopter operations within the communities surrounding LAX are not always under direct FAA tower control.

3. Regional Impact of Helicopters

a. There is no region-wide plan or policy for the development of an integrated system of public use heliports.

b. There is no regional effort to coordinate the activities of local jurisdiction relative to establishment of private use heliports.

4. Federal Helicopter Standards

a. Definitive helicopter noise standards at the federal level have not yet been prepared (i.e., helicopters are not considered under FAR part 36).

b. Advisory helicopter routes as defined by the FAA may require reevaluation due to changing conditions at and around LAX.

c. There are no mandatory helicopter routes for low altitude helicopter operations under Special Visual Flight Rules conditions.

B. Recommendations

1. LAX Helicopter Policy

a. The BOAC should adopt a LAX Helicopter Noise Abatement Policy. This Policy should suggest criteria for approach and departure paths, altitude recommendations, noise limits, community information programs and operating agreement duration limits. A suggested Policy should include the following features:

1) All approach and departure routes at LAX shall be agreed to by FAA and the DOA.

2) The FAA should consider relocating its southerly LAX approach/departure helicopter route from Sepulveda Boulevard to an alignment approximately one-half mile easterly over Douglas Avenue.

3) Helicopter operating agreements authorized by BOAC should incorporate explicit noise mitigation provisions including the following:

- Hours of operations: Option No. 1 - Helicopter operators are encouraged to operate from 7:00 am to 10:00 p.m. Option No. 2 - Limit operations to the hours between 7:00 a.m. and 10:00 p.m.

- Adherence to designated FAA approach/departure helicopter routes.

- Weather, traffic and safety permitting maintain an altitude of 1000 feet or above until reaching the airport boundary

- Utilization of noise abatement approach and departures flight procedures.

4) All training operations be prohibited such as: "Touch and Go", "Stop and Go", and "Low Approach".

5) Prior to issuance of a Helicopter Operating Agreement operators be required to develop an implementable "Fly Neighborly Program" that emphasizes noise abatement and community compatibility through actions in at least the following areas:

- Pilot Awareness
- Pilot training and flight operations planning
- Public information program
- Sensitivity to community concerns

6) All Helicopter Operating Agreements be issued for a period not longer than five years and be reviewed on an annual basis at a public meeting for policy compliance.

7) Regularly scheduled helicopter operators should be encouraged to provide an identification code or symbol readily visible from the ground on each aircraft utilized in scheduled service to and from LAX.

b. The DOA should adopt a Heliport Operating Policy for any future public use heliports under its control that policy should include the following features:

1) Innovations in heliport design and is intrumentation standards should be encouraged.

2) All rotorcraft operations and facilities be on a self supporting basis permitted within a specified time frame.

3) DOA controlled public use heliports should be operated in a manner compatible with a region-wide system of public use heliports.

4) Whenever feasible, heliports should be located in high intensity commercial/industrial centers near public transit stations.

5) Intermodal connections should be established at all heliports throughout the City.

6) Public use heliports should be designed so as to minimize noise impacts on the surrounding communities.

7) Public use heliports should be designed to minimize risk of loss of life, property damage and interruption of essential services in the event of an accident.

8) Public use heliports should be equipped with a precision approach path indicator (PAPI) system and/or a Pulse Light Approach System Indicators (PLASI).

9) Crash, Fire and Rescue (CFR) capabilities should be incorporated at each public use heliport.

10) Public use heliports should be required to meet FAA heliport design criteria.

2. Local Jurisdictions

a. Local jurisdictions should adopt review procedures and regulations governing the establishment and use of private helistops.

1) The following factors should be considered in the local helistop review process:

- The intended location, elevation and design of the proposed facility.
- The intended approach and departure routes.
- The size and type of aircraft anticipated to use the proposed facility.
- The accoustical propagation characteristics of operations at the proposed facility.
- The anticipated number and hours of operations.
- The location and height of surrounding buildings, walls, and other noise attenuation features.
- Prevailing local wind patterns.
- Based upon locally adopted standards, the projected noise impact area.
- The proximity of residential areas, schools, and other noise sensitive areas.
- The proximity of pedestrian or traffic thoroughfares.
- The proximity of specific land uses involving special compatibility and/or safety issues, such as places for public assembly, storage facilities for volatile or dangerous materials, and manufacturing activities particularly sensitive to noise and vibration factors.
- The availability of alternative emergency landing sites along designated approach and departure paths.
- The proximity of other active private use helistops.

There are a number of FAA publications dealing with helicopter operations and helistop design. The primary publication is Advisory Circular 150/5390-1B, Heliport Design Guide. Other references are included as an appendix of this report.

2) The private helistop permits issued by local jurisdictions should incorporate the following:

- A standard defining acceptable noise emission and impacts associated with operation of the proposed helistop.
- Helistop design, location and use conditions as necessary to assure noise and safety compatibility with the surrounding community (i.e., type of aircraft permitted, number and hours of operations, designated approach and departure paths, quiet landing and take of procedures*, restricted over-flight areas, etc.)
- An effective permit duration not to exceed ten years, with annual reviews relative to conditions of approval. Such permits may be renewed upon expiration following formal public review and hearing.
- Helistop owners/operators to maintain an up to date log of aircraft operations at the facility.
- Helistop owners/operators, in conjunction with users, required to develop and institute a 'fly neighborly' program.
- A specific revocation clause based upon violation of the conditions of approval.
- Require maintenance of adequate liability insurance.

3. Regional Areas

a. SCAG, in conjunction with the County Airport Land Use Commission and other appropriate local agencies, should assess the need for, an integrated system of public use heliports and appropriate locational criteria and flight routes linking major urban activity centers and transportation terminals.

b. The Airport Land Use Commission, in cooperation with involved agencies and interests, should develop and distribute to local jurisdictions within the County advisory guidelines, standards and criteria for the establishment of private use helistops. The intent of these guidelines should be: 1) to provide technical assistance to local cities responsibile for the authorization of new helicopter facilities; 2) to foster a uniform local helistop review and approval process; and 3) to reduce unnecessary duplication of effort at the local, regional, state and federal levels.

4. State Efforts

a. The State Division of Aeronautics should support efforts at the regional and local levels to foster greater compatibility between existing as well as future helicopter facilities and the communities within which they are located.

5. Federal Controls

a. The FAA should review and revise as appropriate existing advisory helicopter routes particularly those approaching and departing LAX.

b. A noise metric should be developed by the FAA that adequately assesses and describes helicopter noise emissions.

c. A regulation requiring introduction of new quiet rotorcraft and gradual replacement of older equipment on a time phased basis should be adopted the FAA (i.e., similar to FAR Part 36).

d. The FAA should support effort at the regional and local levels to foster greater compatibility between existing as well as future heliport facilities and the communities within which they are located.

V. APPENDIX

A. Bibliography

National Aeronautics and Space Administration, Ames Research Center, Community Rotorcraft Transportation Benefits and Opportunities, December 1981.

Department of Transportation Federal Aviation Administration, Advisory Circular 150/5390-1B, Heliport Design Guide, August 1977.

City of Houston, Airport Heliport Helistop Ordinance and Manual of Rules and Recommendations for Aircraft Facilities, December 1981.

J. J. Van Houten and Associates, Inc., Noise Assessment and Noise Abatement Recommendations for the Helicopter Operations at Torrance Municipal Airport, September 1982.

B. FAA Helicopter Letter of Agreement

LETTER OF AGREEMENT

LOS ANGELES TOWER and _____ EFFECTIVE _____

SUBJECT: HELICOPTER OPERATIONS

1. PURPOSE. This Letter of Agreement establishes procedures for the control of helicopters operating under VFR, Special VFR and IFR weather minimums within the Los Angeles Airport Traffic Area, Control Zone (attachment 1) and the Terminal Control Area (attachment 2).

2. SCOPE. These procedures apply to operations conducted on the routes described below. Use of these procedures is limited to pilots of those parties who are signatories to this Letter of Agreement. VFR use of published routes is not restricted. Unless otherwise indicated, all routes are shown on the VFR Helicopter Aeronautical Chart. Reporting points in captital letters are depicted on the above noted chart.

3. RESPONSIBILITY.

   A. All operators who have agreed to the use of these procedures shall assure that their pilots are familiar with and comply with these procedures. The operator shall ensure that their pilots have the current issue of the Los Angeles VFR Helicopter Aeronautical Chart.

   B. Pilots are to ensure that they comply with the routes assigned. The pilot shall check the Los Angeles Departure ATIS (Frequency 135.65) or take other necessary action prior to entering Los Angeles Airspace to determine if the airport is VFR.

   C. Pilots shall obtain a clearance from ATC prior to entering or leaving the ATA/TCA in VFR conditions or the control zone in Special VFR conditions. Pilots shall comply with the provisions of FAR Part 91 at all times.

4. ROUTES: Routes defined below begin at the airport for outbound helicopters. For inbound and en route helicopters, the route begins at the edge of the airport traffic area, control zone or TCA, whichever is applicable.

5. VFR HELICOPTER PROCEDURES.

   A. ARRIVALS. Helicopters shall be provided clearance to enter the TCA using the following routes and procedures.

      (1) South: Enter the TCA at Imperial Highway via the Artesia Route at or below 1,000 feet MSL, report the Continental Building.

(2) East: Enter the TCA at Imperial Highway and San Diego Freeway via the south side of Imperial Highway at or below 900 feet MSL, report the San Diego Freeway.

NOTE: Route not specified on Aeronautical Chart.

(3) Northeast:

a. Slauson: Enter the TCA at Centinela Drive-In via the Slauson/Dog Leg route, at or below 1000 feet MSL, report the drive-in.

b. Sepulveda: Enter the TCA at the San Diego Freeway via the Sepulveda Route between 700 and 1000 feet MSL, report FREEWAY.

NOTE: Hughes operations at or below 500 feet MSL west of the San Diego Freeway.

(4) North: Enter the TCA at the San Diego/Marina Freeways intersection via the Santa Monica route between 700 and 1000 feet MSL, report FREEWAY.

NOTE: See note in (3) b above.

(5) Northwest: Enter the TCA at Ballona Creek via the Wilshire route at or below 1000 feet MSL, report MARINA (Harbor entrance). Proceed to the GOLF COURSE or "Imperial Bank". Do not turn eastbound until south of Ballona Creek. The Tower will not issue clearance into the TCA until separation is provided with the VFR fixed wing departures that proceed northbound along the shore line (TCA2 Departure).

(6) Shoreline: Routes not specified on Aeronautical Charts.

a. South: Enter the TCA along the shoreline at Imperial Highway at or below 500 feet MSL, report the smoke stacks.

b. North: Enter the TCA al Ballona Creek southbound along the shoreline at or below 150 feet MSL. Helicopters may proceed south to Imperial Highway then east bound. Heavy jet wake turbulance sepatation will be applied by ATC.

B. DEPARTURES. Helicopters shall be provided clearance out of the TCA using the reverse directions of the arrival routes and altitudes.

C. EN ROUTE. Helicopters shall be provided clearance to operate in the TCA or to proceed through the TCA using the following routes and procedures.

(1) En Route. Helicopters may be cleared through the TCA via:

a. Harbor Freeway route below 900 feet MSL.

1/ Southbound helicopters to contact Hawthorne Tower at Century Blvd.

2/ Northbound - Hawthorne will instruct helicopters to contact Los Angeles Tower at Vermont Ave.

b. Artesia/Sepulveda routes at or below 1000 feet MSL.

c. Along the shoreline at or below 150 feet MSL.

NOTE: The proximity of the sand dunes (177 to 198 feet) at the west end of the airport provides a geographical barrier for non-heavy jet separation. HEAVY JET WAKE TURBULANCE SEPARATION WILL BE APPLIED by ATC.

(2) Helicopter control may authorize operation within the TCA east of the Harbor Freeway, at or 900 feet MSL.

(3) When Los Angeles is departing to the east, altitudes along and east of the Harbor Freeway are restricted to at or below 500 feet due to separation standards for the departing aircraft.

D. VFR SEPARATION

(1) Route separation is provided in the TCA between fixed wing aircraft and helicopters.

(2) Use of the reporting points described above will provide appropriate route separation when necessary.

SPECIAL VFR

A. Helicopters will call Los Angeles Tower prior to entering the Los Angeles Control Zone when the reported weather at Los Angeles Airport is below basic VFR conditions.

B. The following routes may be used for SVFR helicopter operations (see attachment 3).

(1) SLAUSON ROUTE

(2) SEPULVEDA ROUTE

(3) SANTA MONICA ROUTE (Los Angeles Tower will coordinate with Santa Monica Tower.)

(4) WILSHIRE ROUTE (Los Angeles Tower will coordinate with Santa Monica Tower)

(5) ARTESIA ROUTE (Los Angeles Tower will coordinate with Los Angeles Departure Control for use of this route. Some delay may be expected for approval.)

C. REDUCED SPECIAL VFR SEPARATION

(1) Pilots shall maintain visual reference to the surface and shall be prepared to hold visually at points depicted in this letter or on the VFR HELICOPTER AERONAUTICAL CHART.

(2) Separation standards - FAA HANDBOOK 7110.65.

a. Between Special VFR helicopters - one mile, except that 200 feet may be applied if helicopters are diverging and departing simultaneously.

b. Between an arriving Special VFR helicopter and an arriving fixed wing IFR aircraft executing a straight-in approach:

1/ If the fixed wing aircraft is less than one mile from the landing threshold - one-half mile.

2/ If the fixed wing aircraft is one mile or more from the landing threshold - one and one-half miles.

3/ Between a departing fixed wing IFR aircraft and a special VFR helicopter:

a/ If the fixed wing aircraft is less than one-half mile beyond the runway end - one-half mile.

b/ if the fixed wing aircraft is one-half mile or more beyond the runway end - two miles.

4/ Between a departing Special VFR helicopter and a departing fixed wing IFR aircraft - one-half mile if courses diverge after takeoff.

5/ Between an arriving fixed wing IFR aircraft and a Special VFR helicopter, the helicopter shall be established on a diverging course before the arriving aircraft is one mile from the airport.

6/ Visual separation may be applied by ATC at any time.

7. IFR HELICOPTER PROCEDURES

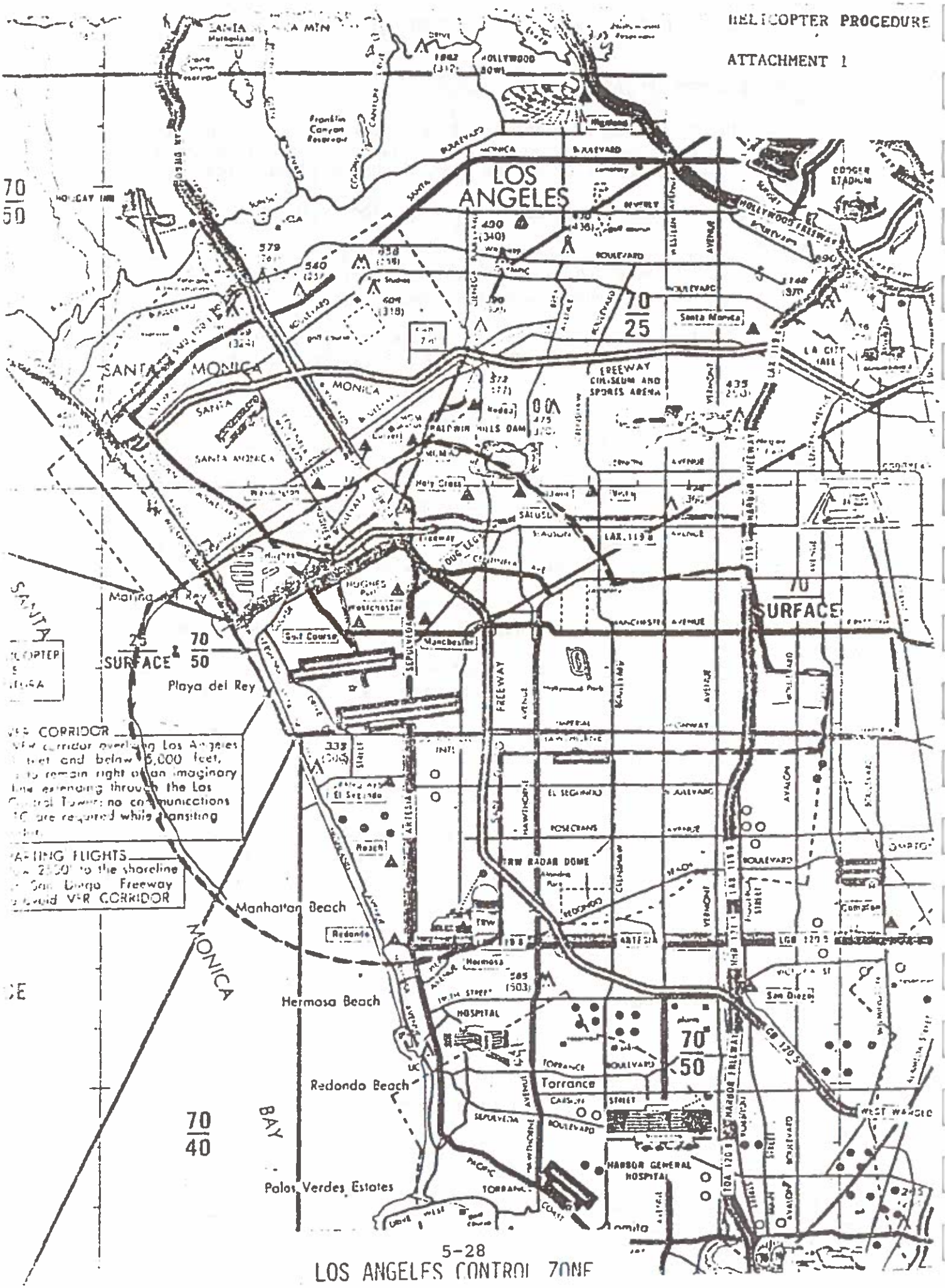
A. IFR helicopter procedures are the same as for fixed wing aircraft.

B. Helicopters shall use the Helicopter Control frequency (119.8) for departures.

C. Arrivals will be assigned the appropriate frequency by Approach Control.

IVAN F. HUNT
CHIEF, Los Angeles Tower

TITLE:
COMPANY:
ADDRESS:



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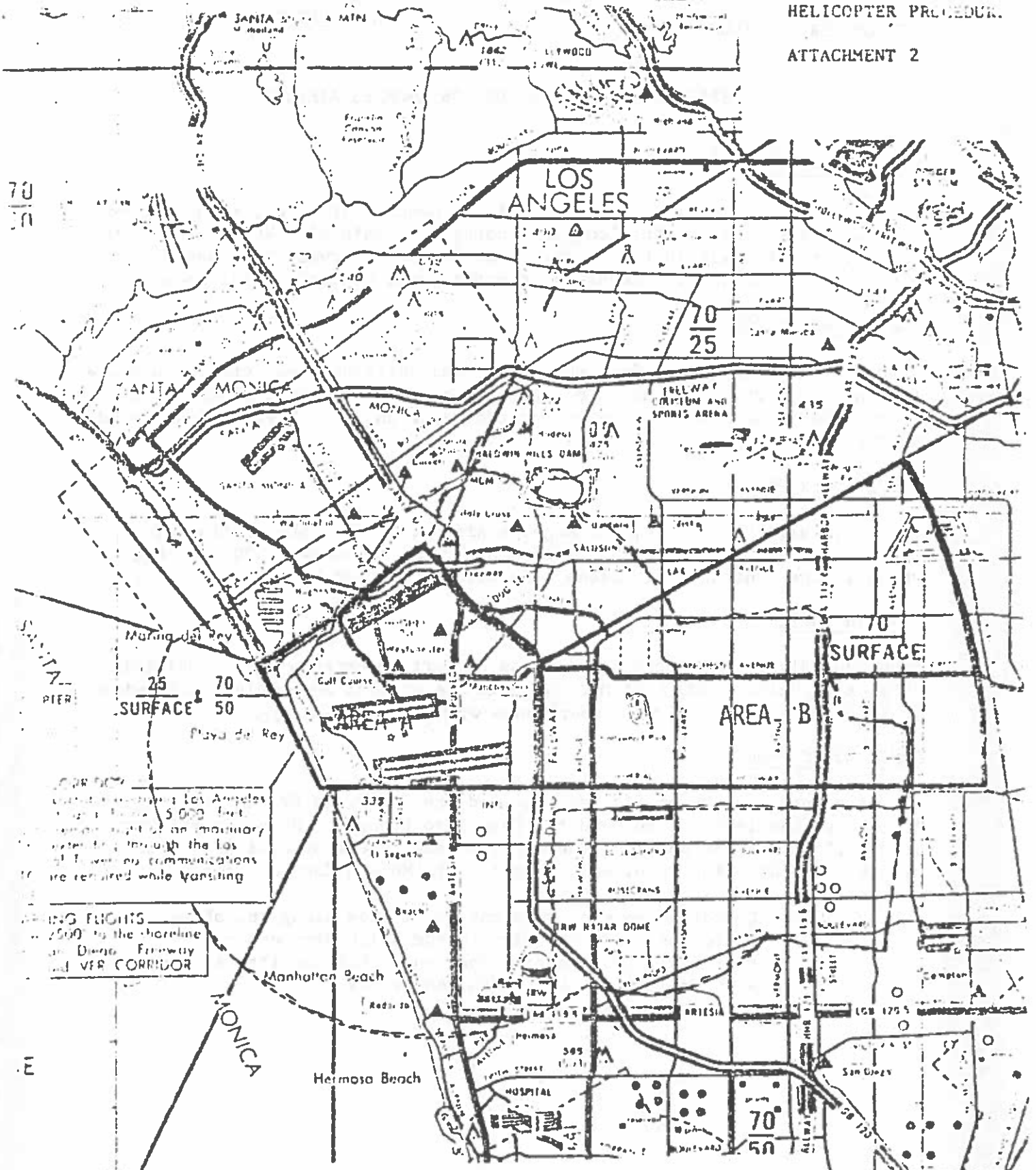
LOS ANGELES CONTROL ZONE



LOS ANGELES TERMINAL CONTROL AREA

ASSIGNED TO LOS ANGELES TOWER

AREA A - SURFACE TO 2500

AREA B - SURFACE TO 1000

SPECIAL VFR ROUTES FOR LOS ANGELES AIRPORT

WILSHIRE ROUTE (WR)

From Los Angeles Terminal complex north to Manchester Blvd., then west to Ballona Creek, then north along the shoreline. Maintain SVFR at or below 1,500 feet MSL while in the Control Zone unless otherwise instructed by ATC. Prior coordination required to enter Santa Monica Control Zone.

SLAUSON ROUTE (SL)

From the intersection of Sepulveda Blvd. and Jefferson Ave. via a route one fourth mile north of Slauson to Angeles Vista Blvd. Maintain SVFR at or below 1,500 feet MSL while in the control zone unless otherwise instructed by ATC.

SEPULVEDA ROUTE

Sepulveda Blvd. north from Los Angeles Airport to the intersection of Sepulveda Blvd. and Rodeo Rd. Maintain SVFR at or below 1,500 feet MSL while in the control zone unless otherwise instructed by ATC.

ARTESIA ROUTE

Sepulveda Blvd. south from Los Angeles Airport to Artesia Blvd. Maintain SVFR at or below 1,500 feet MSL while in the control zone unless otherwise instructed by ATC. ATC must coordinate with Departure Control.

SANTA MONICA ROUTE

From the intersection of Slauson Ave. and the San Diego Freeway to the intersection of Washington Blvd. and the San Diego Freeway. Maintain SVFR at or below 1,500 feet MSL while in the control zone unless otherwise instructed by ATC. Coordination required to enter Santa Monica Control Zone.

NOTE: Coordination with adjacent facilities along the above routes is required prior to the helicopter entering that facility's control zone when that facility's weather is below basic VFR conditions.

SPECIAL VFR ROUTES FOR LOS ANGELES AIRPORT

WILSHIRE ROUTE (WR)

From Los Angeles Terminal complex north to Manchester Blvd., then west to Ballona Creek, then north along the shoreline. Maintain SVFR at or below 1,500 feet MSL while in the Control Zone unless otherwise instructed by ATC. Prior coordination required to enter Santa Monica Control Zone.

SLAUSON ROUTE (SL)

From the intersection of Sepulveda Blvd. and Jefferson Ave. via a route one fourth mile north of Slauson to Angeles Vista Blvd. Maintain SVFR at or below 1,500 feet MSL while in the control zone unless otherwise instructed by ATC.

SEPULVEDA ROUTE

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SANTA MONICA ROUTE

From the intersection of Slauson Ave. and the San Diego Freeway to the intersection of Washington Blvd. and the San Diego Freeway., Maintain SVFR at or below 1,500 feet MSL while in the control zone unless otherwise instructed by ATC. Coordination required to enter Santa Monica Control Zone.

NOTE: Coordination with adjacent facilities along the above routes is required prior to the helicopter entering that facility's control zone when that facility's weather is below basic VFR conditions.

C. Noise Abatement Approach and Departure

A noise abatement approach and landing procedure should be utilized whenever possible. A generalized noise abatement profile for a typical four to seven passenger type helicopter would be as follows:

- When commencing approach, begin descent at least 200 feet per minute (fpm) before reducing airspeed, then reduce airspeed while increasing the rate of descent to about 800 fpm.

- At a convenient airspeed between 50 and 80 knots, set up approach glide slope while maintaining the 800 fpm rate of descent.

- Increase rate of descent if the main rotor tends to slap, or if a steeper glide slope is desired.

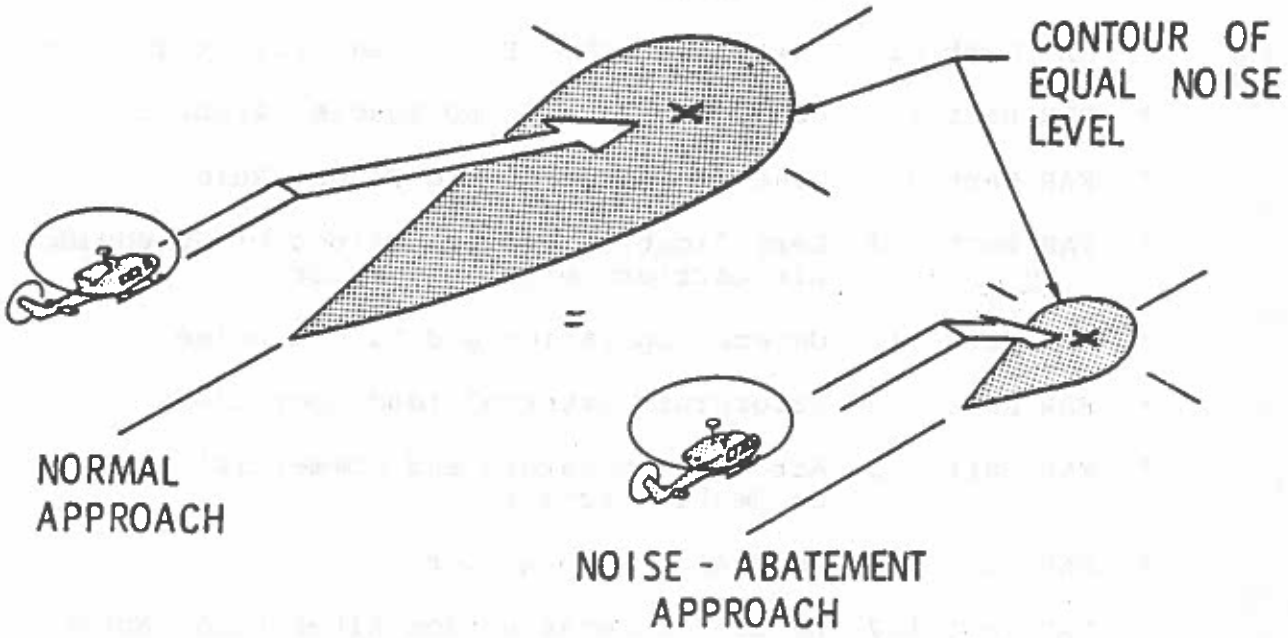
- Approaching the flare, reduce airspeed to below 50 knots before decreasing rate of descent.

- Execute normal flare and landing, decreasing rate of descent and airspeed appropriately.

The basic difference between this quieter approach technique and normal operation is that the pilot begins his descent before reducing airspeed. Both procedures give approximately the same airspeed during the approach, with the quieter technique using a glide slope which is a few degrees steeper. Once the pilot has transitioned from cruise to the approach glide slope, he can then tailor his airspeed and rate of descent to fit local conditions, avoid unsafe regimes, and still guarantee minimum noise. The noise abatement flight technique reduces the ground area exposed to a given noise level by as much as 80 percent. Figure 5 shows this for a conventional straight-in approach.

Takeoffs are reasonably quiet operations, but the pilot can limit the total ground area exposed to helicopter sound by using a high rate of climb and making a very smooth transition to forward flight. Departure routes should be over areas which are the least sensitive to noise.

FIGURE 5
GROUND NOISE - EXPOSURE FOOTPRINT



D. FAA Helicopter Publications

There are many FAA publications dealing with helicopter operations and heliport design. The primary publication is Advisory Circular 150/5390-1B Heliport Design Guide which contains general and technical information pertaining to the establishment or improvement of a heliport. The following FAA publications also relate to heliport activity and should be reviewed.

- FAA 7480-1 Notice of Landing Area Proposal
- FAR Part 27 Airworthiness Standards Normal Category
- FAR Part 29 Airworthiness Standards Transport Category Rotorcraft
- FAR Part 61 Certification: Pilots and Flight Instructors
- FAR Part 77 Objects Affecting Navigable Airspace
- FAR Part 91 General Operating and Flight Rules
- FAR Part 127 Certification and Operations of Scheduled Air Carriers with Helicopters
- FAR Part 91 General Operating and Flight Rules
- FAR Part 133 Rotorcraft External Load Operations
- FAR Part 135 Air Taxi Operators and Commercial Operators of Small Aircraft
- FAR Part 151 Federal Aid to Airports
- FAR Part 157 Notice of Construction Alteration, Activation and Deactivation of Airports

SECTION VI

IMPERIAL TERMINAL OPERATIONS

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I. INTRODUCTION

The Los Angeles International Airport Noise Control/Land Use Compatibility (LAX-ANCLUC) Study identified a number of issues related to the noise impact of LAX. The analysis of these issues will lead to the development of recommended alternative mitigation programs as the product of the ANCLUC, Phase Three Report. These issues involve airport operations, land use adjustments, or a combination of both.

A majority of the issues related to noise from airport operations have been analyzed through the Integrated Noise Model (INM). This model enables the user to measure the impact of noise using the Community Noise Equivalent Level (CNEL) metric to generate noise contour maps and to quantify the effect of an aircraft operational adjustment on the CNEL contour.

However, a few of the identified issues do not lend themselves to computer analysis and would not affect the CNEL contour if modeled. These issues relate to aspects of the airport operations which generate intermittent or single event noise impacts. The issue of jet aircraft operations at the Imperial Terminal falls within this category.

A. Purpose

The Imperial Terminal has been identified as a source of intermittent noise impacts by citizens of El Segundo. According to the noise complaint files, these impacts occur primarily at night. This technical report contains a detailed assessment of this issue and suggested appropriate mitigation measures.

B. Scope

Noise emissions from the operations at Imperial Terminal were evaluated by quantifying the noise sources through empirical observation, noise complaint records and monthly operational schedule summaries. Existing control measures and enforcement have been examined for level of effectiveness. A discussion of additional feasible control measures and operational alternatives have been included. Conclusions and suggested recommendations to mitigate noise emissions from the Imperial Terminal are provided.

II. IMPERIAL TERMINAL FACILITIES

The Imperial Terminal which was until recently designated the West Imperial Terminal is located at 6661 West Imperial Highway (Figure One). The Imperial Terminal is under the operational control of the LAX Airport Manager. It is a passenger facility created as a terminal for passenger flights conducted by Supplemental Air Carriers charter airlines and for other itinerant carriers. Occasionally, certain scheduled air carriers may periodically be assigned to operate at the terminal. This facility has also been available for the drop-off and pick-up of passengers of special flights not adaptable to functioning in the Central Terminal Area. Figure 2 shows the passenger terminal, aircraft parking positions, administrative offices and the adjacent auto parking lots. The terminal building contains a snack bar, passenger seating, ticket counters, a duty free liquor shop and restrooms.

The Imperial Terminal is developed on about 18 acres. Structures occupy one-half acre; landscaping occupies about one acre; automobile parking occupies about seven acres (700 stalls); access or service roads occupy about one acre; aircraft aprons occupy seven and one-half acres; and, associated taxiways utilize two acres. square feet. There are presently 6 structures on the site, the highest of which (a light standard) is 35 feet tall. The terminal operates the year around.

Carriers operating at Imperial Terminal share counter space. There are five aircraft positions for passenger enplaning and deplaning. Baggage is checked in and out at external baggage counters located adjacent to the terminal. Aircraft positions are normally assigned on a first come, first served basis. However, wide bodied aircraft are restricted to the two northernmost positions. Heavy jets, i.e. loaded, also use the northern positions while the lighter jets will be assigned to the southerly positions.

Current regulations require aircraft not operate on the ramps at thrust levels greater than 40 percent. Any aircraft requiring more than 40 percent thrust to taxi must be towed onto the Taxiway F centerline before proceeding independently. Aircraft maintenance, other than minor adjustment, is prohibited at the terminal as is the maintenance run up of engines.

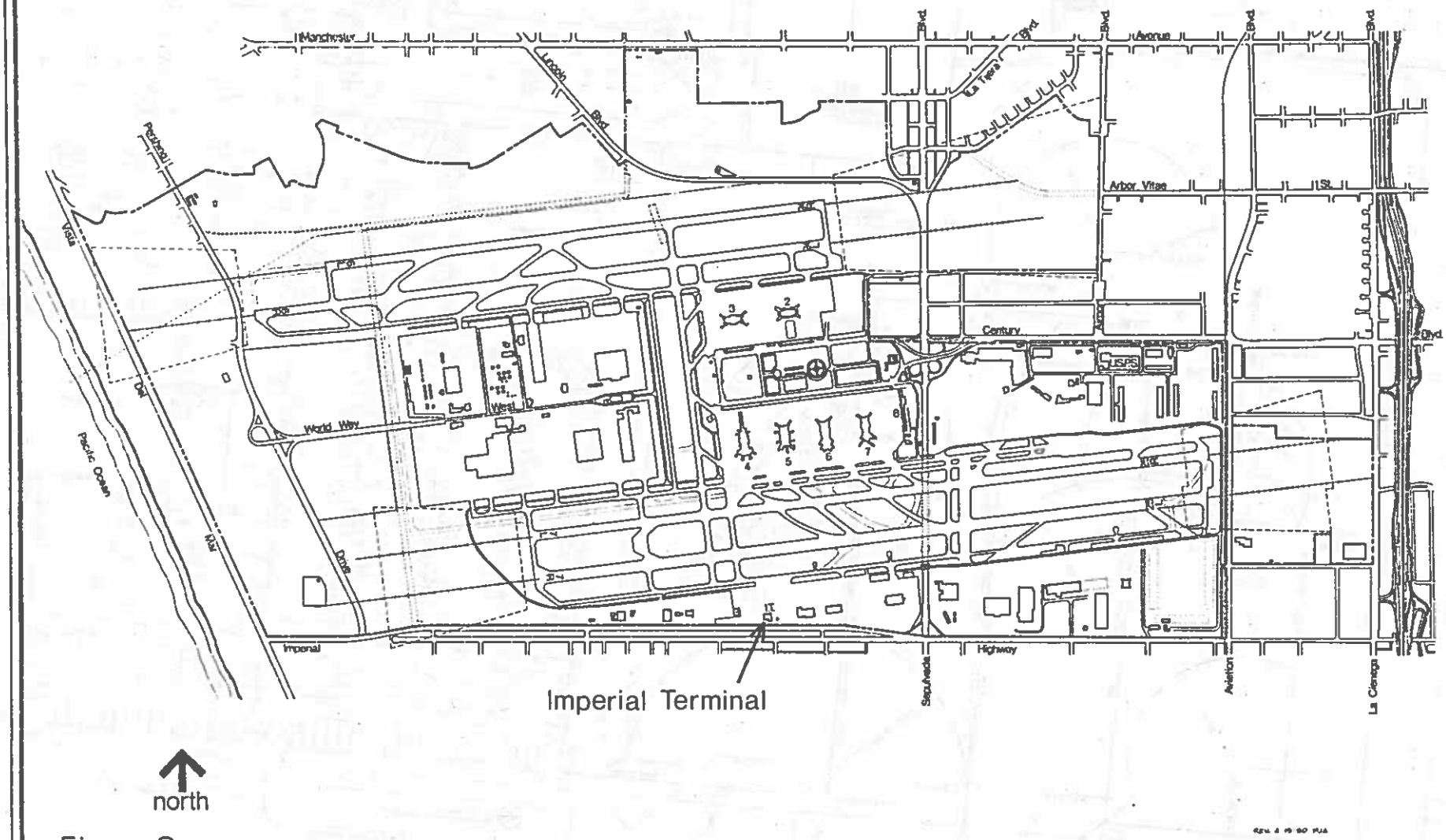

Figure One

Los Angeles International Airport

Office of Facilities Planning
CITY OF LOS ANGELES • DEPARTMENT OF AIRPORTS
#1 WORLD WAY • LOS ANGELES, CALIFORNIA 90009
SCALE: 600' DRAWN PJA DATE 8-77 CHECKED DMC SHEET 1 OF 5 DRAWING No. 7700

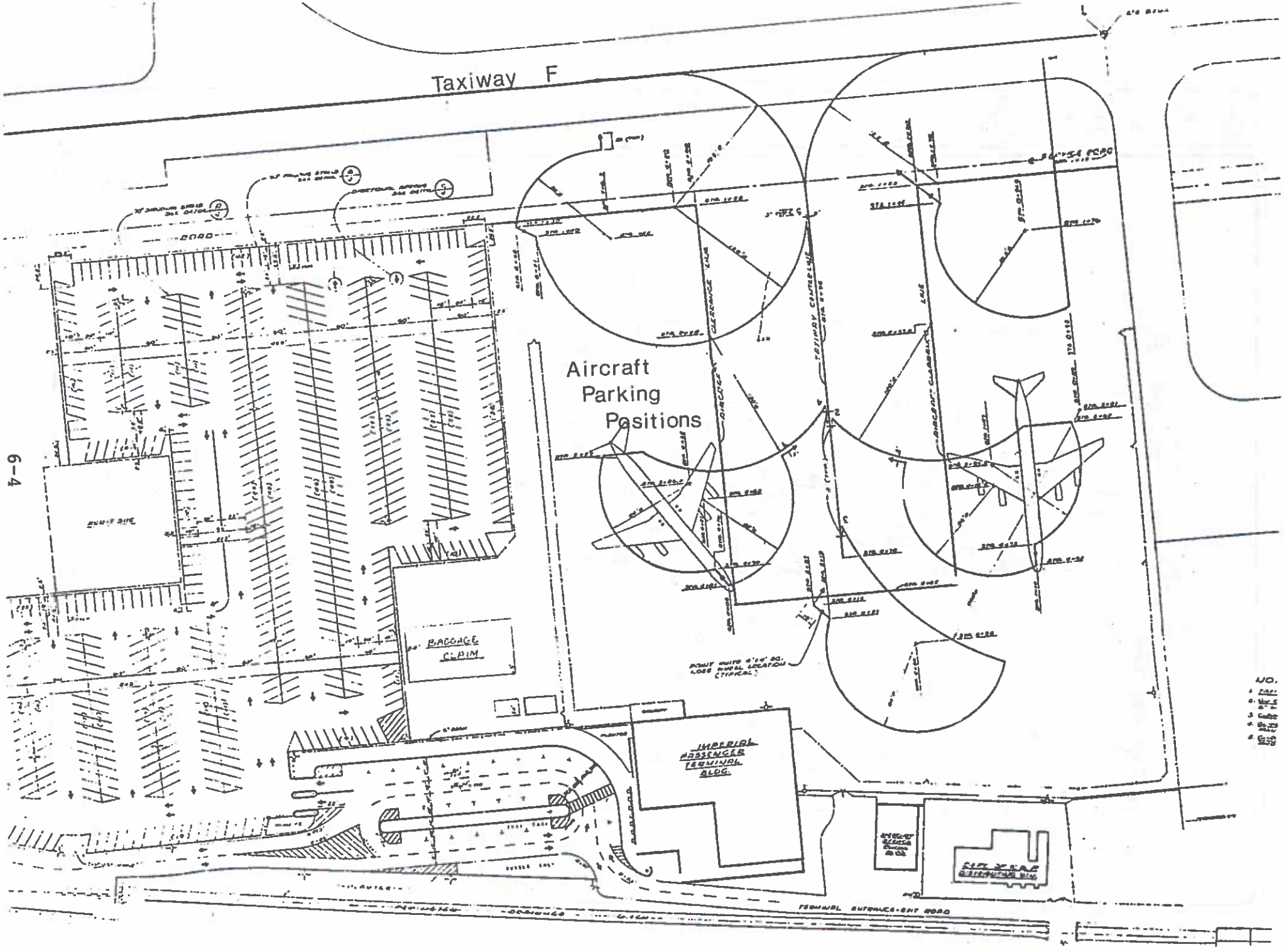

Figure Two Imperial Terminal Facilities

A. Operations Summary

The level of operations at the Imperial Terminal fluctuates on a seasonal basis. Summer months and the winter holiday season are the peak activity periods. A schedule for Imperial Terminal, which indicates a tabulation on daily operations by airline aircraft type, and origin/destination information is maintained by the Department of Airports Operations Bureau. Operations at the Imperial Terminal during July 1982 totaled 497 with a daily average of 16 (2 percent of the total daily LAX commercial operations). Approximately five of these operations occurred between 10:00 p.m. to 7:00 a.m. on a daily basis, which represents 36 percent of the total operations. In December, 1982 Imperial Terminal operations totalled 446, for a daily average of 16, with a range between 14 and 18 (1.7 to 2.3 percent of the total daily LAX commercial operations). The level of operations between 10:00 p.m. and 7:00 a.m. varied from five operations early in the month to eight immediately before and after Christmas day. In March 1983, 290 operations were scheduled for a daily average of nine. Approximately, four of these total operations occurred between 9:00 p.m. and 1:00 a.m.

World Airlines operations comprise 75 percent of the activity at the Imperial Terminal. World Airlines operates DC-10 aircraft. Pacific East and Arrow Airlines represent a major portion of the remaining 25 percent. Pacific East uses both DC-10 and DC-8 aircraft while Arrow Airlines operates a B707. Balair, Royal American, Martinair and other small itinerant airlines also use the Imperial Terminal on an infrequent basis.

The landing takeoff (LTO) cycles for aircraft using Imperial Terminal can be divided into two basic types. The first type involves nighttime arrivals with departures the next morning. The second type involves an LTO cycle of only 45 to 60 minutes in length, where in that span of time an aircraft deplanes the passengers, refuels, reprovisions, enplanes passengers and then departs.

Ground services to the airlines operating at the Imperial Terminal are provided predominantly by Butler Aviation and Mercury Services, Inc. These services include refueling, ground handling tugs, mobile loading stairs and ground power units (GPU).

B. Noise Complaint Assessment

Complaints related to aircraft noise are received by the FAA Control Tower, the DOA Operations Bureau and the DOA Community Relations Office which compiles a cumulative monthly noise complaint summary. In the Spring of 1983, the El Segundo Noise Abatement Committee submitted complaints received from their residents for inclusion in this monthly summary. Examination of these records to establish frequency of complaints regarding Imperial Terminal operations were inconclusive. A large percentage of the noise complaints received at night are nondefinitive regarding the source. Complaints regarding "loud noises and "engine runups" are the most common during these hours. The fact that residents are often unable to distinquish the source of the noise, especially at night, is one of the difficulties in assessing this type of single event impact.

The two predominant nighttime noise sources associated with the terminal are aircraft auxiliary power units (APU) and mobile ground power units (GPU). Both of these systems provide onboard power to the aircraft while the main engines are shut down and are also used for engine startup. Aircraft typically run their APU 30 minutes after arrival at the gate and 30 minutes prior to boarding for airconditioning and heating and provide power to the electronic and hydraulic systems.

The DC-10 which accounts for 75 percent of the Terminal operations is equipped with an APU. However, the DC-8 does not have an APU and are dependent on GPU.

The APU is a small jet turbine which emits a muffled "roar". GPU are typically gas or diesel powered generators mounted on trailers or built into the ground handling equipment. The noise level from a DC-10 APU is approximately 85 dBA at 150 feet. Sound energy from a point noise source such as an APU tends to diminish in intensity by six decibels for each doubling of the distance from the source. The 85 dBA level would therefore diminish by approximately 20 dBA 1200 feet south at Imperial Avenue. Ground attenuation, atmospheric absorption and noise frequency factors could further influence the affect of this noise on the adjacent residential areas (see Empirical Observations).

Complaints regarding noise from the diesel powered GPU's have been received in the past. In response to the complaints additional muffling devices have been installed.

Very infrequently a GPU may not be readily available for a DC-8 immediately upon arrival to the Imperial Terminal. In those rare cases it has been necessary for one of the DC-8 engines to remain in operation, to maintain onboard power. Operation of the engine has been mistaken for an engine runup according to information in the complaint files. Another source of complaints is the use of reverse thrust by arriving aircraft. Reverse thrust generates a noise similar to an engine runup but much shorter in duration.

Aircraft taxiing on the south side of the airport generate complaints at night due to the lower ambient noise environment. Aircraft under power are not permitted in the Imperial Terminal ramp area. Arriving aircraft will approach the ramp area on Taxiway F and be towed from that point to one of the five aircraft positions depicted in Figure Two. Therefore, the taxiing noise is probably related to cargo operations at facilities located east of Sepulveda on the south side of the airfield. The loading cycles of these cargo operations can be hours in length and depending upon the type of cargo may require the continued use of the APU. Cargos ranging from flowers for the east coast to cattle destined for Japan require air conditioning.

C. Empirical Observations

Staff of the airport Environmental Management Bureau accompanied the Superintendent of Operations for the graveyard shift on March 15, 1983 from 10:00 p.m. to 6:30 a.m. in order to sample the noise emissions from the Imperial Terminal. Noise measurements at a variety of locations around the Imperial Terminal were made using a Bruel & Kjoer Precision Sound Level Meter Model Type No. 2204. The noise measurements taken are summarized in Table One.

Momentary or "spot" noise measurements were taken in the residential section of El Segundo immediately south of the Imperial Terminal. Noise measurements of approximately 68 dBA were obtained at these locations. Operations of the south runway complex including the Imperial Terminal were measured from a vantage point at Imperial Avenue and McCarthy Court. The World Airlines DC-10 APU was not discernible to the observers over the background (road traffic, etc.) noise at this location.

The last operation at the Imperial Terminal was the departure at 12:35 a.m. of the World Airlines flight number 14. The aircraft was pushed out onto Taxiway F where the engines were started according to the established procedures.

TABLE ONE

SUMMARY OF NOISE MEASUREMENTS

Time PM	Audiometer Location	Aircraft/Airline	Peak dBA	Duration	Operational Notes
10:55	Imperial Terminal Ramp	DC-10/World	85	25 min.	APU at 150 feet
11:00	Imperial Terminal Ramp	DC-8/Pac. East	80	20 min.	GPU at 150 feet
11:10	Imperial Ave & Sheldon	---	73	---	Noise level check**
11:25	Imperial Ave & Main	---	69	---	Noise level check**
11:40	Maryland/Walnut	---	68		Noise level check**
11:45	Maryland/Walnut	B-727/---	96	5 sec.	Departure 25R
11:50	Imperial Ave/McCarthy Ct	B-727/---	96	7 sec.	Departure 25R
11:55	(immediately south of the Imperial Terminal)	DC-8-63/---	92	---	Departure 25R
12:00		B747/---	89	---	Departure 25R
12:00	"	DC-9-80	88		Reverse Thurst Arrival 25R
12:00	"	---	68		Noise level check**
12:00	"	---	---		Switch to over-the-ocean operations
12:05	"	DC-10/---	84		Reverse Thrust Arrival 7L
12:10	"	DC-8-63/Flying Tiger	88	5 sec.	Reverse Thrust Arrival 7L
12:11	"	B-727/United	92	---	Reverse Thrust Arrival 7L
12:15	"	B-747/Flying Tiger	88		Departure 25R
12:30	"	---	65		Noise level check**
12:35*	"	DC-10/World	72	2 min.	APU during pushout & engine start on Taxiway F
12:40	"	DC-10/World	89	---	Departure 25R

Note: *One Operation (Departure) was observed at Imperial Terminal, the next aircraft operation scheduled was a Pacific East DC-10, Flight No. 7 departure at 9:15 a.m. on March 16, 1983.

**These momentary or "spot" level checks were made during lulls in the arrival/departure activity on the airfield. The "spot" levels recorded generally exceed the nighttime hourly ambients of about 50 dBA which are typical in this section of El Segundo.

III. EXISTING CONTROL MEASURES

The Board of Airport Commissioners (BOAC) has adopted a noise abatement program which addresses the control of nighttime noise sources. No noise control policies related specifically to the Imperial Terminal operation have been adopted by the BOAC. However, many of the noise abatement policies pertain to the Imperial Terminal in general.

A. Noise Control Measures

On March 18, 1970, the BOAC approved Resolution No. 5619 establishing a curfew on nighttime engine runups between the hours of 11:00 p.m. to 6:00 a.m. No runups occur at the Imperial Terminal. That Resolution also established a gate hold procedure where pilots wait to receive instruction from the Tower prior to starting engines thereby reducing aircraft queues, which generate noise and waste fuel.

The Department of Airports Operations Bureau revised the Imperial Terminal operating procedures on July 7, 1982 to instruct "all aircraft departing Imperial Terminal shall not start engines until the aircraft engines are aligned west on Taxiway 'F'". This instruction directs engine startup noise away from the residential area.

B. Noise Monitoring

The Department of Airports Noise Abatement Office has installed a ground noise monitoring network. The monitoring sites are located in the maintenance areas in the West End and cargo facilities on the south side of the airport. These monitors alert pesonnel in the Operations Bureau if an engine run up is being conducted. Operations Bureau personnel working the graveyard shift rely on this system to help them locate the noise source. In March 1983 ground noise monitors were not located at the Imperial Terminal.

C. Land Use Regulations

The LAX Interim Development Plan adopted by the Los Angeles City Council in 1982 designates the area encompassing the Imperial Terminal as "Buffer Area". Aircraft under power and engine runups are not permitted. Moreover, use of existing facilities in buffer areas may continue as required until the Department of Airports can develop alternate facilities.

IV. ADDITIONAL FEASIBLE CONTROL MEASURES

A number of potential strategies exist that could further to mitigate ground noise emissions related to Imperial Terminal operations.

A. Remote Passenger Loading

The Imperial Terminal is considered a nonconforming use in the Buffer Area primarily due to the presence of aircraft. Rather than relocate the terminal, it may be possible to utilize the remote aircraft positions being constructed in the West End by using field buses to transport passengers to and from the aircraft. The remote aircraft positions are being constructed to handle operations from the West Terminal.

The feasibility of remote passenger loading alternative is dependent on a number of factors including:

- The anticipated utilization of these aircraft positions by scheduled West Terminal operation.
- The potential for increased operating costs to Imperial Terminal based airlines.
- The effect on aircraft ground traffic in terms of the potential for:
  - increased delays (fuel consumption, reduced levels)
  - increased taxiing distances (fuel consumption, ground noise)
  - reduced safety (increased ground congestion)

A total of 26 aircraft parking positions are ultimately planned for the West End. Therefore, except for intensified peak activity periods like those expected for the Olympic Games, remote position for Imperial Terminal operations should be available.

B. Facility Relocation

The Facilities Planning Bureau is currently developing a plan for the West End facilities. It may be possible to relocate the Imperial Terminal operation to a facility with access from World Way West. This relocation could possibly be combined with a proposed commuter terminal to replace the facility removed to facilitate construction of the West Terminal.

C. Additional Monitoring

Establishing an additional ground noise monitor at the Imperial Terminal would enable the Operations Bureau to identify excessive noise emissions emanating from that facility. The Operations staff could then take the appropriate mitigating action in reaction to the noise emission rather than in response to a complaint from the adjacent community.

D. Ground Power Units

Equipment to provide ground power to aircraft has advanced to a point where the necessary power and air can be provided to aircraft without the noise emissions and consumption of fuel associated with operations of APU's. This equipment can either be "fixed" or "mobile". The type of equipment most appropriate to service the Imperial Terminal is partially dependent on how long this facility will remain in use. A fixed system would only be feasible if terminal operations continue for a period long enough to amortize the cost of installation. The cost to provide both fixed ground power and air systems ranges from $150,000 to $250,000 per gate. Amortization of these costs would take between 15 to 20 years with current gate utilization levels at the Imperial Terminal. Therefore, mobile equipment of some type appears more appropriate.

The types of GPU equipment are described in the Auxiliary Power Unit Technical Report. Specially constructed trucks with both air and power generating capability are now available. This type of equipment could mitigate ground noise sources associated with Imperial Terminal operations. While this equipment is expensive it has been found that at other airports the cost is usually recovered within one to two years, depending upon the level of utilization.

Funding the purchase of this equipment could be accomplished in a number of ways. The ground service companies could purchase this equipment and recover the cost through contractual services. The Department of Airports could purchase the equipment and either operate the equipment and charge a service fee to the itinerant operators or rent the equipment to the ground service companies who would recover their costs in a similar fashion.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

The assessment of Imperial Terminal operations produced the following conclusions:

1. Operations at the Imperial Terminal are perceived as a major source of ground noise impacts within El Segundo during nighttime hours.

2. Airport operations not associated with the Imperial Terminal such as aircraft taxiing, use of reverse thrust by arriving aircraft, jet roar from departing aircraft and engine maintenance runups until 11:00 p.m., all contribute significantly to nighttime noise emissions on the south side of the airport.

3. An additional ground noise monitoring site at the Imperial Terminal could help quantify noise emissions from the Imperial Terminal operations.

4. The airport reconstruction program includes the new West Terminal and Terminal One. Remote aircraft parking positions to accommodate projected international carrier peaks using the West Terminal are also under construction. These projects are scheduled for completion in June 1984.

5. World Airlines will be relocating to the West Terminal once it is completed in 1984. Therefore, 75 percent of the current 1983 operational level at Imperial Terminal will be relocated reducing the noise impacts from ground operations. It is however not known at this time whether additional air carriers will be allowed to initiate operations at Imperial Terminal.

6. Ground noise emissions from jet powered aircraft at the Imperial Terminal and other southside operations can be attenuated with ground power and conditioned air equipment.

B. Recommendations

1. Future Utilization of the Imperial Terminal

Option No. 1 - The Imperial Terminal as designated in the Buffer Area of the LAX Development Plan may continue as required until the DOA can develop alternate facilities. During this interim period a ground noise mitigation program should be evaluated.

Option No. 2 - Aircraft operations at Imperial Terminal should be phased out by January 1, 1986. As air carriers currently assigned to Imperial Terminal, discontinue use of those facilities, no new or additional aircraft operations should be permitted.

2. Study potential strategies to reduce the noise impacts from operations on the south side. Towing of aircraft during sensitive nighttime hours and reduced use of the outboard Taxiway F and increased use of the inboard Taxiway K are examples of strategies which could be evaluated as part of that study.

3. Evaluate the feasibility of installing a ground noise monitor site at the Imperial Terminal which would enable the Operations staff on duty to quantify a complaint that cites the Imperial Terminal as the source.

4. The Operations Bureau should be sufficiently staffed during all three shifts to enable personnel to perform the many diverse responsibilities under their purview which includes enforcement of regulations.

VI. BIBLIOGRAPHY

A. References Consulted

City of Los Angeles, Planning Department Los Angeles International Airport Interim Plan Approved January,1982

Department of Airports, Environmental Management Bureau Draft Initial Study, Issuance of "Tenant Status" Operating Agreements to Four LAX Supplemental Air Carriers March, 1976.

Department of Airports, Environmental Management Bureau Draft Initial Study, West Imperial Terminal-Parking Lot Expansion August, 1977.

Department of Airports Environmental Management Bureau Los Angeles International Airport Noise Control/Land Use Compatibility (LAX-ANCLUC) Study - Phase One - Task 1.07 Noise Regulation Policies August, 1981.

Department of Airports Operations Bureau Memorandum to Imperial Terminal Airline Tenants from Kenneth A. Shipp Imperial Terminal Manager Engine Start Procedures for Imperial Terminal Departures July, 1982.

B. Personal Communications

Kenneth A. Shipp - DOA Superintendent of Operations and Imperial Terminal Manager

Walter V. Collins - DOA Noise Abatement Officer

ADDENDUM

TO THE

IMPERIAL TERMINAL OPERATIONS TECHNICAL REPORT

FROM THE

CITY OF EL SEGUNDO

A Record of the Official Correspondence between the El Segundo City Council and the Board of Airport Commisioners regarding Imperial Terminal.

City of El Segundo

August 24, 1977

Sam Greenberg, Chairman
Los Angeles International
Airport Commission
1 World Way
Los Angeles, California 90009

Dear Chairman Greenberg:

The City Council has directed that this response to your 'Preliminary Air Cargo Development Plan' be transmitted to your body for your information and guidance.

The City of El Segundo generally agrees with the recommendations contained in the plan; however, we do wish to register our objections to some features of it. The entire south side, west of Sepulveda Boulevard with the exception of the 'B4' hanger, is designated on the Airport Master Plan as 'Buffer Zone, no aircraft under power permitted'. The airport and the City of El Segundo arrived at this agreement after a great deal of discussion. We find potential breeches of that agreement in the following areas:

(1) No provision seems to have been made for the existing West Imperial charter terminal. We understand that all charter operators are now permitted to sub-lease facilities from the scheduled operators if they desire and therefore operate in the main terminal area; but it appears that since no operator has exercised that right so far that this solution isn't very effective, given the present set of incentives;

(2) Page 48 indicates that negotiations are now active with FTL to lease the 'B4' property including 100 feet of the PAA leasehold and that FTL plans to remove the structures and build a 'major cargo facility'. This would definitely increase our noise level. At the time the City of El Segundo agreed to exclude the 'B4' site from the buffer zone, we had no idea or indication that it would be used for a project of this scope and we vigorously protest;

350 Main Street El Segundo, California 90245 (213) 322-4670

(3) Page 51 and associated subjects indicate that the sump area west of old Pershing Drive, adjacent to Imperial Highway is a prime site for air cargo facilities. In fact CAL and FTL are mentioned as being interested at the present time. This property also is adjacent to residential development in El Segundo and we object to the projected use of this property in this manner.

We will insist that new developments do not increase the sound level in the residential area. We do not object to development which may cause a moderate increase of traffic on Imperial Highway; but prefer that extensive traffic and intensive development await the construction of the El Segundo-Norwalk Freeway, as streets serving this area are now overloaded. We will also appreciate mandatory aesthetic standards for any new development.

We invite your inquiry and hope that this is yet another area in which we may cooperate for our mutual benefit.

Sincerely,

L. E. Balmer
Mayor, El Segundo

cc: Clifton Moore, Gen Mgr Airport
Pat Russell, Councilwoman

City of Los Angeles Department of Airports 1 World Way, Los Angeles, California 90009 • (213) 646-5252 Telex 65-3413
Tom Bradley, Mayor

Board of
Airport Commissioners
Robert E. Collins
President
Samuel Greenberg
Vice President
Elizabeth K. Armstrong
Stephen C. Buhaimer
Alexander H. Pope

Clifton A. Moore
General Manager

October 27, 1977

The Honorable E. L. Balmer
Mayor
City of El Segundo
350 Main Street
El Segundo, CA 90245

Dear Mayor Balmer:

Air Cargo Development Plan-LAX

Thank you for your response dated August 24, 1977 to our "Preliminary Air Cargo Development Plan". We are pleased that you are in general agreement with the plan, and we would like to respond to some of your comments.

In reference to the B-4 Hangar, Flying Tiger Line prefers to develop a site on the south side of the airport, east of Sepulveda Boulevard in the designated Air Cargo area. The ultimate development of the B-4 Hangar site is still undecided. The supplemental carriers have expressed interest in developing the site into a supplemental terminal.

We are somewhat confused with regard to your reference to page 51 of our Air Cargo Development Plan pertaining to the "sump area", west of old Pershing Drive. We can discover no such reference on page 51. The west side area referred to in the Cargo Plan for possible air cargo development is located north of the westerly extension of Runway 7L-25R and over 2,000 feet north of Imperial Highway in the west maintenance area. There is an existing ponding basin in the clear zone of the southerly runway complex. This basin is currently part of the airport storm drain system and will be replaced in the future by a filtration facility now under study.

The southern buffer area, which includes the West Imperial Terminal, was not a part of the cargo study. There are no plans to bring additional aircraft under power into this area. All planning policies previously

discussed with the City of El Segundo remain in effect and will be continued.

We again thank you for your response and will be glad to further discuss any of these issues with you.

Very truly yours,

Samuel Greenberg, President
BOARD OF AIRPORT COMMISSIONERS

cc: C.A. Moore
Pat Russell, Councilwoman

City of El Segundo

May 20, 1980

Los Angeles Airport Commission
One World Way
Los Angeles, CA 90009

Attention: Ms. Elizabeth Armstrong,
President

Dear Ms. Armstrong:

LAX management has approved use of the West Imperial Terminal by World Airlines for scheduled commercial air service. This has caused an increase in aircraft noise to El Segundo residents from jet aircraft arriving and departing the West Imperial Terminal under power seven times per day. The El Segundo City Council protests this additional and unnecessary intrusion of jet aircraft noise into our community and requests that use of the West Imperial Terminal for scheduled airline service be discontinued immediately.

Use of the West Terminal has been limited to charter and non-scheduled aircraft operations for many years. This practice is affirmed in Volume II of the LAX Environmental Impact Report which states in the "Existing Facilities" section that "The West Imperial Terminal on the south side of the airport serves charter flights and other non-scheduled operations."

The addition of scheduled service to the West Imperial Terminal is a violation of the 1974 Airport Master Plan and the Commission's policy as stated in the Master Plan. According to the Master Plan, the West Imperial Terminal is located in the airport buffer area from which aircraft under power and engine runups are excluded. The Master Plan permits continued use of existing facilities until alternative facilities are developed; however, this exception cannot reasonably be expanded to justify the introduction of new noise producing activities into the buffer area. One of the general policies stated in the Master Plan is:

> Uses and facilities within the airport shall be located and operated so as to minimize noise, air pollution, glare, odor and vibration emanating from stationary sources and aircraft on the ground.

The change in use of the West Imperial Terminal is a violation of this policy.

During the preparation of the Master Plan, a verbal assurance was given to an El Segundo representative that no new incompatible uses would be added to the buffer area and that existing incompatible uses would be phased out. This verbal assurance has been violated by use of the West Imperial Terminal for scheduled air service.

In its application for a variance from the noise standards of the California Department of Transportation under the California Public Utilities Code, the management of LAX represented to Cal-Trans that it was making good faith efforts to minimize the impacts of aircraft noise on its residential neighbors. The sincerity of these efforts is placed in substantial doubt by management's action in permitting scheduled airline service into the buffer area in violation of Commission policy, the Airport Master Plan, long established practice and verbal assurance to El Segundo. There was no prior notice to El Segundo of this action and no assessment of the probable adverse environmental consequences.

The variance from the California Department of Transportation's Noise Standard for California Airports (File No. L-17031) granted on April 9, 1980 contained the following condition:

> 3. Respondent shall not permit any activity under its control to occur in conjunction with the operation of the Los Angeles International Airport which relates to an increase of the noise impact area described by the present CNEL boundaries. The prohibition, however, shall not apply to any increases in the CNEL boundaries which may result from respondent's efforts to conduct tests related to noise abatement procedures or practices.

The scheduling of regular commercial airline service at the West Imperial Terminal is a violation of at least the spirit and probably the letter of this condition. It reflects both a callous disregard for the interests of El Segundo residents and an arrogant defiance of the authority of the State of California.

The El Segundo City Council believes this to be a matter of significance requiring your immediate attention. We request that you honor California Department of Transportation's Variance No. L-17031, your commitments, your Master Plan and your own policy by immediately stopping the use of the West Imperial Terminal for scheduled airline service.

Please advise me when this matter appears on your Commission agenda.

Sincerely,

R. K. Van Vranken

Richard K. Van Vranken
Mayor

Jack E. Siadek, City Councilman
Delegate to El Segundo Noise
Abatement Committee

RVV/lb

cc: Councilwoman Pat Russell
Clifton A. Moore
Ms. Adriana Gianturico,
Director of Transportation
Gordon Miller, Acting Chief,
Division of Aeronautics,
California Dept. of Transportation
City Council

City of Los Angeles Department of Airports 1 World Way, Los Angeles, California 90009 • (213) 646-5252 Telex 65-3413
Tom Bradley, Mayor

Board of
Airport Commissioners
Elizabeth K. Armstrong
President
Mary Lou Cunningham
Vice President
Robert E. Collins
Samuel Greenberg
Emmett C. McGaughey
Clifton A. Moore
General Manager

June 19, 1980

The Honorable Richard K. Van Vranken
Mayor

The Honorable Jack E. Siadek
City Councilman
City of El Segundo
350 Main Street
El Segundo, CA 90245

Dear Mayor Van Vranken and
Councilman Siadek:

Please accept our apologies for the tardy response to your letter of May 20 to the Board of Airport Commissioners regarding the problems which you perceive with respect to the continued use of West Imperial Terminal.

The Board has discussed the contents of your letter with the staff and requested that we prepare a response based upon our review of the files and our recollection of the events which have transpired over the last 10 years. This is currently in process.

The Board suggested that if either of you would care to appear personally at the Board meeting, that either Wednesday, July 9, or Wednesday July 16, would appear to be convenient. The meetings begin at 2:00 p.m. at the Board Room at Los Angeles International Airport. I would appreciate a call from you or your staff so that we can make appropriate arrangements on the agenda for you, and we would, of course, be pleased to answer any other questions which you might have. My phone number is 646-2060.

Yours truly,

Robert C. Davidson
Deputy General Manager

RCD:bw

cc: Mac Dalgleish
Wendy Cosin

M E M O R A N D U M

TO: Board of Airport Commissioners
Elizabeth K. Armstrong
Mary Lou Cunningham
R. E. Collins
Sam Greenberg
Emmett C. McGaughey

July 2, 1980

FROM: Robert C. Davidson

SUBJECT: El Segundo Complaint Letter

The Board received a letter dated May 20 from the City of El Segundo expressing their concern over the use of West Imperial Terminal for scheduled airline service. Their letter further requests that the use of WIT for scheduled airline service be discontinued immediately. The letter was signed by Mayor Van Vranken and Councilman Siadek, and the letter further indicated that they might wish to address the Board personally on this. We have suggested either the meeting of July 9 or July 16. At this writing, neither date has been confirmed.

In anticipation of El Segundo's appearance, I thought we would provide some background on this matter. Going back to the middle and late '60s, the City Planning Department undertook the Westchester Community Plan and the Los Angeles International Airport Plan. As part of the Los Angeles International Airport Plan, a buffer area was described along the north side of LAX covering the acquisition area, and expressly prohibited aircraft under power, as well as engine runups.

During the many years that ensued, the City of El Segundo felt that a similar buffer area should be designated along the south side of the airport to accord residents of El Segundo much the same level of protection as that proposed for the City of Los Angeles residents on the north. This buffer area was incorporated into the plan, and it included all of the Department of Airports-owned property on the south side of the field west of the B-4 Hangar site (which is now occupied by Federal Express).

It was recognized then, however, that there were existing uses within that area such as the West Imperial Terminal and others, which would have to continue. The plan that was prepared then, as well as the new proposed Los Angeles International Airport Interim Plan, contains a sentence in the description of the airport buffer area, "Uses of existing facilities in buffer area may continue as required until the Department of Airports can develop alternate facilities" (emphasis added). We have no recollection during these early discussions that any particular target date was established for phasing out activities at the West Imperial Terminal.

For some years, however, there have been some limited scheduled operations at the West Imperial Terminal such as Sierra Pacific, Holiday Airlines and Baja Cortez. This was largely due to the fact that these carriers were operating small aircraft which could not be used compatibly within the central passenger terminal area.

For some years the Department had a policy which required the supplemental (charter) carriers to use the West Imperial Terminal for their activities. During that period the supplementals were opposed to entering into our usual form of operating agreement since it would pledge them to support the outstanding bonded indebtedness and operating expenses of the Department. Several years ago, the Board will recall, the Association of Supplemental Carriers and their legal representatives approached the Department and subsequently, most of the major supplementals entered into our usual form of signatory air carrier operating agreement.

With deregulation, nearly two years ago, the supplementals such as World Airways, TIA, which is now Transamerica Airlines, and Capitol, etc., were allowed to enter into scheduled operations. Currently, Transamerica and Capitol are operating from Ticketing and Satellite 2. Laker Airways, also a former large user of the West Imperial Terminal has relocated its operations to Ticketing and Satellite 2, and Condor Airlines, the large charter arm of Lufthansa is also planning to operate from the central terminal area.

Because of these factors, as well as the promotional fares that have been offered by the regularly scheduled airlines over the last few years for foreign travel, the use of West Imperial Terminal has stadily declined. In 1971, for instance, there were 5173 operations during that calendar year with approximately 328,000 passengers. It peaked in 1972 with 6357 operations and then has generally declined so that in calendar year 1979 there were only 3191 operations with about 194,000 passengers.

World Airlines is now operating a maximum of seven flights a day from the West Imperial Terminal. These statistics are cited to show that the use of the West Imperial Terminal has not grown significantly over the past 10 years. ~~When construction of the West Terminal commences, the commuter aircraft area at that location may well have to be relocated to the West Imperial Terminal site.~~

A review of the information obtained from our monitoring sites in El Segundo has likewise indicated that the CNEL level in the community has remained unchanged from the first quarter of 1976 through the first quarter of 1980.

instead of sch. airlines might = future use.

SUMMARY:

Based upon our historical perspective on this matter, it is management's belief that the uses of the West Imperial Terminal have been consonant with the stated goals and objectives of the Master Plan. It would seem to us that the major concern of El Segundo is uses which will increase the noise level. The facts are, however, that the usage of the West Imperial Terminal, even with the introduction of World's service, has diminished. In fairness, however, we can recognize how the El Segundo officials view these sequences of events.

We are entering a difficult period in the operation of this airport during the next four years while significant construction projects are underway. We strongly believe it is essential to retain whatever terminal capacity we have to meet these challenges during that period. We recommend that the Board find that the current policies and usages of the West Imperial Terminal are appropriate with the understanding that the situation will be closely monitored and that following completion of Terminal #1 and the West Terminal, a policy review will be undertaken to determine the future of the West Imperial Terminal.

Robert C. Davidson

Robert C. Davidson

RCD:bw

cc: C. A. Moore
W. M. Schoenfeld
S. Disco
J. Montgomery
W. V. Collins
M. Z. Laham
C. C. Egerton

City of El Segundo

RICHARD K. VAN VRANKEN, Mayor WILLIAM D. BUE, Mayor Pro Tem
Councilmen
E.L. BALMER • MARVIN R. JOHNSON • JACK E. SIADEK

July 15, 1980

Board of Airport Commissioners
City of Los Angeles
One World Way
Los Angeles, CA 90009

Attention: Ms. Elizabeth Armstrong, President

Gentlemen:

This letter supplements the letter from Mayor Richard Van Vranken and myself dated May 20, 1980, and is in partial response to the comments on that letter made by Mr. Robert C. Davidson in his memorandum of July 2.

I realize that the Airport Commission has a legal responsibility to manage LAX in the best interests of all its constituents, including the airport tenants. I believe, however, that you also have a responsibility to prevent airport operations from becoming a nuisance to the residents who live near the airport. This includes a responsibility under California Noise Standards to reduce noise impacts as measured by CNEL and a requirement under the 1980 variance to develop a comprehensive plan for achieving compliance with the Noise Standards. The El Segundo City Council plans to participate actively in efforts to assure that LAX achieves compliance with the standards.

Despite Mr. Davidson's explanation, the El Segundo Council continues to believe that the expansion of uses at the West Imperial Terminal by World Airways is a violation of the Airport Master Plan and casts doubt on the sincerity of airport management to comply with the California Noise Standards in a timely manner.

On behalf of the El Segundo City Council I request that the Board of Airport Commissioners take the following actions to prevent any worsening of current noise impacts on El Segundo residents, and to make a positive effort to reduce CNEL as required in California Noise Standards.

1. Relocate World Airways operations to the central terminal area.

2. Prohibit any future use of the West Imperial Terminal for scheduled airline operations, especially by jet aircraft. We are concerned that substantial additional operations may be transferred temporarily to the West Imperial Terminal during future construction activities in the central terminal area and request that you not permit this to occur.

3. Develop a plan with a time schedule for phasing out all incompatible uses now in the buffer area. I suggest a 5-year maximum deadline.

4. In the interim period until the buffer area is cleared of incompatible uses, impose a 10 p.m. to 7 a.m. curfew on all aircraft operations in the buffer area.

5. Require that all aircraft using the West Imperial Terminal in the interim period be towed in and out of the buffer area.

6. Notify El Segundo in advance of future changes that would increase noise impacts.

7. Before implementing any changes that would increase noise impacts, prepare a thorough environmental review of the proposed action.

8. Inform El Segundo of the methodology that will be used for monitoring engine run-up noise and provide periodic reports on the results of such monitoring.

The El Segundo City Council would like to work with the Board of Airport Commissioners in maintaining an airport operation that is both economically advantageous to area residents and in compliance with California Noise Standards. Thank you for your serious consideration of the suggestions made herein.

Sincerely yours,

Jack E. Siadek

Jack E. Siadek
Councilman

JES/lb
cc: Cal-Trans
Wendy Cosin
Mac Dalgleish
Lee Dolley

City of Los Angeles Department of Airports 1 World Way, Los Angeles, California 90009 • (213) 646-5252 Telex 65-3413
Tom Bradley, Mayor

Board of
Airport Commissioners
Elizabeth K. Armstrong
[redacted]
Mary Lou Cunningham
[redacted] President
Robert E. Collins
Samuel Greenberg
Emmett C. McGaughey
Clifton A. Moore
General Manager

August 5, 1980

The Honorable Jack E. Siadek
Councilman
City of El Segundo
350 Main Street
El Segundo, CA 90245

Dear Councilman Siadek:

The Board and the staff of the Los Angeles Department of Airports have given considerable thought to the issues which the City of El Segundo has raised with respect to the continued operation of the West Imperial Terminal. We have certainly felt that over the years, a constructive relationship has existed between the airport and the City of El Segundo with both parties recognizing the complexities of the problems and benefits which increased air transportation has created.

The City of El Segundo is a signatory to the ANCLUC Study which is now under way and which will address many of the land use compatibility problems as identified by the California Noise Standards. As a working partner in this study, El Segundo will have a direct input in the study result. We believe it is important to again point out, however, that the actual noise monitoring information confirms that the CNEL level in El Segundo has declined since we began our monitoring efforts in early 1976, and that use of the West Imperial Terminal has diminished.

We are, however, facing a difficult construction cycle, beginning late this year, to complete the construction of the Second Level Roadway, Terminal #1 and the West Terminal which will strain our ability to deal with air traffic demands during that four-year period. With this in mind, it would be extremely counter-productive to encourage additional usage of the Central Terminal Area by carriers such as World Airways or others who currently, by choice, operate from the West Imperial Terminal.

The Los Angeles Interim Plan provides that "uses of the existing facilities in the buffer area may continue as required until the Department of Airports can develop alternate facilities." When the completion of Terminal #1 and West Terminal is closer to reality, we can then appropriately undertake a policy review to determine the future of the West Imperial Terminal.

The imposition of a curfew as suggested by you at the West Imperial Terminal raises some very complex legal issues and other policy questions in the light of the criticality of terminal space and the problems which we see ahead. The Board cannot agree with your suggestion.

We will undertake a review with the users of the West Imperial Terminal to determine if towing in and out of this area is appropriate. In the meantime, the carriers have volunteered to tow all departing aircraft to the taxiway so that we can monitor the results of such a policy. We would hope that the channels of communication which exist between the City of El Segundo and the Department of Airports, i.e., the Airport Area Advisory Committee and the ANCLUC will provide forums for discussion of mutual problems and solutions.

The existing law is quite clear in those instances when environmental reviews are required which will increase noise impacts. It has been our policy since the origination of this legislation to scrupulously comply with the spirit and intent of the environmental legislation.

On the subject of runup noise, we are going ahead with the additions to our monitoring system which will permit better identification of violations of our nighttime prohibition against maintenance runups. That system hopefully will be in place within three or four months, and should provide an effective tool for identifying such violations and taking appropriate action to prevent recurrences should they occur.

One issue that was addressed earlier involved the construction of a high speed exit from Runway 25L. Enclosed is a drawing of the Airport Layout Plan showing a dotted high speed taxiway just easterly of the West Imperial Terminal designated 37G which will be built at the time of reconstruction of the south runway complex. This high speed turnoff should resolve the problem which the City of El Segundo brought up earlier.

Finally, we hope that the long standing relationship will continue in that your city will feel free at any time to bring these issues to our attention for a frank and open exchange of ideas.

It is also noted that your letter, Councilman Siadek, is addressed to the Board of Airport Commissioners, Attention: Ms. Elizabeth Armstrong, President, and the salutation was, "Gentlemen". Obviously, this is an inappropriate salutation when corresponding with this Board of Airport Commissioners.

Very truly yours,

Mary Lou Cunningham

Mary Lou Crockett
President, Board of
Airport Commissioners

City of El Segundo

WILLIAM D. BUE, Mayor CHARLES K. ARMSTRONG, Mayor Pro Tem
Councilmembers
MARVIN R. JOHNSON • JACK E. SIADEK • LE SYNADINOS

April 5, 1983

City of Los Angeles
Board of Airport Commissioners
1 World Way
Los Angeles, CA 90009

Attn: Mr. Emmett C. McGaughey

Dear Mr. McGaughey:

On behalf of the City of El Segundo, and in my capacity as City representative to the ANCLUC Steering Committee, I wish to direct the attention of the Board once again to the status of the Imperial Terminal operations and the resultant noise impact on our City. We raise this issue at this time because there is an immediate opportunity for the Board to implement long standing adopted land use plans and to demonstrate willingness to follow through on past promises to the citizens of El Segundo to mitigate a long-standing noise problem.

Specifically, we are requesting that Imperial Terminal operations be relocated to new airport facilities such as those currently under construction at the west end of the airport. Further, that the Imperial Terminal site be converted to only those uses designated in the Master Plan and the LAX Interim Plan for airport buffer areas. Our reasons for this request are as follows:

1. LAX policy, since at least 1969 and most recently affirmed by Mr. Clifton Moore, Airport General Manager, at the 1982 Noise Variance hearings, has expressed the intent to relocate operations from the Imperial Terminal as soon as feasible;

2. The airport buffer area on the south side of the airport described in the Airport Master Plan and in the LAX Interim Plan was designated with the stipulation that "Uses of existing facilities in buffer area may continue as required until the Department of Airports can develop alternate facilities";

350 Main Street El Segundo, California 90245 (213) 322-4670

3. The BOAC has expressed its intent, both verbally and in written response to past requests regarding Imperial Terminal operations, to undertake a policy review to determine the future of Imperial Terminal "when the completion of Terminal #1 and West Terminal is closer to reality";

4. The new Terminal #1 facility at LAX is scheduled for completion by December, 1983 and the new West Terminal is scheduled for completion by June, 1984.

5. The definition of feasible terminal relocation options is consistent with the current ANCLUC work program.

We urgently request your prompt attention to this matter and ask that you direct DOA staff to report back to the Board on a priority basis. Action at this time will re-affirm the Board's intentions of implementing long standing land use policies designed to minimize noise impacts on residential neighbors.

Your cooperation and support will be sincerely appreciated.

Sincerely,

Councilman Charles Armstrong
Mayor Pro Tem, City of El Segundo

cc: Mr. Dale Beland

cc Council
City mgr
City atty

RECEIVED
PLANNING DEPT.

City of Los Angeles Department of Airports 1 World Way, Los Angeles, California 90009 • (213) 646-5252 Telex 65-3413
Tom Bradley, Mayor

AM PM
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May 23, 1983

RECEIVED
JUN 1 1983
CITY ATTORNEY'S OFFICE

Honorable Mayor William D. Bue
and the El Segundo City Council
City of El Segundo
350 Main Street
El Segundo, CA 90254
Attn: Mayor and City Council

Dear Mayor Bue:

The Board of Airport Commissioners has deep concern regarding the letter from the El Segundo Noise Abatement Committee, and the letter from the El Segundo City Council.

With the advent of jet powered aircraft, the Airport Commission has recognized its responsibility to reduce the impact of noise on the surrounding communities. In the early 1960s the Board of Airport Commissioners adopted several noise abatement regulations. Then, in the 1970s the Airport at a cost of over $1 million prepared the most comprehensive Environmental Impact Report (EIR) ever processed for an airport in the United States. That EIR thoroughly identified all of the then existing and projected impacts that would be associated with LAX operating at 40 million annual passengers and identified mitigation measures. The City of El Segundo participated in that EIR process.

The Department of Airports has a history of cooperating with the El Segundo Noise Abatement Committee through its Community Relations representative. In addition, the City of El Segundo is represented on the Airport Area Advisory Committee to the Board of Airport Commissioners.

Moreover, the Airport Public and Community Relations Bureau has been doing its best to keep the lines of communication open between El Segundo and the Department of Airports. Finally, El Segundo has had representation

on the ANCLUC study since its inception and has continually participated in the Joint Land Use/Aviation Technical Committee.

The remainder of this letter contains responses to the Noise Committee's comments in the order they were listed.

Comment No. 1

"The Department of Airports has failed to comply with the State Noise Standards. The State Noise Standards were adopted in the early 1970s, and here, over 10 years later, noise is still increasing from the airport and the airport is still expanding. As a result of three public hearings, it has been shown that the Department of Airports is attempting to confuse the ANCLUC process with the airport's responsibility to reduce noise. This Committee is of the view that the responsibility is solely with the Department of Airports. El Segundo should continue to be involved in the ANCLUC process, not only to protect its own interests, but to assure that the Department of Airports role in ANCLUC is not soleley self-serving."

Response

Los Angeles International Airport is currently operating pursuant to a Variance from the California Airport Noise Standards granted by the State of California. As such, the Department of Airports is in compliance with the terms of the California Noise Standards.

Noise generated by LAX has been decreasing and is projected to further diminish the future. In 1979, the total incompatible land use contained within the 65 CNEL contour was 6.9 square miles. Last year this amount was reduced by 19 percent to 5.6 square miles. Further, by 1985 it is projected there will be only 4.7 square miles of incompatible land use within the 65 CNEL Contour.

The Department of Airports does not confuse the ANCLUC process with its responsibility to reduce noise. Indeed, the primary goal of the ANCLUC study is to identify noise control and land use strategies which can be considered to further reduce the noise.

The ANCLUC study participants which include El Segundo are investigating feasible methods of reducing noise. El Segundo also will be given an invitation to particpate in a Federal Part 150 noise compatibility program, one of the outputs of the ANCLUC study.

In addition, several meetings, the most recent with the Mayor Pro Tem Charles K. Armstrong, the ATA and control tower personnel, have been held with the goal of reducing aircraft departure drifts and early turns over El Segundo.

Comment No. 2

"Over the years the Department of Airports has promised to phase out the Imperial Terminal. This has never been followed up, and at present the Committee believes that there is no intent on the part of the Department of Airports to phase out the Imperial Terminal despite the many promises over the years."

Response

This response has been expanded to also answer a recent letter from Charles K. Armstrong, Mayor Pro Tem of El Segundo to Emmett C. McGaughey, President of the Board of Airport Commissioners.

The Department of Airports has continually maintained the position that the Imperial Terminal would be relocated when feasible and compatible with overall airport operations. Regarding the LAX Interim Development Plan processed through the Airport Commission and adopted by the Los Angeles City Council, the Imperial Terminal is designated in the Buffer Area. The Plan text indicates that existing facilities in the Buffer Area may continue until the Department of Airports can develop alternative facilities.

Between now and mid 1984, the Airport Commission will carefully review the status of the Imperial Terminal. World Airways with over 75 percent of Imperial Terminal operations is scheduled for relocation to the West Terminal in 1984.

Comment No. 3

"The Department of Airports continues to allow heavy use of the south runways to the detriment of the residents of the City of El Segundo and to the betterment of the residents still living in the City of Los Angeles on the north side of the airport. The majority of takeoffs from noisier airplanes still occur on the south runways. While the excuse that the tunnel must be strengthened has been used for a number of years, in fact that program could have gone ahead independently rather than tie that project to the massive building program of expansion currently going on at the airport."

Response

Granted, the south runway complex continues to be heavily used. When the second south runway is reinforced to accommodate widebody aircraft, the Board of Airport Commissioners will review its policy of balanced operations.

Airlines such as PSA, Air Cal, South West, U.S. Air, and Muse are scheduled to be relocated into the new Terminal One. These airlines in combination carry about five million annual passengers or approximately 15 percent of the total LAX operations. It is expected that there basically will be an even distribution of wide and narrow bodied aircraft on both runway complexes in 1984. The noise analysis contained in the ANCLUC study (now more than twothirds complete) is predicated on a 50-50 split of air carrier traffic for the two roadway complexes.

Comment No. 4

"There have been continued delays and excuses. This is shown by the adoption of a noise regulation which has absolutely no effect on noise at the airport because it simply adopts the Federal regulations regarding the retrofitting of airplanes. In addition, the delaying tactics have been evidenced in ANCLUC. After considerable time and expenditure, near the point when it was a possible to look at a number of different alternatives and combinations to reduce noise, it was announced that the money had nearly run out and all of the programs were not important enough to run. The delays are also shown in the workup of a great deal of material that was already available in a number of forms. The hearing on the Variance from State Noise Standards was continued. The City of El Segundo has worked diligently on ANCLUC. This Committee believes that the airport staff has not done the same."

Response

As early as 1975, the Department of Airports was the national leader in the formulation of a regulation which would require the phase-out of non-FAR Part 36 aircraft operations at LAX. Indeed, the Department's efforts in this regard were instrumental in the Federal Government's ultimately adopting their FAR Part 36 compliance rule. The Department's regulation is similar to the Federal regulation. However, there are some important differences; after January 1, 1985 the LAX regulation will not permit continued operations by non-Part 36 two engine aircraft.

During recent hearings on air carriers' requests for Variances from the Fleet Noise Rule, it was made abundantly clear that the Board of Airport Commissioners does not intend to relax its requirement that all operations at LAX must be flown by Part 36 aircraft beginning January 1, 1985.

Currently, about 80 percent of all operations at LAX meet FAR Part 36 requirements. This fact is indicative of the successful effort by the Department of Airports and the airlines to reduce the noise impact in the vicinity of LAX and the airlines.

Granted, in the ANCLUC study, more time has been spent than originally anticipated, about three months of the extra time had to do with establishing a Steering Committee requested by El Segundo that was not included in the original contract among the Airport, FAA, Los Angeles County, and the other affected jurisdictions, including El Segundo.

Then, the Steering Committee decided to hire its own Project Coordinator, Dale Beland. This also took about three months more because many candidates were interviewed before he was ultimately selected. In addition, there was a break of about another three months during the period between the departure of the former El Segundo Planner Ms. Wendy Cosin and the hiring of a new Planning Director Nickolas Romaniello. Finally, there was a demand by all of the jurisdictions for more public input than was originally envisioned, which also resulted in a delay of several months.

El Segundo participated in drafting the ANCLUC contract, which determined the level of resources that could be allocated to the number of alternative operational scenarios that would run by the noise consultant. El Segundo is an explicit party to the ANCLUC study contract, therefore any complaints about its intensity or direction are without foundation. This is doubly true because El Segundo was and continues to be a prime source of all decisions made relative to which operational scenarios will be modelled.

Comment No. 5

"Recently, the Department of Airports developed a Capacity Control Regulation. This regulation, when analyzed carefully, allowed the Department of Airports to actually increase the number of aircraft and would allow growth of the airport to an excess of 40 MAP. The City of El Segundo has already pointed out the faults in the proposed Capacity Control Regulation, and has proposed a proper regulation."

Response

The Department of Airports staff has prepared a proposed Capacity Control Regulation which is currently under consideration and study by the ANCLUC Committee. This proposed Regulation has not been adopted by the Board of Airport Commissioners. The primary objectives of the proposed Capacity Control Regulation is to further reduce noise, traffic congestion and other environmental impacts associated with the operation of the airport.

A majority of the affected jurisdictions in the ANCLUC process have supported, in concept, a capacity control regulation. Without such a regulation, it will not be possible to control the number of operations or passengers using LAX.

Neither the Sound Abatement Committee nor the El Segundo Council has submitted an alternative capacity control regulation to the Department of Airports.

Comment No. 6

Recently, through a series of letters between a developer, the State, the County, and the Department of Airports, the Department of Airports was able to obtain an easement from a developer in El Segundo for air rights. It appears, based upon information supplied to this Committee, that the easement was not voluntarily granted, but rather was granted after a series of misunderstandings and possible misrepresentations, made by the various agencies involved, as to the necessity and requirement of such an easement.

Response

Mr. Jules Walder contacted the Department of Airports and offered the noise easement to the City of Los Angeles as a part of the development of his land. While there is no mandatory State statute which requires the granting of this easement, the action taken by the developer was totally consistent with the California Noise Standards and the California Administrative Code. The easement granted by Mr. Walder was voluntary and in his interests.

Comment No. 7

"The Department of Airports has taken no action on early turns. This problem has been manifested for a long time. Many over-flights occur on takeoffs due to actions taken

by pilots which are not related to safety and which bring aircraft over the City of El Segundo or closer to the City of El Segundo. The airport has made no effort to solve this problem."

Response

The Office of Noise Abatement and those engaged in the ANCLUC study have been working diligently to reduce occurrences of drifts and early turns. The Noise Abatement Office is in regular contact with the Tower and the Airline Transportation Association in an effort to reduce aircraft overflying El Segundo. Pilots are continually instructed to maintain runway heading until they reach the shoreline.

The Department of Airports is investigating whether off-the-shelf technology exists for identifying and regulating drifts and early turns.

Comment No. 8

"From time to time the Department of Airports has adopted policies concerning nighttime runups. Nighttime runups are a source of great annoyance to citizens of El Segundo who are trying to sleep. While policies have been developed, they are not enforced. Nighttime runups occur at the same rate now as in the past. Because of this situation, it is apparent that while the Department of Airports may have recognized this problem, it has not seriously addressed it. A policy, in order to be effective, must be enforced. There appears to be no method of enforcement utilized by the Department of Airports at the present time."

Response

The Department of Airports enforces its long standing policy on curtailing nightly runups between 11:00 p.m. and 6:00 a.m. Grounds noise monitors are in the maintenance areas with alarms in the Operations Office. Airport Management has been and continues to be doing its best to reduce noise in the surrounding communities with available resources. Granted, considerable money has been spent in remodelling LAX, but we disagree that little time and money has been spent on noise reduction. According to a report given to the BOAC last week $173 million has been spent since 1966 to reduce the LAX noise impact. In addition the two southerly runways will be strengthened to accommodate the quieter wide-body aircraft at a cost of about another $45 million.

In summary, the Department of Airports has not ignored its public responsibility to reduce noise experienced by citizens living around the Airport, but rather has actively and aggressively sought to reduce noise based on the many programs outlined earlier in this communication.

Airport Management is both aggressive and imaginative in reducing impacts associated with the operation of LAX.

Sincerely,

Emmett C. McGaughey
President
Board of Airport Commissioners

Reference:

El Segundo Mayor and Council letter January 31, 1983
El Segundo Noise Abatement Committee letter January 31, 1983
El Segundo Mayor Pro Tem Charles Armstrong letter March 25, 1983

SECTION VII

AUXILIARY POWER UNITS

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I. INTRODUCTION

The Los Angeles International Airport Noise Control/Land Use Compatibility (LAX-ANCLUC) Study identified a number of issues related to LAX noise impacts. Analysis of these issues is a part of the effort that will lead to the development of a recommended Noise Control Program as the final product.

A majority of the issues related to noise associated with airport operations have been analyzed using the Integrated Noise Model (INM). This model enables the measurement of noise impact using the Community Noise Equivalent Level (CNEL) metric to generate noise contour maps and to quantify the effects of an aircraft operational adjustment on the CNEL Contour.

However, a few of the identified issues do not lend themselves to computer analysis and would not affect the CNEL contour if modeled. These issues relate to aspects of the airport operations which generate intermittent or single event noise impacts. The issue of auxiliary power unit (APU) utilization is in this category.

A. Purpose

APU noise emissions have been identifed as a source of annoyance by citizens of El Segundo, Playa del Rey, and Westchester. This technical report contains a description of APU utilization at LAX and a discussion of potential measures to reduce the problem.

B. Scope

APU noise emissions are associated with aircraft ground operations. During peak activity periods APU noise is usually masked by the dominant aircraft arrival and departure noise. However, in between these peaks ground aircraft noises including APUs do contribute to the aura of noise eminating from the airport.

Noise complaint reports examined do not specifically identify APU noise emissions as a problem. However, APUs are used in various degrees during most aircraft ground operations. This utilization pattern is expected to continue for sometime in the future. Strategies with the potential to reduce this ground noise source are included in the report along with the preliminary cost estimates.

II. APU UTILIZATION

The Auxiliary Power Unit (APU) is a small jet turbine powered electric generator located in the fuselage of jet aircraft with the exhaust port in the tail section. Early model DC-8-50s and 60s and BAC 1-11s are the aircraft type in operation at LAX that not equipped with an APUs. These aircraft represent less than 5 percent of current operations and will gradually decline due to replacement. APUs are used to power onboard support systems (i.e., cockpit instruments, lights, heating, air conditioning, etc.) while the main jet engines are shut down. The APU is also used during main engine ignition at boarding gates and when ground power systems are unavailable. Noise generated by an APU is a low frequency "rushing roar" which emanates from the exhaust port. APU utilization is variable at LAX depending on which gate or parking position is used, the type of operation, and duration of the aircraft's holdover. However, with the number of daily aircraft movements at LAX, APUs are in use continually throughout the day. The impact of APU noise is sometimes made worse by the positioning of the aircraft at the terminal gates which may direct the APU exhaust at or parallel to the adjacent communities.

Cargo operations are a significant source of APU noise emissions because cargo loading operations usually occur at night. In most cases only a ground power unit will be used because the interior of the aircraft remains cool at night without air conditioning. However, when the loading operations occur during the day or if the cargo being loaded is perishable (e.g., flowers, animals, etc.) conditioned air is necessary to maintain a low cabin temperature. This controlled temperature requirement necessitates APU use for onboard cooling if a ground based air system is not available.

A. Operational Procedures

APU utilization procedures vary among the air carriers and depend upon the facilities available at the ramp/gate areas. For example an aircraft arriving at LAX will taxi to an assigned gate to deplane passengers and cargo. The main engines are shut down at this point but the APU continues to operate providing onboard power and air conditioning to the aircraft until the ground crew connects the aircraft to an external ground power unit (GPU) to supply power requirements. However, if the aircraft is in the middle of a landing takeoff cycle (LTO) the APU may remain in operation to provide the onboard air conditioning for deplaning and enplaning passengers because the electric power provided by the GPU is of insufficient frequency (400 Hertz Cycles) to power

the onboard air conditioning unit, which requires 560 Hertz Cycles. When an aircraft is laying over or being repositioned for next day operations continual air conditioning is not needed. However, the air within the parked aircraft must be reconditioned prior to enplaning passengers for the next operation.

Aircraft operating at Imperial Terminal are allowed to operate the APU one-half hour prior to departure and a half hour after arrival to maintain cabin temperatures during the enplanement and deplanement of passengers. The Noise Abatement Office recently installed signs instructing airlines using Imperial Terminal to minimize the use of both APUs and GPUs. During the preparation of the Imperial Terminal Operations Technical Report noise emissions from a DC-10 APU registered 85 dBA at 150 feet directly behind the APU exhaust port.

B. APU Operating Costs

Operating costs associated with APUs have risen signficantly due primarly to the increase in jet fuel prices and maintenance expense. The hourly cost of APU use for typical aircraft types are listed below:

Aircraft Type	APU Cost/Hour
B747	$141.00
DC-10/L1011	91.00
B727/DC-9	49.00

APU operating costs for the new generation of aircraft (i.e. B757, B767 and DC-9-80) were not available. However, these costs would be very similar to those reported above.

The cost of APU use at LAX is difficult to estimate, but considering there are approximately 500 LTOs (with an average duration of 30 minutes) per day as well as maintenance and cargo activities, the total cost has been estimated at one-half to $1 million a day. The ATA estimates that annual nationwide fuel consumption by APUs is approximately 350 million gallons.

III. GROUND POWER AND AIR FACILITIES

APU dependence can be reduced by providing both ground power and air facilities for aircraft. There are many alternative configurations for these facilities ranging from centralized fixed systems to mobile trailers and trucks. The aircraft manufacturers have standardized aircraft power and air inlets to accommodate this wide range of equipment.

A. Existing Facilities

A survey of the terminal/ramp areas was conducted to identify the type of ground power and air facilities currently available. The results of the survey indicated that some form of ground power has been made available at all gates within the Central Terminal Area (CTA) and at Imperial Terminal. In the case of Terminal #2 and the Imperial Terminal, the ground equipment is mobile, which is operated by ground handling companies on an as-needed basis. Through a retrofit program in most cases, these ground power systems at the other terminals are fixed with long extension cords attached to the bottom of the boarding gates (Attachment A). The airline ground handling equipment also includes mobile ground power units. (Attachment B).

Satellite #2 is not equipped with a fixed power system. The international carriers currently share this terminal for their operations. However, no individual carrier's level of operations is sufficient to justify retrofitting the terminal with fixed power. Due to the various level of operations (frequency of flights, etc.) it has proven extremely difficult for the foreign carriers to agree on how the acquisition of this equipment might be financed.

The installation of fixed power systems at the satellites used by the major trunk carriers was accomplished because the levels of utilization by that carrier was high enough to justify the capital expense required to increase overall operational efficiency.

The survey also indicated that only TWA's gate 37B in Satellite #3 is equipped with both fixed power and air. Airline ground handling equipment does include mobile air conditioning units on trailers, situated around the ramp areas. Many of these portable units are not powerful enough to be effective on larger aircraft.

B. Planned Facilities

The new terminal facilities under construction will be equipped with fixed power and some form of ground based conditioned air system. The variables associated with the most efficient type of ground based air are:

- predominant weather conditions
- terminal/ramp layout
- taxi in-and-out vs. taxiing-in and push-out ground handling capability
- gate utilization system
- aircraft types to be served per gate
- system output requirements
- economic conditions (terminal space, power costs, equipment availability, etc.)
- maintenance and miscellaneous costs

The new West Terminal will provide eleven wide body aircraft gates. These gates will have a fixed power system. The international carriers have formed a corporation LAXTEC to finance and operate this equipment. The decision on what type of air system will be installed is under negotiation. Preconditioned air from either a fixed system or mobile units is being considered. Examples of the mobile units are provided as Attachments C and D. The remote parking positions being contructed to accommodate peak West Terminal operations would be serviced by mobile air units.

Terminal One will provide fourteen aircraft gates for domestic air carrier flights. These gates will be equipped with fixed power and a fixed pneumatic air system (Attachment E).

The provision for both ground power and air system in new construction has been strongly encouraged by the Board of Airport Commissioners (Resolution No. 12388). The air carriers support the acquisition of this equipment due to the potential reduction in overall operating costs, but actual acquisition has been impeded due to the industry's overall economic condition in 1983.

C. Facility Cost Information

Providing ground power and air systems adds significant costs to terminal construction. The ATA estimates that these additional costs are paid back in one year for a 400 cycle ground power system and one to three years for an air system if use is maximized (either pnuematic or preconditioned). The costs are provided below:

- 400 Hz Cycle Power System $35-60,000 per gate
- Fixed Pneumatic Air System $70-170,000 per gate
- Fixed/Mobile Preconditioned Air $70-170,000 per gate

Hourly operating costs of an APU, diesel ground power unit, and a fixed power system are summarized below:

Aircraft Type	APU	Diesel Ground Power	Fixed System
B727/DC-9	$ 49	$ 4.30	.75
DC-10/L1011	$ 91	$12.00	1.20
B747	$141	$17.00	1.70

This material illustrates the fact that while fixed power and air systems are expensive to include in new construction and even more expensive to retrofit, these systems are also extremely cost effective, once in operation. The estimated one-to-three year payback is a very positive return on the initial investment.

Fixed power and either fixed or mobile air system have the potential for other benefits including:

- additional airport revenues if the systems are installed by the airport and the air carriers charged a fee to hook up.

- improved environmental conditions

  - ground noise reduction
  - reduced ramp clutter
  - reduced air emissions (potential air emission offset strategy)

IV. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. APU noise is currently a major source of ground noise at LAX during periods of light traffic or nocturnal hours.

2. Current APU utilization will continue but should gradually decline as the airlines update their ground handling equipment.

3. Both ground based power and air systems of some configuration are required to totally replace the function of an APU during ground operations.

4. Alternative power and air systems are available to replace the APU in a cost effective manner.

5. Reductions in APU utilization would effect ground noise impacts especially at night when background noise levels are lower.

6. The airline industry has recognized the benefits of fixed power and fixed or mobile air systems over the APUs. Moreover, the industry is moving toward retrofitting existing facilities and designing new facilities that will maximize efficiency and reduce operating costs.

B. Recommendations

1. The ATA in cooperation with the Department of Airports should continue to pursue the acquisition of ground based power and air systems to reduce APU use.

2. Nighttime air carrier operations should be required to provide both ground power and air to reduce APU noise emissions during sensitive nighttime hours.

V. BIBLIOGRAPHY

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3. Department of Airports, Los Angeles International Airport Noise Control/Land Use Compatibility (LAX-ANCLUC) Phase One Report Task 1.07, August, 1981.

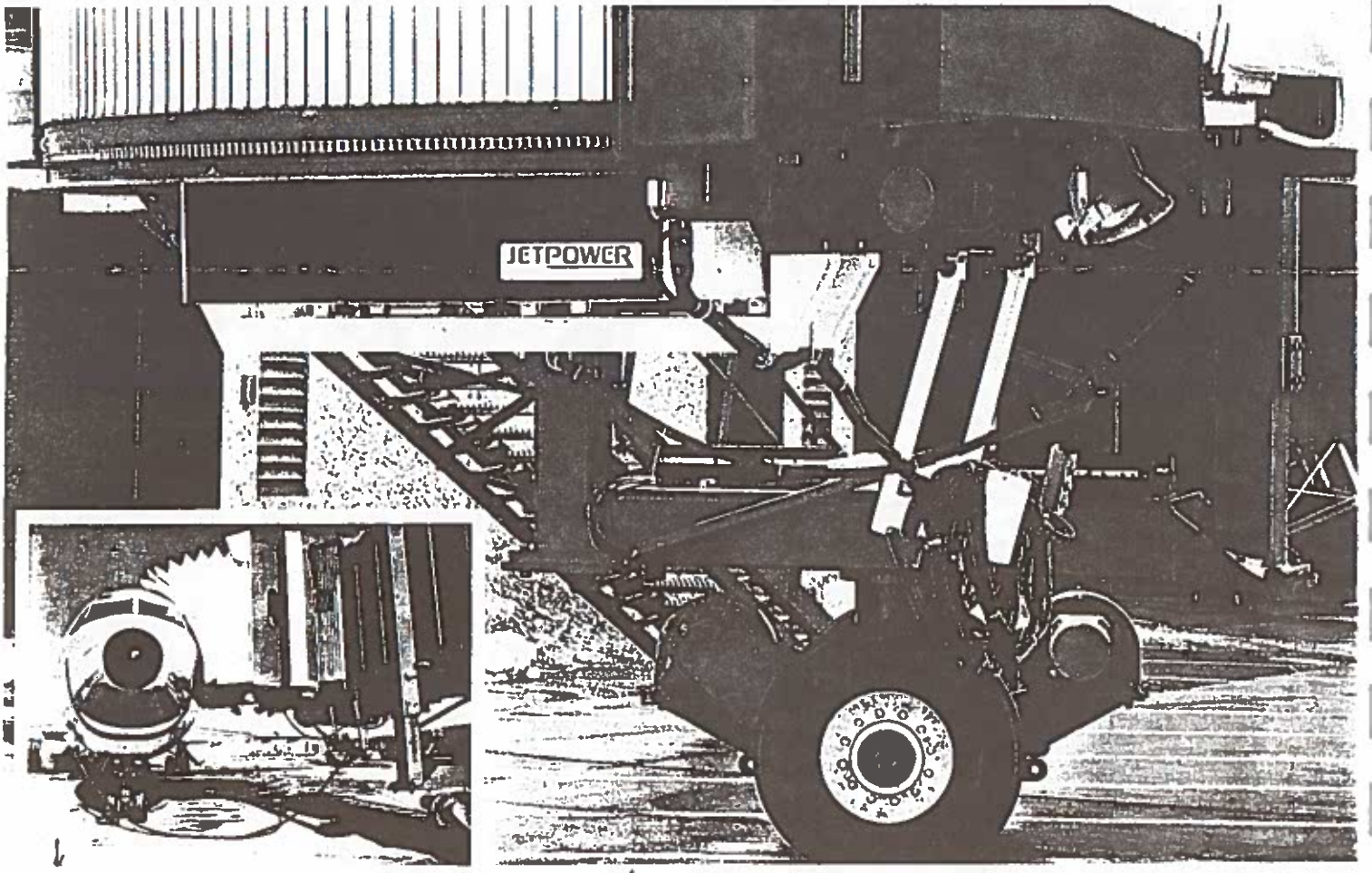
4. Department of Airports, Noise Complaint Monthly Summary, January-August, 1983, Compiled by the Community Relations Office.

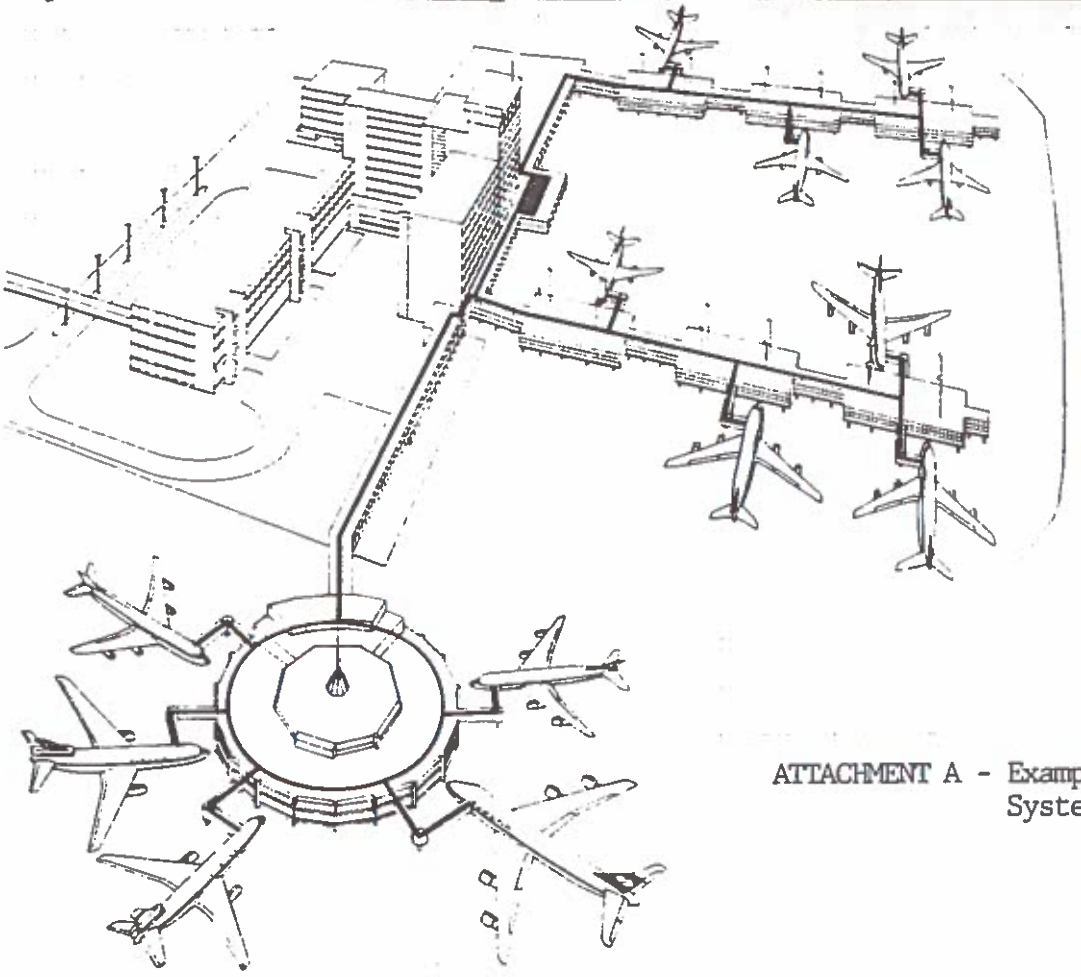
5. _____ Ground Power and Air Systems, (Lecture Notes) Aviation Business '83 Conferences, February 28, 1983. Speaker Phillip Agee of ATA.

B. Persons Consulted

George Carver - Air Transport Association

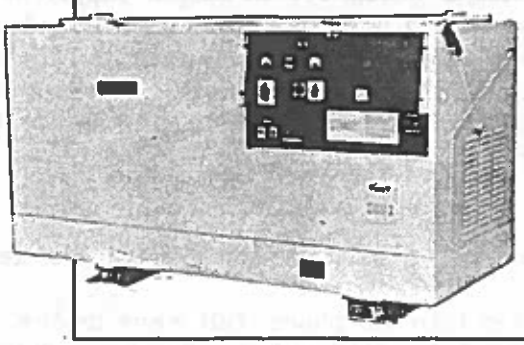
VI. ATTACHMENTS





ATTACHMENT A - Example of a Fixed Ground Power System

Illustration shows power distribution network to thirteen aircraft stands from a conveniently sited power house incorporated in the terminal building.



SPECIFICATION No. 90/677/182

HOUCHIN
MODEL 677
TOW TRACTOR GPU - 90 kVA

The Model 677 Ground Power Unit supplies electrical energy to aircraft for ground servicing checks of radio, radar and other electrical equipment on aircraft having 400Hz systems. The unit, designed specifically for mounting on aircraft towing tractors, is powered by an industrial diesel engine which derives its fuel and electrical starting supply from the tractor fuel tank and battery.

ELECTRICAL PERFORMANCE

The alternator has the following capability:-
90kVA, 115/200V, 3 phase, 400Hz at 0.8 p.f. lagging CONTINUOUS RATING:
100kVA at 1.0 p.f. for 5 MINUTES
180kVA at 0.4 p.f. lagging for 5 SECONDS.

ELECTRICAL STANDARDS

The alternator is a brushless synchronous machine designed and manufactured wholly by Houchin in accordance with BSS2613 and relevant sections of BSS4999. The insulation of the machine is Class 'B', the windings being fully impregnated to ensure protection from moisture. The frame is of drip-proof construction, cooled by an internal axial fan.

OPERATING ENVIRONMENT

The equipment rating is continuous at the SAE standard conditions of 29°C and 150m (500 ft) altitude. Reserve capacity enables correctly-maintained equipment to provide the rated output at up to 1000m (3000 ft) altitude at +29°C OR at +45°C at altitudes up to 150m (500 ft). Beyond these limits, the factory should be consulted for the appropriate derating.

PRIMARY POWER

The GPU is powered by a Cummins V8-555 naturally aspirated diesel engine, developing 166 BHP gross continuous at 2400 rpm in an environment of 29°C and 500 ft altitude. The engine starting system is 24 volts, provided from batteries on the tractor. The engine has an integral water cooled lub. oil heat exchanger and replaceable-element type fuel, oil, and air filters. The basic engine governing is provided by a mechanical governer operating directly into the Cummins P.T. fuel injection system, with fine control by the Houchin electronic speed trim.

ALTERNATOR

This is of Houchin design and manufacture, and is the brushless type. The machine will give a continuous output of 90kVA, 0.8 power factor lagging, and is wound for an output supply of 115/200 volts, 3 phase, 4 wire, 400Hz when running at a speed of 2,400 r.p.m. It will also give a peak intermittent output of 180kVA at 0.4 power factor lagging. The alternator is of the revolving field salient pole type having a single endshield bearing and spring steel disc coupling for direct bolting to the engine flywheel.

EXCITATION

The exciter comprises a 3 phase revolving armature generator, [illegible] The 3 phase supply from the armature is fed into a 3 phase, full wave bridge, rotating rectifier system mounted on the main alternator shaft. The rectifier system consists of silicon diodes which are mounted on aluminium heat sinks. From this rectification system a direct current is fed into the main alternator field system.

ELECTRICAL CHARACTERISTICS

The electrical characteristics of the equipment meet the requirements of BS G219 and MIL-STD-704 in all respects and are entirely adequate for the support of aircraft constructed in any country of the world.

In particular, the a.c. waveform has a crest factor of 1.414 + or - 0.07 at all balanced loads, the value of any single harmonic due to non-linear loads, as defined in G219, will not exceed 2% of the fundamental amplitude, and total harmonic content under the same conditions will not exceed 3%. Under unbalanced load conditions, up to 1/3 full load current (0.8p.f.) on one phase, the others unloaded, the a.c. waveform distortion factor will not exceed 5%.

The Houchin solid-state Automatic Voltage Regulator maintains the a.c. voltage within + or - 1% of the nominal value under all steady conditions of load and power factor.

Transient changes in voltage due to load switching of 100% full load at 0.8 p.f. on or off are held within 20% of nominal voltage, and recover to the steady state tolerance in less than 0.2 seconds.

The Houchin speed trim unit maintains the a.c. frequency within + or - 2Hz under all steady conditions of load and power factor. With this electro-mechanical unit augmenting the engine governor performance, transient speed deviation to 100% load changes, on or off, is held within + or - 13Hz recovering to the steady state limit in 1½ seconds.

CONTROL EQUIPMENT

The instruments and controls for the 400Hz electrical output and engine are incorporated in a steel panel protected by a perspex window, and include the following items:-

ELECTRICAL SECTION
Contactor, triple pole, solenoid operated
Contactor 'On' indicator light
Set of 'On/Off' push button switches
Ammeter, 63.5mm (2½ in) diameter, 90° scale, hermetically sealed
Ammeter selector switch

ELECTRICAL SECTION
Voltmeter, 63.5mm (2½ in) diameter, 90° scale hermetically sealed
Voltmeter selector switch
Three current transformers, ring type, air cooled
Vibrating reed frequency meter, 63.5mm (2½ in) diameter
Voltage trimmer, giving + or - 15% adjustment of normal voltage
Excite switch
Bypass/interlock switch
Idle/service switch
Panel illumination switch

ENGINE SECTION
Master key ignition/start switch
Hour recorder
Oil pressure gauge
Oil pressure override switch

FAULT PROTECTION DEVICES

ELECTRICAL SYSTEM
Under frequency - 380Hz
Over frequency - 420Hz
Under voltage - 180 volts
Over voltage - 220 volts
Overload protection - 120% full load current, 5 minutes time delay

In the event of a fault producing any of these conditions, the output contactor would be opened and the alternator de-energised. Provision is made to prevent cycling against a fault.

ENGINE SECTION
Automatic shut-off is provided for low oil pressure and high water temperature protection.

BATTERY AND FUEL CONNECTIONS

The model 677 receives its fuel and battery supply from the tractor. The d.c. supply is made via a standard NATO 3 pin connection and the flow and return fuel connections are made via 'Aeroquip' quick release connections. (The mating fuel connectors are supplied).

OUTPUT CABLE CONNECTIONS

The output plug is situated on the front of the unit under a protective hinged flap and is suitable for a standard NATO six pin connection socket.

CANOPY

The weather protective enclosure is fabricated from 1.6mm zinc coated sheet steel on a light angle framework. Two hinged doors on the roof provide access for routine maintenance.

TRACTOR MOUNTING

The unit is mounted on a steel base fitted with four flexible mountings. Provision is made for a single central lifting eye and may be fork lifted. Fixing details can be supplied on request.

Note: It is essential that adequate cooling for the GPU is allowed for when positioning on the tow tractor. Houchin will be pleased to liaise with the tow tractor manufacturer to ensure compatibility.

FINISH	The unit exterior can be painted in any single colour according to customer's requirements. Please state British Standard Colour or equivalent.
TESTING	The unit is fully tested before leaving our Works to demonstrate compliance with this specification. All purchasers are invited to inspect the finished unit on test at no additional charge. Test reports can be provided with each unit.
PUBLICATIONS	A comprehensive handbook generally in accordance with ATA 101, Revision No. 1,3/69 is supplied free of charge, and contains the following information:-

General description and specification
Installation and pre-start procedures
Theory of operation
Starting and operation instructions
Maintenance procedures
Detailed, illustrated replacement parts list
Fault finding charts and diagnoses
Schematic and wiring diagrams
Vendor identification lists
Engine workshop manual

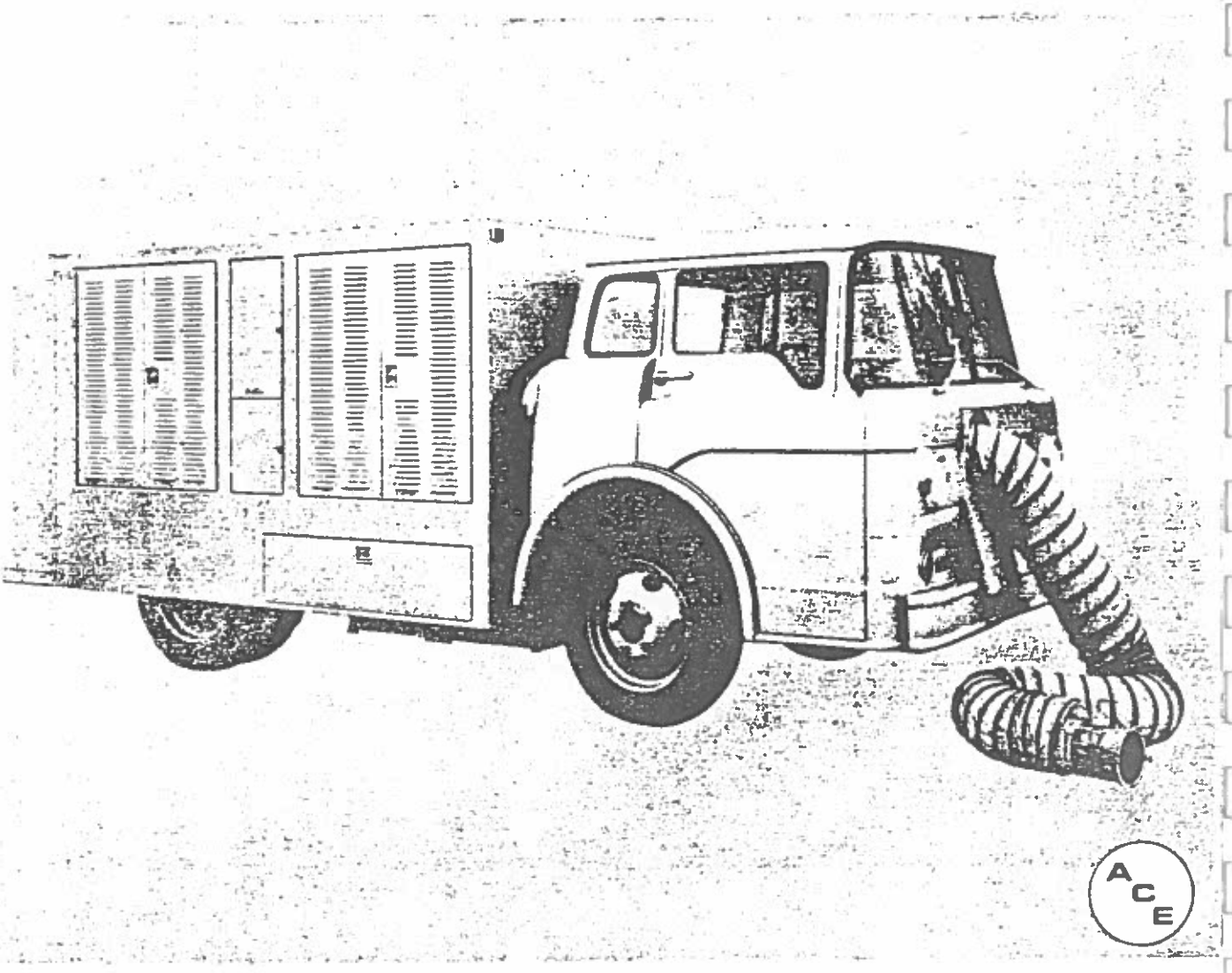
SERVICE BULLETINS	Service bulletins are issued periodically for ten years from unit date of purchase, and include information on improvements in design, modifications, new equipment, and replacement of obsolescent parts.		
SERVICING	The equipment is designed to facilitate maintenance and inspection of parts requiring regular attention, without undue dismantling, and every effort has been made to keep the number of these parts to a minimum. All units are despatched with a complete set of spare filters and elements for the first service.		
OVERALL DIMENSIONS (APPROX.)	Length	2.15m	(85in)
	Width	1.01m	(40in)
	Height	1.17m	(46in)
	Weight (wet)	1935kg	(4266 lb)
SHIPPING DIMENSIONS (APPROX.)	Length	2.44m	(96in)
	Width	1.32m	(52in)
	Height	1.48m	(58in)
	Weight	2275kg	(5016 lb)

OPTIONAL EQUIPMENT

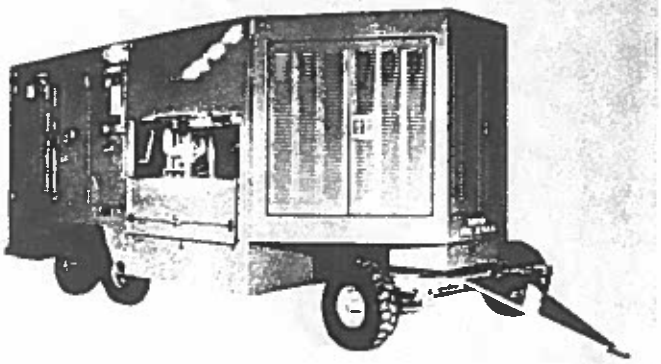
(All items will be quoted on request.)

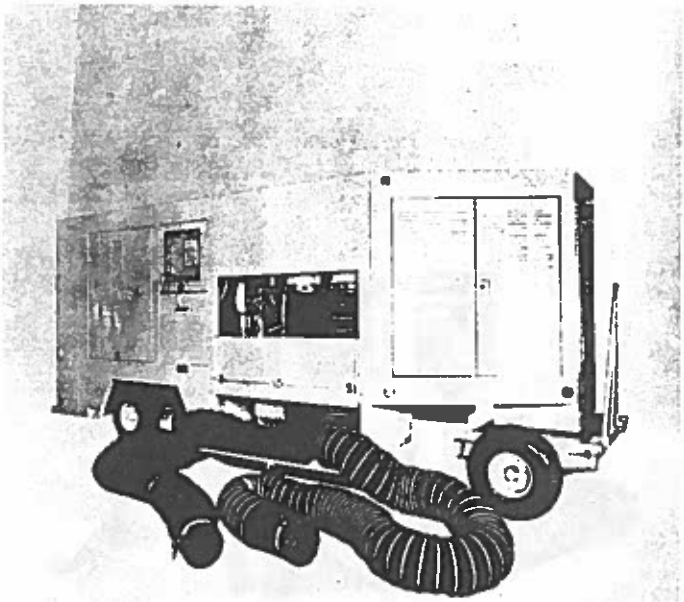
1. OUTPUT CABLE AND SOCKETS
   A 7.6m (25ft) length of 4 core, 70mm^2, EPR insulated, CSP sheathed output cable complete with input and output aircraft sockets of standard 6 pin NATO type.

2. ENGINE COOLANT TEMPERATURE GAUGE



ATTACHMENT C - Truck Mounted Conditioned Air Unit





A-C and A-C/HEATING UNITS

These diesel or gasoline powered units employ an air-operated, automatic, self-adjusting clutch between the engine and compressor. This system allows the blower to operate alone for the ventilating mode. The automatic clutch, coupled with a reversing valve gives simple operation between cooling/heating/ventilating. The change over from one mode to another is so simple it can be performed by the operator at the aircraft. Heating/cooling/ventilating modes are available as they are required throughout the day without taking the unit out of service for adjusting.

The refrigeration system employs a suction control system which regulates the suction pressure to the compressor and isolates the suction side of the compressor upon shut-down. A discharge check valve isolates the discharge side of the compressor upon shut-down. These features alleviate the traditional problem of freon migration back to the compressor which can cause substantial compressor damage. These items, along with automatic pump-down, and other safety devices result in a unit that is simple to operate and easy to maintain in service.

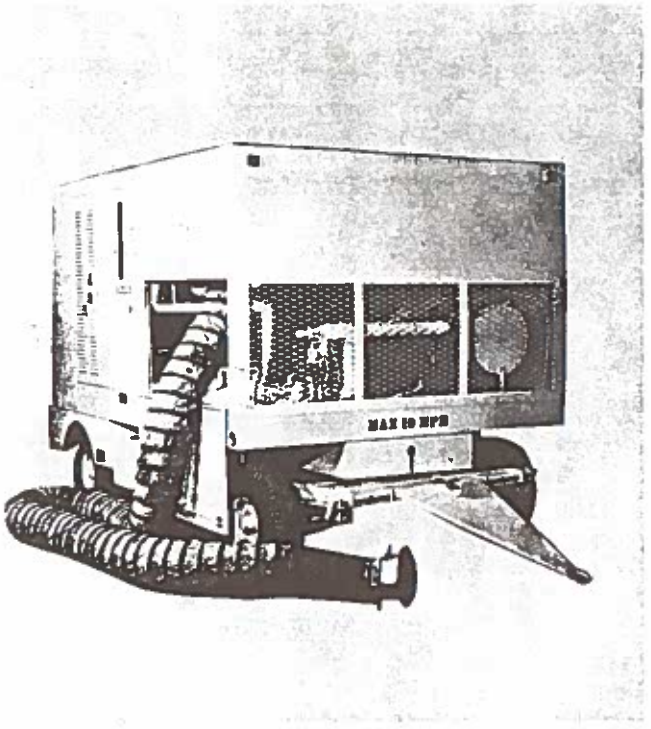
All of these units are self-contained and can be supplied mounted on a chassis or trailer at the factory, or prepared for installation on a properly rated locally available chassis. Mounting instructions and additional information available upon request.

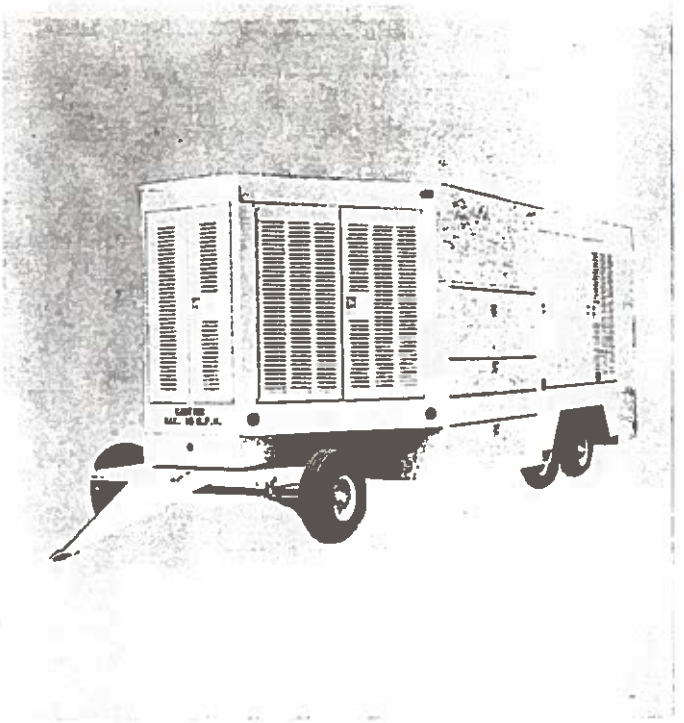
DESIGN FEATURES

- Filter dryer, including a fine mesh Monel filter and dessicant cartridge are provided to maintain a clean and dry system.
- Two (2) each 42" diameter condensing fans driven from the engine (ACE-404/400/406-Series). ACE-405 Series uses 2-36" diameter fans and ACE-401-Series uses 1-42" diameter fan.
- All drive belts provided with protective guards.
- Vernier supply pressure control-used to vary supply pressure to various aircraft types. Also used to dump air from delivery hose without shutting down unit.
- ASME receiver for refrigerant.
- 127 gallon fuel tank is provided (38 gallon on ACE-401 & 405 Series.)
- Body of unit is constructed of preformed channel steel, welded construction. Access doors, recessed handles, hold-open latches, steps and grab handles, provided on both sides of unit.
- Appropriate clearance lights and reflectors, supplied.

Above units can be mounted on properly rated locally available chassis. Additional information and mounting specifications are available on request.

ATTACHMENT D - Trailer Mounted Conditioned Air Unit





INSTRUMENTATION

The following instrumentation is provided as standard equipment in a conveniently located instrument panel. The control panel is divided into two sections with hinged covers for weather protection:

COMPRESSOR
Unloading Indicator Lights
Discharge Pressure Gauge
Oil Pressure Gauge
Suction Pressure Gauge
Oil Level Sight Glass
Superheat Gauge (60/85/110 tons only)

ENGINE INSTRUMENTS
Tachometer
Water Temperature Gauge
Oil Pressure Gauge
Ammeter
Fuel Gauge
Hourmeter
Vernier Speed Control
Ignition Switch
Start Button

OUTPUT INSTRUMENTS
Temperature Gauge
Air Pressure Gauge

REFRIGERANT
Liquid Flow Indicator
Moisture Indicator
Liquid Level Gauge

SAFETY FEATURES
REFRIGERANT SYSTEM
Automatic pump-down upon unit shut-down
Oil Pressure Failure Switch
Suction Control System
Discharge Check Valve
Receiver Relief Valve
High and Low Pressure Switch
High Discharge Temperature Switch (Dunham-Bush only)
Evaporator Pressure Limiter

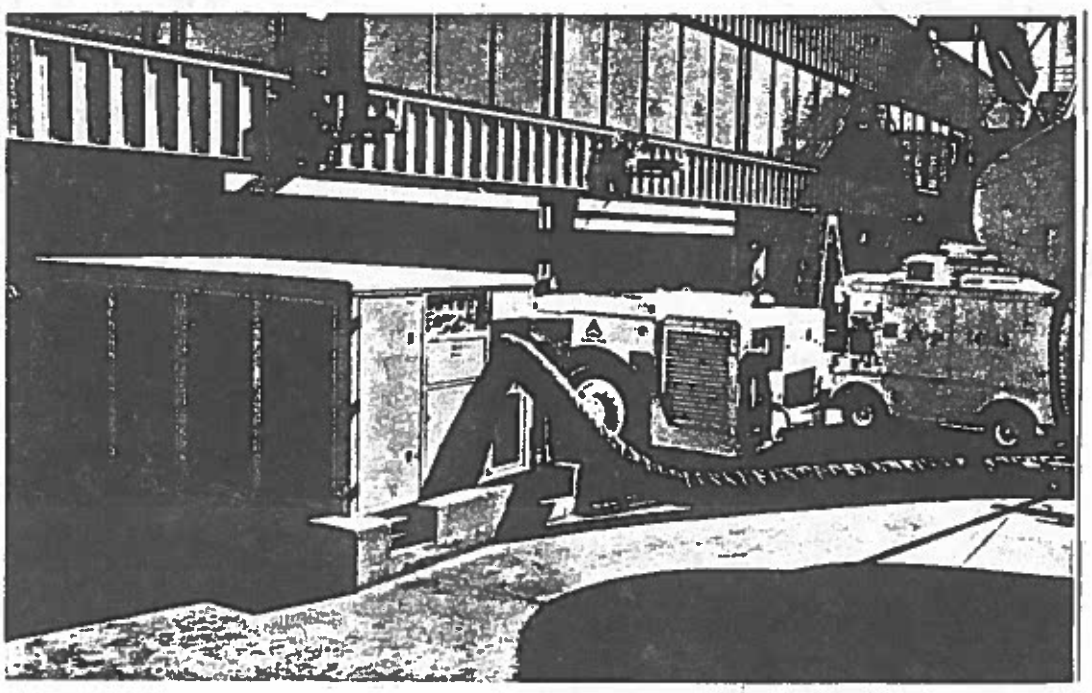
ENGINE
Low Oil Pressure Switch
High Water Temperature Switch
Governor

OPTIONAL EQUIPMENT

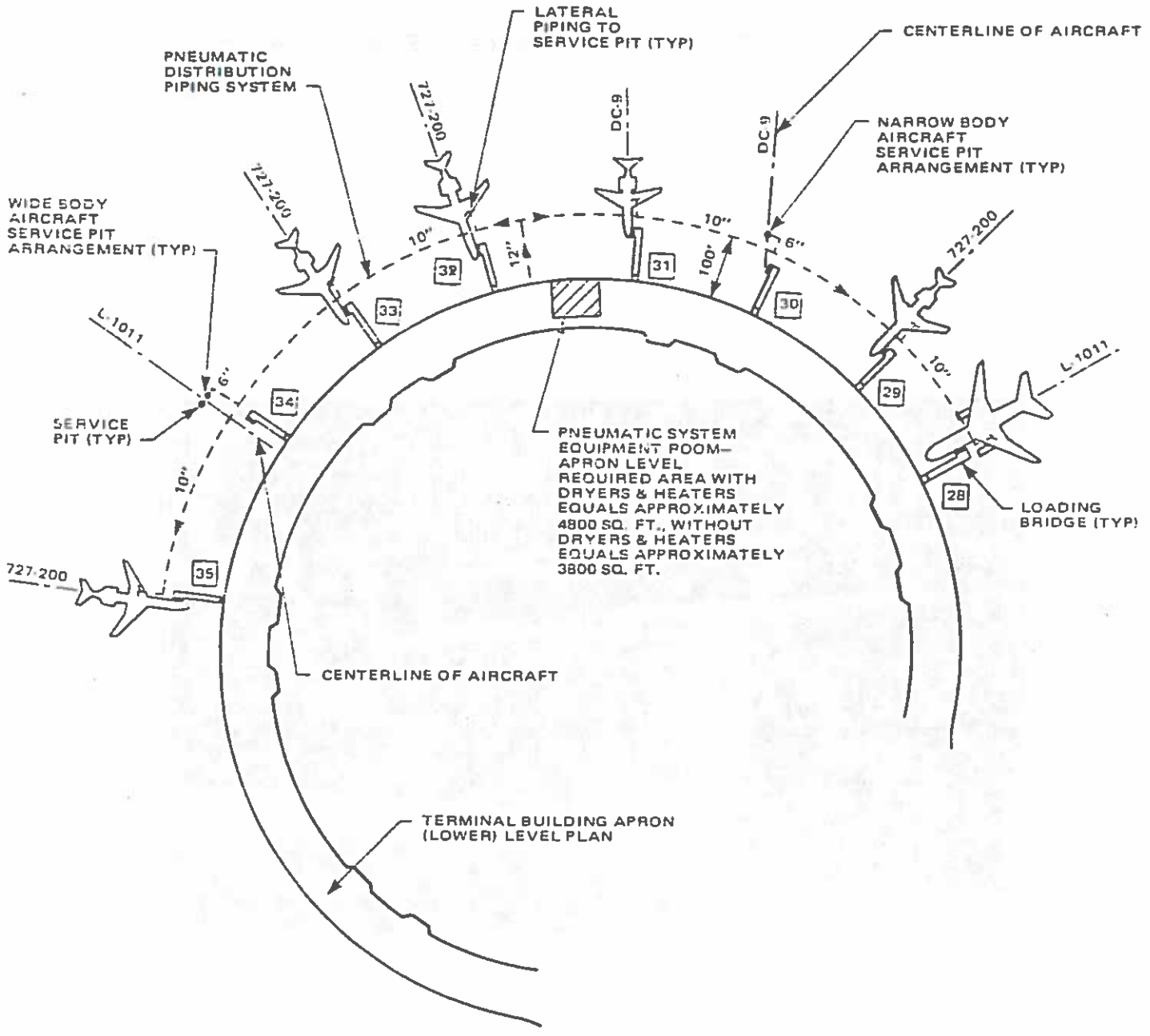
- Second 12-inch diameter Hose Outlet with associated controls, output hose and aircraft coupler (not available ACE-401/405 Series.)
- 25Ft. hose extension kit-including hose, quick disconnect couplings and aircraft coupler.
- Pneumatic engine starter (diesel powered units only)
- Output air thermostat for automatic control of output air temperature.
- Utilization of engine coolant heat to provide partial heating on Air Conditioning Units (for areas where full heating is not required).
- Amber Flashing Beacon (Amber or Red)
- Rear Bumper

All units can be mounted on foreign made chassis such as Berliet, Saviem, English Ford, Mercedes, Deutz, Isuzi, etc. Additional information and mounting specifications available upon request.

ATTACHMENT E - Examples of Fixed Air Systems



Fixed Conditioned Air Unit



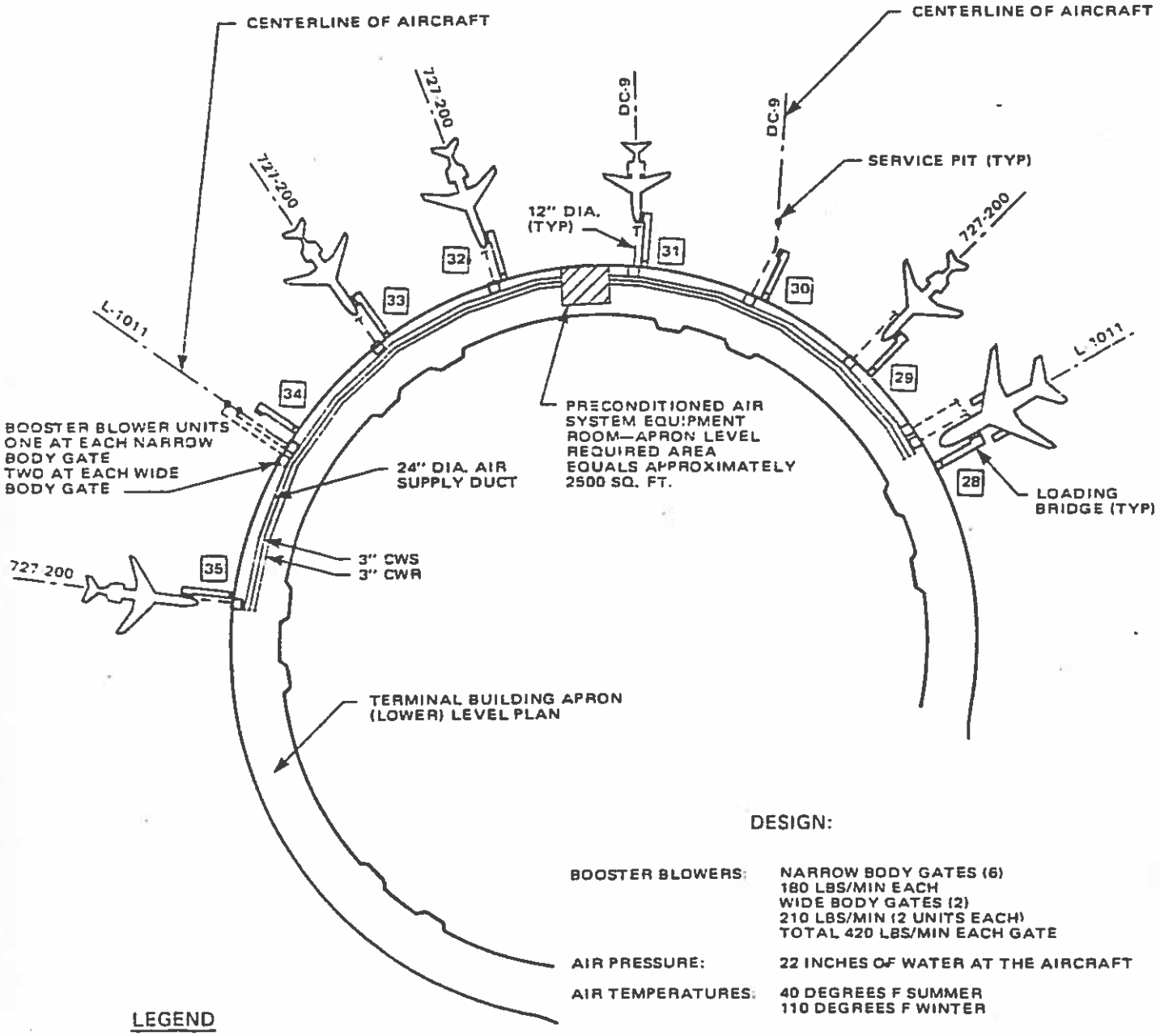
LEGEND

30 GATE NUMBER

– – – – PIPING (UNDERGROUND)

PLAN–8 GATE ARRANGEMENT FOR PNEUMATIC AIR SYSTEM

SYSTEM DESIGN EXAMPLE
KANSAS CITY INTERNATIONAL AIRPORT



DESIGN:

BOOSTER BLOWERS:	NARROW BODY GATES (6) 180 LBS/MIN EACH WIDE BODY GATES (2) 210 LBS/MIN (2 UNITS EACH) TOTAL 420 LBS/MIN EACH GATE
AIR PRESSURE:	22 INCHES OF WATER AT THE AIRCRAFT
AIR TEMPERATURES:	40 DEGREES F SUMMER 110 DEGREES F WINTER

LEGEND

30	GATE NUMBER
CWS & R	CHILLED BRINE SUPPLY & RETURN PIPING

PLAN–8 GATE ARRANGEMENT FOR PRECONDITIONED AIR SYSTEM

SYSTEM DESIGN EXAMPLE
KANSAS CITY INTERNATIONAL AIRPORT

SECTION VIII

NIGHTTIME ENGINE RUNUPS

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I. INTRODUCTION

Use of commercial jet-powered aircraft operations at Los Angeles International Airport (LAX) began in 1959. With the use of these powerful but noisey jet engines, the Department of Airports's initiated noise reduction efforts. The Board of Airport Commissioners (BOAC) approved the first LAX Noise Control Policy in October of 1959. The first group of policies related to jet engine runups were for the airline maintenance area. A synopsis of the BOAC Noise Control Policies is included in Task 1.07 in the Phase One Report.

A. Purpose and Scope

One of the primary purposes of this technical report is to provide background data and the history of nighttime jet engine runups together with a description of the current problem. Another objective is to describe the present airline operational maintenance procedures for jet engines. Also included in this report is a discussion of established noise control measures. Conclusions and recommendations are made that if implemented could further mitigate this noise source. Communities impacted by nighttime jet engine runups are El Segundo, Westchester, Del Aire, and Lennox.

Engine tests and maintenance runups are currently prohibited between the hours of 11:00 p.m. and 6:00 a.m., by BOAC Resolution No. 5619 unless they are in a sound suppression unit. Airlines that have maintenance facilities at LAX are American, Continental, Delta, Flying Tigers, Pan American, Trans World, United, and Western.

These facilities all adhere to the standards established March 18, 1970 as indicated in their letters shown as Appendix A. The complete text of Resolution No. 5619 is provided as Appendix B.

B. Background

The issue identification and public comment workshops conducted during Phase II of the ANCLUC study indicated that the impacted communities consider maintenance runups a single event noise impact. This type of noise impact is most disturbing to nearby residents during the evening and nighttime hours.

During the period between 7:00 a.m. and 10:00 p.m. about 70 percent of all LAX operations occur. In August 1981

during a typical day there were 1,121 operations with 82 recorded as a peak from 10:00 a.m. to 11:00 a.m. The fewest operations, 51 during this busy period occurred between 7:00 a.m. and 8:00 a.m.

The period of light operations or about 15 percent of the daily total occurred from 10:00 p.m. until 7:00 the next morning. As expected the heaviest hour with 44 operations was between 10:00 p.m. and 11:00 p.m. and the lighest (three operations) from 3:00 a.m. to 4:00 a.m.

During a three month period between August and October 1982 the Department of Airports Office of Superintendent of Operations received 17 noise complaints before and after the normal working hours that dealt with nighttime runups or ground noise; three were from the same person.

II. STANDARD MAINTENANCE PROCEDURES

Jet engines are composed of many separate parts that wear out at different rates, depending on function and use. For this reason jet engine maintnenace is very complex. Sub-standard engine performance must be recorded in the Flight Report by the aircraft pilot. Engine parts then have to be inspected, lubricated, adjusted, repaired, and replaced according to established formal procedures and to the satisfaction of the pilot.

The Federal Aviation Administration (FAA), the jet engine manufacturer, and the airline companies prescribe jet engine maintenance and inspection procedures based on a record of flight hours.

Standard maintenance procedures start with the daily flight check. This check occurs prior to the first daily flight, requires approximately 15-30 minutes and consists of a visual check of fluid levels and inspection for fuel, oil, or air leaks.

An increasingly detailed level of scheduled engine maintenance is utilized. Jet engine maintenance checks begin with the "A" level service check after 150 to 200 hours of operation and requires approximately eight hours to perform. A service check at the "B" level occurs after 1,000 hours of operation. Service checks at the "C" level are made every 4,000 hours of operation. A combination of a "B" level service check and one-fourth of a "C" level operation check are referred to as a "Phase Check". A phase check requires about 75 hours per engine to complete. During a phase check the engine cowlings are removed, but the engine remains attached to the aircraft unless it becomes necessary to remove it.

As time on the engine increases, the examination of the jet engine becomes increasingly intensive and technical (i.e., bore scope, spectro-graph inspections and other procedures) additional parts are replaced and more hours of maintenance are required.

Jet engine maintenance activity takes place around the clock, seven days a week within the airlines maintenance areas. The normal jet engine test runup period requires 45 to 75 minutes to adjust all the various parts for the stated thrust requirements and to check that the specific Flight Report complaints have been corrected. Appendix "D" provides a detailed outline of Flying Tiger's general jet engine maintenance for a B-747 as an example.

III. NOISE COMPLAINTS

Written and telephone noise complaints from the public are forwarded to the Department of Airports, Community Relations Representative from other airport offices and adjacent community noise abatement agencies during regular working hours. Telephone complaints before or after normal working hours are received by the Department of Airports's Superintendent of Operations on duty. The Operations staff enters each complaint on a standard form which is first tabulated and then a response is made by the Community Relations staff. The complainant's name, address, telephone, time, and description of complaint are provided on a form. A sample form has been included as Appendix "E". Appendix "F" is from the LAX Airport Operations Manual that describes the maintenance restrictions.

The Community Relations Office prepares a monthly noise complaint summation which is then given to the DOA Management for their review and action. If the complaint is regarding an ongoing activity in one of the airlines maintenance areas, a check on the ground noise monitor system is made by operations personnel who also make and conduct follow-up with field investigations. If a violation is in progress, the Superintendent of Operations is empowered to have it stopped.

IV. EXISTING CONTROL MEASURES

A. LAX Noise Regulations

Jet engine runup regulations for the airline maintenance areas were adopted in October of 1959 by the BOAC. These regulations include the following provisions:

- There will be no wet or dry trim of jet engines and no tail pipe temperature calibration tests between the hours of 10:00 p.m. and 7:00 a.m. unless adequate sound suppression devices are used. (Later revised to 11:00 p.m. and 6:00 a.m.)

- The term adequate sound suppression devices means any facility which will reduce the noise from jet engine runups to approximately sixty perceived noise decibels (PNDB) at the perimeter of the airport.

- Filter change tests will be allowed during these hours provided the jet engine is idled with no runup permitted.

In an effort to further reduce ground associated jet aircraft noise, gate hold procedures, and additional maintenance runup regulations were adopted by BOAC Resolution No. 5619 in March of 1970 which is included as Appendix B. Then in April of 1973 the BOAC created a Noise Abatement Office to assure compliance through continuous monitoring and communication with violators.

The DOA Noise Abatement Office published an updated version of noise abatement procedures at LAX originally adopted by BOAC Resolution No. 5619. These procedures included preferential flight tracks for approaches and departures, prohibitions against non-Part 36 aircraft departing easterly from midnight to 6:30 a.m., gate hold procedures, prohibition of training flights and restricted engine maintenance runups between 11:00 p.m. and 6:00 a.m.

BOAC Resolution No. 11650 of May 1979 resulted in the enactment of the Los Angeles Airport Noise Control Ordinance (Los Angeles City Ordinance No. 152,455) adopted by the City Council on May 31, 1979. This resolution established airport noise regulations basically in conformance with federal aircraft noise control regulations. The difference between the two regulations is that the federal rule allows two engine jet-powered, non-Part 36 aircraft engaged in small community service to remain in operation until January 1988, but the LAX regulation requires they be phased out by January 1, 1985.

B. Noise Monitoring

In January of 1981, a closed circuit noise monitoring system was installed in six airline maintenance areas to detect any unauthorized noise. A contract was awarded to EG&G Washington Analytical Services Center, Inc. to design and install the system. The microphone locations are as follows.

- Site 1 - Flying Tiger Maintenance Hangar, Northeast corner, inside on North wall.
- Site 2 - Trans World Maintenance Hangar, Northeast corner, inside on North wall.
- Site 3 - American Airlines Maintenance Hangar, Southwest corner, inside on South wall.
- Site 4 - Continental Airline Maintenance Hangar, Center South side at East end of large doors, inside on wall.
- Site 5 - Continental Airline Maintenance Hangar, Southwest corner, inside on wall.
- Site 6 - Pan American Airline Maintenance and Supply Building, Second floor East end in room for the telephone and electrical service.

This system allows the on duty Superintendent of Operations to check for excessive noise levels at any time. United and Western Airline Lines's hangars are within eyesight of the Operations Office. The Delta Hangar is on the north, between microphone sites 1 and 2. Locations of these microphones are shown on a map of LAX included as Appendix G.

C. Enforcement Procedures

Engine Runups are prohibited from 11:00 p.m. to 6:00 a.m. If a violation of this noise regulation is identified by either the ground noise monitoring system or a telephone complaint, the Superintendent of Operations has the authority to require its immediate termination.

The Superintendent of Operations responding to the violation prepares an incident report which is forwarded to the Noise Abatement Office, once signed by the Chief of Operations. This incident report describes the corrective action taken at the scene of the violation.

The Noise Abatement Officer using the information contained within the incident report prepares a letter to the maintenance director of the violating airline. The letter describes the violation and requests the director's response on what corrective action was taken at the scene and other corrective actions taken to ensure future compliance.

The Noise Abatement Office indicates that a majority of these violations occur due to new employees who are unaware of the procedure. In most cases, the maintenance directors have fully cooperated with these enforcement procedures.

Engine runups are prohibited at the Imperial Terminal at all times. The Noise Abatement Office has placed signs in the ramp area reminding operators of this prohibition. Engine runups are also prohibited in areas not equipped with blast fences (Imperial Terminal has no blast fences).

IV. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. Engine runup violations do occur, but on an infrequent basis.

2. The monthly noise complaint summaries indicate that a majority of the complaints were received during the period when engine runups are prohibited.

3. Noise from normal aircraft movements in the ramp areas, taxiing operations and reverse thrust on arrival sometimes are being mistaken as engine runups by residents adjacent to the airport.

4. The existing ground noise monitor system and enforcement procedures are adequate to control this problem if properly utilized.

5. A majority of the complaints regarding engine runups come from areas adjacent to the south side of the airport.

6. Engine runups are part of the overall maintenance program requried to maintain the airworthiness and safety of each commercial aircraft.

B. Recommendations

1. A ground noise control program to reduce the impact of aircraft operations south of the 25 Runway Complex west of Sepulveda Boulevard should be developed. This program could include the following features:

   - Utilization of interior taxiways to the maximum extent possible during sensitive nighttime hours (10pm to 7am).

   - Encourage towing of aircraft into and out of all ramp areas on the south of the 25 Runway Complex west of Sepulveda Boulevard during sensitive nighttime hours (10pm to 7am).

2. The DOA and the ATA should collaborate to heighten awareness of ground noise problem among maintenance personnel. Maintenance schedules should be developed in a manner minimizing the need to perform engine runups during the sensitive nighttime hours. Non-scheduled but necessary maintenance activities would not be effected.

3. The Operations Bureau should be sufficiently staffed to ensure enforcement of BOAC noise policies, especially during sensitive nighttime hours.

V. APPENDICES

A. Air Carrier Letters of Response regarding Engine Runup Procedures.

January 18, 1983

Mr. Doug Cain
Station Manager
Western Airlines
500 World Way
Los Angeles, CA 90009

Dear Mr. Cain:

The commercial aviation industry, together with the FAA and communities surrounding LAX, are developing an Airport Noise Control Land Use Compatibility (ANCLUC) Study. A major part of this ANCLUC Study will be a series of Technical Reports. The Department of Airports has been assigned the Technical Report on the problems associated with nighttime engine runups.

Kindly send a schedule of your airlines' engine runups and testing to the Environmental Management Bureau; #1 World Way; Los Angeles, CA 90009. The data needed are the specific times and duration of engine testing and runups. Also needed is a list of noise complaints you may have received.

This Technical Report is scheduled for publication in February; accordingly, it would be greatly appreciated if the information could be provided prior to January 31, 1983.

If possible, please include any sound mitigation techniques and noise control measures you are currently using. If you have any questions, please call Dick Bean or Chuck Zeman at (213) 646-7614.

Sincerely,

Maurice Z. Leham
Airport Environmental Coordinator

MZL:st

A

AmericanAirlines

January 25, 1983

Mr. Maurice Z. Laham
Airport Environmental Coordinator
City of Los Angeles Department of Airports
1 World Way
Los Angeles, California 90009

Dear Mr. Laham:

Ref: Your letter dated 1/18/83

American Airlines does not schedule engine run-ups or tests on a regular basis at LAX. Engine runs are made as the need arises to assure proper operation of our aircraft and are accomplished within the guidelines of the LAX noise abatement procedures.

We have not received any noise complaints within the past year nor have we received any notification of a violation from the Department of Airports.

If further information is required, please do not hesitate to call me at 646-4578.

Andre M. Colandone

Andre M. Colandone
Acting Manager Production
AMERICAN AIRLINES, INC.
World Way Postal Center
P.O. Box 92246
Los Angeles, CA 90009

cc: T. Salvaggio

CONTINENTAL AIRLINES

7300 WORLD WAY WEST
LOS ANGELES INTERNATIONAL AIRPORT
LOS ANGELES, CALIFORNIA 90009

PHONE (AREA 213) 646-2810
CABLE CONAIR USA
TELEX 06-74402

January 25, 1983

Mr. Maurice Z. Laham
Airport Environmental Coordinator
DEPARTMENT OF AIRPORTS
1 World Way
Los Angeles, CA 90009

Dear Mr. Laham:

In reference to your letter of January 18, 1983 regarding the Airport Noise Control Land Use Compatibility Study, Continental Airlines follows the LAX current curfew hours and no engine runs above idle between the hours of 2300 and 0600.

If you have any questions or need any further information please call George Volk, Manager Line Service Maintenance at 646-2837.

Sincerely,

CONTINENTAL AIRLINES

Roy Gibson

Roy Gibson
Manager Airport Services
Los Angeles

RG:kml

A3

DELTA AIR LINES, INC.
GENERAL OFFICES/HARTSFIELD ATLANTA INTERNATIONAL AIRPORT/ATLANTA, GEORGIA 30320 U.S.A.

February 3, 1983

Mr. Maurice Z. Laham
Airport Environmental Coordinator
City of Los Angeles
Department of Airports
1 World Way
Los Angeles, California 90009

Dear Mr. Laham:

This will confirm my telephone conversation with Mr. Bean regarding Delta's aircraft engine runup and testing activity at Los Angeles International Airport.

Delta does not runup or test engines on a regular basis at LAX. All such activity would be related to an engine change or adjustment due to an emergency.

All of our emergency related testing or runup work would be done at the TWA runup pad between the hours of 0600 - 2200, evidently as proscribed by LAX regulations.

As to frequency of such activity, we might average one a month but that is probably on the high side.

We know of no noise complaints received at LAX related to this type of activity.

There are no engine runup suppressor devices at the TWA pad.

Please advise if you need further information from Delta.

Very truly yours,

J. A. Chamberlin

James A. Chamberlin
Regional Manager of Properties

JAC:lc

cc: Mr. James Landers
Mr. P. A. Auwerda
Mr. Karl H. Schramm

A4

DMB

PAN AM.

Pan American World Airways, Inc.
P.O. Box 92278
Los Angeles International Airport
Los Angeles, California 90009

January 26, 1983

Environmental Management Bureau
City of Los Angeles
Department of Airports
#1 World Way
Los Angeles, California 90009

Reference: Letter Dated January 18, 1983 from Maurice Z. Laham - Airport Environmental Coordinator

Gentlemen:

Subject: Airport Noise Control Land Use Compatibility Study

Pan American World Airways, Inc. performs engine runups and testing as required between the hours of 0600 and 2100. The runups and testing are confined to the TWA hangar area.

Pan Am no longer conducts engine runups and testing at our Maintenance/Cargo facility on Imperial Highway. In addition, we no longer operate all-cargo aircraft at LAX.

During the calendar year 1982, we did not receive any noise complaints.

Very truly yours,

J. G. Murphy
Regional Managing Director
Southwest U.S.

JGM:ja

AE

DMB

TWA

7001 WORLD WAY WEST, LOS ANGELES, CALIFORNIA, U.S.A. 90009

January 26, 1983

Mr. Maurice Z. Laham
Airport Environmental Coordinator
City of Los Angeles Department of Airports
One World Way
Los Angeles, California 90009

RECEIVED
JAN 28 1983
ENVIRONMENTAL PLANNING
DEPARTMENT OF AIRPORTS

Dear Maury:

Ken Johnson, TWA's manager of airport services at LAX, forwarded your January 18 letter to me for handling.

TWA does not maintain a specific schedule or record of engine runups performed at our technical services center here in Los Angeles. However, we test a jet engine using this procedure on the average of about two times each week. Engines that were overhauled here at LAX are test run for between 45-75 minutes and those repaired at our primary maintenance base in Kansas City are tested an average of 30-45 minutes.

Please let us assure you that TWA complies fully with the Department of Airports restrictions regarding the runup of jet engines and does not conduct any such tests during the 2300-0600 curfew period. Despite the operational and economic burden this regulation imposes, TWA will continue to follow your department's rules.

I hope that this information proves helpful in the ANCLUC deliberations and we stand ready to assist you and the ANCLUC study group in whatever ways possible.

Sincerely,

Roger Cohen
Director -- Civic Affairs

cc: Mr. K. A. Johnson

RC:mjn

8-14

AG

THE WORLD'S LARGEST
CHARTER AIRLINE

WORLD AIRWAYS, INC. OAKLAND INTERNATIONAL AIRPORT • OAKLAND, CALIF. 94614

CABLE: WORLDAIR, OAKLAND
LOS ANGELES
INTERNATIONAL AIRPORT
6605 W. IMPERIAL HIGHWAY
LOS ANGELES, CA 90045

Maurice Laham
Airport Environmental Coordinator
Department of Airports
1 World Way
Los Angeles, CA. 90009

Dear Mr. Laham,

In reference to your letter dated January 18, 1983 pertaining to the current A.N.C.L.U.C. study, and our recent telecon on this subject, the following is respectfully submitted for your information.

World Airways do not schedule any maintenance for engine runs at W.I.T. Should an aircraft arrive LAX with a specific problem requiring an engine run, such as a suspected fuel, oil, or air leak, that is the only time we request permission to run an engine, to ensure aircraft saftey.

Sincerely

A. Teegan
Maintenance Manager

AT:rd

Appendix B

T. D. DANNENBRINK
SECRETARY

BOARD OF AIRPORT COMMISSIONERS

LOS ANGELES INTERNATIONAL AIRPORT
#1 WORLD WAY
LOS ANGELES, CALIFORNIA 90009
TELEPHONE: 646-2250 OR 6263

Sam Yorty, Mayor

Board File
No. 1704. Abatement
X1047-Resolutions
X1191 Rules & Regulations

RESOLUTION NO. 5619

WHEREAS, it is in the best interest of the City of Los Angeles, and of the residents living in the vicinity of Los Angeles International Airport to reduce, to the extent possible, the noise created by jet aircraft originating on the Airport; and

WHEREAS, it is possible to reduce said noise by the adoption of reasonable regulations, the adoption of which had been generally agreed to by the airlines using Los Angeles International Airport,

NOW, THEREFORE, BE IT RESOLVED:

1. Gate hold procedures shall be put into operation by the tower whenever any of the following conditions exist:

   a. when weather conditions impose departure delays;

   b. at all times between the hours of 2300 and 0600;

   c. at any time when, in the discretion of the tower, an excess of aircraft is on a taxiway holding for take off.

   Whenever gate hold procedures are in effect this information shall be broadcast on the Automatic Terminal Information Service.

   Whenever gate hold procedures are in effect under the conditions stated above, the captains of all jet aircraft preparing to depart from Los Angeles International Airport shall call the control tower prior to starting their engines, and shall not start their engines until directed to do so by the control tower. The tower shall issue a start engine time and shall grant the captain of said aircraft his position in the taxi sequence. All aircraft shall remain at the gate position until cleared to depart by the tower.

2. No maintenance or test running of jet engines not mounted on an aircraft shall be done except in a test cell of adequate design at any time. Said cell shall meet noise level criteria at a measurement distance of 250 feet from the center thereof, as follows:

OCTAVE BAND	SOUND PRESSURE LEVEL
20-75	85 db
75-150	79 db
150-300	73 db
300-600	72 db
600-1200	70 db
1200-2400	68 db
2400-4800	66 db
4800-10Kc	60 db

Maintenance and test running of jet engines not mounted on aircraft is prohibited at the expiration of ninety (90) days from the date hereof by any airline or activity, unless said airline or activity has in existence a valid contract for the design and construction of such test cell, which said cell shall be completed and in operation within eight (8) months from the date hereof.

3. The night run-up of aircraft engines, mounted or unmounted, for maintenance or test purposes is prohibited between the hours of 2300 and 0600, unless this prohibition is waived in an individual case for good cause by the General Manager of the Department of Airports or his duly authorized representatives upon demonstration in such case that the engine or engines will be run in a sound suppression unit that will reduce the sound level at the Airport perimeter to 8 PNdb or less above the ambient background level in surrounding residential areas at the time the run-up is conducted.

4. This resolution shall be effective upon adoption by the Board of Airport Commissioners.

oOo

I hereby certify that the above is a true and correct copy of Resolution No. 5619 adopted by the Board of Airport Commissioners at a special meeting held Wednesday, March 18, 1970.

T. D. Dannenbrink - Secretary
BOARD OF AIRPORT COMMISSIONERS

Appendix C.*

TABLE II-1

Average Level of Hourly Operations (August 1981)

Hours	Hourly Operations
Noon - 1 p.m.	65
1 p.m. - 2 p.m.	72
2 p.m. - 3 p.m.	58
3 p.m. - 4 p.m.	52
4 p.m. - 5 p.m.	65
5 p.m. - 6 p.m.	64
6 p.m. - 7 p.m.	74
7 p.m. - 8 p.m.	65
8 p.m. - 9 p.m.	58
9 p.m. - 10 p.m.	57
10 p.m. - 11 p.m.	44
11 p.m. - 12 p.m.	41
Midnight - 1 a.m.	23
1 a.m. - 2 a.m.	21
2 a.m. - 3 a.m.	4
3 a.m. - 4 a.m.	3
4 a.m. - 5 a.m.	4
5 a.m. - 6 a.m.	6
6 a.m. - 7 a.m.	10
7 a.m. - 8 a.m.	51
8 a.m. - 9 a.m.	66
9 a.m. - 10 a.m.	69
10 a.m. - 11 a.m.	82
11 a.m. - 12 a.m.	67
Total	1,121

* Table from Task 2.03 in the LAX-ANCLUC Phase Three Report

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON

Form Approved.
OMB No. 04-R0075

PART D

OPERATIONS SPECIFICATIONS

FLYING TIGER LINE INC.

PREFACE PAGE
INSPECTION PERIODS
BOEING 747 Series

DAILY CHECK

A daily check will be accomplished in accordance with the following conditions-

1. If an aircraft has not flown in preceding 24 hour period.

2. Whenever a flight terminates at a station approved for this work with 6 hours or more ground time scheduled per operation plan.

-A- TRIP CHECK*

A Trip Check will be accomplished at intervals not to exceed (100 Series and 212B) 150 hours, (245F and 249F) 200 hours Time in-service.

-B- SERVICE CHECK*

A Service Check will be accomplished at intervals not to exceed 1000 hours Time in-service.

-C- OPERATION CHECK*

An Operation Check will be accomplished at intervals not to exceed 4000 hours Time in-service.

One fourth (1/4) of the Operation Check will be accomplished at each Service Check, so that the entire Operation Check is completed repetitively with each four Service Checks. The combination of 1/4 of an Operation Check and a Service Check is referred to as a "Phase Check"

"Phase Checks" - are numbered 1 through 16, per Engineering Report 5-00-301. Each Phase Check will be accomplished in consecutive order at the Time in-Service specified.

-D- BASIC CHECK PERIOD -BCP- UAL BASE VISIT*

BCP will be accomplished at intervals not to exceed 25,000 hours time in-service.

* During the accomplishment of each type of Check all lesser type Checks will also be accomplished.

Effective date JUL 29 1982

B-747 MAINTENANCE PROGRAM

DESCRIPTION

1. GENERAL

The Flying Tiger Line B-747 Maintenance Program has been developed based on the aircraft manufacturers recommendation as contained in the B-747 Maintenance Planning Data Document Number D6-13747, a thorough study of maintenance programs utilized by other airlines operating the B-747 aircraft and supplemented by our own service experience and operational requirements.

This maintenance program meets all Federal Aviation Agency requirements, including Maintenance Review Board Report on B-747 and will at all times result in an airworthy aircraft.

2. MAINTENANCE SERVICES COMPRISING B-747 MAINTENANCE PROGRAM

On the following pages the various services comprising the Maintenance Program have been listed and briefly explained.

A. Daily Check

This service consists of work cards portrayed in FTL B-747 Maintenance Manual, Chapter 4, Page 4/0011, plus such adjustments, repair or replacements as are necessary to correct unsatisfactory operational items reported in Flight Report (Form 1).

(1) Time Interval

(a) A Daily Check will be performed in accordance with the following conditions:

1 If an aircraft has not flown in preceding 24 hour period.

2 Whenever a flight terminates at a station approved for this work with 6 hours or more ground time scheduled per operation plan.

B. Trip Check

This service consists of work cards portrayed in FTL B-747 Maintenance Manual, Chapter 4, Page 4/0026A/B, plus such adjustments, repair or replacements as are necessary to correct unsatisfactory operational items reported in Flight Report (Form 1). The Trip Check is composed of two separate work packages titled Trip Check "A" and Trip Check "B". These will be accomplished alternately at the approved time interval following each Phase Check, starting with Check "A". The "A" or "B" must be reflected as required in Form 1 under maintenance accomplished and maintenance due.

(1) Time Interval

(a) A Trip Check will be required not to exceed (150 for -100 aircraft) (200 for -200 aircraft) flight hours since preceding (Operation, Service Check), Trip Check or Phase Check.

2. C. Service Check

NOTE: Service checks are accomplished only as part of the Phase Check, (Refer to Paragraph 3).

Service Check consists of items listed on an FTL Master Control plus any adjustments, repairs, or replacements which are necessary to correct unsatisfactory operational items that are reported in FTL Flight Report or to correct any undesirable conditions noted during this check. Any plans for accomplishment of a Service Check separated from a Phase Check will have to be with the advance approval of Sr. Director Quality Control and Reliability.

(1) Time Interval

(a) See above notation.

D. Routine Maintenance Operation #1 through #4

NOTE: An Operation is accomplished only as part of a Phase Check (Refer to paragraph 3).

(1) Routine Maintenance Operations consist of items outlined in this chapter under the following titles:

(a) Routine Operations #1 through #4 per cycle. Refer to Paragraph 3 "Phase Check".

(b) Any adjustments, repairs, or replacements as are necessary to correct unsatisfactory operational items reported in FTL Flight Report or undesirable items noted during this service.

(2) In that some items listed on the Routine Operations Work Cards are not necessarily accomplished on each operation, the individual items are broken down for accomplishment according to their required frequency, as follows:

On all operations
On every even numbered or every odd numbered operation
On every 4th operation

(3) Time Intervals

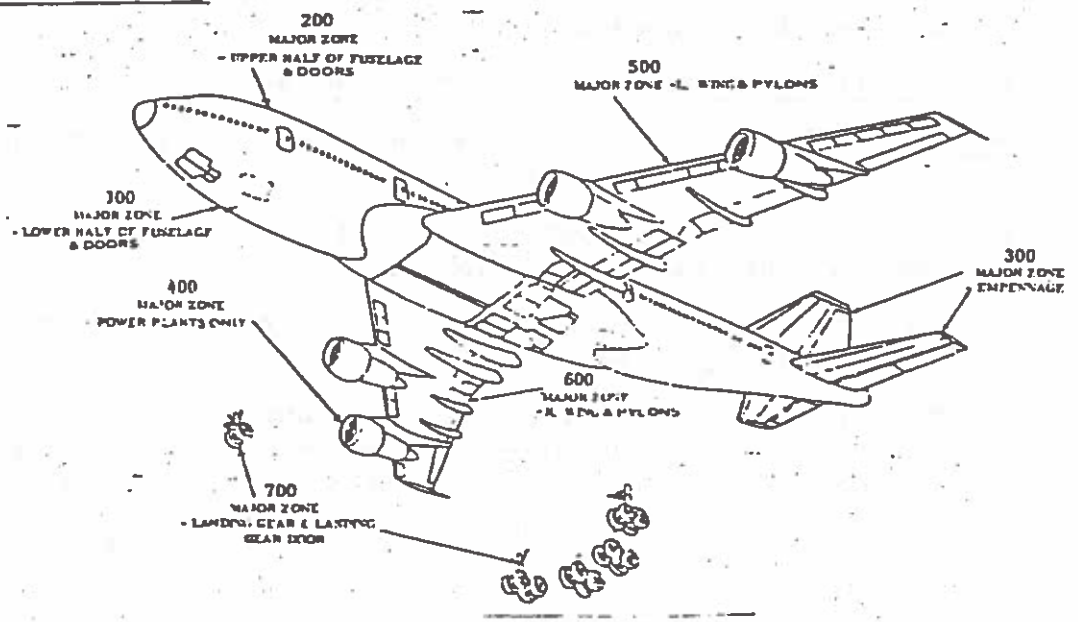
(a) Numbers #1 through #4, will be scheduled per Operations Specifications.

3. Phase Check (Major Routine Service)

A. The Phase Check will be accomplished at the service check time interval as specified in the B-747 Operations Specifications. This check basically consists of a "B" (Service Check) plus 1/4 "C" (Operation). The accomplishment of (4) four consecutive Phase Checks will constitute one Operation on the entire aircraft 16 consecutive Phase Checks will constitute a Cycle.

B. The aircraft has been divided in eight major zones by the manufacturer. These zones will be used to divide the Operation into the four Phase Checks as follows: (Zone 8 (doors) has been integrated into zones 1 & 2).

B-747 Zoning



747
MAJOR ZONE LOCATIONS

Major Zone 100 - Lower half of fuselage. (Extends from the main cabin floor through the pressure deck to the underside of the fuselage). WL 199.8

Major Zone 200 - Upper half of fuselage. (Extends from the top of the main cabin floor to the top of the fuselage). WL 199.8

Major Zone 300 - Empennage

Major Zone 400 - Power plants and struts

Major Zone 500 - Left wing, Zone 600 - Right Wing

Major Zone 700 - Landing gear and landing gear doors

Major Zone 800 - Doors

(1)

Phase	Area of Heavy Inspection
#1	Left Wing (Zone 5) and #1 Engine (Zone 41,)
#2	Lower Fuselage (Zone 1), Empennage (Zone 3) and #2 Engine (Zone 42,)
#3	Right wing (Zone 6), #3 Engine (Zone 43,)
#4	Upper Fuselage (Zone 2), #4 Engine (Zone 44,) Note: (Zone 7) Landing Gear will be divided to equalize the man-hour utilization thru the 4 Phase Checks.

(2) During the performance of the major inspection of any of the above mentioned Phases a lighter inspection will be performed on the remaining portion of the aircraft and remaining engines. The lighter inspection items have been integrated into the routine work cards issued for the Phase Check and may be considered the Service Check.

(3) Multiple of Phase breakdown:

(a) There are certain areas and/or components which do not require inspection during each Phase or specific Phase but will be required to be inspected in multiples of Phases. Example: Each Second Phase. To properly control those inspection items which fall in multiples of Phases, we have incorporated a frequency called "Cycle". A Cycle consists of consecutively completed 1 thru 16 Phases or 4 Operations. Each Phase will be controlled by use of a Master Control Form.

(b) Master Control Form

Sixteen Master Control Forms have been initiated, one for each Phase to be performed. Each Master Control Form calls out all the inspection and routine maintenance work cards which will be required for that Phase.

(4) In performing an inspection or mechanic skill item, the inspection and/or work performed shall be in accordance with the descriptive text instructions attached.

(5) All space allocated for Mechanic and/or Inspector signature must be properly completed. The Inspector must clear each Inspection item with a signature or his assigned stamp.

(6) A detailed explanation of Phase Check is covered under Progressive Maintenance System 4/2-1.

4. Minor Routine Maintenance Services

A. Daily and Trip Checks

Routine work on all minor checks is accomplished using the itemized preprinted work cards for the particular check required. These work cards have a provision for a mechanic's signature which will indicate compliance of each item as it is signed. (Refer to signature requirements, G.M.M. 4-33-1). Due to the brevity of each item, a detailed maintenance instruction which must be complied with is attached to each routine work card along with a Master Control which will list all required cards to complete the particular check.

The check is not complete until all items on the particular work card have been properly signed. Effort must be taken to keep these cards as neat as possible, as they become part of the aircraft historical records.

The Daily, and Trip Check Cards are listed on the table of contents displayed in the B-747 Maintenance Manual Chapter 4, Continuous Maintenance.

B. Non Routine Items

(1) Operation/Phase Check

During an Operation, Phase Check Form 6407 will be used for all non routine items except as noted in 4/2-3, B-747 Maintenance Manual. Form 6006/6008 may be used whenever work books are issued for particular jobs.

(2) Daily, Trip

During all other services all discrepancies or corrective actions will be transcribed to Form 6006 or if Form 6006 is not used corrective action must be entered into the aircraft Flight Report Form 1A. (Refer G.M.M. 4-14-3).

(3) During all routine maintenance, all non-routine items must be properly cleared before release of aircraft for flight. (Refer to G.M.M. 6-23-1 and 4-33-1).

C. Component Removals and Installations

Whenever the need exists, component change cards will be developed and used for all component changes, and shall be displayed in the B-747 Maintenance Manual, Chapter 4.

C. Component Removals & Installations (Continued)

When component change cards have not been developed, the B-747 Maintenance Manual section for the particular component has a removal, installation and test procedure which must be followed when any component is replaced. These M/M pages need not be retained in the work package unless used as a sign-off form.

The purpose of these cards is to set forth the proper removal, installation, rigging and functional check procedures. In most instances, the card is self-explanatory. All procedural steps shall require the mechanic's signature and, if required, final approval of component replacement must be made by a Quality Control Inspector or designee RII card holder.

All component change cards will require detailed inspection of the area before installation or replacement of component, if the area is not readily accessible for inspection with component installed. Such inspection must be conducted by a Quality Control Inspector or designee RII card holder. At other stations where Q. C. Inspectors are not assigned, RII authorized personnel (G.M.M. 10-6-1) shall accomplish this inspection.

APPENDIX E. Noise Complaint Report Form

LAX

INTERNATIONAL AIRPORT COMMUNITY RELATIONS

COMPLAINT REPORT

Complaint Number

Office Use Only

Call Received: Date: ___ / ___ / ___ (Mo Day Yr) Time: ___ : ___ (24-Hr.)

Name: ☐ Mr. ☐ Ms. ☐ ___ Last ___ First ___ Middle (or initials) ___ Jr., III, etc.

Mailing Address: ___ Number ___ Street Name ___ St., Ave., etc. ___ Apt. No.

___ City ___ Zip Code

Cross Street: ___ Street Name ___ St., Ave., etc.

Telephone: ( ) ___ - ___ (Ext. ___)

Location at Time Noise Occurred (St. Address) if Different from Above: ___ Number ___ Street Name ___ St., Ave., etc.

___ City ___ Zip Code

Cross Street: ___ Street Name ___ St., Ave., etc.

Location Code

. / /

Office Use Only

Time Noise Occurred:

Enter any additional single events or time spans in Comments section.

Time Span / Single Event

Time: ___ : ___ (24-Hr.) Date: ___ / ___ / ___ (Mo Day Yr) To Time: ___ : ___ (24-Hr.) Date: ___ / ___ / ___ (Mo Day Yr)

Description of Noise: ☐ Loud Noise ☐ Low Rumble ☐ Vibration ☐ Aircraft Too Low ☐ Short turns

☐ Backblast ☐ Runup ☐ Other: ___

Activity Interrupted: ☐ Sleep ☐ Conversation ☐ Reading ☐ TV, Radio, Stereo

☐ Social ☐ Business ☐ Other: ___

Comments: ___

___

___

To Be Filled In Immediately After Call: Aircraft Type: (if indicated to be other than commercial jet): ___

Attitude of Complainant: ☐ Anger ☐ Annoyance ☐ Frustration ☐ Fear ☐ Other ___

Specific Action Requested by Complainant ☐ Phone Call ☐ Other ___

Complaint Taken by: ___

E

V. MAINTENANCE RESTRICTIONS

A. Mounted Engines - The night run-up of aircraft engines for maintenance or test purposes is prohibited between the hours of 2300 and 0600 unless this prohibition is waived in an individual case for good cause by the General Manager of the Department of Airports or his duly authorized representative.

1. The General Manager of the Department of Airports waives the above restriction under the conditions noted below:

a. The engine/s will be run in a sound suppression unit that will reduce the sound level at the Airport perimeter to 8 PNdb or less above the ambient background level in surrounding residential areas at the time the run-up is conducted.

b. A single engine will not be operated ~~to exceed~~ idle power at each leasehold area.

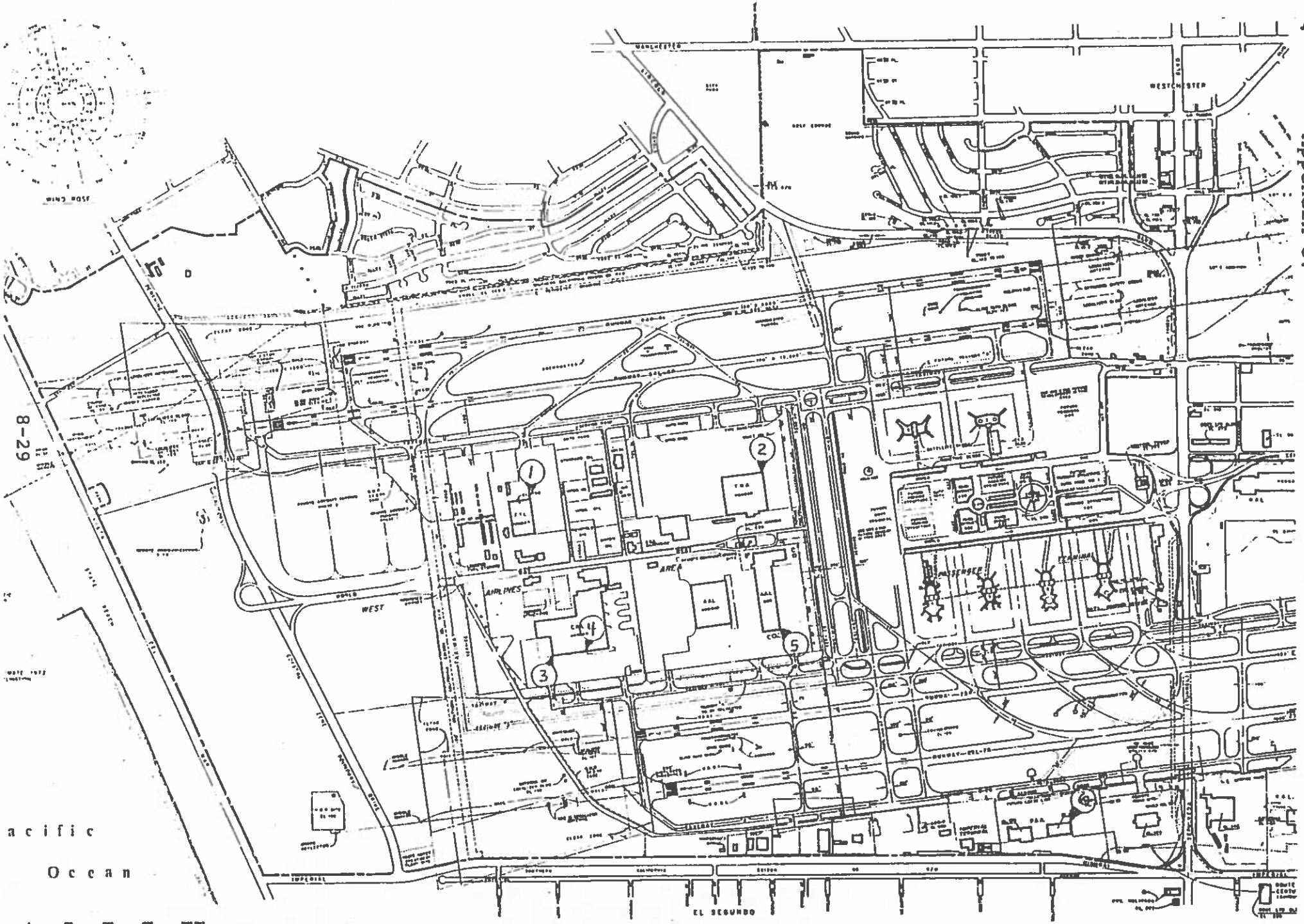
c. Auxiliary power units are only operated for maintenance and preflight checks.

d. When engines are idled during compass checks on the compass rose and tractors are used to orient aircraft heading.

2. Idle engine checks and auxiliary power units are to be operated at the minimum time required to accomplish the necessary maintenance or preflight check.

B. Unmounted Engines - No maintenance or test running of jet engines not mounted on an aircraft shall be done except in a test cell of adequate design at any time. Said cell shall meet noise level criteria at a measurement distance of 250 feet from the center thereof, as follows:

Octave Band	Sound Pressure Level
20-75	85 db
75-150	79 db
150-300	73 db
300-600	72 db
600-1200	70 db
1200-2400	68 db
2400-4800	66 db
4800-10kc	60 db



LAX MAINTENANCE AREAS NOISE MONITORING SITES

SECTION IX

LAX NORTH SIDE DEVELOPMENT STUDY

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I. INTRODUCTION

The growth of the Los Angeles International Airport (LAX) has played a major role in the changes that have taken place over the past decade in the surrounding communities. In the 1970s, over 3,500 homes containing nearly 10,000 residents were acquired by the Department of Airports and removed due to the effects of aircraft noise. This has resulted in the Department's acquisition of 358 acres of land north of LAX and westerly of the Westchester Central Business District. This area is referred to as the LAX North Side Development Area.

During public meetings held by the ANCLUC staff, several comments were received regarding the future development of the North Side Area. The major points of concern were potential traffic, odor, night lighting and noise impacts associated with the development. This paper is a general description and orientation of the proposed development pattern for the North Side project.

The City of Los Angeles Department of Airports is interested in developing this property to provide optimum buffering between the stable residential area to the north, the commercial area to the east and the Airport.

A. Purpose and Scope

The purpose of the proposed LAX North Side Development Area Project is to recycle 358 acres of property north of Los Angeles International Airport. The area consists of three distinct units of varied terrain, access, and use potential. The proposed project comprises various separate development proposals and areawide circulation improvements, which are consistent with neighborhood concerns, airport needs, economic demands, and local, regional, and state goals for the area.

The primary benefits of the program will be socioeconomic in nature. The 358 acres would be returned to productive uses in commercial activities which provide employment and generate retail sales and property taxes which directly benefit the City of Los Angeles and the larger Southern California Region. Of particular significance is the subject property's strategic location adjacent to LAX; the availability of this property will allow new or expanding firms which require direct airport access to stay in the local market rather than seek locations outside the Los Angeles region.

The near-term objectives of the project are to obtain necessary zoning, subdivision, and other permit clearances, to complete initial site preparation, including the installation of necessary utilities, and the construction of street improvements. Longer-term objectives include the leasing of sites and the phased construction of commercial and industrial buildings.

B. Background and Historical Perspective

The predecessor of LAX was Mines Field, located in an agricultural area outside the City of Los Angeles. In the early 1920s, a 640-acre field was leased by William M. Mines for use as an aircraft landing strip.

In 1920 the City of Los Angeles leased Mines Field and adopted an ordinance creating the Department of Airports. The first official action was the construction of two hangars and a 2000-foot oiled runway.

In order to fulfill the need for a metropolitan airport, the City of Los Angeles purchased Mines Field in 1937. The following year, extensive improvements and runway expansion were undertaken by the Works Progress Administration (WPA) of the Federal government. A City ordinance created the Board of Airport Commissioners in 1940, and Mines Field was officially changed to Los Angeles Airport in 1941.

The start of World War II brought about rapid development of the Airport. Wartime demands led to the purchase of additional land, expansion of the two main runways, and the installation of an instrument landing system. This expansion received support from the citizens of Los Angeles with the passage of a $12 million bond issue in 1945. In 1949 runways were again extended westerly across Sepulveda Boulevard, and the purchase of additional property increased the size of the Airport to almost 3,000 acres.

During this period of Airport growth, the surrounding area also was experiencing marked changes. The Airport no longer was isolated from the city, as urbanization and industrialization had encroached upon its boundaries.

The postwar years brought increasing changes. Primary impetus was the inauguration of commercial airline service in 1946. The importance of this new role was recognized when the Airport was officially named Los Angeles International Airport (LAX) in 1949.

Industry, which was attracted to the Airport area during World War II, eventually stimulatd postwar construction of nearby residential development. Other factors were the favorable climate and the national trend of migration to the suburbs. The announcement of airport expansion plans did not curtail residential growth in the nearby area. Development around the Airport was essentially complete in the late 1950s.

In anticipation of jet service requirements, the voters of Los Angeles passed a $59 million bond issue in 1956 for the development of a new passenger terminal complex. With the advent of commercial jet service in 1959, the Airport experienced its greatest increase in air passenger demand. In response, it has completed several major expansion programs.

In 1961 Vice President Lyndon B. Johnson dedicated the then new Central Terminal Area. In 1963, the voters of Los Angeles approved a charter amendment enabling the Department of Airports to issue revenue bonds to finance development of the north runway complex, the construction of new multideck parking structures, and the purchase of clear zone properties in Playa del Rey. The first revenue bonds, totaling $30 million, were sold in 1965.

Residential and Airport conficts arose in 1963 with the creation of the north runway complex which brought aircraft within one-quarter mile of residential land use. As a result of advanced aviation technology, the range and intensity of aircraft noise had increased to the point where annoying levels could no longer be contained within the Airport boundaries.

In the period from the late 1960s to the late 1970s. the Department of Airports acquired the subject noise impacted property, relocated the residents, and removed the structures. While land was acquired to the west, north, and east of the airport during this acquisition period, it is the 358 gross acres located northerly of the north runway system, westerly of Sepulveda Boulevard, and easterly of Pershing Drive that are the focus of this report.

II. PROJECT DESCRIPTION

A. Location

The proposed project is completely contained within the boundaries of Los Angeles International Airport. The project area incorporates 358 gross acres (including roads and existing golf course) and 245 net acres and is located to the north of runway 24R-6L. The site is bounded on the north by primarily residential uses in the Los Angeles communities of Westchester and Playa del Rey, on the east by the Westchester Central Business District, on the south by the Airport runway, and on the west by Department of Airports owned property as illustrated by Figure 3.3.

B. Proposed Uses

For purposes of analysis the proposed project has been divided into three development units reflecting their spatial distributon, terrain, access, and surrounding land uses. Unit A includes the land between Sepulveda Westway and Lincoln Boulevard. Unit B encompasses property lying between Lincoln Boulevard and Hastings Avenue. Finally, Unit C encompasses the area between Hastings Avenue and Pershing Drive. The units are shown graphically in Figure 3.4.

The existing Westchester Golf Course area, which comprises approximately 70 acres, is also included in the study because some modifications may be required to the Golf Course due to possible changes to adjacent lands and revisions to the traffic pattern.

FIGURE 3.3
LOCATION OF PROPOSED PROJECT

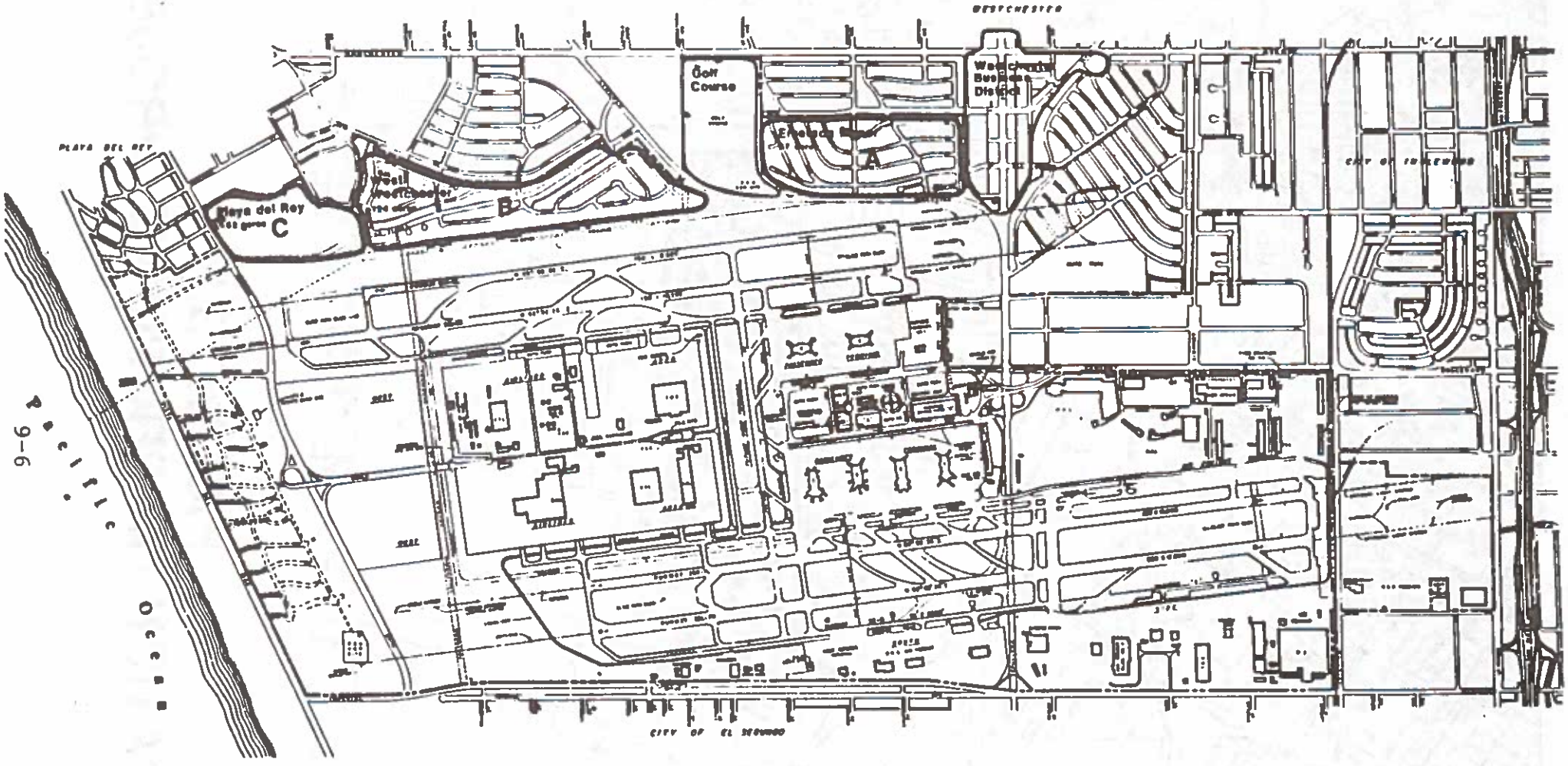


FIGURE 3.4 DEVELOPMENT UNITS

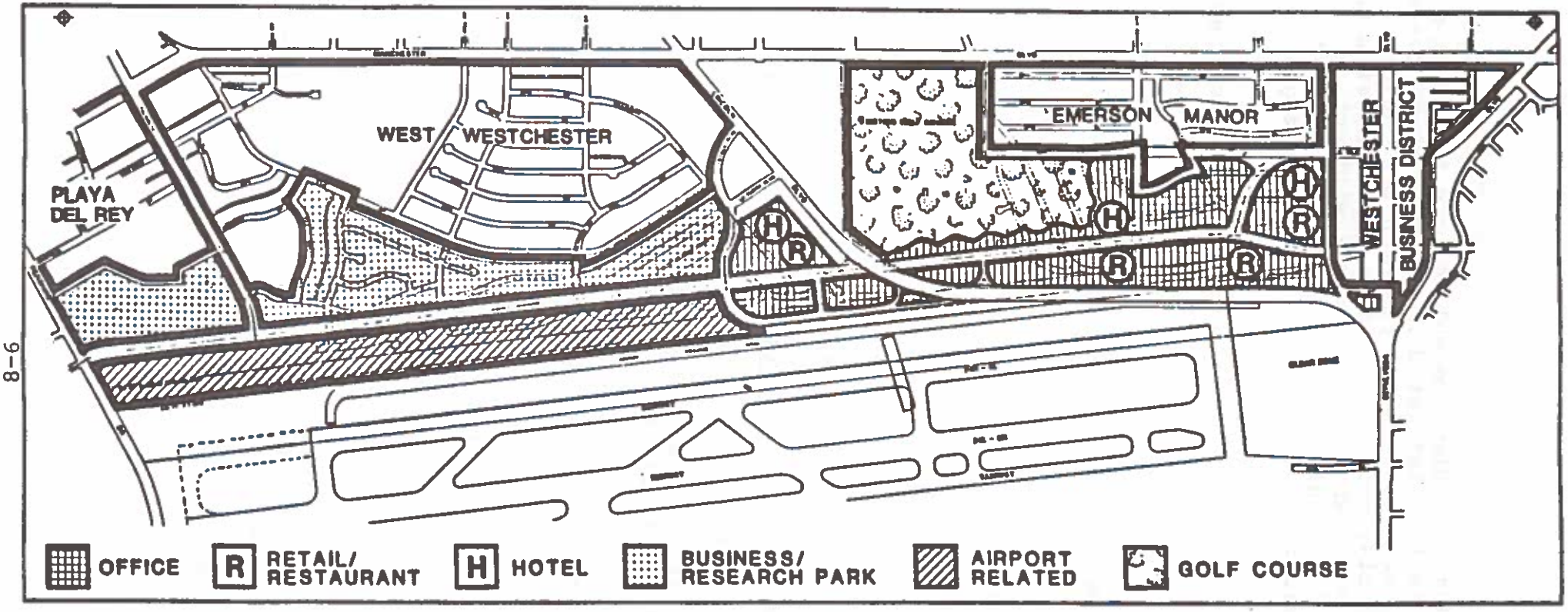
LAX AIRPORT NORTH DEVELOPMENT STUDY

The proposed land use plan concept for the LAX North Side Development Area is illustrated in Figure 3.6 and features a balanced mix of office space, research park space, recreation, hotels, retail/restaurant uses, and airport-related land uses. While the exact mix will not be determined until actual development occurs, the preliminary plan concept allocates the following gross acreages to each of the land uses:

Land Use	Acres	Percentage of Total
Office	71	20%
Research Park	88	25
Golf Course	69	19
Airport-related	69	19
Retail/Restaurant	11	3
Hotel-Motel (1,050 rooms)	7	2
Subtotal:	314	88
Major Roadways	44	12
Total:	358	100%

Realization of this concept could result in a range of 3.5 to 5.0 million square feet of developed space, which could serve 9,000 to 15,000 workers at full development. Additionally, a key feature of the preliminary plan is the new east-west arterial roadway, which is planned as a major highway to accommodate vehicle traffic from Pershing Drive on the west through the North Side Development Area, to Sepulveda Boulevard on the east. At Sepulevda the roadway would join with the existing Will Rogers Street, which in turn is planned to be widened to accommodate the increased traffic flow. The roadway would then merge into Arbor Vitae Street, extending easterly to a full interchange with the San Diego Freeway.* The arterial's

*The proposed Arbor Vitae/San Diego Freeway interchange is currently under study by California Department of Transporttion. Alternatives other than a full interchange are also being considered.



LAX NORTH SIDE DEVELOPMENT AREA STUDY

LAND USE AND CIRCULATION

VKA

FIGURE 3.6 PROPOSED LAND USE PLAN

intersection with Lincoln Boulevard will be designed as a bridge so as not to interrupt the flow on either roadway. A special ramp system will be designed to effectuate access to the project and to the Westchester CBD for motorists on Lincoln Boulevard.

1. Unit A

The proposed development in Unit A is projected to be primarily a low to mid-rise office park of approximately one million square feet of leasable office space. Most structures are expected to be from two to six stories in height. Substantial landscaping and architectural coordination between buildings is proposed to enhance the image of a high-quality office environment.

The focal point of the development will be a 12-14 acre mixed use plaza at the easternmost area of Unit A nearest the Westchester CBD. This mixed-use center will likely feature a hotel, office suites, retail shops and restaurants developed in a pedestrian-oriented plaza environment. The intent of the plaza is to attract the employees and visitors from the office park to the plaza and also to the adjacent business district. The retail element of the plaza, aproximately 50,000 square feet, is intended to compliment the retail land uses existing in the CBD. It is projected that the hotel of approximtely 800-1,000 rooms would also provide an additional source of demand for the CBD shops.

The landscaping at the office park will be designed in such a way so as to serve as a buffer* between the proposed development and the Emerson Manor community. An extensive landscaped edge treatment is recommended as the proposed buffer system due to its frequent use at existing comparable developments and its ability to act as a visually and aesthetically pleasing interface. A variety of plant materials have been suggested so as to provide effective screening at the date of planting and to ensure sufficient growth

*Buffer: A combination of separate and distinct elements which work together to effectuate a land use separation. Important components of a buffer system include fencing, shrubbery, trees, ground cover, walls, earth mounds or berms, and landscaped building setbacks.

to full height and density within a reasonable period of time.

Road improvements which would accompany the development proposed for Unit A include the following. The construction of the Westchester Parkway major highway and 88th Street extended to intersect with the extension of La Tijera in a modified "T" configuration which would permit all movements except westbound on 88th Street from northbound on the La Tijera extension.

2. Unit B

The proposed development in Unit B is composed of three distinct and complimentary land uses. The easternmost parcels, which generally front along Lincoln Boulevard are planned as low and mid-rise office and hotel development, with about 50-80 thousand square feet of associated retail shops and restaurant space.

A hotel or motel facility of approximately 200-400 rooms, which would range from three to six stories in height, is projected to be the major structure of this area. Approximately 200-300 thousand square feet of office space in low-rise structures are also planned for these easternmost parcels of Unit B.

The northerly portion of Unit B is proposed to be developed as a low-density research park, with a predominantly office and aerospace orientation.* The approximately 55 acres of land northerly of the new east-west arterial roadway in Unit B is projected to accommodate substantial landscaping and about one million square feet of research park space in two to four story structures.

*Research Park - A research park is a land use term describing a development which features a combination of office and industrial structures in an architecturally coordinated fashion. The typical tenants of research parks include engineering and design professions, product testing activities, computer centers, and laboratories. Land uses in research parks range from 30 percent to 90 percent office space with a large amount of landscaped open areas. Examples of such research parks in the Los Angeles Metropolitan Area include Fox Hills Business Center in Culver City (67 percent office, 33 percent light industrial uses), Continental Park in El Segundo (90 percent office uses), and the Airport Marina Center in Marina del Rey (60 percent office uses).

The southernmost portion of Unit B--which is southerly of the new arterial and approximately 45 acres in size--is planned to be developed as a modern low-density airport-related industrial park*, featuring one and two-story structures.

To compliment the proposed development in Unit B, a buffer system will be constructed along the northern perimeter of the North Side properties to separate the residential community of West Westchester from the commercial and industrial activities occurring within the North Side development. The residents of this area overwhelmingly favored developing the North Side structures closer to the new arterial roadway than to the community/Airport property line. The residents expressed a very strong desire to limit the height of the new structures close to the property line to avoid visual intrusion and shadowing and to construct a visual and security barrier along the Airports north property line.

The most popular type of buffer system, particularly for those living immediately adjacent to the property line, appeared to be a six to eight foot concrete or masonry wall constructed on the north edge of the North Side property with tall trees and shrubs planted immediately behind the wall on airport property.

At the westerly edge of Unit B there is a private high school which may require special treatment similar to that proposed for the area around the Emerson Manor School. This edge condition calls for a dense evergreen screen and a chain link fence. As in the other school related buffer area, the fence would be between the school and the trees so as not to create a potential security problem.

With regard to internal circulation, the only north-south roadway proposed for Unit B is the extension of Loyola Boulevard which would provide a connection from Lincoln Boulevard to the new east-west arterial.

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*Airport land uses: Airline and airport support services such as flight kitchens, caterers, ticket reservation centers, customhouse brokers, airport maintenance and ground services (excluding engine shops), freight forwarders, package delivery services, security services, import/export services and airline accessory services. Note: No uses which require aircraft access to the site are being proposed, and no aircraft will be able to access either Units B or C since no taxiway is proposed.

3. Unit C

The proposed development in Unit C is planned to feature:

1) a low density office and research park environment in the northerly area of Unit C, designed for compatibility with the multi-family residential uses immediately to the north.

2) an airport related office/industrial park in the southernmost area, similar in density and design to that proposed in Unit B.

The 33 acre research park northerly of the roadway is projected to contain 550-700 thousand square feet of space in two to six story structures, with all structures located so as to minimize the obstruction of views from adjacent multi-family dwellings. The 23 acres southerly of the roadway are projected to contain about 300-400 thousand square feet of airport-related land uses.

A buffer system is also planned for the northern edge of Unit C to effectuate a secure, minimum view obstructing land use separation between the North Side properties and the residential community of Playa del Rey.

The buffer system which was received favorably by the community and is recommended for Unit C consists of a six-foot chain link fence with a row of palm trees, which would be placed on a foundation at the level of the adjacent community residences. The North Side land would then slope down to a lower grade and the development would occur within a landscaped setting with landscaped parking areas, rather than structures located near the airport property line.

III. CONCLUSION

The implementation of the North Side Development Area represents a significant beneficial impact to the Community, to the vitalization of the Westchester and Playa del Rey communities, and to the taxpayers of the City of Los Angeles, the County of Los Angeles and the State of California. The fiscal and economic benefits of the North Side project are expected to result in millions of dollars of municipal revenues each year and thousands of employment opportunities. Further, the North Side Development will provide an aesthetic and acoustical buffer between the Airport and adjacent communities.