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COMMUNITY REACTIONS TO AIR FORCE NOISE

PART II. DATA ON COMMUNITY STUDIES AND THEIR INTERPRETATION

PAUL N. BORSKY

NATIONAL OPINION RESEARCH CENTER
UNIVERSITY OF CHICAGO

MARCH 1961

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CONTRACT No. AF 41(657)-79

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BIOMEDICAL LABORATORY
AEROSPACE MEDICAL LABORATORY
WRIGHT AIR DEVELOPMENT DIVISION
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

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CONTRACT No. AF 41(657)-79
PROJECT No. 7210
TASK No. 77444

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AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

FOREWORD

This report was prepared by Paul Borsky, Study Director for the National Opinion Research Center (NORC), University of Chicago, under the direction of Clyde W. Hart. The report, Part II of two parts, describes the application of a questionnaire method to assess the responses of community residents to the noise of aircraft operations (see Part I) and the author's interpretation of the data. The work was accomplished during 1956 and 1957 under Contract AF 41(657)-79 with the Air Force Personnel and Training Research Center, Lackland Air Force Base, Texas, in support of Project No. 7210, "Human Response to Vibratory Energy," Task No. 77444, "Assessment of Community Reactions to Air Force Noise." Daniel Camp served as contract monitor.

The detailed research was conducted by David E. Ryan and Richard L. Blumenthal, Assistant Study Directors at NORC, and Dr. Kenneth N. Stevens of Bolt Beranek and Newman, Inc. Valuable advice and assistance was given by Dr. H. O. Parrack and Dr. Henning E. von Gierke of the Bio-Acoustics Branch, Aero Medical Laboratory, * Wright Air Development Center, * Wright-Patterson Air Force Base, Ohio.

The studies reported in Parts I and II of the present report formed the basis for Air Force operational procedures to assess community reaction to air base operations and to guide further research in this area. Many publications and procedures published in the meantime have made use of the information contained in this report; a limited number of copies of this report was distributed to interested Government agencies on request. The research data contained in this report originally were planned to be a part of a more complete evaluation of the overall problem and would have presented more definite results. In the meantime, Air Force research activity in this area was de-emphasized. However, many requests for these data were received and it was decided to publish this report at this date without further modification. It should be kept in mind that the manuscript was written by the authors nearly four years ago and that general research activity in this area has continued through this period. Although the data presented are considered valid and valuable, the reader is reminded that they do not constitute the latest or final results in this complex research area.

Air Force publications connected with or growing out of the work reported here include the following:

1. Stevens, K. N., Pietrasanta, A. C., and the Staff of Bolt Beranek and Newman, Inc., "Procedures for Estimating Noise Exposure and Resulting Community Reaction from Air Base Operations," WADC Technical Note 57-10, April 1957.
2. Clark, W. E., "Noise from Aircraft Operations," Bolt Beranek and Newman, Inc., To be published as WADD Technical Report, 1961.
3. Pietrasanta, A. C., and the Staff of Bolt Beranek and Newman, Inc., "Field Measurement of Community Noise Exposure Near Hanscom Field," WADC Technical Note 58-163, August 1958.
4. Clark, W. E., Pietrasanta, A. C., and the Staff of Bolt Beranek and Newman, Inc., "Intrusion of Aircraft Noise into Communities Near Two USAF Bases," WADC Technical Note 58-213, July 1958.

* Redesignated the Biomedical Laboratory, Aerospace Medical Laboratory, Wright Air Development Division.

To determine preliminary relationships between variations in acoustic situations and disturbance, annoyance, and complaint potentials, personal interviews were held with almost 2500 residents at different air bases. The detailed acoustic conditions at three of these bases were measured. From these studies, the instruments and procedures for assessing neighborhood reactions have been fully developed, pretested, and validated. The data has provided valuable findings and the development of prototype statistical models for estimating neighborhood disturbance, annoyance, and complaint readiness. Community reactions are directly related to the intensity of the noise levels. A person is more disturbed, annoyed, and ready to complain if he is fearful of crashes and feels the air base is less important to local welfare and is less considerate of neighborhood feelings. Greatly disturbed people are also less satisfied with general living conditions in their areas, are more sensitive to noise of cars and trucks, and have less experience with flying. Time by itself has been proved no automatic cure of the annoyance problem. People who have lived near air bases longer are even more bothered by the airplane noise.

PUBLICATION REVIEW

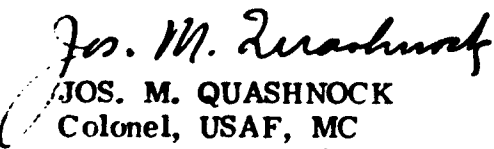

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SECTION I

INTRODUCTION

This report summarizes five years of developmental research effort to create a system for measuring and analyzing community reactions to airplane noise and flight operations.

During the spring of 1952, following the intense public reaction to the tragic accidents of Elizabeth, New Jersey, and Jamaica, Long Island, the National Advisory Committee for Aeronautics (NACA) asked the National Opinion Research Center (NORC) to develop a research plan for determining the nature and extent of human annoyance with airplanes flying overhead. After a brief pilot study at the New York and Chicago Municipal Airport areas, a questionnaire and survey procedure were developed for a full scale investigation. Over 3600 personal interviews were obtained in 180 different neighborhoods adjacent to 8 major commercial airports. An analysis of the detailed comments provided valuable insights into the human aspects of disturbance and annoyance with propeller-driven commercial airplanes. The highly qualitative nature of these early interviews, however, made quantification of analytical relationships extremely difficult. Most of the questions were designed to encourage spontaneous comments in language formulated by the respondent himself. Without a uniform set of preceeded questions, it is difficult to quantify answers. It was possible, however, to isolate the major acoustical and sociopsychological variables for further study. Detailed findings are reported in the NACA report, "Community Aspects of Aircraft Annoyance," NORC Report No. 54, December 15, 1954.

Since plans were already under way to replace most propeller planes with jet airliners, it was recognized that further research on airplane noise problems should concern itself primarily with jet operations. The U. S. Air Force, which already had converted to jet aircraft, indicated it was very much interested in community annoyance problems and offered to support additional research efforts.

During the following year, 1955, NORC conducted a series of experimental depth interviews, averaging 2 to 3 hours in length. These detailed discussions with neighbors of jet air bases and with a selected panel of NACA respondents who had previously revealed extreme attitudes of adjustment or annoyance sharpened our conceptual understanding of the human reaction to aircraft noise. Forearmed with a list of important sociopsychological variables, it was possible to develop a highly structured questionnaire capable of systematically recording a wide range of individual feelings and attitudes on these variables. After a series of pretests and questionnaire revisions, the survey tool was finally ready for validation.

Under continued Air Force support, it was decided to conduct a pilot study at a Strategic Air Command (SAC) air base. Following extensive evaluation of the initial 732 interviews, it was found that the questionnaire responses could be systematically combined into a series of reliable sociopsychological attitudinal Guttman Scales providing numerical values to these variables. In the process of developing these scales, a number of weaknesses were revealed in the questionnaire, and efforts were made to revise it accordingly.

Since there was continued pressure from air base commanders for even a rough practical device for estimating community reactions to air base operations, it was decided to expand our research efforts. In the process of further testing and validating the questionnaire at two Air Defense Command (ADC) bases, an effort was made to gather enough data so that preliminary analyses could be made of the different variables. Over 2300 usable interviews were obtained at these three air bases. The high consistency of response enabled us to develop a series of preliminary conclusions on the relative importance and interactions of a number of key human factors. However, these findings are often based on relatively small samples of respondents. In the process of analysis, when only people living under comparable acoustic conditions and reporting similar attitudes on four or five psychological variables are separated for evaluation of their responses, there are often less than 50 people answering all the criteria.

Consequently, it cannot be emphasized too strongly that the major purpose of this phase of our research was to develop and validate the research instruments. As a subsequent task, an effort has been made to provide preliminary findings on the substantive nature of the community reactions to Air Force operations. To reduce the variability of these findings and to test further the validity of the research techniques, it will be necessary to study additional air base areas and to conduct several thousand more personal interviews. After a sufficient number of interviews, we believe that a valid mathematical model can be developed which can be used by Air Force operations personnel to estimate a neighborhood's reactions to a given acoustical situation without the necessity for additional interviews. Naturally, such a model would represent an average response, but the error of estimate should be small enough for planning purposes.

The substantive report which follows is divided into four main sections. The first deals with the description and measurement of the aircraft stimulus at the three air base areas. This section was prepared primarily by Adone Pietrasanta and summarizes the work of Bolt Beranek and Newman, Inc. (B. B. & N.). The second section evaluates human disturbance and annoyance with jet aircraft noise. The third section analyzes the complaint potential, or the relationships between disturbance, annoyance, and other psychological variables and the readiness of people to complain to air base officials. The fourth section includes a summary of our findings, practical use of annoyance and complaint potential models, and a number of recommendations for further research.

The development and validity of the various research tools and methods used in this study are described in Appendices A through F.

SECTION II

THE NOISE STIMULUS IN COMMUNITIES NEAR JET AIR BASES

Actual human experience generally represents an integration of many different variables, the theoretical description of the airplane problem analytically divided into seven phases:

- I The objective characteristics of neighborhood problems**
- II The spatial and sociological relationships of individual residents in a single neighborhood and of adjacent neighborhoods**
- III The intervening sociopsychological factors affecting individual feelings of disturbance, annoyance, and complaint**
- IV The range of neighborhood disturbance and annoyance**
- V Readiness to complain**
- VI The intervening factors affecting community action**
- VII The forms of community action**

This section describes Phase I, the character of the airplane noise stimulus as it existed at the three air base areas studied.

A. Specification of Noise Stimulus

The noise stimulus or noise exposure in communities near jet air bases is a complicated quantity. In any one neighborhood, the variation of noise with time might look like the pattern shown in figure 1. The sound pressure level (SPL) of the noise rises and falls as aircraft take off and pass over or near an area, as indicated by the more pronounced noise peaks in figure 1. In the absence of jet aircraft activity the time pattern of noise indicates simply the ambient or background noise of automobile and truck traffic, trains, children playing, etc.

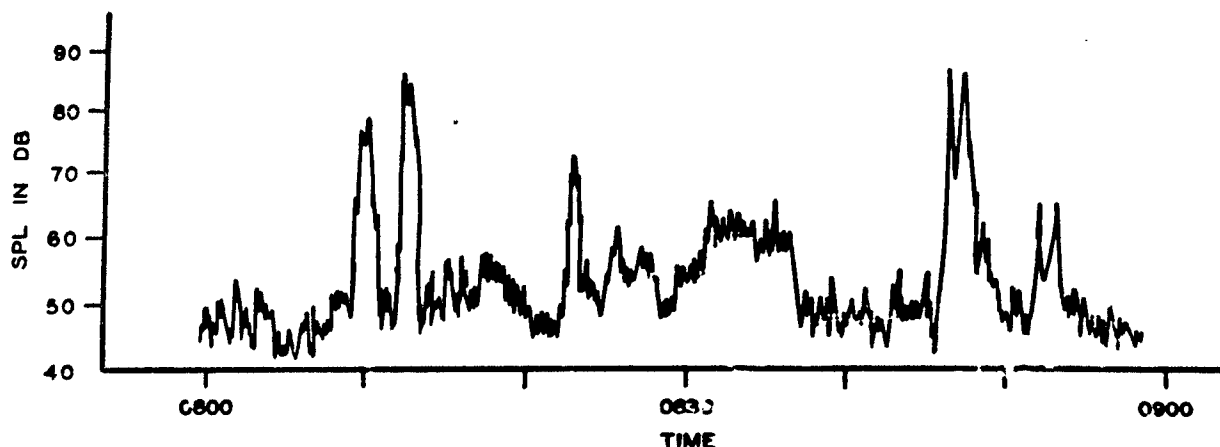


Figure 1. Typical Time Pattern of Noise in a Community Near a Jet Air Base

The frequency spectrum as well as the SPL of the noise varies with time, adding to the complexity of the problem. Measurements of aircraft noise are usually made in the following octave bands of frequency, 20-75, 75-150, 150-300, 300-600, 600-1200, 1200-2400, 2400-4800, and 4800-10,000 cycles per second (cps). Hence the time pattern of noise in figure 1 might represent the variation of noise in only one octave band—for example, the 600-1200 cps band. A more complete description of the noise stimulus would require, therefore, similar time patterns (extending over much longer periods of time, of course) for all eight octave bands. Such a complete description, however, in addition to being unwieldy, is unnecessary for our present purposes.

The time pattern of noise arising from air base operations is basically the same regardless of the air base involved or the community in which the noise is measured. The pattern is usually composed of a number of peaks of SPL distributed in some manner with time and superimposed on a fluctuating background noise. Certain characteristics of the time pattern—such as the frequency or occurrence of the peaks, the amplitude or height of the peaks, and the time duration of the peaks—will vary from base to base and community to community as the pattern of airplane operations differs. Therefore, we have selected numbers that specify these salient variables of the noise, as well as numbers that represent, in our opinion, their integrated effect, including that on activities such as speech communication or listening. We believe that these basic characteristics of the noise stimulus can be used to identify a gradient of physical situations under which different neighborhoods exist. Where the stimulus numbers are comparable, the aircraft noise and flight operations are comparable. The key stimulus numbers are:

1. Average number of aircraft per hour whose maximum SPL in the 300-600 cps band exceeds 6 db
2. Maximum SPL in the 300-600 cps band exceeded by 10 percent of aircraft above

3. Average "duration of peak" in seconds for aircraft whose maximum SPL in 300-600 cps band exceeds 80 db

4. Equivalent continuous SPL in 300-600 cps band (L_{eq})

5. Average number of seconds per hour during which a speech interference level (SIL) of 60 db is exceeded

6. Average number of seconds per hour during which an SIL of 75 db is exceeded

These numbers are specified for each of the different neighborhoods and in one or more periods:

	<u>Hours</u>	<u>Period</u>
A)	2400-0600	All week
B)	0600-1800	Monday - Friday
C)	1800-2400	All week
D)	0600-1800	Saturday - Sunday
E)	Entire week	

Further explanation of the stimulus terms with some rationale for their selection follows:

1. Average Number of Aircraft per Hour Whose Maximum SPL in 300-600 cps Band Exceeds 60 db. This number specifies the "volume" of aircraft operations over or in the vicinity of a particular neighborhood. An SPL of 60 db was selected because it is about 10 to 15 db above the average background noise level, hence eliminating the problem of when and when not to count an aircraft.

If a plane is flying a considerable distance to the side of a neighborhood, it may be barely audible above the rumble of ordinary traffic noises. Should such a noise recording be counted as a flight exposure? Since there are known individual differences in acuity of hearing, it was arbitrarily decided to count a plane only when its recorded SPL exceeded 60 db, and was clearly audible to most persons. Since the purpose of this stimulus number is to specify the volume of aircraft flying over a neighborhood, it could well be associated with a cut-off value of the overall SPL or the SPL in any one of the eight octave bands. The choice of the 300-600 cps band is somewhat arbitrary although it simplifies the noise measurement problem. Measurement of the overall SPL or of the SPL in the octave bands below the 300-600 cps band is sometimes affected, especially in the case of distant aircraft, by the background noise. In the octave bands above the 300-600 cps band the measurement problem is sometimes complicated by the diminution and fluctuation in SPL because of atmospheric effects influencing the transmission of sound through the air.

2. Maximum SPL in the 300-600 cps Band Exceeded by 10 Percent of Aircraft Above. This stimulus number serves to specify the noise level of the most intense aircraft disturbances. Since pilot techniques and planes differ and every flight may be considered a slightly different experience, a recording of the highest SPL's for a series of flights would present a statistical scatter of different levels. The cut-off value of 10 percent was also somewhat arbitrary but was chosen to permit greater differentiation among neighborhoods for the high-intensity aircraft noises. Raising the percentage cut-off value would serve to reduce the differentiation, and a median level would show very little differentiation at all. The reasons for the choice of the 300-600 cps band are the same as above.

3. Average "Duration of Peak" in Seconds for Aircraft Whose Maximum SPL in 300-600 cps Band Exceeds 80 db. This number measures how long the more intense aircraft noises are "on." The average "duration of peak" is defined as the average length of time the SPL for one peak is within 5 db of the maximum SPL. The duration of peak is usually a function of the altitude and airspeed of the airplane along with other factors. Presumably a comparable peak of longer duration would be more disturbing than one with a shorter average duration.

4. Equivalent Continuous SPL in the 300-600 cps Band (L_{eq}). In contrast to the stimulus numbers above where specific characteristics of the noise stimulus were described, this quantity attempts to combine level, frequency of operation, and duration into a single index. The equivalent continuous SPL in the 300-600 cps band (L_{eq}) is equal to the SPL of a continuous noise having the same average intensity as the sharply fluctuating noise generated by aircraft. This number has been used in other analyses of air base-community noise problems.* Further discussion of this overall measure is presented in part B of this section.

5. Average Number of Seconds per Hour during Which an SIL of 60 db Is Exceeded. This stimulus number is associated with the effect of aircraft noise on speech communication. A noise with an SIL of 60 or greater would normally interrupt conversations being carried on in a raised voice over a distance of 3 feet. Telephone conversation would probably be difficult in such a noise environment. This stimulus number specifies the average amount of time per hour that such a condition is exceeded out-of-doors. For speech interference indoors, see (6) below.

* Stevens, Kenneth N., Adone C. Pietrasanta, and the staff of Bolt Beranek and Newman, Inc., Procedures for Estimating Noise Exposure and Resulting Community Reaction from Air Base Operations, WADC Technical Note 57-10, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio, 1957.

6. Average Number of Seconds per Hour during Which an SIL of 75 db Is Exceeded. This stimulus number is related to the effect of aircraft noise on speech communication indoors. Since external noise in traveling through the walls and open windows of typical residential dwellings would be reduced by about 15 db in the SIL frequency bands, an SIL of about 75 db outside corresponds to an SIL of 60 db inside. Hence, (5) and (6) specify the number of seconds per hour that interference with speech and listening may occur both out-of-doors and indoors (windows open), respectively.

Analysis of the answers to our questionnaires reveals that the stimulus number, "average number of seconds per hour during which an SIL of 60 db is exceeded," is the most sensitive of the various stimulus numbers with regard to the relation of "activity disturbance" to the noise stimulus. Of the five activities involved—listening, talking, sleeping, feeling vibrations, and resting—only two are specifically related to speech and listening. The relatively good correlation obtained with this stimulus number would seem to represent an anomaly. However, such is not the case, since the various aircraft frequency spectra involved are very similar in shape. Therefore, we could just as well describe these noise spectra by the SPL in a particular octave band, and hence specify the number of seconds per hour that this octave band SPL is exceeded. Stimulus numbers described in this manner would have rank ordered in about the same way as the "SIL numbers." Apparently then, the important quantity is not so much the choice of SIL to describe the noise, but the amount of time a given noise spectrum is exceeded.

7. Time Periods. Several time periods were selected in an attempt to account for variation in aircraft operations at an air base as well as variations in residential living activities. Basically, the 24-hour day was divided into three periods, the daytime (0600-1800), evening (1800-2400), and nighttime (2400-0600). In general, nighttime and evening air base operations vary little throughout the week, so time period A was selected as "2400-0600 all week," and time period C as "1800-2400 all week." In contrast, the daytime base operations are usually somewhat different over the weekend compared with those during the normal work week. Either the operations are very curtailed, such as during the nighttime, or a different kind of activity occurs, such as reserve and National Guard flying. Consequently, the period 0600-1800 was broken into two periods: (B) "0600-1800 Monday - Friday," and (D) "0600-1800 Saturday - Sunday." Finally, time period E was designated to cover the average for the "entire week."

In summary, the complicated pattern of noise exposure in neighborhoods near jet air bases (see figure 1) has been reduced to a specification of the six stimulus numbers described above. These numbers give a measure of the volume of aircraft activity, the intensity and duration of the more intense aircraft noise levels, the integrated effect of volume, intensity, and duration, and, finally, the interference with speech and listening both indoors and out-of-doors, or, more broadly stated, the amount of time a given noise level is exceeded.

B. Determination of the Noise Stimulus

One approach in determining the stimulus numbers described above is the use of direct acoustical measurements only. The variation of SPL with time could be recorded in each of the various neighborhoods. From this recorded data one could then extract the pertinent stimulus numbers. This technique, although apparently simple and straightforward, has two serious drawbacks. First, the amount of field survey time required alone would be prohibitive. Any statistically adequate description of the noise exposure would require continuous field measurements around the clock every day for at least several weeks. These measurements would also have to be taken simultaneously in each of the several selected community neighborhoods. With present techniques, several hundred to a few thousand man-days of engineering time would be required just to record the data and reduce it to a usable form from which the stimulus numbers could be derived.

The second drawback of the direct measurement approach is that it essentially precludes the development of generalized procedures that could be used for computing the noise stimulus in community areas near any jet air base. Each set of measurements would apply only to a particular base over a particular period. The development of generalized procedures, however, represents one of the basic objectives of this study and of the program of air base noise studies being carried out by Bolt Beranek and Newman, Inc. (acoustical engineers) under the direction of the Bioacoustics Branch, Aerospace Medical Division, of the Wright Air Development Division. Under their program comprehensive noise surveys have been performed at five major Air Force bases to date.* During these surveys detailed acoustical measurements have been made of the noise produced by all types of Air Force aircraft undergoing various in-flight and ground run-up operations. In addition, photographic data have aided in describing the actual movements of aircraft during in-flight operations including take-offs, landings, ground-controlled approaches (GCA), instrument landing system approaches (ILS), etc. Further, base records have been examined to obtain as accurate a picture as possible of the time schedule of base operations.

From these and related studies procedures are being developed to permit the determination of the noise exposure in community neighborhoods adjacent to air bases by a "paper analysis" only. For such an analysis only a certain amount of operational information obtainable from air base personnel is required. On the basis of this information the procedures could be employed to compute the noise stimulus in any given community. Clearly, such techniques would greatly reduce the time required to describe the noise stimulus in communities near jet air bases.

* The results of these air base surveys will be summarized in a series of reports being prepared by Bolt Beranek and Newman, Inc., for the Aerospace Medical Division, Wright Air Development Division, Wright-Patterson Air Force Base, Ohio.

How, then, were the stimulus numbers as previously described determined for this study? Since the procedures discussed above are presently under development (some are available, one illustrated below), the actual stimulus numbers were obtained by an involved combination of discussions with air base personnel, observations, and direct acoustical measurements and computations. From the control tower and base records (or from records kept by base personnel for several weeks prior to and during the field survey at the request of the survey team), a "long-time average" picture of the time schedule of the air base operations is obtained. The number of each type of aircraft taking off, landing, etc., on each of the active runways is included. Next, from photographic data the location of each aircraft in space is determined and average flight paths and flight profiles are described statistically. Further, the noise produced on the ground by the aircraft operations is measured and related to the position of the aircraft in space.

Using this data a model can be developed that describes, for any one type of aircraft, for example, approximately how often it takes off and lands on each of the available runways during each period. Concomitantly, the noise exposure can be determined in the same way. Finally, the various noise exposure values in any one neighborhood are totaled to give the noise exposure arising from all air base operations.

NORC questionnaire surveys were carried out in neighborhoods in the vicinity of three of the five air bases mentioned above: 1) West Coast ADC base, 2) West Coast SAC base, and 3) East Coast ADC base. The actual detailed acoustical data for the different neighborhoods at these air bases are presented in part D. A comparison of detailed estimates and rough estimates derived from the average engineering model is presented in part C.

C. Illustration of the Use of Engineering Procedures for Calculating the Noise Stimulus

There are available procedures for calculating certain aspects of the noise exposure arising from jet air base operations. Stevens and Pietrasanta* describe a method for calculating the equivalent continuous SPL in the 300-600 cps band (L_{eq}). The method utilizes graphical aids in the form of noise contours which can be overlaid on a map of an air base and its environs. The contours are drawn in terms of L_{eq} and apply for take-off operations. The values of L_{eq} on the contours need be corrected only for the type of aircraft involved (in other words, the amount of noise it produces) and the volume of activity (number of take-offs per hour). From the corrected contours one can pick off the value of L_{eq} that is estimated to exist at any location near an air base.

For illustration, estimates of L_{eq} have been made for the six community neighborhoods under and near the take-off path at the "West Coast SAC

* See reference on pg. 6

base." The seventh neighborhood was under a landing path. These estimates are then compared with the stimulus values of L_{eq} given in part D. This is primarily a B-47 heavy jet bomber base. A study of operational records kept by the base showed that, in period B, there was approximately one B-47 take-off per hour. Making corrections to the contour values for this activity and for the type of aircraft, we found that, by overlaying the contours on the air base and its surroundings, the estimated values of L_{eq} were as listed in column 3 in table 1. For comparison the stimulus values of L_{eq} based on the detailed field observations are given in column 2. The values are in good agreement, the greatest difference being only 3 decibels.

TABLE 1
COMPARISON OF ESTIMATES OF L_{eq} WITH
STIMULUS VALUES OF L_{eq}

(1) Neighborhood Area	(2) Stimulus Value of L_{eq} (db)	(3) Estimated Value of L_{eq} (db)
1	75	73
2	69	60
3	65	62
4	68	69
5	63	63
6	63	63

Actually the average number of aircraft per hour appearing over or near these six community areas in time period B totaled about 4.6, 1 B-47 and 3.6 "other" aircraft per hour, as noted in Section D. However, the estimates noted above are little affected by the fact that the 3.6 "other" aircraft per hour have not been considered. The other aircraft are generally 5 decibels or more quieter than B-47's and, furthermore, are at a higher altitude than the B-47's over or near any of the six community areas. Hence, even though there are almost four times as many of these aircraft, the fact that they are both quieter and higher means that their effect on the estimated values of L_{eq} would be less than 1 decibel, which is negligible.

D. Tabulation of Stimulus Data

Before the personal interviews were analyzed, all people living under comparable airplane noise conditions were identified. Any differences in their responses could not be attributed to variations in the physical aspects of the airplane problem but would have to be explained by psychological and sociological variables. Consequently, after detailed engineering studies, the SAC base was divided into 7 homogeneous neighborhoods, the West Coast ADC base into 10 neighborhoods, and the East Coast ADC base into 5 different neighborhoods. Figures 2, 3, and 4 show the locations of these neighborhoods in relation to the major flight paths of their air bases.

In the analyses presented in succeeding sections, different neighborhoods are grouped into comparable classes of acoustical situations in order to

increase the number of cases available for analysis in each grouping. In the following tables both the detailed acoustical estimates as well as the different classes of data will be shown.

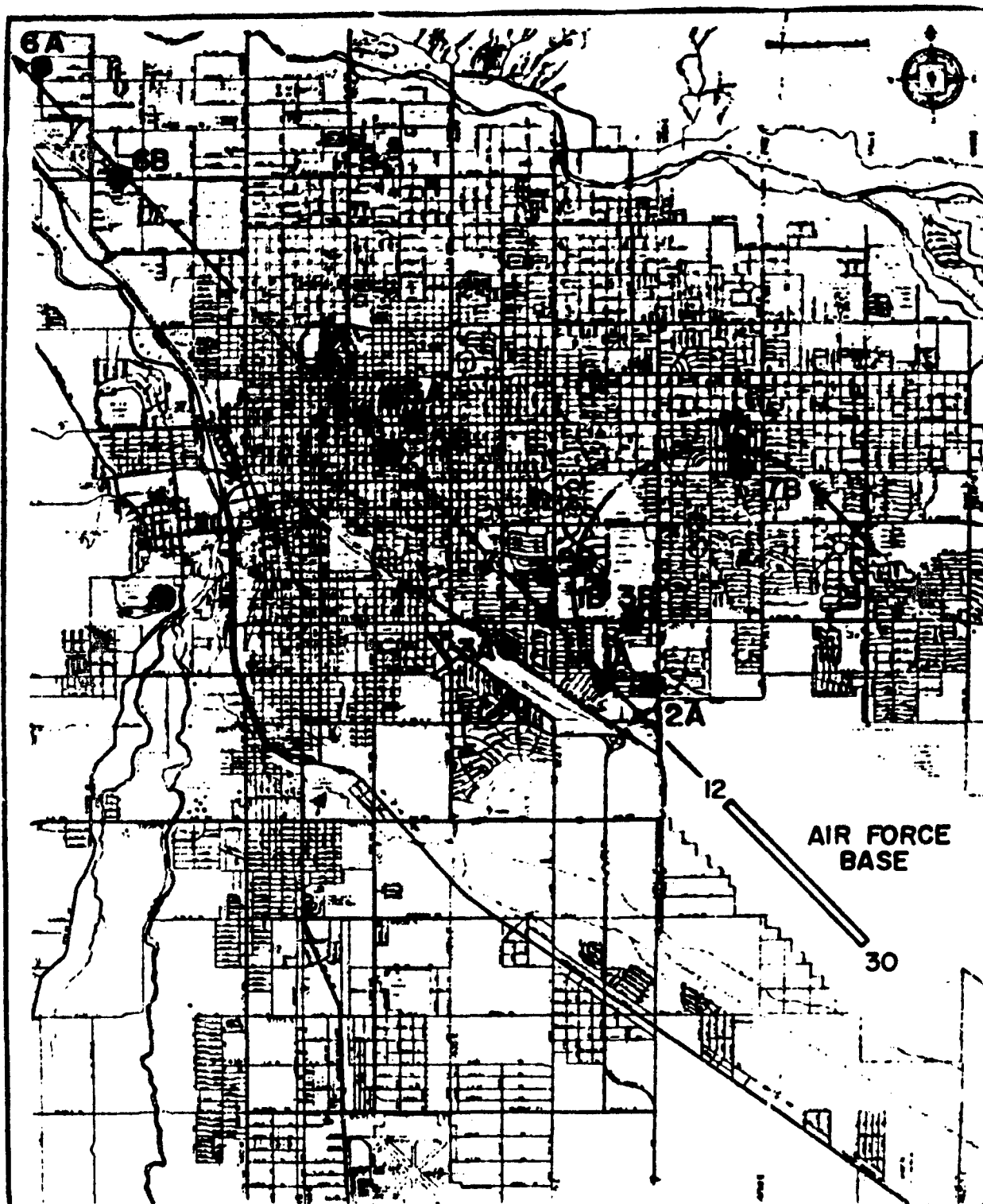


Figure 2. Noise Exposure Areas - West Coast SAC Base

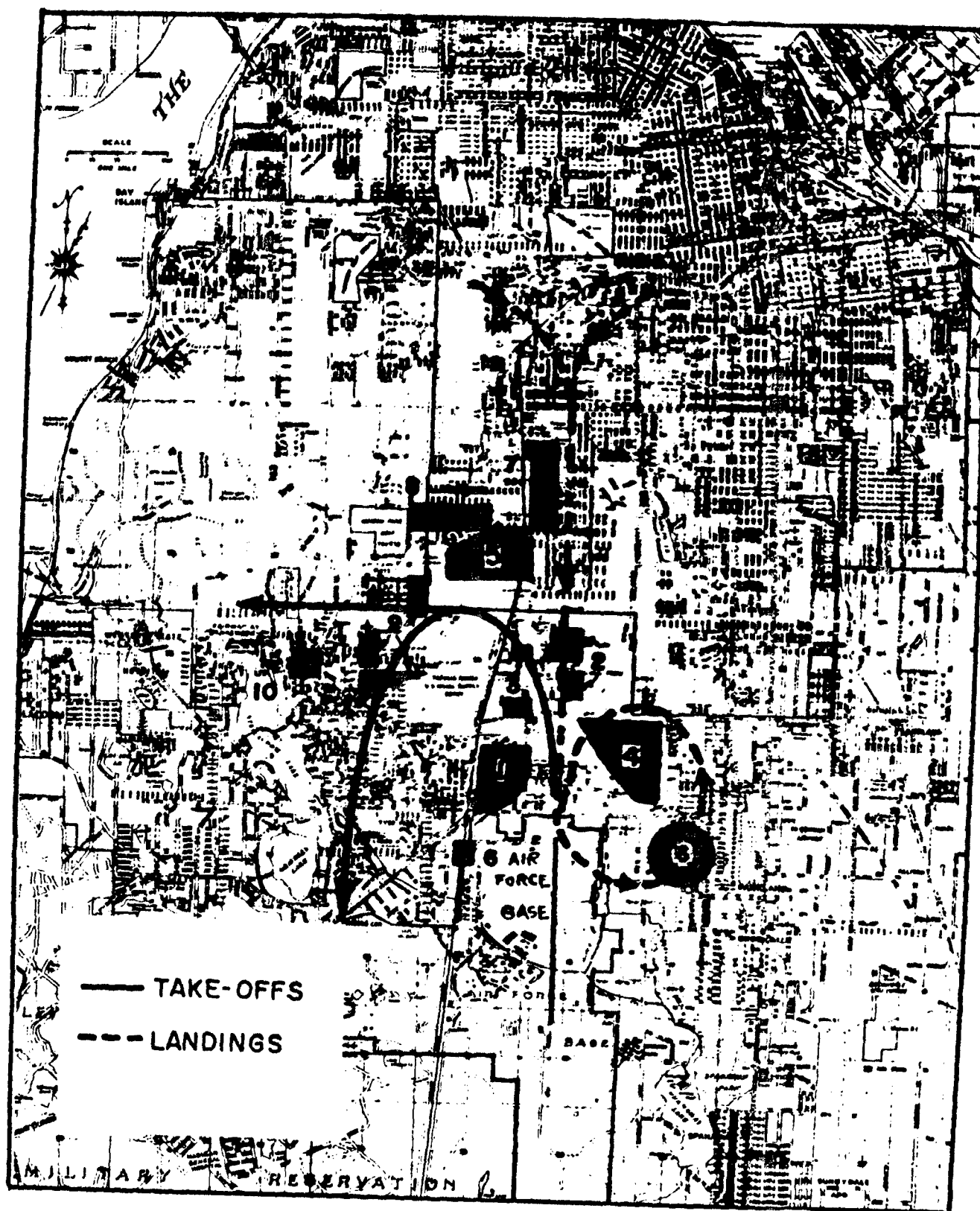


Figure 3. Noise Exposure Areas - West Coast ADC Base

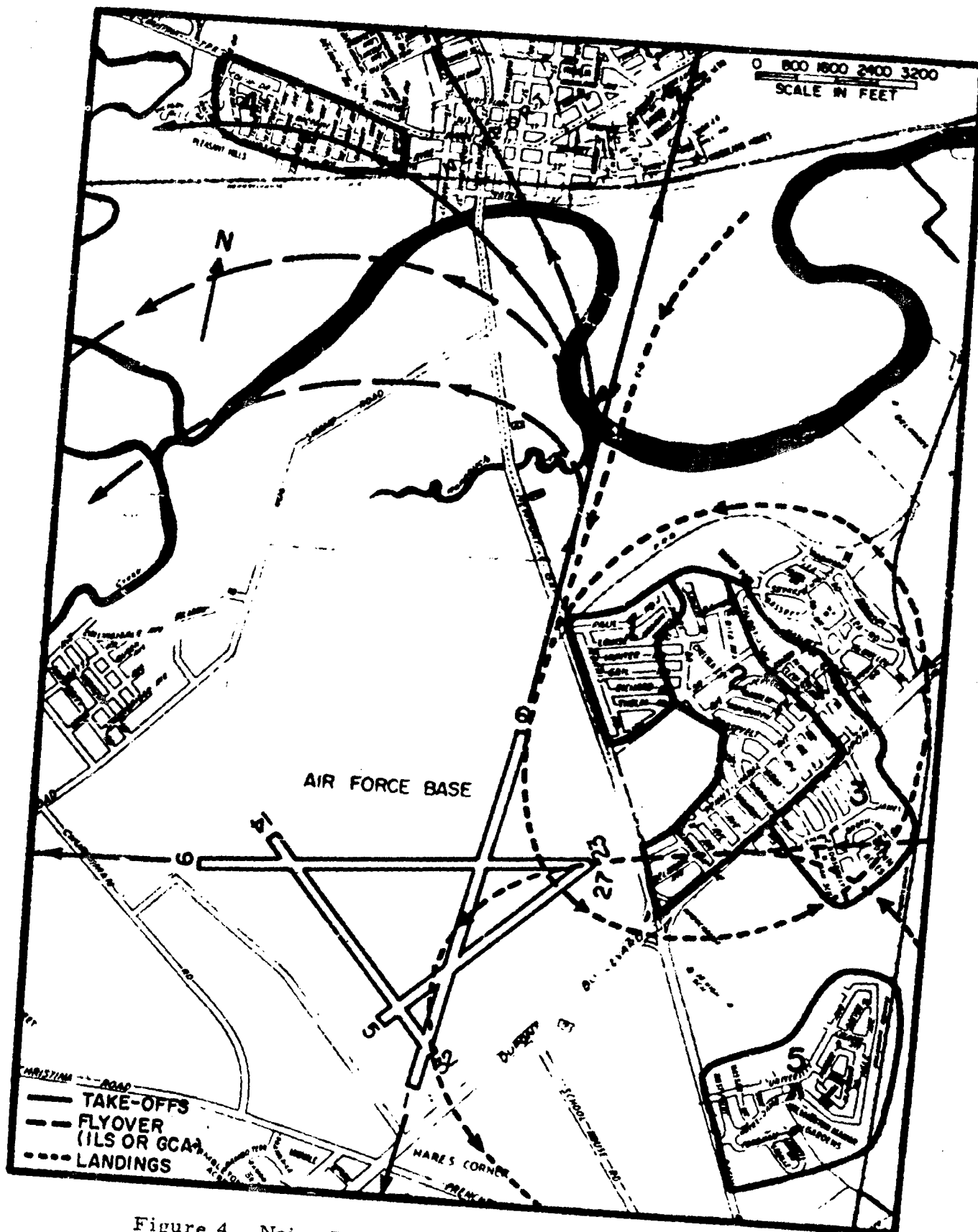


Figure 4. Noise Exposure Areas - East Coast ADC Base

1. Number of Aircraft Flying Over or Near a Neighborhood

The first acoustic variable, presented in table 2, is the number of planes to which a neighborhood is exposed during various periods. The classes of data are designated by the letters A-E in the following groupings.

<u>Class</u>	<u>No. of Operations Per Hour</u>
A	Less than 0.3
B	0.3-0.9
C	1.0-2.9
D	3.0-5.9
E	6.0 or more

As shown in table 2, there is very little night flying at these three air bases and most of the daytime flying occurs during the Monday-Friday period. Because of the concentration of activity during the day, the rank ordering of day-time volume is considered the best single measure of aircraft operations.

TABLE 2
AVERAGE NUMBER OF AIRCRAFT PER HOUR
FLYING OVER DIFFERENT NEIGHBORHOODS *

<u>Air Base & Neighborhood</u>		<u>Time Period</u>									
<u>SAC Air Base</u>		<u>Night</u>		<u>Day</u>		<u>Evening</u>		<u>Weekend</u>		<u>All Week</u>	
<u>Neighborhood</u>		<u>No</u>	<u>Class</u>	<u>No</u>	<u>Class</u>	<u>No</u>	<u>Class</u>	<u>No</u>	<u>Class</u>	<u>No</u>	<u>Class</u>
1		0.9	B	5.7	D	2.6	C	2.3	C	3.3	D
2		0.9	B	5.6	D	2.6	C	2.3	C	3.2	D
3		0.9	B	5.4	D	2.6	C	2.2	C	3.1	D
4		0.5	B	2.8	C	1.6	C	1.2	C	1.7	C
5		0.3	B	2.8	C	1.9	C	0.9	B	1.7	C
6		0.2	A	2.2	C	1.6	C	0.5	B	1.3	C
7		1.1	C	1.9	C	0.7	B	0.4	B	1.2	C
<u>West Coast</u>											
<u>ADC Air Base</u>											
<u>Neighborhood</u>											
1		0.7	B	7.2	E	2.9	C	2.4	C	3.7	D
2		0.5	B	6.3	E	2.4	C	1.9	C	3.3	D
3		0.5	B	6.3	E	2.3	C	1.8	C	3.2	D
4		0.4	B	5.1	D	1.8	C	1.4	C	2.6	C
5		0.6	B	5.9	D	2.4	C	1.9	C	3.1	D
6		0.6	B	5.9	D	2.7	C	2.0	C	3.4	D
7		0.4	B	4.9	D	2.0	C	1.5	C	3.1	D
8		0.4	B	5.1	D	1.8	C	1.4	C	2.6	C
9		0.6	B	6.1	E	2.5	C	1.9	C	3.2	D
10		0.6	B	6.3	E	2.6	C	2.0	C	3.3	D
<u>East Coast</u>											
<u>ADC Air Base</u>											
<u>Neighborhood</u>											
1		0.1	A	8.7	E	3.8	D	2.7	C	4.8	D
2		0.1	A	8.2	E	3.6	D	2.3	C	4.6	D
3		0.1	A	7.8	E	3.6	D	2.4	C	4.7	D
4		0.1	A	1.6	C	1.6	B	0.1	A	1.8	B
5		0.1	A	3.3	D	1.5	C	1.6	C	2.0	C

* Planes are counted only if the noise exceeds 60 db SPL in the 300-600 band.

2. Peak Sound Pressure Level

The peak SPL is presented in table 3 for each of the neighborhoods and periods. This data is also grouped into the following classes and designated by the letters A-H.

<u>Class</u>	<u>Range in Peak SPL</u>
A	106 db or more
B	101 - 105
C	96 - 100
D	91 - 95
E	86 - 90
F	81 - 85
G	75 - 80
H	less than 75

TABLE 3

PEAK SPL (100-600 CPS) EXCEEDED BY 10% OF
AIRCRAFT BY TIME PERIOD AND NEIGHBORHOOD

<u>Air Base & Neighborhood</u>		<u>Time Period</u>									
<u>SAC Air Base</u>		<u>Night</u>		<u>Day</u>		<u>Evening</u>		<u>Weekend</u>		<u>All Week</u>	
<u>Neighborhood</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	
1	108	A	108	A	110	A	98	C	106	A	
2	99	C	99	C	101	B	89	E	99	C	
3	89	E	89	E	90	E	89	E	89	E	
4	100	C	101	B	101	B	91	D	101	B	
5	93	D	92	D	91	D	85	F	92	D	
6	95	D	94	D	94	D	92	D	94	D	
7	89	E	89	E	89	E	89	E	89	E	
<u>West Coast</u>											
<u>ADC Air Base</u>											
<u>Neighborhood</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	
1	81	F	99	C	96	C	88	E	98	C	
2	98	C	98	C	98	C	97	C	98	C	
3	93	D	94	D	93	D	93	D	94	D	
4	81	F	93	D	93	D	92	D	93	D	
5	84	F	91	D	90	E	86	E	91	D	
6	68	H	76	G	76	G	75	G	76	G	
7	85	F	85	F	84	F	79	G	85	F	
8	82	F	87	E	87	E	85	F	87	E	
9	82	F	90	E	87	E	82	F	90	E	
10	82	F	85	F	82	F	80	G	85	F	
<u>East Coast</u>											
<u>ADC Air Base</u>											
<u>Neighborhood</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	<u>No db</u>	<u>Class</u>	
1	*	H	87	E	87	E	84	F	87	E	
2	*	H	81	F	81	F	78	G	81	F	
3	*	H	77	G	77	G	76	G	76	G	
4	*	H	83	F	82	F	*	H	83	F	
5	*	H	77	G	75	G	75	G	76	G	

* Negligible number of aircraft

From other studies and from preliminary analyses of marginal tabulations of the 22 neighborhoods described above it became apparent that both volume of operations and level of noise should be combined. The class intervals for this combination shown below are based on two principal considerations. First, intervals to provide a reasonable distribution of interviews were selected. Second, gross differences in disturbance and annoyance responses were examined for each neighborhood so that extreme differences among neighborhoods would not be combined into a single class. Each class represents a fairly homogeneous group of interviews.

The five classes of volume were divided into two groups:

- a) Heavy volume - three or more per hour (groups D and E)
- b) Light volume - less than three planes per hour (groups A to C).

Peak SPL was divided into four groups:

- a) 101 db or more (classes A and B)
- b) 91 to 100 (classes C and D)
- c) 81 to 90 (classes E and F)
- d) 80 or less (classes G and H)

Table 4 shows the distribution of neighborhoods by air base area for these combinations of volume and peak SPL.

TABLE 4
VOLUME OF DAYTIME OPERATIONS AND
PEAK SPL BY AIR BASE AND NEIGHBORHOOD

No. of Planes per Hour (Day)	Peak SPL	Neighborhoods by Air Base		
		SAC	West Coast ADC	East Coast ADC
≥ 3	101+ db	1	-	-
< 3	101+	4	-	-
≥ 3	91 - 100	2	1-5	-
< 3	91 - 100	5-6	-	-
≥ 3	81 - 90	1	7, 8, 9, 0	1-2
< 3	81 - 90	7	-	4
≥ 3	80 or less	-	6	3, 5
< 3	80 or less	-	-	-

As table 4 indicates, the three air bases were very dissimilar in types of aircraft noise exposure. The SAC base had the most intense situations and the best range of noise exposures. It had representation in the first six acoustic groups. The West Coast ADC base had no neighborhoods in the most intense stimulus class and no areas in the light air traffic categories (less than three planes per hour. The East Coast ADC base had no neighborhoods in the top two

peak SPL groups and only one neighborhood in a light air traffic classification. This wide disparity of stimulus situations makes overall air base area comparisons difficult. It also creates sizable distortions in analysis of psychological responses by the eight acoustical categories shown in table 4. As will be seen in later analyses, to the extent that there are sizable differences among air bases with respect to public relations programs and neighborhood attitudes about the importance of the local air base and its considerateness, etc., the inclusion or exclusion of neighborhoods from a given air base in a particular stimulus category influences the overall average response in that category. The absence of ADC base data in many of these eight stimulus groups limited the use of these groups in the analysis of interview material.

3. Average "Duration of Peak" in Seconds for Aircraft Whose Maximum SPL Exceeds 80 db

Only three classes of data are available for this variable:

- a) Less than 3 seconds
- b) 3 to 6 seconds
- c) 7 or more seconds.

Table 5 shows the distribution of neighborhoods according to this factor. Unfortunately circumstances prevented any extensive use of this factor in the subsequent analysis. It is interesting to note, however, that neighborhood 3 at the SAC base and neighborhood 4 at the East Coast ADC base reported relatively high disturbance and annoyance reactions and also longer durations of peak. Of course other variables contribute to these differences.

4. Equivalent Continuous SPL (L_{eq})

Table 6 summarizes the estimates of this summary index by air base area and neighborhood. The five classes of data (A to E) are:

<u>Class</u>	<u>L_{eq} Levels</u>
A	Less than 56 db
B	56 - 60
C	61 - 64
D	65 - 70
E	71 - 76

The interval in class C is only 4 because there were three neighborhoods with an L_{eq} of 65, whose marginal tabulations indicated responses more like the data in class D than class C. In order to keep the data within a class as homogeneous as possible, the interval of class C was arbitrarily set at 4 db.

TABLE 5

AVERAGE DURATION OF PEAK SPL'S IN EXCESS
OF 80 DB DURING THE ENTIRE WEEK

<u>Air Base & Neighborhood</u>		
<u>SAC Air Base Neighborhood</u>	<u>No. of Seconds</u>	<u>Class</u>
1	4	B
2	6	B
3	11	C
4	6	B
5	8	C
6	7	C
7	7	C
<u>West Coast ADC Air Base Neighborhood</u>		
1	4	B
2	3	B
3	8	C
4	5	B
5	5	B
6	"	A
7	6	B
8	9	C
9	8	C
10	7	C
<u>East Coast ADC Air Base Neighborhood</u>		
1	6	B
2	5	B
3	2	A
4	7	C
5	7	A

* Negligible number

TABLE 6

EQUIVALENT CONTINUOUS SPL DURING THE
DAY BY AIR BASE AND NEIGHBORHOOD

<u>Air Base & Neighborhood</u>		
<u>SAC Air Base Neighborhood</u>	<u>No. in Db</u>	<u>Class</u>
1	75	E
2	69	D
3	65	C
4	68	D
5	63	C
6	63	C
7	59	B
<u>West Coast ADC Air Base Neighborhood</u>		
1	72	E
2	71	E
3	69	D
4	65	D
5	65	D
6	58	B
7	60	B
8	62	C
9	64	C
10	62	C
<u>East Coast ADC Air Base Neighborhood</u>		
1	66	D
2	61	C
3	56	B
4	54	A
5	50	A

Table 7 groups the same data by L_{eq} categories so that area and neighborhood comparisons are possible.

TABLE 7

AIR BASE & NEIGHBORHOODS BY L_{eq} LEVELS

<u>L_{eq} Levels</u>	<u>Total No. Intv.</u>	<u>SAC</u>		<u>West Coast ADC</u>		<u>East Coast ADC</u>	
		<u>Neigh.</u>	<u>No. Intv.</u>	<u>Neigh.</u>	<u>No. Intv.</u>	<u>Neigh.</u>	<u>No. Intv.</u>
< 56 db	318	-	-	-	-	4-5	318
56 - 60	585	7	104	6-7	250	3	231
61 - 64	671	3,5,6	308	8,9,0	204	2	159
65 - 70	497	2,4	213	3-5	200	1	84
71 - 76	257	1	107	1-2	150	-	-
Total	2328	-	732	-	804	-	792

As can be seen there are fewer blanks than in table 4 but the unequal number of interviews contributed by each air base to different L_{eq} categories still creates serious biases.

5. Average Number of Seconds per Hour during Which an SIL of 60 db or 75 db Is Exceeded

As indicated earlier, these particular SIL's were selected to represent the points on an SIL spectrum at which normal conversation in a raised voice at 3 feet would be interrupted. While these numbers have been standardized on disturbances of communications, they can also be used to rank other disturbances such as sleep, rest and relaxation, and vibrations. The data is grouped into the following 10 categories:

<u>Class</u>	<u>Average No. of Seconds</u>
A	< 3 seconds
B	3 - 9
C	10 - 19
D	20 - 29
E	30 - 39
F	40 - 49
G	50 - 59
H	60 - 79
I	80 - 99
J	100 or more

Table 8 lists the SIL numbers and classes by neighborhoods.

Since the use of ten SIL categories results in many zero categories and very few cases in other groups, only 5 combinations of classes were used in the analysis. Furthermore, since only a few neighborhoods experienced significant interference at SIL-75 db, the major analyses were based on SIL-60 db. Table 9 summarizes the groupings of neighborhoods by these combined SIL categories.

TABLE 8
AVERAGE NUMBER OF SECONDS PER HOUR DURING THE
DAY SPEECH INTERFERENCE LEVELS ARE EXCEEDED

<u>Air Base & Neighborhood</u>		<u>SIL 60</u>		<u>SIL 75</u>	
<u>SAC Air Base Neighborhood</u>	<u>No. Seconds</u>	<u>Class</u>	<u>No. Seconds</u>	<u>Class</u>	
1	81	I	23	D	
2	56	G	16	C	
3	42	F	9	B	
4	33	F	13	C	
5	26	D	7	B	
6	25	I	8	B	
7	12	C	1	A	
<u>West Coast</u>					
<u>ADC Air Base Neighborhood</u>					
1	63	H	11	C	
2	58	G	21	D	
3	77	H	11	C	
4	57	G	*	A	
5	51	G	3	B	
6	35	E	*	A	
7	29	D	2	A	
8	40	F	*	A	
9	45	F	2	A	
10	39	E	*	A	
<u>East Coast</u>					
<u>ADC Air Base Neighborhood</u>					
1	104	J	11	C	
2	42	F	.5	A	
3	23	D	*	A	
4	17	C	.6	A	
5	6	B	*	A	

* Negligible number

TABLE 9
AVERAGE NUMBER OF SECONDS PER HOUR DURING THE DAY SIL 60-DB IS EXCEEDED

<u>No. of Seconds</u>	<u>Total No. Intv.</u>	<u>Neighborhoods by Air Base</u>			
		<u>SAC</u>	<u>West Coast</u>	<u>East Coast</u>	
		<u>Neigh. No. Intv.</u>	<u>ADC Neigh. No. Intv.</u>	<u>ADC Neigh. No. Intv.</u>	
80+	191	1 107	- -	1 84	
50 - 79	461	2 111	1-5 350	- -	
40 - 49	424	3 105	8, 9 160	2 159	
20 - 39	830	4-6 305	6, 7, 0 294	3 231	
19 or less	422	7 104	- -	4-5 318	
Total	2328	- 732	- 804	- 792	

Table 10 summarizes the rank order of the 22 neighborhoods at the 3 air bases by three of the acoustic indexes. For all three air bases the rank order of different neighborhoods shifts according to the particular acoustic index used. The SIL-60 db index appears best correlated with disturbance and annoyance scales.

Due to unequal distribution among acoustic groupings of interviews at different air bases, an evaluation of reasons for the difference in correlations between different acoustical indexes and reports of disturbance and annoyance is extremely difficult. One possible hypothesis is that the L_{eq} index doesn't weigh frequently heard, low-peak SPL noises as much as the SIL-60 series. Further research, however, is necessary to explain these differences.

TABLE 10

RANK ORDER OF NEIGHBORHOODS UNDER
SELECTED ACOUSTICAL CRITERIA

Air Base	Peak SPL & Volume of Operations	SIL 60 db	L_{eq}
SAC	1	1	1
	4	2	2,4
	2	3	3,5,6
	5-6	4-6	7
	3	7	
Western ADC Base	7		
	1-5	1-5	1-2
	7,8,9,0	8,9	3-5
	6	6,7,0	6-7
Eastern ADC Base	1-2	1	1
	4	2	2
	3-5	3	3
		4-5	4-5

TABLE 11

REPORTS OF ACTIVITY DISTURBANCE AT
THREE AIR BASE AREAS

Scale Type	Air Base Areas			All Respondents N=2329
	SAC N=712	West Coast ADC N=804	East Coast ADC N=792	
5 - Rest	21%	14%	22%	19%
4 - Sleeping	16	12	17	15
3 - Talking	21	22	19	20
2 - Listening	19	24	17	20
1 - Vibrations	12	18	17	16
0 - None	11	10	8	10

SECTION III

ACTIVITY DISTURBANCE AND ANNOYANCE

The major response variables of activity disturbance and annoyance are analyzed in this chapter. Although a few individual questions included in the survey are evaluated below, major emphasis is placed on the summary scales and indexes developed from combinations of answers to different questions. Detailed explanations of these scales and indexes are given in Appendix D.

Tables 4, 7, and 9 indicated that residents interviewed at the three air base areas did not live in comparably intense noise environments. Consequently, any valid comparisons of activity disturbance or annoyance should only group respondent reports from almost equal noise situations. The plan of analysis recognizes this requirement. Respondents from all three air base areas living under comparable acoustic conditions are combined into homogeneous analytical classes. Then, the residents from each of the three air bases are analyzed separately for each of the different acoustic categories. In this way, the air base variability as well as the variability attributable to acoustic differences may be examined.

A. Overall Air Base Differences

It may be interesting to examine some of the gross air base area differences. Table 11 compares the reports of activity disturbance by the total samples of respondents from each of the three air bases, without controlling for any differences in noise exposures or differences in sociopsychological attitudes. As shown later, these uncontrolled variables account for much of the variation in respondent reports of disturbance. However, just an overall view is presented now.

All respondents were asked a series of questions about the frequency of airplanes disturbing sleep, rest and relaxation, speech, listening to radio or TV, or creating vibrations in the house. Reports of any amount of disturbance in these five activities are combined into a six-point Guttman scale, described in detail in Appendix D of this report. In general, the larger the number, the more intense the attitude of the variable. In table 11, "0" represents none of the five activities being disturbed, while "5" represents all five as being disturbed. Each number also represents a cumulative hierarchy of reported activity disturbances. Thus, 2 represents both vibration and listening disturbances, scale type 3 represents vibrations, listening, and talking disturbances, etc.

As shown in table 11, respondents at the SAC air base and East Coast ADC air base report about the same overall intensities of disturbance, but reports at the West Coast ADC air base are somewhat lower. The biggest differences are in sleep and rest interference. The West Coast ADC base reports only 26 percent claiming sleep disturbance, while the other two bases report almost 40 percent. A glance at tables 3 and 4 does not provide a ready explanation in terms of differences in the acoustic variables. In terms of night exposures, the volume of airplane activity is greater at the West Coast ADC base and almost as great during the evening hours. The peak noise levels are definitely greater at the West Coast ADC base than at the East Coast base. An explanation must be sought among the sociopsychological variables. But first let us examine the other response variable, intensity of annoyance. Table 11 reported the activities disrupted by airplane noise, while table 12 summarizes the way residents feel about these disruptions. The full scale of annoyance includes 14 categories. To simplify analysis, however, only five summary groups are presented in table 12. As before, these groups are arranged in a hierarchy of responses. Thus, all persons in Group A also generally report the annoyances of Group B, all persons in Group C also report annoyances of Group D, etc.

Again respondents at the West Coast ADC base are considerably less annoyed than the other two air bases. Likewise, it is significant that only one out of five persons are more than a little annoyed with any disturbance.

A good part of the reports of lower disturbance at the western ADC base can be explained by differences in local feelings concerning fear of crashes and the importance and considerateness of the local air base. Respondents at

the western ADC base generally report less fear and feel the base is more important to local welfare. They also maintain that the pilots and base officials are more considerate of resident feelings and make a greater effort to minimize disturbances. As will be shown later, these positive attitudes generally reduce reports of disturbances and annoyance. Tables 13 to 15 document the above generalizations concerning the attitudes at the western ADC base.

TABLE 12
SCALE OF ANNOYANCE BY DISTURBED
ACTIVITIES AT THREE AIR BASE AREAS

Scale Types	Air Base Area			All Respondents N=2374
	SAC N=732	West Coast ADC N=804	East Coast ADC N=792	
A. More than a little annoyance with sleep or rest disturbance. . .	15%	3%	11%	10%
B. More than a little annoyance with listen- ing, talking or vibra- tions	9	9	16	11
C. A little annoyance with sleep or rest distur- bance.	29	19	24	24
D. A little annoyance with listening, talking or vibrations.	30	46	34	37
E. No annoyance with any specific activities . .	17	23	15	18

TABLE 13
REPORTS OF RELATIVE FEAR OF CRASHES
AT THREE AIR BASE AREAS

Scale Type	Air Base Areas			All Respondents N=2328
	SAC N=732	West Coast ADC N=804	East Coast ADC N=792	
3 - Most fear	25%	3%	5%	11%
2 - Moderate fear	15	12	21	16
1 - Little fear	46	61	58	55
0 - No fear	14	24	16	18

TABLE 14
RESPONDENT FEELINGS OF BASE IMPORTANCE
AT THREE AIR BASE AREAS

Index of Feelings	Air Base Areas			All Respondents N=2328
	SAC N=732	West Coast ADC N=804	East Coast ADC N=792	
3 - Most important . . .	56%	21%	3%	26%
2 - Moderately important .	40	54	34	43
1 - Least important. . .	4	25	63	31

TABLE 15
RESPONDENT FEELINGS OF BASE CONSIDERATENESS
AT THREE AIR BASE AREAS

Scale of Feelings	Air Base Areas			All Respondents N=2328
	SAC N=732	West Coast ADC N=804	East Coast ADC N=792	
3 - Most considerate . . .	22%	29%	20%	23%
2 - Moderately considerate	41	45	48	45
1 - Least considerate . .	37	26	32	32

B. Volume of Airplane Operations and Peak SPL

The first of the detailed series of analyses is in terms of the eight stimulus groups in table 4. Volume of operations and level of noise (peak SPL) are two very important physical variables. The greater the volume and the higher the peak SPL, the greater the disturbance and annoyance. This particular acoustic index may prove a valuable yardstick of aircraft noise exposure. In these field tests, however, the overall relationships of disturbance and annoyance are generally obscured by the unequal distribution of interviews among the different volume-peak SPL classes at the three air bases. There are no western ADC interviews in any low volume classes and a disproportionate number in class D1. There are no eastern ADC responses in class B1 and only a few in class D1. These distortions limit the reliability of the average percentages presented.

1. Scale 4 - Activity Disturbances

As table 16 shows, 73 percent of all persons in a neighborhood with three or more planes an hour propagating a peak SPL of 101 db or more report disturbance by four or five activities. In contrast, only 28 percent of all residents reported as much disturbance when they had less than three planes per hour creating a peak SPL of only 81 to 90 db.

TABLE 16
NUMBER OF ACTIVITIES DISTURBED BY
VOLUME OF AIRCRAFT AND PEAK SPL

Class	Number Planes Per Hour	Peak SPL	Number of Interviews	Types of Scale 4- Disturbance		
				0	1-3	4-5
A1	≥3	101+ db	107	2%	25%	73%
A2	<3	101+	102	2	57	41
B1	≥3	91-100	441	7	54	39
B2	<3	91-100	203	22	65	13
C1	≥3	81-90	672	8	60	32
C2	<3	81-90	288	17	55	28
D1	≥3	80 or less	495	9	50	33
Average volume ≥3*			1735	7%	49%	44%
<3			593	14	59	27
Average peak SPL 101 db			209	2%	41%	57%
Average peak SPL 91-100			654	15	59	26
Average peak SPL 81-90			960	13	57	30
Average peak SPL 80 or less			495	9	50	33

* Unweighted averages used since N's are unequal

As table 16 indicates, twice as many residents with less than three planes per hour report no disturbances and, conversely, one-and-one-half times as many residents with 3 or more planes per hour report 4 or 5 activities disturbed. The influence of volume of aircraft on activity disturbance is clearly demonstrated.

The comparisons of average peak SPL's are obscured by the unusually low disturbance reported in class B2. If the peak SPL's with the same volume of activity are compared, then the importance of peak SPL becomes clear. For example, annoyance in class A1 is greater than B1, and B1 is greater than C1, but C1 = D1. For the lower volume (less than 3 per hour) classes, the overall relationships are less consistent. Annoyance in class A2 is greater than B2 and C2, but class B2 is less than C2.

This inconsistency is primarily due to the low disturbance reported at only two neighborhoods at the SAC base and at the few neighborhoods exposed to low volume air activity at the two other bases. As table 17 shows, for the other two bases and for all other comparisons at the SAC base, disturbance is directly related to peak SPL and volume of air activity. For the neighborhoods at the SAC base, disturbance in A1 is greater than B1 which is greater than C1. For the western ADC base, there is no A1, but B1 is greater than C1 which is greater

than D1. For the eastern ADC base, there are no interviews under A1 or B1 but C1 is greater than D1.

For comparisons of the low volume air activity, the western ADC base had no such neighborhoods included in the study, and the eastern ADC base had only one such neighborhood in class C2. Only the SAC base included neighborhoods under low volume air activity in peak SPL classes A, B, and C and only class B reported the unexpectedly low disturbance rates. Wherever valid comparisons are possible, the reported disturbance at the western ADC neighborhoods is always less than the disturbance reported by the other air bases.

TABLE 17
NUMBER OF ACTIVITIES DISTURBED BY VOLUME OF
AIRCRAFT, PEAK SPL, AND AIR BASE AREAS

Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Interviews	Types of Scale 4- Disturbance		
					0	1-3	4-5
A1	≥3	101+ db	SAC	107	2%	25%	72%
A2	<3	101+ db	SAC	102	2	57	41
B1	≥3	91-100	SAC	111	2	44	54
			West ADC	350	8	57	35
B2	<3	91-100	SAC	203	22	65	13
C1	≥3	81-90	SAC	105	4	62	34
			West ADC	124	11	67	22
			East ADC	243	6	48	46
C2	<3	81-90	SAC	184	26	48	26
			East ADC	184	12	59	29
D1	≥3	80 or less	West ADC	130	13	71	16
			East ADC	365	8	53	39

2. Scale 5 - Frequency of Activity Disturbances

The above discussion concerned the relationships of volume and peak SPL and the number of activities ever disturbed. The following discussion will relate the same physical stimulus categories to the frequency with which these same activities are disturbed. Table 18 summarizes these relationships.

TABLE 18
FREQUENCY OF ACTIVITY DISTURBANCE
BY VOLUME OF AIRCRAFT AND PEAK SPL

Class	Number Planes Per Hour	Peak SPL	Number of Interviews	Types of Scale 5-Frequency of Disturbance				
				0 None	1-2 Few Occas.	3-5 Many Occas.	6-7 Few Freq.	8-10 Many Freq.
A1	≥3	101+ db	107	2%	8%	21%	21%	48%
A2	<3	101+	102	2	24	44	16	14
B1	≥3	91-100	461	7	23	38	17	15
B2	<3	91-100	203	22	41	28	7	2
C1	≥3	81-90	672	8	29	37	13	13
C2	<3	81-90	288	17	34	33	9	7
D1	≥3	80 or less	495	9	34	34	11	12
Average Volume								
	≥3		1735	7%	23%	32%	16%	22%
	<3		593	14	34	35	10	7
Average Peak SPL								
		101 db	209	2%	16%	32%	19%	11%
		91-100	664	14	32	33	12	9
		81-90	960	13	31	35	11	10
		80 or less	495	9	34	34	11	12

The problems involved in evaluating table 16 are again reflected in table 18. Frequency of activity interference is directly related to the volume of aircraft activity with more than twice as many residents reporting frequent disturbances when they actually experienced 3 or more flights per hour. The extent of disturbance by peak SPL is again distorted by the unusually low disturbance in class B2. Table 19 shows the comparisons by air base area.

TABLE 19
FREQUENCY OF ACTIVITY DISTURBANCE BY VOLUME
OF AIRCRAFT, PEAK SPL, AND AIR BASE AREAS

Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Inter- views	Types of Scale 5 - Frequency of Disturbance				
					0	1-2	3-5	6-7	8-10
					None	Few	Many	Few	Many
A1	23	101+ db	SAC	107	25	8%	21%	21%	46%
A2	<3	101+	SA	107	2	24	44	16	14
B1	23	91-100	SAC	111	2	12	39	21	26
			West ADC	350	8	27	38	26	11
B2	<3	91-100	SAC	203	22	41	28	7	2
C1	23	81-90	SAC	105	4	23	40	17	16
			West ADC	324	11	37	37	9	6
			East ADC	243	6	24	35	16	19
C2	<3	81-90	SAC	104	26	32	31	8	3
			East ADC	184	11	35	34	10	10
D1	23	80 or less	West ADC	130	13	44	33	3	7
			East ADC	165	8	30	34	14	14

In all cases where comparisons are possible at the SAC base and at the eastern ADC base, respondents experiencing heavier volume of air traffic report more frequent disturbances. In most comparisons of disturbance by peak SPL, the higher the peak SPL, the greater the disturbance. In SAC neighborhoods, A1 is greater than B1 which is greater than C1. Similarly in western ADC areas, B1 is greater than C1 which is greater than D1. Finally, in eastern ADC neighborhoods C1 respondents tend to be somewhat more disturbed than D1 respondents.

Again respondents at western ADC areas are always the least disturbed. Consequently, the omission of higher disturbance eastern ADC neighborhoods from B1 and their inclusion in C1 reduces the overall difference between these two groups. Likewise, comparisons of C1 and D1 are distorted by the unequal numbers of interviews combined from the less disturbed western ADC base. Interviews from western ADC neighborhoods constitute almost 50 percent of all cases in C1, while in D1 they constitute only about 25 percent of all cases. The net effect of this inequality is to reduce the overall disturbance in C1 and to increase it in D1, reducing the difference in response between the two groups. Unweighted averages would have minimized this disproportionality but, due to the complete omission of ADC cases from some classes, this technique could not be used.

In the case of relative disturbance among neighborhoods experiencing lower volume of air traffic, the patterns are similar to those described in table 17. In the SAC comparisons, A2 reports more disturbance than B2, but B2 is not much different from C2. With higher disturbance eastern ADC areas added to C2, the differences between B2 and C2 are further reduced.

3. Scale 6 - Annoyance by Disturbed Activities

The comparison of feelings of annoyance by volume of air activity and peak SPL also follows a pattern similar to the one discussed above. Annoyance is directly related to volume, with greater annoyance associated with greater volume. Differences in annoyance by peak SPL can be explained largely by the combinations of data from the three air base areas. Table 20 summarizes annoyance by peak noise levels, and table 21 presents the more detailed air base subtotals.

TABLE 20
REPORTED ANNOYANCE BY VOLUME
OF AIRCRAFT AND PEAK SPL.

Class	Number Planes Per Hour	Peak SPL	Number of Interviews	Types of Scale 6 - Annoyance				
				0	1-3	4-7	8-9	10-12
				None	Few, A Little	Many Little	Few Much	Many Much
A1	≥3	101+ db	107	6%	16%	20%	18%	40%
A2	<3	101+	102	14	32	36	3	15
B1	≥3	91-100	461	17	36	24	9	14
B2	<3	91-100	203	27	41	26	4	2
C1	≥3	81-90	672	17	39	22	9	13
C2	<3	81-90	288	21	40	23	7	9
D1	≥3	80 or less	495	19	36	23	8	14
Average Volume	≥3		1735	15%	32%	22%	11%	20%
	<3		593	21	38	28	5	8
Average Peak SPL		101+ db	209	10%	24%	28%	10%	25%
		91-100	664	22	38	25	7	8
		81-90	960	19	40	22	8	11
		80 or less	495	19	36	23	8	14

In every instance, annoyance is greater when volume is greater. For identical air bases, annoyance is generally greater when the SPL is greater. In the case of lower volume air activity at the SAC base, however, B2 just about equals C2. But, as in the case of frequency of disturbance, the absence of any B1 neighborhoods at the eastern ADC base and the disproportionality of western ADC interviews in C1 and D1 obscures the real differences among these classes in table 20.

TABLE 21
REPORTED ANNOYANCE BY VOLUME OF AIRCRAFT,
PEAK SPL, AND AIR BASE AREAS

Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Inter- views	Types of Scale 6 - Annoyance				
					0	1-3	4-7	8-9	10-12
					None	Few, A Little	Many Little	Few Much	Many Much
A1	≥3	101+ db	SAC	107	6%	16%	20%	18%	40%
A2	<3	101+	SAC	102	14	32	36	3	15
B1	≥3	91-100	SAC	111	10	19	33	14	24
			West ADC	350	20	41	21	8	10
B2	<3	91-100	SAC	203	27	41	26	4	2
C1	≥3	81-90	SAC	105	12	27	36	12	13
			West ADC	324	24	51	17	4	4
			East ADC	243	11	30	23	14	22
C2	<3	81-90	SAC	104	26	37	27	7	1
			East ADC	184	17	43	22	6	12
D1	≥3	80 or less	West ADC	130	27	46	19	5	1
			East ADC	165	16	33	25	9	17

4. Scale 7 - Combination of Activity Disturbance and Annoyance

A much more sensitive indicator of disturbance and annoyance is revealed when Scales 4 and 6 are combined. Table 22 which presents the over-all comparisons shows that, in the most intense aircraft situation, more than half (54 percent) report much bother with many activity disturbances. The same distortions in peak SPL comparisons, however, persist in these tables. This can be seen in table 23, which presents the data by air base area.

TABLE 22
ACTIVITY DISTURBANCE AND ANNOYANCE
BY VOLUME OF AIRCRAFT AND PEAK SPL

Class	Number Planes Per Hour	Peak SPL	Number of Inter- views	Types of Scale 7 - Disturbance and Annoyance					
				Few Activities		Moderate Activities		Many Activities	
				A Little Annoy	Much Annoy	A Little Annoy	Much Annoy	A Little Annoy	Much Annoy
A1	≥3	101+ db	107	4%	1%	10%	12%	10%	54%
A2	<3	101+	102	8	5	24	22	22	19
B1	≥3	91-100	441	14	4	27	16	23	15
B2	<3	91-100	203	21	18	24	24	9	4
C1	≥3	81-90	672	17	7	27	16	15	18
C2	<3	81-90	288	29	10	16	17	15	13
D1	≥3	80 or less	495	21	7	21	18	14	19
Average Volume			≥3	1735	14%	9%	21%	15%	27%
			<3	593	19	11	21	22	15
Average Peak SPL			101+ db	209	6%	3%	17%	17%	20%
			91-100	664	18	11	26	19	16
			81-90	950	23	8	22	16	15
			80 or less	495	21	7	21	18	14

In every case, annoyance is greater when volume is greater. In SAC neighborhoods, annoyance varies directly as peak SPL increases when volume of aircraft is high. The same direct relations are found at the western ADC base, but are not found at the eastern ADC base. Annoyance at the D1 type noise exposure is greater than expected and almost equal to the C1 group. Western annoyance is always the lowest.

TABLE 23
ACTIVITY DISTURBANCE AND ANNOYANCE BY VOLUME
OF AIRCRAFT, PEAK SPL, AND AIR BASE AREAS

Class	Number Planes Per Hour	Peak SPL	Air Base Area	No. of Inter- views	Types of Scale 7 - Disturbance and Annoyance					
					Few Activities		Moderate Activities		Many Activities	
					A Little Annoy	Much Annoy	A Little Annoy	Much Annoy	A Little Annoy	Much Annoy
A1	≥3	101+ db	SAC	107	4%	1%	10%	12%	10%	54%
A2	<3	101+	SAC	102	8	5	24	22	22	17
B1	≥3	91-100	SAC	111	5	2	14	25	25	29
			West ADC	350	16	4	31	14	22	13
B2	<3	91-100	SAC	203	21	18	24	24	9	4
C1	≥3	81-90	SAC	105	9	9	18	30	14	20
			West ADC	324	23	5	39	11	13	9
			East ADC	243	12	8	16	18	17	29
C2	<3	81-90	SAC	104	35	12	10	17	18	8
			East ADC	184	25	9	20	17	13	16
D1	≥3	80 or less	West ADC	130	38	6	25	15	10	6
			East ADC	365	15	8	20	18	16	23

5. Scale 2 - Fear of Air Crashes

As table 24 shows, over two-thirds of all persons living under the most intense noise exposure (A1) report a great amount of fear. The next highest fear response is reported among residents living under the same high peak SPL but lower volume of exposure. The other groups appear to have about the same amount of fear. As shown in table 25, however, this similarity of response is in part due to offsetting air base area differences.

TABLE 24
FEAR OF AIR CRASHES BY VOLUME
OF AIRCRAFT AND PEAK SPL

Class	Number Planes Per Hour	Peak SPL	Number of Interviews	Types of Scale 2 - Fear			Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Interviews	Types of Scale 2 - Fear		
				None	Moderate	Much						None	Moderate	Much
A1	23	101+ db	107	9%	24%	67%	A1	23	101+ db	SAC	107	9%	24%	67%
A2	<3	101+	102	18	39	43	A2	<3	101+	SAC	102	18	39	43
B1	23	91-100	461	23	51	26	B1	23	91-100	SAC	111	12	40	48
B2	<3	91-100	203	17	59	24	B2	<3	91-100	West ADC	150	27	54	19
C1	23	81-90	672	19	50	31	C1	23	81-90	SAC	105	11	42	47
C2	<3	81-90	288	16	63	21				West ADC	124	25	65	10
D1	23	80 or less	495	16	61	23				East ADC	243	13	56	31
							C2	<3	81-90	SAC	104	14	62	24
										East ADC	184	17	64	19
							D1	23	80 or less	West ADC	130	12	71	17
										East ADC	365	16	61	23

In every comparison for identical air base areas, the greater the volume of planes, the greater the fear. In 4 out of 5 comparisons of high volume activity, fear is also greater when peak SPL is greater. In the comparison of SAC base neighborhoods, classes B1 and C1 are about equal. It is significant to note that SAC areas with B2 noise conditions, which consistently have reported low disturbance and annoyance, also have very low fear responses. In fact, there is less fear reported for SAC B2 residents than for SAC C2 residents. The lower fear reports among western ADC respondents and the disproportionality of air base interviews continues to explain many of the inconsistencies in the overall comparisons of table 24.

6. Reported Feelings of Base Importance

Table 26 indicates a direct relationship between peak level and reported feelings of base importance and an inverse relationship between volume of activity and respondent feelings of base importance. At the highest peak level of 101+ db, 57 percent of all residents feel the local base is most important to their welfare. At the lowest peak level of only 80 db or less, only 8 percent feel their base is most important. Apparently, many persons most affected by the noise disturbance have already been convinced that the base is very important. As we shall see, this tends to moderate feelings of disturbance and annoyance. Conversely, however, with the exception of the highest peak SPL, residents exposed to greater volume of aircraft appear to feel the base is less important than residents living under lower volume of air traffic. This apparent correlation, however, as shown in table 27 is largely spurious.

TABLE 26
INDEX OF REPORTED BASE IMPORTANCE
BY VOLUME OF AIRCRAFT AND PEAK SPL

Class	Number Planes Per Hour	Peak SPL	Number of Interviews	Index II Groups-Base Importance		
				0-1 Little	2-3 Moderate	4-5 Most
A1	≥ 3	101+ db	107	5%	33%	62%
A2	< 3	101+	102	5	44	51
B1	≥ 3	91-100	461	17	50	33
B2	< 3	91-100	201	4	42	54
C1	≥ 3	81-90	672	36	44	18
C2	< 3	81-90	288	41	38	21
D1	≥ 3	80 or less	495	54	38	8
Average						
Volume ≥ 3				20%	41%	30%
< 3				17	41	42
Average Peak						
SPL 101+ db				5%	38%	57%
91-100				10	46	44
81-90				40	41	19
80 or less				54	38	8

Table 27, which includes the air base area detail, shows that the above generalizations are not fully validated by the inter air base area comparisons. In the case of SAC base neighborhoods, feelings of base importance reported by class A1 are greater than B1, but class C1 about equals class A1. Western ADC respondents' reports indicate that B1 is greater than C1 but D1 about equals C1. In the third air base area, residents in C1 neighborhoods feel the same as residents in D1 areas. The overall tendency bears out the direct relationship between feelings of base importance and peak SPL.

TABLE 27
INDEX OF REPORTED BASE IMPORTANCE BY VOLUME
OF AIRCRAFT, PEAK SPL, AND AIR BASE AREAS

Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Interviews	Index II Groups- Base Importance		
					0-1 Little	2-3 Moderate	4-5 Most
A1	≥ 3	101+ db	SAC	107	5%	33%	62%
A2	< 3	101+	SAC	102	5	44	51
B1	≥ 3	91-100	SAC	111	3	41	56
			West ADC	350	21	54	25
B2	< 3	91-100	SAC	203	4	42	54
C1	≥ 3	81-90	SAC	104	6	32	62
			West ADC	324	28	55	17
			East ADC	243	64	33	3
C2	< 3	81-90	SAC	104	6	41	53
			East ADC	184	61	37	2
D1	≥ 3	80 or less	West ADC	130	26	53	21
			East ADC	365	64	32	4

The reported inverse relationship between aircraft volume and feelings of base importance are largely spurious due to the previously mentioned absence of western ADC interviews in lower volume areas and the disproportionality of cases in the different peak SPL classes. In the case of SAC neighborhoods, representing the bulk of the lower volume interviews, class A1 is greater than A2, B1 is greater than B2 (not significantly), and C1 is greater than C2. Likewise, the eastern ADC area C1 equals responses from C2. These more detailed comparisons are opposite from the overall relationships shown in table 26.

The same pattern of relationships holds true when scale 10, Base Importance, is used. The scale consists of only 3 items, while the index cited in tables 26 and 27 is composed of 5 items. Tables 28 and 29 present a summary of scale 10. Since the index appears to separate a wider range of responses, it is used in preference to the scale in more detailed analyses.

TABLE 26
SCALE OF FEELINGS OF BASE IMPORTANCE
BY VOLUME OF AIRCRAFT AND PEAK SPL

Class	Number Planes Per Hour	Peak SPL	Number of Interviews	Types of Scale 10- Base Importance		
				0 Little	1 Moderate	2 Most
A1	≥3	101+ db	107	6%	15%	79%
A2	<3	101+	102	4	25	71
B1	≥3	91-100	461	6	25	69
B2	<3	91-100	203	4	25	71
C1	≥3	81-90	672	14	40	46
C2	<3	81-90	288	12	70	18
D1	≥3	80 or less	495	24	45	31

TABLE 29
SCALE OF FEELINGS OF BASE IMPORTANCE BY VOLUME
OF AIRCRAFT, PEAK SPL, AND AIR BASE AREAS

Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Interviews	Types of Scale 10- Base Importance		
					0 Little	1 Moderate	2 Most
A1	≥3	101+ db	SAC	107	6%	15%	79%
A2	<3	101+	SAC	102	4	25	71
B1	≥3	91-100	SAC	111	5	18	77
			West ADC	350	7	28	65
B2	<3	91-100	SAC	203	2	25	73
C1	≥3	81-90	SAC	105	4	17	79
			West ADC	324	10	38	52
			East ADC	243	24	52	24
C2	<3	81-90	SAC	104	5	27	68
			East ADC	184	16	63	21
D1	≥3	80 or less	West ADC	130	3	32	65
			East ADC	365	32	49	19

7. Base Considerateness

There are three measures of the reported efforts of air base personnel to minimize aircraft disturbance. The first is an overall index of reported local air base considerateness; the second is a scale of the considerateness of the Air Force in general (not specifically the local air base); and the third is a scale of local pilot considerateness available only for the ADC bases.

As shown in tables 30 and 31, the index of reported local air base considerateness, there is no clear relationship between reported feelings of base considerateness and volume of air traffic and peak SPL's. As will be seen later, however, the relationships of these feelings of base importance are more related to reports of annoyance and complaint potential.

TABLE 30
INDEX OF FEELINGS OF AIR BASE CONSIDERATENESS
BY VOLUME OF AIRCRAFT AND PEAK SPL

Class	Number Planes Per Hour	Peak SPL	Interviews	Index 9 Groups- Base Considerateness		
				1-2 Least	3-4 Moderate	5 Most
A1	≥3	101+ db	107	43%	31%	26%
A2	<3	101+	102	32	40	28
B1	≥3	91-100	461	26	43	31
B2	<3	91-100	203	43	44	13
C1	≥3	81-90	672	28	51	21
C2	<3	81-90	288	26	51	23
D1	≥3	80 or less	495	32	42	26

TABLE 31
INDEX OF REPORTED FEELINGS OF AIR BASE CONSIDERATENESS
BY VOLUME OF AIRCRAFT, PEAK SPL, AND AIR BASE AREAS

Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Interviews	Index 9 Groups- Base Considerateness		
					1-2 Least	3-4 Moderate	5 Most
A1	≥3	101+ db	SAC	107	43%	31%	26%
A2	<3	101+	SAC	102	32	40	28
B1	≥3	91-100	SAC	111	32	40	28
			West ADC	350	24	44	32
B2	<3	91-100	SAC	203	43	44	13
C1	≥3	81-90	SAC	105	21	48	31
			West ADC	324	31	48	21
			East ADC	243	28	55	17
C2	<3	81-90	SAC	104	39	43	18
			East ADC	184	29	49	22
D1	≥3	80 or less	West ADC	130	12	44	44
			East ADC	365	37	42	21

The second measure, scale 14, AF Image of Considerateness, also reflects contradictory relationships. In general, however, the areas with higher volume and peak SPL's appear to feel the Air Force is more considerate. This positive correlation parallels the findings on base importance and tends to minimize disturbance and annoyance. Table 32 summarizes the overall Air Force image data. The highest amount of considerateness is reported in B2 which also has unexpectedly low reports of disturbance and annoyance. Table 33 presents the air base area detail which casts serious doubts as to the reliability of the overall relationships.

TABLE 32

SCALE OF AIR FORCE CONSIDERATENESS
BY VOLUME OF AIRCRAFT AND PEAK SPL

Class	Number Planes Per Hour	Peak SPL	Number of Interviews	Types of Scale 14- Air Force Image			Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Interviews	Types of Scale 14- Air Force Image		
				0-1	2-3	4-5						0-1	2-3	4-5
				Least	Moderate	Most						Least	Moderate	Most
A1	≥3	101+ db	107	8%	37%	55%	A1	≥3	101+ db	SAC	107	8%	37%	55%
A2	<3	101+	102	11	32	57	A2	<3	101+	SAC	102	11	32	57
B1	≥3	91-100	461	35	36	29	B1	≥3	91-100	SAC	111	6	26	68
B2	<3	91-100	203	10	30	60	B2	<3	91-100	West ADC	350	43	39	18
C1	≥3	81-90	672	44	37	19	C1	≥3	81-90	SAC	203	10	30	60
C2	<3	81-90	288	34	35	31	C1	≥3	81-90	West ADC	105	6	22	72
D1	≥3	80 or less	495	49	44	7	C2	<3	81-90	East ADC	324	49	41	10
											243	56	37	7
							C2	<3	81-90	SAC	104	6	26	68
										East ADC	184	49	42	9
							D1	≥3	80 or less	West ADC	130	44	45	11
										East ADC	365	51	43	6

The wide variations in feelings among air base areas should be recognized. The SAC base reports the most favorable responses, the western ADC base reports the next most favorable attitudes, while the eastern ADC base reports the least favorable feelings of Air Force considerateness.

At the SAC areas, the most favorable attitudes are expressed by residents in the least intense noise environments, i. e., C1 reports greater considerateness than B1 or A1. At the western ADC base, however, B1 is slightly greater than C1, while at the eastern ADC base, the opposite is true—D1 is slightly higher than C1. All of these differences, however, are small and might be due to chance variations.

Variations in feelings of considerateness by volume of aircraft are also contradictory and inconclusive. At the SAC areas, A1 and A2 are about equal, while B1 and C1 are greater than B2 and C2. At the eastern ADC base, however, C2 reports somewhat greater considerateness than class C1.

Index 8, Pilot Considerateness, also reflects little relationship between respondent feelings and volume or level of aircraft noise. The data available for ADC bases only are shown in table 34.

TABLE 34

INDEX OF PILOT CONSIDERATENESS BY VOLUME OF
AIRCRAFT, PEAK SPL, AND ADC AIR BASE AREAS

Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Interviews	Index 8 Groups - Pilot Considerateness		
					0	1-2	3-4
B1	≥3	91-100 db	West ADC	350	14%	43%	43%
C1	≥3	81-90	West ADC	324	12	49	39
			East ADC	243	20	49	31
C2	<3	81-90	East ADC	184	18	55	27
D1	≥3	80 or less	West ADC	130	12	44	44
			East ADC	165	16	51	31

8. Scale 1 - Overall Satisfaction with Neighborhood

Persons living in neighborhoods exposed to a heavy volume of air traffic and persons living under high peak SPL's appear to be less satisfied with overall living conditions in their areas. Table 35 summarizes these findings and table 36 presents the air base area comparisons.

TABLE 35

SCALE OF OVERALL SATISFACTION WITH NEIGHBORHOOD
BY VOLUME OF AIRCRAFT AND PEAK SPL

Class	Number Planes Per Hour	Peak SPL	Number of Interviews	Types of Scale 1 - Overall Satisfaction					
				0-1	2-3	4-6	7-8	9-10	Total
A1	≥3	101+ db	107	0%	15%	38%	53%	37%	10%
A2	<3	101+	102	0	3	23	26	45	29
B1	≥3	91-100	461	1	4	38	43	42	15
B2	<3	91-100	203	0	2	35	37	40	23
C1	≥3	81-90	672	0	4	30	34	44	22
C2	<3	81-90	288	2	7	31	40	41	19
D1	≥3	80 or less	495	0	1	29	32	42	26
Average									
Volume	≥3		1735	0%	7%	34%	41%	41%	18%
	<3		593	0	4	30	34	42	24
Average Peak SPL	101+ db		209	0%	9%	30%	39%	41%	20%
	91-100		664	1	3	36	40	41	19
	81-90		960	1	6	30	37	43	20
	80 or less		495	0	3	29	32	42	26

TABLE 36

SCALE OF OVERALL SATISFACTION WITH NEIGHBORHOOD BY
VOLUME OF AIRCRAFT, PEAK SPL, AND AIR BASE AREA

Class	Number Planes Per Hour	Peak SPL	Air Base Area	Number of Interviews	Types of Scale 1 - Overall Satisfaction		
					0-6	7-8	9-X
A1	≥3	101+ db	SAC	107	53%	37%	10%
A2	<3	101+	SAC	102	26	45	29
B1	≥3	91-100	SAC	111	43	41	16
			West ADC	350	45	41	14
B2	<3	91-100	SAC	203	37	40	23
C1	≥3	81-90	SAC	105	56	37	7
			West ADC	324	23	47	30
			East ADC	243	39	43	18
C2	<3	81-90	SAC	104	34	52	14
			East ADC	184	44	35	21
D1	≥3	80 or less	West ADC	130	32	45	23
			East ADC	365	33	41	26

Scale types 0 to 1 represent all persons satisfied with none or only one of the ten residential conditions questioned. Scale types 7 to 8 include those satisfied with the "noise" and "danger" aspects of their neighborhoods. If an independent non-aircraft scale of satisfaction is desired, the cumulative total of scale types 0 to 6 is the appropriate measure. Table 35 indicates that 53 percent of all residents exposed to the most intense noise environment were satisfied only with as many as 6 of the 10 residential conditions. In contrast, only 32 percent of those living under the least intense noise conditions reported so little satisfaction. The comparable overall average for heavy volume of aircraft is 41 percent while the average for residents living under low volume air traffic is only 34 percent. The average differences for peak SPL's are not as clear-cut because of offsetting smaller variability due to aircraft volume in the lower SPL's.

Table 36 indicates that, in 4 of 7 possible comparisons, overall satisfaction is less when peak SPL and volume of aircraft are high. In SAC neighborhoods A1 reports 53 percent in scale types 0 to 6, while B1 is only 43 percent; C1, however, about equals A1. In western ADC comparisons, B1 is greater than C1, but D1 is greater than C1 but less than A1. In the one comparison in eastern ADC areas, C1 is greater than D1.

In all 3 comparisons of aircraft volume at SAC base neighborhoods, residents in high volume situations were less satisfied. In the one comparison at eastern ADC areas, however, C1 was slightly more satisfied with living conditions than C2.

Another interesting observation is the fact that less than 1 percent was dissatisfied with all 10 aspects of living in an area and only about 5 percent were satisfied with as few as 2 to 3 items. This indicates that very few cranks or chronic complainers are included in our study.

9. Summary of Relationships

The volume-peak acoustic index may prove to be a sensitive indicator of disturbance and annoyance but it is of limited value in this study. Due to significant air base area differences and the great disproportionality in the distribution of interviews from each air base among the different analytical acoustic classes, the overall relationships are obscured. When the range in acoustic situations is examined for each air base separately, the tendency is for reports of disturbance and annoyance to be directly related to the volume-peak index. Likewise, fear of air crashes appears to increase as air traffic and peak SPL increases, thus adding to the annoyance at the higher peak SPL's. Offsetting this, however, is the positive correlation between higher peak SPL's and feelings of base importance. Apparently, residents living closest to the three air bases in the highest noise environments are more convinced of the importance of the activity at the local air base. Reports of the extent to which respondents feel the air base could reduce its disturbance are not too well correlated with the volume-peak index. The effect of this variable is not systematically reflected in variations in annoyance reports. Persons living in noisier environments are also less satisfied with non-aircraft aspects of living in their neighborhoods. This may add to the annoyance with aircraft noise.

D. Equivalent Continuous Noise Levels (L_{eq})

The second acoustic index evaluated is the Equivalent Continuous Noise Level. As described in Chapter 1, it attempts to combine into a single number the peak level and its duration and the volume of operation of all aircraft. As shown in this section, this acoustic measure is not too well correlated with the grouped human response data. Many of the discrepancies, however, appear to be explained by variations in psychological attitudes among a few neighborhoods

at particular air bases. The familiar disproportionality of responses obtained from western ADC residents under different L_{eq} conditions also contributes to a narrowing of differences in response. For example, western ADC respondents account for 58 percent of A, 40 percent of B, 30 percent of C, 43 percent of D, and none of E. Since disturbance and annoyance responses at western ADC neighborhoods are generally lower, this distribution of interviews tends to reduce the average of A and increase the averages in the other L_{eq} groups, thus minimizing group differences.

1. Scale 4 - Number of Activities Disturbed

Table 37 presents the grouped disturbance responses by L_{eq} classes, and table 38 presents the more detailed air base area data.

TABLE 37
NUMBER OF ACTIVITIES DISTURBED BY L_{eq} GROUPS

Class	L_{eq}	Number of Interviews	Types of Scale Number 4- Disturbance		
			0	1-3	4-5
A	71-76 db	257	8%	43%	49%
B	65-70	497	4	51	45
C	61-64	671	13	63	24
D	56-60	585	11	55	34
E	55 or less	318	12	64	24

TABLE 38
NUMBER OF ACTIVITIES DISTURBED BY L_{eq} GROUPS AND AIR BASE AREAS

Class	L_{eq}	Air Base Area	Number of Interviews	Types of Scale Number 4 Disturbance		
				0	1-3	4-5
A	71-76 db	SAC	107	2%	25%	73%
		West ADC	150	10	58	32
B	65-70	SAC	213	2	50	48
		West ADC	200	5	48	47
		East ADC	84	4	38	58
C	61-64	SAC	308	16	63	21
		West ADC	204	13	69	18
		East ADC	159	8	54	38
D	56-60	SAC	104	26	48	26
		West ADC	250	10	68	22
		East ADC	231	5	43	52
E	55 or less	East ADC	318	12	64	24

Table 37 shows that A and B report the greatest disturbances, while C and E are about the same. Class D indicates an unexpected discontinuity, or increase in disturbance. In general, the L_{eq} series does not seem to explain much variation in disturbance responses. When table 38 is examined, however, some of these discrepancies are clarified. First, A represents only SAC and West ADC neighborhoods, of which SAC respondents report twice as much disturbance as the ADC group. Responses at East ADC neighborhoods are considerably higher on the average than the other two bases. Consequently, if any of the East ADC responses had been included in A, and if the western ADC responses had been relatively fewer, then the overall average for A would have been higher.

A second obvious distortion results from the unusually high disturbances reported by East ADC class D respondents, twice as great as the comparable residents at the other bases. As will be shown shortly, the unexpectedly low disturbances at West ADC class A areas and the equally unusual high disturbance at the East ADC class D neighborhood can be explained in part by other psychological factors.

When SAC areas are compared, a direct relationship exists between L_{eq} noise level and the amount of disturbance. L_{eq} group A reports more disturbance than B, which is greater than C or D. At West ADC areas, L_{eq} group A is unexpectedly low and reports less disturbance than group B, which is greater than C or D. Likewise at East ADC groups, with the exception of class D, the higher the L_{eq} level, the greater the disturbance.

In summary, while the overall relationships between L_{eq} classes and the amount of reported disturbance are not too clear, a more detailed examination of air base area data reveals that the particular groupings of data in our study cannot be considered a fair test. When the rank order of L_{eq} group is examined at each air base separately, it appears as if the amount of disturbance is directly related to a hierarchy of L_{eq} classes.

2. Scale 5 - Frequency of Activity Disturbance

The L_{eq} scale is a bit more successful in rank ordering frequency of disturbance responses. The range for the most intense response (4 to 5 activities frequently disturbed), as shown in table 39, is from 26 percent for A to only 6 percent for E. Only D is out of line and table 40 demonstrates that this is due to the disproportionate weight of unusually disturbed residents at an East ADC neighborhood. It is interesting to note again that East ADC residents are more frequently disturbed than their counterparts at the other two bases. Since East ADC residents represent 40 percent of D and only 24 percent of C, the higher disturbance at D neighborhoods is multiplied by almost 2 in distorting the C-D comparisons.

TABLE 39

FREQUENCY OF ACTIVITY DISTURBANCES BY L_{eq} GROUPS

Class	L_{eq}	Number of Interviews	Types of Scale 5-Frequency of Disturbance				
			0	1-2	3-5	6-7	8-10
			None	Few Occas.	Many Occas.	Few Freq.	Many Freq.
A	71-76 db	257	8%	20%	30%	16%	26%
B	65-70	497	4	20	40	18	18
C	61-64	671	13	34	33	11	9
D	56-60	585	11	30	37	10	12
E	55 or less	318	12	40	31	11	6

TABLE 40
FREQUENCY OF ACTIVITY DISTURBANCE
BY L_{eq} GROUPS AND AIR BASE AREAS

Class	L_{eq}	Air Base Area	No. of Interviews	Types of Scale 5-Frequency of Disturbance				
				0	1-2	3-5	6-7	8-10
				None	Few Occas.	Many Occas.	Few Freq.	Many Freq.
A	71-76 db	SAC	107	2%	8%	21%	21%	48%
		West ADC	150	9	30	39	13	9
B	65-70	SAC	213	11	36	33	10	10
		West ADC	200	6	25	36	18	13
		East ADC	84	4	14	37	20	25
C	61-64	SAC	308	16	35	32	11	6
		West ADC	204	13	37	34	9	5
		East ADC	159	8	28	33	15	16
D	56-60	SAC	104	26	32	30	9	3
		West ADC	250	10	40	37	6	7
		East ADC	231	5	20	39	15	21
E	55 or less	East ADC	318	12	40	31	11	6

When each air base area is examined separately, the direct relationship between L_{eq} groups and the frequency of disturbance is brought into better focus. At SAC, class A reports the most disturbances, followed by B and then C. Disturbance differences between C and D are very small and may be considered equal. At West ADC base areas, A is surprisingly low and less than B disturbances. The latter are greater than C which equals D. At the East Coast ADC, B is greater than C, which is greater than E. However, D is unusually high and greater than C. Tables 39 and 40 summarize these relationships.

3. Scale 6 - Annoyance by Disturbed Activities

The pattern of relationships between L_{eq} groups and annoyances is very much like those found with frequency of disturbance. With the exception of class D, as shown in table 41, annoyance appears to rank order with L_{eq} categories. The difference between groups, however, is small due to the problems of disproportionability already cited above. When the neighborhoods of each air base are analyzed separately in table 42, the higher L_{eq} groups generally report the greater annoyances. The exceptions are the same as described in section 2. Class A of West ADC neighborhoods is unusually low, while D of East ADC areas is much higher than expected. At both SAC and West ADC bases, the differences between C and D are very small.

TABLE 42

REPORTED ANNOYANCE BY L_{eq} GROUPS AND AIR BASE AREAS

TABLE 41 REPORTED ANNOYANCE BY L_{eq} GROUPS							Type of Scale 6 - Annoyance							
Class	L_{eq}	Number of Interviews	Types of Scale 6 - Annoyance				Class	L_{eq}	Air Base Area	Number of Interviews	Type of Scale 6 - Annoyance			
			0 None	1-3 Few A Little	4-7 Many A Little	8-10 Much Annoyance					0 None	1-3 Few A Little	4-7 Many A Little	8-10 Much Annoyance
A	71-76 db	257	16%	31%	19%	34%	A	71-76 db	SAC	107	6%	16%	20%	58%
									West ADC	150	22	44	18	16
B	65-70	497	13	30	29	28	B	65-70	SAC	213	17	43	22	18
									West ADC	200	17	39	23	21
									East ADC	84	6	19	30	35
C	61-64	671	21	41	22	16	C	61-64	SAC	308	22	36	29	13
									West ADC	204	35	41	15	9
									East ADC	159	14	35	20	31
D	56-60	585	19	36	26	19	D	56-60	SAC	104	26	37	27	10
									West ADC	250	25	47	20	8
									East ADC	231	10	25	30	35
E	55 or less	318	21	44	19	16	F	55 or less	East ADC	318	21	44	19	16

4. Scale 7 - Combination of Activity Disturbance and Annoyance

When activity disturbance and annoyance are combined into a single scale, the L_{eq} groups appear to rank order responses for the top three classes. However, as expected, D is out of line and E about equals C. Table 43 summarizes the overall relationships.

When each air base area is examined separately in table 44, the same pattern of responses emerges. At SAC areas, the L_{eq} scale rank orders responses in every case although C and D are almost equal. At the West ADC base, A is about equal to B which is greater than C, but C equals D. Likewise, at the East ADC base, which generally reports greater annoyance, B is greater than C or E, but D is greater than C.

Another interesting comparison, used in connection with an evaluation of L_{eq} groups and complaint potential, is presented in table 45. It combines all persons, who report relatively "little annoyance" with a few, a moderate number of, or many activities, into one category. In contrast, all persons are grouped together who report relatively "much annoyance," regardless of the number of activities involved. As can be seen there are very small and not significant differences among the L_{eq} groups.

TABLE 43

ACTIVITY DISTURBANCE AND ANNOYANCE BY Leq GROUPS

Class	Leq	Number of Interviews	Types of Scale 7-Disturbance and Annoyance					
			Few Activities		Moderate Activities		Many Activities	
			Little Annoy	Much Annoy	Little Annoy	Much Annoy	Little Annoy	Much Annoy
A	71-76 db	257	14%	4%	20%	13%	20%	29%
B	65-70	497	8	4	24	19	23	22
C	61-64	671	20	10	27	19	11	13
D	56-60	585	23	6	21	16	18	16
E	55 or less	318	24	12	23	17	10	14

TABLE 45

RELATIVELY "LITTLE" ANNOYANCE AND
RELATIVELY "MUCH" ANNOYANCE BY Leq GROUPS

Class	Leq	Number of Interviews	Groups of Scale 7-Disturbance and Annoyance	
			(1+3+5) Little Annoyance	
			(2+4+6) Much Annoyance	
A	71-76 db	257	54%	46%
B	65-70	497	55	45
C	61-64	671	58	42
D	56-60	585	62	38
E	55 or less	318	57	43

TABLE 44

ACTIVITY DISTURBANCE AND ANNOYANCE
BY Leq GROUPS AND AIR BASE AREAS

Class	Leq	Air Base Area	No. of Interviews	Types of Scale 7-Disturbance and Annoyance					
				Few Activities		Moderate Activities		Many Activities	
				Little Annoy	Much Annoy	Little Annoy	Much Annoy	Little Annoy	Much Annoy
A	71-76db	SAC	107	4%	1%	10%	12%	19%	54%
		West ADC	150	14	5	31	13	21	11
B	65-70	SAC	213	7	3	17	23	24	24
		West ADC	200	12	3	35	14	23	13
		East ADC	84	5	6	12	19	21	37
C	61-64	SAC	308	17	15	22	26	11	9
		West ADC	264	25	6	40	10	9	9
		East ADC	140	16	9	19	17	15	24
D	56-60	SAC	184	35	12	10	17	18	8
		West ADC	250	29	5	31	14	14	7
		East ADC	231	21	4	15	18	21	31
E	55 or less	East ADC	318	24	12	23	17	10	14

5. Scale 2 - Fear of Air Crashes

The next four sections will consider the relationships of various psychological attitudes and Leq groups. It will be seen that marked differences among the air base area groups are in part responsible for the poor correlations cited above.

Relative fear of air crashes is related to Leq groups in table 46. As can be seen the higher the Leq class, the greater the fear, with the exception that C and D are about equal. When the separate air base data are examined in table 47, these overall relationships and some of the exceptions previously mentioned are clarified.

The neighborhoods at the SAC base are rank ordered for intensity of fear in every Leq class. When class A areas at SAC and West ADC are compared, it is seen that residents at the SAC areas, who persistently reported much greater disturbance and annoyance, are three times more fearful of crashes than the ADC respondents. Likewise, class D eastern ADC respondents, who consistently reported more than expected disturbance and annoyance, reveal an unexpectedly high fear. With 36 percent of the group reporting much fear of crashes, they outrank all other East and West ADC groups and all groups in classes C or D.

Tables 16 and 47 reveal that fear of crashes and disturbance and annoyance are all positively correlated by Leq groups.

TABLE 47

FEAR OF AIR CRASHES BY L_{eq} GROUP AND AIR BASE AREASTABLE 46
FEAR OF AIR CRASHES BY L_{eq} GROUPS

Class	L_{eq}	Number of Interviews	Types of Scale 2 - Fear			Class	L_{eq}	Air Base Area	Number of Interviews	Types of Scale 2 - Fear		
			None	Moderate	Much					None	Moderate	Much
A	71-76 db	257	21%	42%	37%	A	71-76 db	SAC	107	9%	24%	67%
B	65-70	497	16	49	33			West ADC	150	28	51	21
C	61-64	671	19	97	24	B	65-70	SAC	213	15	40	45
D	56-60	585	15	61	24			West ADC	200	26	55	19
E	55 or less	318	21	64	15			East ADC	84	9	56	35
						C	61-64	SAC	308	15	53	32
								West ADC	204	27	64	9
								East ADC	159	14	56	30
						D	56-60	SAC	104	14	62	24
								West ADC	250	17	69	14
								East ADC	231	13	51	36
						F	55 or less	East ADC	318	21	64	15

6. Base Importance

The psychological variable of respondent feelings of base importance is measured by a five-item index and a three-item scale. Both of these measures indicate fairly good direct relationships between L_{eq} groups and the extent to which residents feel the base is important to their localities. The higher the L_{eq} class the more important the base is considered. Tables 48 and 50 summarize these overall relationships.

TABLE 48

INDEX OF REPORTED BASE IMPORTANCE BY L_{eq} GROUP

Class	L_{eq}	Number of Interviews	Index II Groups-Base Importance		
			0-1 Little	2-3 Moderate	4-5 Most
A	71-76 db	257	13%	45%	42%
B	65-70	497	22	46	32
C	61-64	671	25	43	32
D	56-60	585	41	40	19
E	55 or less	318	58	38	4

TABLE 50

SCALE OF REPORTED BASE IMPORTANCE BY L_{eq} GROUPS

Class	L_{eq}	Number of Interviews	Types of Scale 10-Base Importance		
			0 Little	1 Moderate	2 Most
A	71-76 db	257	7%	21%	72%
B	65-70	497	8	32	60
C	61-64	671	10	33	57
D	56-60	585	17	39	44
E	55 or less	318	22	58	20

TABLE 49

INDEX OF REPORTED BASE IMPORTANCE
BY L_{eq} GROUP AND AIR BASE AREAS

Class	L_{eq}	Air Base Area	Number of Interviews	Index II Groups-Base Importance		
				0-1 Little	2-3 Moderate	4-5 Most
A	71-76 db	SAC	107	5%	34%	61%
		West ADC	150	18	56	26
B	65-70	SAC	213	4	42	54
		West ADC	200	23	53	24
		East ADC	84	65	35	0
C	61-64	SAC	308	4	39	57
		West ADC	204	25	59	16
		East ADC	159	62	33	5
D	56-60	SAC	104	6	41	53
		West ADC	250	29	51	20
		East ADC	231	69	29	2
E	55 or less	East ADC	318	58	38	4

TABLE 51

SCALE OF REPORTED BASE IMPORTANCE
BY L_{eq} GROUPS AND AIR BASE AREAS

Class	L_{eq}	Air Base Area	Number of Interviews	Types of Scale 10-Base Importance		
				0 Little	1 Moderate	2 Most
A	71-76 db	SAC	107	6%	15%	79%
		West ADC	150	6	25	69
B	65-70	SAC	213	5	21	74
		West ADC	200	8	30	62
		East ADC	84	10	63	21
C	61-64	SAC	308	2	23	75
		West ADC	204	8	38	54
		East ADC	159	28	46	26
D	56-60	SAC	104	5	27	68
		West ADC	250	8	35	57
		East ADC	231	32	48	20
E	55 or less	East ADC	318	22	58	20

A closer look at tables 49 and 51, however, which present the air base area detail, casts some doubt on the validity of the overall trends. When each air base is evaluated separately, very small and hardly significant differences emerge. SAC base areas are consistently highest in reporting base importance, while East ADC neighborhoods are uniformly the lowest in their judgments of base importance. The way in which the subsamples of these three air base areas are combined results in the apparently significant overall pattern of relationships.

It is significant, however, to note that our exceptional sub-areas are properly related to this variable. Class A in the West ADC areas has the highest evaluation of base importance of all ADC areas, and D of the East ADC areas has the lowest appraisal of base importance. The atypical western ADC area has unusually low disturbance while the East ADC area has the exceptionally high disturbance and annoyance.

7. Air Base Considerateness

The degree to which respondents feel the air base is considerate of their welfare and the extent to which they feel the base tries to minimize its disturbance is measured by three scales and indexes. The first is an index based on reports of local air base considerateness, presented in table 52. Table 53 presents a comparable scale of the considerateness of the Air Force in general (not specially related to the local base). Tables 54 and 55 present these same measures in air base area detail. Finally, table 56 presents an index of pilot considerateness, available only for the two ADC bases.

TABLE 52
INDEX OF FEELINGS OF BASE CONSIDERATENESS
BY Leq GROUPS

Class	Leq	Number of Interviews	Index 9 Groups- Base Considerateness		
			1-2 Little	3-4 Moderate	5 Most
A	71-76 db	257	30%	39%	31%
B	65-70	497	29	45	26
C	61-64	671	33	48	19
D	56-60	585	31	42	22
E	55 or less	318	20	49	25

TABLE 53
SCALE OF AIR FORCE CONSIDERATENESS BY Leq GROUPS

Class	Leq	Number of Interviews	Types of Scale 14- Air Force Considerateness		
			0-1 Least	2-3 Moderate	4-5 Most
A	71-75 db	257	24%	40%	36%
B	65-70	497	33	33	34
C	61-64	671	29	36	35
D	56-60	585	46	36	18
E	55 or less	318	46	47	7

TABLE 54
INDEX OF FEELINGS OF BASE CONSIDERATENESS
BY Leq GROUPS AND AIR BASE AREAS

Class	Leq	Air Base Area	Number of Interviews	Index 9 Groups- Base Considerateness		
				1-2 Least	3-4 Moderate	5-6 Most
A	71-76 db	SAC	107	43%	31%	26%
		West ADC	150	16	58	26
		East ADC	84	21	59	20
B	65-70	SAC	213	36	39	25
		West ADC	200	25	44	31
		East ADC	84	21	59	20
C	61-64	SAC	308	36	45	19
		West ADC	204	31	47	22
		East ADC	150	31	53	16
D	56-60	SAC	101	39	43	18
		West ADC	250	25	45	30
		East ADC	231	45	38	17
E	55 or less	East ADC	118	26	49	25

Both overall comparisons reveal a direct relationship between Leq groups and reports of base considerateness. The higher the Leq exposure, the greater the base considerateness generally reported. When the detailed air base patterns are examined, however, some questions are raised about the overall picture.

TABLE 55

SCALE OF AIR FORCE CONSIDERATENESS
BY Leq GROUPS AND AIR BASE AREAS

Class	Leq	Air Base Area	Number of Interviews	Types of Scale 14- Air Force Considerateness		
				0-1 Least	2-3 Moderate	4-5 Most
A	71-76db	SAC	107	8%	37%	55%
		West ADC	150	40	39	21
B	65-70	SAC	213	8	29	63
		West ADC	200	49	37	14
		East ADC	84	60	33	7
C	61-64	SAC	308	8	28	64
		West ADC	204	41	47	12
		East ADC	159	54	39	7
D	56-60	SAC	104	6	26	68
		West ADC	250	52	39	9
		East ADC	231	57	36	7
E	55 or less	East ADC	318	46	47	7

TABLE 56

INDEX OF PILOT CONSIDERATENESS
BY Leq GROUP AND ADC AIR BASE AREAS

Class	Leq	Air Base Area	Number of Interviews	Index 8 Groups- Pilot Considerateness		
				Least	1-2 Moderate	3-4 Most
A	71-76db	West ADC	150	11%	39%	50%
		East ADC	84	26	44	30
B	65-70	West ADC	200	17	46	37
		East ADC	84	26	44	30
C	61-74	West ADC	204	13	48	39
		East ADC	159	24	56	20
D	56-60	West ADC	250	11	48	41
		East ADC	231	30	61	9
E	55 or less	East ADC	318	16	54	30

Table 54 reveals very small differences among the SAC neighborhoods. But for the ADC bases, class A is somewhat greater than B which is greater than C and D. The greatest amount of considerateness among West ADC areas is reported by class A neighborhoods which also report a very low disturbance and annoyance. Likewise, the lowest amount of considerateness is reported by D of East ADC areas, which correspondingly reports a very high level of disturbance and annoyance.

The striking interrelationship of these response variables is seen in table 56 on expressions of pilot considerateness. About half of all residents in class A of western ADC areas feel the pilots are most considerate, while only 9 percent of D residents at the eastern ADC base feel this way.

8. Scale 1 - Overall Satisfaction with Neighborhood

There is a direct relationship between the Leq noise level and the degree of overall satisfaction with neighborhood environment reported by residents of all three air bases. Scale types 0 to 6 and 9 to 10 reported in table 57 represent expressed satisfaction with non-aircraft phenomena. Scale types 7 to 8 represent satisfaction with noise and safety aspects of a neighborhood and could be closely related to the aircraft noise levels. (To measure satisfaction with noise and safety, scale types 7 to 8 and 9 to 10 must be combined.) While the differences are small, table 57 indicates that residents in class A aircraft environments like fewer non-aircraft living conditions in their areas than class D or C residents.

When air base area detail is compared in table 58 some inconsistencies appear, but the exceptional areas at ADC bases reinforce the generalizations. At SAC base areas, for example, class A is less satisfied than class B residents, but C respondents are less satisfied than B.

At western ADC areas, class A respondents report greater overall satisfaction (and as previously reported, less aircraft disturbance and annoyance). Class B residents, however, report less satisfaction than C or D groups which are about equal.

TABLE 55

SCALE OF OVERALL SATISFACTION WITH NEIGHBORHOOD
BY Leq GROUP AND AIR BASE AREAS

TABLE 57
SCALE OF OVERALL SATISFACTION WITH NEIGHBORHOOD BY
BY Leq GROUP

SCALE OF OVERALL SATISFACTION WITH NEIGHBORHOOD BY BY Leq GROUP										Types of Scale 1- Overall Satisfaction						
Class	Leq	Number of Interviews	Types of Scale 1- Overall Satisfaction					Class	Leq	Air Base Area	Interviews	Types of Scale 1- Overall Satisfaction				
			0-4	5-6	Total							0-4	5-6	Total		
					0-6	7-8	9-10							0-6	7-8	9-10
A	71-76 db	257	15%	30%	45%	41%	14%	A	71-76 db	SAC	107	22%	31%	22%	35%	10%
										West ADC	150	11	28	39	44	17
B	65-70	497	14	29	43	40	17	B	65-70	SAC	213	12	23	35	43	22
										West ADC	200	13	35	48	40	12
										East ADC	84	25	27	52	36	12
C	61-64	671	9	26	35	44	21	C	61-64	SAC	373	13	31	44	39	17
										West ADC	204	5	20	25	49	26
										East ADC	159	11	22	33	46	21
D	56-60	585	7	24	31	45	24	D	56-60	SAC	104	8	24	32	52	16
										West ADC	250	6	20	24	45	29
										East ADC	231	9	27	36	42	22
E	55 or less	318	14	23	37	36	27	E	55 or less	East ADC	318	14	23	37	36	27

At eastern ADC areas, class B reports the least satisfaction, but D and E are somewhat less satisfied with overall living conditions than C residents.

9. Summary of Relationships

The Leq index like the volume-peak index has limited usefulness in the present study and does not discriminate disturbance and annoyance responses as well as might be expected. This does not mean that the Leq index is a poor acoustic measure but that in this particular study certain biases in the distribution of interviews among the different Leq classes and air base areas obscure some of the analytical relationships. When the neighborhoods at each air base area are rank ordered by the Leq index, disturbance and annoyance appear to vary directly with Leq levels—the higher the Leq level the greater the disturbance and annoyance reported. Two classes of neighborhoods at the two ADC base areas also consistently report unexpectedly high and low disturbance-annoyance levels, further reducing the overall differences among the Leq classes.

A number of psychological variables are found to be directly related to the Leq measures. Fear of air crashes and feelings of base considerateness are greatest when Leq levels are highest. The exceptional ADC areas cited above also reflect the extremes of these relationships. The area with unusually high disturbance-annoyance responses is the most fearful and feels the base is least considerate. Conversely, the area with unexpectedly low annoyance reports the least fear and feels the base is the most considerate. Feelings of overall satisfaction with the total residential environment are inversely related to Leq classes. The highest Leq groups report the least overall satisfaction. While the overall relationships of feelings of base importance also appear directly related to Leq classes, the air base area detail reflect very small differences among the Leq classes.

E. Duration of Speech Interference Level 60 db (SIL 60)

The duration of speech interference level 60 db is the third measure of the aircraft stimulus evaluated. This level has generally been found to be loud enough to interrupt outdoors conversation in a raised voice at as little as 3 feet distance.

Although the distribution of interviews among the SIL-60 classes is far from ideal, the distortions caused by the unequal weighting of different air base areas is less than expected. As the following analysis shows, the SIL-60 series is the most discriminatory index for disturbance and annoyance responses.

1. Scale 4 - Number of Activities Disturbed

As table 59 indicates, the number of residential living activities disturbed is directly related to the SIL-60 classes. About two-thirds of all residents report 4 to 5 activities disturbed when the SIL-60 duration averages 80 seconds or more per hour, while only a fourth of all persons report as much interference when the duration is less than 20 seconds per hour.

The overall differences between SIL-60 classes might have been even greater if the interviews from the three air bases had been proportionately distributed among them.

TABLE 60

NUMBER ACTIVITIES DISTURBED BY SIL-60 db GROUPS
AND AIR BASE AREAS *

TABLE 59						TABLE 60						
NUMBER OF ACTIVITIES DISTURBED BY SIL-60 db GROUPS						NUMBER ACTIVITIES DISTURBED BY SIL-60 db GROUPS AND AIR BASE AREAS *						
Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Types of Scale 4- Disturbance			Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Types of Scale 4- Disturbance		
			0	1-3	4-5					0	1-3	4-5
A	80+	191	3%	31%	66%	A	80+	SAC- Fast ADC	107 84	2% 4	25% 38	73% 58
B	50-79	461	7	54	39	B	50-79	SAC West ADC	111 350	2 8	44 57	54 35
C	40-49	424	8	61	31	C	40-49	SAC West ADC	105 160	4 12	62 66	34 22
D	20-39	830	11	60	29			Fast ADC	159	8	54	38
F	19 or less	422	15	60	25	D	20-39	SAC West ADC Fast ADC	305 204 231	15 11 5	62 69 43	22 20 52
						F	19 or less	SAC Fast ADC	104 318	26 12	48 64	26 24

* Unweighted means could not be used to eliminate this unequal distribution because in two of the five classes, there were no reports at all from one of the three air base areas.

As table 60 shows, class A does not include any interviews from West ADC neighborhoods and B omits any cases from East ADC areas. The effect of these omissions is to increase the average of A and reduce the average of B. Likewise, the inclusion in D of the previously mentioned high disturbance reports from an East ADC neighborhood boosts the average of D, while the absence of any West ADC reports from E areas also raises the overall totals for this last group. The net effect of all these unequalities is to increase the difference between A and B, and decrease the differences between B, C, and D. Consequently, the consistent rank ordering of disturbance achieved by the SIL-60 classes may be considered minimal.

When the air base area details are examined in table 60, the rank ordering is consistently maintained in all but two comparisons. Classes C and D of the West ADC base are about equal, and disturbance reported by D of the East ADC base is greater than that of C and almost as great as that of A. This latter exceptional group is the same as already described in the L_{eq} comparisons. As already reported, and as will be shown again in the other tables of this section, this East ADC group reports feelings of greater fear, less base considerateness, less base importance, and less overall satisfaction with the area. All of these attitudes tend to increase the reported disturbance and annoyance feelings.

2. Scale 5 - Frequency of Activity Disturbance

As expected, frequency of disturbance is directly related to duration of SIL 60. The range of response is from 57 percent reporting frequent disturbance at 80 seconds or more per hour to only 15 percent at less than 20 seconds per hour. Table 61 presents the overall relationships and table 62 includes the air base area details. In all but the one exceptional East ADC base area (class D), the SIL-60 series rank orders responses of frequency of disturbance for each air base area.

TABLE 61

FREQUENCY OF ACTIVITY DISTURBANCE
BY SIL-60 db GROUPS

Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Types of Scale 5 - Frequency of Disturbance				
			0 None	1-2 Few Occas.	3-5 Many Occas.	6-7 Few Freq.	8-10 Many Freq.
A	80+	191	3%	11%	29%	20%	37%
B	50-79	461	7	23	38	17	15
C	40-49	424	8	29	36	14	13
D	20-39	830	11	34	36	9	10
E	19 or less	422	15	39	31	10	5

TABLE 62

FREQUENCY OF ACTIVITY DISTURBANCE
BY SIL-60 db GROUPS AND AIR BASE AREAS

Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Types of Scale 5 - Frequency of Disturbance				
				0 None	1-2 Few Occas.	3-5 Many Occas.	6-7 Few Freq.	8-10 Many Freq.
A	80+	SAC	187	2%	7%	22%	21%	48%
		East ADC	84	4	14	37	20	25
B	50-79	SAC	111	2	12	39	21	26
		West ADC	350	8	27	38	16	11
C	40-49	SAC	105	4	23	40	17	16
		West ADC	160	12	34	36	11	7
		East ADC	159	8	28	33	15	16
D	20-39	SAC	305	15	35	33	11	6
		West ADC	294	11	42	35	6	6
		East ADC	231	5	20	34	15	21
E	19 or less	SAC	104	26	32	30	9	3
		East ADC	318	12	40	31	11	6

3. Scale 6 - Annoyance by Disturbance Activities

The degree of reported annoyance is also directly related to the SIL-60 scale. Although the overall differences between B and C are small and not significant, the relationships are clear—as duration increases, annoyance increases. At the upper level, 53 percent report much annoyance, while at the lower end of the SIL scale, only 14 percent report much annoyance. Table 63 presents the overall relationships between annoyance and SIL-60 classes. Table 64 includes the air base area comparisons. In all but two cases, the annoyance is rank ordered by the SIL-60 series at each air base area. The two exceptions are: D and E at SAC areas are about equal and, as expected, D at the East ADC base is greater than C.

TABLE 64

REPORTED ANNOYANCE BY SIL-60 db GROUP
AND AIR BASE AREAS

REPORTED ANNOYANCE BY SIL-60 db GROUPS							Types of Scale 6- Reported Annoyance							
Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Types of Scale 6- Reported Annoyance				Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Types of Scale 6- Reported Annoyance			
			0 None	1-3 A Little	4-7 A Little	8-10 Much Annoyance					0 None	1-3 A Little	4-7 A Little	8-10 Much Annoyance
A	80+	191	6%	17%	24%	53%	A	80+	SAC East ADC	107 84	5% 6	15% 19	21% 30	59% 45
B	50-79	461	17	36	24	23	B	50-79	SAC West ADC	111 350	10 20	19 41	33 21	38 18
C	40-49	424	18	37	23	22	C	40-49	SAC West ADC	105 160	12 26	27 46	36 16	25 12
D	20-39	830	20	39	25	16			East ADC	159	14	25	20	31
E	19 or less	422	22	42	22	14	D	20-39	SAC West ADC East ADC	305 294 231	23 24 10	35 51 25	29 18 30	9 7 35
							E	19 or less	SAC East ADC	104 318	26 21	37 44	27 19	10 16

4. Scale 7 - Combination of Activity Disturbance and Annoyance

Almost half of all residents experiencing 80 seconds or more of SIL-60 noise, report much annoyance with 4 to 5 activities. In contrast, only 12 percent, exposed to an average of less than 20 seconds of this noise level, report as much annoyance. While some of the class differences are small, SIL 60 appears to rank order the combined scale of disturbance and annoyance. Table 65 presents the overall comparisons, and table 66 includes the area details.

TABLE 66

ACTIVITY DISTURBANCE AND ANNOYANCE
BY SIL-60 db GROUPS AND AIR BASE AREAS

ACTIVITY DISTURBANCE AND ANNOYANCE BY SIL-60 db GROUPS										Types of Scale 7 - Disturbance and Annoyance								Types of Scale 1 - Disturbance and Annoyance							
Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Types of Scale 7 - Disturbance and Annoyance						Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number Interviews	Few Activities		Moderate Activities		Many Activities								
			Few Activities		Moderate Activities		Many Activities						Few Activities		Moderate Activities		Many Activities								
			Little Annoy	Much Annoy	Little Annoy	Much Annoy	Little Annoy	Much Annoy					Little Annoy	Much Annoy	Little Annoy	Much Annoy	Little Annoy	Much Annoy							
A	80+	191	4%	3%	11%	15%	20%	47%	A	80+	SAC	107	4%	1%	10%	12%	19%	54%							
											East ADC	84	5	6	12	19	21	37							
B	50-79	461	14	4	27	16	23	16	B	50-79	SAC	111	8	5	24	22	22	19							
											West ADC	350	16	4	31	14	22	13							
C	40-49	424	17	7	27	18	13	18	C	40-49	SAC	105	9	9	18	30	14	20							
											West ADC	160	23	4	40	11	11	11							
D	20-39	830	20	8	25	18	15	14			East ADC	159	16	9	19	17	15	24							
E	19 or less	422	27	12	20	17	12	12	D	20-39	SAC	305	17	13	24	23	14	9							
											West ADC	294	30	6	32	13	13	6							
											East ADC	231	11	4	15	18	21	31							
									E	19 or less	SAC	104	25	12	10	17	18	8							
											East ADC	318	24	12	23	17	10	14							

Only in the case of class D of the East ADC base does the SIL-60 series fail to rank order scale 7. This scale also reflects some of the dynamics of disturbance and annoyance. When A and B of SAC areas are compared, class A residents report more annoyance with many activities (4 to 5), while B reports more annoyance with only 2 to 3 activities (excludes sleep and rest). Likewise, when C and D of the West ADC bases are compared, class D reports more respondents complain about a little annoyance with only vibrations, while class C respondents are more numerous in feeling a little annoyance with speech and listening interference and much annoyance with sleep or rest disturbance. The

exceptional group in class D of the East ADC base indicates that almost one-third feel much annoyed by 4 to 5 activity disturbances, as compared to only 6 to 9 percent of the comparable respondents in the other two air base areas. In general, this scale may be considered the most useful single yardstick of respondent reactions to noise disturbances.

5. Scale 2 - Fear of Air Crashes

In general the tendency is for greater fear to be expressed by residents living under SIL-60 noise levels of longer average duration. Feelings of disturbance and annoyance are normally heightened. In the overall comparisons presented in table 67, the small differences between classes B and C, and the somewhat higher fear response in D can be explained by reference to the air base area data, presented in table 68. The general effectiveness of the SIL-60 series to rank order fear responses is seen in comparisons of extreme classes of the acoustic range. More than half of all residents exposed to an average of 80 seconds or more per hour of SIL-60 noise report much fear, while only 17 percent of the group experiencing less than 20 seconds per hour of this noise report the same amount of fear.

TABLE 67

FEAR OF AIR CRASHES BY SIL-60 db GROUPS

Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Types of Scale 2 - Fear		
			None	Moderate	Much
A	80+	191	9%	38%	53%
B	50-79	461	23	51	26
C	40-49	424	19	55	26
D	20-39	830	16	58	26
E	19 or less	422	20	63	17

TABLE 68

FEAR OF AIR CRASHES BY SIL-60 db GROUPS
AND AIR BASE AREAS

Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Types of Scale 2 - Fear		
				None	Moderate	Much
A	80+	SAC	107	9%	24%	67%
		East ADC	84	9	56	35
B	50-79	SAC	111	12	40	48
		West ADC	350	27	54	19
C	40-49	SAC	105	11	42	47
		West ADC	160	28	62	10
		East ADC	159	14	56	30
D	20-39	SAC	305	17	52	31
		West ADC	294	18	69	13
		East ADC	231	13	51	36
E	19 or less	SAC	104	14	62	24
		East ADC	318	21	64	15

A number of observations should be made of table 68. First, West ADC base residents uniformly report very little fear and, while class B is a little more than C, there is no significant difference between C and D. Second, all of the SAC areas rank order by fear and SIL-60 groups. Third, class D of the East ADC base reports 36 percent of respondents with much fear, the highest of all areas at this air base.

6. Base Importance

Although the tendency is for persons living in areas with longer durations of SIL 60 to feel the air base is more important, many inconsistencies cast doubts as to the validity of these relationships. Tables 69 and 70 present the overall comparisons, while tables 71 and 72 present the area detail. In both, the index and the scale, the upper SIL-60 groups report greater base importance than the lower groups. But all of the five SIL-60 classes do not rank order.

When the area detail is examined, it becomes apparent that the wide area differences and disproportionality of case distribution are obscuring relationships that may exist. For example, the SAC base residents feel much more strongly that their base is important to their welfare than respondents at the other two bases. Likewise, responses at the West ADC base are generally higher than at the East ADC base. Consequently, it appears as if base differences are much more important than SIL-60 groupings.

TABLE 69

INDEX OF BASE IMPORTANCE BY SIL-60 db GROUPS

Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Index 11 Groups - Base Importance		
			0-1 Little	2-3 Moderate	4-5 Most
A	80+	191	31%	34%	35%
B	50-79	461	17	50	33
C	40-49	424	35	42	23
D	20-19	830	31	42	27
E	19 or less	422	45	39	16

TABLE 70

SCALE OF REPORTED BASE IMPORTANCE BY SIL-60 db GROUPS

Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Types of Scale 10- Base Importance		
			0 Little	1 Moderate	2 Most
A	80+	191	10%	16%	54%
B	50-79	461	7	25	62
C	40-49	424	15	37	48
D	20-19	830	13	35	52
E	19 or less	422	18	50	32

TABLE 71

INDEX OF BASE IMPORTANCE BY SIL-60 db GROUPS
AND AIR BASE AREAS

Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Index 11 Groups - Base Importance		
				0-1 Little	2-3 Moderate	4-5 Most
A	80+	SAC	107	5%	14%	61%
		East ADC	84	65	35	0
B	50-79	SAC	111	3	41	56
		West ADC	350	21	54	25
C	40-49	SAC	105	6	32	62
		West ADC	160	26	58	16
		East ADC	159	62	33	5
D	20-19	SAC	305	4	43	53
		West ADC	294	28	53	19
		East ADC	231	69	29	2
E	19 or less	SAC	104	6	41	53
		East ADC	318	58	38	4

SCALE OF REPORTED BASE IMPORTANCE
BY SIL-60 db GROUPS AND AIR BASE AREAS

Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Types of Scale 10- Base Importance		
				0 Little	1 Moderate	2 Most
A	80+	SAC	107	6%	15%	79%
		East ADC	84	16	63	21
B	50-79	SAC	111	5	18	77
		West ADC	350	7	28	65
C	40-49	SAC	105	4	17	79
		West ADC	160	9	41	50
		East ADC	159	28	46	26
D	20-19	SAC	305	2	26	72
		West ADC	294	8	34	58
		East ADC	231	32	48	20
E	19 or less	SAC	104	5	27	68
		East ADC	318	22	58	20

For both the index and scale, there are very small differences in response among SAC base residents. The full range is only from 79 to 68 percent. Likewise, the index shows only small differences among SIL-60 groups at the other two bases. But the scale shows A and B at the ADC bases greater than C. Class C, however, is about equal to D, which is a little less than E. The relationship of SIL-60 classes and air base importance are not consistent.

7. Air Base Considerateness

The relationship between SIL-60 groups and air base considerateness is also unclear. While the overall pattern reflected by the index of base considerateness (table 73) shows small and insignificant variations among the SIL-60 classes, the area detail reflected in table 75 shows a tendency for a direct relationship. In comparison, the overall picture presented in table 74, based on the scale of the generalized Air Force image of considerateness, shows a tendency toward a

direct relationship with SIL-60 classes. When the hypothesis of a direct relationship is examined in the area detail of table 76, however, very few significant differences are found among the individual area groups.

TABLE 73

INDEX OF FEELINGS OF BASE CONSIDERATENESS
BY SIL-60 db GROUPS

Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Index 9 Groups- Base Considerateness		
			1-2 Least	3-4 Moderate	5 Most
A	80+	191	34%	43%	23%
B	50-79	461	25	44	31
C	40-49	424	28	49	23
D	20-39	830	37	43	20
F	19 or less	422	29	48	23

TABLE 74

SCALE OF AIR FORCE CONSIDERATENESS
BY SIL-60 db GROUPS

Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Types of Scale 14- AF Considerateness		
			0-1 Least	2-3 Moderate	4-5 Most
A	80+	191	31%	35%	34%
B	50-79	461	35	36	29
C	40-49	424	38	37	25
D	20-39	830	37	37	26
F	19 or less	422	36	42	22

TABLE 75

INDEX OF FEELINGS OF BASE CONSIDERATENESS
BY SIL-60 db GROUP AND AIR BASE AREAS

Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Index 9 Groups- Base Considerateness		
				1-2 Least	3-4 Moderate	5 Most
A	80+	SAC	107	43%	31%	26%
		East ADC	84	21	59	20
B	50-79	SAC	111	32	40	28
		West ADC	150	44	44	32
C	40-49	SAC	105	22	48	30
		West ADC	160	30	46	24
		East ADC	159	31	53	16
D	20-39	SAC	305	42	42	16
		West ADC	294	26	46	28
		East ADC	231	45	36	17
E	19 or less	SAC	104	39	43	18
		East ADC	318	26	49	25

TABLE 76

SCALE OF AIR FORCE CONSIDERATENESS
BY SIL-60 db GROUPS AND AIR BASE AREAS

Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Types of Scale 14-AF Considerateness		
				0-1 Least	2-3 Moderate	4-5 Most
A	80+	SAC	107	8%	37%	55%
		East ADC	84	60	33	7
B	50-79	SAC	111	4	26	68
		West ADC	150	43	39	18
C	40-49	SAC	105	6	42	52
		West ADC	160	44	42	14
		East ADC	159	54	39	7
D	20-39	SAC	305	10	31	59
		West ADC	294	49	42	9
		East ADC	231	57	36	7
F	19 or less	SAC	104	6	26	68
		East ADC	318	46	47	7

Since the index consists of direct questions about local base personnel, somewhat greater importance may be placed on its interpretation. As table 75 shows, at SAC areas D and E reflect feelings of the least amount of considerateness, followed by C and B. Class A, however, includes as many people who feel the base is least considerate as D and E include. In western ADC areas, class B reflects more considerateness than C which equals D. At East ADC areas, residents in A reflect feelings of the most considerateness, followed by C and D. But respondents in E report feelings almost as favorable as those in A. Again note that D reports the least favorable attitudes.

The best that can be said from all this contradictory evidence is that there is a tendency for people living under more intense SIL-60 conditions to feel the base is more considerate and is making a greater effort to minimize the disturbance. Individual variations and air base differences are often great enough to obscure the overall trends.

This overall tendency is more pronounced in table 77, reflecting the index of Pilot Considerateness for ADC base areas. When comparisons are made for each air base, no significant differences are revealed.

8. Scale 1 - Overall Satisfaction with Neighborhood

Neighborhoods exposed to the most intense SIL-60 noise also appear to have more non-aircraft problems. Its residents are generally less satisfied with living conditions in their areas. Table 78, presenting the overall relationships, reveals that 23 percent of all residents in class A are satisfied with only as many as 4 of the 10 residential criteria. In contrast, no other SIL-60 group reports more than 13 percent in this category. The total of scale types 0 to 6 reflects the number of people satisfied with only as many as 6 of the 10 residential criteria. As can be seen with the exception of class E, all of the responses are rank ordered by the SIL-60 classes.

TABLE 77

INDEX OF PILOT CONSIDERATENESS
BY SIL 60 GROUPS AND ADC AREAS

Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Index 8 Groups- Pilot Considerateness		
				0 Least	1-2 Moderate	3-4 Most
A	80+	East ADC	84	26%	44%	30%
B	50-79	West ADC	350	14	43	43
C	40-49	West ADC	160	12	46	42
		East ADC	159	16	52	32
D	20-19	West ADC	294	11	49	40
		East ADC	231	20	51	29
E	19 or less	East ADC	318	16	54	30

TABLE 78

SCALE OF OVERALL SATISFACTION WITH NEIGHBORHOOD
BY SIL 60 GROUP

Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Types of Scale 1 - Overall Satisfaction				
			0-4	5-6	0-6	7-8	9-10
A	80+	191	21%	10%	51%	16%	11%
B	50-79	461	12	31	43	42	15
C	40-49	424	13	24	37	43	20
D	20-30	830	7	23	30	44	26
E	19 or less	422	12	24	36	41	23

TABLE 79

SCALE OF OVERALL SATISFACTION WITH NEIGHBORHOOD
BY SIL 60 GROUP AND AIR BASE AREAS

Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Types of Scale 1 - Overall Satisfaction				
				0-4	5-6	0-6	7-8	9-10
A	80+	SAC	107	22%	33%	55%	35%	10%
		East ADC	84	25	27	52	36	12
B	50-79	SAC	111	14	29	43	41	16
		West ADC	350	14	42	56	32	12
C	40-49	SAC	105	24	32	56	37	7
		West ADC	160	7	23	30	44	26
		East ADC	159	11	22	33	46	21
D	20-39	SAC	305	7	26	33	42	25
		West ADC	294	5	18	23	48	29
		East ADC	231	9	27	36	42	22
E	19 or less	SAC	104	8	24	32	52	16
		East ADC	318	14	23	37	36	27

The tendency for overall satisfaction to increase as the duration of SIL 60 decreases is generally found valid when individual air base areas are evaluated in table 79. At the SAC areas, A shows less satisfaction than B, followed by D and E. Class C, however, is about the same as A. At the West ADC base areas, B reports less satisfaction than C which equals D. At the East ADC base, however, there are no significant differences.

9. Summary Relationships

The SIL-60 acoustic scale is the best of the three acoustic measures for rank ordering disturbance and annoyance responses. All three response variables—number of activities disturbed, frequency of activity disturbance, and annoyance—are directly correlated with the duration of SIL-60 noise. As the duration of speech interference levels increases, the disturbance and annoyance also increase. The best single response scale reflecting the greatest range of feelings is the combined disturbance and annoyance scale 7. The effectiveness

of the SIL-60 scale to rank order human responses is considered at a minimum in this particular study. As the air base area detail clearly shows, the responses would have shown greater SIL-60 differences, if the interviews at the three air bases had been distributed more proportionally among the acoustic classes. The sizable air base area differences in response and the unequal distribution of the interviews from each air base among the SIL-60 classes tend to minimize the variations in average response which are related to the SIL-60 series.

All four of the major intervening psychological variables—fear, base importance, base considerateness, and overall satisfaction with each local area—appear directly related to the SIL-60 index. The clearest relationships are reflected by the scales of fear and overall satisfaction. As the duration of SIL 60 increases the amount of fear of crashes and the overall dissatisfaction with living conditions in a neighborhood also increase. In the case of feelings of base importance and base considerateness, the overall tendency is for these variables to be greater when the duration of SIL 60 is greater. However, the differences by air base area and individual response are often more important than the SIL-60 grouping. Consequently, the overall relationship reflected by the inequalities of sample distributions among the three air base areas is not always consistent.

F. Evaluation of Sociopsychological Factors by SIL-60 Groups and Annoyance with Aircraft

In the previous sections, disturbance and annoyance responses have been analyzed in terms of three acoustic measures: volume of operations and peak SPL, equivalent continuous SPL, and SIL-60 groups. The latter has been found the most discriminating indicator of human responses. Consequently, it was decided to use the SIL-60 series as the primary acoustic variable in the more detailed phases of this analysis. While such human variables as fear, feelings of base importance and base considerateness, and overall satisfaction with living in an area have been compared with varying SIL-60 groups, the interrelationships with feelings of annoyance have had to be deduced from parallel rank ordering of these variables by the SIL-60 classes. In this section, direct comparisons are made for each SIL-60 class and annoyance group and each of the sociopsychological variables believed to have some influence on annoyance responses.

In order to avoid having very few observations in any primary analytical group, only four SIL-60 groups and three annoyance groups are used in the cross-tabulations. Even with only 12 primary groups, two of the most intense acoustic classes contain fewer than 50 interviews. If it were possible to separate the acoustic and annoyance groups into greater detail, the interrelationships would be even sharper. The acoustic groups are self-explanatory and the annoyance groups are as follows:

- a) Few-a little. Only listening disturbances annoy only a little.

b) Many-a little. From 2 to 5 activity disturbances annoy only a little.

c) Much annoyance. From 1 to 5 activity disturbances annoy more than a little or much.

1. Activities Disturbed

Tables 80 and 81 give us some greater insight into the relationships between the number and frequency of activities disturbed and each of the 12 analytical groups. The least annoyed class in the least intense SIL-60 group reports almost a fourth of all respondents have no annoyance and no disturbances at all, while the number for the most intense SIL-60 group is only half as large. Conversely, the least annoyed group has 16 percent of its members who report 4 to 5 disturbances, but, of course, these disturbances occur only occasionally.

TABLE 80

NUMBER OF ACTIVITIES DISTURBED BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Types of Scale 4 - Disturbance		
				0	1-3	4-5
A1	80+	Few a little	43	12%	72%	16%
A2		Many a little	47	0	49	51
A3		Much annoy	101	0	5	95
B1	50-79	Few a little	245	13	76	11
B2		Many a little	111	0	50	50
B3		Much annoy	105	0	8	92
C1	20-49	Few a little	721	18	76	6
C2		Many a little	308	0	62	38
C3		Much annoy	225	0	5	95
D1	19 or less	Few a little	272	24	71	5
D2		Many a little	90	0	60	40
D3		Much annoy	60	0	10	90
E1	Totals	Few a little	1281	18	75	7
F2		Many a little	556	0	58	42
F3		Much annoy	491	0	6	94

TABLE 81

FREQUENCY OF ACTIVITY DISTURBANCE BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Types of Scale 5 - Disturbance Frequency			
				0-2	3-5	6-7	8-10
A1	80+	Few a little	43	54%	37%	7%	2%
		Many a little	47	4	62	26	8
		Much annoy	101	0	12	24	64
B1	50-79	Few a little	245	54	40	5	1
		Many a little	111	6	59	29	6
		Much annoy	105	0	12	33	55
C1	20-49	Few a little	721	68	30	2	0
		Many a little	308	12	62	18	8
		Much annoy	225	0	18	31	49
D1	19 or less	Few a little	272	77	22	1	0
		Many a little	90	18	63	17	2
		Much annoy	60	0	23	43	34
E1	Totals	Few a little	1281	67	31	2	0
		Many a little	556	11	61	21	7
		Much annoy	491	0	16	32	52

The second most intense annoyance group also shows somewhat less disturbance when the duration of SIL 60 is reduced. While just more than half of all residents who experience 80 seconds or more of SIL-60 interference and who are annoyed a little with many disturbances report 4 to 5 disturbances, only 40 percent of the comparable annoyance group with less than 20 seconds of exposure report as much disturbance. The most annoyed group, however, is the most homogeneous and reports about the same number of activity interferences in all SIL-60 classes. Table 80 summarizes these data.

Table 81 shows the high correlation between frequency of disturbance and acoustic level and annoyance. Only 2 percent of all persons annoyed only a little by one activity report frequent disturbances, while 84 percent of the most annoyed group report frequent disturbances. Fewer frequent disturbances are required at the lower SIL-60 groups to produce much annoyance. While only

34 percent of all persons with much annoyance reported many frequent disturbances in the lowest SIL-60 class, almost two-thirds (64 percent) of the comparably annoyed group in the highest SIL-60 group reported many frequent disturbances. This general tendency for comparably annoyed persons in the more intense SIL-60 groups to report more activities frequently disturbed is also found to be valid in the other two annoyance groups. One can only speculate that this is a sign of adaptation, i. e., more disturbance is required to produce a comparable annoyance as the noise stimulus is increased in intensity.

2. Scale 12 - Complaint Potential

The next chapter analyzes in detail the dynamics of readiness to complain or the action potential. At this time, the overall relationships between annoyance, the noise level, and the complaint potential should be examined.

Table 82 presents these overall comparisons, showing that readiness to complain is directly related to annoyance levels. While two-thirds of all residents who are much annoyed are very ready to complain, only one out of five persons who are least annoyed are equally ready to complain. Likewise, almost half of all persons who are only annoyed a little with one activity disturbance refuse to support any complaint activity. The comparable "no complaint" group for the much annoyed is only 13 percent.

TABLE 82
SCALE OF COMPLAINT POTENTIAL BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Types of Scale 12 - Complaint Potential		
				0 None	1-2 Moderate	3-5 Most
A1	80+	Few - little	43	51%	30%	19%
A2		Many a little	47	26	38	36
A3		Much annoy	101	12	28	60
B1	50-79	Few - little	245	48	35	17
B2		Many a little	111	38	39	23
B3		Much annoy	105	21	16	63
C1	20-49	Few - little	721	46	34	20
C2		Many a little	308	26	32	42
C3		Much annoy	225	11	18	71
D1	19 or less	Few - little	272	5	36	28
D2		Many a little	90	24	33	43
D3		Much annoy	60	12	23	65
F1	Totals	Few - little	1281	45	34	21
F2		Many a little	556	28	34	38
F3		Much annoy	491	13	20	67

While annoyance rank orders the complaint potential consistently for each SIL-60 category, the biggest effect is in the lower two SIL groups. When the duration of SIL 60 is less than 50 seconds, an equally annoyed group of people appears to have a higher action potential than when the duration is longer and more intense. This tendency, already noted in connection with the discussion of frequency of activity interference, is valid in many other psychological variables. Apparently, the influence of moderating psychological factors appears to be greatest when the stimulus levels are moderate.

3. Scale 2 - Fear of Air Crashes

In previous discussions, fear of air crashes was found directly related to the intensity of the noise stimulus. As table 83 shows, however, these relationships are primarily due to the presence of more annoyance at the higher noise levels. When comparable annoyance groups are examined for each SIL-60 group, only relatively small differences are generally found among the stimulus categories. About 60 percent of all persons much annoyed with aircraft disturbances express much fear of crashes. In contrast, only 13 percent of the least annoyed feel as much fear. Some tendency for greater fear to exist in the more intense noise environments is found in the comparison of extreme situations. While the top three stimulus groups are not greatly different, the highest and lowest groups are significantly different. Almost two-thirds of all much annoyed in stimulus group A3 are much afraid of a crash, while comparable fear is expressed by only a little more than a third of the much annoyed in class D3.

TABLE 83

FEAR OF AIR CRASHES BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Types of Scale 2- Fear of Crashes		
				0 None	1 Moderate	2 Much
A1	80+	Few a little	43	21%	49%	30%
A2		Many a little	47	6	45	49
A3		Much annoy	101	5	71	64
B1	50-79	Few a little	245	31	56	13
B2		Many a little	111	20	57	23
B3		Much annoy	105	7	34	59
C1	20-49	Few a little	721	21	66	13
C2		Many a little	308	15	50	35
C3		Much annoy	225	6	37	57
D1	19 or less	Few a little	272	23	66	11
D2		Many a little	90	19	60	21
D3		Much annoy	60	6	57	37
F1	Totals	Few a little	1281	24	63	13
F2		Many a little	556	16	53	31
F3		Much annoy	491	6	37	57

TABLE 84

INDEX OF BASE IMPORTANCE BY SIL 60 GROUPS AND
ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Index 11 Groups- Base Importance		
				0-1 Little	2-3 Moderate	4-5 Most
A1	80+	Few a little	43	25%	40%	35%
A2		Many a little	47	34	40	26
A3		Much annoy	101	33	29	38
B1	50-79	Few a little	245	12	52	36
B2		Many a little	111	21	56	23
B3		Much annoy	105	24	43	33
C1	20-49	Few a little	721	22	49	29
C2		Many a little	308	37	38	25
C3		Much annoy	225	59	26	15
D1	19 or less	Few a little	272	42	40	18
D2		Many a little	90	43	41	16
D3		Much annoy	60	64	28	8
F1	Totals	Few a little	1281	24	48	28
F2		Many a little	556	34	42	24
F3		Much annoy	491	47	30	23

4. Base Importance

The "much annoyed" residents also feel the local air base is least important to their welfare. Almost half of all greatly annoyed residents feel the base is of little importance while only 24 percent of the least annoyed feel that way. In each SIL-60 class the tendency persists for the most annoyed persons to feel that the base is the least important. The biggest differences, however, are found in the less intense noise levels. Almost two-thirds of the "much annoyed" in class D3 feel the base is least important, while only one-third of the "much annoyed" in class A3 feel this way. Table 84 presents these comparisons as an Index of Base Importance, while comparable trends are noted in table 85, Scale of Base Importance.

In each interview, every respondent was asked, "If the United States should get into another war, which one of the Armed Services do you think would be most important in winning that war?" The answer to this question is

obviously related to our "base importance" variable. It reflects the overall importance of the Air Force compared to the other branches of the armed forces. As table 86 indicates, annoyance with aircraft noise does not affect the overall feelings about the Air Force as an institution of defense. When the size of each sample is considered, the differences in response are generally within sampling error. About half of all residents feel the Air Force is most important, while less than 10 percent favor another branch of the armed services.

TABLE 85

SCALE OF BASE IMPORTANCE BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Type of Scale 10- Base Importance		
				Little	Moderate	Most
A1	80+	Few a little	43	5%	42%	53%
A2		Many a little	47	6	43	51
A3		Much annoy	101	15	31	54
B1	50-79	Few a little	245	4	20	76
B2		Many a little	111	6	36	58
B3		Much annoy	105	13	26	61
C1	20-49	Few a little	721	8	34	58
C2		Many a little	308	17	36	47
C3		Much annoy	225	26	40	34
D1	19 or less	Few a little	272	16	51	33
D2		Many a little	90	15	47	38
D3		Much annoy	60	28	50	22
F1	Totals	Few a little	1281	9	35	56
E2		Many a little	556	14	38	48
E3		Much annoy	491	21	37	42

TABLE 86

RELATIVE IMPORTANCE OF AIR FORCE IN WINNING A WAR
BY SIL 60 GROUP AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Reported Relative Importance		
				Air Force Most	Other Branch Most	All Equal
A1	80+	Few a little	43	46%	12%	42%
A2		Many a little	47	60	8	32
A3		Much annoy	101	57	9	34
B1	50-79	Few a little	245	47	5	48
B2		Many a little	111	57	6	37
B3		Much annoy	105	42	5	53
C1	20-49	Few a little	721	46	6	48
C2		Many a little	308	54	5	41
C3		Much annoy	225	56	9	35
D1	19 or less	Few a little	272	58	7	35
D2		Many a little	90	60	12	28
D3		Much annoy	60	58	12	30
F1	Totals	Few a little	1281	49	6	45
E2		Many a little	556	56	7	37
E3		Much annoy	491	53	9	38

Another question asked in the survey, related to feelings of the importance of the military service, was: "Some people have said that the best way to stay out of war is to be so strong that no one would dare attack us. In general, how do you feel about this statement — Do you strongly agree, agree, disagree, or strongly disagree?" As table 87 indicates, very few people disagreed with this statement, but the less annoyed were a little firmer in their convictions. Again it will be noted that the biggest effect seems to be at the lowest SIL-60 group. About 42 percent of the least annoyed strongly agree while only 30 percent of the most annoyed feel the same way.

TABLE 87

EXTENT OF AGREEMENT WITH STATEMENT,
"BEST WAY TO STAY OUT OF WAR IS TO BE -- STRONG"
BY SIL 60 GROUP AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Extent of Agreement		
				Strongly Agree	Agree	Disagree
A1	80+	Few a little	43	40%	46%	14%
A2		Many a little	47	36	53	11
A3		Much annoy	101	41	38	21
B1	50-79	Few a little	245	55	33	12
B2		Many a little	111	40	49	11
B3		Much annoy	105	34	52	14
C1	20-49	Few a little	721	38	47	15
C2		Many a little	308	35	53	12
C3		Much annoy	225	39	41	20
D1	19 or less	Few a little	272	42	46	12
D2		Many a little	90	28	59	13
D3		Much annoy	60	30	53	17
F1	Totals	Few a little	1281	42	44	14
E2		Many a little	556	35	53	12
E3		Much annoy	491	37	44	19

5. Base Considerateness

The "much annoyed" residents consistently feel the base is less considerate of their welfare and could do more to reduce the disturbances. These findings are reflected in both the Index of Base Considerateness (table 88) and the general Scale of Air Force Considerateness (table 89). The index appears to be the more sensitive indicator and is used in the following more complicated analyses. Again the biggest differences in response occur in the lower SIL-60 classes. While 56 percent of the "much annoyed" feel the base is the least considerate, only 23 percent of the "least annoyed" in SIL-60 class C feel that way. The overall variation is 49 percent of the much annoyed versus 21 percent of the least annoyed who feel the base is least considerate.

TABLE 88

INDEX OF BASE CONSIDERATENESS BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Index 9 Groups- Base Considerateness		
				1-2 Least	3-4 Moderate	5 Most
A1	80+	Few a little	43	16%	47%	37%
A2		Many a little	47	30	47	23
A3		Much annoy	101	43	39	18
B1	50-79	Few a little	245	16	46	38
B2		Many a little	111	28	42	30
B3		Much annoy	105	45	38	17
C1	20-49	Few a little	721	23	49	28
C2		Many a little	308	45	41	14
C3		Much annoy	225	56	37	7
D1	19 or less	Few a little	272	22	49	29
D2		Many a little	90	41	47	12
D3		Much annoy	60	45	44	11
E1	Totals	Few a little	1281	21	48	31
F2		Many a little	556	40	42	18
F3		Much annoy	491	49	39	12

TABLE 89

SCALE OF AIR FORCE CONSIDERATENESS BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Types of Scale 14- Air Force Considerateness		
				0-1 Least	2-3 Moderate	4-5 Most
A1	80+	Few a little	43	28%	28%	44%
A2		Many a little	47	34	34	32
A3		Much annoy	101	31	38	31
B1	50-79	Few a little	245	33	36	31
B2		Many a little	111	31	39	30
B3		Much annoy	105	42	32	26
C1	20-49	Few a little	721	30	41	29
C2		Many a little	308	40	33	27
C3		Much annoy	225	60	23	17
D1	19 or less	Few a little	272	31	45	24
D2		Many a little	90	42	39	19
D3		Much annoy	60	50	32	18
E1	Totals	Few a little	1281	30	41	29
F2		Many a little	556	38	34	27
F3		Much annoy	491	49	29	22

6. Scale 1 - Overall Satisfaction with Neighborhood

The strong relationship between annoyance with airplanes and overall satisfaction with living in an area is apparent in table 90. While 29 percent of all "least annoyed" persons are satisfied with 9 to 10 of the residential criteria in their neighborhoods, only 7 percent of the "much annoyed" feel as favorable. On looking at the other side, 57 percent of the "much annoyed" are satisfied with only 0 to 6 categories, while only 27 percent of the least annoyed report as little satisfaction. The biggest differences are reported in SIL-60 classes A and C.

7. Annoyance with Noise of Cars and Trucks

People differ in their ability to tolerate intense noise. In an earlier study of civilian propeller noise, people annoyed by airplane noise also tend to be more annoyed by other noises. Table 91 tends to substantiate this earlier observation with respect to traffic noise. Almost half of all "least annoyed" (with aircraft) report they never hear cars and trucks go by. Another third who do hear them state they are never bothered or annoyed. Adding these two groups together, the total not bothered by traffic noise amounts to 84 percent compared

to 62 percent for the comparable "much annoyed" group. Of the extreme noise tolerance group reporting little aircraft annoyance with only listening activities when the duration of SIL 60 is 80 seconds or more, 98 percent are never bothered by traffic noise as compared to 76 percent of the "much annoyed" group living in the same environments.

TABLE 90

SCALE OF OVERALL SATISFACTION WITH NEIGHBORHOOD
BY SIL 60 GROUPS AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Types of Scale 1- Overall Satisfaction		
				0-6	7-9	10
A1	80+	Few a little	43	10%	40%	30%
A2		Many a little	47	58	38	4
A3		Much annoy	101	60	34	5
B1	50-79	Few a little	245	31	46	23
B2		Many a little	111	52	39	7
B3		Much annoy	105	61	34	3
C1	20-49	Few a little	721	25	45	30
C2		Many a little	308	36	45	19
C3		Much annoy	225	54	37	9
D1	19 or less	Few a little	272	29	38	33
D2		Many a little	90	42	51	7
D3		Much annoy	60	55	37	8
E1	Totals	Few a little	1281	27	44	29
E2		Many a little	556	42	44	14
E3		Much annoy	491	57	36	7

TABLE 91

ANNOYANCE WITH NOISE OF CARS AND TRUCKS
BY SIL 60 GROUPS AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Annoyance with Cars and Trucks			
				Never Hear	No Annoy	Little Annoy	Much Annoy
A1	80+	Few a little	43	54%	44%	2%	0%
A2		Many a little	47	49	21	13	17
A3		Much annoy	101	51	25	13	11
B1	50-79	Few a little	245	54	34	10	2
B2		Many a little	111	51	31	13	5
B3		Much annoy	105	36	32	15	15
C1	20-49	Few a little	721	49	35	10	6
C2		Many a little	308	51	18	21	10
C3		Much annoy	225	34	15	19	20
D1	19 or less	Few a little	272	43	36	11	10
D2		Many a little	90	50	10	20	12
D3		Much annoy	60	37	17	23	23
E1	Totals	Few a little	1281	49	35	10	6
E2		Many a little	556	46	21	18	15
E3		Much annoy	491	39	23	17	21

Another interesting observation is the comparison of annoyance with airplanes and cars and trucks. While only 10 percent of all persons in the most intense airplane noise environment (class A) are much disturbed by street traffic noise, 53 percent are much bothered by airplane noise.

8. Length of Exposure to Aircraft Stimulus

Will people learn to accept aircraft noise as an inevitable evil, given enough time? Are people who have been exposed to aircraft noise over a longer period of time more tolerant of the noise than people who more recently moved into an area? The answers to these questions have puzzled and challenged responsible government and civilian officials. It would be so convenient to be able to say "yes" to these questions and then sit back while the annoyance problem solves itself with time. Unfortunately, there is no evidence that would tend to support the above wishful thinking. In fact, all available information contradicts this hypothesis.

Table 92 summarizes the average time patterns of exposure to the aircraft noise. It indicates the percentages of all residents in a stimulus-annoyance group who are usually at home during the four time periods of the day. The data indicate no significant differences in exposure for the three annoyance groups. If the above hypothesis were valid then the least annoyed should report greater exposure. In fact, the opposite tendency is noted. In the case of SIL-60 classes B and D, the "much annoyed" report somewhat greater exposure, but the differences are small enough to be attributable to chance variations. Likewise, the opposite tendency noted during morning and afternoon hours in class A is not statistically significant.

TABLE 92

TIME EXPOSED TO AIRCRAFT IN NEIGHBORHOOD
BY SIL 60 GROUPS AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Percent Residents Usually at Home			
				Morning	Afternoon	Evening	Night
A1	80+	Few + little	43	63%	60%	84%	91%
A2		Many + little	47	55	60	92	98
A3		Much annoy	101	57	55	91	96
B1	50-79	Few + little	245	67	65	92	94
B2		Many + little	111	60	58	92	99
B3		Much annoy	105	76	68	90	91
C1	20-49	Few + little	721	68	64	91	95
C2		Many + little	308	69	69	96	96
C3		Much annoy	225	69	67	90	94
D1	10 or less	Few + little	272	48	58	92	95
D2		Many + little	90	73	68	93	97
D3		Much annoy	60	67	65	97	100
E1	Totals	Few + little	1281	66	63	91	95
E2		Many + little	556	67	66	92	97
E3		Much annoy	491	68	65	91	96

TABLE 93

LENGTH OF RESIDENCE IN NEIGHBORHOOD BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Number of Years Residence				
				<1	1-3	3-6	6-10	>10
A1	80+	Few + little	43	9%	23%	33%	30%	5%
A2		Many + little	47	13	11	40	36	-
A3		Much annoy	101	9	13	46	27	5
B1	50-79	Few + little	245	27	26	19	11	17
B2		Many + little	111	19	26	25	15	15
B3		Much annoy	105	19	25	26	10	20
C1	20-49	Few + little	721	14	16	25	16	29
C2		Many + little	308	14	14	25	21	22
C3		Much annoy	225	9	16	27	26	22
D1	10 or less	Few + little	272	12	18	27	24	19
D2		Many + little	90	13	16	23	29	19
D3		Much annoy	60	12	12	26	27	23
E1	Totals	Few + little	1281	16	18	24	18	24
E2		Many + little	556	15	19	26	22	18
E3		Much annoy	491	11	17	31	23	18

Another test of the "time heals all" thesis is seen in table 93 which shows length of residence of respondents. The data again appears to refute the hypothesis. No real significant differences are noted. While 6 percent more of the least annoyed report living in their areas 10 or more years, an almost equal and offsetting number of "much annoyed" report living there from 6 to 10 years.* Since large scale Air Force operations are less than 10 years old at these air bases, these two time periods should be combined. If anything, it appears as if the "least disturbed" have lived near the air base a shorter period of time. About 34 percent have lived there only three years or less, as compared to 28 percent of the "much annoyed." When individual SIL-60 classes are examined, the same tendencies are noted in all cases. It appears as if the opposite hypothesis could be established: if anything, greater annoyance results from longer exposure to the aircraft stimulus. In order to test this latter thesis more fully, however, it would be necessary to examine some of the key psychological attitudes of each group of residents by their length of residence. The gross differences observed in table 93 may not be only a function of length of exposure, but rather an interrelationship of time and other psychological variables. More detailed analyses were not possible due to the small sizes of sample groups.

9. Respondents' Experience with Flying

While the differences are not large, greater and more recent personal experiences with flying in airplanes tends to be associated with less annoyance. As table 94 shows, 43 percent of the "much annoyed" never flew in an airplane as compared to only 37 percent of the "least annoyed." Moreover, a greater percentage of the "least annoyed" flew more often and more recently. These same patterns are present in all SIL-60 classes with the greatest differences

* Practically all of this difference is due to the relationships noted in class C and the large number of interviews in this category.

observed in the lower SIL-60 groups. Almost 60 percent of the "much annoyed" in SIL-60 class D have never flown as compared to only 45 percent for the "least annoyed" living in the same neighborhoods.

TABLE 94

RESPONDENTS' EXPERIENCES WITH FLYING BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Number Flights			Time Last Flight (Years)		
				0	1-4	5+	0-1	1-3	4+
A1	80+	Few a little	43	44%	37%	19%	49%	7%	0%
A2		Many a little	47	30	43	27	40	11	19
A3		Much annoy	101	39	38	23	42	9	10
B1	50-79	Few a little	245	28	37	35	31	17	24
B2		Many a little	111	27	42	31	37	12	24
B3		Much annoy	105	35	40	29	36	12	17
C1	20-49	Few a little	721	32	37	25	34	1	14
C2		Many a little	308	44	35	21	33	9	14
C3		Much annoy	225	43	35	14	21	13	23
D1	19 or less	Few a little	272	45	34	21	26	8	21
D2		Many a little	90	48	42	10	28	8	16
D3		Much annoy	60	50	32	10	17	8	17
E1	Totals	Few a little	1281	37	37	26	32	13	18
E2		Many a little	556	40	39	21	34	10	16
E3		Much annoy	491	43	36	21	28	11	18

* Less than 0.5.

TABLE 95

RESPONDENTS' DIRECT CONNECTIONS WITH AIR BASE
BY SIL 60 GROUPS AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Connection with Base			
				None	In or Work for AF	Do Bus. with Base	Work for Firm Does Bus. with Base
A1	80+	Few a little	47	86%	0%	5%	9%
A2		Many a little	47	83	2	2	13
A3		Much annoy	101	80	1	3	16
B1	50-79	Few a little	245	77	10	5	18
B2		Many a little	111	78	3	5	14
B3		Much annoy	105	83	0	4	13
C1	20-49	Few a little	721	81	3	3	13
C2		Many a little	308	87	0	5	8
C3		Much annoy	225	78	0	6	16
D1	19 or less	Few a little	272	75	3	5	17
D2		Many a little	90	35	0	4	11
D3		Much annoy	60	84	2	5	7
E1	Totals	Few a little	1281	77	4	4	13
E2		Many a little	556	84	1	5	10
E3		Much annoy	491	79	1	5	15

10. Respondents' Direct Connections with the Air Base

To what extent does personal involvement and personal economic benefits derived from spending by the base and its personnel affect annoyance with aircraft? Table 95 offers some clues on this problem. The differences are small, but the tendency is for the "much annoyed" to have less direct benefits from the base operations. In all but the most intense SIL-60 exposures, the percentage of residents having no connections with the air base is greater for the "much annoyed" group. At the latter group the differences are too small to be significant.

Two further observations should be made. First, about 8 out of every 10 residents had no connection or direct economic benefit from the base operation, and, consequently, this factor could not be very important in the overall picture. Second, the biggest effect again is observed in the lowest SIL-60 class.

A more detailed picture of the respondent's present and past connections with the military services is presented in table 96. All persons were asked, "Have you ever been a member or worked for one of the military services?" As table 96 shows, slightly more "much annoyed" have had no connections, fewer current connections, and fewer Air Force affiliations than the less annoyed groups. The biggest differences are again found in the lower SIL-60 classes.

11. Personal Variables

Annoyance does not vary greatly by the typical personal variables of age, sex, occupation, income, etc. The differences are always small and generally due to chance. There is some tendency, however, for more of the

TABLE 96

RESPONDENTS' CONNECTIONS WITH MILITARY BRANCHES
BY SIL-60 GROUPS AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number Inter- views	Connection with Military						
				Never Present			Past			
				Any	A. F.	Other	Total	A. F.	Other	Total
A1	80+	Few a little	43	51%	0%	2%	2%	2%	45%	47%
A2		Many a little	47	47	2	4	6	2	45	47
A3		Much annoy	101	57	1	0	1	1	41	42
B1	50-79	Few a little	245	47	10	9	19	2	32	34
B2		Many a little	111	62	3	10	13	1	24	25
B3		Much annoy	105	34	0	7	7	0	29	29
C1	20-49	Few a little	721	58	3	4	7	4	31	35
C2		Many a little	308	64	0	3	3	3	30	33
C3		Much annoy	225	64	0	2	2	5	29	34
D1	19 or less	Few a little	272	66	3	1	4	3	27	30
D2		Many a little	90	72	0	0	0	3	25	28
D3		Much annoy	60	72	2	0	1	2	24	26
F1	Totals	Few a little	1281	56	4	5	9	3	30	33
F2		Many a little	556	63	1	4	5	2	30	32
F3		Much annoy	491	63	1	2	3	3	31	34

* Less than 0.5 percent.

"least annoyed" to be 60 years old or more, to have more education, and to live in smaller family groups without any children. Details of these personal characteristics are presented in tables 97 to 104.

TABLE 97

SEX AND AGE OF RESPONDENTS BY SIL-60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number Inter- views	Sex		Age				
				Female	Male	<30	30-39	40-59	60+ ^a	INA ^a
A1	80+	Few a little	43	54%	46%	12%	53%	23%	12%	0%
A2		Many a little	47	49	51	26	43	28	2	1
A3		Much annoy	101	51	49	26	47	24	3	0
B1	50-79	Few a little	245	47	53	28	33	26	11	2
B2		Many a little	111	47	53	30	20	38	12	0
B3		Much annoy	105	57	43	24	26	34	13	3
C1	20-49	Few a little	721	49	51	22	27	33	16	2
C2		Many a little	308	55	45	23	31	29	16	1
C3		Much annoy	225	52	48	20	38	30	10	2
D1	19 or less	Few a little	272	49	51	27	31	32	10	0
D2		Many a little	90	53	47	28	29	36	7	0
D3		Much annoy	60	57	43	30	30	30	7	3
F1	Totals	Few a little	1281	49	51	24	30	31	14	1
F2		Many a little	556	52	48	25	29	32	13	1
F3		Much annoy	491	53	47	23	36	30	9	2

^aINA - Information Not Available.

TABLE 98

COMPOSITION OF HOUSEHOLD BY SIL-60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number Inter- views	Type Family Group			
				Respondent Alone	2/More Adults Only	Children Under 18	Children 64 Years or Over
A1	80+	Few a little	43	7%	26%	16%	51%
A2		Many a little	47	2	24	21	53
A3		Much annoy	101	0	14	33	53
B1	50-79	Few a little	245	3	28	22	47
B2		Many a little	111	6	33	24	37
B3		Much annoy	105	7	36	17	40
C1	20-49	Few a little	721	6	34	26	34
C2		Many a little	308	5	29	29	37
C3		Much annoy	225	3	29	28	40
D1	19 or less	Few a little	272	3	28	25	44
D2		Many a little	90	0	27	30	43
D3		Much annoy	60	0	32	25	43
E1	Totals	Few a little	1281	5	31	25	39
E2		Many a little	556	4	29	27	40
E3		Much annoy	491	3	28	26	43

TABLE 99

NUMBER OF PERSONS LIVING IN EACH HOUSEHOLD
BY SIL-60 GROUPS AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Number of Persons in Household			
				1-2	3	4	5+
A1	80+	Few a little	43	28%	12%	28%	32%
A2		Many a little	47	21	26	23	30
A3		Much annoy	101	11	26	35	28
B1	50-79	Few a little	245	27	22	28	23
B2		Many a little	111	36	18	25	21
B3		Much annoy	105	40	14	26	20
C1	20-49	Few a little	721	37	22	20	21
C2		Many a little	308	29	21	26	24
C3		Much annoy	225	24	22	24	30
D1	19 or less	Few a little	272	23	30	26	21
D2		Many a little	90	21	34	26	19
D3		Much annoy	60	26	27	22	25
F1	Totals	Few a little	1281	32	21	21	22
F2		Many a little	556	28	21	26	21
F3		Much annoy	491	25	22	26	27

TABLE 100

EDUCATIONAL EDUCATION OF RESPONDENTS BY SIL-60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Education Level		
				Grade School	High School	College
A1	80+	Few a little	43	23%	56%	21%
A2		Many a little	47	15	66	19
A3		Much annoy	101	9	74	17
B1	50-79	Few a little	245	16	58	26
B2		Many a little	111	21	58	21
B3		Much annoy	105	19	62	19
C1	20-49	Few a little	721	21	56	23
C2		Many a little	308	15	62	23
C3		Much annoy	225	16	64	20
D1	19 or less	Few a little	272	15	65	20
D2		Many a little	90	11	68	21
D3		Much annoy	60	20	70	10
F1	Totals	Few a little	1281	19	58	23
F2		Many a little	556	15	63	22
F3		Much annoy	491	16	66	18

TABLE 101

**RESPONDENTS' OCCUPATIONS BY SIL 60 GROUP
AND ANNOYANCE WITH AIRCRAFT**

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Profes- sional and Proprietor	Clerical and Sales	Skilled Crafts	Operative and Service	Laborer	Not at Work
A1	80+	Few a little	43	9%	16%	10%	16%	2%	47%
A2		Many a little	47	17	6	13	24	2	38
A3		Much annoy	101	15	16	13	12	0	44
B1	50-79	Few a little	245	20	5	10	16	2	47
B2		Many a little	111	15	9	11	19	1	45
B3		Much annoy	105	12	6	12	14	0	56
C1	20-49	Few a little	721	15	9	14	17	2	43
C2		Many a little	308	17	8	8	14	2	51
C3		Much annoy	225	16	9	12	12	2	46
D1	19 or less	Few a little	272	18	10	15	16	1	40
D2		Many a little	90	17	12	16	8	2	45
D3		Much annoy	60	10	10	17	10	2	43
E1	Totals	Few a little	1281	16	9	13	16	2	44
E2		Many a little	556	16	9	10	14	2	48
E3		Much annoy	451	14	9	13	13	2	49

TABLE 102

**MAIN EARNERS' OCCUPATIONS BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT**

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Profes- sional and Proprietor	Clerical and Sales	Skilled Crafts	Operative and Service	Laborer	Not at Work
A1	80+	Few a little	43	26%	9%	10%	28%	5%	12%
A2		Many a little	47	34	8	26	28	2	2
A3		Much annoy	101	26	25	27	10	1	3
B1	50-79	Few a little	245	32	6	24	29	2	7
B2		Many a little	111	19	13	20	35	4	9
B3		Much annoy	105	27	10	24	27	1	11
C1	20-49	Few a little	721	27	10	22	27	3	11
C2		Many a little	308	30	10	23	24	3	10
C3		Much annoy	225	27	14	25	24	5	5
D1	19 or less	Few a little	272	27	11	33	23	1	5
D2		Many a little	90	23	16	35	10	3	6
D3		Much annoy	60	20	12	32	27	3	6
E1	Totals	Few a little	1281	28	10	24	27	2	9
E2		Many a little	556	27	12	24	26	3	8
E3		Much annoy	491	26	15	26	24	3	6

TABLE 103

**FAMILY INCOME BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT**

Class	Duration SIL-60 db (Seconds per Hour)	Annoyance Scale	Number of Interviews	Annual Family Income (Thousands of Dollars)				
				<4	4-6	6-10	>10	INA *
A1	80+	Few a little	43	19%	56%	23%	0%	2%
A2		Many a little	47	19	45	28	2	6
A3		Much annoy	101	18	48	32	1	1
B1	50-79	Few a little	245	33	38	24	3	2
B2		Many a little	111	41	30	27	2	0
B3		Much annoy	105	32	38	23	5	2
C1	20-49	Few a little	721	28	40	25	3	4
C2		Many a little	308	30	38	24	4	4
C3		Much annoy	225	20	36	33	6	5
D1	19 or less	Few a little	272	14	45	29	5	7
D2		Many a little	90	21	33	37	1	8
D3		Much annoy	60	12	50	30	5	3
E1	Totals	Few a little	1281	26	41	26	3	4
E2		Many a little	556	30	36	27	3	4
E3		Much annoy	491	21	41	30	5	3

* INA - Information Not Available.

TABLE 104

MONTHLY RENT OR MARKET VALUE OF HOME
OWNED BY RESPONDENT BY SIL 60 GROUPS
AND ANNOYANCE WITH AIRCRAFT

Class	Duration SIL-60 db (Seconds per hour)	Annoyance scale	Number of Interviews	Monthly Rentals (Dollars)				Market Value (Thousands Dollars)				INA*
				<80	80- 99	100+	Total	<12	12- 16	16+	Total	
A1	80+	Few a little	43	5%	5%	5%	15%	65%	14%	10%	79%	6%
A2		Many a little	47	2	2	11	15	81	2	0	83	2
A3		Much annoy	101	2	6	3	11	79	8	0	87	2
B1	50-79	Few a little	245	12	8	10	30	36	16	16	68	2
B2		Many a little	111	16	8	5	29	45	13	13	71	0
B3		Much annoy	105	13	11	16	40	42	9	7	58	2
C1	20-49	Few a little	721	7	6	9	22	47	21	8	76	2
C2		Many a little	338	8	4	6	18	53	19	9	81	1
C3		Much annoy	225	5	3	5	13	45	30	10	85	2
D1	10 or less	Few a little	272	7	11	13	31	43	19	6	68	1
D2		Many a little	90	10	9	11	30	43	20	6	69	1
D3		Much annoy	60	2	10	12	24	53	20	3	76	0
E1	Totals	Few a little	1281	3	8	9	25	45	19	8	73	2
E2		Many a little	556	9	5	7	21	52	17	7	76	1
E3		Much annoy	491	6	6	8	20	53	19	7	79	1

* Information not available

12. Summary of Relationships

Annoyance with aircraft disturbance is highly correlated with a number of sociopsychological attitudes. These relationships are not always equal for all aircraft noise levels. For many of the key psychological variables there is strong evidence that the greatest effects of these attitudinal factors are in the lower noise exposure levels where the possibilities for accommodating noise interference may also be greater. More specifically, greater annoyance appears to be directly related to greater activity interference, greater fear, feelings that the base is less important and less considerate of the local welfare, and less overall satisfaction with living conditions in an area. Persons with greater annoyance with aircraft are also more often bothered by auto and truck traffic noises, although reports of aircraft annoyance are five times greater than traffic noise disturbance in the more intense airplane noise exposures. The "much annoyed" also have fewer and less recent personal flying experiences and less direct involvement or economic benefits from the air base operations. While the differences are small, there is no evidence that annoyance decreases over longer periods of exposure. If anything, the tendency is for annoyance to be greater for persons exposed to the noise longer. Personal differences due to age, sex, income, education, occupation, etc., are very small and not too significant. The "least annoyed" do tend to be somewhat older, have more education, and have smaller family units without any children. Finally, as expected, the "more annoyed" are more ready to complain to the authorities. More will be said of the latter relationship in the next chapter.

G. Evaluation of Sociopsychological Factors by Combined Scale of Annoyance and Disturbance

In section F, many of the sociopsychological variables were highly correlated with the annoyance scale. Because of the relatively small number of interviews available in each analytical group when noise level and annoyance

were simultaneously evaluated, the number of annoyance classes was reduced to only three. Since the greatest variability is between the attitudinal factors and feelings of annoyance, it is now possible to combine all SIL-60 groups and evaluate annoyance responses in greater detail. Since the combination of number of activities disturbed and relative annoyance (scale 7) has been found the most sensitive measure of annoyance responses, it will be used in the further analysis of annoyance and disturbance.

1. Scales 4 and 5 - Activity Disturbance

Table 105 indicates that in the "least disturbance group" about 40 percent report no disturbance and 60 percent report only one disturbance. It also shows how the second group of "moderate disturbance" reflects 2 to 3 activity interferences and the third group of "most disturbed" represents reports of 4 to 5 disturbances.

TABLE 105
NUMBER OF ACTIVITIES DISTURBED BY
ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Types of Scale 4 - Disturbance		
			0	1-3	4-5
Little	A little	420	38%	62%	0%
	Much	170	41	59	0
Moderate	A little	545	0	100	0
	Much	405	0	100	0
Most	A little	379	0	0	100
	Much	409	0	0	100

TABLE 106
FREQUENCY OF ACTIVITY DISTURBANCE BY
ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Type of Scale 5 - Disturbance Frequency			
			0-2 Few Occas.	3-5 Many Occas.	6-7 Few Freq.	8-10 Many Freq.
Little	A little	420	100%	0%	0%	0%
	Much	170	100	0	0	0
Moderate	A little	545	44	54	2	0
	Much	405	21	69	10	0
Most	A little	379	0	48	34	18
	Much	409	0	14	31	55

Table 106 shows the direct relationship between relative annoyance and frequency of disturbance. The "little disturbance" group reflects only occasional disturbance of listening. The "moderate" disturbance class also reflects mostly occasional interference but more than half are with 3 to 5 activities. Lastly, the group with the most disturbance (4 to 5 activities) which is only a little annoyed reports mostly many occasional or a few frequent disturbances. The greatly annoyed group, on the other hand, indicates that 86 percent have frequent disruption of many activities. It can be seen that there is a consistent relationship between the frequency of disturbance and the intensity of annoyance as reflected in the six categories of scale 7.

2. Scale 12 - Action Potential

There is an almost perfect relationship between readiness to act and degree of annoyance. As shown in table 107, the "much annoyed" always has a greater action potential than the "little annoyed," and the highest action readiness is reported by 67 percent of the most disturbed. In contrast, only 20 percent report the same potential in the least annoyed group.

TABLE 107

SCALE OF ACTION POTENTIAL BY
ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Types of Scale 12- Action Potential		
			0 None	1-2 Moderate	3-5 Most
Little	A little	420	51%	29%	20%
	Much	170	39	29	32
Moderate	A little	545	43	40	17
	Much	405	28	32	40
Most	A little	379	30	33	37
	Much	409	12	21	67

TABLE 108

FEAR OF AIR CRASHES BY ANNOYANCES
AND DISTURBANCE GROUP

Disturbance	Annoyance	Number of Interviews	Types of Scale 2 - Fear of Crashes		
			0 None	1 Moderate	2 Much
Little	A little	420	24%	68%	8%
	Much	170	23	64	13
Moderate	A little	545	25	62	13
	Much	405	13	56	31
Most	A little	379	17	47	36
	Much	409	6	38	56

3. Scale 2 - Fear of Air Crashes

The close relationship between fear of air crashes and annoyance can be seen in table 108. Over half of the most annoyed also report "much fear," while less than 10 percent of the "least annoyed" report as much fear. Likewise, at each level of disturbance, the "much annoyed" always report considerably more fear than the "little annoyed."

4. Base Importance

The close relationship between feelings of base importance and annoyance is best seen in the comparison of responses that the base is "least important." Almost half of the most annoyed feel their base is of very little importance to the local welfare as compared to 20 percent of the least annoyed group. As table 109 shows, the much annoyed consistently feel the base is less important, and, as disturbance increases, this negative feeling also increases.

Specific feelings of annoyance with local base operations do not appear to affect general feelings about the importance of the Air Force as an arm of defense or of the importance of a strong national defense policy. Tables 110 and 111 show only small differences between disturbance and annoyance groups. If anything, the tendency is for the more annoyed to recognize the Air Force as most important to our winning another war. On the other hand, the less annoyed tend to feel a little more strongly that "the best way to stay out of war is to be strong."

5. Air Force Considerateness

As Table 112 shows, feelings of base considerateness are closely related to degree of annoyance. The more annoyed always feel the base is less considerate and, as the amount of disturbance increases, the negative feelings of base considerateness also grow. Over half of the most annoyed feel the base is least considerate.

6. Scale 1 - Overall Satisfaction with Neighborhood

As expected, the "most annoyed" with airplane disturbances are least satisfied with overall living conditions in their areas. The more annoyed consistently are satisfied with fewer aspects of living in their neighborhood and, as

disturbance increases, the dissatisfaction also increases. In the most annoyed group, 22 percent are satisfied with only as many as 4 of the 10 residential criteria, while, in the least annoyed group, only 5 percent are as little satisfied with their neighborhoods. If the cumulative total of satisfaction with up to 6 of the 10 criteria is considered the extent of favorable attitudes toward non-aircraft conditions, then the full impact of overall satisfaction is seen. The most annoyed report that almost 60 percent are satisfied with only as many as 6 neighborhood conditions, while the least annoyed report only 23 percent with so little satisfaction.

TABLE 109

INDEX OF BASE IMPORTANCE BY ANNOYANCE
AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Index 11 Groups - Base Importance		
			0-1 Little	2-3 Moderate	4-5 Most
Little	A little	420	20%	40%	32%
	Much	170	31	41	28
Moderate	A little	545	24	47	29
	Much	405	34	43	23
Most	A little	379	35	43	22
	Much	409	47	31	22

TABLE 111

EXTENT OF AGREEMENT WITH STATEMENT
"BEST WAY TO STAY OUT OF WAR IS TO BE ---
STRONG" BY ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Extent of Agreement		
			Strongly Agree	Agree	Disagree
Little	A little	420	41%	44%	15%
	Much	170	35	50	15
Moderate	A little	545	43	43	14
	Much	405	37	50	13
Most	A little	379	36	54	10
	Much	409	38	43	19

TABLE 110

RELATIVE IMPORTANCE OF AIR FORCE
IN WINNING A WAR BY ANNOYANCE
AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Reported Relative Importance Group		
			Air Force Most	Other Branch Most	All Equal
Little	A little	420	50%	4%	16%
	Much	170	48	8	44
Moderate	A little	545	48	6	46
	Much	405	57	8	35
Most	A little	379	56	8	36
	Much	409	52	7	41

TABLE 112

INDEX OF BASE CONSIDERATENESS BY
ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Index 9 Groups - Base Considerateness		
			1-2 Least	3-4 Moderate	5 Most
Little	A little	420	17%	49%	34%
	Much	170	29	51	20
Moderate	A little	545	22	48	30
	Much	405	38	42	20
Most	A little	379	34	46	20
	Much	409	51	38	11

7. Annoyance with Traffic Noise

As noted before, there appears to be a general factor of noise tolerance. Those persons most annoyed with airplane noise also are most annoyed with traffic noise. The relationship is found in every annoyance comparison of table 114. Only 6 percent of the least annoyed are much bothered by traffic noise, while 22 percent of the most annoyed with airplanes also are much bothered by traffic.

TABLE 113

SCALE OF OVERALL SATISFACTION WITH NEIGHBORHOOD
BY ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Types of Scale 1 - Overall Satisfaction					
			0-2	3-4	5-6	Total 0-6	7-8	9-10
Little	A little	420	1%	4%	18%	23%	39%	38%
	Much	170	0	5	25	30	51	19
Moderate	A little	545	1	4	21	26	46	28
	Much	405	3	12	28	43	42	15
Most	A little	379	3	9	29	41	45	14
	Much	409	4	18	35	57	35	8

TABLE 114

ANNOYANCE WITH NOISE OF CARS AND TRUCKS
BY ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Annoyance With Cars & Trucks			
			Never Hear	No Annoy	Little Annoy	Much Annoy
Little	A little	420	52%	34%	8%	6%
	Much	170	45	31	13	11
Moderate	A little	545	48	38	9	5
	Much	405	50	21	16	13
Most	A little	379	38	29	20	11
	Much	409	42	19	17	22

8. The Effect of Background Noise

An interesting comparison of the effect of daytime background noise on reports of frequency of disturbance should be reported at this time. At the SAC base, the acoustic engineers measured the background noise as well as the airplane noise at each of the neighborhoods. Insufficient time and funds prevented similar background noise measurements at the ADC bases.

All residents living under comparable aircraft noise conditions were divided into roughly equal noisy and quiet background noise groups. Reports of disturbance by aircraft noise could then be compared and the effects of background noise ascertained. Theoretically, aircraft noise should stand out more (emerge) in quiet background areas than in noisy areas. As table 115 shows there is no evidence of greater disturbance in quiet background areas. In 5 of the 7 neighborhoods, the tendency was for the opposite effect to be noted, greater disturbance in noisy areas. In neighborhood 3, the difference is significant at the 5 percent level. In the other areas, the differences are too small to be statistically significant.

TABLE 115
COMPARISON OF REPORTS OF AIRCRAFT DISTURBANCES
AT SAC NEIGHBORHOODS WITH EQUAL AIRCRAFT NOISE
BUT DIFFERENT BACKGROUND NOISE

SAC Neighborhood	Number of Interviews Quiet Noisy		Types of Scale 5 - Frequency of Disturbance							
			0-2 Few Occas.		3-5 Many Occas.		6-7 Few Freq.		8-10 Many Freq.	
			Quiet	Noisy	Quiet	Noisy	Quiet	Noisy	Quiet	Noisy
1	10	97	0%	10%	20%	22%	20%	22%	60%	46%
2	42	69	14	14	40	38	24	19	22	29
3	31	73	35	23	52	36	10	21	5	20
4	26	76	38	21	42	46	12	17	8	16
5	19	88	53	48	37	41	10	9	0	2
6	66	10	85	67	11	23	3	10	1	0
7	27	77	56	58	26	32	15	7	3	3

9. Exposure to Aircraft Stimulus

The length of exposure does not appear to have any significant effect on feelings of disturbance and annoyance. As table 116 shows, there are no differences in evening and night hours and only small variations during morning and afternoon periods. Table 117 also shows no great variation of annoyance by length of residence.

TABLE 116
TIME EXPOSED TO AIRCRAFT IN NEIGHBORHOOD
BY ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Percent of Residents Usually at Home			
			Morning	Afternoon	Evening	Night
Little	A little	420	64%	99%	88%	94%
	Much	170	64	59	88	92
Moderate	A little	545	67	67	94	96
	Much	405	62	62	94	96
Most	A little	379	73	70	93	96
	Much	409	68	64	92	96

TABLE 117
LENGTH OF RESIDENCE IN NEIGHBORHOOD BY
ANNOYANCE AND DISTURBANCE GROUP

Disturbance	Annoyance	Number of Interviews	Number of Years Residence			
			<1	1-3	3-6	>6
Little	A little	420	17%	18%	26%	39%
	Much	170	22	16	28	34
Moderate	A little	545	15	19	23	43
	Much	405	18	18	24	40
Most	A little	379	10	20	27	43
	Much	409	10	17	32	41

This failure of annoyance to fade away automatically with the passage of time is a confirmation of an earlier finding reported in the NACA propeller

noise study. One of the suggested reasons for this persistence of annoyance is the special role of fear in the airplane noise environment.

Since trolleys, trucks, and trains pass over a fixed track or road, and the average sound level of traffic noise does not vary greatly from day to day, the meaning and source of traffic noise is easily recognized and does not require conscious identification with each occurrence. After a prolonged period of exposure to traffic noise a person can often push the awareness of the noise into the background of his consciousness and actually function as if the noise didn't exist.

Airplane noise, on the other hand, generally fluctuates more widely from one flight to another, depending on such factors as the type and weight of the plane, pilot technique, weather conditions, air speed, altitude, etc. People know that planes do not fly over a fixed track and, therefore, the variations in plane noise signal these differences in aircraft performances. If a person is unconcerned about the variety of air operations connoted by these changes in the noise stimulus, then he still is likely to relegate these different airplane sounds into the general background and ignore them.

But, if fear of crashes is present or latent, there is concern and awareness with each separate experience and the noise is not pushed into the subconscious. Each airplane noise stimulus must be separated from the ambient noise background and identified as to whether it is a potential hazard. As the noise reaches its peak, a person knows the plane is approaching and tension and fear of a possible crash also increases. As the noise fades away, a fearful person recognizes that another safe passage has occurred. But, with a fearful person, the past occurrence of hundreds of safe passages does not necessarily mean that each new flight will also be safe. Only a conscious listening to the rise and fall of each noise level can allay anxiety or fear. Consequently, the plane noise acts as a trigger mechanism in arousing repetitive tension or fear. With the passage of time, a fearful person doesn't reduce his annoyance because the amount of tension increases and is cumulative in a sense with greater exposure. Since fear is so closely correlated with greater annoyances, it is our hypothesis that this close relationship is most important in explaining why time does not automatically reduce annoyance.

10. Respondents' Experience with Flying

As reported before, there is a tendency for more annoyed persons to report fewer and less recent flying experience. The differences, however, are very small and not statistically significant.

11. Respondents' Direct Connections with the Air Base

Persons who are more annoyed tend to have less direct involvement or economic tie with the three air bases. The differences, however, are not great and could not be expected to greatly affect overall annoyance responses. Table 119 summarizes these relationships and table 120 shows the greater details of respondent connections with the military branches.

TABLE 118

**RESPONDENTS' EXPERIENCES WITH FLYING
BY ANNOYANCE AND DISTURBANCE GROUP**

Disturbance	Annoyance	Number of Interviews	Number Flights			Time Last Flight (Years ago)		
			0	1-4	5+	Less 1	1-3	4+
Little	A little	420	32%	34%	29%	36%	14%	18%
	Much	170	44	31	22	39	12	5
Moderate	A little	545	38	35	27	28	13	21
	Much	405	38	41	21	34	9	19
Most	A little	379	44	35	21	24	13	19
	Much	409	62	45	22	27	10	21

TABLE 119

**DIRECT CONNECTIONS WITH AIR BASE BY
ANNOYANCE AND DISTURBANCE GROUP**

Disturbance	Annoyance	Number of Interviews	Connection With Air Base			
			None	In or Work For AF	Do Business With Base	Work For Firm Does Business With Base
Little	A little	420	74%	7%	1%	14%
	Much	170	84	2	4	11
Moderate	A little	545	75	4	4	17
	Much	405	86	1	3	10
Most	A little	379	81	1	6	12
	Much	409	79	1	4	16

TABLE 120

**RESPONDENTS' CONNECTIONS WITH MILITARY BRANCHES
BY ANNOYANCE AND DISTURBANCE GROUP**

Disturbance	Annoyance	Number of Interviews	Connection With Military						
			Never	Present		Total	Past		
			Any	AF	Other		AF	Other	
Little	A little	420	53%	7%	4%	11%	4%	30%	34%
	Much	170	53	2	6	8	4	35	39
Moderate	A little	545	61	4	3	7	2	30	32
	Much	405	61	1	5	6	3	30	33
Most	A little	379	64	1	3	4	2	30	32
	Much	409	63	1	2	3	3	31	34

12. Personal Variables

With the use of more homogeneous categories of annoyance and disturbance, none of the personal variables are found to vary significantly by annoyance group. The only tendencies worth noting are the somewhat greater number of men who are more annoyed, and the greater concentration of larger families with older children among the more annoyed. Tables 121 to 127 present this data.

TABLE 121

**SEX AND AGE OF RESPONDENTS BY
ANNOYANCE AND DISTURBANCE GROUP**

Disturbance	Annoyance	Number of Interviews	Sex		Age (Years)				
			Female	Male	<30	30-39	40-59	60+	INA
Little	A little	420	45%	55%	25%	30%	31%	12%	2%
	Much	170	41	59	22	31	32	14	1
Moderate	A little	545	54	46	25	30	30	15	0
	Much	405	47	53	27	32	28	12	1
Most	A little	379	57	43	22	29	35	13	1
	Much	409	54	46	24	36	29	9	2

13. Summary of Relationships

The use of a scale of annoyance and disturbance with more homogeneous categories of response has increased some of the significant relationships and

eliminated some of the marginal factors. Frequency of disturbance, fear, feelings of base importance and considerateness, overall dissatisfaction with the neighborhood, and complaint potential are even more directly related to the intensity of annoyance. Likewise, it is found that people more annoyed with aircraft also tend to report more bother with traffic noise. It is also found that persons living in quiet background areas are not greatly different in their feelings of aircraft annoyance from people living in noisy areas. Length of residence and length of exposure to airplane noise are not found to be important variables, nor are personal flying experiences, or economic connections with the air base. Finally, none of the personal variables such as age, sex, education, etc., are found to explain any significant variation in annoyance.

TABLE 122

COMPOSITION OF HOUSEHOLD BY ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Type Family Group			
			Respondent Alone	2 or More Children Adults Only	Under 6 Years	Children 6+ Years
Little	A little	420	4%	31%	26%	39%
	Much	170	4	32	25	39
Moderate	A little	545	6	31	23	40
	Much	405	4	27	24	45
Most	A little	379	4	32	29	35
	Much	409	3	27	27	43

TABLE 123

NUMBER OF PERSONS LIVING IN EACH HOUSEHOLD BY ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Number of Persons in Household			
			1-2	3	4	5+
Little	A little	420	31%	24%	25%	20%
	Much	170	29	24	24	23
Moderate	A little	545	33	20	23	24
	Much	405	25	24	27	24
Most	A little	379	33	22	21	24
	Much	409	24	22	28	26

TABLE 124

FORMAL EDUCATION OF RESPONDENTS BY ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Education Level		
			Grade School	High School	College
Little	A little	420	20%	57%	23%
	Much	170	19	60	21
Moderate	A little	545	18	60	22
	Much	405	15	60	25
Most	A little	379	16	65	19
	Much	409	16	65	19

TABLE 125

RESPONDENT'S OCCUPATION BY ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Proprietor & Sales	Clerical	Skilled Crafts	Oper. & Sv.	Laborer	Not at Work
Little	A little	420	19%	10%	15%	16%	2%	38%
	Much	170	14	8	16	22	2	38
Moderate	A little	545	14	8	12	15	2	49
	Much	405	19	8	11	18	2	42
Most	A little	379	16	8	11	11	1	53
	Much	409	13	10	13	13	2	49

TABLE 126

MAIN EARNERS' OCCUPATIONS BY ANNOYANCE AND DISTURBANCE GROUP

Disturbance	Annoyance	Number of Interviews	Proprietor	Clerical & Sales	Skilled Crafts	Oper. & Sv.	Laborer	Not at Work	Disturbance	Annoyance	Number of Interviews	Annual Family Income (thousand dollars)				
												<4	4-6	6-10	10+	INA
Little	A little	420	23%	9%	27%	25%	3%	8%	Little	A little	420	26%	39%	25%	4%	6%
	Much	170	25	10	25	32	3	5		Much	170	23	51	19	3	4
Moderate	A little	545	29	10	22	28	2	9	Moderate	A little	545	26	40	27	3	4
	Much	405	28	10	25	27	3	7		Much	405	27	37	30	3	3
Most	A little	379	27	14	25	22	2	10	Most	A little	379	27	38	28	3	4
	Much	409	25	15	26	24	3	7		Much	409	22	41	29	5	3

TABLE 127

FAMILY INCOME BY ANNOYANCE AND DISTURBANCE GROUPS

Disturbance	Annoyance	Number of Interviews	Proprietor	Clerical & Sales	Skilled Crafts	Oper. & Sv.	Laborer	Not at Work	Disturbance	Annoyance	Number of Interviews	Annual Family Income (thousand dollars)				
												<4	4-6	6-10	10+	INA
Little	A little	420	23%	9%	27%	25%	3%	8%	Little	A little	420	26%	39%	25%	4%	6%
	Much	170	25	10	25	32	3	5		Much	170	23	51	19	3	4
Moderate	A little	545	29	10	22	28	2	9	Moderate	A little	545	26	40	27	3	4
	Much	405	28	10	25	27	3	7		Much	405	27	37	30	3	3
Most	A little	379	27	14	25	22	2	10	Most	A little	379	27	38	28	3	4
	Much	409	25	15	26	24	3	7		Much	409	22	41	29	5	3

H. Model for Estimating Disturbance and Annoyance

1. Introduction

In the previous section, the combined annoyance and disturbance response scale was found most directly related to the following seven variables:

1. Duration of SIL-60 noise

2. Fear of crashes
3. Feelings of air base considerateness
4. Feelings of air base importance
5. Overall satisfaction with area
6. Greater bother with other noise
7. Connection to air base or military

Ideally, if we could cross-tabulate all seven related variables, it would be possible to establish the widest range of interrelated disturbance and annoyance responses. Theoretically, a group with the most positive attitudes should be least bothered and one with seven negative attitudes should be the most bothered. Unfortunately, since each of the seven variables has a number of groupings, the combination of all seven factors would result in a fantastic number of analytical groups. If only 4 groups were selected for duration of SIL 60, and 2 for each of the other six variables, then a minimum of 256 classes would be required for the independent variables alone. Then, with a minimum of six groups necessary for the dependent disturbance-annoyance scale, a total of 1536 groups would be required to evaluate simultaneously all seven independent variables. With only 2328 interviews available for analysis, such a scheme is obviously impossible.

2. Actual Interrelationships between Disturbance and Annoyance and Fear and Base Considerateness

It was decided, therefore, to select the top three independent variables, and cross-tabulate them with the six classes of the disturbance-annoyance scale. This compromise resulted in the following 96 analytical groups shown in table 128. The scales of fear and considerateness were each divided into two parts, so that the most intense responses were kept separate, i. e., groups with the most fear and the most considerateness were placed in separate classes and all persons with less fear or less considerateness were grouped into the remaining classes. As table 128 shows, even with only 96 primary groups, some of the classes have fewer than 5 or 10 interviews, obviously placing severe limitations on the accuracy of the relationships that may be found. It is only because of the strong interrelationships which exist among these 96 groups that any consistent analysis is possible. Additional cases are needed, however, to validate our first approximations of the numerical values of these relationships.

As can be seen, all three independent variables are directly interrelated. First, the greater the SIL-60 group, the more disturbance and annoyance. Then, for each SIL-60 group, the more fear and the less considerateness, the more annoyance. Knowing these three factors, it is possible to estimate more accurately the average annoyance and disturbance responses. When only the acoustic

variable was related to the disturbance-annoyance scale (table 65), the average number of persons with much annoyance with 4 to 5 activities in the top SIL-60 class (duration of 80 + seconds) was only 47 percent. Now, knowing how these people feel about fear and base considerateness, we can further refine our estimates to state that 75 percent of those who feel the base is less considerate and are more fearful of crashes will also feel much annoyance. Also, we can state that only 32 percent who feel the base is more considerate and have little fear will feel as greatly annoyed. This is a range of over 40 percent in differences in annoyance responses attributable to these three variables. The same differentiation is also possible for each of the other SIL-60 classes.

TABLE 128
DISTURBANCE AND ANNOYANCE BY SIL 60, FEAR OF
CRASHES, AND FEELINGS OF BASE CONSIDERATENESS

Duration SIL 60 db (seconds per hour)	Feelings of Base Considerateness	Fear of Crashes	Number of Interviews	Number of Activities Disturbed					
				0-1		2-3		4-5	
				Annoy Little	Annoy Much	Annoy Little	Annoy Much	Annoy Little	Annoy Much
80+	Less	Less	21	10%	0%	9%	14%	24%	43%
		More	43	0	2	2	12	9	75
	More	Less	69	4	4	22	19	19	32
		More	58	5	3	5	14	20	45
50-79	Less	Less	74	11	4	28	19	18	20
		More	43	0	2	2	17	23	56
	More	Less	266	20	5	33	17	20	5
		More	74	2	1	17	14	35	31
20-49	Less	Less	288	13	8	22	23	17	17
		More	142	3	4	8	24	19	4
	More	Less	641	28	9	32	13	12	6
		More	191	7	4	19	25	19	26
19 or less	Less	Less	102	16	14	17	24	13	16
		More	22	14	4	14	9	32	27
	More	Less	249	33	13	23	14	9	8
		More	49	23	4	10	20	20	23

The serious limitations of the small samples involved in some of these averages raises the question of how large the error of estimate is likely to be. This is a typical problem in the analysis of variance, but, with so many variables involved, the complicated computations were not undertaken. In an analysis of variance, however, with extreme disproportionality in the distribution of cases among the 96 different analytical groups, the least biased estimate is usually considered the unweighted mean. Consequently it was decided to consider each percentage as the best estimate for each of the 96 different classes, and to develop average effects for each of the three independent variables. This would smooth the relationships and reduce the extreme effects of particularly small samples. From these smoothed average relationships, a generalized model can be developed expressing the average interrelationships of these three variables. The development of these average effects and the final generalized model are described below.

3. Average Effects of SIL 60

In order to develop the average effects of the acoustic variable, each of the four percentages representing different fear and considerateness groups are averaged together. Table 129 presents these combined unweighted averages, and the average percentage differences between SIL-60 classes. If only the "much annoyed by 4 to 5 disturbances" group is compared, it can be seen that

the four SIL-60 groups explain a 31 percentage point difference between the upper and lower SIL-60 groups. Likewise, the average for the least annoyed group varies by 17 percentage points from the upper to the lower SIL-60 groups. Each of these average annoyance differences among the SIL-60 groups will be used to develop the overall model.

TABLE 129

THE AVERAGE RELATIONSHIPS BETWEEN SIL 60 GROUPS
AND DISTURBANCE AND ANNOYANCE

Duration SIL-60 db (Seconds per Hour)		Number of Activities Disturbed					
		0-1		2-3		4-5	
		Annoy Little	Annoy Much	Annoy Little	Annoy Much	Annoy Little	Annoy Much
80+	Average	4%	2%	10%	15%	20%	49%
50-79	Average	8	3	21	16	24	28
	Difference from 80	+4	+1	+11	+1	+4	-21
20-49	Average	13	6	20	21	17	23
	Difference from 50-79	+5	+3	-1	+5	-7	-5
19 or less	Average	21	9	16	17	19	19
	Difference from 20-49	+8	+3	-4	-4	+2	-5
	Cumulative differences	+17	+7	+6	+2	-1	-31

4. Average Effects of Fear

The eight averages for the different SIL-60 and considerateness groups are combined in table 130 to show the average effects of fear of disturbance and annoyance. As shown the average difference due to fear in the most annoyed group totals 22 percentage points.

TABLE 130

THE AVERAGE RELATIONSHIP BETWEEN FEAR OF CRASHES
AND DISTURBANCE AND ANNOYANCE

	Number of Activities Disturbed					
	0-1		2-3		4-5	
	Annoy Little	Annoy Much	Annoy Little	Annoy Much	Annoy Little	Annoy Much
Less fear	17%	7%	23%	18%	17%	18%
More fear	6	3	10	17	24	40
Difference	-11	-4	-13	-1	+7	+22

TABLE 131

DIFFERENCES BETWEEN LESS CONSIDERATE
AND MORE CONSIDERATE GROUPS
BY SIL 60 AND FEAR GROUPS

Duration SIL-60 db (Seconds per Hour)	Fear of Crashes	Number of Activities Disturbed					
		0-1		2-3		4-5	
		Annoy Little	Annoy Much	Annoy Little	Annoy Much	Annoy Little	Annoy Much
80+	More	- 5%	- 1%	- 3%	- 2%	-17%*	28%*
	Less	6	- 4	-13	- 5	9	11
50-79	More	- 2	1	-15	3	-12	25
	Less	- 9	- 1	- 5	2	- 2	15
20-49	More	- 4	0	-11	- 1	0	16
	Less	-15	- 1	-10	10	9	11
19 or less	More	- 9	0	4	-11	12	4
	Less	-17	1	- 6	10	4	8

*Rounded 2% to avoid negative numbers in Table 132.

5. The Average Effect of Base Considerateness

The average effects of feelings of base considerateness were calculated by combining SIL-60 and fear categories. Because of the strong intercorrelations of these three factors, it was necessary to take the actual differences for this factor. If the combined averages are used for this factor, when the three average effects are recombined into an overall model, some negative percentages are obtained. To avoid such spurious estimates, the actual percentage differences were computed from table 128 as shown in table 131.

6. Computation of Overall Model

With the above three sets of average effects of SIL 60, fear, and base considerateness, a smoothed overall model of these relationships is computed. The first step is to select an origin or an actual set of percentages in one of the 96 groups for establishing a base level. It was decided to use one of the extreme classes, representing the least annoyance category: the SIL-60 group with less than 20 seconds of duration which expressed less fear and more base considerateness. Since there were 249 interviews in this category, it represented a substantial sample and, therefore, a more valid base level.

The second step involved applying the average differences in disturbance and annoyance attributable to SIL-60 groups. As table 129 indicates, the "much annoyed by 4 to 5 activities in the SIL-60 class with a duration of 20 to 49 seconds was 5 percent greater than the comparable group in SIL-60 class with a duration of less than 20 seconds. This difference was added to the base level percentage of 8 percent to total 13 percent for the 20- to 49-second class. In like fashion the average differences, obtained in tables 129 to 131, were added to the base levels and the overall model shown in table 132 was obtained.

TABLE 132
MODEL FOR ESTIMATING DISTURBANCE
AND ANNOYANCE RESPONSES

Duration SIL-60 db (Seconds per Hour)	Feelings of Base Considerateness	Fear of Crashes	Number of Activities Disturbed					
			0-1		2-3		4-5	
			Annoy Little	Annoy Much	Annoy Little	Annoy Much	Annoy Little	Annoy Much
80+	Less	Less	22%	2%	4%	7%	15%	50%
		More	0	1	1	9	0	89
	More	Less	16	6	17	12	10	39
		More	5	2	4	11	17	61
50-79	Less	Less	11	6	23	19	12	33
		More	7	4	0	15	9	65
	More	Less	20	7	28	13	14	18
		More	9	3	15	12	21	40
20-49	Less	Less	10	9	17	20	12	24
		More	10	6	3	16	14	51
	More	Less	25	10	27	18	7	13
		More	14	6	14	17	14	35
19 or less	Less	Less	16	14	17	24	13	16
		More	13	9	14	2	28	34
	More	Less	33	13	23	14	9	8
		More	22	9	14	13	16	30

The percentages in table 132 are smoothed or computed values, while the percentages in table 128 are the unadjusted actual interview responses. A comparison of percentages in both tables will indicate something of the variability of the computed values. The largest difference of 14 percentage points is found in the 80+ SIL-60 groups with more fear, but the samples in these groups number only 43 and 58 interviews, respectively. Most of the other differences are under 10 percent and, where the size samples in the original data are substantial, the differences are about 5 percent. Comparisons of a few of the smaller and larger samples are shown below in table 133.

One note of caution is required. Based on the 2328 interviews obtained at three Air Force bases, the above model proves to be unexpectedly accurate.

Since air base differences in response have been found to be sizable, however, it is important to validate the model at other air base areas before accepting it as a final tool for planning purposes. The present model may be used as an experimental prototype, but additional testing and possible modification of actual numbers may be required.

TABLE 133
COMPARISON OF COMPUTED AND ACTUAL DATA
FOR DISTURBANCE AND ANNOYANCE GROUPS

Duration SIL-60 db (Seconds per Hour)	Feelings of Base Consider- ateness	Fear of Crashes	Number of Inter- views		Number of Activities Disturbed					
					0-1		2-3		4-5	
					Annoy Little	Annoy Much	Annoy Little	Annoy Much	Annoy Little	Annoy Much
80+	Less	More	43	Actual	0%	2%	2%	12%	9%	75%
				Computed	0	1	1	9	0	89
				Difference	0	+1	+1	+7	9	-14
50-79	More	Less	266	Actual	20	5	11	17	20	5
				Computed	20	7	28	13	14	18
				Difference	0	-2	5	4	6	-13
20-49	Less	Less	288	Actual	13	8	22	23	17	17
				Computed	10	9	17	28	12	24
				Difference	3	-1	5	-5	5	-7
19 or less	More	Less	249	Base used for model	33	13	23	14	9	8

SECTION IV

COMPLAINT POTENTIAL

In the previous chapter the factors influencing disturbance and annoyance responses were evaluated. By probing into the relationships between the acoustic and attitudinal variables, better estimates of disturbance and annoyance could be obtained. In this chapter, we shall attempt to isolate the important variables which influence a neighborhood's readiness to complain and, in conclusion, a model for estimating the complaint potential will be presented.

Part A will indicate the gross overall air base area differences in complaint activity and in the complaint potentials. Part B will compare the relationships of complaint potentials and the three acoustic measures. Part C will explore the interrelationships of the SIL-60 series and other attitudinal variables. Finally, Part D will develop the prototype model for estimating the complaint potential.

A. Overall Air Base Area Differences

Considerable variations are found to exist in the complaint potentials of the three air base areas. Table 134, summarizing these overall comparisons, indicates that paralleling disturbance and annoyance differences, the East ADC base shows the highest complaint potential, followed by the SAC base and the West ADC base.

TABLE 134
OVERALL COMPLAINT POTENTIAL
AT THREE AIR BASE AREAS

Scale Type Complaint Potential	Description	SAC N=732	West ADC N=804	East ADC N=792	Total N=2328
0	Take no action	39%	41%	23%	34%
1	Sign petition	17	17	14	16
2	Attend meeting	14	15	16	15
Sub total 1-2		31%	32%	30%	31%
3	Write or call officials	13	13	17	15
4	Visit officials	7	6	14	9
5	Help start group	10	8	16	11
Sub total 3-5		30%	27%	47%	35%

At the two ADC bases, each resident was asked a series of questions designed to ascertain his underlying belief in the possibility of successfully influencing corrective action by the Air Force officials. Table 135 indicates that residents at both ADC bases have equal feelings on this matter. About a fourth were completely pessimistic and another fourth were completely optimistic. Table 136 shows a cross-tabulation of the complaint potential by belief in successful action. As shown respondents with greater action potential also more often believe that their efforts will succeed.

TABLE 135

BELIEF IN THE POSSIBILITIES OF SUCCESSFUL
ACTION BY ADC BASE AREA

Scale Type	Description	West ADC	East ADC	Total
0	No success	25%	25%	25%
1	Success if organization complains	19	17	18
2	Success if neighbors complain	31	34	32
3	Success if respondent complains	25	24	25

TABLE 136

RELATIONSHIPS BETWEEN COMPLAINT POTENTIAL AND
BELIEF IN THE POSSIBILITY OF SUCCESSFUL ACTION

Scale Types - Possibilities of Success	Complaint Potential		
	0 None	1-2 Moderate	3-5 Most
No success.	33%	23%	21%
Success if organization complains	18	20	16
Success if neighbors complain	30	33	34
Success if respondent complains	19	24	29

One of the indexes most available to air base officials for gauging complaint levels is the actual number of complaints made by residents. On the next page is a chart indicating the number answering the direct question, "Have you yourself ever felt like getting in touch with somebody about the airplanes around here?", is smaller than the values in the complaint potential scale, and the number who ever call is only a small fraction of the potential. The neighborhoods in each area are arranged in SIL-60 rank order, with neighborhood 1 always having the highest acoustic level. As shown neighborhood number 3 at the East ADC base shows unusually high complaint activity. This is the same area previously reported in Chapter 2 as reflecting greater than expected disturbance, annoyance, fear, and feelings that the base is less considerate and less important. Without attempting to evaluate fully the neighborhood situation in this area, it should be noted that there were organized protests in this area involving feelings that a grade school in the landing flight path was in danger of an accident. The other two air bases were free of any organized protest movements. In fact, there were strong anti-protest sentiments expressed by leaders of both communities.

REPORTED NUMBER OF COMPLAINTS
BY RESPONDENTS IN NEIGHBORHOODS ARRANGED IN SIL-60 RANK ORDER

<u>A. SAC Neighborhoods</u>						
N =	<u>Total</u> 732	<u>1</u> 107	<u>2</u> 111	<u>3-5</u> 314	<u>6</u> 96	<u>7</u> 104
Ever felt like complaining ..	11%	28%	16%	8%	1%	8%
Actually complained	2	5	2	2	-	2

<u>B. West ADC Neighborhoods</u>				
N =	<u>Total</u> 804	<u>1-5</u> 350	<u>8-9</u> 160	<u>6,7,0</u> 294
Ever felt like complaining ..	15%	17%	17%	13%
Actually complained	1.1	2.0	0.6	0.3

<u>C. East ADC Neighborhoods</u>					
N =	<u>Total</u> 792	<u>1</u> 84	<u>2</u> 159	<u>3</u> 231	<u>4-5</u> 318
Ever felt like complaining ..	27%	36%	28%	39%	15%
Actually complained	6	8	6	11	2

Before attempting to establish some of the numerical relationships underlying the complaint potential, some of the qualitative comments offered by respondents at these bases should be examined.

When residents who felt like getting in touch with authorities, but failed to do so were asked "Why?", some of their answers were as shown in table 137. Most of these reasons indicate lack of faith in the possible success of complaining. With an underlying complaint potential, the actual complaint level might increase if organized efforts improved the prospects for success.

TABLE 137
REASONS GIVEN FOR NOT CONTACTING OFFICIALS

	<u>SAC</u> N=64	<u>East ADC</u> N=166	<u>West ADC</u> N=113
Authorities uncooperative -- would do no good	25%	33%	35%
Nothing can be done	30	7	16
Personnel inadequacy	16	8	18
Not enough people complain	9	11	4
Base is too important	-	10	15

One last item worth reporting is the general feeling that most people believe they will remain in their present homes in the immediate future. About one-third of all people stated they were considering moving in the near future, but only 5 to 8 percent said they had actually found another place. It is clear that, for over 90 percent of the residents, continued indefinite exposure to the noise was in prospect.

B. Relation of Acoustic Variables and Complaint Potential

1. Volume of Airplane Operations and Peak SPL

In general, readiness to complain is related to volume of aircraft, but the relationship to peak SPL is not so clear. As table 138 shows the complaint potential is greater when volume of aircraft is greater. As far as peak SPL classes are concerned, class A has the highest complaint potential and is greater than B, but C and D are greater than B.

TABLE 138
COMPLAINT POTENTIAL BY VOLUME
OF AIRCRAFT AND PEAK SPL

Class	Number of Planes Per Hour	Peak SPL	Number of Interviews	Types of Scale 12 - Complaint Potential		
				0 None	1-2 Moderate	3-5 Most
A1	21	101+ db	107	28%	21%	51%
A2	<1	101+ db	102	39	31	30
B1	21	91-100	461	39	32	29
B2	<1	91-100	201	48	33	19
C1	21	81-90	672	17	30	33
C2	<1	81-90	248	30	35	35
D1	21	80 or less	495	22	31	47

TABLE 139
COMPLAINT POTENTIAL BY VOLUME OF AIRCRAFT,
PEAK SPL, AND AIR BASE AREAS

Class	Number of Planes Per Hour	Peak SPL	Air Base Area	Number of Interviews	Types of Scale 12 - Complaint Potential		
					0 None	1-2 Moderate	3-5 Most
A1	21	101+ db	SAC	107	28%	21%	51%
A2	<1		S/C	102	39	31	30
B1	21	91-100	S/C	111	31	31	36
			West ADC	350	41	32	27
B2	<1	91-100	SAC	203	48	33	19
C1	21	81-90	SAC	105	37	31	32
			West ADC	324	43	32	25
			East ADC	243	27	29	44
C2	<1	81-90	SAC	104	40	36	24
			East ADC	164	25	34	41
D1	21	80 or less	West ADC	130	32	35	33
			East ADC	365	19	30	51

When the detailed air base area data is examined in table 139, some of these discrepancies are clarified. In comparing SAC base areas, class A1 shows more readiness to complain than B1, but C1 is about equal to B1. In examining West ADC areas, B1 and C1 are found nearly the same, but D1 shows greater complaint potential. The biggest differences are due to East ADC areas, which have the highest complaint potential. Class B1 contains no interviews from East ADC areas, while C1 does. This maldistribution of cases artificially reduces the B1 and C1 differences. Since class D1 consists of almost three-fourths of East ADC residents who express a very high complaint potential, the C and D comparisons are also obscured.

2. Equivalent Continuous Noise Level (Leq)

While the overall relationships between Leq classes and the complaint potential are not too good, some of the differences are due to the oft-mentioned disproportionality of cases from different air base areas. Table 140 presents the overall data and table 141 presents the air base area detail.

When SAC areas are compared, it is found that class A complaint potential is greater than B, which is followed by C, but D is about the same as C. In West ADC neighborhoods, the complaint potential in A, as in the case of annoyance, is quite low and less than B. The latter shows more readiness to complain than C, but D shows a greater potential than C. The highest complaint levels are reported by East ADC areas, and D tops all other air base areas. The rest

of the East ADC neighborhoods are rank ordered by L_{eq} groups: B is somewhat greater than C which is greater than D.

TABLE 140

COMPLAINT POTENTIAL BY L_{eq} GROUPS

Class	L_{eq} Groups	Number of Interviews	Types of Scale 12 - Complaint Potential		
			0 None	1-2 Moderate	3-5 Most
A	71-76 db	257	19%	28%	13%
B	65-70	497	33	33	34
C	61-64	671	42	28	30
D	56-60	585	27	33	40
F	55 or less	318	26	33	41

TABLE 141
COMPLAINT POTENTIAL BY L_{eq} GROUPS
AND AIR BASE AREAS

Class	L_{eq} Groups	Air Base Area	Number of Interviews	Types of Scale 12 - Complaint Potential		
				0 None	1-2 Moderate	3-5 Most
A	71-76 db	SAC	107	28%	22%	50%
		West ADC	150	45	33	22
B	65-70	SAC	213	36	31	33
		West ADC	200	36	32	32
		East ADC	84	29	43	38
C	61-64	SAC	308	44	33	23
		West ADC	204	48	27	25
		East ADC	159	31	22	47
D	56-60	SAC	104	40	36	24
		West ADC	239	34	37	29
		East ADC	231	13	29	58
E	55 or less	East ADC	118	24	33	41

The low complaint neighborhoods in A at the West ADC base and the unusually high complaint area in D at the East ADC base both reported certain attitudes in Chapter II which may help explain their unexpected complaint responses. Class A residents were least fearful of crashes and believed the air base most considerate in their operations. In contrast, the D respondents were most fearful and felt the base was least considerate of their welfare.

In conclusion, it can be said that the overall L_{eq} groups failed to rank order the complaint potential because of a series of procedural and attitudinal factors. In all fairness, the L_{eq} groupings were not given a full and controlled test of their effectiveness.

3. Speech Interference Level - 60 db

An examination of table 142, which presents the gross comparisons of the complaint potential and the SIL-60 groups, reveals only a slightly better relationship than that achieved by the L_{eq} groups. Class A shows the highest readiness to complain, but the other SIL-60 classes show very little differences.

When the air base area detail is evaluated in table 143, the relationships improve somewhat. When SAC areas are compared, A shows the highest complaint potential, followed in order by B, C, and D. Class E is about the same as D. The West ADC areas show no significant differences, but the East ADC show mixed relationships: D, of course, is the highest, followed by SIL-60 C, A, and E.

The disproportionality of air base interviews again explains in part the inconsistent overall relationships. Obviously, however, other factors besides the intensity of the physical stimulus may also be affecting the complaint potential. If only the physical variable were important in determining the complaint potential, then the gross comparisons would be better. But if other attitudinal factors were equally important, then differences in these variables could also

create spurious gross inconsistencies with the acoustic levels. Some of these human variables will now be examined.

TABLE 142
COMPLAINT POTENTIAL BY SIL-60 db GROUPS

Class	Duration SIL-60 db (Seconds per Hour)	Number of Interviews	Types of Scale 12 - Complaint Potential		
			0 None	1-2 Moderate	3-5 Most
A	80+	191	24%	31%	45%
B	50-79	461	39	32	29
C	40-49	424	38	27	35
D	20-39	830	33	32	35
F	19 or less	422	59	24	16

TABLE 143
COMPLAINT POTENTIAL BY SIL 60 GROUPS
AND AIR BASE AREAS

Class	Duration SIL-60 db (Seconds per Hour)	Air Base Area	Number of Interviews	Types of Scale 12 - Complaint Potential		
				0 None	1-2 Moderate	3-5 Most
A	80+	SAC	107	28%	2%	50%
		East ADC	84	19	43	38
B	50-79	SAC	111	33	31	36
		West ADC	350	41	37	27
C	40-49	SAC	105	37	31	32
		West ADC	160	44	30	26
		East ADC	159	31	22	47
D	20-39	SAC	305	45	33	22
		West ADC	704	37	35	28
		East ADC	221	13	29	58
F	19 or less	SAC	104	40	36	24
		East ADC	318	25	33	41

C. Evaluation of Sociopsychological Factors by SIL-60 Groups and Complaint Potential

In the previous section readiness to complain was poorly related to overall groupings of acoustic data. It was suggested that intervening psychological variables may account for most of the difficulties. In this section, some of the more important sociopsychological factors are examined, and, when these attitudinal differences are taken into consideration, the relationships to the SIL-60 classes become more distinct.

1. Activity Disturbance

The complaint potential is clearly related to the number and frequency of activity disturbances. As table 144 shows, the group reporting the greatest complaint potential also reports two and a half times more interference with more activities than the group with no readiness to complain. This general relationship is also directly related to SIL-60 classes. At the most intense duration of SIL 60, 77 percent report the most activity interference when they are most ready to complain, while at each succeeding lower SIL class the percentage is reduced until only a third of the residents with the highest complaint potential report as much disturbance.

Table 145, which correlates frequency of disturbance and the complaint potential, also shows the same high direct relationships. The overall totals indicate that 43 percent of the most ready to complain are frequently disturbed, while only 14 percent of the group with the lowest complaint potential report as much disturbance. Likewise, this relationship is rank ordered by the SIL-60 classes. When the duration of speech interference is 80 seconds or more, 76 percent report frequent disturbance when their complaint potential is greatest. In contrast, only half as many people living in the same noise environment who report no complaint potential report as much disturbance. At the lower end of the SIL-60 groups, only 29 percent of the most ready to complain report frequent disturbances, compared to 6 percent of the noncomplainers.

TABLE 144

NUMBER OF ACTIVITIES DISTURBED BY SIL 60
GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Types of Scale 4 - Activity Disturbance		
				0	1-3	4-5
A1	80+	None	46	2%	46%	52%
A2		Moderate	59	2	35	63
A3		Most	86	3	20	77
B1	50-79	None	181	11	62	27
B2		Moderate	147	5	63	32
B3		Most	133	2	34	64
C1	20-49	None	439	15	69	16
C2		Moderate	382	10	66	24
C3		Most	433	5	46	49
D1	19 or less	None	125	23	62	15
D2		Moderate	142	17	49	24
D3		Most	155	8	59	33
F1	Totals	None	791	14	65	21
F2		Moderate	730	10	61	29
F3		Most	807	5	44	51

TABLE 145

FREQUENCY OF ACTIVITY DISTURBANCE
BY SIL 60 GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Types of Scale 5 - Disturbance Frequency			
				0-2 Occas.	3-5 Occas.	6-7 Freq.	8-10 Freq.
A1	80+	None	46	17%	44%	24%	15%
A2		Moderate	59	15	41	17	27
A3		Most	86	9	15	21	55
B1	50-79	None	181	42	37	14	7
B2		Moderate	147	30	44	16	10
B3		Most	133	15	32	22	31
C1	20-49	None	439	60	30	7	3
C2		Moderate	382	42	42	10	6
C3		Most	433	24	36	17	23
D1	19 or less	None	125	65	29	5	1
D2		Moderate	142	54	36	8	2
D3		Most	155	44	27	17	12
F1	Totals	None	791	54	32	10	4
F2		Moderate	730	40	41	11	8
F3		Most	807	25	32	18	25

2. Annoyance with Aircraft

As might be expected, annoyance with aircraft which is interrelated to disturbance also shows a high correlation with the complaint potential. In general, as table 146 shows, five times more people with the highest complaint potential report "much annoyance" than the noncomplaining group. As in the case of disturbance, annoyance is also rank ordered by SIL-60 classes. At the highest SIL class, 71 percent with the most readiness to complain report much annoyance, while at the lowest SIL class only 25 percent with the same high complaint potential report as much annoyance. This indicates that other psychological variables besides direct annoyance are adding to the complaint potential at the lower SIL categories.

TABLE 146

ANNOYANCE WITH AIRCRAFT BY SIL 60 GROUPS
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Types of Scale 6 - Annoyance		
				0-3 A Little	4-7 A Little	8-10 Much Annoyance
A1	80+	None	46	48%	26%	26%
A2		Moderate	59	22	30	48
A3		Most	86	9	20	71
B1	50-79	None	181	65	23	12
B2		Moderate	147	59	29	12
B3		Most	133	31	19	50
C1	20-49	None	439	77	18	5
C2		Moderate	382	63	26	11
C3		Most	433	33	30	37
D1	19 or less	None	125	78	16	6
D2		Moderate	142	69	21	10
D3		Most	155	49	26	25
F1	Totals	None	791	73	19	8
F2		Moderate	730	60	26	14
F3		Most	807	33	27	40

TABLE 147

FEAR OF AIR CRASHES BY SIL 60 GROUPS
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Types of Scale 2 - Fear of Crashes		
				0 None	1 Moderate	2 Much
A1	80+	None	46	13%	50%	37%
A2		Moderate	59	10	39	51
A3		Most	86	6	31	63
B1	50-79	None	181	28	53	19
B2		Moderate	147	22	47	21
B3		Most	133	17	41	42
C1	20-49	None	439	23	61	16
C2		Moderate	382	15	60	25
C3		Most	433	12	51	37
D1	19 or less	None	125	19	62	19
D2		Moderate	142	22	61	17
D3		Most	155	18	66	16
F1	Totals	None	791	23	58	19
F2		Moderate	730	18	58	24
F3		Most	807	14	50	36

3. Fear of Air Crashes

Fear is one of the most important attitudinal factors directly related to the complaint potential. Table 147 shows that almost twice as many people with

the most readiness to complain express much fear as compared to the noncomplainers. Likewise, fear is also intercorrelated with SIL-60 classes. At the upper SIL class, 63 percent of the residents with the greatest complaint potential have much fear, while in the lowest SIL class only 16 percent of the most ready to complain have much fear. Each of the other SIL classes rank order the fear responses.

4. Base Importance

Feelings of local base importance are inversely related to the complaint potential. While 44 percent of the most ready to complain feel the base is of little importance, only 20 percent of the noncomplainers feel this way. Likewise almost twice as many noncomplainers feel the base is "most important" as compared to the group with the highest complaint potential. The greatest differences in this variable are reported by the high complaint group in the lower SIL-60 classes. Apparently, this is one of the equalizing factors noted in connection with the discussion of annoyance. Almost 60 percent of the high complaint group in the lowest SIL class feel the base is least important. In the next SIL class (20 to 49 seconds) 50 percent of the most ready to complain feel this way. At the upper SIL class, only 32 percent of the same high complaint group feel the base is least important. Table 148 summarizes this data.

TABLE 148
INDEX OF BASE IMPORTANCE BY SIL-60 GROUPS
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Index 11 groups - Base Importance		
				0-1 Little	2-3 Moderate	4-5 Most
A1	80+	None	46	22%	35%	43%
A2		Moderate	59	37	31	27
A3		Most	86	32	34	34
B1	50-79	None	181	11	52	37
B2		Moderate	147	15	53	32
B3		Most	133	27	46	27
C1	20-49	None	439	19	48	33
C2		Moderate	382	30	42	28
C3		Most	433	47	36	17
D1	19 or less	None	125	36	41	23
D2		Moderate	142	41	41	18
D3		Most	155	57	35	8
F1	Totals	None	791	20	47	33
F2		Moderate	730	30	43	27
F3		Most	807	44	37	19

TABLE 149
RELATIVE IMPORTANCE OF AIR FORCE
IN WINNING A WAR BY SIL-60 GROUPS
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Reported Relative Importance		
				Other Branch Most	Air Force Most	All Equal
A1	80+	None	46	9%	65%	26%
A2		Moderate	59	9	47	44
A3		Most	86	10	56	34
B1	50-79	None	181	4	48	48
B2		Moderate	147	6	46	48
B3		Most	133	7	52	41
C1	20-49	None	439	5	45	50
C2		Moderate	382	5	55	40
C3		Most	433	9	56	35
D1	19 or less	None	125	7	54	39
D2		Moderate	142	5	61	34
D3		Most	155	13	60	27
F1	Totals	None	791	5	48	47
F2		Moderate	730	5	54	41
F3		Most	807	10	53	37

At this time, two related variables should be examined. As table 149 indicates, the high complaint group recognizes that the general Air Force is most important in our defense effort, despite their readiness to complain about the local base. Although the differences are small, the tendency is for more of the high complaint group to select the Air Force as most important. This is uniformly true in all SIL-60 classes.

With respect to feeling that "the best way to stay out of war is to be ... strong," the tendency is for the noncomplainers to more strongly agree with this statement. Table 150 presents these relationships.

TABLE 150

EXTENT OF AGREEMENT WITH STATEMENT, "BEST WAY
TO STAY OUT OF WAR IS TO BE . . . STRONG"
BY SIL 60 GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Extent of Agreement		
				Strongly Agree	Agree	Disagree
A1	80+	None	46	46%	46%	8%
A2		Moderate	59	36	44	20
A3		Most	86	39	42	19
B1	50-79	None	181	58	31	11
B2		Moderate	147	41	44	15
B3		Most	133	37	53	10
C1	20-49	None	439	38	47	15
C2		Moderate	382	35	50	15
C3		Most	433	38	46	16
D1	19 or less	None	125	42	50	8
D2		Moderate	142	39	47	14
D3		Most	155	31	52	17
E1	Totals	None	791	44	44	12
E2		Moderate	730	37	48	15
E3		Most	807	37	48	15

TABLE 151

INDEX OF BASE CONSIDERATENESS BY SIL 60
GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Index 9 Groups - Base Considerateness		
				1-2 Least	3-4 Moderate	5 Most
A1	80+	None	46	20%	41%	39%
A2		Moderate	59	27	54	19
A3		Most	86	45	36	19
B1	50-79	None	181	17	46	37
B2		Moderate	147	20	44	36
B3		Most	133	43	39	18
C1	20-49	None	439	22	51	27
C2		Moderate	382	31	46	23
C3		Most	433	50	37	13
D1	19 or less	None	125	18	53	29
D2		Moderate	142	31	47	22
D3		Most	155	37	43	20
E1	Totals	None	791	20	50	30
E2		Moderate	730	28	47	25
E3		Most	807	46	38	16

5. Base Considerateness

Another key psychological variable directly related to the complaint potential is the feeling by high complainers that the air base personnel are least considerate of their welfare. As table 151 indicates, 46 percent of the most ready to complain feel this way as compared to only 20 percent of the noncomplainers. SIL-60 group C (duration of 20 to 49 seconds) has the greatest difference in response; 50 percent of the most ready to complain feel the base is least considerate as compared to only 22 percent of the noncomplaint group.

TABLE 152

SCALE OF AIR FORCE CONSIDERATENESS BY
SIL 60 GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Types of Scale 14 - Air Force Considerateness		
				0-1 Least	2-3 Moderate	4-5 Most
A1	80+	None	46	20%	28%	52%
A2		Moderate	59	34	36	30
A3		Most	86	35	38	27
B1	50-79	None	181	24	39	37
B2		Moderate	147	35	35	30
B3		Most	133	48	32	20
C1	20-49	None	439	26	40	34
C2		Moderate	382	34	38	28
C3		Most	433	53	31	16
D1	19 or less	None	125	23	45	32
D2		Moderate	142	38	44	18
D3		Most	155	44	38	18
E1	Totals	None	791	25	40	35
E2		Moderate	730	35	38	27
E3		Most	807	49	33	18

TABLE 153

SCALE OF OVERALL SATISFACTION
WITH NEIGHBORHOOD BY SIL 60 GROUPS
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Types of Scale 1 - Overall Satisfaction		
				0-6	7-8	9-X
A1	80+	None	46	41%	44%	13%
A2		Moderate	59	56	36	8
A3		Most	86	58	30	12
B1	50-79	None	181	44	43	13
B2		Moderate	147	37	47	16
B3		Most	133	50	34	16
C1	20-49	None	439	27	48	25
C2		Moderate	382	33	42	25
C3		Most	433	38	42	20
D1	19 or less	None	125	33	41	26
D2		Moderate	142	36	44	22
D3		Most	155	38	39	23
E1	Totals	None	791	33	45	22
E2		Moderate	730	36	43	21
E3		Most	807	42	39	19

The same relationships are presented in table 152, which measures considerateness in terms of the overall Air Force rather than the local base. As can be seen the local index is slightly more discriminating in complaint responses, and it will be used in the more detailed analyses.

6. Overall Satisfaction with Neighborhood

Although the differences are not so great as some of the other variables, persons with high complaint potentials also are generally less satisfied with overall living conditions in their neighborhoods. In general, 42 percent of the most ready to complain are satisfied with only as many as 6 out of 10 residential conditions as compared to 33 percent of the noncomplainers. Table 153 presents these findings.

7. Exposure to Aircraft Stimulus

Contrary to the wishful thinking of some people, there is no evidence that more continuous exposure to the aircraft noise results in greater adjustment. As table 154 shows there is no significant difference among complaint potential groups regarding the time spent in the neighborhood during the day or night. In fact, the opposite tendency is noted in table 155, showing the relationship between length of residence and complaint potential. The group most ready to complain has lived in their neighborhoods slightly longer than the noncomplainers. The highest complaint groups in the lower SIL-60 groups report longer residence than the upper SIL groups.

TABLE 154

TIME EXPOSED TO AIRCRAFT IN NEIGHBORHOOD
BY SIL 60 GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Percent of Residents Usually at Home			
				Morning	Afternoon	Evening	Night
A1	80+	None	46	57%	59%	89%	94%
A2		Moderate	59	71	68	90	95
A3		Most	86	50	50	90	97
B1	50-79	None	181	64	61	91	93
B2		Moderate	147	66	63	94	98
B3		Most	133	74	69	92	96
C1	20-49	None	439	70	66	93	95
C2		Moderate	382	69	67	92	96
C3		Most	433	67	66	91	94
D1	19 or less	None	125	55	55	93	96
D2		Moderate	142	68	66	93	94
D3		Most	155	64	62	92	98
E1	Totals	None	791	65	63	92	95
E2		Moderate	730	68	66	92	96
E3		Most	807	66	64	91	96

TABLE 155

LENGTH OF RESIDENCE IN NEIGHBORHOOD
BY SIL 60 GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Number Years of Residence			
				<1	1-3	3-6	>6
A1	80+	None	46	11%	15%	44%	30%
A2		Moderate	59	7	8	42	43
A3		Most	86	11	19	41	29
B1	50-79	None	181	26	24	24	26
B2		Moderate	147	24	31	18	27
B3		Most	133	18	23	23	36
C1	20-49	None	439	14	19	24	43
C2		Moderate	382	14	15	23	48
C3		Most	433	12	13	28	47
D1	19 or less	None	125	14	17	26	43
D2		Moderate	142	13	22	25	40
D3		Most	155	10	12	27	51
E1	Totals	None	791	16	20	26	38
E2		Moderate	730	15	19	24	42
E3		Most	807	13	15	28	44

This finding corresponds with the data reported in a previously mentioned study on propeller noise, and is not at all surprising. Since fear is an important element of annoyance and complaint potential, continued anxiety and worry about danger from planes would probably not reduce the complaint potential over time.

8. Respondents' Experience with Flying

Very small and insignificant differences in flying experiences are found among different SIL or complaint potential groups. About 40 percent have had no flying experiences and about a fourth have had 5 or more trips. Table 156 summarizes this data.

TABLE 156

RESPONDENTS' EXPERIENCES WITH FLYING BY
SIL 60 GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Number of Flights		
				0	1-4	5+
A1	80+	None	46	41%	55%	24%
A2		Moderate	59	32	49	19
A3		Most	86	39	35	26
B1	50-79	None	181	26	40	34
B2		Moderate	147	32	36	32
B3		Most	133	32	40	28
C1	20-49	None	439	39	38	23
C2		Moderate	382	39	39	22
C3		Most	433	43	33	24
D1	19 or less	None	125	41	35	24
D2		Moderate	142	38	37	21
D3		Most	155	47	34	18
F1	Totals	None	791	57	37	26
F2		Moderate	730	40	39	21
F3		Most	807	41	35	24

TABLE 157

RESPONDENTS' DIRECT CONNECTIONS WITH
AIR BASE BY SIL 60 GROUPS WITH
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Connections with Base		
				None	In or Work for Air Force	Do Business with Base
A1	80+	None	46	81%	2%	0%
A2		Moderate	59	74	1	8
A3		Most	86	90	0	1
B1	50-79	None	181	68	10	4
B2		Moderate	147	73	4	5
B3		Most	133	84	0	3
C1	20-49	None	439	8*	3	3
C2		Moderate	382	74	2	4
C3		Most	433	71	1	5
D1	19 or less	None	125	79	3	2
D2		Moderate	142	77	1	5
D3		Most	155	76	3	6
F1	Totals	None	791	79	5	3
F2		Moderate	730	76	3	5
F3		Most	807	81	1	4

9. Respondents' Direct Connections with the Air Base

There are also only small differences among the SIL and complaint groups with respect to the number of residents with direct connections with the air base. Generally slightly more noncomplainers report they are members of or work for the Air Force, but the numbers doing business or working for a firm that does business with the base are the same. Tables 157 and 158 present these findings.

TABLE 158

RESPONDENTS' CONNECTIONS WITH MILITARY BRANCHES
BY SIL 60 GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Never Any	Connection with Military					
					Present			Past		
					A. F.	Other	Total	A. F.	Other	Total
A1	80+	None	46	44%	2%	0%	2%	0%	54%	54%
A2		Moderate	59	63	1	0	1	5	31	36
A3		Most	86	52	0	2	2	0	46	46
B1	50-79	None	181	53	10	9	19	2	26	28
B2		Moderate	147	55	6	9	15	1	20	30
B3		Most	133	56	0	8	8	1	35	36
C1	20-49	None	439	61	3	4	7	3	29	32
C2		Moderate	382	63	2	3	5	3	29	32
C3		Most	433	59	1	3	4	4	33	37
D1	19 or less	None	125	61	3	1	4	2	33	35
D2		Moderate	142	73	1	0	1	3	23	26
D3		Most	155	70	3	1	4	3	23	26
F1	Totals	None	791	58	5	4	9	3	30	33
F2		Moderate	730	63	3	4	7	3	27	30
F3		Most	807	60	1	3	4	3	33	36

10. Personal Variables

As in the case of disturbance and annoyance, none of the personal variables vary greatly among the complaint potential groups. All groups are equal with respect to sex, education, income, or occupation. There were some slight tendencies for noncomplainers to be somewhat older, have smaller family groups, and be renters rather than owners of their own homes. None of these differences, however, are big enough to greatly affect the complaint levels. Tables 159 to 165 present this demographic data.

TABLE 159

SEX AND AGE OF RESPONDENTS BY SIL 60 GROUPS
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Sex		Age (years)				
				Female	Male	<30	30-39	40-59	60+	INA
A1	80+	None	46	48%	52%	13%	52%	33%	2%	9%
A2		Moderate	59	61	39	25	49	19	5	2
A3		Most	86	48	52	26	43	25	6	0
B1	50-79	None	181	44	56	29	29	29	12	2
B2		Moderate	147	58	42	30	29	27	12	2
B3		Most	133	47	51	24	26	30	11	1
C1	20-49	None	439	52	18	20	29	30	19	2
C2		Moderate	382	52	48	25	27	32	15	1
C3		Most	433	48	52	21	34	32	11	2
D1	19 or less	None	125	43	57	24	30	36	10	0
D2		Moderate	142	54	44	28	30	30	12	0
D3		Most	155	52	48	30	30	32	5	3
F1	Totals	None	791	47	51	23	30	31	15	1
F2		Moderate	730	54	46	26	30	30	13	1
F3		Most	807	49	51	24	33	32	7	2

TABLE 160

NUMBER OF PERSONS LIVING IN EACH HOUSEHOLD
BY SIL 60 GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Number of Persons			
				1-2	3	4	5
A1	80+	None	46	22%	13%	30%	35%
A2		Moderate	59	9	20	34	37
A3		Most	86	21	29	26	23
B1	50-79	None	181	30	23	28	19
B2		Moderate	147	35	19	21	25
B3		Most	133	31	14	32	23
C1	20-49	None	439	18	22	17	23
C2		Moderate	382	32	21	24	23
C3		Most	433	26	21	27	26
D1	19 or less	None	125	24	33	25	18
D2		Moderate	142	22	32	21	25
D3		Most	155	22	28	30	20
F1	Totals	None	791	33	23	22	22
F2		Moderate	730	29	23	23	25
F3		Most	807	26	22	28	24

TABLE 161

FORMAL EDUCATION OF RESPONDENTS BY
SIL 60 GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Grade School	High School	College
A1	80+	None	46	11%	70%	19%
A2		Moderate	59	12	68	20
A3		Most	86	16	68	16
B1	50-79	None	181	15	56	29
B2		Moderate	147	20	59	21
B3		Most	133	18	64	18
C1	20-49	None	439	19	58	23
C2		Moderate	382	16	60	24
C3		Most	433	20	59	21
D1	19 or less	None	125	14	69	17
D2		Moderate	142	15	66	19
D3		Most	155	16	65	19
F1	Totals	None	791	17	60	23
F2		Moderate	730	17	61	22
F3		Most	807	18	62	20

TABLE 162

MAIN EARNERS' OCCUPATIONS BY SIL 60 GROUPS
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Professional and Clerical						Not at Work
				Proprietor	Clerical and Sales	Skilled Crafts	Operative, Service	Laborer		
A1	80+	None	46	35%	17%	15%	22%	2%	9%	
A2		Moderate	59	25	17	27	27	2	2	
A3		Most	86	27	17	29	20	2	5	
B1	50-79	None	181	32	10	19	30	2	7	
B2		Moderate	147	26	7	24	33	1	9	
B3		Most	133	25	8	28	27	2	10	
C1	20-49	None	439	30	8	21	26	3	12	
C2		Moderate	382	29	12	23	24	3	9	
C3		Most	433	25	12	24	28	4	7	
D1	19 or less	None	125	27	8	30	28	2	5	
D2		Moderate	142	20	13	34	27	1	5	
D3		Most	155	28	15	35	14	2	6	
F1	Totals	None	791	30	9	22	27	2	10	
F2		Moderate	730	26	11	26	27	2	8	
F3		Most	807	26	13	27	24	3	7	

TABLE 163
RESPONDENTS' OCCUPATIONS BY SIL 60
GROUPS AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Profes- sional and Proprietor	Clerical and Sales	Skilled Crafts	Operative, Service	Laborer	Not at Work
A1	80+	None	46	22%	15%	9%	15%	2%	37%
A2		Moderate	59	7	11	10	14	0	56
A3		Most	86	15	13	15	17	1	39
B1	50-79	None	181	23	8	8	15	2	44
B2		Moderate	147	12	6	11	18	0	53
B3		Most	133	16	5	14	14	1	50
C1	20-49	None	439	14	8	11	15	2	48
C2		Moderate	382	16	9	15	14	1	47
C3		Most	433	14	9	11	18	3	45
D1	19 or less	None	125	19	7	16	19	3	36
D2		Moderate	142	13	11	15	15	0	46
D3		Most	155	17	12	16	11	1	43
F1	Totals	None	791	17	8	11	16	2	44
F2		Moderate	730	14	9	14	15	1	47
F3		Most	807	15	9	13	14	2	45

TABLE 164
FAMILY INCOME BY SIL 60 GROUPS
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Annual Family Income (Thousands of Dollars)				
				<4	4-5	6-10	>10	INA
A1	80+	None	46	18%	52%	28%	0%	2%
A2		Moderate	59	15	53	26	3	3
A3		Most	86	21	45	32	0	2
B1	50-79	None	181	34	32	29	3	2
B2		Moderate	147	37	38	21	3	1
B3		Most	133	34	39	23	4	0
C1	20-49	None	439	32	35	25	3	5
C2		Moderate	382	27	43	21	4	5
C3		Most	433	22	39	31	4	4
D1	19 or less	None	125	18	38	27	5	12
D2		Moderate	142	18	43	33	2	4
D3		Most	155	18	48	32	5	5
E1	Totals	None	791	29	36	27	3	5
F2		Moderate	730	26	43	24	3	4
E3		Most	807	22	41	30	4	3

TABLE 165
MONTHLY RENT OR MARKET VALUE OF HOMES
OWNED BY RESPONDENTS BY SIL 60 GROUPS
AND COMPLAINT POTENTIAL

Class	Duration SIL-60 db (Seconds per Hour)	Complaint Potential	Number of Interviews	Monthly Rentals (Dollars)				Market Value (Thousands of Dollars)				
				<50	50-99	100+	Cum. Total	<12	12-16	16+	Cum. Total	INA
A1	80+	None	46	4%	4%	9%	17%	70%	7%	0%	77%	6%
A2		Moderate	59	0	3	7	10	85	3	0	88	2
A3		Most	86	4	6	2	12	74	12	0	86	2
B1	50-79	None	181	12	9	10	31	35	18	15	68	1
B2		Moderate	147	17	10	11	38	37	11	11	59	3
B3		Most	133	12	7	9	28	48	11	12	71	1
C1	20-49	None	439	7	8	8	23	47	20	7	74	3
C2		Moderate	382	8	5	8	21	51	19	8	78	1
C3		Most	433	5	3	6	14	47	27	11	85	1
D1	19 or less	None	125	8	11	15	34	40	18	7	65	1
D2		Moderate	142	8	8	13	29	49	18	3	70	1
D3		Most	155	5	13	10	28	44	21	7	72	0
E1	Totals	None	791	8	8	10	26	44	18	9	71	3
F2		Moderate	730	9	6	9	24	51	16	7	74	2
E3		Most	807	6	6	7	19	49	22	9	80	1

11. Summary of Relationships

The groups most ready to complain have been found to possess the following characteristics:

- A. They are bothered by more disturbances more frequently.
- B. They are more fearful of crashes.
- C. They feel the base is less important to their welfare.
- D. They feel the base is less considerate of their welfare.
- E. They are less satisfied in general with living conditions in their areas.

No significant differences have been found regarding duration of exposure or length of residence, personal experience with flying, direct connections with the air base, or with the many personal variables such as sex, age, education, income, occupation, etc.

D. Model for Estimating Complaint Potential

1. Introduction

Since there are five variables most highly correlated to the complaint potential, all five were combined into one analysis. These five variables are disturbance, annoyance, feelings of base importance and base considerateness, and fear of crashes. Ideally, it is desirable to control for sound level as well, but the familiar limitation of sample size ruled this out. In the chapter on disturbance, however, a model was developed linking disturbance and annoyance to SIL-60 classes. Starting with this model, therefore, it is possible to link the aircraft stimulus level to an estimate of the complaint potential.

2. Actual Interrelationships of Five Variables

The first tabulation divided annoyance and base importance into two classes and the other three independent variables into three classes each. All together, this constituted 108 classes tabulated against three complaint potential response categories, or a total of 324 response groups. As expected there were many zero cells and many subgroups with less than 5 interviews. After careful examination of the data, the scales of fear and base considerateness were divided into two parts, so that the groups with great fear and the most considerateness were separated from the less intense responses. Table 166 presents the actual data obtained in the 144 remaining classifications.

As shown all of these five variables are intercorrelated with the complaint potential. When disturbance, annoyance, and fear are least, and feelings of base importance and considerateness are high, only 15 percent report "much"

complaint potential. At the opposite extreme, when disturbance, annoyance, and fear are greatest, and base importance and considerateness are low, 88 percent report much readiness to complain. By using these five variables, a difference in response of almost 75 percent has been explained.

TABLE 166
ACTUAL REPORTS OF COMPLAINT POTENTIAL
BY DISTURBANCE, ANNOYANCE, FEAR, BASE
IMPORTANCE, AND BASE CONSIDERATENESS GROUPS

Activities Disturbed	Annoyance	Base Con- siderate- ness	Complaint Potential								
			Fear Less						Fear More		
			Base Less Important			Base More Important			Base Less Important		
			None	Mod	Much	None	Mod	Much	None	Mod	Much
0-1	Less	Less	38% (N=21)	33% (N=21)	29% (N=21)	45% (N=54)	18% (N=54)	39% (N=54)	33% (N=3)	67% (N=3)	0%
		More	49	32	19 (N=43)	55	30	15 (N=267)	25	25	50
	More	Less	10	10	80 (N=10)	41	27	32 (N=14)	17	17	66
		More	40	37	23 (N=30)	47	35	18 (N=66)	67	0	33
2-3	Less	Less	24	52	24 (N=25)	41	40	19 (N=80)	50	17	33
		More	35	42	23 (N=70)	48	38	14 (N=289)	20	40	40
	More	Less	9	23	68 (N=47)	17	37	46 (N=92)	12	25	63
		More	36	25	39 (N=61)	36	36	28 (N=122)	22	34	44
4-5	Less	Less	11	41	48 (N=44)	22	45	33 (N=51)	5	35	60
		More	38	24	38 (N=37)	46	25	29 (N=109)	11	46	43
	More	Less	6	11	83 (N=51)	12	25	63 (N=48)	2	10	88
		More	11	29	60 (N=35)	21	24	54 (N=42)	9	14	77

A further examination of table 166 reveals that the intermediate classes of disturbance and annoyance, when analyzed in terms of relative feelings of fear, base importance, and base considerateness, also rank order responses of complaint potential. One serious limitation of the table, of course, is the small number of cases in some of the groups. In very small samples of less than 25 to 30, wide variations in response may be due only to chance. In order to minimize the effects of these small samples, an averaging process was used to develop a model of average relationships. From our knowledge that some of these variables have greater influence in the lower SIL-60 classes, a curvilinear smoothing curve may prove most efficient. The scarcity of cases, however, prevented the development of such a curvilinear relationship, and a straight unweighted average was used.

3. Development of Model Relationships

In a procedure similar to the one described in the development of the model for estimating disturbance and annoyance, average effects were computed

for each of the five independent variables. These are shown in table 167. Then, using as a base level the most favorable extreme class (least disturbance, annoyance, and fear, and most favorable attitudes on base considerateness and importance) which had 267 interviews and the average effects shown in table 167, table 168 was constructed as a smoothed model for estimating the complaint potential.

TABLE 167

AVERAGE EFFECTS OF THE FIVE INDEPENDENT
VARIABLES ON COMPLAINT POTENTIAL

A. Disturbance Averages		Complaint Potential Groups		
		None	Moderate	Much
0-1	Activities	40%	28%	32%
2-3	Activities	31	34	33
	Differences from 0-1	(-9)	(+3)	(+1)
4-5	Activities	18	28	54
	Differences from 2-3	(-13)	(-6)	(+21)
Cumulative difference		(-22)	(+0)	(+22)
B. Annoyance Averages				
		None	Moderate	Much
Less		35%	36%	29%
More		24	26	30
	Difference	(-11)	(-10)	(+21)
C. Base Importance Averages				
		None	Moderate	Much
Less		24%	31%	45%
More		15	30	35
	Difference	(+9)	(-1)	(-10)
D. Base Considerateness Averages				
		None	Moderate	Much
Less		24%	29%	47%
More		15	33	32
	Difference	(+9)	(+4)	(+15)
E. Fear Averages				
		None	Moderate	Much
Base Less Important - More Fear		23%	27%	50%
Base More Important - Less Fear		26	30	44
	Difference	(+3)	(+3)	(-6)
Base More Important - More Fear		34	34	32
Base Less Important - Less Fear		16	32	32
	Difference	(+18)	(+2)	(+0)

TABLE 168

MODEL FOR ESTIMATING COMPLAINT POTENTIAL

Dis- turb- ance			Complaint Potential											
			Fear - Less						Fear - More					
			Base Importance						Base Importance					
			Less			More			Less			More		
	Annoy- ance	Base Con- siderate- ness	None	Mod.	Most	None	Mod.	Most	None	Mod.	Most	None	Mod.	Most
0-1	Little	Less	33%	27%	40%	44%	26%	30%	30%	24%	46%	42%	28%	30%
		More	44	31	25	55	30	15	41	28	31	53	32	15
	Much	Less	22	17	61	33	16	51	19	14	67	31	18	51
		More	33	21	46	44	20	36	30	18	52	42	22	36
2-3	Little	Less	24	35	41	35	34	31	21	32	47	33	36	31
		More	35	39	26	46	38	16	32	36	32	44	40	16
	Much	Less	13	25	62	24	24	52	10	22	68	22	26	52
		More	24	29	47	35	28	37	21	26	53	31	30	37
4-5	Little	Less	11	27	62	22	26	52	8	24	68	20	28	52
		More	22	31	47	33	30	37	19	28	51	31	32	37
	Much	Less	0	17	83	11	16	73	0	11	89	9	18	73
		More	11	21	68	22	20	58	8	18	74	20	22	58

4. Comparison of Actual and Computed Complaint Potential

Since the model for estimating the complaint potential is computed from very small samples in some cases, its variances would probably be greater. Table 169 indicates that the largest variations between actual and computed values occur when the actual samples totaled only 3 interviews. The second largest variation occurred with only 30 cases in a group. The usual variation averages between 10 and 15 percent, and the larger samples average less than 10 percent error. The most favorably disposed group was used as the base level, but the least favorable group was computed according to the average weights for each factor. The computed error for this group, as shown in table 169, is about 1 percent. Certainly, as a first approximation, the computed values offer good accuracy.

TABLE 169
COMPARISON OF SELECTED ACTUAL AND COMPUTED
MODEL ESTIMATE OF COMPLAINT POTENTIAL

Disturbance	Annoyance	Base Considerateness	Base Importance	Fear	Number of Interviews	Complaint Potential		
						None	Moderate	Much
0-1	Less	Less	Less	More	3	Actual	33%	67%
						Model	30	24
						Difference	-3	+46
0-1	More	More	Less	Less	30	Actual	40	37
						Model	33	21
						Difference	-7	-16
2-3	Less	More	More	Less	249	Actual	40	38
						Model	46	38
						Difference	-6	0
2-3	More	More	More	Less	122	Actual	36	36
						Model	35	28
						Difference	-1	-8
4-5	Less	More	More	Less	109	Actual	46	25
						Model	33	30
						Difference	-13	+5
4-5	More	Less	Less	More	58	Actual	2	10
						Model	0	11
						Difference	-2	+1

5. Example of Application of Models for Estimating Disturbance, Annoyance, and Complaint Potential

As a final test of the validity of the models, an actual application will be made to the West ADC base. About 350 interviews were conducted at the West ADC base, where the duration of SIL 60 was estimated to be from 50 to 79 seconds per hour. From our knowledge of the West ADC area, we concluded:

1. People are less fearful.
2. People regard the base as more important.
3. People regard the base as more considerate.

Using these conclusions, we turn to table 132, the model for estimating disturbance and annoyance, and, under the SIL-60 class for a duration of 50 to 79 seconds, we estimate the disturbance and annoyance. Table 170 compares the computed values taken from table 64 for the West ADC area. As shown, the mean difference is 4 percent and the largest single variation is only 8 percent.

TABLE 170
COMPARISON OF ACTUAL AND COMPUTED
ESTIMATES OF ANNOYANCE AND
DISTURBANCE FOR A WEST ADC AREA

Activities Disturbed	Annoyance	Actual	Computed	Difference from Actual
0-1	Little	16%	20%	+4%
	Much	4	7	+3
2-3	Little	31	28	-3
	Much	14	13	-1
4-5	Little	22	14	-8
	Much	13	18	+5

Then, turning to table 166, the model for estimating the complaint potential and using the same conclusions listed above, the complaint potential for the West ADC area is computed. Table 171 shows the computations and also compares the actual reported complaint potential taken from table 143. As shown, the computed values are practically identical to the actual data obtained from the lengthy interviews. A base planner using the two models could have estimated the complaint potential with an error of less than 3 percent.

TABLE 171
COMPUTATION OF COMPLAINT POTENTIAL
FROM MODEL DATA AND COMPARISON
WITH ACTUAL INTERVIEW REPORTS

Computed			Computed Complaint Potential					
			None		Moderate		Much	
Disturbance	Annoyance	(Col. 1)	Model Value (Col. 2)	Col. 1X (Col. 3)	Model Value (Col. 4)	Col. 1X Col. 4 (Col. 5)	Model Value (Col. 6)	Col. 1X Col. 6 (Col. 7)
0-1	Little	20%	55%	11.0%	30%	6.6%	15%	3.0%
	Much	7	44	3.1	20	1.4	36	2.5
2-3	Little	28	45	12.9	38	10.6	16	4.5
	Much	13	35	4.6	28	3.6	37	4.8
4-5	Little	14	33	4.6	30	4.2	37	5.2
	Much	18	22	4.0	20	3.6	38	10.4
Totals Computed			--	40.2	--	29.4	--	30.4
Actual				41.0		32.0		27.0
Difference				- 0.8		- 2.6		3.4

SECTION V

SUMMARY AND RECOMMENDATIONS

A. Introduction

After five years of research, instruments and procedures have been developed, field tested, and validated for the following:

1. Estimating the acoustic characteristics of the aircraft stimulus
2. Estimating the human response variables of disturbance, annoyance, and complaint potentials
3. Estimating the scale of responses for interrelated sociopsychological variables
4. Developing prototypes of models for estimating neighborhood responses of disturbance, annoyance, and complaint potentials
5. Pretesting the models in an illustrative case study.

The tools developed in this research should be used to gather sufficient response data to validate fully the analytical findings and the models based on these findings. It must be clearly understood that, while the findings are believed to be generally valid for the situations described, they are based on only 2300 interviews at three air base areas. Since there were considerable variations in response among the three air bases, it is extremely important that the findings be further validated at other air bases before they are accepted for general use.

B. Procedures for Estimating the Acoustic Variable

Detailed procedures have been developed for the measurement of the key physical parameters of the aircraft stimulus. These physical variables are:

1. Average number of aircraft per hour whose maximum SPL in the 300 to 600 cps band exceeds 60 db. These measures are recorded for day and night periods.
2. Maximum SPL in the 300 to 600 cps band exceeded by 10 percent of aircraft listed in (1) above
3. Average "duration of peak" in seconds for aircraft whose maximum SPL in 300 to 600 cps band exceeds 80 db
4. Equivalent continuous SPL in 300 to 600 cps band (L_{eq})
5. Average number of seconds per hour during which an SIL of 60 db is exceeded
6. Average number of seconds per hour during which an SIL of 75 db is exceeded

The three air base areas studied were divided into 22 homogeneous neighborhoods, and acoustic estimates for each of the above 6 physical indexes were obtained. The major human response variables were then analyzed by the

physical indices. For these particular areas, the SIL-60 measurements proved the best single series for correlating human responses. It is also likely that a combination of volume of aircraft and peak SPL, and the L_{eq} series may prove to be equally efficient. Due to the peculiar unequal distribution of interviews from the three air bases among the different acoustic classes, however, these two indexes were not well correlated with disturbance, annoyance, and complaint potential. It is further believed the SIL series was effective because it measured the amount of time a given noise spectrum was exceeded. The use of other spectra besides the SIL series as a function of time may prove to be the key physical variables.

At the present time a short statistical procedure for estimating L_{eq} classes has been developed. Comparable procedures for estimating the other acoustical parameters have been developed.*

C. Development of Guttman Scales for Three Response Variables--
Disturbance, Annoyance, and Complaint Potential

Detailed descriptions of the development of accurate measurements for these three human response variables are included in Volume II of this report. Four retests of the scales (a split sample at the SAC base and two ADC bases) indicate the very high reliability of these measures. The disturbance scale contains 11 classes of relative intensity, the annoyance scale contains a maximum 15 subgroups, and the complaint potential consists of six rank ordered classes. Actually, an insufficient number of interviews necessitated combining many of these finer classifications in the analysis of data.

D. Measurement of Interrelated Sociopsychological Variables

Summary measurements were developed for each of seven additional variables found most important in modifying annoyance and complaint potentials:

1. Fear of air crashes
2. Base considerateness
3. Pilot considerateness
4. Base importance
5. Overall satisfaction with neighborhood
6. Belief in the possibility of successful action
7. Overall Air Force image of considerateness

* Clark, Welden, Reaction to Aircraft Noise, Report No. 572, Bolt Beranek and Newman, Inc., Los Angeles, California, June 1960.

In a series of detailed analyses the following relationships were found:

1. The number of activities and the frequency of activity disturbance are directly related to the duration of the SIL-60 series. When the duration is 80 seconds or more, two-thirds of all residents report 4 to 5 activities disturbed, and 57 percent report frequent disturbances. In contrast, when the duration is 20 seconds or less, only a fourth report as many activities disturbed and only 15 percent report frequent interference.
2. Annoyance with activity interference is also directly related to the SIL-60 series, with reported annoyance increasing as the duration increases. At the longest duration (80+), more than half of all residents express much annoyance while at the lowest levels (-20), only 14 percent are greatly annoyed.
3. Fear of air crashes is directly related to SIL-60 duration. More than half of all residents at the top SIL-60 class express much fear, while only 17 percent are as fearful at the lowest durations. When fear is related to both annoyance and SIL-60 durations, almost two-thirds of the much annoyed in the top SIL-60 class express much fear while only 37 percent of the much annoyed in the lowest SIL-60 class express the same fear.
4. The much annoyed generally feel the local air base is of less importance to the welfare of their areas. In the upper SIL-60 class a third of all greatly annoyed residents feel the base is of little importance, while in the lower SIL-60 class, almost two-thirds feel as negative about base importance. This indicates that the greatest effects of some psychological variables appears to be at the lower intensities of noise, where the possibilities for adaptation are likely to be greater.
5. Feelings about the relative importance of the Air Force in winning a war or of the importance of defense efforts to prevent wars are not greatly affected by annoyance with aircraft noise. About half of all respondents felt the Air Force was the most important branch of the armed forces, while 40 to 45 percent felt all branches were of equal importance. Only 5 to 10 percent selected another branch as the most important. Likewise, only 12 to 19 percent disagree with the statement, "The best way to stay out of war is to be strong."
6. The much annoyed also feel that local base personnel are least considerate of their welfare and do not make enough efforts to minimize the disturbances. Almost half of the much annoyed feel this way as compared to only a fifth of the least annoyed.
7. Persons greatly annoyed by aircraft noise also are more often annoyed by noise of cars and trucks. Persons living in quiet background areas, however, report less annoyance with aircraft noise than persons living in noisy environments. The implications of this finding are unclear, in terms of possible transference of feelings of one annoyance to another. In the highest SIL-60 category, only 10 percent were much disturbed by street noise, while 53 percent were much annoyed by airplane noise.

8. The "much annoyed" by aircraft noise are also generally less satisfied with overall living conditions in their areas. While almost 60 percent of the much annoyed were satisfied with only 6 out of 10 or fewer residential criteria, only about half as many felt the same way among the least annoyed.

9. Time by itself is no automatic cure for noise annoyance. People who have lived longer in their areas or are at home more often during the daytime hours are no less annoyed than those living in the area a shorter period of time or exposed less often. If anything, the tendency is for older residents to feel more annoyed.

10. While differences are small, persons with less annoyance generally have fewer and less recent flying experiences.

11. None of the many personal variables such as age, sex, education, income, occupation, etc., proved significantly different for different annoyance groups.

12. Readiness to complain or the complaint potential is generally related in the same way to the above psychological variables as annoyance. People are more prone to complain when they are more frequently disturbed and annoyed, are more fearful, feel the base is less important and less considerate, and report less overall satisfaction with their neighborhoods.

E. Development of Multi-Variate Models for Estimating Disturbance, Annoyance, and Complaint Potentials

1. Model for Estimating Disturbance and Annoyance

From the knowledge of the above interrelationships, cross tabulations were prepared of SIL-60 classes, fear of crashes, feelings of base considerateness, and combined scale of disturbance and annoyance. All variables were highly interrelated, but the small sample sizes in some classes made the relationships a bit uneven. Consequently, using an averaging process, a smoother model of these interrelationships was constructed. In comparing actual and computed estimates of annoyance and disturbance, the model was generally within 5 to 10 percent of the actual estimates. In applying the model to an actual neighborhood with 350 interviews, the average error was only 4 percent.

2. Model for Estimating Complaint Potential

Six variables were combined to develop a tool for estimating the complaint potential. Tied to the six disturbance-annoyance estimates produced by the first model, data on fear, base importance, and base considerateness are added to estimate three complaint potential classes. This second model generally is less reliable than the first because it is often based on very small samples. The average error generally is between 10 and 15 percent. In a practical test at the same ADC neighborhood, cited above, the reliability proved unbelievably high, only about 3 percent error. This small error may be due to chance,

and the model will have to be tested in other areas not used in the development of the models. The models may be regarded as prototypes explaining considerable variations in human response, but requiring further testing and validating.

F. General Recommendations

1. The revised questionnaire should be used to collect additional response data from as many different types of air base areas as possible. This will facilitate the averaging of individual air base area differences and the development of reliable numerical relationships among the acoustic and sociopsychological variables.

2. The prototype models for estimating disturbance, annoyance, and complaint potentials without additional area sampling of public attitudes towards an air base should be used only experimentally by competent personnel. As additional field data becomes available, the numerical values should be rechecked and refined.

3. Work should also begin in evaluating neighborhood-community relationships affecting community complaint action. The tools developed in this study are for estimating neighborhood responses. Other variables must be studied to relate neighborhood reactions to the overall community responses.

4. Before and after community studies should be experimentally undertaken to test the effectiveness of different administrative programs on reducing annoyance and complaint potentials.

5. After the additional research described above, it is our belief that a valid short procedure can be developed for estimating public reactions to a scale of noise levels without the requirement of additional special area studies.

APPENDIX A

DEVELOPMENT OF QUESTIONNAIRE

One of the results of an earlier exploratory phase of jet noise research was the development of a comprehensive theoretical framework of the factors believed to affect the community noise problem. Before we discuss the series of developmental revisions in the questionnaire itself, which was designed to secure adequate data on the factors included in the theoretical framework, it might be well to describe the conceptual scheme itself.

1. Theoretical Framework of Factors Believed to Affect Community Reactions to Aircraft Operations

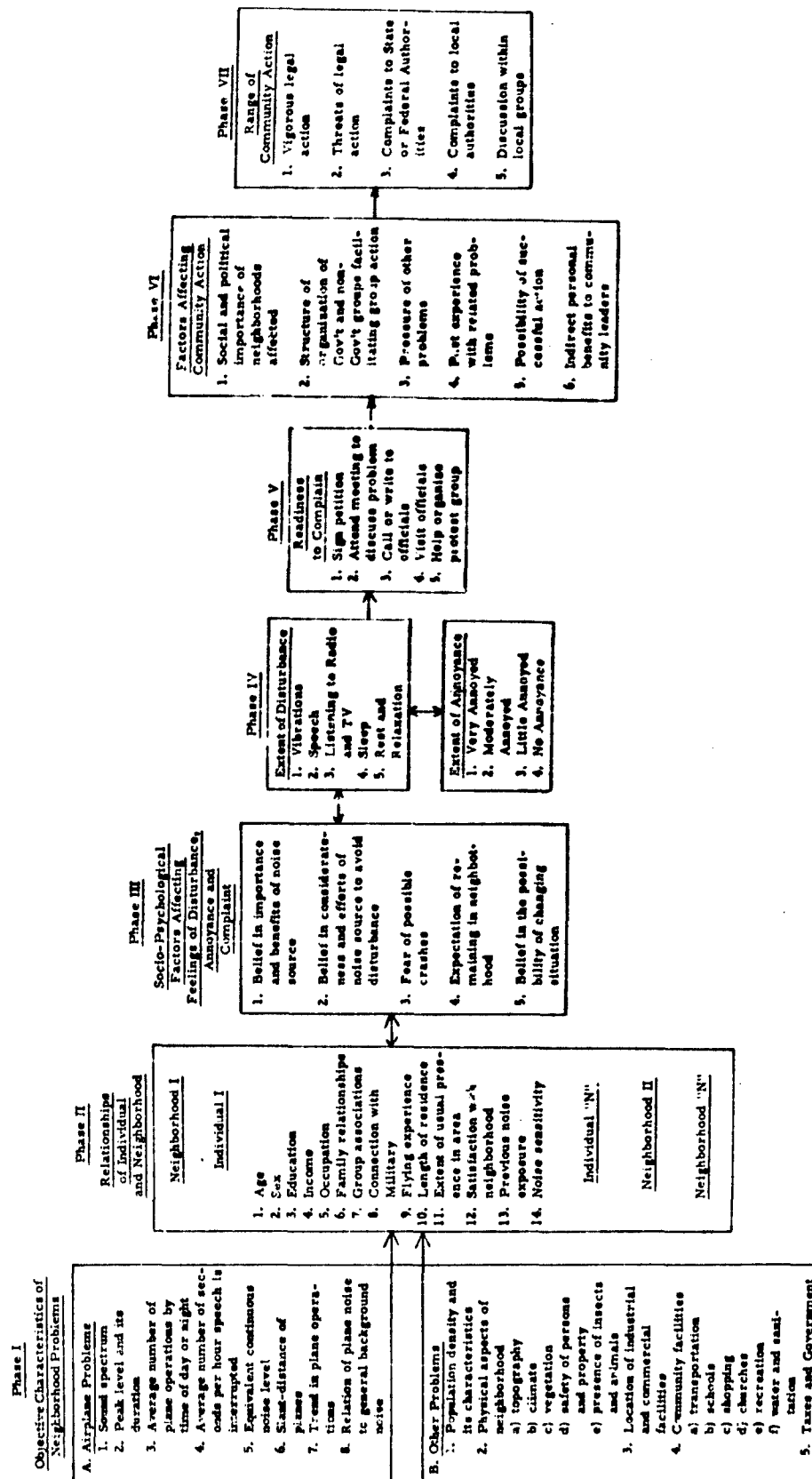
It should be clearly recognized at the outset that human reactions to jet noise and flight operations are extremely complex and that there are numerous unique aspects to every individual experience. Consequently, in attempting to synthesize many different individual experiences and to establish broad generalizations, some details are necessarily oversimplified. With this caution in mind, table I (App. A) is presented below as a suggested schematic outline of the factors affecting community aspects of the aircraft problem.

As the network of arrows on table I (App. A) indicates, each set of factors is interrelated in a complicated pattern to other physical and psychological conditions. Although it is recognized that in a real experience these factors tend to operate simultaneously and that it is impossible to isolate distinct phases of the annoyance and complaint processes, it is nevertheless convenient for analytical purposes to consider separately the following seven conceptual phases of the problem:

Phase I	The objective characteristics of neighborhood problems
Phase II	The spatial and sociological relationships of individual residents in a single neighborhood and of adjacent neighborhoods
Phase III	The intervening socio-psychological factors affecting individual feelings of disturbance, annoyance and complaint
Phase IV	The range of neighborhood disturbance and annoyance
Phase V	Readiness to complain
Phase VI	The intervening factors affecting community action
Phase VII	The forms of community action

TABLE 1 (APP. A)

THEORETICAL FRAMEWORK OF FACTORS BELIEVED TO AFFECT
COMMUNITY REACTIONS TO AIRCRAFT OPERATIONS



The first phase of the aircraft problem logically involves an analysis of the characteristics of the stimulus situation itself. In order to ascertain whether there are any statistical relationships between variations in the stimulus and in the human perception, feelings, and expression of those feelings about the stimulus, it is important to establish some objective measurements of the stimulus which are independent of the subjective reports obtained from respondents. The subjective respondent reports can then be related to the measured variations in the aircraft stimulus and any statistical relationships between the two can be established.

For example, in evaluating a jet flight or stimulus at a given place and time it is possible to measure objectively certain acoustic parameters of the noise such as the sound spectrum, the peak sound pressure levels (SPL's) in various octave bands, and the duration of those SPL's. From actual flight and operations records, it can be further ascertained how often and how regularly these noises are propagated, and how present activity compares with past trends and expected future trends. It is also possible to estimate the range and average altitude of planes flying over a particular house or neighborhood, and the extent to which it is directly overhead or off to a side (slant-distance of plane). The objective relationships of the jet noise to other environmental noises can also be obtained by similar methods. These objective physical aspects of the aircraft stimulus will vary from house to house and from neighborhood to neighborhood. In order to determine whether there is a statistical relationship between these variations in the objective jet stimulus and the human response to it, these objective characteristics must first be determined. To the extent that some specific relationships can be established, it may be possible for operations officials to manipulate the character of jet operations in order to minimize the disturbance.

Since the jet noise stimulus seldom occurs as an isolated environmental experience but is usually part of a larger complex of problems involved in residential living, it is not enough merely to measure the characteristics of the jet disturbance. It is also important to establish the total context of residential problems in any neighborhood or community. Some of the more important residential problems are listed in the schematic outline, but there are undoubtedly others which could also be listed. The reversible arrows connecting airplane and non-airplane problems indicate the probable complex interactions of these factors.

The second phase of the schematic outline attempts to show the spatial and sociological composition of a community in relation to the physical characteristics of the stimuli. Each neighborhood has a definite physical structure in which different homes in that neighborhood and consequently the individual residents in those homes are exposed to different intensities of the stimulus. Some homes are closer to the airport and flight paths and receive the most intense stimulation; others are farther off the side or farther away and experience less intense stimulation. "Individuals I--N" comprise "Neighborhood I." The rest of a given community consists of other neighborhoods in varying spatial relationships to the stimuli. These are designated as "Neighborhoods II--N."

In addition to the spatial composition of a neighborhood or a community, there are the social interactions of individuals and groups of individuals in different neighborhoods. By social interactions we mean the indirect stimulation produced by communication of various individuals or groups of individuals in the community. For example, let us assume that Individual "I" in Neighborhood "I" received the most intense stimulation and the Individual "N" the least. Through sympathetic discussion, however, it is possible that the "feelings" of Individual "N" can be affected by discussion with Individual "I" and vice versa. Likewise, the social relationships among neighborhoods can affect "feelings" of individuals in different parts of the community. It is important to recognize that different individuals and neighborhoods actually experience the stimulus differently in terms of direct exposure and indirect social exposure.

It is also obvious that each individual has different characteristics which may affect his perception and "feelings" about the stimulus. In analyzing individual "response" patterns, therefore, such personal factors as age, sex, education, income, occupation, family relationships and group associations, connections with military groups, flying experiences, length of residence, extent of usual presence in the area, general satisfaction with living in area, previous noise experiences and general noise sensitivity should be considered.

Assuming that two or more individuals with similar personal factors are found to be exposed to comparable jet stimuli, is there any indication that their "feelings" about jets will be similar? Our findings indicate that a host of other intervening socio-psychological variables must also be considered. These variables are described as Phase Three of our scheme. While it is impossible to list all of the possible socio-psychological factors which may affect an individual's "feelings," it is believed that the key factors are included in table 1 (App. A). For the sake of simplicity, only the factors affecting Individual "I" are charted on table 1 (App. A). It should be understood, however, that comparable schemes can be drawn for each individual and that each individual has a possible interaction with every other individual, as is shown in Phase Two. It is also possible to group individuals in a neighborhood and describe their feelings and attitudes in statistical terms.

The first group of psychological variables concern the positive aspects of jet operations. Like many things in life upon which judgments are formed, the overall attitude is often a function of the relative advantages balanced off with the relative disadvantages. In this regard, the general importance of the air base to the individual as a source of income, convenience or general protection is significant. Likewise, the perceived importance to friends or neighbors or to the larger community is relevant. If a facility is performing an important function and the disturbance is a by-product of the activity, there may be some reluctance to even recognize the interference and possibly jeopardize the important function. On the other hand, it isn't always sufficient to feel merely that the operation is essential, it is also necessary to believe that the facility has to remain at its present site. Although there may be agreement as to the general value of the facility, if a person feels it could be moved elsewhere to an alternative site where there would be less disturbance,

there generally would be less reluctance to express oneself. Perhaps it should be mentioned again, that these psychological factors may not affect all groups of people uniformly, and that the interaction of the intensity of the airplane stimulus undoubtedly accounts for much of the variation.

A second important group of factors inhibiting or encouraging reports of disturbance and annoyance involve the feelings about the avoidability of the disturbance. If a person feels that it is physically possible to reduce the disturbance, then he is more likely to urge the adoption of remedial measures. On the other hand, if he feels that given the best intentions, nothing can be done by the authorities to reduce the annoying situation, he is more likely to feel that complaining is a waste of time. It is the extent to which he feels the authorities and pilots are considerate about his welfare and are trying to avoid disturbances which may affect reports of disturbance feelings and readiness to complain about them.

A third key variable is the presence or absence of fear of possible crashes. If in addition to the inconvenience of interrupted residential activities, there is a constant anxiety about a threat to life itself, then the likelihood increases that reports of disturbance, annoyance and complaints will be intensified.

A fourth intervening variable involves the expectations of duration of exposure. If a person has definite plans to move from the neighborhood in the near future, he may be willing to put up with the disturbance for a short period without expressing his feelings. On the other hand, if he expects to remain in the area for a long time, then feelings of what disturbances are acceptable may be different.

Assuming that a person feels that remedial measures are technically possible, there is still the further consideration as to whether it is socially possible to secure the adoption of such measures. A person generally has to feel that his complaint may be of some value in securing relief from the disturbance in order for him to go to the trouble of even expressing himself. Of course, these hypotheses do not apply to the crank or chronic complainer who enjoys the very act of complaining. The present discussion concerns most people whose complaints are based on actual disturbances.

There are several factors which can contribute to the belief in the social possibility of success. A primary consideration is usually the belief that other residents in the community are equally annoyed and that a complaint would be socially approved. In addition, a person has to have confidence in his own ability to express himself adequately and in the effectiveness of neighborhood or community groups to bring sufficient pressure on the authorities to effect a change. Underlying this last factor is the belief that the authorities are willing to listen and can be persuaded to adopt reasonable remedial measures.

Of course, past experience with similar neighborhood and community problems will influence one's faith in the possibilities of successful group action. A series of unsuccessful efforts will generally tend to discourage expression, while

previous successes will usually stimulate new efforts. The extent of neighborhood and community organization and the ease of various forms of expression, naturally also contribute to the readiness to complain. For example, it is generally easier to get a neighbor to sign a petition than it is to get him to write a lengthy letter or to visit the officials personally. Again it must be emphasized that all of the above factors interact with one another and that the net positive or negative balance results in the expression or suppression of feelings of disturbance and annoyance.

Phase IV lists some of the most important activities of residential living that are often affected by jet operations. As is reported in the findings of the report, the interactions of the intensity of the stimulus, the personal characteristics of the individual, and the socio-psychological variables just discussed, affects feelings about the extent to which even activities are disturbed. The first item listed, vibrations, is not really an activity comparable to the others. The shaking and pulsating of dishes, windows and other objects in a house by the low noise from jet planes is a disturbance, however, frequently reported. The other activities are self explanatory and involve basic activities of residential living.

Although two people may report equal frequency of disturbance of a given activity, their feelings of annoyance may differ. One may be greatly bothered, while the other regards it as a minor inconvenience. It is our hypothesis that the extent of annoyance is a function of the same socio-psychological variables described above. A person will be more annoyed if he feels the base is less important, less considerate of his feelings, more fearful of crashes, expects to be exposed to the noise indefinitely and feels it is possible to effect an improvement in the situation.

Likewise, two people may be rated as equally disturbed and annoyed but they may be unequal with respect to all the socio-psychological and personal variables cited above. It is our further hypothesis that expressions of annoyance or "readiness to complain" are a further function of the interaction of the same personal and socio-psychological variables. Consequently, it would follow that a person who was most annoyed by most disturbances and also reported all the action-prone attitudes (base least important, officials less considerate, fear of crashes, etc.) would be more ready to complain than a person not reporting some of these negative attitudes.

Phase V lists some of the most frequently experienced forms of complaint. Some of the forms of expression involve more personal effort than others. Presumably, there is less personal effort to sign a petition a neighbor puts in front of you than to go from door to door circulating the petition itself. Consequently, it would be our assumption that a person willing to do the latter is more ready to complain than the former, who merely signs a petition circulated by someone else.

The first five phases of table 1 (App. A) have described the stimulus and the individual neighborhood reactions to it. The last two phases of the schematic presentation concern the factors affecting the larger community. A more detailed discussion of neighborhood and community differences will be presented in subsequent sections of the report. For purposes of this summary section, however,

we may define a neighborhood as a geographic cluster of blocks or contiguous individual properties, and a local community as the smallest unit of political authority, including a number of neighborhoods, which can take some legislative or administrative action concerning the jet problem.

In the previous discussion of the relationship of individuals and neighborhoods, it was stated that different individuals and neighborhoods are differentially exposed to the jet stimulus. Some persons and neighborhoods are more intensely affected than other neighborhoods located in more distant areas. It is reasonable to expect, therefore, that feelings of annoyance might also vary from neighborhood to neighborhood. The process whereby the community as a whole concerns itself with the jet disturbance is reflected in the six items listed under Phase Six of the schematic diagram.

The process of relating neighborhood annoyance with jets to community action is not a universal one but varies from community to community in accordance with local customs and practices in dealing with neighborhood problems. Some of the broader generalizations, however, are listed in table 1 (App. A). The first consideration is the universality of the problem. Are many neighborhoods affected or only a few? If the problem is widespread in the community, it is generally easier to secure community-wide action. On the other hand, even if relatively few neighborhoods are directly involved, the social and political importance of the affected neighborhoods must be considered. If the residents in the complaining neighborhoods are leaders of the community or have ready access to the leaders, the chances of securing community action are enhanced.

The second important consideration involves the complexity of the community and the ease of individual and neighborhood expression. If the accepted procedures for the solution of neighborhood problems are clearly established and understood, and if the mechanism is relatively simple, the chances of securing community action are further increased. For example, in many New England towns, the town meeting is the customary forum for securing legislative redress. Likewise in most of these communities, there are established civic groups which concern themselves with local environmental problems. These local groups are readily available to residents of different neighborhoods and are expected to furnish leadership and organizational know-how in the solution of these problems. Under such direct and simple forms of local government, it is relatively easy for residents in particular neighborhoods to organize themselves, to appear at a town meeting where each resident has an equal vote, and to secure community-wide support for their neighborhood problems. On the other hand, where communities are large and less well integrated and the forms of government are more complicated and indirect, and the process of securing support from numerous less affected neighborhoods involves a huge organizational effort, the chances of securing community-wide action are reduced unless the problem is fairly universal.

A third factor involves the relative importance of the jet problem in relation to other problems facing the community as a whole. If the officials are preoccupied with other pressing affairs, the chances of securing concerted action on the jet situation are generally less.

Previous experiences of neighborhoods in securing community-wide support for similar problems are also important. If there is an established tradition of community-wide action on such problems, it is generally easier to secure current community-wide support. On the other hand, if similar efforts by the same or other neighborhoods have failed in the past, it might discourage the presently affected neighborhoods from pressing for community action. While this factor influences the neighborhood in its willingness to appeal for community support, it also influences community leaders in their deliberation. If these leaders have tried to secure remedial action in the past and have failed, they may feel it is useless to continue the effort. Correspondingly, if they previously succeeded in securing some improvement, they might be encouraged to press their efforts further.

A final important factor influencing community action involves the possible indirect personal benefits that community leaders may hope to derive from championing the issue. These benefits might merely involve the expected additional political support derived from the publicity of leading such a campaign, or it could involve more personal benefits. In some cases, some of the leaders may own property in the vicinity of the airport, and by pressing for changes in jet operations may hope for financial and other personal benefits. These considerations are usually difficult to establish but, nevertheless, can be very important.

The final phase of the schematic diagram indicates the particular forms of possible community action. It is largely self-explanatory and ranges from court suits and local legislation restricting the operations of the facility to legislative inquiries and forums discussing the problem.

2. Selection of Primary Variables

The many items discussed in the previous section are all considered important and relevant to evaluating community reactions of disturbance, annoyance and complaint potential. Qualitative and even some quantitative documentation for our belief in their significance is given in the body of this report.

In designing a field test of the above broad hypotheses, it was necessary to limit the number of variables that could be included in a simple practical questionnaire. To explore thoroughly every item would involve a three hour depth interview, which is both costly and difficult to administer on a large scale. Consequently, after considerable discussion with Air Force technical personnel, it was agreed to limit our field test to the following key variables, shown in table 2 (App. A).

3. Development of Questionnaire in First Field Test

After considerable pretesting, a questionnaire was developed embodying questions on all of the above variables. An outline of the questionnaire used in the first pilot study is shown in table 3 (App. A), while the actual questionnaire is designated as table 4 (App. A).

TABLE 2 (APP. A)

SELECTED VARIABLES BELIEVED TO AFFECT COMMUNITY
REACTIONS TO AIR FORCE NOISE

I. Physical Parameters	II. Response Variables	
1. Peak S, P, L,	1. Number and frequency of activities disturbed	2. Overall satisfaction with area
2. Duration of peak	2. Degree of annoyance caused by disturbances	3. Feelings of importance of air base
3. Number of exposures per time period	3. Readiness to complain now	4. Feelings of consideration of pilots
a. Day - week		5. Feelings of consideration of officials
b. Day - weekend		6. Feelings about potential success of complaining
c. Night		7. Feelings about Air Force as an institution
4. Duration of Speech Interference Level (60 db and 75 db)	III. Intervening Socio-Psychological Variables	8. Personal variables of age, sex, etc.
5. Equivalent S, P, L,	1. Fear of possible crashes	

A detailed discussion of the field problems involved in the pilot study at a S. A. C. Air Base is given in Part B of the Appendices. In this section, we are concerned about the changes in the questionnaire itself which resulted from the field experience.

Although interviewing was completed in early July, 1956, detailed analysis was not completed until February of 1957. These eight months were spent in coding, analyzing, developing and testing analytical scales and prototypes of analytical models. The coding experiences will be discussed in Part C of the appendices and the scale development will be described in Part D of the appendices. Results of these evaluations, which revealed weaknesses in the questionnaire will be discussed below.

TABLE 3 (APP. A)

CONCEPTUAL OUTLINE OF QUESTIONNAIRE

I. Attitudes toward the Community - Introductory Q. 1-5	C. Maturity of Air Force Personnel
II. Attitudes toward Noise and Living Activities Affected	Q. 27E, I, L, M, N
Q. 6 Overall noise rating	V. Relative Standing of Air Force and Other Military Services
Q. 7 Kinds of noise heard	Q. 26 Relative importance in another war
Q. 8 Overall annoyance with noise	Q. 25B-E Relative spending on different services
Q. 9 Living activities disturbed and reported affect	VI. Importance of Military Defense Activities
Q. 10 Spontaneous report of fear	Q. 22 Expectation of war
Q. 14 Physical avoidability of aircraft noise	Q. 23 Trend of threat since year ago
Q. 16 Social approval or disapproval of neighbors	Q. 24 Peace thru military strength
III. Attitudes toward Local Air Base Operations	Q. 25 Attitude toward government spending on defense
A. Considerateness	VII. Population Variables
Q. 10 Volunteered comments about "low" planes	A. Mobility
Q. 12 Pilots concern about residents - ability to fly higher	Q. 21 Intention to move
Q. 13 Air Base officials doing all they can	Q. 31 Previous residential areas
Q. 15 Air Base officials concern about residents	B. Opportunities for Exposure
Q. 16 or 17 Reaction of officials to complaints	Q. 30 Presence in home
B. Role of Base in Community	Q. 31 Length of residence in home
Q. 11 Importance of missions - necessity for location - economic	C. Personal Variables
Q. 28 Air Force men's interest in community problems	Q. 32 Family composition, age, sex, race
Q. 29A Rating of overall inconvenience and disturbance caused by base	Q. 33 Occupation
Q. 29B Rating of overall benefits of Air Base	Q. 34 Connection with military services
C. Readiness to Act	Q. 35 Education
Q. 16 Personal desire and experience with complaints	Q. 36 Income
Q. 17 Belief in possibility of group action	Q. 37 Previous flying experiences
Q. 18 Reported feelings and experiences of neighbors (cohesiveness)	Q. 38 Attitudes toward personal flying
Q. 19 Reported interest and effectiveness of groups	Q. 39 TV set ownership
Q. 20 Projected types of complaint activity	Q. 40 Special air conditioning and air cooler systems
IV. General Attitudes toward Air Force	Q. 41 Ownership or rental of home
A. Efficiency of Operation	Q. 42 Business connection with local air base
Q. 27A, D, F, J	
B. Policy of Consideration of Civilian Interests	
Q. 27B, C, G, H, K	

TABLE 4 (APP. A)

NOISE SURVEY 385

1 JUNE 1956

NATIONAL OPINION RESEARCH CENTER

Respondent No. 1 - 2 - 3

Time interview began _____
ended _____

Hello. I'm from the opinion research center at the University of Chicago.
We are doing a study about how people feel about living in different places, and
I'd like to get some of your views.

1. In general, how do you feel about living in this part of Tucson. Do you rate it as an excellent, good, fair, poor, or very poor -- place to live?

Excellent..... 4-10
Good 20
Fair 10
Poor 400
Very Poor 500
Don't Know 60

*IF "EXCELLENT", "GOOD", OR "FAIR", ASK Q. 2 AND Q. 3

*IF "POOR", "VERY POOR", OR "DON'T KNOW", ASK Q. 3 FIRST AND THEN Q. 2

2. A. What are some of the things you like about living around here -- things that you feel are advantages or that make this a good place to live? (Anything else?) 5-
3. A. Now what are some of the things you don't like about living around here -- things you feel are sometimes nuisances or are unpleasant or disagreeable to you? 6-
- B. Have we overlooked anything -- even little things that may bother or annoy you that you just take for granted because nothing much can be done about them? 7-

4. A. Taking everything into consideration, would you say this is a very safe place to live, or are there some dangerous conditions affecting this area?

Some dangerous..... 8-10
Very safe 0
Don't know X

*IF "SOME DANGEROUS CONDITIONS", ASK B:

B. Could you describe them to me? (Anything else?) 8-

5. Now to be sure I have all your feelings straight. Here is a list of things that many people consider important in a residential area.

I'd like you to tell me for each of these items how you would rate this area in terms of actually having them. For example, would you say this area was very good, good, fair, poor or very poor in terms of being "close to your work or place of business?" (How about schools? etc.)

	Very Good	Good	Fair	Poor	Very Poor	Don't Know
a. Close to work or place of business	9-1	2	3	4	5	6
b. Schools.....	10-1	2	3	4	5	6
c. Amount of noise	11-1	2	3	4	5	6
d. Shopping facilities	12-1	2	3	4	5	6
e. Taxes or rent	13-1	2	3	4	5	6
f. Roads and transportation facilities	14-1	2	3	4	5	6
g. Safety of area	15-1	2	3	4	5	6
h. Neighbors	16-1	2	3	4	5	6
i. Sewage and sanitation service.....	17-1	2	3	4	5	6
j. Close to church.....	18-1	2	3	4	5	6
k. Local government.....	19-1	2	3	4	5	6

6. A. Now how would you rate the noise around here -- in general, would you say it's Very Noisy, Fairly Noisy, Fairly Quiet or Very Quiet?

NOTE If a qualification is given, "Except for the _____ noise it's _____," Enter the qualified noise and the overall noise rating, then ask B.

Except for _____ * Very Noisy..... 20-1
Fairly Noisy..... 2
Fairly Quiet..... 3
Very Quiet..... 4
Don't Know..... X

- *2. Now including the _____ noise, how would you rate it -- would you say it's Very Noisy, Fairly Noisy, Fairly Quiet, or Very Quiet?

Very Noisy..... -5
Fairly Noisy..... 6
Fairly Quiet..... 7
Very Quiet..... 8
Don't Know..... 9

7. A. Could you tell me (again) what kinds of noises or sounds you usually hear around here? (Any others?)

NOTE Record verbatim comments below about the "kinds of noises", then be sure to circle each noise in Q. 8.

Also be sure to find out whether the respondent ever hears jet and propeller planes in flight and on the ground and circle the appropriate four items below. Unless a "Yes" or "No" answer is spontaneously given to each of the four items, Ask B & C as they apply.

B. Do you (also) ever hear (jet and/or propeller) planes fly by here?

C. Do you ever hear (jet and/or propeller) planes warming up or testing their engines?

	B. Flight			C. Ground		
	Yes	No	Don't Know	Yes	No	Don't Know
Jets heard.....	1	2	3	1	2	3
Propeller heard	1	2	3	1	2	3
Planes heard -- types unknown...	1	2	3	1	2	3

21-

8. Now let's see if we have all the noises and sounds you hear around here --

NOTE: Go over answers to Q. 6 and Q. 7, reading aloud the noises and sounds mentioned, and circling the numbers preceding each noise listed below: Then ask A-1 - 6 for each noise mentioned.

- A1. Does the _____ noise ever bother or annoy you very much, moderately, only a little, or not at all? (How about the (second noise)? etc.)

	Kinds of Noise							
	22-Jet Flight	23-Jet Ground	24-Propeller Flight	25-Planes Ground	26-Propeller Flight	27-Planes Ground	28-Traffic	29-People
Very Much...	1*	1*	1*	1*	1*	1*	1*	1*
Moderately...	2*	2*	2*	2*	2*	2*	2*	2*
A little.....	3*	3*	3*	3*	3*	3*	3*	3*
Not at all.....	400	400	400	400	400	400	400	400
Don't know...	500	500	500	500	500	500	500	500

*IF BOTHERS "VERY MUCH", "MODERATELY", OR "A LITTLE", ASK A2 AND A3:

*A2. Does it bother you (insert category selected in A1) Very Often, Fairly Often, or only Occasionally?

	22-Jet Flight	23-Jet Ground	24-Propeller Flight	25-Planes Ground	26-Propeller Flight	27-Planes Ground	28-Traffic	29-People
Very often....	7	7	7	7	7	7	7	7
Fairly often..	8	8	8	8	8	8	8	8
Occasionally..	9	9	9	9	9	9	9	9
Don't know...	X	X	X	X	X	X	X	X

TABLE 4 - APP. A (Cont.)

- *A3. Could you tell me just how you feel about the () noise -- in what way does it bother you? (How would you describe your feelings to a friend who was thinking of moving here and asked you about it?)
NOTE: List number of noise before each answer

30-

31-

32-

**IF "NOT AT ALL", OR "DON'T KNOW", ASK A4 TO A6

- **A4. Now if it came to a choice would you say you like having the noise, or that you'd rather not have it?

	33-Jet Flight	34-Jet Ground	35-Propeller 36-Planes Flight	37-Propeller 38-Planes Ground	39-Traffic	40-People
Like it	1	1	1	1	1	1
Not have it ..	2	2	2	2	2	2
Don't care...	3	3	3	3	3	3
Don't know...	4	4	4	4	4	4

- **A5. Was it ever unpleasant or did it ever bother you at all in the past?

	33-Jet Flight	34-Jet Ground	35-Propeller 36-Planes Flight	37-Propeller 38-Planes Ground	39-Traffic	40-People
Yes	6	6	6	6	6	6
No	7	7	7	7	7	7
Don't know..	8	8	8	8	8	8

- **A6. Does it ever bother or annoy other members of your family?

	33-Jet Flight	34-Jet Ground	35-Propeller 36-Planes Flight	37-Propeller 38-Planes Ground	39-Traffic	40-People
Yes	O	O	O	O	O	O
No	Y	Y	Y	Y	Y	Y
Don't know..	X	X	X	X	X	X

- *. Well, I have a pretty good idea of how you feel about these noises, but could you tell me:

- A1. Do any of them ever frighten or startle you very often, fairly often, or only occasionally -- or don't they ever frighten you at all? (Could you tell me which ones?)

	Very Often	Fairly Often	Occasionally
Jet planes.....	41-1*	2*	3*
Propeller planes.....	42-1*	2*	3*
Planes (type unknown).....	43-1*	2*	3*
Traffic.....	44-1*	2*	3*
Other (specify).....	45-1*	2*	3*
Never.....			

4-

*IF BOTHERS "VERY OFTEN", "FAIRLY OFTEN", OR "OCCASIONALLY", ASK A2:

- *A2. When the () noise frightens you, does it make you feel very annoyed, moderately annoyed, or only a little annoyed, or doesn't it annoy you at all?

	Very Annoyed	Mod- erately Annoyed	A Little Annoyed	Not at all	Don't Know
Jet planes	41-5	6	7	8	X
Propeller planes	42-5	6	7	8	X
Planes (type unknown).....	43-5	6	7	8	X
Traffic.....	44-5	6	7	8	X
Other (specify).....	45-5	6	7	8	X

- B1. Do any of these noises ever wake you up or keep you from going to sleep very often, fairly often, or only occasionally, or don't they ever wake you up? (Which ones?)

	Very Often	Fairly Often	Occasionally
Jet planes.....	46-1*	2*	3*
Propeller planes	47-1*	2*	3*
Planes (type unknown).....	48-1*	2*	3*
Traffic.....	49-1*	2*	3*
Other (specify).....	50-1*	2*	3*
Never.....			

4-

*IF WAKES UP "VERY OFTEN", "FAIRLY OFTEN" OR "OCCASIONALLY", ASK B2:

- B2. When the () noise wakes you up does it make you feel very annoyed, moderately annoyed or only a little annoyed, or doesn't it annoy you at all?

	Very Annoyed	Mod- erately Annoyed	A Little Annoyed	Not At All	Don't Know
Jet planes	46-5	6	7	8	X
Propeller planes	47-5	6	7	8	X
Planes (type unknown)	48-5	6	7	8	X
Traffic.....	49-5	6	7	8	X
Other (specify).....	50-5	6	7	8	X

- C1. Do any of them ever disturb you when you are trying to rest or relax -- very often, fairly often, or only occasionally, or don't they ever disturb you at all? (Which ones?)

	Very Often	Fairly Often	Occasionally
Jet planes	51-1*	2*	3*
Propeller planes	52-1*	2*	3*
Planes (type unknown)	53-1*	2*	3*
Traffic.....	54-1*	2*	3*
Other (specify).....	55-1*	2*	3*
Never.....			

4-

*IF DISTURBS "VERY OFTEN", "FAIRLY OFTEN", OR "OCCASIONALLY", ASK C2:

- C2. Does this make you feel -- very annoyed, moderately annoyed, or only a little annoyed, or doesn't it annoy you at all?

	Very Annoyed	Mod- erately Annoyed	A Little Annoyed	Not At All	Don't Know
Jet planes	51-5	6	7	8	X
Propeller planes	52-5	6	7	8	X
Planes (type unknown)	53-5	6	7	8	X
Traffic.....	54-5	6	7	8	X
Other (specify).....	55-5	6	7	8	X

- D1. Do any of them ever make the TV picture flicker -- very often, fairly often, or only occasionally, or don't they ever interfere at all? (Which ones?)

	Very Often	Fairly Often	Occasionally
Jet planes	56-1*	2*	3*
Propeller planes	57-1*	2*	3*
Planes (type unknown).....	58-1*	2*	3*
Traffic.....	59-1*	2*	3*
Other (specify).....	60-1*	2*	3*
Never.....			
No television set.....			

*IF INTERFERES "VERY OFTEN", "FAIRLY OFTEN", OR "OCCASIONALLY", ASK D2:

- D2. How does this make you feel -- very annoyed, moderately annoyed, or only a little annoyed, or doesn't it annoy you at all?

	Very Annoyed	Mod- erately Annoyed	A Little Annoyed	Not At All	Don't Know
Jet planes	56-5	6	7	8	X
Propeller planes	57-5	6	7	8	X
Planes (type unknown).....	58-5	6	7	8	X
Traffic.....	59-5	6	7	8	X
Other (specify).....	60-5	6	7	8	X

- E1. What about your talking to other people on the telephone or in normal conversation -- Do they ever interfere with this -- very often, fairly often, or only occasionally, or don't they ever interfere at all? (Which ones?)

	Very Often	Fairly Often	Occasionally
Jet planes	61-1*	2*	3*
Propeller planes	62-1*	2*	3*
Planes (type unknown)	63-1*	2*	3*
Traffic.....	64-1*	2*	3*
Other (specify).....	65-1*	2*	3*
Never.....			

*IF INTERFERES "VERY OFTEN", "FAIRLY OFTEN", OR "OCCASIONALLY",
ASK E2:

E2. And how does this make you feel -- very annoyed, moderately annoyed, or only a little annoyed, or doesn't it annoy you at all?

	Very Annoyed	Mod-erately Annoyed	A Little Annoyed	Not At All	Don't Know
Jet planes.....61-5	6	7	8	X	
Propeller planes.....62-5	6	7	8	X	
Planes (type unknown).....63-5	6	7	8	X	
Traffic.....64-5	6	7	8	X	
Other (specify).....65-5	6	7	8	X	

F1. How about listening to the TV or radio -- do any of them ever make it more difficult for you to do these things -- very often, fairly often, or only occasionally, or don't they ever disturb your listening at all? (Which ones?)

	Very Often	Fairly Often	Occasionally
Jet planes.....66-10	20	30	
Propeller planes.....67-10	20	30	
Planes (type unknown).....68-10	20	30	
Traffic.....69-10	20	30	
Other (specify).....70-10	20	30	
Never.....			

*IF DISTURBS "VERY OFTEN", "FAIRLY OFTEN", OR "OCCASIONALLY",
ASK F2:

F2. How does this interference make you feel -- very annoyed, moderately annoyed, or only a little annoyed, or doesn't it annoy you at all?

	Very Annoyed	Mod-erately Annoyed	A Little Annoyed	Not At All	Don't Know
Jet planes.....66-5	6	7	8	X	
Propeller planes.....67-5	6	7	8	X	
Planes (type unknown).....68-5	6	7	8	X	
Traffic.....69-5	6	7	8	X	
Other (specify).....70-5	6	7	8	X	

G1. Now how about making the house vibrate or shake -- Do they ever do this -- very often, fairly often, or only occasionally, or don't they ever make the house vibrate or shake at all? (Which ones?)

	Very Often	Fairly Often	Occasionally
Jet planes.....71-10	20	30	
Propeller planes.....72-10	20	30	
Planes (type unknown).....73-10	20	30	
Traffic.....74-10	20	30	
Other (specify).....75-10	20	30	
Never.....			

*IF DISTURBS "VERY OFTEN", "FAIRLY OFTEN", OR "OCCASIONALLY",
ASK G2:

G2. And how does this make you feel -- very annoyed, moderately annoyed, or only a little annoyed, or doesn't it annoy you at all?

	Very Annoyed	Mod-erately Annoyed	A Little Annoyed	Not At All	Don't Know
Jet planes.....71-5	6	7	8	X	
Propeller planes.....72-5	6	7	8	X	
Planes (type unknown).....73-5	6	7	8	X	
Traffic.....74-5	6	7	8	X	
Other (specify).....75-5	6	7	8	X	

10. A. Do the airplanes ever seem to fly very low when they pass by here, or are they always pretty well up?

Fly low.....76-10
Well up.....2
Don't know.....3

*B. IF "FLY LOW": How do you feel about it when they fly low? (Why is that?)

77-
78-
79-
80-

11. A. Do you have any idea or impression of the sort of jobs assigned to the airplanes around here? (Why do they have them here?)

Yes.....4-10
No.....0

*IF "YES", ASK B:

B. What are they?

NOTE: Number each different "job" mentioned 1, 2, 3 etc. and ask about each in Part C and D.

4-

C. As far as you are concerned, how important do you feel (each job -- or if "No" to 11A, whatever they do) is -- would you say it's very important, moderately important, or hardly important at all?

(Jobs)	1	2	3	General
Very important.....	5-1	6-1	7-1	7-5
Moderately important.....	2	2	2	6
Hardly important.....	3	3	3	7
Don't know.....	4	4	4	8

D1. As far as you know, are there some special reasons why the Air Base has to be located near here, or could it just as well be located someplace else?

Located here.....8-10
Someplace else.....20
Don't know.....3

9-

*D2. Why is that?

E. Now, how about the prosperity of the area -- do you think the amount of money spent by the Air Base is: very important, only moderately important, or hardly important at all to the prosperity of Tucson?

Very important.....10-1
Moderately important.....2
Hardly important.....3
Don't know.....4

12. A. Do you suppose that pilots care very much about the feelings of people, like yourself, when they fly by here?

Yes.....11-1
No.....2
Don't know.....3

B. Do you think that pilots could fly higher, or make less noise if they want to when they fly by here?

Yes.....12-1
No.....2
Don't know.....3

13. A. As far as you know, are the Air Base officials doing all they can to reduce any noise or safety problems in this area, or could they do more?

Doing all they can.....13-1
Could do more.....20
Don't know.....3

*IF "COULD DO MORE", ASK B:

B. What could they do?

14-

14. A. At the present time, do you think that scientists and engineers know how to reduce the noise and danger of airplanes where it is bothersome?

Yes.....15-1
No.....20
Don't know.....30

*IF "NO", OR "DON'T KNOW", ASK B:

B. Do you think someone is likely to find a solution in the next few years?

Yes.....15-5
No.....6
Don't know.....7

15. A. If you wanted to get in touch with someone at the Air Base about the airplanes around here, whom would you call? 16-
- B. As far as you know, are the Air Base officials very concerned about how local residents feel about the airplanes or not?
- Concerned 17-1
Not concerned 2
Don't know 3

16. A. Have you, yourself ever felt like getting in touch with somebody about the airplanes around here?
- Yes 18-1*
No 2*** (Ask Q. 17)
Don't know... 3*** (Ask Q. 17)

**IF "YES", ASK B-D, then skip to Q. 18.

- B. Have you yourself ever called anyone, signed a petition or done anything else about it?

Yes 18-4***
No 5**
Don't know... 6**

**IF "NO" OR "DON'T KNOW", ASK C:

- C. Why is that? (Do you think that you and your neighbors could help get the people in charge to do something?)

***IF "YES" TO B, ASK D:

- D1. What did you do? (Anything else?) 20-

- D2. When was that? 21-

- D3. Did it do any good? (What happened?)

IF "YES" TO Q. 16A, SKIP TO Q. 18.

17. NOTE: ASK ONLY IF "NO" OR "DON'T KNOW" TO Q. 16A.

- A. Suppose you were bothered by the airplanes -- Do you think that you and your neighbors could help get the people in charge to do something?

Yes 22-1
No 2*
Don't know 3*

**IF "NO" OR "DON'T KNOW", ASK B:

- B. Why is that? 22-

18. A. Could you tell me how your neighbors feel about the airplanes -- are any of them ever bothered or annoyed by them?

Bothered 23-1*
Not bothered 2
Don't know 3

**IF "BOTHERED", ASK B:

- B. As far as you know, have any of them (your neighbors) ever tried to do anything?

Yes 23-5***
No 6**
Don't know 7

***IF "NO", ASK C:

- C. Why is that? 24-

***IF "YES", ASK D:

- D. Did it do any good? (What happened?) 25-

19. A. Are there any local groups or organizations around here that might take an interest in such problems?

Yes 26-1*
No 2
Don't know 3

**IF "YES", ASK B-D

- B. Do you happen to belong to any of them?

Yes 26-5
No 6
Don't know 7

- C. As far as you know have they ever discussed the airplane situation?

Yes 27-1
No 2
Don't know 3

- D1. Do you think they could help to get something done if they wanted to?

Yes 27-5
No 6**
Don't know 7

***IF "NO" TO D1, ASK D2:

- D2. Why is that? 28-

20. A. Now suppose some of your neighbors who were concerned about the airplanes asked you to sign a petition urging the Air Base officials to reduce their disturbance -- do you think that you would very likely sign it, that you might but you're not sure, or that you probably wouldn't sign such a petition?

Very likely 29-1
Might 2
Wouldn't 3
Don't know 4

- B. How about calling up or writing to these officials -- if your neighbors asked you to call or write about the noise or danger, do you think you would very likely call or write, that you might but you're not sure, or that you probably wouldn't write or call?

Very likely 30-1
Might 2
Wouldn't 3
Don't know 4

- C. If a meeting was called to urge the officials to do something, do you think you would very likely attend, that you might but you're not sure, or that you probably wouldn't attend?

Very likely 31-1
Might 2
Wouldn't 3
Don't know 4

- D. If they asked you to visit the officials at the Air Base to discuss the airplanes, do you think you would very likely go, that you might but you're not sure, or that you probably wouldn't go?

Very likely 32-1
Might 2
Wouldn't 3
Don't know 4

- E. Now suppose some of your neighbors asked you to help them set up a special committee to improve the airplane situation, do you think you would very likely help them, that you might but you're not sure, or that you probably wouldn't?

Very likely 33-1
Might 2
Wouldn't 3
Don't know 4

21. A. As far as you know, are you very likely to move from this area in the next few years or not?

Very likely 34-1*
Not likely 2
Don't know 3

**IF "VERY LIKELY", ASK B:

- B. Have you already found a place to live in another area, or not?

Yes 34-5
No 4
Don't know 7

Now here is an interesting question:

22. A. Do you expect the United States to get into an all-out war with Russia during the next two years?

Yes 35-1
No 2*
Don't know 3*

TABLE 4 - APP. A (Cont.)

*IF "NO" OR "DON'T KNOW", ASK B:

- B. Do you think we can avoid a big war with Russia entirely, or will we have to fight them sooner or later?

Avoid it 35-5
Have to fight 6
Don't know 7

23. In your opinion, is the threat of an all-out war with Russia greater now than it was a year ago -- or not as great as it was then?

Greater 36-1
Not as great 2
Same 3
Don't know 4

24. Some people have said that the best way to stay out of war is to be so strong that no one would dare attack us. In general, how do you feel about this statement -- do you strongly agree, agree, disagree, or strongly disagree?

Strongly agree 37-1
Agree 2
Disagree 3
Strongly disagree 4
Don't know 5

25. A. During the coming year, do you think we should cut down the amount we are spending on our arms program, keep it about the same, or spend even more on our armed forces?

- B. How about the different branches of the armed forces -- first of all the Army -- should we cut down the amount, keep it about the same, or spend even more?

- C. How about the Navy?

- D. The Air Force?

- E. The Marine Corps?

	A Armed Forces	B Army	C Navy	D Air Force	E Marine Corps
Cut down.....	38-1	39-1	40-1	41-1	42-1
Keep it same...	2	2	2	2	2
Spend more....	3	3	3	3	3
Don't know.....	4	4	4	4	4

26. If the United States should get into another war, which one of the Armed Services do you think would be most important in winning that war -- the Army, Navy, Air Force or Marine Corps?

Army 43-1
Navy 2
Air Force 3
Marine Corps 4
All important..... 5
Don't know 6

27. Now, here are some statements about the Air Force. Would you tell me, for each one, whether you agree or disagree with each statement? The first one is:

- | | Agree | Disagree |
|---|-------|----------|
| A. The Air Force is about as well run as can be expected for an organization of its size..... | 44-1 | 2 |
| B. The Air Force probably isn't very much concerned with what the average civilian thinks about it..... | 45-1 | 2 |
| C. The Air Force goes out of its way to keep down the disturbance its activities cause for people living near Air Bases..... | 46-1 | 2 |
| D. The Air Force is usually slower than most big businesses in adapting new technical and scientific improvements..... | 47-1 | 2 |
| E. Most Air Force pilots would probably sacrifice their own lives, if necessary, to avoid crashing a plane into a populated area..... | 48-1 | 2 |
| F. The Air Force is unnecessarily wasteful in the way it spends the taxpayers' money..... | 49-1 | 2 |
| G. The Air Force is likely to be pretty careless sometimes about respecting the rights of civilians..... | 50-1 | 2 |

- H. The only interest the Air Force has in most civilians is in the taxes they pay to keep it going..... 51-1 2

- I. Most Air Force pilots don't pay very strict attention to flying rules and regulations when they get up in the air away from their commanding officers..... 52-1 2

- J. The Air Force could do its defense job better if it weren't so tied up in rules and regulations and set ways of doing things..... 53-1 2

- K. An average civilian couldn't hope to get any real satisfaction from the Air Force if he complained about a low-flying Air Force plane..... 54-1 2

- L. Most of the Air Force pilots are as serious and careful about their work as most commercial airline pilots..... 55-1 2

- M. The kind of men who become pilots in the Air Force get a thrill out of being reckless and taking chances..... 56-1 2

- N. Most Air Force pilots feel superior to ordinary civilians..... 57-1 2

28. Do you think that the Air Force men who live in Tucson take as much of an interest in local community problems as other Tucson residents do?

Yes 58-1
No 2
Don't know 3

29. Now, to sum it all up:

- A. How much inconvenience and disturbance altogether would you say the Davis-Monthan Air Base creates here in Tucson -- a great deal, a moderate amount, or hardly any inconvenience or disturbance at all?

Great deal 59-1
Moderate amount 2
Hardly any..... 3
Don't know 4

- B. All in all, would you say it is a good thing, or not such a good thing, for the people of Tucson to have the base located here?

Good..... 60-1
Not good..... 2
Don't know..... 3

30. Now we have what we call background data, and we'll be through.

- Are you usually in this neighborhood during the morning? The afternoon? The evening? The night?

	Yes	No	Don't Know
Morning (8AM - 11:59AM).....	61-1	2	3
Afternoon (12N - 5:59PM).....	4	5	6
Evening (6PM - 10:59 PM).....	7	8	9
Night (11 PM - 7:59 AM).....	0	X	Y

31. A. How long have you lived in this part of Tucson _____ years*

62-

*IF LESS THAN 3 YEARS, ASK B-D:

- B. Where did you live just before moving here?

- C. About how far is that from here? _____ miles

- D. How long did you live there? _____ years**

63-

**IF TOTAL OF A & D IS LESS THAN 3 YEARS, ASK E & F:

- E. And where did you live before that?

- F. And how long did you live there?

32. Family Composition:

Including yourself, how many people live with you in this house? _____
Please list them for me.

Relation to head of family	SEX		AGE	RACE		64
	M	F		W	N. W.	
Self	M	F				65
	M	F				
	M	F				
	M	F				
	M	F				
	M	F				

33. A. What sort of work does (main earner in the family) do?

Job:

Industry:

66-

67-

IF RESPONDENT IS NOT MAIN EARNER, ASK B:

B1. Do you have a job away from your home?

Yes	10
No	2
Don't know	3

*IF "YES" TO B1, ASK B2:

B2. What sort of work is that?

67-

Job:

Industry:

34. A. Have you ever been a member or worked for one of the military services?

Yes	68-10
No	2
Don't know	3

*IF "YES", ASK B: Which one(s)?

68-

35. Now what is the highest grade of school you completed?

Completed 0-4 years of grade school	69-1
" 5-6 years of grade school	2
" 7-8 years of grade school	3
" 1-3 years of high school	4
" 4 years of high school	5
" 1-3 years of college	6
" 4 or more years of college	7

36. Here is a card with a list of typical family incomes. Could you tell me the one which comes closest to the amount that all members of your family earned last year. I mean how much money did they get all together from all sources -- before taxes and other deductions?

A. under \$2,000	70-1
B. \$2,000 - 4,000	2
C. \$4,000 - 6,000	3
D. \$6,000 - 8,000	4
E. \$8,000 - 10,000	5
F. \$10,000 and more	6

37. A. By the way, have you ever flown in a plane?

Yes	71-10
No	200
Don't know	300

*IF "YES", ASK: B-C:

B. About how many times? _____

C. When was the last time? _____

*IF "NO", ASK D:

D. Has anyone in your family ever flown in one?

Yes	72-1
No	2
Don't know	3

38. A. How do you feel about flying?

73-

B. What are some of the (other) things about flying you don't like so much?

C. Suppose you were invited to go for a ride in a jet plane -- how would you feel about it?

39. A. Do you happen to have a TV set in this house?

Yes	74-10
No	2
Don't know	3

*IF "YES", ASK B:

B. Does your TV set have a special device to eliminate picture flicker?

Yes	74-5
No	6
Don't know	7

40. Do you happen to have air conditioning or air cooler equipment in this house?

Air conditioning	74-9
Air cooler	0
None	X
Don't know	Y

41. Do you rent or own this house? (circle code and get appropriate information)

75-

76-1 Rent -- IF RENT, ASK: A. How much do you pay per month, including the cost of heat, light and cooking fuel?

76-

\$ _____ 77-

76-2 Own -- IF OWN, ASK: B. About how much would you say your home is worth today?

78-

\$ _____ 79-

80-

42. By the way, do you or any member of your family happen to do business with the Air Base or any of the military or civilian people working at the Base?

Yes	77-10
No	200
Don't know	3

*IF "YES", ASK B:

B. Could you tell me what sort of business that is?

*IF "NO", ASK C:

C. Do you or any member of your family happen to work for a company or organization which does business with the Base or with the people working at the Base?

Yes	77-5000
No	6
Don't know	7

*IF "YES" TO C, ASK D:

D. Could you tell me what sort of business that is?

TO BE COMPLETED BY THE INTERVIEWER AFTER THE INTERVIEW

1. Was R suspicious of the purpose of the interview or the interviewee?
IF "YES", EXPLAIN: Yes () No ()

TABLE 4 - APP. A (Cont.)

2. Was R always relaxed and willing to answer all questions frankly, or was he sometimes tense, defensive, uncooperative? <u>IF "NO", EXPLAIN:</u> Always frank... Yes () No ()	6. Are there any indications of R's feelings about the appropriateness of "complaining" which are not recorded in the interview? <u>IF "YES", EXPLAIN:</u> Yes () No ()
3. Did R understand all of the questions without any difficulty, or were there some questions which presented difficulties? <u>IF "YES", EXPLAIN:</u> Some difficulty... Yes () No ()	7. Are there any indications of R's feelings about the "futility" of complaining, or discussing the aircraft problem which are not recorded? <u>IF "YES", EXPLAIN:</u> Yes () No ()
4. Were there any factors such as, limitations of time, social influences, or other activities of respondent which significantly affected the interview situation? <u>IF "YES", EXPLAIN:</u> Yes () No ()	8. Other comments:
5. Are there any indications of R's feelings about the airplane situation which are not recorded in the interview? (Non-verbal indications, comments before or after interview etc.) <u>IF "YES", EXPLAIN:</u> Yes () No ()	Name of Interviewer _____ Date _____ Address of Respondent _____

4. Development of Questionnaire for Second Field Test

Table 5 (App. A) summarizes the changes made in the questionnaire, after the pilot study, and table 6 (App. A) is the revised questionnaire used at the second and third Air Base Areas. Additional discussion of changes follows:

- Question 1. Easy opener and also used in Scale 1 - Overall satisfaction with community.
- Question 2. Transition question for Q. 3. Records salience of most important positive aspects.
- Question 3. Records salience of negative aspects - Used in Scale 2 - Fear of crashes, and Scale 1 - Overall Satisfaction.
- Question 4. Records salience of fear of planes vs. other fears - also used in Scale 2.
- Question 5. Scale 1 could integrate only 8 items; remaining 3, therefore, dropped as surplus. Besides respondents had different feelings about roads and transportation and sewage and sanitation. It would have been necessary to add two new questions or have 13 parts. For economy sake, both parts were dropped.
- Question 6. Two part question was difficult for interviewers to handle and complicated coding and tabulations. Results indicated that 41% of all R's volunteered comment "except for (noise)"; of which one-third mentioned plane noise and 9% traffic and other noise. Including the exceptional noise, 80% reported noisier overall ratings, while 20% reported quieter ratings. By rephrasing the question to emphasize that the rating includes all noises, the questionnaire and analysis are simplified and we know that plane noise stands out as the most intense.

SUMMARY OF CHANGES MADE IN QUESTIONNAIRE AFTER PILOT STUDY

Question	Retained Use	Dropped	Added	Revised	Question	Retained Use	Dropped	Added	Revised
1 - Overall Like	Scale 1 - Satisfaction with Community				15 - Concern of Air Base	Scale 9 Base Considerateness	Knowledge of place to call		Old 2 pts code changed to 4 pt
2 - Open Like	Transition Question				16 - Base Change Rules	Scale 9 Base Considerateness		Describe efforts of base - 4 items of effort to reduce disturbance	
3 - Open Dislike	Scale 2 - Fear				17 - Pilots Obv Rules	Scale 8 Pilot Considerateness		4 pts scale of considerateness	
4 - Open Danger	Scale 2 - Fear				18 - (Old 16) Feeling About Complaint	Scale 13 Action-Promess	What do? When? Q. 17 - corollary to Q. 16		Possible success of complaint - more direct question
5 - Ratings of Community Items	9 Items in Scale 1	i. Ambiguous k. Resentment & Suspicion f. Transportation ambiguous with roads			19 - (Old 18) Neighbors Annoyance	Scale 13			2 pts changed to 4 pts scale
6 - Overall Noise	To correlate With Acoustic Data Also Transitional			Simplify coding one overall rating	20 - (Old 18B) Neighbors Complaint	Scale 13			
7 - Kind of Noise	Correlate With Acoustic also Transitional			Made more direct and simplified	21 - Neighbors get together	Scale 13		Belief in neighbor action potential	
8 - Overall Annoyance Noises	Scale 6 Annoyance - Transitional	A1 people A3 open question how bothers A4 rather not have it A6 bothers others in family			22 - Possible success of neighbor action	Scale 13		Possibility of success in complaint	
9 - Specific Activities Disturbed	Scales 4-6; also 2			Order shifted - fear second. Standard probe - jets and props. Language change - fear to startle. Annoyance asked about planes in general.	23 - (Old 19) Know of local organization	Transition - Correlation with Scale 13	C. Ever discussed D2. Why no action		
10 - Planes Fly Low FB? Safety	Scale 2 - Fear		Frequency of Low Fly	Intro concept of safety in direct fashion, changes open to direct question on annoyance	24 - (Old 19D) Success of Organization Complaint	Scale 13		Made direct question - asked of everyone	
11 - Importance of Base	Scale 10 Base Importance	D2 - Why Location?	B-Special Importance to Area D-Relative importance to Area	A-Make import of job - direct quest. C-Money spent for prosperity.	25 - (Old 20) Action now	Scale 12			
12 - Concern of Pilots	Scale 8 - Pilots Considerateness			Expand yes-no to 4 pt scale	26 - (Old 21) Move from area (Old 22) War with Russia (Old 23) Threat war		Controversial - No scale used Controversial - No scale used		
13 - Science Can Avoid (old 14)	Scale 13 Action-Proneness				27 - (Old 24) Importance of Military strength	Correlate Scale 11			
14 - Pilot Attitudes	Scale 8 Pilot Considerateness		4 pt Scale on Fly high as can		28 - (Old 25) Spending for AF		Controversial		
B Pilots Control of Noise	Scale 8 Pilot Considerateness		4 pt scale reduce noise		29 - (Old 26) Importance in winning war	Correlate Scale 11			

Question	Retained Use	Dropped	Added	Revised	Question	Retained Use	Dropped	Added	Revised
30 - (Old 27) AF Image		A, D & F - reduce length			31 - (Old 29) Summary Attitude to Base	A. Overall attitude B. Scale 10			2 pt scale changed to 3 pts
	Scale 14 - AF Considerate - ness			A, B, D (Old C) G, H					
	Scale 14 A Maturity Item E	Old M		C, E, F, H, I, J			39 - TV owner- ship (incorpor- ated in Q. 9)		
(Old 28) AF & Community		Ambiguous & little use		32 - Personal 42 data on age, sex, etc.					

Question 7. There is value in using an open question to obtain a measure of salience. But the probing was difficult for interviewers and Parts B & C were not uniformly asked. Since the major function of Question 7 is to filter out R's who do not hear planes at all, so they can be skipped on Q. 8, it was simpler to ask a uniform direct question.

Question 8. For economy and brevity, it was decided to drop questions on human noises. Besides, results indicated little annoyance. The open question on bother (8A3) was difficult to code, not answered uniformly and, therefore, not usable in the scale of annoyance. Part A4 was not too productive in separating those not now bothered. About 3/4 liked the jet flight noise or didn't care, and 2/3 liked jet ground noise or didn't care. Likewise, A6 revealed only 18% not bothered themselves by jet flight noise reporting others in family were bothered. For economy reasons, these sub-parts were dropped.

Question 9. Since the question of fear involves a complicated emotional response and is often resented by R, it was felt a question on sleep disturbance would be a better opener. Likewise, reactions to jet and propeller noise were made regular sub-questions. The spex had called for standard probes in the pilot study, but interviewers often failed to ask about prop planes. To simplify a rather tedious interviewing situation, it was decided to key annoyance responses to all planes combined. Besides answers on the pilot study revealed little differences when they were asked separately.

Question 10. An open question is not a uniform stimulus and, therefore, produces spotty answers. Since the scale on fear needed improvement, it was decided to forego salience for inclusiveness and make this a direct question.

Question 11. Very few people really knew the functions of air base and parts A, B and C were difficult to code. Whatever the factual basis of their beliefs, every R had an overall feeling about the importance of the base. Consequently, Parts A and B were dropped and Part C revised. Parts B and D were added to improve scale development of this variable.

Question 12. Two-part scale was expanded to 4-part question in the hope that better distribution of answers would be obtained.

Question 13. No change.

Question 14.- 17. Attitudes toward pilot considerateness are often different from feelings about base official considerateness. Additional questions, therefore, were added, so that separate scales could be developed. Since most people just call Base telephones, Part 15A was dropped.

Question 18. Questions 16 and 17 were difficult to administer and since a filter question was used, some R's were not asked about their feelings of possible success of complaining. Since it was desirable to develop a scale on this dimension, a more direct question was used.

Questions 19-24. These questions were made more direct with additional cutting points, so they could be used in scale development. Open sub-parts eliminated to reduce coding cost and to increase uniformity of response.

Question 25. Part C revised to specify that meeting was for purpose of "voicing the community's concern" and not just a question and answer session. Results indicated people might go out of curiosity.

Question 26. No change

Question 27. Old Questions 22 and 23 were designed to get at feelings of threat to national security. R's resented question as inappropriate to local community survey and since answers didn't scale anyway, they were dropped. Question on armaments as a means of deterring war was retained.

Question 28. Since Congress was debating military appropriations, it was feared a question on attitudes toward budgets for different Branches of the Armed Forces might be misinterpreted and resented. Therefore, this question was dropped.

Question 29. No change.

Question 30. Questions on Air Force efficiency did not scale effectively. Besides it was felt that fewer questions and more cutting points would be more productive, therefore, all questions dealing with A. F. efficiency were dropped and others added and revised to attempt to improve the chances of securing scales on the other two items.

Question 31. Additional cutting points were added in the hope that better distributions of answers would be obtained.

Questions 32-42. No change - Old Question 39 on T.V. ownership consolidated with Q. 9 on T.V. picture disturbance. Q. 38 eliminated because answers were ambiguous and difficult to evaluate.

TABLE 6 (APP. A)

NOISE SURVEY 385

1 APRIL 1957

NATIONAL OPINION RESEARCH CENTER

Respondent No. 1- 2- 3- 4- Time interview began ended

Hello. I'm from the opinion research center at the University of Chicago. We are doing a study about how people feel about living in different places, and I'd like to get some of your views.

1. In general, how do you feel about living in this part of (name of area)? Do you rate it as an excellent, good, fair, poor, or very poor -- place to live?

Excellent..... 5-1*
Good..... 2* } Ask Q. 2 then 3
Fair..... 3*
Poor..... 4**
Very poor..... 5** } Ask Q. 3 then 2
Don't know..... 6**
NORC use... Y

2. What are some of the things you like about living around here -- things that you feel are advantages or that make this a good place to live? (Anything else?)

6-

3. A. Now what are some of the things you don't like about living around here -- things you feel are sometimes nuisances or are unpleasant or disagreeable to you?

7-

H. Have we overlooked anything -- even little things that may bother or annoy you that you just take for granted because nothing much can be done about them?

4. A. Taking everything into consideration, would you say this is a very safe place to live, or are there some dangerous conditions affecting this area?

Some dangerous..... 8-1*
Very safe..... 0
Don't know..... X
NORC use..... Y

*IF "SOME DANGEROUS CONDITIONS", ASK B:

B. Could you describe them to me? (Anything else?) 8-

5. Now to be sure I have all your feelings straight. Here is a list of things that many people consider important in a residential area.

I'd like you to tell me for each of these items how you would rate this area in terms of actually having them. For example, would you say this area was very good, good, fair, poor or very poor in terms of being "close to your work or place of business?" (How about schools? etc.)

	Very Good	Good	Fair	Poor	Very Poor	Don't Know	NORC Use
A. Close to work or place of business.....	9-1	2	3	4	5	6	Y
B. Schools.....	10-1	2	3	4	5	6	Y
C. Amount of noise.....	11-1	2	3	4	5	6	Y
D. Shopping facilities.....	12-1	2	3	4	5	6	Y
E. Taxes or rent.....	13-1	2	3	4	5	6	Y
F. Safety of area.....	14-1	2	3	4	5	6	Y
G. Neighbors.....	15-1	2	3	4	5	6	Y
H. Close to church.....	16-1	2	3	4	5	6	Y

6. Now including all the different noises you hear around here, would you say in general, that it's very noisy, fairly noisy, fairly quiet or very quiet around here?

Very noisy..... 17-1
Fairly noisy..... 2
Fairly quiet..... 3
Very quiet..... 4
Don't know..... 5
NORC use..... Y

7. Could you tell me (again) about the different kinds of noises you sometimes hear around here?

	Yes	Can't Tell	Type	NORC
A. First, do you ever hear jet planes fly by here?	18-1	2	3 (skip B)	X
B. How about propeller planes -- Do you ever hear them fly by here?.....	18-4	5	-	Y
C. And do you ever hear jets warming up or testing their engines on the ground?.....	19-1	2	3 (skip D)	X
D. And do you ever hear prop planes warming up on the ground?.....	19-4	5	-	Y
E. Now how about cars and trucks -- Do you ever hear them go by?.....	20-1	2	-	X
F. Are there any other noises you hear around here? (specify type).....	20-3	4	-	Y

21-

8. Now let's see if I have this right --

NOTE: For each "Yes" answer to Q. 7, read aloud the noise heard and circle the appropriate column number below. Then ask parts A-C for the first column number circled, then A-C for the second column number circled, etc.

A. Does the noise of the (kind of noise) ever bother or annoy you very much, moderately, only a little, or not at all? (How about the _____ noise?)

	22	24	25	23	26	27	28
	Jet	Prop	DK Type	Jet	Prop	DK Type	Cars
	Flight	Flight	Flight	Ground	Ground	Ground	Trucks
Very much.....	1*	1*	1*	1*	1*	1*	1*
Moderately.....	2*	2*	2*	2*	2*	2*	2*
A little.....	3*	3*	3*	3*	3*	3*	3*
Not at all.....	4**	4**	4**	4**	4**	4**	4**
Don't know.....	5**	5**	5**	5**	5**	5**	5**
NORC use.....	6	6	6	6	6	6	6

*IF BOTHERS "VERY MUCH", "MODERATELY", OR "A LITTLE", ASK B

B. Does it bother you (insert category selected in Part A) very often, fairly often, or only occasionally?

	22	24	25	23	26	27	28
	Jet	Prop	DK Type	Jet	Prop	DK Type	Cars
	Flight	Flight	Flight	Ground	Ground	Ground	Trucks
Very often.....	7	7	7	7	7	7	7
Fairly often.....	8	8	8	8	8	8	8
Occasionally.....	9	9	9	9	9	9	9
Don't know.....	X	X	X	X	X	X	X
NORC use.....	Y	Y	Y	Y	Y	Y	Y

29- 30- 31- 32-

**IF "NOT AT ALL" OR "DON'T KNOW", ASK C

C. Was it ever unpleasant or did it ever bother you at all in the past?

	33	35	36	34	37	38	39
	Jet	Prop	DK Type	Jet	Prop	DK Type	Cars
	Flight	Flight	Flight	Ground	Ground	Ground	Trucks
Yes.....	1	1	1	1	1	1	1
No.....	2	2	2	2	2	2	2
Don't know.....	3	3	3	3	3	3	3
NORC use...	4	4	4	4	4	4	4

40-

9. Now I'd like to get a better idea how you feel about some of these noises.

A1. Could you tell me, do the jet planes wake you up or keep you from going to sleep very often, fairly often, only occasionally, or don't they ever wake you up?

A2. How about the propeller planes? (Do they ever wake you up very often, fairly often, only occasionally, or not at all?)

	Very Often	Fairly Often	Occasionally	Not At All	NORC
Jet planes.....	41-1*	2*	3*	4	Y
Propeller planes.....	42-1*	2*	3*	4	Y
Planes - DK type.....	43-1*	2*	3*	4	Y

*If "Jet Planes", "Propeller Planes", or "Planes - DK Type", "wake up", Ask A3

*A3. When the planes wake you up, do you feel very annoyed, moderately annoyed, only a little annoyed, or not at all annoyed?

Very annoyed.....	43-5
Moderately annoyed.....	6
A little annoyed.....	7
Not at all.....	8
Don't know.....	9
NORC use.....	0

B1. Do the jet planes ever startle you very often, fairly often, occasionally -- or don't they ever startle you at all?

B2. What about the propeller planes? (Do they ever startle you very often, fairly often, occasionally, or not at all?)

	Very Often	Fairly Often	Occasionally	Not At All	NORC
Jet Planes.....	44-1*	2*	3*	4	Y
Propeller planes.....	45-1*	2*	3*	4	Y
Planes - DK type.....	46-1*	2*	3*	4	Y

*If "Jet Planes", "Propeller Planes", or "Planes - DK Type" "startles" ask B3

*B3. When the planes startle you, does it make you feel very annoyed, moderately annoyed, a little annoyed, or doesn't it annoy you at all?

Very annoyed.....	46-5
Moderately annoyed.....	6
A little annoyed.....	7
Not at all.....	8
Don't know.....	X
NORC use.....	0

C1. Is your rest or relaxation ever disturbed by the jets -- very often, fairly often, occasionally, or don't they ever disturb your rest at all?

C2. How about the propeller planes? (Do they ever disturb your rest or relaxation -- very often, fairly often, occasionally, or don't they ever disturb your rest at all?)

	Very Often	Fairly Often	Occasionally	Not At All	NORC
Jet planes.....	47-1*	2*	3*	4	Y
Propeller planes.....	48-1*	2*	3*	4	Y
Planes - DK type.....	49-1*	2*	3*	4	Y

*If "Jet", "Propeller Planes", or "Planes Type Unknown", "disturb", ask C3

*C3. When the planes disturb your rest, does this make you feel very annoyed, moderately annoyed, a little annoyed, or not annoyed at all?

Very annoyed.....	49-5
Moderately annoyed.....	6
A little annoyed.....	7
Not at all.....	8
Don't know.....	X
NORC use.....	0

D1. By the way, do you happen to have a TV set in this house?

Yes.....	50-1*
No.....	2
Don't know.....	3
NORC use.....	4

*If "Yes", Ask D2 & D3

*D2. Do the jets make the TV picture flicker -- very often, fairly often, occasionally or don't they ever interfere at all?

*D3. And the propeller planes? (Do they ever make the TV picture flicker -- very often, fairly often, occasionally or don't they ever interfere at all?)

	Very Often	Fairly Often	Occasionally	Not At All	NORC
Jet planes.....	51-1**	2**	3**	4	Y
Propeller planes.....	52-1**	2**	3**	4	Y
Planes - DK type.....	53-1**	2**	3**	4	Y

*If "Jet, Propeller or Planes - Type Unknown" "interfere", ask D4.

*D4. When the planes interfere do you feel very annoyed, moderately annoyed, a little annoyed, or not annoyed at all?

Very annoyed.....	53-5
Moderately annoyed.....	6
A little annoyed.....	7
Not at all.....	8
Don't know.....	X
NORC use.....	0

E1. What about talking to other people on the telephone or in normal conversation -- Do the jets ever interfere with this very often, fairly often, occasionally or not at all?

E2. And the propeller planes? (Do they interfere with this very often, fairly often, occasionally, or not at all?)

	Very Often	Fairly Often	Occasionally	Not At All	NORC
Jet planes.....	54-1*	2*	3*	4	Y
Propeller planes.....	55-1*	2*	3*	4	Y
Planes - DK type.....	56-1*	2*	3*	4	Y

*If "Jet, Propeller, or Planes-Type Unknown", "Interfere" ask E3

*E3. When the planes interfere does this make you feel very annoyed, moderately annoyed, a little annoyed or not at all?

Very annoyed.....	56-5
Moderately annoyed.....	6
A little annoyed.....	7
Not at all.....	8
Don't know.....	X
NORC use.....	O

F1. How about listening to the TV or radio -- do the jets ever make it more difficult for you to do these things -- very often, fairly often, occasionally, or don't they ever disturb your listening at all?

F2. And the propeller planes? (Do they ever disturb your listening -- very often, fairly often, occasionally, or don't they ever disturb your listening at all?)

	Very Often	Fairly Often	Occasionally	Never	NORC
Jet planes.....	57-1*	2*	3*	4	Y
Propeller planes.....	58-1*	2*	3*	4	Y
Planes - DK types.....	59-1*	2*	3*	4	Y

*If "Jet, Propeller, or Planes - Type Unknown", "disturb" ask F3.

*F3. When the planes interfere does this make you feel very annoyed, moderately annoyed, a little annoyed, or doesn't it annoy you at all?

Very annoyed.....	59-5
Moderately annoyed.....	6
A little annoyed.....	7
Not at all.....	8
Don't know.....	X
NORC use.....	O

G1. Now the last of these questions. Do the jets ever make the house vibrate or shake -- very often, fairly often, or occasionally -- or don't they ever do this?

G2. And the propeller planes? (Do they do this very often, fairly often, or occasionally -- or don't they ever do this?)

	Very Often	Fairly Often	Occasionally	Never	NORC
Jet planes.....	60-1*	2*	3*	4	Y
Propeller planes.....	61-1*	2*	3*	4	Y
Planes - DK type.....	62-1*	2*	3*	4	Y

*If the "Jet, Propeller or Planes - Type Unknown", make house "vibrate", ask G3

*G3. When the planes do this do you feel very annoyed, moderately annoyed, a little annoyed, or not annoyed at all?

Very annoyed.....	62-5
Moderately annoyed.....	6
A little annoyed.....	7
Not at all.....	8
Don't know.....	X
NORC use.....	O

10. A. Do the airplanes ever seem to fly too low for safety when they pass by here?

Yes.....	63-1*
No.....	2
Don't know.....	3
NORC use.....	Y

*If "Yes", ask B1

B1. Would you say they do this very often, fairly often or only occasionally?

Very often.....	63-4
Fairly often.....	5
Occasionally.....	6
NORC use.....	7

11. A. In your opinion, how important is the job of this Air Base near here -- would you say it is one of the very most important, that it is fairly important, or that it is hardly important at all?

Very most important.....	64-1
Fairly important.....	2
Hardly important.....	3
Don't know.....	4
NORC use.....	Y

B. Do you feel that the Air Base here has some special importance to (name or area) or is it mainly important to the general defense of the country?

Special importance.....	65-1
General defense.....	2
Don't know.....	3
NORC use.....	Y

C. How about the prosperity of (name of area), do you think the amount of money spent by the Air Base is very important, only moderately important, or hardly important at all to (name of area)?

Very important.....	65-4
Moderately important.....	5
Hardly important.....	6
Don't know.....	7
NORC use.....	X

D. If you were asked to pick the one activity most important to prosperity of (name of area) which of the following would you pick -- trading, farming, Air Base spending, or manufacturing?

Trade.....	66-1
Farming.....	2
Air Base.....	3
Manufacturing.....	4
Don't know.....	5
NORC use.....	Y

E. As far as you know are there any special reasons why the Air Base has to be kept where it is, or could it just as well be located some place else?

Located here.....	66-6
Someplace else.....	7
Don't know.....	8
NORC use.....	X

12. How much concern do you feel the pilots have for the feelings and comfort of residents like yourself when they fly by here -- would you say they are concerned very much, moderately, only a little, or not at all?

Very much.....	67-1
Moderately.....	2
Only a little.....	3
Not at all.....	4
Don't know.....	5
NORC use.....	6

13. A. At the present time, do you think that scientists and engineers have ways of reducing the noise and danger of airplanes where it is bothersome?

Yes.....	68-1
No.....	2*
Don't know.....	3*
NORC use.....	Y

*IF "NO", OR "DON'T KNOW", ASK B:

B. Do you think someone is likely to find a solution in the next few years?

Yes.....	68-5
No.....	6
Don't know.....	7
NORC use.....	X

14. A. From what you've read or heard, do you feel that the pilots fly by here as high as they possibly can, all of the time, most of the time, only sometimes or that they never fly as high as they can?

All the time.....	69-1
Most of the time.....	2
Sometimes.....	3
Never.....	4
Don't know.....	5
NORC use.....	Y

B. What about the noise the plane makes. Do you feel that the pilots could fly quieter all of the time, most of the time, only sometimes or that they can never fly quieter than they do?

All of the time.....	70-1
Most of the time.....	2
Sometimes.....	3
Never.....	4
Don't know.....	5
NORC.....	6

15. As far as you know, how much concern do the Air Base officials have for the feelings and comfort of residents like yourself -- would you say they are concerned very much, moderately, only a little, or not at all?

Very much 71-1
 Moderately 2
 A little 3
 Not at all 4
 Don't know 5
 NORC use Y

16. A. As you know, the Air Base officials make rules and regulations for military airplanes flying around here -- do you feel they could change the flight patterns so the planes would pass over areas with lower residential homes?

Yes 72-1
 No 2
 Don't know 3
 NORC use 4

B. Do you think they could develop procedures so the planes would fly higher than they do?

Yes 72-5
 No 6
 Don't know 7
 NORC use 8

C. How about the noise -- do you think the officials could show the pilots how to make less noise than they do?

Yes 72-9
 No 8
 Don't know X
 NORC use Y

D1. Do you know of anything that the officials could do to reduce any disturbance caused by the airplanes?

Yes 78-10
 No 2
 Don't know 3
 NORC use 4

*IF "YES", ASK D2

D2. What is that? 73-

17. Do you feel the pilots obey all the flying rules and regulations all the time, most of the time, only occasionally, or hardly ever?

All the time 74-1
 Most of the time 2
 Occasionally 3
 Hardly ever 4
 Don't know 5
 NORC use Y

18. A. Suppose you yourself were bothered by the planes, do you think it would do any good to call or write the Air Base officials?

Yes 75-1
 No 2
 Don't know 3
 NORC use Y

B. Have you yourself ever felt like getting in touch with somebody about the the airplanes around here?

Yes 75-4*
 No 5
 Don't know 6
 NORC use 7

*IF "YES", ASK C

C1. Have you yourself ever called anyone, signed a petition or done anything else about it?

Yes 75-8**
 No 9**
 Don't know 0
 NORC use X

*IF "YES" TO PART C1, ASK C2

C2. Did it do any good?

Yes 76-1
 No 2
 Don't know 3
 NORC use Y

*IF "NO" TO PART C1, ASK C3

C3. Could you tell me why not?

76-

77-

78-

79-

80-

19. Just from what you've heard, could you tell me how your neighbors feel about the airplanes -- are most of them annoyed very much, moderately, only a little or not at all?

Very much 5-1
 Moderately 2
 Little 3
 Not at all 4
 Don't know 5
 NORC use 8

1- 2- 3- 4-

20. A. As far as you know have you ever heard of any of them (neighbors) trying to do something about the airplane disturbance?

Yes 6-1*
 No 2
 Don't know 3
 NORC use 4

*IF "YES", ASK B

B. Did it do any good?

Yes 6-5
 No 6
 Don't know 7
 NORC use Y

21. Suppose most of your neighbors were bothered by the airplanes, do you think they would get together and try to do something about it?

Yes 7-1
 No 2
 Don't know 3
 NORC use 4

22. If you and your neighbors did get together and got in touch with officials at the Air Base, do you think that you would have a very good chance of improving the situation, a good chance, only a fair chance, or hardly any chance at all to improve things?

Very good 7-5
 Good 6
 Fair 7
 Hardly any 8
 Don't know 9
 NORC use Y

23. A. Do you know of any local civilian groups or organizations around here that might take an interest in airplane disturbance problems?

Yes 8-1*
 No 2
 Don't know 3
 NORC use 4

*IF "YES", ASK B

B1. Do you happen to belong to any of them?

Yes 8-5**
 No 6
 Don't know 7
 NORC use 8

****IF "YES" TO B1, ASK B2**

B2. Are you an officer or active member of any committee?

Yes..... 8-9
No..... O
Don't know..... X
NORC use..... Y

24. If some of the local organizations became concerned about the airplanes and got in touch with the Air Base officials, do you think they would have a very good chance of improving the situation, a good chance, only a fair chance, or hardly any chance at all to improve things?

Very good..... 9-1
Good..... 2
Fair..... 3
Hardly any..... 4
Don't know..... 5
NORC use..... 6

25. A. Now suppose some of your neighbors who were concerned about the airplanes asked you to sign a petition urging the Air Base officials to reduce their disturbance -- do you think that you would very likely sign it, that you might but you're not sure, or that you probably wouldn't sign such a petition?

Very likely..... 10-1
Might..... 2
Wouldn't..... 3
Don't know..... 4
NORC use..... Y

B. How about calling up or writing to these officials -- If your neighbors asked you to call or write about the noise or danger, do you think you would very likely call or write, that you might but you're not sure, or that you probably wouldn't write or call?

Very likely..... 11-1
Might..... 2
Wouldn't..... 3
Don't know..... 4
NORC use..... Y

C. If a meeting was called to voice the community's concern about the airplanes do you think you would very likely attend, that you might but you're not sure, or that you probably wouldn't attend?

Very likely..... 12-1
Might..... 2
Wouldn't..... 3
Don't know..... 4
NORC use..... Y

D. If they asked you to visit the officials at the Air Base to discuss the airplanes, do you think you would very likely go, that you might but you're not sure, or that you probably wouldn't go?

Very likely..... 13-1
Might..... 2
Wouldn't..... 3
Don't know..... 4
NORC use..... Y

E. Now suppose some of your neighbors asked you to help them set up a special committee to improve the airplane situation, do you think you would very likely help them, that you might but you're not sure, or that you probably wouldn't?

Very likely..... 14-1
Might..... 2
Wouldn't..... 3
Don't know..... 4
NORC use..... Y

26. A. As far as you know, are you likely to move from this area in the next few years or not?

Very likely..... 15-10
Not likely..... 2
Don't know..... 3
NORC use..... 4

****IF "VERY LIKELY", ASK B:**

B. Have you already found a place to live in another area, or not?

Yes..... 15-5
No..... 6
Don't know..... 7
NORC use..... Y

Now here are some questions about our country that affect (name of area) as well as other communities.

27. Some people have said that the best way to stay out of war is to be so strong that no one would dare attack us. In general, how do you feel about this statement -- do you strongly agree, agree, disagree, or strongly disagree?

Strongly agree..... 16-1
Agree..... 2
Disagree..... 3
Strongly disagree..... 4
Don't know..... 5
NORC use..... Y

29. If the United States should get into another war, which one of the Armed Services do you think would be most important in winning that war -- the Army, Navy, Air Force or Marine Corps?

Army..... 22-1
Navy..... 2
Air Force..... 3
Marine Corps..... 4
All important..... 5
Don't know..... 6
NORC use..... Y

30. Now, here are some statements about the Air Force. Would you tell me, for each one, whether you strongly agree, agree, disagree, or strongly disagree with each statement? The first one is:

Strongly Agree Agree Disagree Strongly Disagree Don't Know NORC

A. The Air Force probably doesn't care very much what the average civilian thinks about it.....

23-1 2 3 4 X Y

B. The Air Force goes out of its way to keep down the disturbance its activities sometimes cause.....

24-1 2 3 4 X Y

C. Most Air Force pilots would probably sacrifice their own lives, if necessary, to avoid crashing a plane into a populated area.....

25-1 2 3 4 X Y

D. The Air Force is pretty careless sometimes about respecting the rights and feelings of civilians.....

26-1 2 3 4 X Y

E. The major interest the Air Force has in most civilians is in the taxes they pay to keep it going.....

27-1 2 3 4 X Y

F. Almost every Air Force pilot sometimes breaks flying rules and regulations when they get up in the air away from their commanding officers.....

28-1 2 3 4 X Y

G. Even though the Air Force has important military jobs to do, they could still pay more attention to reasonable civilian complaints, than they do now.....

29-1 2 3 4 X Y

H. Most of the Air Force pilots are more serious and careful about their work than most commercial airline pilots.....

30-1 2 3 4 X Y

I. Some Air Force pilots enjoy flying low and buzzing civilian homes.....

31-1 2 3 4 X Y

J. Most Air Force pilots feel very superior to ordinary civilians.....

32-1 2 3 4 X Y

J. Most Air Force pilots feel very superior to ordinary civilians.....

31. Now, thinking of (name of area) as a whole:

- A. How much inconvenience and disturbance altogether would you say the Air Base creates here in (name of base) -- a great deal, a moderate amount, or hardly any inconvenience or disturbance at all?

Great deal 39-1
 Moderate amount 2
 Hardly any 3
 No inconvenience 4
 Don't know 5
 NORC use Y

- B. All in all, how would you describe the overall effect of having the Air Base here -- would you say it is entirely good for the people around here, it is a good thing but it has some disadvantages, or that it is not such a good thing to have here?

Entirely good 39-6
 Good 7
 Not good 3
 Don't know 9
 NORC use Y

32. Now we have what we call background data, and we'll be through.

Are you usually in this neighborhood during the morning? The afternoon? The evening? The night?

	Yes	No	Don't Know
Morning (8AM - 11:59AM) ...	40-1	2	3
Afternoon (12M - 5:59PM) ...	4	5	6
Evening (6PM - 10:59PM) ...	7	8	9
Night (11PM - 7:59AM) ...	0	X	Y

33. A. How long have you lived in this part of (name of area)?

_____ years* 41-

*IF LESS THAN 3 YEARS, ASK B-D:

B. Where did you live just before moving here?

D.

C. About how far is that from here? _____ miles

D. How long did you live there? _____ years**

**IF TOTAL OF A & D IS LESS THAN 3 YEARS, ASK E & F:

E. And where did you live before that?

F. And how long did you live there? _____ years

34. Family Composition:

Including yourself, how many people live with you in this house? _____
 Please list them for me.

Relation to head of family	SEX		About how old is	RACE		
	M	F		W	N.W.	
Self	M	F		W	N.W.	42-
	M	F		W	N.W.	43-
	M	F		W	N.W.	
	M	F		W	N.W.	
	M	F		W	N.W.	
	M	F		W	N.W.	

35. Now what is the highest grade of school you completed?

Completed 0-4 years of grade school 44-1
 Completed 5-6 years of grade school 2
 Completed 7-8 years of grade school 3
 Completed 1-3 years of high school 4
 Completed 4 years of high school 5
 Completed 1-3 years of college 6
 Completed 4 or more years of college 7
 NORC use Y

36. Here is a card with a list of typical family incomes. Could you tell me the one which comes closest to the amount that all members of your family earned last year. I mean how much money did they get all together from all sources -- before taxes and other deductions?

A. under \$2,000 45-1
 B. \$2,000 - 4,000 2
 C. \$4,000 - 6,000 3
 D. \$6,000 - 8,000 4
 E. \$8,000 - 10,000 5
 F. \$10,000 and more 6
 Refused X
 NORC Y

37. Do you rent or own this house? (Circle rent and get appropriate information)

44-A Rent -- IF RENT, ASK: A. How much do you pay per month, including the cost of heat, light and cooking fuel? _____ 47-
 \$ _____ 48-

44-B Own -- IF OWN, ASK: B. About how much would you say your home is worth today? _____

38. Do you happen to have air conditioning or water cooler equipment in this house?

Air conditioning 49-1
 Water cooler 2
 None 3
 Don't know 4
 NORC use Y

39. A. By the way, have you ever flown in a plane?

Yes 50-10
 No 200
 Don't know 300
 NORC Y

*IF YES, ASK B-C

B. About how many times?

Once or twice - a few 50-4
 Three or four 5
 Five or more 6
 Don't know 7
 NORC use 8

C. When was the last time?

12 months ago or less 51-1
 One to 3 years 2
 Four or more years 3
 Don't know 4
 NORC use 5

**IF "NO", ASK D

D. Has anyone in your family ever flown in one?

Yes 51-6
 No 7
 Don't know 8
 NORC Y

40. A. What sort of work does (main earner in the family) do?

Job:

Industry:

IF RESPONDENT IS NOT MAIN EARNER, ASK B:

B1. Do you have a job away from your home?

Yes 10
 No 200
 Don't know 3

IF "YES" TO B1, ASK B2:

B2. What sort of work is that?

Job:

Industry:

IF "NO" TO B1, ENTER STATUS BELOW: (student, housewife, retired, etc.)

B3.

41. A. Have you ever been a member or worked for one of the military services?

Yes 54-10
 No 2
 Don't know 3
 NORC use Y

IF "YES", ASK B & C

B. Which one (s)?

C. Are you (a member working there now?)

Air Force 54-4		Now 55-1		Not now 55-2	
Army	1	Now	3	Not now	4
Navy	6	Now	5	Not now	6
Marines	7	Now	7	Not now	8
Other	8	Now	9	Not now	6
NORC	X			NORC	Y

42. A. By the way, do you or anyone in your family happen to own their own business?

Yes 56-10
 No 200
 Don't know 3
 NORC use 4

IF "Yes" ask B

B. Do you (they) ever do business directly with the Air Base or with any civilian or military personnel working at the Base?

Yes 56-3
 No 6
 Don't know 7
 NORC use 8

IF "No" ask C

C. Do you or anyone in your family happen to work for a company that does business with the base or with people working at the base?

Yes 56-9
 No 0
 Don't know X
 NORC use Y

57	62	69	75
58	64	70	76
59	65	71	77
60	66	72	78
61	67	73	79
62	68	74	80

Date _____ Name of interviewer _____

5. Final Questionnaire

In general, the above revisions worked very well and very few additional changes are suggested in table 7 (App. A), the final form of the questionnaire. Detailed analysis of the data from the second and third field trials did reveal the possibilities for further simplifications which are discussed below. Table 8 (App. A) summarizes the structure and use of the questions retained on the final form of the questionnaire.

There are two major changes made in the final questionnaire. The first involves combining questions on jet and prop noise; the second omits questions on the Air Force image.

The second field trials specifically questioned all respondents about their feelings about jet and prop noises to determine if there are differential effects. As table 9 (App. A) shows, jets are generally rated about twice as disturbing as prop planes. Table 10 (App. A) reveals that when specific activities are questioned, very few people report that propeller planes disturb an activity but that jet planes do not. By asking about propeller planes, separated, only 1 - 3 percent additional disturbances are mentioned. The one exception was on the West Coast, where 8 percent additional vibration disturbances are reported. This can be explained by the numerous propeller transport planes in operation at that base. Consequently, it can be seen that

where jets and propeller planes are using the same base, a count of individuals reporting jet disturbance constitutes about 97 - 98 percent of all disturbed people. Since the separate question on jet and prop disturbances are both tedious and time consuming and since it produces practically identical responses, the two sets of questions are combined in table 7 (App. A).

The second important change involves the elimination of 10 questions on a general Air Force image. Despite our revisions, it was impossible to develop a scale for Air Force maturity. Large non-scale types persisted. Additional experimental work would be necessary to develop a satisfactory measure for this item. Furthermore, it is unlikely that such a scale would contribute greatly to our problem. Originally, it was felt that a generalized scale of Air Force maturity might reflect hidden feelings about pilot considerateness, since the questions did not deal with local base personnel directly. An analysis of answers reveals that many respondents appear to generalize in terms of their own local experiences. Consequently, these Air Force image questions duplicate more direct and more efficient questions about the local base.

It was possible to develop a scale for the image of Air Force considerateness, and as table 11 (App. A) shows, it adds very little to our direct data. Consequently, it is our recommendation that these questions be omitted.

TABLE 7 (APP. A)

NOISE SURVEY 385

FINAL, 1 NOVEMBER 1957

NATIONAL OPINION RESEARCH CENTER
University of Chicago

Respondent No. 1- 2- 3- 4-
Block No. _____ Time interview began _____
Address _____ ended _____

*IF "SOME DANGEROUS CONDITIONS," ASK B:

B. Could you describe them to me? (Anything else?)

9-

Hello, I'm from the opinion research center at the University of Chicago. We are doing a study about how people feel about living in different places, and I'd like to get some of your views.

1. In general, how do you feel about living in this part of (name of area)? Do you rate it as an excellent, good, fair, poor, or very poor -- place to live?

Excellent.....	5-1*	Ask Q. 2 then 3
Good.....	2*	
Fair.....	3*	Ask Q. 3 then 2
Poor.....	4**	
Very poor.....	5**	
Don't know.....	6**	
NORC use.....	Y	

2. What are some of the things you like about living around here -- things that you feel are advantages or that make this a good place to live? (Anything else?)

3. A. Now what are some of the things you don't like about living around here -- things you feel are sometimes nuisances or are unpleasant or disagreeable to you?

B. Have we overlooked anything -- even little things that may bother or annoy you that you just take for granted because nothing much can be done about them?

4. A. Taking everything into consideration, would you say this is a very safe place to live, or are there some dangerous conditions affecting this area?

Some dangerous.....	9-1*
Very safe.....	0
Don't know.....	X
NORC use.....	Y

5. Now to be sure I have all your feelings straight. Here is a list of things that many people consider important in a residential area.

I'd like you to tell me for each of these items how you would rate this area in terms of actually having them. For example, would you say this area was very good, good, fair, poor or very poor in terms of being "close to your work or place of business?" (How about schools? etc.)

	Very Good	Good	Fair	Poor	Very Poor	Don't Know	NORC Use
A. Close to work or place of business....	10-1	2	3	4	5	6	Y
B. Schools.....	11-1	2	3	4	5	6	Y
C. Amount of noise.....	12-1	2	3	4	5	6	Y
D. Shopping facilities.....	13-1	2	3	4	5	6	Y
E. Taxes or rent.....	14-1	2	3	4	5	6	Y
F. Safety of area.....	15-1	2	3	4	5	6	Y
G. Neighbors.....	16-1	2	3	4	5	6	Y
H. Close to church.....	17-1	2	3	4	5	6	Y

6. Now including all the different noises you hear around here, would you say in general, that it's very noisy, fairly noisy, fairly quiet or very quiet around here?

Very noisy.....	18-1
Fairly noisy.....	2
Fairly quiet.....	3
Very quiet.....	4
Don't know.....	5
NORC use.....	Y

7. Could you tell me (again) about the different kinds of noises you sometimes hear around here?

A. First do you ever hear airplanes fly by here?

B. And do you ever hear planes warming up or testing their engines on the ground?

C. Now how about cars and trucks -- do you ever hear them go by?

D. And are there any other noises you sometimes hear around here?

specify type(s) 26-

	A Planes Flight	B Planes Ground	C Cars, Trucks	D Other Noises
Yes	19-20	20-21	21-22	22-23
No	0	0	0	0

****IF HEAR NOISE, ASK E:**

E. Does the noise of the bother or annoy you very much, moderately, only a little or not at all? (How about the noise?)	Very much... 17-18	Moderately... 18-19	A little... 19-20	Not at all... 20-21	Don't know... 21-22	NORC use... 22-23
	2	3	4	5	6	7

****IF BOTHERS, ASK F:**

F. Does it bother you (category of Part E) very often, fairly often or only occasionally?	Very often... 19-20	Fairly often... 20-21	Occasionally... 21-22	Don't know... 22-23	NORC use... 23-24
	2	3	4	5	6

*****IF NOT BOTHER AT ALL, ASK G:**

G. Was it ever unpleasant or did it ever bother you at all in the past?	Yes	No	Don't know...	NORC use ..
	23-24	24-25	25-26	26-27
	2	3	4	5

8. Now I'd like to get a better idea how you feel about some of these noises.

A1. Could you tell me, do the planes wake you up or keep you from going to sleep very often, fairly often, only occasionally, or don't they ever wake you up?

Very often	27-28
Fairly often	28-29
Occasionally	29-30
Not at all	30-31
Don't know	31-32
NORC use	32-33

***IF PLANES "WAKE UP," ASK A2:**

A2. When they wake you up, do you feel very annoyed, moderately annoyed, only a little annoyed, or not at all annoyed?

Very annoyed	27-28
Moderately annoyed	28-29
A little annoyed	29-30
Not at all	30-31
Don't know	31-32
NORC use	32-33

B1. Do the planes ever startle you very often, fairly often, occasionally -- or don't they ever startle you at all?

Very often	28-29
Fairly often	29-30
Occasionally	30-31
Not at all	31-32
Don't know	32-33
NORC use	33-34

***IF PLANES "STARTLE," ASK B2:**

B2. When the planes startle you, does it make you feel very annoyed, moderately annoyed, a little annoyed, or doesn't it annoy you at all?

Very annoyed	28-29
Moderately annoyed	29-30
A little annoyed	30-31
Not at all	31-32
Don't know	32-33
NORC use	33-34

C1. Is your rest or relaxation ever disturbed by the planes -- very often, fairly often, occasionally, or don't they ever disturb your rest at all?

Very often	29-30
Fairly often	30-31
Occasionally	31-32
Not at all	32-33
NORC use	33-34

***IF PLANES "DISTURB REST," ASK C2:**

C2. When the planes disturb your rest, does this make you feel very annoyed, moderately annoyed, a little annoyed, or not annoyed at all?

Very annoyed	29-30
Moderately annoyed	30-31
A little annoyed	31-32
Not at all	32-33
Don't know	33-34
NORC use	34-35

D1. By the way, do you happen to have a TV set in this house?

Yes	30-31
No	31-32
Don't know	32-33
NORC use	33-34

***IF "YES," ASK D2 & D3:**

D2. Do the planes make your TV picture flicker -- very often, fairly often, occasionally, or don't they ever interfere at all?

Very often	31-32
Fairly often	32-33
Occasionally	33-34
Not at all	34-35
Don't know	35-36
NORC use	36-37

***IF PLANES "INTERFERE," ASK D3:**

D3. When they interfere do you feel very annoyed, moderately annoyed, a little annoyed, or not annoyed at all?

Very annoyed	31-32
Moderately annoyed	32-33
A little annoyed	33-34
Not at all	34-35
Don't know	35-36
NORC use	36-37

E1. What about talking to other people on the telephone or in normal conversation -- Do the planes ever interfere with this very often, fairly often, occasionally, or not at all?

Very often	32-33
Fairly often	33-34
Occasionally	34-35
Not at all	35-36
Don't know	36-37
NORC use	37-38

***IF PLANES "INTERFERE," ASK E2:**

E2. When they interfere does this make you feel very annoyed, moderately annoyed, a little annoyed or not at all?

Very annoyed	32-33
Moderately annoyed	33-34
A little annoyed	34-35
Not at all	35-36
Don't know	36-37
NORC use	37-38

F1. How about listening to the TV or radio -- Do they ever make it more difficult for you to do these things -- very often, fairly often, occasionally, or don't they ever disturb your listening at all?

Very often	33-34
Fairly often	34-35
Occasionally	35-36
Not at all	36-37
Don't know	37-38
NORC use	38-39

IF PLANES "DISTURB," ASK F2:

F2. When the planes interfere does this make you feel very annoyed, moderately annoyed, a little annoyed, or doesn't it annoy you at all?

Very annoyed..... 33-5
Moderately annoyed..... 6
A little annoyed..... 7
Not at all..... 8
Don't know..... 9
NORC use..... 0

G1. Now the last of these questions. Do the planes ever make the house vibrate or shake -- very often, fairly often, or occasionally. -- or don't they ever do this?

Very often..... 34-10
Fairly often..... 20
Occasionally..... 30
Not at all..... 4
Don't know..... X
NORC use..... Y

*IF THE PLANES MAKE HOUSE "VIBRATE," ASK G2:

G2. When they do this, do you feel very annoyed, moderately annoyed, a little annoyed, or not annoyed at all?

Very annoyed..... 34-5
Moderately annoyed..... 6
A little annoyed..... 7
Not at all..... 8
Don't know..... X
NORC use..... 0

9. When you hear planes fly overhead, do you ever feel there is any danger that they might crash nearby?

Yes..... 35-1
No..... 2
Don't know..... 3
NORC use..... Y

10. A. In your opinion, how important is the job of this Air Base near here -- would you say it is one of the very most important, that it is fairly important, or that it is hardly important at all?

Very most important..... 36-1
Fairly important..... 2
Hardly important..... 3
Don't know..... 4
NORC use..... Y

B. Do you feel that the Air Base here has some special importance to (name of area) or is it mainly important to the general defense of the country?

Special importance..... 36-5
General defense..... 6
Don't know..... 7
NORC use..... X

C. How about the prosperity of (name of area), do you think the amount of money spent by the Air Base is very important, only moderately important, or hardly important at all to (name of area)?

Very important..... 37-1
Moderately important..... 2
Hardly important..... 3
Don't know..... 4
NORC use..... Y

D. If you were asked to pick the one activity most important to prosperity of (name of area) which of the following would you pick -- trade, farming, Air Base spending, or manufacturing?

Trade..... 37-5
Farming..... 6
Air Base..... 7
Manufacturing..... 8
Don't know..... 9
NORC use..... X

11. How much concern do you feel the pilots have for the feelings and comfort of residents like yourself when they fly by here -- would you say they are concerned very much, moderately, only a little, or not at all?

Very much..... 38-1
Moderately..... 2
Only a little..... 3
Not at all..... 4
Don't know..... 5
NORC use..... 6

12. A. At the present time, do you think that scientists and engineers have ways of reducing the noise and danger of airplanes where it is bothersome?

Yes..... 39-1
No..... 20
Don't know..... 30
NORC use..... Y

*IF "NO," OR "DON'T KNOW," ASK B:

B. Do you think someone is likely to find a solution in the next few years?

Yes..... 39-5
No..... 6
Don't know..... 7
NORC use..... X

13. A. From what you've read or heard, do you feel that the pilots fly by here as high as they possibly can, all of the time, most of the time, only sometimes, or that they never fly as high as they can?

All of the time..... 40-1
Most of the time..... 2
Sometimes..... 3
Never..... 4
Don't know..... 5
NORC use..... Y

B. What about the noise the plane makes. Do you feel that the pilots could fly quieter all of the time, most of the time, only sometimes, or that they can never fly quieter than they do?

All of the time..... 40-6
Most of the time..... 7
Sometimes..... 8
Never..... 9
Don't know..... 0
NORC use..... X

14. As far as you know, how much concern do the Air Base officials have for the feelings and comfort of residents like yourself -- would you say they are concerned very much, moderately, only a little, or not at all?

Very much..... 41-1
Moderately..... 2
A little..... 3
Not at all..... 4
Don't know..... 5
NORC use..... Y

15. A. As you know, the Air Base officials make rules and regulations for military airplanes flying around here -- Do you feel they could change the flight patterns so the planes would pass over other areas?

Yes..... 42-1
No..... 2
Don't know..... 3
NORC use..... 4

B. Do you think they could show the pilots how to fly higher than they do now?

Yes..... 42-5
No..... 6
Don't know..... 7
NORC use..... 8

C. How about the noise -- do you think the officials could show the pilots how to make less noise than they do?

Yes..... 42-9
No..... 0
Don't know..... X
NORC use..... Y

D. Do you think the officials could do anything else to reduce any disturbances caused by the airplanes?

Yes..... 43-1
No..... 2
Don't know..... 3
NORC use..... 4

16. Do you feel most pilots obey all the flying rules and regulations all the time, most of the time, only occasionally, or hardly ever?

All the time..... 44-1
Most of the time..... 2
Occasionally..... 3
Hardly ever..... 4
Don't know..... 5
NORC use..... Y

17. A. Suppose you yourself were bothered by the planes, do you think it would do any good to call or write the Air Base officials?

Yes 45-1
No 2
Don't know 3
NORC use Y

- B. Have you yourself ever felt like getting in touch with somebody about the airplanes around here?

Yes 45-40
No 5
Don't know 6
NORC use 7

***IF "YES", ASK C:**

- C1. Have you yourself ever called anyone, signed a petition or done anything else about it?

Yes 45-800
No 9-00
Don't know 0
NORC use Y

****IF "YES" TO PART C1, ASK C2:**

- C2. Did it do any good?

Yes 46-1
No 2
Don't know 3
NORC use Y

*****IF "NO" TO PART C1, ASK C3:**

- C3. Could you tell me why not?

18. Just from what you've heard, could you tell me how your neighbors feel about the airplanes - are most of them annoyed very much, moderately, only a little or not at all?

Very much 47-1
Moderately 2
A little 3
Not at all 4
Don't know 5
NORC use Y

19. A. As far as you know have you ever heard of any of them (neighbors) trying to do something about the airplane disturbance?

Yes 48-10
No 2
Don't know 3
NORC use 4

***IF "YES," ASK B:**

- B. Did it do any good?

Yes 48-5
No 6
Don't know 7
NORC use Y

20. Suppose most of your neighbors were bothered by the airplanes, do you think they would get together and try to do something about it?

Yes 48-8
No 9
Don't know 0
NORC use X

21. If you and your neighbors did get together and got in touch with officials at the Air Base, do you think that you would have a very good chance of improving the situation, a good chance, only a fair chance, or hardly any chance at all to improve things?

Very good 49-1
Good 2
Fair 3
Hardly any 4
Don't know 5
NORC use Y

22. A. Do you know of any local civilian groups or organizations around here that might take an interest in airplane disturbance problems?

Yes 50-10
No 2
Don't know 3
NORC use 4

***IF "YES," ASK B1:**

- B1. Do you happen to belong to any of them?

Yes 50-500
No 6
Don't know 7
NORC use 8

****IF "YES" TO B1, ASK B2:**

- B2. Are you an officer or active member of any committee?

Yes 50-3
No 0
Don't know X
NORC use Y

23. If some of the local organizations became concerned about the airplanes and got in touch with the Air Base officials, do you think they would have a very good chance of improving the situation, a good chance, only a fair chance, or hardly any chance at all to improve things?

Very good 51-1
Good 2
Fair 3
Hardly any 4
Don't know 5
NORC use 6

24. A. Now suppose some of your neighbors who were concerned about the airplanes asked you to sign a petition urging the Air Base officials to reduce their disturbance -- do you think that you would very likely sign it, that you might but you're not sure, or that you probably wouldn't sign such a petition?

Very likely 52-1
Might 2
Wouldn't 3
Don't know 4
NORC use Y

- B. How about calling up or writing to these officials -- if your neighbors asked you to call or write about the noise or danger, do you think you would very likely call or write, you might but you're not sure, or that you probably wouldn't write or call?

Very likely 52-5
Might 6
Wouldn't 7
Don't know 9
NORC use X

- C. If a meeting was called to voice the community's concern about the airplanes do you think you would very likely attend, that you might but you're not sure, or that you probably wouldn't attend?

Very likely 52-1
Might 2
Wouldn't 3
Don't know 4
NORC use Y

- D. If they asked you to visit the officials at the Air Base to discuss the airplanes, do you think you would very likely go, that you might but you're not sure, or that you probably wouldn't go?

Very likely 53-5
Might 6
Wouldn't 7
Don't know 8
NORC use X

- E. Now suppose some of your neighbors asked you to help them set up a special committee to improve the airplane situation, do you think you would very likely help them, that you might but you're not sure, or that you probably wouldn't?

Very likely 54-1
Might 2
Wouldn't 3
Don't know 4
NORC use Y

25. A. As far as you know, are you very likely to move from this area in the next few years or not?

Very likely.....55-1*
 Not likely..... 2
 Don't know..... 3
 NORC use..... X

*IF "VERY LIKELY," ASK B:

- B. Have you already found a place to live in another area, or not?

Yes.....55-5
 No..... 6
 Don't know..... 7
 NORC use..... Y

Now here are some questions about our country that affect (name of area) as well as other communities.

26. Some people have said that the best way to stay out of war is to be so strong that no one would dare attack us. In general, how do you feel about this statement -- do you strongly agree, agree, disagree, or strongly disagree?

Strongly agree.....56-1
 Agree..... 2
 Disagree..... 3
 Strongly disagree..... 4
 Don't know..... 5
 NORC use..... Y

27. If the United States should get into another war, which one of the Armed Services do you think would be most important in winning that war -- the Army, Navy, Air Force or Marine Corps?

Army.....57-1
 Navy..... 2
 Air Force..... 3
 Marine Corps..... 4
 All important..... 5
 Don't know..... 6
 NORC use..... Y

28. Now, thinking of (name of area) as a whole:

- A. How much inconvenience and disturbance altogether would you say the Air Base creates here in (name of area) -- a great deal, a moderate amount, or hardly any inconvenience or disturbance at all?

Great deal.....53-1
 Moderate amount..... 2
 Hardly any..... 3
 No inconvenience..... 4
 Don't know..... 5
 NORC use..... Y

- B. All in all, how would you describe the overall effect of having the Air Base here -- would you say it is entirely good for the people around here, it is a good thing but it has some disadvantages, or that it is not such a good thing to have here?

Entirely good.....58-6
 Good..... 7
 Not good..... 8
 Don't know..... 9
 NORC use..... X

29. Now we have what we call background data, and we'll be through.

Are you usually in this neighborhood during the morning? The afternoon? The evening? The night?

	Yes	No	Don't Know
Morning (8AM - 11:59 AM)...	59-1	2	3
Afternoon (12N - 5:59PM) ...	4	5	6
Evening (6PM - 10:59PM) ...	7	8	9
Night (11PM - 7:59AM).....	0	X	Y

30. A. How long have you lived in this part of (name of area)?

*IF LESS THAN 3 YEARS, ASK B-D:

- B. Where did you live just before moving here?

- C. Did planes usually fly overhead when you lived there? Yes.....1
 No.....2
 Don't know...3

- D. How long did you live there? _____ years**

*IF TOTAL OF A & D IS LESS THAN 3 YEARS, ASK E-G:

- E. And where did you live before that? _____

- F. And how long did you live there? _____ years

- G. And did planes usually fly overhead there? Yes.....1
 No.....2
 Don't know.....3

31. Family Composition:

Including yourself, how many people live with you in this house? _____
 Please list them for me.

Relation to Respondent	SEX		About how old is	RACE		
	M	F		W	N. W.	
Self	M	F		W	N. W.	61-
	M	F		W	N. W.	62-
	M	F		W	N. W.	
	M	F		W	N. W.	
	M	F		W	N. W.	
	M	F		W	N. W.	

32. Now what is the highest grade of school you completed?

Completed 0-4 years of grade school..... 63-1
 Completed 5-6 years of grade school..... 2
 Completed 7-8 years of grade school..... 3
 Completed 1-3 years of high school..... 4
 Completed 4 years of high school..... 5
 Completed 1-3 years of college..... 6
 Completed 4 or more years of college..... 7
 NORC use..... Y

33. Here is a card with a list of typical family incomes. Could you tell me the one which comes closest to the amount that all members of your family earned last year. I mean how much money did they get all together from all sources -- before taxes and other deductions?

A. under \$2,000..... 64-1
 B. \$2,000 - 4,000..... 2
 C. \$4,000 - 6,000..... 3
 D. \$6,000 - 8,000..... 4
 E. \$8,000 - 10,000..... 5
 F. \$10,000 and more..... 6
 Refused..... X
 NORC..... Y

34. Do you rent or own this house? (Circle code and get appropriate information)

- 65-A Rent -- IF RENT, ASK: A. How much do you pay per month, including the cost of heat, light and cooking fuel?

\$ _____

- 65-B Own -- IF OWN, ASK: B. About how much would you say your home is worth today?

\$ _____

35. A. By the way, have you ever flown in a plane?

Yes.....66-1*
 No..... 2**
 Don't know..... 3**
 NORC use..... Y

*IF "YES," ASK B-C:

- B. About how many times?

Once or twice - a few.... 66-4
 Three or four..... 5
 Five or more..... 6
 Don't know..... 7
 NORC use..... 8

C. When was the last time?

12 months ago or less.....67-1
One to 3 years..... 2
Four or more years..... 3
Don't know..... 4
NORC use..... 5

**IF "NO," ASK D:

D. Has anyone in your family ever flown in one?

Yes 67-6
No 7
Don't know..... 8
NORC use Y

*IF "YES," ASK B & C:

B. Which one(s)?

C. Are you (a member) working there now?

	70-4	Now	71-1	Not now	71-2
Air Force					
Army	5	Now	3	Not now	4
Navy	6	Now	5	Not now	6
Marines	7	Now	7	Not now	8
Other	8	Now	9	Not now	0
NORC use	X				Y

36. A. What sort of work does (main earner in the family) do?

Job:

Industry:

68-

IF RESPONDENT IS NOT MAIN EARNER, ASK B:

B1. Do you have a job away from home?

Yes 10
No 200
Don't know..... 3

*IF "YES" TO B1, ASK B2:

B2. What sort of work is that?

Job:

Industry:

69-

**IF "NO" TO B1, ENTER STATUS BELOW: (Student, housewife, retired, etc.)

B3.

38. A. By the way, do you or anyone in your family happen to own their own business?

Yes 72-10
No 200
Don't know..... 3
NORC use 4

*IF "YES," ASK B:

B. Do you (they) ever do business directly with the Air Base or with any civilian or military personnel working at the Base?

Yes 72-5
No 6
Don't know..... 7
NORC use 8

*IF "NO," ASK C:

C. Do you or anyone in your family happen to work for a company that does business with the base or with people working at the base?

Yes 72-9
No 0
Don't know..... X
NORC use..... Y

37. A. Have you ever been a member or worked for one of the military services?

Yes 70-10
No 2
Don't know..... 3
NORC use..... Y

Date _____ Name of interviewer _____

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TABLE 8 (APP. A)
SUMMARY OF CHANGES MADE IN FINAL QUESTIONNAIRE
FOR NOISE SURVEY 385

1 NOVEMBER 1957

NATIONAL OPINION RESEARCH CENTER

Question	Retained Use	Dropped	Revised or Added	Question	Retained Use	Dropped	Revised or Added
1-Overall Like	Scale 1 - Satisfaction with Neighborhood			17-Personal Attitudes about Complaint	Scale 13		
2-Open Likes	Transition			18-Neighbors Annoyance	Correlate with Scale 13		
3-Open Dislikes	Scale 1 - Scale 2 Fear			19-Neighbors Complaint	Correlate with Scale 13		
4-Open Dangers	Scale 2 - Fear			20-Neighbors Got Together	Correlate with Scale 13		
5-Ratings of Community	Scale 1			21-Possible Success of Neighbor Action	Scale 13		
6-Overall Noise	Correlate with Acoustic Data			22-Know of Local Organization	Transition - Correlate with Scale 13		
7-Overall Annoyance with Noise	Scale 6 - Comparative Noise Annoyances		Old Q. 7 & 8 combined = Jet & Prop questions combined - Other noises added	23-Possible Success of Organization Action	Scale 13		
8-Activity Disturbance & Annoyance	Scale 4, 5, 6			24-Readiness to Complain	Scale 12		
9-Danger of crash	Scale 2 - Fear			25-Move from Area	Mobility		
10-Importance of Base	Scale 10	Part E not used - ambiguous	Wording made more direct	26-Importance of Military Strength	Correlate Scale 11		
11-Concern of Pilots	Scale 8 - Pilot Considerateness			27-Relative Importance in War	Correlate Scale 11		
12-Science can Avoid	Correlate with Action Proneness			(OM 38 - AF Image)			A. F. Image Not productive - Difficulty in Scaling.
13-Pilot Attitudes	Scale 8			28-Summary attitudes about Base	Scale 11 Also Scale 6		
14-Concern of Base	Scale 9 - Base Considerateness			29-38 Personal Data on Age, Sex, etc.		Old 38 not too productive	Question 30 generalized for multi-base use
15-Base Change Rules		15D2-open-ambiguous	Language clarified				
16-Pilots Obey Rules	Scale 8						

TABLE 9 (APP. A)

COMPARISON OF OVERALL REPORTED DISTURBANCE
BY JET AND PROPELLER PLANES IN FLIGHT

A. West Coast Base

Disturbance Categories	Average Number Seconds Per Hour Noise Exceeds Speech Interference Level 60db							
	50 Sec. or More		40-49 Sec.		20-39 Sec.		Less Than 20 Sec.	
	Jet	Prop	Jet	Prop	Jet	Prop	Jet	Prop
Very much	17%	6%	14%	6%	10%	3%	--	--
Moderately	23	15	21	12	20	10	--	--
A little	30	27	22	22	26	24	--	--
Not at all	30	52	43	60	44	63	--	--
Number of Interviews	(350)	(350)	(160)	(160)	(294)	(294)		

B. East Coast Base

Very much	19%	2%	17%	5%	26%	8%	13%	3%
Moderately	26	15	25	10	32	22	27	10
A little	27	21	23	22	15	22	24	13
Not at all	28	62	35	63	27	48	36	74
Number of Interviews	(81)	(81)	(156)	(156)	(227)	(227)	(316)	(316)

TABLE 10 (APP. A)

PER CENT OF RESPONDENTS REPORTING PROPELLER PLANE
DISTURBANCES BUT NOT JET PLANE DISTURBANCES

A. West Coast Base

Type Disturbance	Average Number Seconds Per Hour Noise Exceeds Speech Interference Level 60 db			
	50 Sec. or More		Less Than 20 Sec.	
	Jet	Prop	Jet	Prop
Vibrations	8%	8%	8%	--
Talking	2	3	1	--
Listening	2	2	1	--
Sleeping	2	2	1	--
Rest and Relaxing	1	2	0	--
Number of Interviews	(350)	(160)	(294)	

B. East Coast Base

Vibrations	0%	0%	0%	0%
Talking	0	1	1	1
Listening	0	0	1	1
Sleeping	1	2	0	1
Rest and Relaxing	2	1	1	1
Number of Interviews	(81)	(156)	(227)	(316)

TABLE 12 (APP. A)

COMPARISON OF LOCAL BASE CONSIDERATENESS SCALE
WITH THE AIR FORCE CONSIDERATENESS SCALE

Average Number Seconds Per Hour Noise Exceeds SIL 60 db	Number of Interviews	Degree of Considerateness					
		Least		Moderate		Most	
		Base Scale	AF Scale	Base Scale	AF Scale	Base Scale	AF Scale
80 +	191 = 100%	34%	31%	43%	35%	23%	34%
50 - 79	461 = 100%	25	35	44	36	31	29
40 - 49	424 = 100%	28	38	49	37	23	25
20 - 39	879 = 100%	37	37	43	37	20	26
- 20	422 = 100%	29	36	47	42	23	22

6. Specifications for Final Questionnaire

Table 12 (App. A) includes the detailed instructions for interviewers in administering the final questionnaire. With minor exceptions, it is identical with the instructions used in the actual field trials.

TABLE 12 (APP. A)

SPECIFICATIONS FOR NOISE SURVEY 385

REVISED, 1 NOVEMBER 1957

NATIONAL OPINION RESEARCH CENTER

SPECIFICATIONS FOR NOISE SURVEYI Purposes of Survey

The following information on the background and purposes of this survey is only for you, the interviewer. Under no conditions should it be revealed to any respondent.

This is an experimental survey of people living near a U.S. Air Force base and their reactions to the noise and air traffic resulting from base operations. With the rapid development of air power, the size and speed of propeller and jet airplanes have steadily increased. As a by-product of these technical developments, the level of noise and air safety problems have also multiplied. Persons living in the vicinity of air bases have complained about these disturbances and have urged the Air Force to change its operations in order to minimize interference with residential living activities. Consequently, the Air Force has become increasingly concerned about the effects of its operations on nearby population centers and has requested NORC to conduct this study.

The Air Force is interested in assessing the extent of actual disturbances resulting from its operations, and its effect on people's feelings toward the Air Force. It is also interested in evaluating the influence of various socio-psychological factors on the tolerance of noise and other disturbances and on the readiness of people to express their feelings of bother and annoyance.

This area has been selected for study because it affords a variety of acoustic and flight conditions which are important to our experimental research. The area was not selected because of any special concern about local complaints or contemplated changes in air operations. Our interest is not to solve its local problems but to learn something about the different acoustic situations which happen to be present here.

You will readily recognize the prime importance of keeping the real purposes of this study confidential. Our interest is in determining the unbiased reports of disturbances and people's feelings about them. If a person knew this study was sponsored by the Air Force, and if he felt that his answers might influence some administrative action, he might exaggerate his answers in an effort to emphasize his feelings about the Air Force. That is why we are cautioning you at the outset never to reveal the purposes of this study to a respondent.

II Approach

Most respondents are generally curious about the "purpose" of a study and will usually ask about it some time or other during an interview. A simple approach which has been thoroughly pretested on hundreds of NORC surveys is printed on the first page of the questionnaire and should be used as your introduction. You greet your respondent. You explain that you're working on a public

opinion survey, you tell him you want his ideas and opinions, and you go immediately into the first question. The wording of the suggested introduction follows:

"Hello, I'm from the opinion research center at the University of Chicago. We are doing a study about how people feel about living in different places, and I'd like to get some of your views."

Usually this brief statement is sufficient to start the interview. You do not ask him whether he wants to be interviewed, or whether he has the time to be interviewed. You do not tell him what the survey is specifically about. You do not go into details about NORC unless he is curious or suspicious. Your aim is to forestall any hesitancy on his part by getting immediately to the most interesting thing -- the questions -- and to avoid wasting time in lengthy explanations. You will find that most of your respondents will answer Q. 1, start thinking about Q. 2, and very often will go through the entire interview without once raising the question of whom you represent and why you want their answers. In such cases, when you complete the interview, make your farewell and leave promptly.

If the respondent wants to know what the survey is about, what kind of questions you have, say, "Well, the first one is ..." In general, how do you feel about living in this part of () etc." If he seeks further information, explain that, "This survey is designed to assist City Planners in their work and is concerned with the way in which different people in different communities feel about various problems. The ways in which you and other people have actually solved your local problems will assist in the planning of new communities."

During the interview, some of the respondents will realize that many of the questions are concerned with the air base, and they may ask you directly whether the survey is for the Air Force. Always deny any Air Force connection. Tell them, "This study has no connection with the Air Force. Each community we study has its own different problems. Before we interview in an area, we talk to a number of local residents to get an idea of the important problems in that area. Then we try to word our questions so we get their attitudes on their own local problems. In this area the air base seems to be quite important and we have a number of questions about it. In other cities we'll be interested in other problems which are important in those areas." Remember, be brief and avoid any lengthy explanation.

III. Finding Your RespondentA. General Considerations -

Each sampling area has been carefully selected by an acoustics engineer to represent particular noise levels and flight characteristics of Air Force planes (on path and off path at different average altitudes). After we have completed our interviewing, these engineers will revisit these areas and make sound recordings

1. All respondents must be 18 years of age or over.
2. All must have their permanent residence on the block. Do not interview visitors or houseguests.
3. Do not interview people whose command of English is so poor, or who are so hard of hearing, that interview results would be dubious.
4. In every case, interview only one respondent from the same household.

Five interviewers will normally be assigned to each sampling area, with a quota of five respondents for each interviewer. Since half of all respondents will be men and half women, specific quotas will be assigned to each interviewer. Some will be requested to select 3 women and 2 men; others will be asked to interview 2 women and 3 men. Normally, an interviewer will be given a pair of nearby sampling areas, so that he will select 3 men and 5 women in these two sampling areas. Be careful to meet your specific quota, because someone else's assignment balances yours.

While you are not required to interview at any specific hour of the day or night, the scheme described below is designed to give you the most efficient results. An overall consideration underlying the suggested scheme is the desirability of completing all interviews in a small area as soon as possible. Since spontaneity of response is an important objective, it is necessary to complete all assignments quickly. Experience has shown that neighbors will discuss their interviewing experiences and if we prolong interviewing in an area, the respondent may be forewarned of the contents of the questionnaire. A second underlying consideration is the desirability of avoiding "interviewer fatigue." If too many interviews are completed without interruption, normal fatigue will generally dull the alertness of the interviewer. The suggested scheme provides for a maximum of three consecutive interviews.

A square with vertices labeled Side A (top), B (right), C (bottom), and D (left).

Side 1
L J
K

REPORT ALL UNSUCCESSFUL
CONTACTS ON THE BACK OF
OF THIS SHEET

1. Schedule 2 or 3 interviews with women during the morning hours before lunch.
2. Schedule 2 or 3 interviews with women in the adjoining area for the early afternoon.
3. Return in the evening and schedule 2 or 3 interviews with men in one area.
4. Schedule the return of your first day's completed interviews to the field supervisor and discuss them with him. This step is mandatory for all interviewers. After your first assignment, return your completed interviews and receive your new assignment. Then proceed to interview women during the morning and afternoon hours.
5. Return in the evening to the area in which you interviewed women only the day before, and complete your interviews with men.

The following system will be used in the selection of dwelling units: The use of a systematic procedure will minimize any biases in your selections.

[illegible]

- a) On your first assigned block, start with the first corner house, then skip every other house until you have filled your quota. On your second assigned block, start with the second house from the corner and proceed as described above. On the third assigned block, start with the first corner house etc. . . . This procedure will avoid your selection of too many corner houses, only the well-kept homes etc.
- b) If you reach the end of your assigned block and have not filled your quota, return to the first skipped house and try each skipped house until you have filled your quota . . .
- c) If you are unable to fill your quota after contacting every house on the assigned block, call your field supervisor for further instructions.

F. Instructions for Block Assignment Sheet -

1. The assigned sides of each block will be shown in red on the sketch maps of the Block Assignment Sheet. Any special limitations in terms of house numbers, etc., will be listed under Special Instructions. If there is any doubt about the limits of the assigned area, call your field supervisor for clarification.

2. For each completed interview, list the address and sex of the respondent under Part I on the front of the Block Assignment Sheet. Be sure to check the sex quota requirements at the bottom of the Block Assignment Sheet, before you proceed with your selection of respondents.

3. For each unsuccessful contact which does not result in a completed interview, record the following information on the back of the Block Assignment Sheet:

- a) The address of the unit approached
- b) The time of approach -- A call-back may be scheduled at a different time.
- c) Check "Yes" or "No" to indicate whether any adult was at home at the time of contact.
- d) If the reason for not securing an interview was that the person did not meet the survey requirements, indicate the specific reason under "D" -- i.e. transient, visitor, deaf, language difficulty etc.
- e) If the person refused to be interviewed or broke off the interview before completion, indicate the sex and approximate age of the person and the specific circumstances of the refusal or break-off. This information is important because in the case of a refusal due to temporary inconvenience, a call-back may be necessary.

Do not count as refusals persons whom you approach and then find do not fit your quota. Such persons have not refused.

Similarly, do not count as refusals people who are willing to be interviewed, but whom you yourself reject because they speak no English, are drunk, or otherwise not qualified.

Don't count it as a refusal if nobody comes to the door, even though you have reason to believe someone is home.

Count as refusals only those persons you approach who refuse to answer your questions, or who terminate the interview after you have started.

4. If you complete your quota before contacting every house in your assigned block, list the address of each unit which you failed to contact on Part III of this form. It may be necessary to assign these homes to another interviewer, and this information is vital to the field supervisor so that a current inventory of available dwelling units may be maintained.

IV SPECIAL REMINDERS

Please study again your "First Instructions to New Interviewers", and brush up on the notes you took during the training sessions. The general rules of good interviewing are not repeated here, except as they are particularly relevant to the study.

A. BE PATIENT -- USE ONLY NEUTRAL PROBES.

The general interviewing instructions have pointed up the general rule for all interviewers to maintain an impartial, objective attitude while interviewing. You should be especially conscious of this in the present survey, because the problem of

aircraft noise and safety is probably particularly important to the people we will interview. Some of the respondents may be slow in answering questions because they may not have thought through the problem. You may be tempted, therefore, to show your approval of certain responses, or you may unintentionally use a biased probe to elicit a certain response. Forget your own interests and attitudes toward the problem while in the process of interviewing and concentrate only on giving your respondents the maximum opportunity for the free expression of their own opinions and ideas within the limits set by the questionnaire.

B. USE A CLEAR, LEGIBLE HANDWRITING.

Unless we can read the answers, your hard work will be of little value. Therefore, as soon as you can, take the time to edit the completed questionnaire and to clean up any bad writing.

C. ASK ALL THE QUESTIONS INCLUDING THE RELEVANT SUB-PARTS.

In most instances, a series of related questions have been included on each different psychological factor under study. If one or more parts of the series is accidentally left blank, the entire battery of questions may be voided.

To help you select the appropriate sub-parts, a code of asterisks has been used. For example: On question 4 if the respondent (H) answers Part A, "There are some dangerous conditions", circle punchcard code "T". You will note a single asterisk next to code "T", and immediately below an explanation of the single asterisk, in capital letters, it says, "IF 'SOME DANGEROUS CONDITIONS', ASK B". Part B asks B to describe the "dangerous conditions". Note that if B answered Part A, "The area is very safe with no dangerous conditions", then, you would circle code "ND" and since there is no asterisk, you would skip part B, as irrelevant. Therefore, whenever you circle a code that has one or more asterisks next to it, look for the sub-part immediately below with the same number of asterisks, and ask the sub-part question as directed.

Below each pre-coded question is a category, "NORC use." This code is used whenever a question is accidentally left blank. You are never to circle this category, and we hope we never have to circle it either.

D. RECORD ALL RELEVANT COMMENTS.

Some of the questions, especially the first four, are of the free-answer type and require the recording of verbatim comments. This is extremely important because the exact language used is very often a significant clue of the intensity of the respondent's feelings.

Even more important are the extra-unsolicited comments which a respondent may offer in connection with a pre-coded question -- or as an afterthought to a previous question. The subject of this study involves the complex emotions of fear, annoyance, national security etc., and our experience indicates that the most revealing comments are often made at the most unexpected moments of the interview.

BE ALERT TO ALL RELEVANT COMMENTS WHENEVER THEY ARE MADE AND RECORD THEM IN THE MARGINS OF THE QUESTIONNAIRE OR ON THE BACK OF EACH PAGE. Remember, our only clues about the respondent's feelings are the pre-coded answers and the comments which you actually record on the questionnaire.

E. AVOID LAZY "DON'T KNOWS."

We are asking the respondents to pin-point their attitudes and experiences. But for many of them the process of answering our questions will be the first opportunity to think through the problem. Be patient and reassuring. If the respondent gets impatient or unsure of himself, interrupt your questioning and explain, "There are no right or wrong answers -- we're interested in finding out just how you feel about these things. . . ." Don't accept an, "I don't know", answer immediately. It may be an easy way out -- of not thinking about the question. Use such neutral probes as, "Well, nobody can be sure -- but what do you think from what you've heard or read. . . ." or "Nobody really knows -- but what do you believe (the situation) to be. . . .?"

"Don't know" answers make the analysis of the questionnaire more difficult, but some "don't know" answers are bona fide answers. You will learn to judge a real "don't know" from a "lazy don't know". After making an extra effort to get the respondent to answer the question, and he still does not know, accept it as such. In some cases, the "don't know" is the real answer and reflects the lack of knowledge or crystallization of thought among a certain segment of the population.

F. PROBE AMBIGUOUS PHRASES SUCH AS, "AIRPLANES", "AIR BASE, "NOISE", AND "LOW FLYING".

In analyzing verbatim answers recorded on the questionnaire, it is necessary to select from among many closely related categories, the one which most nearly fits the actual words of the respondent. It is important, therefore, to secure as clearcut an answer as possible. Special care should always be taken with the following ambiguous words:

1. **AIRPLANES** - If a respondent says the "airplanes" bother him, be sure to find out:
 - a) What kinds of planes -- "jets" or "propeller"
 - b) In what way they bother -- is it noise disturbance, fear, TV picture, flicker, vibration, etc. Use such probes as "Can you tell me a little more about that? What do you mean by that? In what way do they bother? Just what do they do to make you feel that way? Can you give me an example?"
2. **AIR BASE** - A respondent may also say, "The Air Base is a nuisance." This may cover a multitude of items. Be sure to find out:
 - a) What aspect of the Air Base is bothersome -- Is it the jet planes making noise, social problems of base personnel, land values, congestion of population etc.,
 - b) In what way a particular aspect is bothersome. What about the jet planes etc. is disliked. Get a clear statement about the person's feelings.
3. **NOISE** - If a respondent says the "noise" bothers him, find out:
 - a) What kind of noise - Is it jet, propeller, truck or auto -- children -- dogs etc.... Ask neutrally, "Just what kinds of noise do you mean?"
 - b) In what way does noise bother - Is it sleep interference, speech or radio listening -- telephone conversation or just rest or relaxation. Use the neutral probes suggested above.
4. **LOW FLYING** - Very often a respondent will use the term "those low-flying planes". Find out:
 - a) What kinds of planes he means
 - b) In what way is low flying an annoyance -- Is it the noise of fear which is important -- or both. Some respondents merely mean that they come so low that they are very loud. Others mean that they are so low that they are a threat to their personal safety. Use the usual probes -- "What do you mean by that? ... what about low flying don't you like? etc."

V -- THE QUESTIONNAIRE

A. General Structure of Questionnaire

One of the major problems involved in devising a standard questionnaire is the arrangement of questions in a natural sequence. Certain questions frequently stimulate a typical pattern of thought and unless the questionnaire is organized to correspond with the natural flow of answers, interviewing problems are increased. In analyzing the spontaneous pretest interviews, great care was taken to determine these normal patterns of response and to adapt them in the design of the questionnaire.

In general, the questionnaire is divided into six major units:

- 1) General open discussion about feelings involved in living in the neighborhood.
- 2) Direct questions about the noise environment.
- 3) Direct questions about the Air Base mission and personnel
- 4) Questions about overt expressions of annoyance with noise and aircraft.
- 5) Questions about general attitudes toward national defense.
- 6) Background data on the characteristics of the respondent.

Each unit generally has a similar structure which begins with more general questions and proceeds to more specific direct questions. This approach gradually introduces each topic, permits a spontaneous discussion of qualified feelings and indicates the relative importance of various factors. It generally puts the respondent at ease since it permits him to think about the overall features of the problem and to emphasize the particular aspects which he, himself, feels are important. Another important advantage is the likelihood that the general discussion will include voluntary reports of some of the detailed aspects of the problem and it will appear less prying for the interviewer to follow up these leads with more specific probes. It has been our frequent experience that when interviews begin "cold" with very specific and detailed questions, that respondents become suspicious and less willing to express their frank objections.

Following ample opportunity for spontaneous mention of airplanes and noises, a series of uniform questions is asked about the component aspects of the problem. If these disturbances are not voluntarily reported, the direct questions serve as a last resort. In this way, not only can the content of the answers be analyzed but the sequence of different answers can also be studied for salience and intensity of feelings.

B. SPECIFIC QUESTIONS

QUESTION 1: This question is an "easy opener". It ties in very neatly with your explanation of the purpose of the interview and helps to set with respondent at ease right at the outset with a simple and familiar topic of discussion.

The question has an important objective, however, so be sure that the person hears all of the pre-coded scale from "excellent" to "very poor" before giving his answer. We want a measure of the respondent's generalized feelings about the area in which he lives before it is possibly colored by the discussion of particulars.

Some people start right in to discuss particular things that they like or dislike, either expanding on their general rating or without actually giving it. This is perfectly natural, and you should go right along with them--writing down their responses verbatim. Before leaving the question, however, get their rating by reformulating the question as follows: "That is fine, now, taking everything into consideration, how do you feel, etc."

If the respondent generally rates living in his area as "Excellent", "Good", or "Fair", you will proceed to Question 2, which asks about particular things that he likes, then to Question 3, which inquires into the things that he doesn't like. If his answer to Question 1 is "Poor" or "Very Poor", first ask all parts of Question 3, then return to Question 2 and ask about the things that he likes. This order has been found to be easy and natural to most respondents.

QUESTION 2: The aim of this question is to learn what the respondent values in his residential environment. Any aspect which he values, social or physical, tangible or intangible, is an appropriate response. You will observe that the question has many aspects to it. It asks for "things you like", "things that you feel are advantages" or "that make life a good place to live." All of these phrases have been pretested very successfully both as parts of separate questions and in combination. The combination form is employed here to avoid duplication in response and to suggest the generality of our interests. Probe for "Anything else?" as long as the respondent has anything to offer. Be sure to probe for clear, intelligible and complete answers. The tendency to classify and generalize has proven to be troublesome. When the respondent says "Oh, I sort of like the environment," for example, he hasn't really told you much. You will have to ask, "Mr. [name], I see, and what is it about the environment that you like?" Similarly, a respondent may say "It's very peaceful." We've found in pretesting this may mean the absence of noise, or a comparative social isolation such that one is not often disturbed by callers or the telephone. It may also mean the slow pace of activities, or the absence of disagreeable, bickering people in the vicinity. There are many other specific meanings which the term could have for different people. The moral is obvious: You must be alert to vague and unspecific answers and you must probe patiently for clear and specific ones. "What about the so-and-so?" "What are you thinking of particularly?" "What sort of thing do you have in mind?" "Can you tell me a little more about it?" etc., are examples of neutral probes that you can use.

Don't, on the other hand, pursue answers which are actually irrelevant to the question. Keep in mind that we are interested in learning about things which affect the respondent's satisfaction with living where he does. Conditions which contribute to personal happiness but which have no particular connection with his residence -- since they would obtain no matter where he resided -- like a "happy marriage" or "my wonderful children" -- are not actually relevant to the question. Record all such responses, but probe for further feelings in terms of "living around here."

NOTE: You will find that a question about "things you like" will sometimes prompt the respondent spontaneously to tell you about something he doesn't like. This is perfectly all right. Don't cut him off. Probe for a clear picture of what he has in mind. When you resume your questioning, however, return to the particular question sequence you were following before he digressed. A suggested transitional phrase might be, "I see. Now, are there any other things you like?"

QUESTION 3: As in Question 2, both parts of Question 3 have the same general aim -- to learn the sources of dissatisfaction to the respondent in his residential environment. Both Parts A and B must be asked of every respondent. As in Question 2, the combination form has been employed for the sake of brevity. You should practice reading these questions aloud until you can deliver them smoothly and naturally -- without giving undue stress to particular phrases and understressing other parts of the question.

Keep in mind here, too, that not all factors which affect the life satisfaction of the respondent -- an unhappy marriage, illness uncomplicated by climate, etc. -- are connected with his residence, and such responses should not be pursued at length. Rather, you will have to shift the emphasis to things connected with "living around here", as discussed earlier for Question 2.

It cannot be stressed too emphatically that you will have to be on your guard against vague and general answers to all parts of Question 3. Beware of too easily accepting one-word answers, which all too often seem plausible enough in the interview situation but are later found to be hopelessly vague. In response to Q. 3-A, for example, the respondent may say emphatically "The neighbors" in a tone and manner that suggests that he expects you to know exactly what he means. But what, in fact, does he mean? Are they over-friendly or not friendly enough? Too old or too young? Do they make too much noise or don't they like people (like him) who make noise? Probe -- "Uh huh, now could you tell me, what is it about the neighbors (you don't like)?" etc.

Certain answers seem clear enough on first hearing, for example: "The heavy traffic on this corner is pretty annoying". But again, the question is, what is the specific annoyance -- what is it about the traffic that is annoying? There are several possibilities, any or all of which may apply for a particular respondent. Among these are vibrations of the house, interference with hearing other desired

sounds, the danger involved in crossing the street for the respondent himself or other members of his household, and so on. Remember always probe vague answers such as: "Airplanes, Air Base, Noise and Low Flying."

Caution: While it has been stressed above that you must probe conscientiously for a clear statement of the nature of the "dislike," "annoyance" or "disagreeable condition," you must exercise reasonable caution to avoid going too far into details with respect to questioning about various aspects of noise and aircraft matters at this stage of the interview. Unfortunately, if the respondent goes into considerable detail in describing his feelings about aircraft operations in the vicinity of his residence he frequently becomes uneasy later on when this matter is taken up intensively in the battery of direct and detailed "airplane" and "noise" questions. On this account, caution is necessary in exploring these subjects in the early part of the interview. On the other hand, one of the major purposes of these open questions is to permit the respondent to volunteer his feelings about aircraft operations and other noise sources freely and to describe them in the context of other environmental circumstances which are sources of satisfaction or of dissatisfaction of him. Therefore, when you feel the respondent has gotten his most important feeling "off his chest" proceed to Q. 4.

The following example will illustrate an adequate series of probes:

- R: The airport
- I: Mm hmm -- what is it about the airport that you don't like?
- R: It's a nuisance.
- I: How do you mean?
- R: Well, it's those darn airplanes! You'd think they were going to come through the roof!
- I: I see, tell me some more about that -- I want to be sure I know just what you mean.
- R: Well, what more can I say?
- I: Well you say you'd think they were going to come through the roof --
- R: Yeah, well what I had in mind there is mainly the noise. Honestly, sometimes you can't hear yourself think when they come over like that. There's also a fear that they might not make it someday 'cho they never have had a real serious accident around here.... not yet.
- I: Have we overlooked anything....(Part B of Q. 3)

Probed sufficiently? In our judgment, yes. The respondent will have many later opportunities to amplify, clarify (and even contradict) his feelings about airplanes, the way in which the noise bothers him, the hazard of airplane operations and his feelings about that, etc. At this point, however, we have what we need to satisfy the objectives of this question area and would be content to proceed, the respondent permitting.

Be sure to ask Part B of all respondents. It is a summary-type probe and suggests that we are interested in all kinds of problems. Frequently, a respondent may be quite bothered by something but will be reluctant to discuss it because he feels nothing can be done about it. We are interested in finding out whether such feelings of futility affect Air Base problems.

QUESTION 4: This is a direct question about the presence of "dangerous conditions" in this area. If it is neutral, however, in that it does not suggest any particular type of danger. If the respondent answers that there are some dangers in the area, circle Code 1, and ask Part B. If the answer is, "This is a very safe place", circle code 0 and proceed to Q. 5. If R says, "it's very safe, except for the jets", circle code 1, add "jets" under Part B, and probe, "what do you mean by that?"

In Part B, probe for a clear statement of the kinds of dangerous situations. It could be traffic, a hole or pit, lack of street lights, etc. It also may be the first mention of the danger of jet or propeller planes. Do not go into details about annoyance with jet or propeller planes, but be sure to get a clear statement about the way in which they are dangers.

QUESTION 5: This question asks for a rating of several specific aspects of the respondent's residential area. He, himself, may or may not have brought up these matters earlier. In any event, he gets a chance to consider them now. The question constitutes the second screening device to the respondent to tell us about all of his likes and dislikes in his residential situation.

If R doesn't volunteer one of the five categories, probe, e.g., "Would you say this area was very good, good, fair, poor, or very poor in terms of its schools?" Then circle the appropriate code number and proceed to the next item.

If R answers ambiguously, "Well, it's pretty good," probe, "Would you say very good, good, or fair?" Conversely, if he says, "It's not so good," or "pretty bad," probe, "Would you say fair, poor or very poor?"

If R qualifies his answer, record the qualification as a voluntary comment and continue as follows, "Well, taking everything into consideration, would you say it's very good etc?"

In Part A if R says, "I'm a housewife and have no job away from home," ask, "Well, how about your husband's work?"

If R is retired and there is no other "main earner" in the household, ask "Well considering most people who live around here how would you rate this area in terms of being close to their work etc....?"

Likewise, in Part B if R has no children in school, and says, "I don't know," probe, "Well, from what you've heard from neighbors and others, how would you rate the schools?"

QUESTION 6: This question aims at R's overall assessment of the noise level in his residential environment. If R qualifies his answer, "It's generally quiet", except for those planes or trucks" record the comment and probe, "I see, but including all the different noises --- etc?" Be sure to get an overall rating.

QUESTION 7: This question deals with R's overall feelings about airplanes, and is divided into seven parts.

Parts A-D record what R ever hears particular noises. Parts E-G record R's feelings of annoyance with them.

Parts A-D: We are interested in recording when R sometimes or ever hears a particular noise. The term "again" is inserted parenthetically because R may have mentioned some of the noises earlier. Be sure to get a complete listing on this question because Parts E-G are skipped if R reports never hearing a particular noise.

Ask Part A first and circle code R under Part A if the answer is Yes, or Code "O" if No. Then ask, Parts B, C and D and circle the appropriate codes for "Yes" or "No" answers.

If R says Yes to Part D, ask for the types of noises R has in mind and list them on the blank line.

Parts E-G: Then, proceed to the first noise heard (first R circled), and ask Part E for that noise. Insert the name of the noise heard as follows: (If 19-R is circled) "Does the noise of the planes in flight bother or annoy you very much-- etc?" Circle the code number corresponding to the appropriate answer and proceed directly to Part F or G. If R is bothered and code 1-3 is circled (single statement) ask Part F, inserting "very much," "moderately" or "only a little" as appropriate. If R is not bothered or doesn't make a decision and Code 4 or 5 is circled, skip Part F and ask Part G. Then go back and ask Part E, for the second noise heard, etc.

If R starts to elaborate his feelings record his comments but don't encourage lengthy details. If he distinguishes between different kinds of planes, tell him we are concerned with both jets and propeller planes and the effects of either or both on his feelings.

QUESTION 8: This is one of the most important questions in the survey since it pinpoints the activities affected by the different noises and his feelings about each interference. If R indicates that he has already mentioned some of the items on previous questions, indicate that, "It is important to find out the extent of the disturbances... that is why we are asking about them again in this way." Try to use a conversational tone and humor R when you repeat the categories. If the number of specific selections appears to be tiresome to R you might say, for example on E and subsequent parts of this question, "How does this interference make you feel -- you know the categories -- very annoyed, moderately annoyed, a little annoyed, or doesn't annoy you at all?"

In Part D, ask Parts D2-3 only if code 1 is circled in part D1 (R has TV set).

In Part F, emphasize the "listening" vs "picture interference."

QUESTION 9: This is a second opportunity for R spontaneously to report his feelings about airplanes. Question 8 covered the topic in detail but you shouldn't be surprised if this question produces a different delayed response.

Remember, the question is "ever feel there is any danger." If R says only once in a while, circle Code 1 for "Yes" and proceed to Q. 10.

QUESTION 10: This series of questions inquires about the purposes and importance of the local Air Base. If R wants to know what we mean by "jobs," say, "You know, what do they have the planes here for What they are supposed to be doing when they fly around here?" etc.

All four parts of this question (A-D) must be asked.

In Part B, we are interested in the importance of the Base to the immediate locality as distinguished from its importance to the defense of the general region. Whenever "name of area" appears in parentheses, insert the name of the locality.

In Parts C and D, include direct spending by the Air Base or by civilian and military personnel who are paid by the Air Base.

QUESTION 11: This is the first direct question about the considerateness of Air Force pilots. While we don't ask R to explain why he feels the way he does, he may volunteer such comments. Record them and proceed to Q. 12.

If R wants to know what we mean by "feelings and comforts," say, "You know, could they fly differently and create less disturbance?"

QUESTION 12: The previous question dealt with the intentions and considerateness of Air Base pilots. This question concerns the physical possibilities of reducing noise and danger. Does anyone have the technical knowledge to improve the situation where it is bothersome? Again, a distinction may be made between noise and danger. Record the qualification and if either one can be reduced circle Code 1 and proceed to Q. 13. Don't accept a lazy "don't know." Reassure R by telling him, "Of course we may not know how it's done, but from what you've heard or read, do you think . . . etc.?"

If R feels no one knows how to reduce the noise and danger at the present time, circle Code 2 and ask Part B. A "don't know" should be treated like a "no" response and Part B should be asked.

Part B attempts to distinguish between temporary futility and total futility. R may not know the answer now but does he or does he not expect that a solution will be found in a few years?

QUESTION 13: This question delves into two specific aspects of pilot considerateness - low flying and noise of plane. If R says he doesn't know enough about flying to answer, tell him that there are no right or wrong answers. It's just his opinion, what he believes the situation to be.

QUESTION 14: This is a parallel question to Q. 11, and concerns the Air Base officials. If R wants to know "what officials," answer, "You know, the officials in charge of the way the Base is run."

QUESTION 15: Details of Air Base management and the avoidability of disturbances by proper Air Base regulations are probed in this question. All four parts A-D must be asked. If the answer is "sometimes," circle the code for "yes." In Part D, we are interested in any action other than change of flight path, fly higher or fly quieter. If R repeats one of these three, probe, "Is there any other thing the officials can do?"

QUESTION 16: This is a summary question about Pilot obedience of Air Base regulations. Again reassure R, if necessary, that we want his own honest feelings - whatever the situation may be. If R qualifies his answer, "Some pilots break the rules - but most don't," record answer and repeat question in terms of "most of the pilots."

QUESTION 17: This question concerns R's actual complaint behavior.

In Part A, emphasize the hypothetical nature of the question. If R says, "but I'm not really bothered," answer, "I realize that, but we want to know if you were bothered, whether you feel it would do any good . . . etc."

Ask Part B of all persons. If the answer to Part B is "Yes," ask Part C. If the answer is "No," skip to Q. 19.

If the answer to Part C, is "Yes," ask C2; if "No," ask C3. If R asks, "What do you mean, did it do any good?" answer, "Well, did it improve the situation or not?"

QUESTIONS 18-21: If R reports he doesn't know how his neighbors feel, don't accept a "I don't know" right away. Our pretests show that some people are reluctant to report on a neighbor's feelings, perhaps because they feel it's like gossiping. Reassure R that "We're not interested in having you quote your neighbors -- we're not checking up on them -- but we're just interested in what your impression is of your neighbors' reactions to the airplanes . . . just from what you've heard or discussed with them."

QUESTION 19: If R says, "I don't know of any neighbors ever complaining," circle code 2 (No). We want to find out whether R ever heard of any neighbors taking action. If R says, however, "I really don't know whether they have or not," indicating uncertainty, circle code 3 for D.K.

QUESTION 20: Concerns R belief in the willingness of neighbors to get together for a common object. Stress the hypothetical question, "Suppose they were bothered . . . etc."

QUESTION 22: Concerns the existence of local groups that take an interest in such civic problems as airplane noise and safety and R's affiliation with them.

If R asks, "What do you mean by local groups or organizations?" answer, "Well, you know, any civic groups, property owner associations -- any clubs that are concerned with local community problems."

If R says there are such groups, circle Code 1 and ask Part B.

If R's answer is there are no such groups or "I don't know of any groups," circle code 2 (No), and skip to Q. 24.

QUESTION 24: This question is asked of all persons whether or not they are bothered by airplanes. It's a projection-type question which asks them to imagine an assumed situation and to report their reaction to it. We are concerned with a summary measure of "readiness to act" under a variety of circumstances.

Some people may be so literal-minded that they will balk at accepting the suggested assumptions. If they say, "But they (the neighbors) aren't bothered by the airplanes," reassure R by saying, "Well, just suppose they were, and they asked you to sign -- do you think that you would very likely . . . etc.?" If further reassurance is needed, explain, "We are interested in finding out how different people would express themselves in different situations."

Be patient and alert to "I guess so" answers. Remember, R may not have ever thought of doing the things we are asking him to evaluate. Give him time and repeat the categories slowly, so he can make a reconsidered selection. In most cases, R will enter into the "game" of supposing and go right thru the list without a question. But if he hesitates, take the time to explain that there are no "right and wrong" answers -- that we are merely interested in his own feelings about these things.

QUESTION 25: This is an easy "change of pace" question about R's expectations of moving and the status of his plans. If R expects to move, circle Code 1 and ask part B. In part B, we are interested in finding out if R has a definite time and place to move, or whether he is just looking.

QUESTION 26: This is a straightforward question on the threat of war and the importance of building up our arms programs. Repeat the categories of - strongly agree, agree, disagree, strongly disagree -- slowly so R can distinguish each category. If R starts to answer before you finish reading the categories repeat the question, before recording his answer.

QUESTION 27: This question attempts to establish R's feelings about the relative importance of the different branches of the armed forces. The question approaches the problem in terms of military effectiveness.

While R is asked for a selection among the four major branches of the armed forces, if R refuses to distinguish among them, stating that they are equally important, circle Code 5.

QUESTION 28: This is the last opinion question about the Air Force and in a sense is a summary measure of R's feelings. While it is a pre-coded question, be sure to record any relevant comments which explain R's selection.

In Part B, note that the question is not in terms of R's welfare, but in terms of R's perception of the general welfare of most people in the area. If R qualifies his answers, use the standard probes to secure an overall selection of "extremely good," "good" or "not good."

QUESTION 29: This is the first of the questions about respondent characteristics. Use the introductory phrase printed on the questionnaire to assure R that we are almost finished. If necessary, we have also found it helpful to explain the purposes of these "background" questions as follows, "You know all of your answers are strictly confidential. They are put on tabulating cards and combined with answers from many other people. But to help in the analysis of answers, the office has to know something about the people we talk to -- that's why we have these questions about yourself."

In Question 29, we want to know how often people are around the neighborhood and are exposed to the airplanes. If R gives a qualified answer, tell him, "Well we're not interested in any single day or week -- but in general, would you say you are usually . . . etc.?"

Enter for each coded, a separate one for morning, afternoon, evening, and night.

QUESTION 30: The question concerns R's length of residence over the past three years. If R has lived at his present address less than a year, enter the number of months and cross out the word "years" and enter "months" over it.

If R has lived at his present address less than three years, ask Parts B-D. Under Part B, get the name of the neighborhood, if it is a neighborhood of the same area, otherwise, the name of the town and state will be sufficient.

If R's present length of residence plus the time he lived at the place "before moving here" still totals less than 3 years, ask Parts E-G. Since Part E is comparable to Part B, the above comments also apply here.

QUESTION 31: This is a listing of the family and related groups. Enter the total number of persons living in the house, whether or not they are members of the family, i.e. lodgers, friends, etc. Under the column heading, "Relation to Respondent", start with R and describe the relationship to R, . . . i.e. wife -- mother-in-law, etc. List the relationships of all other persons living in the house.

For each person listed including "self," circle "M" if he is a male or "F" if she is a female, enter his approximate age as of his last birthday, and whether he is white (W) or non-white (N, W.). Mexicans are included in the "white" category, while Negroes, Chinese and other Orientals are included as "non-whites."

One comment about "Age" is in order. Some people believe that women are especially reluctant to reveal their ages to pollsters. In general, this is not true. You will find that if your introduction preceding Q. 29 was made properly, that R

will realize we are not prying but are interested in getting these personal facts for statistical purposes only. If necessary, reassure R about our purposes. You will note the suggested probe printed on the questionnaire is purposely vague, "About how old is _____?" Indicate that we only want the approximate age -- not the actual birthday, etc. If R still refuses to reveal his age, enter your best guess in parentheses () and put the letter "I" for interviewer next to it.

QUESTION 32: We are concerned only with years of formal schooling -- usually eight years of grammar school, four years of high school, and four years of college. Do not count trade schools, correspondence or adult education courses. Circle the one code that describes the number of years of formal schooling the person had.

QUESTION 33: Give R the card with the list of income categories and have him select the income group that reflects the entire family's earnings from all sources: wages and salaries, self-employment income, interest and dividends, pensions, relief checks, etc. If he objects that he doesn't know for sure, indicate that we only want his best guess of the income group for statistical purposes only. If he absolutely refuses to make a selection, circle code "X".

QUESTION 34: Circle 65-A or 65-B whether R owns or rents his house, and then ask about rent or sale value of house. If R says the cost of heat, etc., varies, indicate we only want "an average figure including summer and winter months." By "worth", we mean how much would it sell for on the present market.

QUESTION 35: This question concerns R's experiences as a passenger in an airplane. If the answer to Part A is "Yes," circle code "1," ask Part B and C. If "No," circle code 2 and ask Part D.

QUESTION 36: Part A is asked about the main earner in the family. If R is the main earner, skip Part B; if he is not the main earner, ask Part B in addition to A.

The precise phrasing of this item can best be left to you. If the respondent is a man, it is usually wise to inquire about his occupation and (unless he is retired or unemployed or his job is of such a nature to make you doubtful) to assume that he is the main earner. If R is a woman, it is usually best to ask about her husband's job

(if Q. 31 indicates she has one) or the main earner's job if the answer to Q 31 does not indicate who the main earner is. If R is not the "main earner" and is temporarily unemployed circle the code for "Yes," enter the comment "temporary unemployed" and enter his usual line of work in B2.

Ask Part B of all persons who are not main earners. If R is not working away from home circle Code 2 and enter whether he or she is student, retired, a housewife, chronically ill etc. in Part B3.

If R does have a job away from home and is not the main earner, ask Part B2.

"Job" refers to the person's line of work, the job he performs. Examples are: Farm owner, Farm tenant, President, Owner, Manager, Lawyer, Physician, Sales clerk, Bellhop, Domestic, Secretary, etc. In the case of factory labor, record the job title -- what the job is called.

"Industry" refers to the type of business that employs the person. Examples might be: Dairy farm, General farm, Real-estate agency, Drug store, Bowling alley, Private practice, Oil company, Tire company, Barber shop, Private family, Self-employed, etc. Do not record the names of companies and agencies; we merely want to know the type of business or industry or agriculture which employs him and whether it is private, gov't or self-employment.

QUESTION 37: If R ever was a member or worked for one of the military services, circle code "1" in Part A and ask parts B and C. Under Part C, code whether R is now or not now a "member of working" for each branch mentioned in Part B.

QUESTION 38: This last question involves the extent of R's actual business dealings with the base.

If R wants to know what we mean by "business" in Part B say, "You know, do you sell anything or perform some service for them."

If R wants to know what we mean by "family," say, "Your close family -- like your husband, your sons, or your father, or your brothers."

PAUL N. BORSKY
STUDY DIRECTOR

TABLE 13 (APP. A)

FIRST INSTRUCTIONS FOR NEW INTERVIEWERS ON NORC SURVEY 385

5 JUNE 1954

NATIONAL OPINION RESEARCH CENTER

GENERAL INFORMATION

All interviews are to be conducted face-to-face with each respondent. Never interview anyone over the phone.

The respondent should never be permitted to read the questionnaire, or to fill it out himself. The interviewer asks the questions and records the person's answers.

Never interview people in groups. Try to avoid interviewing any person in the presence of another.

No substitutes or assistants are allowed to do your work. If you cannot do the assignment yourself, contact the field supervisor immediately and hold all materials until you hear from him.

All NORC questionnaires and materials are confidential. Problems about the work should be discussed only with us.

Do not reveal the results of your interviews, nor the answers of any particular respondent, to anyone except NORC.

WHERE TO INTERVIEW

Ordinarily, all of your interviews will be conducted in homes, where the respondent will be more at ease.

HOW TO INTERVIEW

Make your approach briefly and casually. Go directly into the first question as quickly as possible, with the very minimum of explanation.

Introduce yourself by saying something like this: "Hello. I'm from the Opinion Research Center at the University of Chicago. We are doing a study on how people feel about living in different places, and I'd like to get some of your views."

Aim to interview every individual you approach. Explain that no names are taken, that people's opinions are important in a democracy.

Your attitude at all times should be friendly, conversational and impartial. Take all opinions in stride. Never show surprise at a person's answer, nor reveal your own opinions.

Remember that the interviewer is fundamentally a reporter. Your job is simply to obtain answers to the questions, and to report those answers faithfully.

Keep the respondent on the point. Discourage irrelevant conversation.

Ask all questions exactly as they are worded on the questionnaire, and in the same order.

Do not explain a question or elaborate upon it. If the respondent does not understand the question, repeat it slowly with proper emphasis. Your survey specifications suggest specific explanatory probes.

Do not accept as final answers, replies that do not specifically answer the question. In such cases, repeat the question, or tell the respondent you're not quite sure what he means.

Avoid qualified answers ("Well, it depends") by pressing for an opinion. "Well, taking everything into consideration" or "On the basis of the way things look now."

Do not accept a "Don't know" answer until you have first repeated the question and emphasized that you want "Just your own opinion."

Indicate the respondent's answer by circling the particular code number that comes closest to his opinion on the question. Do not use X's or checks.

Use a soft pencil (preferably a No. 2) to mark your questionnaires.

On free answer questions (where the question is "open" and no selection of code numbers is provided), write down the person's answer word for word, in his own language. Do not presume to summarize or paraphrase.

Never suggest a possible answer, nor help the respondent to arrive at any particular answer. Let him express his own opinions in his own way.

Throughout the interview, be on your toes to write down any pertinent comments or elaborations on his opinion that the respondent volunteers. Write these word for word.

Inspect each questionnaire carefully, question by question, to catch any errors or omissions. Do this immediately after you finish the interview, and preferably before you leave the premises. Be sure it is filled in completely and accurately before you go on to your next respondent. Do not wait till you get home to do this.

Never recopy your interviews.

Approved abbreviations that are universally accepted and self evident will be allowed.

SPECIFICATIONS, TIME AND EXPENSE REPORT, INTERVIEWER'S REPORT

Specifications (specific instructions) are enclosed with the materials already given to you.

These should be studied carefully, word for word, before you start out on your assignment. NORC pays you for this studying time.

Interviewers find it important to review the specifications after they have completed each phase of the assignment to make sure they are following the correct procedure on every aspect of the job.

All time and expenses must be billed on NORC Time and Expense Reports, and returned along with your completed interviews.

Checks are sent to interviewers from the Chicago office, usually about one week after completion of the survey.

IMPORTANT!!

Be thoroughly familiar with all instructions before you even try to interview.

INTRODUCING YOURSELF

Introduce yourself in the shortest possible way. Memorize the introduction noted on Page 1 of these instructions.

If you're not sure whether your respondent is of age, you might substitute the following for the last sentence of the introduction:

"I want to interview an adult member of your family -- anyone 18 years old or over. The first question is..."

"The first question is..." is included to emphasize that you should get the interview started just as soon as you can. In this way, you avoid tedious explanations and the "too busy" reaction. If someone asks how long it will take, reassure him that it will only take about 20 minutes. After you have started, most respondents will forget all about the time.

On questions about sponsorship, talk to the respondent about NORC. (You have been supplied with pamphlets; give one if necessary.) Explain that NORC is a non-profit organization, and we do these surveys all the time all over the country. Don't talk about the content of the study -- let the questions do that.

If anyone asks "Why me?", say "The statisticians in the Chicago office tell me where to go." (You can always refer questions to the Chicago office.) If that's not enough, continue your explanation with something like this: "You see, our sampling department figures out a random sample of all the places in the United States and then they pick some blocks from each place (it's almost like drawing numbers out of a hat), and your house just happened to fall into our sample! It's all done very carefully so that we get a good cross-section of the American people. You see, we want to be sure that the people we interview include both rich and poor, people from the city and people from the country, people from all walks of life. That's why it's important that I talk to you and not to someone else. Of course, when they sent me to this block, they had no idea who lived here..."

Get inside the house (or apartment) and sit down before you really get into the interview. Even though you've seen pictures of "pollsters" standing in the doorway, clipboard in hand, we want you to get inside your respondent's home for the interview. You'll both be more relaxed and more comfortable and so you'll get a better interview. If there seems to be some legitimate reason for not letting you inside, don't press the issue and do your interview on the stairs. But you'll find yourself seated inside seconds after you have suggested something like: "Why don't we go inside and sit down -- I don't want to keep you standing too long!"

THE ETHICS OF INTERVIEWING

The interviewer must ask many questions he would never dream of asking a close friend, questions one might regard as "too personal." But you will find the average person willing to answer questions -- or even volunteering information -- he would never tell a close friend or relative. Just as a stranger on a train bears many confidences from people he will probably never see again, the interviewer has the great advantage of anonymity which encourages the respondent to confide in him.

The main reason survey research organizations are able to collect useful data is that our interviewers can and do assure their respondents that their replies will be completely confidential. We promise the people whom we interview that we will never reveal what they have told us, but simply publish summary statements to the effect that: "...% of the people interviewed think such and such." IT IS YOUR RESPONSIBILITY AS AN INTERVIEWER TO KEEP THAT PROMISE.

A few questions deal with people's attitudes toward Russia, etc. Should you have any concern that this issue is "hot" or "dangerous" or that you will encounter a great deal of suspicion and hostility, we can tell you quite flatly: That is not at all true. Our interviewers have asked questions on this subject before with little or no trouble. The issues are "hot," in the sense that they are current, and of interest to almost everyone. Most people have thought about them to some extent, and many have strong opinions. And finally, they are obviously "opinion" questions to which there's no "right" or "wrong" answer.

Similarly, the factual data we seek on the last pages of each questionnaire cover some questions that inexperienced interviewers may be reluctant to ask. Again, you need not be apologetic about asking people's income and the like. This information too is confidential and will never be divulged.

Once in a while a respondent may need reassurance that the interview is anonymous and that their friends or employer will never know their replies. Never divulge the opinions expressed by anyone you interview. While interviewers are entitled to their own opinions, whatever they are, they cannot let these opinions enter into the interview situation. Moreover they must not report any suspicions which arise as a result of information they get from an interview.

The interviewer has a responsibility here much like that of the priest, doctor, or lawyer, none of whom may pass on to others what his clients have told him in private. The whole basis of opinion research rests on the respondent's confidence that what he says is off the record, and if these confidences were violated the entire profession would suffer great harm.

These rules apply to the opinions you hear, the information you receive, no matter what the subject. There can be no exceptions to **CONFIDENTIALITY**:

SOME GENERAL RULES

In view of the fact that this is your first assignment for NORC, we are including some general rules on interviewing for you to study. On the following pages you will find a review of certain problems that are important in all of our surveys. Before you begin interviewing be sure you have studied all of this material very thoroughly.

One distinction should be made before you go on to study these rules. An "open-ended" question looks like this:

Q. 2. A. What are some of the things you like about living around here -- things that you feel are advantages or that make this a good place to live?

Such a question is followed by lots of blank space, with no code number to circle. It's your job to fill in that blank space with the respondent's own words -- word for word with no "summaries." We want strictly verbatim recording.

A "pre-coded" question looks like this:

Q. 1. In general, how do you feel about living in this part of Tucson. Do you rate it as an excellent, good, fair, poor, or very poor -- place to live?

Excellent	4-1*
Good	2*
Fair	3*
Poor	4**
Very poor	5**
Don't know	6**

*IF "EXCELLENT," "GOOD" OR "FAIR," ASK Q. 2 AND Q. 3

**IF "POOR," "VERY POOR," OR "DON'T KNOW," ASK Q. 3 FIRST AND THEN Q. 2

With this kind of question, you circle the appropriate code number. If the respondent answered "Excellent" to the above, circle the number 1 with a careful circle. Then ask Q. 2 and 3. If he answered "Good," then circle 2, and so on. In addition to circling the right number, you are to write in whatever relevant volunteered comments are offered by the respondent. (In circling the code numbers, you can ignore the number and dash before the first "1" in each group of codes. This simply tells the office where on an IBM card to punch the code you circled.)

If you cannot fit an answer into one of the pre-coded categories, circle the "Don't know" code and write in what the respondent says word for word.

RULES FOR GOOD INTERVIEWING

The main task in interviewing is to take every precaution to make sure that you get a clear, complete and unambiguous statement of your respondent's ideas. Before you can confidently give a pre-coded response, you must ask yourself whether the respondent has given a complete answer. Don't accept vague and unclear answers here or in the open-ended questions. Before you can leave an open-ended question and go on to the next topic, you must ask yourself the same questions.

The primary difference between the correct way to handle pre-coded and open-ended questions is a difference in recording. In the pre-coded question, you need only circle the appropriate code and record those spontaneous comments which add something relevant that would not be reflected by the pre-code alone. In the open-ended question, you are responsible for writing down -- word for word -- everything relevant that the respondent has to say.

Probing is important for both the pre-coded and the open-ended question. While you do not have to record the verbatim answer, you are still responsible for all the probing (continued neutral questioning) needed to get a satisfactory answer to pre-coded questions. You'll find, of course, that most pre-coded questions need less intensive probing than do the open-ended questions, but they will often need probing.

Most interviewers find the open-ended question somewhat more difficult -- and therefore more challenging -- than the pre-coded question. On every one of the open-ended questions, the general goal is to find out exactly what the respondent is thinking, both in relation to the general objectives of the survey and the specific purpose of that question. Your objective is to draw the person out, and to get him to express all of his ideas before leaving that question and going on to the next one. It is not enough simply to get an answer from the respondent. Instead, you must follow up what the respondent says, using probes to get him to expand and clarify his answer, until you are sure that you have the entire picture of the way the respondent thinks about the question.

Ten points to watch. Here are ten things you must do in order to get a good interview:

1. Keep in mind the purpose of each question -- that is, the kind of information we are trying to get by asking this particular question. (The Specifications always try to make this clear for each question.) Once you know your objective on any particular question, you will find it much easier to tell whether you have a satisfactory answer or whether you should probe further.
2. Beware of one-word replies. Generally speaking, in our surveys one word -- or even one sentence -- will not completely meet the objectives of the question. Try the suggested probes and use probes of your own to get the respondent talking more fully. For instance, "Can you tell me more about that?", "Would you explain that a little?", "How do you mean?", etc., will often get the respondent to talk more freely.
3. Be sure to use only neutrally-worded probes. We have tried, both in the questionnaire itself and in the Specifications, to suggest helpful probes. These cannot, however, provide for every possible situation, so you will also be using probes of your own. When you use your own probes, remember never to suggest answers to your respondents. ALWAYS use probes like:
 - How do you mean?
 - Can you give me an example?
 - What do you have in mind?
 - Why do you say that?
 - Could you explain that a little?
 - Do you have any other things in mind?

Or, you can repeat the respondent's own words with a rising inflection, to suggest that you are not sure of exactly what he means.

DON'T SUGGEST ANSWERS. The new interviewer may find it hard not to suggest answers for in normal conversation we often do so without realizing it. While one may think of interviewing as a friendly conversation, it is a rather artificial one. In most conversations it's quite common for a person who is not certain what his partner means by an expression to suggest the meaning.

Several common conversational devices are undesirable interviewing techniques simply because they do suggest answers. For example: (1) Asking whether a person means A or B by a given term suggests one of two answers, even though there may be many other possibilities. (2) Summarizing what someone has said may suggest that your interpretation of his feelings is "the right answer," even though you may be interpreting his feelings inadequately. (3) Asking whether a term is used with a particular meaning suggests one answer, when another might have been intended. The more insecure your respondent feels about his opinions, the more likely he is to be affected by biased probing -- thinking that there must be a "right" answer.

Here are some examples of remarks that an individual might make in response to a hypothetical question about the most important problems facing this country. After each, we cite typical examples of the usual conversationalist's reply (not correct for interviewers) and appropriate probes the interviewer might use:

A. "Our biggest worry today is the economic situation."

A friend: "Do you mean the possibility of a depression or of inflation?" (Bad interviewing technique because a respondent might have a third idea or NO idea.

Interviewer: "What do you have in mind when you say the economic situation?" or "Economic situation -- how do you mean?"

B. "We've been having a lot of trouble in our foreign affairs, but you don't hear much about conditions in this country."

A friend: "Then you feel that foreign affairs represents a more serious problem than domestic affairs?" (Bad interviewing technique, even though it appears to summarize what has already been said. His friend's interpretation may be correct, but the respondent may feel that domestic affairs represent an equally important problem even though he hears less about it; he may be saying that domestic problems are more vital because of the fact that such problems are not being discussed; or he may have some other idea in mind.)

Interviewer: "Well, which of the various kinds of problems do you think are most important?" or "That's an interesting point of view -- can you explain that a little?"

C. "The Communists are our number one problem."

A friend: "You mean the communist leaders in this country?" (Bad interviewing technique because a respondent might be thinking of all communists in this country; he might be thinking of communist nations in other parts of the world; the term "communist" may be one which he uses frequently but which is a fuzzy term with no clear meaning for him.)

Interviewer: "Could you explain that a little -- in what way do you think that's true?" or "The Communists -- just like are you using that term?" or "When you used the term communist, what did you have in mind?"

4. Be on your guard against irrelevant answers. We all know how people can talk a good deal, but still be talking off the point. If what they are saying is relevant to one of the main objectives of the survey, you will want to get it down and explore it with the respondent, but no matter how much the respondent has said and you have written down, don't leave the question until you are sure that you have gotten an answer to that question.
5. Be on your guard against vague, general answers. Sometimes respondents find it difficult to verbalize what they mean; they are having difficulty expressing themselves, or can't find the words they need, and take refuge in vague generalities which might mean anything or nothing. It is very important to try to get the respondent to sharpen up his thinking, express himself more concretely. It may help, in such cases, to ask the respondent to give you an example.
6. Be on your guard against circular answers. A respondent can talk a great deal and still be just repeating his answer to the previous closed question or the information you have just given him in the question. Be very careful on this point. For example, in answer to "Why are you annoyed?", he may say, "Because it's so bothersome." The question remains, "Why?"
7. Be on your guard against ambiguous answers. Ask yourself: Are you sure you know what the respondent means by what he has said? And, are you sure that we in the office will know what the respondent means from what he has said? If you are not sure in either case, you should probe further. Ambiguities frequently occur when the respondent uses certain words or phrases without explaining what they mean by them. If a person uses words which could be interpreted differently by different people, you must go back to this and ask him to explain the expression he used, by asking: "How do you mean?", "What do you have in mind?", etc., without suggesting anything to the respondent. The important thing is to recognize ambiguity when it occurs and ask other probes until you clear it up.

For example, if your husband reported at the dinner table that "That old stinker sure gave me a rough time today," you might know that he was referring to his boss. Now obviously, the woman who knows her husband knows who usually is labelled in this fashion. As an interviewer, you do not share her familiarity with this man's vocabulary and you would have to ask questions designed to get this man to expand his remarks. The interviewer must not assume that a term with several possible definitions means what it means to the interviewer.

8. Use the symbol "X" to indicate where you probed, either by repeating the question or by using a new probe. That is, write down what the respondent said unprompted, then an "X" for what you said, then what he said to that, and so on. Use of this symbol will save you a lot of recording time, and still permits us to understand the interview.
9. Be sure to record the respondent's replies verbatim. Everything the respondent says on the question will be useful to use in interpreting his point of view. If he tells illustrative anecdotes, cites cases with which he is familiar, etc., be sure to include these in his answers.
10. Be sure to clarify one response before asking for additional factors. Often interviewers find that probes like "Anything else?" or "What else?" encourage respondents to add to a listing of factors (or of causes, of names, or whatever the question asks). It is often needed to exhaust all ideas a respondent can offer on a given subject. (Of course, it is not appropriate in a question asking for ONE answer.) This type of probe is excellent PROVIDING that what the respondent has already said is perfectly clear.

Perhaps an example is in order: The respondent who defines "What security means to me" as "a good home," should be asked something like, "And what do you mean by a good home?" before asking what else the term means. One respondent will reply in terms of financial considerations while another will think in terms of personal relationships, and it is important to find out precisely what is meant by each term, rather than to continue a "cafeteria" listing of unrelated, vague terms.

TIPS ON RECORDING

Be ready to write. Have your pencil poised -- ready to write -- when you ask your question. Start writing when your respondent starts talking. If you wait until your respondent completes a complicated thought, you may lose half of what he has to say. As you become more experienced, you will develop the knack of looking at your respondent with an interested expression while you are writing.

Circle codes carefully. When you circle a code, be sure that it's obvious which code is circled. (Sometimes, you'll find that your circle embraces two numbers when you intended to include only one.)

Use the margins or the back of the page if you need more room.

Always record in the respondent's own language. Quote your respondent directly -- just as though he were some important official.

Don't polish what the respondent says. If he uses slang, bad grammar, or profanity we still want it. Let our interviewees speak for themselves.

Don't summarize what the respondent says. Don't change "I think the pilots do a fine job on ____" to "Agrees with pilots action on ____".

Watch those pronouns. Quite often interviewers record such replies as "They should get together on it like he said. Those fellows are always trying to upset things", etc.

Sometimes the interviewer accidentally or deliberately substitutes the pronoun for the noun used by the respondent, but more often that's the way the respondent actually talked, and the interviewer probably knew exactly what he meant by such words as "they", "it", "he", "those fellows", "things", etc.

When we come to code the response, however, we are often completely in the dark. Is the respondent talking about his neighbors, friends, the pilots or what?

Please be sure in recording free answers and comments, that you yourself understand whom the respondent has in mind when he uses pronouns; and then help us by writing in, in parentheses, the person or thing he is referring to.

Don't use quotation marks. We use quotation marks in the Spec simply to clarify the distinction between what a respondent might say and our own suggestions. Quotation marks are, however, unnecessary in your interviews. Unless you use parentheses, we assume that all comments are direct quotes.

Use parentheses to indicate your own explanatory remarks.

If you have trouble writing rapidly, you'll find it helps to:

Use common abbreviations. "DK" is a universal symbol for "Don't know". You can also use "Govt" for "Government", "AF" for "Air Force", and any other abbreviations that someone else will be able to interpret. Cross out, instead of erasing. Crossing out is faster than erasing and besides, it's just as neat.

How to carry the respondent along with you. Respondents are usually flattered when you ask them to speak a little more slowly, or repeat something, or wait a minute until you catch up, because you "don't want to miss anything he is saying" or "want to get this all down".

THE QUESTIONS

Listed below are some points to remember; they apply to all questions:

1. Definition of terms in the questions. Sometimes respondents may ask you to define the terms you are using. You should, of course, leave the matter of definition to the respondent, except where the Specifications authorize defining the term.

If the respondent asks for a definition of a term used in your question -- say "danger", your reply might be: "Whatever you think of as a danger."

2. Questions which appear to be of information type. Some respondents may regard opinion questions as dealing with matters of fact, having right and wrong answers. Actually, for such questions there are no "right" answers, even experts have different points of view about them. So, if a respondent says, "That's a question for experts," or "I don't know what the facts are," etc., you should reassure him that these are not factual questions, and ask the question again, adding something like, "Just the way you look at it," or "Just what you think," etc.

3. "Don't know" answers. Never accept a "Don't know" answer the first time it is offered, on any question. Frequently, these respondents feel it's a matter of information they don't have, and if you use the approach just suggested in 2, or say something like, "Well, what's your point of view on that?" they will have an answer to express. Always reassure the respondent and repeat the question, before recording any answer as "Don't know".

You've probably noticed your friends -- and yourself -- initially answering a question with, "I don't know" and then answering it! This is what we refer to as the "lazy don't know" -- it's simply a conversational tool to give us time to think of what we have to say. Don't be in too big a rush to code a reply as "Don't know". If you sit quietly -- but expectantly -- your respondent will usually think of something further to say. Silence and waiting are frequently your best probe for a "Don't know." You'll also find that other useful probes are: "Well, what do you think?" "I just want your own ideas on that." "Does he really know, I suppose. But what's your opinion?"

4. Qualified answers. On some surveys we provide an "escape" answer -- "Depends" -- for respondents who say, "Some people are one way, some are another" or "Sometimes it's this way, other times, another", etc. But, before you accept such an answer from a respondent, you should first try to get him to generalize by repeating the question and saying, "Just generally speaking, is it this way or that, or 'Most of the time' or 'In most cases,' etc."

5. Repetitiousness. If your respondent is talking freely, you may feel that he has already answered some of the questions before you get to them, even though these are questions to be asked of everyone. It is usually not safe to assume that the respondent has fully answered a subsequent question, however, for this tends to make the respondent sound more consistent than he actually is. Asking the question might have revealed some contradictions in his thinking. Except where specified under the individual questions, do not skip over any of the questions, even though you guess there may be some repetition. If an occasional respondent should get a little annoyed and say something like, "I thought I just told you that," you can always say something pleasant like, "Well, the question is down here, and I just wanted to make sure that I had your full answer to that."

6. Ask all questions exactly as they are worded. It's important that everyone ask the same question.

7. Ask all questions in the same order as they appear. Do not let the respondent see the questionnaire, so he can tell what question is coming next. Never go back and change a prior answer in the light of a later response. The order in which the questions are asked can easily exert an influence on the replies, and we must be certain that all our respondents hear the questions in the same order as they are listed.

WAIT A MINUTE !

1. Take a couple of minutes right after you complete each interview to inspect the questionnaire, and make sure it's all filled out accurately and completely. Do this before you conduct another interview.

When you're busy asking the questions, recording answers and trying to hold the respondent's interest, it's easy to forget to circle a code for a particular question or to make some other type of error. Because of the inter-related nature of the questions, the omission of a single item can make a whole interview worthless in various stages of the statistical analysis.

Therefore, be sure you've recorded an answer for every question that applies.

2. Review these instructions and your Specifications after you have actually completed one or two interviews. By doing so, you may very likely catch some error or misunderstanding which would otherwise persist.
3. Review your Specifications again periodically throughout the course of interviewing to insure a thorough understanding of all pertinent points.

STUDY DESIGN AND FIELD ADMINISTRATION

As most experienced researchers know, it is one thing to plan a field experiment and another thing to administer it. Unfortunately, the researcher is never able to control the many variables operative in real life, with the result that the study design is an objective, while the real field situation never quite measures up to the full objective. The three field studies discussed in this report were no exception to the rule. Unforeseen events which may have influenced the results occurred in two of the three air base areas. We can only describe them and try to assess their significance.

1. First, West Coast Strategic Air Command Air Base

The objectives of the first field study were entirely developmental. They were to test the understanding of the questionnaire, the problems in administering it, the response rate, the average length of each interview, and the development of a system for coding and analyzing the answers. Since a parallel objective was to develop a shortcut technique for estimating the nature of the acoustic variables from a knowledge of operational data, a relatively simple air base situation was selected. As stated in the body of this report, a base with a single runway was selected with a flight path projected over 10 - 12 miles of heavily populated neighborhoods.

Since the objective was to test the questionnaire over a wide range of acoustic situations, seven neighborhoods were selected according to the following criteria:

Neighborhoods 1, 4, and 6 were directly under the projected take-off flight path, with Neighborhood 1 being close to the edge of the air base, Neighborhood 4, being 4 - 6 miles from the air base, and Neighborhood 6 being 10 - 12 miles distant. Neighborhoods 2 and 3 were close to the air base but off to the side of the theoretical flight path. The slant-distance from Neighborhoods 2 and 4 to the average flight path were planned to be equal, so that the sound level at both neighborhoods would be approximately equal. Likewise, the slant-distances from Neighborhoods 3, 5, and 6 were designed to be equal so that their noise levels should be comparable. It was hoped that this design would enable comparisons of response under comparable noise levels but different on-path and off-flight conditions. A seventh neighborhood was selected on the landing flight path, where planes were estimated to be 1500' high.

An acoustic engineer from B. B. N. and the study director gathered operational data from air base officials, plotted the flight paths, and made a number of sample observations and noise level readings of actual take-offs and landings before selecting the actual study neighborhoods. Each of the seven neighborhoods were then enumerated and blocks randomly selected for interviewing assignments.

In general, a quota of 100 interviews was scheduled for each neighborhood, and with 20 interviewers, the assignment for each interviewer averaged only 5 per neighborhood. The plan was for all 20 interviewers to start a single neighborhood together and finish interviewing within 2 - 3 days. In this way the interviewer effects would be minimized. Since each interviewer contributed only 5 cases per neighborhood, any bias due to differential interviewer skill would be minimized. Likewise, if interviewing was completed within 2 - 3 days, the opportunities for neighbors to discuss their experiences would also be reduced. Instructions describing the random procedure for selecting respondents are included in table 12 (App. A). Actual performance of interviewer assignments was close to ideal during the first few neighborhoods studied. Then, as drop-outs occurred, the average assignment per interviewer increased somewhat. Also, due to our desire to maintain a low non-response rate, 31 additional call-backs were made to bring the total of completed interviews to 732.

About 30 interviewers were initially hired, with more than half of them teachers and graduate students of the local university. The others were mostly women with some college training, who were active in civic affairs. After an eight hour orientation discussion, each interviewer trainee conducted 5 practice interviews in specially designated areas. These completed questionnaires were evaluated individually with the trainee and if the performance showed a grasp of the basic interviewer techniques and the purpose of the survey, he was given his first assignment. Otherwise, 2 - 3 additional practice interviews were often assigned. In other instances it was decided to drop those trainees who proved inadequate for the job. In no case was an interviewer given a real assignment until he successfully completed training.

Interviewing began in early June and was completed during the first week of July, 1956. As "misfortune" would have it, on the first day of interviewing an F-86D fatally crashed into an empty lot near Neighborhoods 1 and 2. The press emphasized the pilot's sacrifice in directing the plane into a vacant lot and avoiding the loss of civilian lives. Comments on our completed interviews indicate that most residents accepted this version of the accident. On Question 27, in answer to the question, "Do you agree with the statement that, 'Most pilots would probably sacrifice their own lives, if necessary to avoid crashing a plane into a populated area?'", many R's volunteered comments like "That's just what one did the other day." How, if at all, this crash affected feelings of fear is hard to say. A four point scale of fear developed for all three air base areas, indicates that SAC respondents had greater fear than respondents at the other two bases. On the other hand, the residents at this base were subjected to larger B-47's while the others were exposed to F-102's and F-94 fighter planes.

A second minor interference worth mentioning was the chance interviewing of a local TV newscaster's wife on the very first day. On the 11 PM newscast, the study was mentioned in suspicious overtones. The newscaster mentioned that people from the University of Chicago were noseying around asking a lot of questions about the airplanes. Through the local Public Information Officer, the newscaster

was immediately contacted, as well as the other newspapers and radio stations. They all promised to drop the issue and avoid any discussion of our study until our interviewers were finished. From this experience, we contacted all news media in advance at the other two air base areas and avoided similar publicity. The net effect of this newscast appears to be the disqualification of 19 people who mentioned hearing the program to our interviewers. They had been instructed to avoid a complete interview with anyone voluntarily mentioning the newscast. It is doubtful if most of the respondents actually heard or noted comments on the TV program.

Perhaps because of the air crash or because the area was particularly security conscious, about 10 - 15 people called the Better Business Bureau, the Chamber of Commerce, and the air base, asking about the legitimacy of N. O. R. C. As a standard procedure fortunately, these organizations had been briefed in advance of the study and suspicions were allayed. They had promised to tell all enquirers that N. O. R. C. was just doing a regular community survey.

As table 14 (App. B) indicates the overall response was extremely good. Less than 10% of the eligible persons contacted refused an interview, and only 10 people (1%) broke off an interview once begun. It is also interesting to note that there was no significant difference among the close and distant areas, revealing no bias by intensity of exposure or annoyance. A definite refusal generally included a hostile statement by the respondent, while a temporary refusal generally involved some sort of temporary inconvenience.

TABLE 14 (APP. B)

ANALYSES OF RESPONDENT CONTACTS AT S.A.C. AIR BASE

Number of People at	Total	Neighborhoods		
		1 - 3	4 - 5	6 - 7
Home	981	442	278	260
Number of People				
Ineligible	172	85	52	35
Wrong sex	83	43	25	15
Under age	17	7	4	6
Illness	25	14	6	5
Informed of survey...	19	8	7	4
Non-resident	18	9	8	1
Language difficulty...	10	4	2	4
Number of People				
Eligible	808 100%	357 100%	226 100%	225 100%
Refusals and				
Breakoffs	76 9.4%	34 9.5%	22 9.7%	20 8.9%
Breakoffs	10	6	0	4
Definite refusals...	50	20	16	14
Temporary refusals.	16	8	6	2
Completed Interviews	732 90.6%	323 90.5%	204 90.3%	205 91.1%
First calls	701	302	199	200
Call-backs	31	21	5	5

TABLE 15 (APP. B)

LENGTH OF INTERVIEWS AT S.A.C. AIR BASE

No. of Minutes	No. of Interviews	Percent	Cummulative Percent
-25	6	.8%	.8%
25	10	1.4	2.2
30	50	6.8	9.0
35	65	8.9	17.9
40	86	11.8	29.7
45	123	16.8	46.5
50	98	13.4	59.9
55	67	9.2	69.1
60	90	12.3	81.4
65	64	8.7	90.1
70	30	4.1	94.2
75	11	1.5	95.7
80	32	4.3	100.0

Table 15 (App. B) indicates the average length of our interview was slightly over 45 minutes. Almost 60% of the interviews required 50 minutes or less and over 80% were an hour or less. Likewise, although the data are not presented here, the length of the interviews did not vary greatly from neighborhood to neighborhood. Contrary to expectation, the closer areas required a little less time than some of the distant areas.

The experimental data from the first field trial looked so promising and the pressure for preliminary substantive data was so great, that it was decided to enlarge the objectives of this research project to attempt to secure preliminary analytical findings. Since research funds were not increased with the change in program, it was decided to optimize the study design at the second and third air bases by interviewing only those residents who lived closest to the air base. Experience from the first field trial and from other studies, indicated that distant areas did not present a serious annoyance problem. Consequently, it was felt that if a maximum of interviews could be obtained from residents living under the most intense noise conditions, it would increase the possibilities of determining the dynamic relationships of the various socio-psychological variables. This belief was based on the assumption that the influence of these human attitudes would be greatest where the level of disturbance was greatest. As the findings indicate, this assumption proved largely valid.

Since a bomber base had been studied in the first field test, it was decided to select two fighter air bases for the second field tests. One of these bases was on the West Coast while the other was on the East Coast. Both had a minimum of 100 take-offs and landings a day.

The procedures described in the first field trial for determining the flight patterns and selecting interviewing areas were repeated. Assignments for 800 interviews were carefully laid out at each air base, with 400 in neighborhoods closest to the air base and 400 at the next closest areas. As reported in detail in the first section of the findings, the acoustical engineers returned to these neighborhoods after all interviewing was completed and actually recorded the noise levels with their acoustic equipment. The preliminary noise recordings were only used to select the interviewing areas but the detailed recordings were used to describe the acoustic situation in the analyses of responses.

The preliminary judgments of the engineers proved highly accurate at two of the air bases, but were unfortunately high at the third base. At the latter base, the patterns of flight attenuation were much more complicated and the detailed engineering survey revealed that noise levels were lower than originally anticipated. Naturally the actual estimated levels were used in our analyses, but the net effect of this recalculation was to reduce the number of planned interviews under the most intense noise conditions and to increase the number under less intense stimulation. This imposed some limitations on the kinds of analyses which were possible for the analytical report.

Interviewing at the West Coast base started during the last week of May 1957 and was substantially completed during June. Interviewing at the East Coast base started in the middle of June 1957 and was completed in July. Before interviewing began, all of the local radio and TV stations, newspapers, police officials, Chambers of Commerce, and Better Business Bureaus were briefed on the survey objectives and promises were obtained to avoid any publicity. Our careful preparations paid off at the West Coast base but were not fully successful at the East Coast base.

During the second week of interviewing, a Pentagon General wrote to the local U.S. Senator and informed him that the local A.D.C. air base would be closed "by the end of 1958." This news appeared in the local press and may have influenced some of the answers reported to our interviewers. Unfortunately, it wasn't possible to determine even the direction of any bias because of the survey design. Most of the close neighborhoods were interviewed during the first week before this announcement, and no middle distance neighborhoods were surveyed until the second and third weeks after the announcement. Consequently, it wasn't possible to compare answers before and after the announcement since the respondents lived in entirely different noise environments.

As table 16 (App. B) indicates, only 8% of the eligible contacts refused to begin or complete an interview. Less than 1 out of 100 refused to complete the interview once it was begun. The relatively low non-response rate attests to the success of the questionnaire in mass administration. Although an effort was made to analyze refusals by age and sex of respondents, interviewers accidentally failed to supply the necessary information on 1/3 of the refusals. From those interviews supplying estimates of age and sex of respondents it appears as if there were twice as many refusals from women and from persons over 40 years of age.

TABLE 16 (APP. B)

RESPONSE RATES AT A. D. C. BASES

	West Coast Air Base		East Coast Air Base	
	Number	Percent	Number	Percent
No. of Eligible People.....	870	100%	862	100%
No. of Completed Interviews.....	804	92.4	794	92.1
No. of Refusals or Breakoffs.....	66	7.6	68	7.9
Breakoffs.....	8	.9	7	.8
Definite refusals.....	33	3.8	23	2.7
Temporary refusals.....	25	2.9	38	4.4

TABLE 17 (APP. B)

LENGTH OF INTERVIEWS AT A. D. C. BASES

East Coast (794 Interviews)			West Coast (804 Interviews)		
No. of Minutes	Percent	Cumulative %	No. of Minutes	Percent	Cumulative %
-25	1.0%	1.0%	-25	.8%	.8%
25	3.9	5.3	25	3.2	4.0
30	21.9	27.2	30	11.3	15.3
35	16.5	43.7	35	17.0	32.3
40	22.0	65.7	40	21.8	54.1
45	15.6	81.3	45	16.6	70.7
50	8.1	89.4	50	9.1	79.8
55	3.9	93.3	55	7.2	87.0
60	4.0	97.3	60	5.5	92.5
65	1.6	98.9	65	1.9	94.4
70 +	1.1	100.0	70 +	5.6	100.0

Table 17 (App. B) indicates the median length of interview was about 40 minutes, or about 5 minutes less than the first field trial. Between 80 - 90% of the interviews required only 50 minutes. After the proposed revisions of the final questionnaire are pre-tested, it is believed the average length of interviews will be reduced to under a half hour.

EDITING AND CODING OF QUESTIONNAIRES

The first step in processing completed questionnaires was to regroup and renumber them according to the series of block numbers. Each questionnaire was originally numbered by the field supervisor in a consecutive series as it was returned by the interviewers. There were 160 blocks assigned to interviewers at each ADC base. If an interviewer assigned to block No. 10 for example, returned his five completed interviews first, his questionnaires were numbered from 0001 to 0005. If the next five questionnaires came from block No. 6, they were numbered 0006 - 0010 etc. This system was used to determine at a glance how many completed interviews were returned. For coding acoustical data however, it was important to renumber each questionnaire according to the series of assigned block numbers. Consequently, the five questionnaires in block No. 1 were renumbered 0001 - 0005. The next five in block No. 2 were numbered 0006 - 0010 etc. These numbers could have been assigned to each block in the first place, but in case of an incomplete assignment there would have been unused numbers and tabulations controls would have been complicated.

The second step involved editing the questionnaires for completeness and consistency of coding pre-coded questions. The questionnaire specifications describe in detail the procedures for asking sub-parts of a question. The questionnaire itself uses an internal system of asterisks to key the required sub-parts. The coder, in a sense, was performing a 100% check on the accuracy of the work done by the interviewer. Three tasks were involved: 1) Making certain that only one code was circled in each question as required, 2) Checking the verbatim comments to make certain that the proper code number was circled, and 3) entering a "Not Asked" code number if the question was accidentally left blank. The work of the coders was spot checked by a supervisor as a further effort to achieve accuracy and as an administrative quality check on the coder's performance.

The third step involved the building of codes for the free-answer open questions. A random sample of verbatim responses was taken from the questionnaires and similar answers were grouped into different coding categories. Table 17 (App. B) contains a complete set of general coding instructions and specific instructions for each of the different open questions used in the final questionnaires. The question and punch card column numbers correspond to the revised final questionnaire. Identical code categories were actually used in the three field trials.

Some of the complicated open questions such as Q. 2 - 3 were checked 100% by different coders. Other questions were checked 50%, 33% etc. as required by a spot check of answers.

NATIONAL OPINION RESEARCH CENTER
New York Office**A. General Instructions**

Coding of survey results is a process of classifying into a limited number of categories the unique responses each person makes. Its purpose is to summarize the original data so that they may be transferred to punch cards and tabulated mechanically. A key number or code is assigned to each major response category, and these numbers are later punched onto a card to represent an individual's response. A punch card has eighty columns, each of which is used for a question or part of a question; the complete card represents one respondent's answers to the entire survey.

This brief description by itself should tell you that the fundamental rule in coding is: **BE ACCURATE**. If you assign the wrong code to an answer or write your figures so illegible that the puncher misinterprets them, or puts them in the wrong column, the results of the survey are distorted. So we give you these general rules to follow:

1. Use red pencil
2. Write your figures clearly.
3. Do not erase. Cross out incorrect material.
4. Enter your codes just to the right of the column number.

In surveys, two types of questions are generally used: **PRECODED AND FREE-ANSWER**. A precoded question is one for which the answer categories were supplied in advance. These categories are printed in the questionnaire with the code numbers already assigned to them. Free-answer questions, on the other hand, are not worked out in advance. The interviewer simply writes down exactly what the respondent says. In general, the following rule applies: On precoded questions, you edit the interviewer's work to see that an appropriate code number has been circled; in free-answer questions, you enter the appropriate code number yourself.

B. Instructions for Precoded Questions

These questions are for the most part already coded by the interviewer who has circled a code number to stand for the respondent's answer. You are to check and edit the interviewer's coding.

1. Make sure that a code has been circled for each question which should have been asked of the particular respondent.
2. Make sure that nothing has been circled if the question should not have been asked of the particular respondent.
3. If the interviewer has placed his circle badly -- so that the puncher might misinterpret the number he is to punch -- recircle accurately in red.
4. If the interviewer has skipped a question which should have been asked, enter the assigned code to designate "Answer Not Ascertainable".
5. If the interviewer has left the question uncoded but has written in what the respondent said -- as he will sometimes do if he is not sure how to classify the respondent's answer -- read the comments and circle the code which seems to you to come closest to the respondent's opinion. If the written answer is too qualified to fit any of the major categories, it will have to be edited to the "Don't Know" category.
6. If the interviewer has circled two contradictory codes on the same question -- for most of these questions only one code can logically be circled -- you are also to edit by reference to the comments as in No. 5 above. If there are no comments, consult your supervisor.
7. If an answer has been circled but the accompanying comment suggests that a different answer should have been circled consult your supervisor.
8. A sub-question should have been asked only when it is applicable. Its applicability is usually dictated by the answer to the original question itself. If the sub-question is answered and the original question is blank, or if applicable and inapplicable code numbers have been circled in the original question, the sub-question is to be considered applicable. In case of contradiction, consult your supervisor.
9. In some cases you will have to code an "other" or "qualified" category on precoded questions. Here you supply the proper code from your code sheets.

C. Instructions for Free-answer Questions

Codes have been developed for these questions by reading a sample of responses. These codes appear on the coder's instruction sheets which have been given you.

The coder will enter the appropriate code(s) for each question on the code listing sheet.

1. Whenever the question is applicable, at least one code must be entered. If a code instruction sheet states "multiple coding permitted", this means that more than one code may be used for the question. In all other cases, only one code is to be used. As before, if the question should have been asked but was left blank, enter the assigned code for "Answer not Ascertainable".
2. Familiarize yourself with the codes and make sure you understand the distinctions between codes for a given question. Read all the examples. The title of the code category is merely a guide, not a complete statement of what is contained in the category.
3. Read each verbatim response and assign a code or codes to it. You are coding ideas not words, so you may not find the exact phrase before you on your code sheet. Most of the time you will find the idea behind it in the code, however.
4. One idea should receive only one code. If you use two codes you should be able to point to separate words, phrases or clauses in the answer corresponding to them. If you have to point to the same set of words for both codes, only one code should have been used. This difficulty usually arises when a coder thinks an answer could be either Code 1 or Code 2, and then codes both to save making the decision. Double-coding of an "either-or" type of problem is always incorrect.
5. Where multiple codes are permitted, every idea in the answer should be coded.
6. When more than one code is used they are usually to be listed alongside of each other with a dash between each number as: 2-5.
7. A "miscellaneous" code is provided for all genuine ideas which are not contained in the code proper. Do not put unintelligible, vague, irrelevant responses in the "miscellaneous" category; separate provision is made in the codes for this sort of response. A "miscellaneous" answer must be one for which a separate code could be provided if it arose with sufficient frequency.
8. Write in on your misc. sheet all answers which you have coded "miscellaneous". Unanticipated answers may come up with a frequency which dictates that they be reported separately. Writing in all miscellaneous responses enables us to know what is contained in the "miscellaneous" category.
9. "Vague", "irrelevant", "Don't know" and "No answer" codes always apply to the entire answer and are, therefore, not to be coded in combination with any other code. If anything else can be coded, these codes are not used.

D. Checking Procedure

All coding will be independently checked by another coder, and any "conflicts" in codes will be resolved by the supervisor. The checker will code each assigned question directly on the questionnaire next to the appropriate column number. The supervisor will compare the coder's and checker's code(s) and will list all differences on a "conflict" sheet.

E. Administrative Procedures

Questionnaires are numbered as they are received and grouped in packs of twenty-five. A pack (or 25 questionnaires) is the unit with which you will usually be working at any given time. As a general rule, you are asked to code only one or two questions at a time. In this way you will become familiar with the codes for the questions more quickly than if you were to code the entire questionnaire at once. Thus at any given time you will be working on "Pack X, Area X, Page X."

When you take a pack be certain to initial the control sheet in its proper space. When you complete the question(s) assigned for the entire pack, return it to the place where you picked it up, circle your initials on the control sheet, and continue coding the next pack for the same question(s) or receive a new assignment, as the case may be.

We have established several rules concerning coding operations, which we ask you to observe:

1. If you are in doubt about what code number to place on a questionnaire, consult your supervisor, not your fellow coders. Since we maintain a record of the reliability of our coding operations, we want the independent judgment of the coder on a question, rather than group judgments. The individual whom you consult might later be asked to check your work, and

...of course, and himself is agreeable and you, thereby spuriously initiating the reliability of our operations.

2. If you wish to consult the supervisor on a coding problem, wait until you have finished a pack on a given page. Bring up all the questions you have on that pack at that time. This procedure saves time for the supervisor who is usually engaged in other work.
3. Please keep discussion at a minimum during working periods. Due to crowded conditions it is difficult for a coder to work accurately while conversation is going on, and errors inevitably result when a coder is trying to code and listen to an interesting conversation at the same time. Whenever you need a break from the work -- take it. But don't get involved in any discussions while working, or in the same place others are working.
4. It is the responsibility of coders coding page 1, to make sure that the questionnaire has been properly processed. The following check should be made by those coding page 1:
 - (1) See that the questionnaire is adequately stapled.
 - (2) See that each questionnaire has been assigned a number, and that there are no numbers omitted or duplicated. Any numbering deficiencies should be reported at once to the supervisor.
 - (3) Rewrite any questionnaire number which is illegible.
5. Coders in general should watch out for duplicate pages, or omitted pages in the questionnaires. Tear out any duplicate pages. Report to the supervisor as soon as discovered.
6. All material is to be considered confidential. This includes questions, codes, responses and any names or addresses that come to your attention during coding. NORC surveys are done entirely for non-profit organizations and institutions and we have committed ourselves to both our clients and our respondents not to reveal anything about the survey to unauthorized persons. We ask you to aid us in keeping our pledges. Please do not discuss any aspect of the survey with anyone except NORC personnel.

QUESTION 2

"What are some of the things you like about living around here -- things you feel are advantages or that make this a good place to live? (Anything else?)"

Question 2 and Q. 3 are complementary questions, the former inquires about advantages and likes while the latter deals with disadvantages and dislikes. Respondents may mention both likes and dislikes in answer to Q. 2 and Q. 3. Some voluntary reports of "likes" may even be recorded as part of the answer to Q. 1. Read all answers to Q. 1, 2, and 3 before coding Q. 2, then code all mentions of "advantages etc." as they apply in Column 6.

Multiple coding is permitted.

8-1 CONVENIENCE OF LOCATION: GOOD TRANSPORTATION, GOOD ACCESS TO TOWN AND FACILITIES, CLOSE TO WORK OR BUSINESS

Pretty good school bus service; most people have jobs near here. Close to schools. Close to my husband's work. Accessible to town about 7 miles. Convenient to work. Convenient to shopping centers. Not far from entertainment. Easy access to highways. Fairly close to Portland, Seattle, San Francisco. We have a bus right here on the corner. They're getting ready to put a playground 5-6 blocks down the street. Ball park close by. Close to the University and its activities. Convenient to base -- we're AF people.

8-2 GOOD COMMUNITY FACILITIES -- SHOPPING, SCHOOLS, CHURCHES, RECREATION, UTILITIES

Have gas and electricity; schools are good. School system best in Tacoma. The parks -- (nearness or location not specified). Shopping facilities are reasonably good. Very nice shops -- good restaurants. Good shopping centers. There's a nice park near. Nice shopping centers. The high schools are very good institutions. Uncrowded schools. Paving of streets.

8-3 AREA NOT CONGESTED, MORE SPACE, MORE PRIVACY, AWAY FROM TOWN

Not so crowded area, neighbors just far enough. Space for children to play. We don't like to be crowded -- lots of acreage. Like the farming and garden. All the houses are spaced. It's nice and residential.

8-4 SOCIAL ASPECTS, PEOPLE ARE FRIENDLY AND NEIGHBORLY, NICE, FRIENDS OR RELATIVES LIVE NEAR HERE

People are more friendly. People are more in one class (income group). Near relations. People are fine. People are good. Close to our friends. Nice neighbors. People friendly and cooperative. Very nice children. Not

fancy -- not too many professional people. Not too big a city -- people are friendly. Nice people, everybody minds their own business. Nice class of people -- mostly middle income group.

8-5 PHYSICAL ASPECTS -- CLIMATE GOOD, SOIL GOOD, COUNTRIFIED, NO DUST

Ground better than other locations for crops; good soil; cooler; little dust. Cool place as you'll find in town -- if any breeze we get it. Climate is most important. It's dust free -- away from sand. Have good top soil for flowers. Climate is good. We like the winters here -- beneficial to boy's health. Weather is wonderful. Nights are so wonderful for sleeping -- it gets so cool. Good fresh air. Tacoma is clean little town. Grass grows fine. Good health resort.

8-6 QUIET AREA -- AWAY FROM HUB BUS

Place is quiet. When we moved here away from town -- it was quieter. It's away from town's businesses and hub bus. Not too noisy -- not too much traffic. It's a nice quiet neighborhood -- no one bothers you.

8-7 AREA IS SAFE -- AWAY FROM TRAFFIC, LESS TRAFFIC, POLICE PROTECTION, AIR FORCE PROTECTION

No gangs -- safe for youngsters. Area away from traffic which is dangerous for children. Crime rate is very low. Police protection is very good. Protection of the AF -- you know it's there. Not so much traffic as in town.

8-8 APPEARANCE OF AREA NICE

People keep yards up. Pleasant buildings and landscape. People try to keep their places up. People take good care of their homes. Nice scenery.

8-9 NO ADVANTAGES

8-0 MISCELLANEOUS -- Houses are well built, Low cost homes, Getting the house cheap, House is adequate.

8-X ECONOMIC ADVANTAGES

8-Y DON'T KNOW, VAGUE AND IRRELEVANT ANSWERS

I think it's worth the living here -- makes you feel good. Very desirable. Like the desert. It's a nice town. Very nice subdivision.

NO ANSWER -- QUESTION LEFT BLANK

QUESTION 3

A. Now what are some of the things you don't like about living around here -- things you feel are sometimes nuisances or are unpleasant or disagreeable to you?

E. Have we overlooked anything -- even little things that may bother or annoy you that you just take for granted because nothing much can be done about them?

All negative comments recorded in Parts A and B of Q. 3 will be coded together, as well as those volunteered in answer to Q. 1 and Q. 2. So, be sure to read all three questions (Q. 1 - Q. 3) before you code Q. 3.

If "low-flying" airplanes are mentioned and the rest of the answer is too vague to decide whether this means "noise annoyance" or "fear," look at the answer to Q. 4. If airplanes are reported as a "dangerous condition" in Part B of Q. 4, enter Code 1 and in Column 6. If airplanes are not mentioned in Q. 4, enter Code 2 only in Column 6.

Multiple coding is permitted except as noted.

6-1 AIRPLANE DANGER, FEAR OF PLANES -- (SELF AND OTHERS)--(Include "low-flying" in this category if, as noted above, airplanes are mentioned as dangerous on the following Question 4B.)

One feels they are going to drop on you or on the roof. Jets come low -- we don't have insurance against wreckage. It's so close to airport and the planes nearly take off your head. Don't like living in this flight pattern. They thrill me but something about them frightens me to death. Feel they're going to drop. I'm afraid of the planes -- we're right in the pattern.

6-2 AIRPLANE NOISE -- SPEECH, SLEEP, RADIO, TELEPHONE INTERFERENCE (Include "low-flying" in this category if as noted above comment is vague and ambiguous.)

They seem to fly so low -- the noise is tremendous. Just those planes. They bother us. The noise is so loud. Planes get a little noisy. Only thing is noise of airplanes. The big jets -- the noise interferes with hearing the radio and conversation. Ground checks on aircraft. Jet planes interrupt phone conversation and television programs. They come over real low with terrific roar.

6-3 OTHER AIRPLANE-AIRPORT DISTURBANCES -- (GENERAL AS WELL AS SPECIFIC ANNOYANCES OTHER THAN NOISE AND FEAR)

Oh yes, the planes. How about jet planes. Just the airplanes. Airplanes over too often. The only thing is those airplanes. Aircraft taking off and landing. The airplanes -- wish they wouldn't go over. They make the TV picture flicker.

6-4 AIRPLANE -- NO ANNOYANCE -- USED TO IT -- DON'T BOTHER

Only the planes and they don't bother me. Jet planes -- but we get used to them. Sometimes these bombers all night long are disagreeable but I'm used to it.

6-5 AIRPLANE DISTURBANCE IS UNAVOIDABLE

This business about the airplanes -- don't think we can do anything. We can't stop them. Airplanes make a terrible lot of noise but guess we have to have it (Double-code with 6-2). The airplanes but they were here first -- they've built a million dollar business and what can you do?

6-6 AIRPLANES ARE A BENEFIT TO COMMUNITY

The airplanes but you look at them and say "Thank God they're ours and not someone else's." Tucson would be dead without E-M.

6-7 TRAFFIC NOISE - R.R. TRAINS

The noise from trucks and buses; the garbage trucks are noisy. The sirens go blaring by. The hot rods screaming around corners.

6-8 OTHER NOISES -- CHILDREN, ANIMALS - INDUSTRY

Sometimes the children are noisy and I get bothered. We haven't rested nights for a week on account of the dogs. Dogs yelping at night. Model planes in park -- those gasoline engines are very noisy.

6-9 TRAFFIC AND NON-AIRPLANE DANGERS, UNSAFE AREA, INADEQUATE POLICE

Traffic -- streets too narrow. School kids taking advantage in cross walks; Bad road intersection. Use Wetmore Road as race track -- go about 80 miles. Some of the hot rodders speeding thru our streets.

6-0 POOR LOCATION -- INCONVENIENT ACCESS TO COMMUNITY FACILITIES

Don't like far distance to school and shopping center. It's too far from school. Don't have a store near us.

6-X DON'T KNOW, VAGUE OR IRRELEVANT ANSWERS

6-Y NO ANSWER, QUESTION LEFT BLANK

7-1 INADEQUATE COMMUNITY FACILITIES, RECREATION, SCHOOLS, CHURCHES

Poor drainage in rainy season -- mud in driveway. The drainage would make this a fine place to live, flash floods. No sidewalks -- the kids have to roller skate in the roads. We have to pay high rates for water and even then the pressure is poor. We don't have paving, but will soon. Garbage removal -- have to carry it to the curb or they won't pick it up. Poor location of sewers and water pipes. Absence of street lights. Poor bus service. Lack of entertainment and recreation. Parking problem downtown. No street lighting.

7-2 SOCIAL ASPECTS -- DISLIKE PEOPLE IN AREA

There are quite a few foreigners -- Something you can't do about neighbors. Unfriendly neighborhood. The neighbors are not quite what I would like them to be. We have a juvenile delinquent down the street. A neighbor who likes to stay up all night. Too far from family. Don't like the children on my lawn.

7-3 DISLIKE DOGS AND ANIMALS, INSECTS -- (Disturbances other than noise)

Dogs loose at night upsetting garbage cans. Tom cats. Nothing can be done about the cats and dogs because there are lots of children and they have to have their pets. We have a few stray dogs and cats. There are cats and bugs but they have to live too, mosquitoes.

7-4 PHYSICAL ASPECTS -- DUST, CLIMATE, SOIL, NATURAL CONDITIONS

Not too much shade around here. My gardening problem with desert growth. Maybe the dust. Air cooler is inadequate. May fever started to bother me here. Summer heat. Sand on a windy day. Soil isn't good. Tremors of earthquake.

7-5 CONGESTION -- NOT ENOUGH SPACE FOR PLAY OR GARDEN

Closeness to neighbors. Too many houses -- too close together.

7-6 POOR APPEARANCE OF AREA

There's an eyesore over there -- a junk yard. House across street -- everybody moves out cause it's dirty. The beer cans they throw on the lawn.

7-7 DEFINITE STATEMENT THAT NOTHING BOTHERS OR ANNOYS RESPONDENT (Do not double-code)

Not a thing. I like everything here. Nothing I know of. Nothing. I'm satisfied.

7-8 ECONOMIC PROBLEMS -- PRICES, TAXES HIGH, TOO FEW JOBS

We have to pay for garbage pickup. Rent is too high. Taxes are fairly high. Aren't enough jobs. Wages are very low.

7-9 AIRPLANES OR AIRPORT REDUCE PROPERTY VALUES

Make it harder to sell or rent houses.

7-X COMPLAINTS ABOUT VALUE, CONSTRUCTION OR LAYOUT OF HOUSE

7-Y OTHER LAND USES OBJECTIONABLE

Commercial, industrial, multiple dwellings, inadequate zoning. Dairy next door.

7-0 MISCELLANEOUS DISLIKES

Bright lights. Street being paved.

QUESTION 4B

*IF "SOME DANGEROUS CONDITIONS" --

"Could you describe them to me?" (Anything else?)

If Code 9-1 is circled one or more codes must be selected from the list below. If Codes 9-0, X or Y are circled, do not select any additional codes.

Multiple coding is permitted except where noted.

9-2 AIRPLANES-AIRPORT -- (Do not double-code with 9-3)

One danger might be -- the planes over the city -- the pattern is directly over city area. Jets going over -- you never know when any of them are going to go down. Just 5 blocks away there was a jet crashup X I can't think of anything else. This is the west route of the airplanes, and they can crash right in here. That plane crashed close to here yesterday and one might come down here. The overflying aircraft upon takeoff create a feeling of fear X you wonder if they'll all get up okay. With the number of airplanes flying over I'd say it wasn't as safe as it could be X no. This airplane traffic isn't exactly what you'd call safe X they can always crash. The flight line of the Base being so close -- outside of that it's all right. We're right on the flight pattern. If anything went wrong we'd be right under the crash X that's all. The planes are sometimes a fear to me especially going over to the school -- the planes just about clear the telephone wires -- especially since the plane crash. It's not the safest -- We're just at the end of a runway here. This is so close to the field and they take off and land near here one could come down here like it did the other day. Near enough to D-M that we run danger of crashes -- like the one the other day.

9-3 AIRPLANES-AIRPORT -- NOT CONCERNED ABOUT THEM (Do not double-code with 9-2)

The main thing is the jet bombers but we take that for granted. I don't think any more dangerous here than any other section X we don't worry about the bombers.

9-4 TRAFFIC AND R.R. TRAFFIC

Traffic is dangerous wherever you are -- have to be careful, isn't too safe to drive around here unmarked, blind corners, Aviation highway is close and there's heavy traffic on this street, there are many fast drivers which is a hazard. Narrow streets with cars parked make it dangerous for children, I think the most dangerous is the way the cars drive through this street X with children playing outside it's bad, Traffic is very dangerous to kids. Traffic - cars go by so fast its dangerous - crossing streets. The speeding cars, they really race around here X Automobiles at intersections pretty dangerous, Along at certain street corners - it's dangerous - people go by too fast, Traffic - Road used as race track.

9-5 DITCHES, EXCAVATIONS, NO SIDEWALKS, UNFINISHED CONSTRUCTION

There should be guards on the watch for the children so they don't get drowned, Irrigation ditches fill up to about 3 to 3-1/2 feet and a small child could drown in one.

9-6 FLOODS-EARTHQUAKES, NATURAL HAZARDS

The street dept. has been negligent in preparing to handle overflow during floods. Of course floods, lightning.

9-7 INADEQUATE POLICE PROTECTION -- VANDALISM, BURGLARIES, TRAFFIC CONTROL

Some reckless hoodlums at university are happy about quiet of summer, No police protection.

9-8 MISCELLANEOUS

Scorpions, spiders, dogs.

9-9 NO ANSWER, DON'T KNOW, VAGUE AND IRRELEVANT ANSWERS

10-7 DANGER OF BEING BOMBED IN TIME OF WAR

Air Base a target in event of war, first place to go, to be bombed.

QUESTION 7-D (Types of other noises)

If Code 0 is circled in Column 22, do not code this question.

Multiple coding is permitted, except as noted.

If Code R is circled in Column 22, one or more of the following codes must be entered under Code 26.

26-1 HUMAN NOISES - Children, neighbors

26-4 ANIMAL NOISES - Dogs, cats, birds

26-5 INSECT NOISES - Crickets, mosquitoes

26-6 TRAINS, SIRENS, WHISTLES - Police, ambulances

26-7 GUNS, FIRING, BLASTING

26-8 MISCELLANEOUS - Lawn mowers, machine noises

26-9 NO ANSWER, VAGUE, IRRELEVANT

QUESTION 17-C

(Have never called anyone, signed a petition or done anything else about it. Could you tell me why not?)

If Code 5, 6, or 7 is circled in Column 45, leave this question blank. Do not code.

If Code 8, 9, or X is circled in Column 45, leave this question blank. Do not code.

If Code 9 is circled in Column 45, one or more of the following codes must be entered in Column 46 or 47.

Multiple coding is permitted except as noted.

46-4 IT WOULDN'T DO ANY GOOD -- AUTHORITIES DON'T CARE -- WOULDN'T PAY ATTENTION

Other people have called and gotten no results.

46-5 NOT ENOUGH PEOPLE COMPLAIN -- CAN'T GET ENOUGH SUPPORT

46-6 PERSONAL INADEQUACY -- CAN'T EXPRESS SELF TOO WELL

I won't be the starter of trouble, I don't know what to do, I'm not much of a talker.

46-7 NO ONE EVER APPROACHED ME

If someone came along to me, I'd go with them, No one ever approached me with a petition.

46-8 NOTHING CAN BE DONE ABOUT IT -- PHYSICALLY IMPOSSIBLE

It's a necessary evil what can they do, I didn't think they could know which plane was flying.

46-9 SITUATION ISN'T THAT BAD

Don't think it's important enough to set one up.

46-0 HAVEN'T HAD TIME -- WAS DOING SOMETHING ELSE

46-X AIRBASE IMPORTANT AND NECESSARY -- MUST ACCEPT ANNOYANCE

47-6 KNEW ABOUT DISTURBANCE BEFORE MOVING HERE

47-0 MISCELLANEOUS

47-X DON'T KNOW, VAGUE, IRRELEVANT ANSWERS, NO ANSWER -- QUESTION NOT ASKED

QUESTION 30

How long have you lived in this part of (name of area)?

All six parts of Q. 30 will be coded as one question. The objective of this question is to determine how many years R has been living under flight paths of air base.

If the answer to part A is 3 years or more, parts B-F should be blank and the answer to part A will be considered complete. Using the answer to part A, only one code should be entered in Column 60 from the list of categories presented below.

If the answer to part A is less than 3 years then the answers to parts B-F must be considered.

If the answers to B and/or E indicate places outside of air base area then the answer to part A will be left unadjusted and coded in Column 60, (Code 60-1, or 2, or 3, or 4)

If the answers to B and/or E are placed in the same air base area, then the following procedure will be used:

Check answer to "C" and/or "G". a) If answer to "G" or "C" is yes, then add the time lived there ("D" or "F") to the answer of part "A" and code the combined number of years in Column 60. Also double-code with code 61-X to indicate the answer includes two or more neighborhoods.

b) If the answer to "D" or "F" is "no", then do not adjust answer in part A. Leave it as is and code in Column 60.

Only one code should be entered in Column 60, except Code X may be double-coded when R has lived in more than one neighborhood under the flight pattern.

60-1 LESS THAN 6 MONTHS

60-2 6 MONTHS BUT LESS THAN ONE YEAR

60-3 1 YEAR BUT LESS THAN 2 YEARS

60-4 2 YEARS BUT LESS THAN 3 YEARS

60-5 3 YEARS BUT LESS THAN 4 YEARS

60-6 4 YEARS BUT LESS THAN 5 YEARS

60-7 5 YEARS BUT LESS THAN 6 YEARS

60-8 6 YEARS BUT LESS THAN 10 YEARS

60-9 10 YEARS BUT LESS THAN 15 YEARS

60-0 15 OR MORE YEARS

60-X LIVED IN MORE THAN ONE NEIGHBORHOOD UNDER FLIGHT PLAN --
Double-code with one of above codes.

60-Y NO ANSWER, DON'T KNOW, VAGUE AND IRRELEVANT

QUESTION 31

Family Composition: Including yourself, how many people
live with you in this house? Please
list them for me.

Household Composition, Size of Household, Age and Sex are the four parts to
this question. One code only must be selected for each part except as noted
below.

Household Composition

Select one code only and enter in Column 61.

Do not double-code.

61-1 SELF ALONE

61-2 ADULTS ONLY (18 or more years old) ----- NO CHILDREN

61-3 ONE OR MORE CHILDREN -- NO CHILD LESS THAN 6 YEARS OLD
(6 to 18)

61-4 ONE OR MORE CHILDREN -- AT LEAST ONE CHILD UNDER 6 YEARS

61-X ONE OR MORE CHILDREN BUT INFORMATION ON CHILDREN'S AGE
MISSING OR INCOMPLETE

Number in Household

Enter one code only in Column 61.
If Code 61-1 is entered, leave this part blank.
Do not double-code.

61-5 TWO MEMBERS IN HOUSEHOLD

61-6 THREE MEMBERS IN HOUSEHOLD

61-7 FOUR MEMBERS IN HOUSEHOLD

61-8 FIVE MEMBERS IN HOUSEHOLD

61-9 SIX OR MORE MEMBERS IN HOUSEHOLD

61-Y NO ANSWER OR INCOMPLETE INFORMATION ON MEMBERS OF HOUSE-
HOLD

Age of Respondent

Enter one code only in Column 62 to designate the age of the respondent.

Do not double-code.

62-1 18-24 YEARS

62-2 25-29 YEARS

62-3 30-34 YEARS

62-4 35-39 YEARS

62-5 40-44 YEARS

62-6 45-54 YEARS

62-7 55-59 YEARS

62-8 60-64 YEARS

62-9 65 AND OLDER

62-0 NO ANSWER, VAGUE ANSWER

Sex of Respondent

Enter one code only in Column 62 to designate sex of respondent.

Do not double-code.

62-X Female

62-Y Male

QUESTION 32 - Education

This is a straightforward precoded question. It is asked of all
respondents, only one code is circled in Column 63.

If NA or "Don't know", enter Code "Y".

Only years of formal schooling are to be considered in this coding.
Volunteered comments about attendance at trade schools, correspond-
ence or night courses are not to be included.

QUESTION 33 - Income

One code only must be entered in Column 64. This question is also
asked of all respondents.

If the question was not asked enter Code "Y".

If R refused to give this information and no estimate was made by the
interviewer, enter Code "X".

If R refused to give this information and an estimate is included by
the interviewer, enter Code "X" in addition to the code circled by the
interviewer (his estimate).

QUESTION 34 - Rental or Home valuation

This question is asked of all respondents. It is a two-part ques-
tion which requires both editing and coding.

FOR THOSE WHO RENT

1. Check to see that Code A is circled in Column 65. (This appears
to the left of "Rent -- IF RENT ASK:....").
2. A rental figure is found in the box. Code this figure in Col-
umn 65, using the codes which follow:

CODE	RENTAL FIGURE (\$)
65-1	UNDER 60
65-2	60 - 69
65-3	70 - 79
65-4	80 - 99
65-5	100 OR MORE
65-Y	NA (Not-ascertainable, Not asked, or Don't know, Vague)

If there is an estimate of "60 to 70" or "75 to 85" or some other fig-
ure which encompasses two classes of data, code for the lower class
("75 to 85" would be coded 65-3).

FOR THOSE WHO OWN

1. Check to see that Code B is circled in Column 65 (This
appears to the left of "Own -- IF OWN, ASK:.....").
2. An estimate of home worth is found in the box. Code this
figure in Column 65, using the codes which follow:

CODE	HOME WORTH (\$)
65-6	UNDER 6000
65-7	6000 - 7999
65-8	8000 - 11,999
65-9	12,000 - 15,999
65-0	16,000 - 19,999
65-Y	20,000 OR MORE
65-Y	NA (Non-ascertainable, Not asked, and Don't know, Vague)

If there is an estimate of "7500 to 8500" or some other figure which encompasses two classes of data, code for the lower class ("7500 to 8500" would be coded 65-7).

Be certain that either 65-A is circled and rental codes 1, or 2, etc., are entered in Column 65 or 65-B is circled and home worth codes 6, or 7, etc., are entered in Column 65.

QUESTION 40

QUESTION 36

OCCUPATION

The respondent's occupation should be coded in Column 69.

The main earner's occupation should be coded in Column 68.

Where the respondent himself is the main earner, the same code is entered in both columns.

Double-code 0 if main earner is not presently employed.

Column

69 68

1	1	Professional, semi-professional
2	2	Farmers, Farm managers
3	3	Proprietors, Managers, Officials, except farm.
4	4	Clerical, sales
5	5	Craftsmen, Foremen and kindred workers
6	6	Operatives
7	7	Service workers
8	8	Farm laborers, Foremen
9	9	Laborers, except farm and mine
0	0	Retired, unemployed, pensioner, etc. (If main earner, always double-code with former occupation. If no former occupation given, double-code 0-Y).
X	-	Housewife, married woman, not employed, not seeking work, student.
Y	Y	Not ascertainable

See separate instruction sheets for definition and examples of above categories.

If the respondent's occupation has been left blank, but an occupation recorded for the main earner, observe the following procedure:

If the respondent is a male, treat the reported main earner's occupation as the respondent's and enter the same code in both columns.

If the respondent is a female, code the respondent as a housewife in Column 69 and enter the reported occupation in Column 68, unless the reported occupation is likely to be that of a female (nurse, beauty parlor operator, etc.). In this case, treat the reported occupation as that of the respondent, and enter the same code in both columns.

DEVELOPMENT OF ANALYTICAL SCALES AND INDEXES

1. General Description of Scales

Earlier in this report two of our major objectives were described as the quantification of each of the key physical and socio-psychological variables and the determination of their combined inter-actions on disturbance, annoyance, and complaints. An attitudinal scale is a statistical device for expressing variations in the intensity of a psychological attitude, and whenever possible, it is used to measure the human factors affecting the noise annoyance problem. Generally, "Guttman type" scales are employed, and before we describe the development of individual scales, it may be worthwhile to state briefly the characteristics and criteria of these scales. A description of the development of a scale for "Readiness to Complain" will illustrate the process.

Our problem is to measure the relative readiness of a sample of residents to complain about airplane disturbances. From our depth interview materials and from the volunteered answers to open questions, the forms of complaint respondents actually used have been determined. The five major forms of complaint are listed on table 1 (App. A), the overall scheme describing the aircraft problem. These are: (1) signing a petition, (2) attending a meeting to discuss the problem, (3) calling or writing to base officials, (4) visiting base officials, and (5) helping to organize an action group. Five questions covering these items were developed as Question 25 of the questionnaire and table 19 (App. D) lists these questions as they appear on the questionnaire.

TABLE 19 (APP. D)
QUESTIONS RELATING TO "READINESS TO COMPLAIN"

25. A. Now suppose some of your neighbors who were concerned about the airplanes asked you to sign a petition urging the air base officials to reduce their disturbance--do you think that you would very likely sign it, that you might but you're not sure, or that you probably wouldn't sign such a petition?	Very likely 10-1 Might 2 Wouldn't 3 Don't know 4 NORC use Y	Very likely 12-1 Might 2 Wouldn't 3 Don't know 4 NORC use Y
B. How about calling up or writing to these officials--if your neighbors asked you to call or write about the noise or danger, do you think you would very likely call or write, that you might but you're not sure, or that you probably wouldn't write or call?	Very likely 11-1 Might 2 Wouldn't 3 Don't know 4 NORC use Y	Very likely 13-1 Might 2 Wouldn't 3 Don't know 4 NORC use Y
C. If a meeting was called to voice the community's concern about the airplanes, do you think you would very likely attend, that you might but you're not sure, or that you probably wouldn't attend?		Very likely 14-1 Might 2 Wouldn't 3 Don't know 4 NORC use Y
D. If they asked you to visit the officials at the air base to discuss the airplanes, do you think you would very likely go, that you might but you're not sure, or that you probably wouldn't go?		
E. Now suppose some of your neighbors asked you to help them set up a special committee to improve the airplane situation, do you think you would very likely help them, that you might but you're not sure, or that you probably wouldn't?		

If these questions form a Guttman scale, then the responses will be related in a hierarchal fashion. One question will be answered positively by most respondents while one question will be answered by relatively few respondents. Moreover, the questions will be so inter-related that if a person answers

positively to the most difficult form of complaint, then he will be expected to answer positively to all other forms of complaint. Likewise, if he answers "No" to the most difficult form of complaint, but "Yes" to the next most difficult question, then he will be expected to answer "Yes" on all other less difficult forms of complaint, etc. The "zero" group represents those persons who answer "No" to all forms of complaint. Naturally, some inconsistency in behavior is to be expected and the maximum allowed deviations from perfect scale types are reflected in the following criteria:

1. The total scale error (deviations from perfect scale types) not to exceed 10%, i. e., reproducibility (R) of perfect types at least .90;
2. Largest error in any one single item (question) not to exceed 15% of all respondents;
3. Scale error for any one non-scale type not to exceed 5%, i. e., when a person is expected to say "Yes" or "No" to a particular question, no more than 5% may deviate from the expected pattern;
4. For each part of a question, non-error must exceed error. Each question or item in a scale has a negative expectation ("No" answers) and a positive expectation ("Yes" answers). If a "Yes" is expected and a "No" answer is given, then the error is described as a negative (-) error, and vice versa, if a "No" is expected and a "Yes" is given, it is called a positive (+) error. In our example scalogram, table 20 (App. D), total "Yes" answers to Q.25A equals 69, of which 30 were errors and 39 were correct answers. Consequently, non-error exceeded error.

A further explanation of criteria 2 is in order. With the relatively small number of items, the placement of non-scale types is often arbitrary. For example, non-scale type X0XXX (7 respondents) in table 20 (App. D) could be considered as error in scale types 5 or 3. Following Guttman's rule of thumb of scoring toward the middle scale score whenever there is a choice, this inevitably maximizes the error in the first and last items. Consequently, as much as a 20% item error may be accepted, provided the adjusted error does not exceed 15%. The error is adjusted according to the "Ford Procedure" by computing it as if half the cases are scored one way and half the cases the other way. The total error and reproducibility, of course, remain the same.

The procedures followed in developing a scale are as follows:

1. First all the items (questions) thought to go together are cross tabulated by every other item as guidance in dichotomizing the items (If an answer already is divided into "Yes"- "No" categories, this step may be omitted);

2. If dichotomization is not satisfactory, a scalogram of 2 types is tabulated, as in table 20 (App. D) (two types were omitted in scale type 5, because there were no respondents reporting these types);

3. Then item error, non-scale type errors, total error and error - non-error ratios are computed;
4. If any of the four criteria is not satisfied, items are dropped or dichotomization is changed and new trial scalograms are tabulated until an acceptable scale is developed or it is decided that a scale cannot be developed.

In table 20 (App. D), the X's represent "Yes" answers and the O's "No" answers. The asterisks next to the number of respondents represent perfect scale types. The standard formula used for computing total error is $R = 1 - \frac{E \frac{e}{c}}{nN}$.

Where e = total error in an item
 c = number of answer categories for that item
 n = number of items
 N = number of respondents

Since in dichotomous questions, c always is 2, and if only the positive side of a scalogram is computed (the negative side is a duplication of the positive side and that is why total errors are divided by 2), then the simpler formula can be used i. e. $R = 1 - \frac{Ee'}{nN}$. Where e' is the one sided error or $\frac{e}{2}$.

A few other general comments should be made before we examine individual scales. The reproducibility rate (R) is a statistical measure of the validity of each scale. As a further test of reliability or the variability of the scale from sample to sample, the respondents at the S. A. C. Air Base were randomly divided into two sub-samples and independent scalograms were run for each sub-sample. Likewise, separate scalograms were developed for the other two air bases, so that four independent comparisons of reproducibility are possible for each scale.

In a few instances, where it was impossible to develop a satisfactory scale, because the question items didn't rank order, a simple index of frequency of "Yes" answers was devised as a crude measure of attitudinal variability. These are also presented below. In general, satisfactory scales were developed for the three response variables but additional improvement is needed for a few of the psychological variables.

2. Discussion of Individual Scales

Nineteen different scales and indexes were developed during the course of this study, of which 14 were used in the analysis and five were tabulated for the

A. C. Base only. Of the fourteen scales and indexes described in this section, eleven are available for all three air bases, while three are available only for the A. D. C. Air Bases studied in the second field trials. Table 21 (App. D) lists the different scales and indexes and the reproducibility ratios for each of the air base areas.

TABLE 20 (APP. D)

SCALOGRAM FOR READINESS TO COMPLAIN

Scale Type	Question and Answer Category					Number Respondents
	25-A Very Likely	25-C Very Likely	25-B Might	25-D Might	25-E Might	
5	X	X	X	X	X	35*
5	X	X	O	X	X	3
5	X	X	X	X	O	1
4	O	X	X	X	X	8*
4	O	X	X	O	X	1
3	O	O	X	X	X	32*
3	X	O	X	X	X	7
3	O	O	X	O	X	7
3	O	O	X	X	O	5
3	X	O	X	O	X	2
3	X	O	X	X	O	2
2	O	O	O	X	X	22*
2	O	X	O	X	X	10
2	O	O	O	X	O	10
2	O	X	O	X	O	4
2	X	O	O	X	X	2
1	O	O	O	O	X	36*
1	O	X	O	O	X	3
1	X	O	O	O	X	5
1	X	X	O	O	X	2
0	O	O	O	O	O	122*
0	O	X	O	O	O	5
0	X	O	O	O	O	7
0	O	O	O	X	O	6
0	O	O	X	O	O	1
0	O	O	X	X	O	2
0	O	X	O	X	O	1
0	X	O	X	O	O	2
0	X	X	X	O	O	1
Positive Item Frequency	69	76	107	151	175	366
+ Error	30	28	7	10		
- Error	-	-	3	10	22	
$R = 1 - \frac{E^2}{nN} = 1 - \frac{120.5}{(366)(5)} = .934$						
Adjusted						
+ Error	23	19.5	11.0	17.0	11.0	81.5
- Error	-	5.5	11.0	7.0	15.5	39.0
Total	23	25.0	22.0	24.0	26.5	120.5

TABLE 21 (APP. D)

SCALES AND INDEXES USED IN THE ANALYSIS

Scale Number	Description	Rep. Reliability Ratios			
		S. A. C. Base Part I	S. A. C. Base Part 2	West Coast ADC Base	East Coast ADC Base
1-	Overall Satisfaction with Neighborhood (10 item scale)	.84	.83	.895	.88
2-	Fear of Air Crashes (3 item scale)	.94	.94	.99	.99
3-	Fear of Crashes Index (5 item index)	--	--	--	--
4-	Activity Disturbance (5 item scale)	.91	.91	.92	.92
5-	Frequency of Activity Disturbance (10 item scale)	.89	.89	.89	.89
6-	Intensity of Annoyance (12-14 item scale)	.91	.90	.90	.90
7-	Combination of Scale 5 and 6 (6 categories)	(same as scales 5 and 6)			
8-	Pilot Considerateness Index (4 items)	--	--	--	--
9-	Base Considerateness Index (5 items)	--	--	--	--
10-	Base Importance Scale (3 items)	.93	.93	.97	.97
11-	Base Importance Index (5 items)	--	--	--	--
12-	Readiness to Act (5 items)	.94	.94	.93	.91
13-	Possibility of Successful Action (1 items)	--	--	.97	.96
14-	A. F. Image of Considerateness (5 items)	.92	.91	.95	.95

Scale 1 - Overall Satisfaction with Neighborhood

As table 21 (App. D) indicates, the reproducibility ratios are just below our criterion in two of the four tests. However, the errors are random and not clustered in any large non-scale types. Since there is no reason to expect the different non-aircraft aspects of neighborhood living to rank order perfectly, this scale may be considered a quasi-scale. The ideal item order listing is shown in table 22 (App. D).

Item	Scale Type										
	10	9	8	7	6	5	4	3	2	1	0
Q. 3 Nothing bothers	X										
Q. 5 Taxes or rent	X	X									
Q. 5 Noise	X	X	X								
Q. 5 Safety	X	X	X	X							
Q. 5 Closeness to work	X	X	X	X	X						
Q. 5 Church	X	X	X	X	X	X	X				
Q. 1 Overall rating	X	X	X	X	X	X	X	X			
Q. 5 Shopping	X	X	X	X	X	X	X	X	X		
Q. 5 Neighbors	X	X	X	X	X	X	X	X	X	X	
Q. 5 Schools	X	X	X	X	X	X	X	X	X	X	X

NOTE: Positive ratings are Good or Very Good for all items.

To describe the overall satisfaction, it is proper to include aircraft noise and danger as appropriate items in the neighborhood complex. But in correlating aircraft disturbance and annoyance with overall satisfaction, the inclusion of these overlapping items creates a spurious correlation. Consequently, in the analysis these overlapping items are removed, but the revised reproducibility ratio was not calculated.

Scale 2 - Fear of Air Crashes

Although the R ratios are very high, only three items are used in this scale. If at all possible this scale should be strengthened in future studies by including additional items. Moreover, the S. A. C. data and the A. D. C. base data are not exactly comparable.

TABLE 23 (APP. D)

SCALE TYPES USED IN SCORING S.A.C. BASE DATA ON FEAR OF CRASHES

Number of Spontaneous Fear Responses	Q. 5G Safety not very good				Q. 5G Safety - Very Good			
	Bothers More Than a Little	Bothers A Little	Not Bother		Bothers More Than a Little	Bothers A Little	Not Bother	
	Scale Types				Scale Types			
2 +	6	5	5		5	0		
1	6	4	3		4	4	3	
0	6	4	2		0	0	0	

In the analysis of S. A. C. data, it was necessary to use a contrived item composed of four volunteered comments. Since spontaneous comments are often a function of verbal facility and/or interviewing skill, as well as reflections of particular respondent attitudes, sizeable non-scale types could not be eliminated. It was decided, therefore, to score according to scale type to compensate for non-random errors in the voluntary comments. The scale was divided into six categories with a score of six representing the most fear and a score of 0 representing no reports of fear. Table 23 (App. D) represents the method used in scoring to scale type.

For the two A.D.C. bases a regular three item scale was developed as shown in table 24 (App. D).

TABLE 24 (APP. D)
ITEM ORDER OF SCALE 2 - FEAR OF AIR CRASHES
AT A.D.C. BASES

Item	Scale Type			
	1	2	3	0
Q. 3-Airplanes dangerous				X
Q. 4-Airplanes a safety hazard..	X			X
Q. 5-Safety of Area not Very Good	X	X	X	

In order to combine SAC base data with ADC data the following groups were combined:

<u>Scale Types</u>	<u>Scale Types SAC Base</u>	<u>Scale Types ADC Bases</u>
0	0	0
1	2-3	1
2	4-6	2-3

Index 3 - Fear of Crashes

In order to use answers to five questions, two of which did not scale, this index was computed. There are five categories of response - "Yes" to all five questions, "Yes" to any four questions, etc. The index was not available for SAC data and consequently could not actually be used in the full analysis. It is reported separately, however, for the ADC bases.

The questions included are:

1. Q. 5F-Safety of area not very good
2. Q. 4-Voluntary mention airplanes are a safety hazard
3. Q. 3-Voluntary mention-airplanes dangerous
4. Q. 9B-Airplanes sometimes startle
5. Q. 10A-Airplanes seem to fly too low for safety.

Scale 4 - Activity Disturbances

As table 21 (App. D) indicates, the over-all error is less than 9%, which is more than satisfactory. One weakness of this scale, however, is the occurrence of one sizeable non-scale type at the Western A. D. C. base. This non-scale type does not occur in either the SAC base or East Coast ADC base reports. There are 68 residents living primarily in 4 neighborhoods who report vibration and speech interference, but no interference with radio or TV listening. According to our 5% rule only 40 persons should have been in this category. Of course, if all three Air Bases are combined this non-scale type totals much less than 5%, so that overall scale is acceptable.

since radio and TV listening is usually an indoors activity, a S.I. L. of at least 75 db would be necessary to interfere with it. In the four neighborhoods where this non-scale type is most numerous, the noise never gets as high as SIL 75 db. Therefore, by turning up the volume, it is possible to listen to radio or TV without too much disturbance. Furthermore, in these same neighborhoods, the number of families without TV sets is unusually high. In one of the four, 14% had no TV sets while the average for all neighborhoods was 7%. A final consideration is the fact that large propeller planes are more important at this air base and the low frequency noise generated by these planes may have accentuated the reports of vibration disturbance.

The perfect scale types are shown in table 25 (App. D).

TABLE 25 (APP. D)
ITEM ORDER OF SCALE 4 - ACTIVITY DISTURBANCE

Item Disturbed	Scale Type				
	5	4	3	2	1
Q. 9-Rest and relaxation	X				
Q. 9-Sleep	X	X			
Q. 9-Talking	X	X	X		
Q. 9-Listening to Radio or TV	X	X	X	X	
Q. 9-Vibrations	X	X	X	X	X

Scale 5 - Frequency of Activity Disturbance

While Scale 4 dichotomized the occurrence or non-occurrence of activity disturbances, Scale 5 trichotomizes disturbance by frequency of occurrence. Disturbance is scored as follows:

- a) more than occasionally - 2 points
- b) occasionally - 1 point
- c) never - 0 points.

While overall error is just below the 10% level, there are no large non-scale types in two of the three air bases. Consequently, this scale can be considered a good quasi-scale. The same non-scale type discussed under Scale 4 occurs in this scale, and the explanation cited above applies to this scale as well. Table 26 (App. D) shows the perfect scale types.

TABLE 26 (APP. D)
ITEM ORDER OF SCALE 5 - FREQUENCY OF ACTIVITY DISTURBANCE

Items Disturbed	Scale Type									
	10	9	8	7	6	5	4	3	2	1
Q. 9-Rest and relaxation frequently....	X									
Q. 9-Sleep frequently.....	X	X								
Q. 9-Listening to radio or TV frequently	X	X	X							
Q. 9-Talking frequently.....	X	X	X	X						
Q. 9-Vibrations frequently.....	X	X	X	X	X					
Q. 9-Rest and relaxation occasionally..		X	X	X	X	X				
Q. 9-Sleep occasionally.....		X	X	X	X	X	X			
Q. 9-Listening to radio or TV occasionally.....			X	X	X	X	X	X		
Q. 9-Talking occasionally				X	X	X	X	X	X	
Q. 9-Vibrations occasionally.....					X	X	X	X	X	X

Scale 6 - Intensity of Annoyance

As table 21 (App. D) indicates, reproducibility for this scale was .90 or better in all four tests. As in Scale 5, this is a trichotomous scale with scores counted as follows:

- a) more than a little annoyance - 2 points
- b) a little annoyance - 1 point
- c) no annoyance - 0 points

By adding an additional question on overall annoyance, an additional two categories are possible in the ADC base areas. But by collapsing these categories, comparability is established for all bases in the major analysis. There are no special problems with non-scale types or with the other scale criteria. Table 27 (App. D) lists the item order of the perfect scale types.

TABLE 27 (APP. D)
ITEM ORDER OF SCALE 6 - INTENSITY OF ANNOYANCE

Kinds of Annoyance	Scale Types											
	12	11	10	9	8	7	6	5	4	3	2	1
Q. 9-More than little - resting...	X											
Q. 9-More than little - sleeping...	X	X										
Q. 9-More than little - talking...	X	X	X									
Q. 9-More than little - vibrations	X	X	X	X								
Q. 9-More than little - listening...	X	X	X	X	X							
Q. 9-A little - rest		X	X	X	X	X						
Q. 9-A little sleep.....			X	X	X	X	X					
Q. 9-A little - talking.....				X	X	X	X	X				
Q. 9-A little - vibrations.....					X	X	X	X	X			
Q. 9-A little - listening.....						X	X	X	X	X	X	
Q. 31-Much overall+Much flight.....	X	X	X	X	X	X	X	X	X	X	X	X
Q. 8A-Much overall+Little flight.....										X	X	
C. 31A-No activity annoyance or Little overall only.....												X

Scale 7 - Combination of Scale 5 and Scale 6 - Disturbance and Annoyance

There are many ways in which the degree of disturbance and annoyance may be cross tabulated. Two combinations which were used in the analysis are shown in table 28 (App. D).

Index 8 - Pilot Considerateness

There are four questions dealing with pilot considerateness of local residents. They are:

Question 12. How much concern do you feel the pilots have for the feelings and comfort of residents like yourself when they fly by here --

would you say they are concerned very much, moderately, only a little, or not at all?

Question 14A. From what you've read or heard, do you feel that the pilots fly by here as high as they possibly can, all the time, most of the time, only sometimes, or that they never fly as high as they can?

Question 14B. What about the noise the plane makes. Do you feel that the pilots could fly quieter all the time, most of the time, only sometimes, or that they can never fly quieter than they do?

Question 17. Do you feel the pilots obey all the flying rules and regulations all the time, most of the time, only occasionally or hardly ever?

The categories underlined represent the most favorable attitudes toward the pilots and are used in the index. The index of pilot considerateness, therefore, has five categories: 4 favorable answers, 3, 2, 1, and no favorable answers.

TABLE 28 (APP. D)

TYPOLGY OF SCALE 7 DISTURBANCE AND ANNOYANCE

Version	Disruption	Annoyance	Group	Definition	
				Disruption Score	Accompanying Annoyance Score
<u>Version A</u>	Little	Low	1	0	0
				1	0 - 1
	Little	High	2	0	1 - 2
				1	2 - 4
	Moderate	Low	3	2	0 - 2
				3	0 - 3
	Moderate	High	4	2	3 - 6
				3	4 - 8
	Much	Low	5	4	0 - 6
				5	0 - 9
	Much	High	6	4	7 - 10
				5	10 - 12
<u>Version B</u>	Most not disrupted	Low	1	1	0
				2	0 - 1
		Medium	2	0	0
				1	1
				2	2 - 3
		High	3	0	1 - 2
				1	2 - 4
				2	4 - 6
	Most disrupted	Low	4	3	0 - 2
				4	0 - 5
				5	0 - 7
		Medium	5	3	3 - 4
				4	6 - 8
				5	8 - 11
	High	6	6	3	5 - 8
				4	9 - 10
				5	12

Great efforts were made to combine answers to these questions into an acceptable Guttman scale. While the overall error was within acceptable limits, it was impossible to eliminate large non-scale types. It seems as if there are

many aspects to pilot considerateness which are not related in a hierarchal fashion. Consequently it was decided to simply count the number of favorable answers and to consider the person with the most favorable answers as one who felt the pilots were the most considerate.

The presumptive scale order of questions was Q. 14A, 17, 12 and 14B and some of the non-scale types were:

1-Flies as high as he can, obeys the rules, flies as quiet as he can, but does not have very much concern for the feelings of residents. Perhaps respondents feel that the pilot acts considerately merely because he is ordered to act that way, or because it is more efficient to act that way, but apparently not because he is concerned about the feelings of residents.

2-A similar non-sequitor is the person who obeys the rules, flies as quietly as he can, but not as high as he can or not because he is concerned about the residents.

3-Flies as high as he can and as quiet as he can, is concerned very much about feelings of residents, but does not obey the rules all the time.

4-Is concerned very much, but feels pilots do not fly as high, or as quiet, or obey rules all the time.

On the assumption that by dropping Q. 12 a scale on acting considerate might be developed, the remaining three questions were tested. Unfortunately the third large non-scale type persisted -- "flies as high and as quiet but does not obey the rules all the time." Consequently, efforts to develop a scale for pilot considerateness were abandoned at this time. In future studies, further developmental work should be continued on this item.

Index 9 - Base Considerateness

The developmental problems with this item were similar to those described under Index 8 and at the S. A. C. base, a single scale for pilot and base officials' considerateness was developed, with an acceptable R of .93. Three of the four items in the scale concerned base officials, and one involved voluntary comments. Table 29 (App. D) lists the scale types.

TABLE 29 (APP. D)
ITEM ORDER OF SCALE 9 - BASE CONSIDERATENESS -
S. A. C. BASE ONLY

Items	Scale Type				
	4	3	2	1	0
Voluntary comments (Q. 8A3, 10B, 16, 17, 18C, D)	X				
Q. 12. Pilots concerned	X	X			
Q. 13. Base doing all can	X	X	X		
Q. 15. Base officials concerned	X	X	X	X	

An analysis of these scale items revealed that feelings about pilots and officials often differed, and as reported under Appendix A, additional questions were added to permit the development of separate scales. Unfortunately, the questions recording voluntary comments were eliminated as an economy measure and it wasn't possible even to replicate the combined scale at the ADC bases. As a lesser of the evils, it was decided to use the scale for SAC respondents and an index based on the following five questions for the ADC residents.

Question 16B. Do you think they (officials) could develop procedures so the planes would fly higher than they do? Yes, No.

Question 15. As far as you know, how much concern do the Air Base officials have for the feelings and comfort of residents like yourself -- would you say they are concerned very much, moderately, only a little, or not at all?

Question 16A. As you know the Air Base officials make rules and regulations for military airplanes flying around here -- do you feel they could change the flight patterns so the planes would pass over areas with fewer residential homes? Yes, No.

Question 16C. How about the noise -- do you think the officials could show the pilots how to make less noise than they do? Yes, No.

Question 16D. Do you know of anything that the officials could do to reduce any disturbance caused by the airplanes? Yes, No.

The scale developed for SAC respondents included items similar to Q. 16D, 15, 12 and volunteered comments. The scale and index are therefore combined as follows:

<u>Analysis Category</u>	<u>SAC Scale Type</u>	<u>ADC Index Type</u>
Least considerate	0-2	0-2
Moderately considerate.....	3	3-4
Most considerate	4	5

In attempting to develop a scale for ADC respondents, the questions seemed to fall into the following scale order, Q. 16B, 15, 16A, 16C and 16D, but the following non-scale types persisted:

1-Can't do any of the things to improve situation (not fly higher, not change path, not make less noise, not do anything else) but not very much concerned about residents.

2-Very much concerned, can't make less noise or do anything else but could change paths.

When Question 15 on base officials' concern was eliminated, all large non-scale types were removed from one ADC base but others developed at the other ADC base, viz.

3-Can't change paths, or do anything else, but can make less noise.

4-Can't fly higher, make less noise or do anything else, but can change flight path.

When Question 16A - change flight path - is removed, two other non-scale types emerged.

5-Can't fly higher or make less noise but can do something else.

6-Can't fly higher or do something else but can make less noise. In order to follow up non-scale type 5, a listing was made of all things officials could also do. The things most frequently mentioned were to move the base, eliminate night flying, put mufflers on engines and change location of ground runup.

Obviously, the various questions which we attempted to arrange into a scale are independent of one another, and do not form a scale. Since they all do reflect the efforts of base officials to reduce neighborhood disturbances, it is reasonable to group the favorable answers into a simple index. Consequently, the person with the most favorable answers is assumed to feel the base officials are more considerate than the person with the least number of favorable answers.

Scale 10 - Base Importance

Starting with six items, it was necessary to eliminate three before an acceptable scale could be developed. Five of these questions are used in Index 11 and are described below. The very high reproducibility ratio in part is due to the few items used. It should also be noted that the scales used in the two ADC bases are not fully comparable to the scale used at the SAC base. The two scales are described in table 30 (App. D).

TABLE 30 (APP. D)
SCALE TYPE FOR SCALE 10 - BASE IMPORTANCE

Item	A. S. A. C. Base	Scale Type			Item	B A. D. C. Bases	Scale Type			
		2	1	0			3	2	1	0
Q. 29-Base good to have located here.....		X			Q. 11-Base has special importance to area....		X			
Q. 11-Base very important to prosperity.....		X	X		Q. 11-Base very important to prosperity.....		X	X		
					Q. 11-Job of base very important.....		X	X	X	

The scales were combined as follows:

Relative Importance	Scale Types	
	SAC	ADC
High	2	2-3
Moderate	1	1
Low	0	0

Index 11 - Base Importance

In order to utilize the answers to the following five questions on base importance, an index of favorable responses was also developed. As discussed above, three of these 5 questions were used in Scale 10, but the other two questions produced large non-scale types.

Question 11A In your opinion, how important is the job of this air base near here -- would you say it is one of the very most important, that it is fairly important, or that it is hardly important at all?

Question 11B. Do you feel that the Air Base here has some special importance to (name of area) or is it mainly important to the general defense of the country?

Question 11C. How about the prosperity of (name of area), do you think the amount of money spent by the Air Base is very important only moderately important, or hardly important at all to (name of area)?

Question 11D. If you were asked to pick the one activity most important to prosperity of (name of area), which of the following would you pick -- trade, farming, Air Base spending or manufacturing?

Question 31B. All in all, how would you describe the overall effect of having the Air Base here -- would you say it is entirely good for the people around here, it is a good thing, but it has some disadvantages, or that it is not such a good thing to have here?

Scale 12 - Readiness to Act

This is one of the most important and most reliable of the scales. As table 21 (App. D) shows, the reproducibility ratio is well above .90. This scale was used to illustrate the general principles of scale development and the scale types are shown in table 20 (App. D).

Scale 13 - Possibility of Successful Action

In developing Scale 12, it became apparent that underlying a Readiness to Act Now there was a general factor of belief in the possible success of complaining. Consequently, additional questions were added to the questionnaire used at A. D. C. bases. As table 21 (App. D) shows the scale measuring this factor has a very high reproducibility and reliability ($R = .96$ and $.97$). Table 31 (App. D) summarizes the scale types for this variable.

TABLE 31 (APP. D)

ITEM ORDER OF SCALE 13 - POSSIBILITY OF SUCCESSFUL ACTION

Item	Scale Type			
	3	2	1	0
Q. 17-Personal complaint de good.....	X			
Q. 21-Neighbor complaint de good.....	X	X		
Q. 23-Organizations complaint de good..	X	X	X	

Scale 14 - Image of Air Force Considerateness

This is the last of the scales used in the analysis. As discussed under Appendix A, it was felt that projective type questions about the Air Force in general might be more effective in recording attitudes about considerateness of Air Force personnel. Consequently, a five item scale with high reproducibility was developed. Table 32 (App. D) presents the scale types.

TABLE 32 (APP. D)

ITEM ORDER IN SCALE 14 - IMAGE OF AIR FORCE CONSIDERATENESS

Items in Q. 27 (ADC only)	Scale Types				
	5	4	3	2	1
Strongly disagree - AF is careless of feelings of civilians.....	X				
Strongly disagree - Major interest of AF is taxes.....	X	X			
Strongly disagree - AF doesn't care what civilians think.....	X	X	X		
Disagree - AF could pay more attention to complaints.....	X	X	X	X	
Agree - AF goes out of its way to reduce disturbance.....	X	X	X	X	X

MAIL QUESTIONNAIRE

I. Introduction

Two mail questionnaire studies were conducted as methodological tests of a short cut procedure. Both studies were under the active supervision of Daniel L. Camp, the Air Force task scientist. The first was conducted at the SAC air base without the assistance of NORC personnel, while the second was conducted by NORC staff at the West ADC base.

The objectives of the mail questionnaire approach were: a) to determine the feasibility of using a shorter and less expensive self-enumeration form to collect information on disturbance and annoyance, b) to compare such reports of disturbance obtained by a mail questionnaire with reports obtained by a personal interview, c) to supplement information obtained by personal interviews and facilitate statistical analysis by increasing the number of respondents.

Preliminary statistical tabulations are presented for the SAC study, and reports of the procedures and response rates are presented for the ADC study.

II. Procedures

A four-page mail questionnaire containing a number of questions on frequency of activity disturbance and overall annoyance was mailed to over 1400 homes in the vicinity of the SAC air base. The questions were similar but not identical with those used in the NORC interview study. About 600 questionnaires were sent to the NORC sample of homes, and approximately 600 were sent to another random sample in the same neighborhoods as the NORC sample but not included in the interview study. In addition, about 200 special sub-samples were selected to represent homes which refused NORC interviews, and those adjacent to NORC sample areas.

The questionnaires were mailed to residences rather than to designated individuals. In the case of NORC homes, however, the covering letter was addressed to an adult of the same sex previously interviewed by NORC. In other samples, the letters were randomly addressed to male and female residents.

Copies of the covering letter and questionnaire used in the ADC study are shown in tables 33 and 34 (App. E). These are practically identical with the forms used in the first SAC study. The first mailing in the SAC area was sent six weeks after the personal interviews were completed. About two weeks later, a follow-up letter urging cooperation was sent to those failing to return the questionnaire. At the ADC base, the procedures were similar except that only about a week or two had elapsed from the completion of the last interview. The sampling scheme

was also a little different. Neighborhood 1 was a 50% random sample (400) of the NORC respondents and an equal number of non-NORC homes (400) in the same neighborhoods. Neighborhoods 2-9 were selected along the landing and take off flight paths farther away from the air base. Because of the limitations of funds, no personal interviews could be conducted at these distant areas. As table 35 (App. E) shows all of the returns from Neighborhood 1 were accidentally lost in the mail. Consequently, no matched comparisons between NORC and mail respondents can be made for the ADC base.

TABLE 34 (APP. E)

CN FORM PT 2A

MAIL QUESTIONNAIRE

JUNE 1957

Office for Social Science Programs
AIR RESEARCH AND DEVELOPMENT COMMAND
Randolph Air Force Base, Texas

This survey is being conducted as a part of an Air Force-wide study of military aircraft noise. We are asking men and women about aircraft noise conditions at a number of different locations in several communities. The information is to be used for engineering research purposes.

INSTRUCTIONS

WHO IS TO ANSWER THE QUESTIONNAIRE:

We ask that this questionnaire be filled out by an adult man. If no man over 17 years of age is present or available in your household right now, we request that it be filled out by an adult woman.

In either case, we ask that it be answered only by someone living in your home.

WHAT WE WANT YOU TO DO.

Please read the questions carefully and answer them frankly. Most of them can be answered by merely making check marks in the space provided.

When you have filled out the form, soon after you receive it, please seal and mail it in the inclosed stamped, addressed envelope.

1. How frequently would you say that military aircraft of any kind fly within hearing distance of your residence?

☐ Almost continuously all day
☐ Many times a day
☐ A few times a day
☐ Once or twice a day, or less
☐ Not sure, or can't say

2. Can the noise made by military aircraft engines warming up or running on the ground be heard noticeably at your residence?

☐ No
☐ Yes, frequently
☐ Yes, occasionally
☐ No sure, or can't say

3. How often do you personally hear military aircraft noise of any kind at your present residence?

☐ Very often
☐ Fairly often
☐ Only occasionally
☐ Never, or almost never

IF YOU HEAR MILITARY AIRCRAFT NOISE AT YOUR HOME, PLEASE ANSWER ALL OF THE REMAINING QUESTIONS. IF YOU ALMOST NEVER HEAR IT, PLEASE SKIP TO QUESTION 7.

4. a. Is the military aircraft activity ever so close or so loud as to seem to make your house vibrate or shake?

☐ Very often
☐ Fairly often
☐ Only occasionally
☐ Never, or almost never

- b. Does it ever make your television picture flicker or distort the picture in any other way?

☐ Very often
☐ Fairly often
☐ Only occasionally
☐ Never, or almost never
☐ Don't have a TV in my home

- c. Does it ever interfere with talking on the telephone, or with normal conversation in your home?

☐ Very often
☐ Fairly often
☐ Only occasionally
☐ Never, or almost never

- d. Does it ever wake you up, or keep you from going to sleep?

☐ Very often
☐ Fairly often
☐ Only occasionally
☐ Never, or almost never

- e. Does it ever disturb your rest or relaxation in other ways?

☐ Very often
☐ Fairly often
☐ Only occasionally
☐ Never, or almost never

- f. Does it ever frighten or startle you?

☐ Very often
☐ Fairly often
☐ Only occasionally
☐ Never, or almost never

- g. Does it ever frighten or startle anyone else in your household?

☐ Very often
☐ Fairly often
☐ Only occasionally
☐ Never, or almost never

- h. Is there any other way in which military aircraft noise causes interference or bother for you or the members of your household?

☐ No, none I can recall
☐ Yes
☐ If yes, in what way?

5. How annoying altogether would you say the disturbance created by the military aircraft activity is to you personally?

☐ Very annoying to me
☐ Fairly annoying to me
☐ Just slightly annoying to me
☐ Not at all annoying to me

6. Insofar as you know, do any of the other members of your household find the disturbance to be either fairly annoying or very annoying?

☐ No
☐ Yes
☐ Can't say
☐ No one else lives in household

8. Please write in:

- a. The approximate length of time you have lived in your present home:

_____ (years)

- b. Your age:

_____ (years)

9. a. Is anyone living in your household a member of the military service on duty at the present time?

☐ No
☐ Yes
☐ If yes, which service?
☐ Army
☐ Navy
☐ Air Force
☐ Other

- b. Does anyone in your household work for the military service in a civilian capacity?

☐ Yes
☐ No

10. If you have additional comments you would like to make about military aircraft noise or disturbance, please write them on the other side of this page.

LETTER OF 10 JUNE 1957 ACCOMPANYING MAIL QUESTIONNAIRE

June 10, 1957

Dear Madam:

We are asking you and a number of other residents in this area to answer the inclosed brief questionnaire to help us supplement engineering studies of aircraft noise.

The purpose is to assist scientists in their efforts to develop engineering means of controlling aircraft disturbance to whatever extent is compatible with the successful conduct of our air defense mission.

The households we are asking to take part in the survey have been carefully selected on the basis of the physical relationship of the residence to the airbase. For this reason, it is important that every household contacted provide the requested information. The questionnaire has been kept as short as possible. It should take no more than five minutes of your time.

The reports you give will be combined with those obtained from residents at other locations and analyzed statistically. This information will then be combined with similar information obtained at other airbases. We don't ask you to sign your name. For our purpose we need to know only your neighborhood location, which has already been recorded on the form.

Please read the instructions carefully and answer the questions honestly and frankly.

Thank you for your cooperation.

Sincerely yours,

(Commander of local air base)

We have not yet received a completed copy of the inclosed questionnaire from your household.

If you have already mailed your copy, or plan to do so within the next two or three days, please ignore this letter.

If you did not receive a questionnaire, or if it has been misplaced or destroyed, please fill in the inclosed duplicate copy, and mail it in the attached, addressed envelope.

Thank you.

Daniel L. Camp
Project Officer

III. Response Rates

Almost 80% of all respondents returned usable questionnaires in the SAC area, but only 64% cooperated in the ADC study. If the number of questionnaires which were returned unopened because of incorrect addresses are subtracted from the SAC mailing, then the response rate is raised to about 82%. Table 35 (App. E) shows the response rates for both areas.

TABLE 35 (APP. E)

RESPONSE RATES FOR MAIL QUESTIONNAIRE STUDIES

Air Base	Neighborhood	Number of Questionnaires Returned	Percent Returned
SAC	1	172	91%
	2	105	90
	3	104	86
	4	140	75
	5	129	77
	7	150	78
	Special	132	81
	Total	1092	82%
ADC	1	---	--
	2	81	56
	3	93	61
	4	86	60
	5	85	57
	6	89	61
	7	112	77
	8	115	74
	9	90	62
	Total	751	64%

There were no significant differences in answers obtained from NORC respondents and other persons in the same areas. This clearly indicates no increase in reports of disturbance as a result of the interview experience. Table 36 (App. E) indicates some selected comparisons of answers.

It is quite significant, however, that the responses on the mail questionnaires were considerably greater than on the personal interview. These differences were not uniform by type of disturbance or type of neighborhood. Table 37 (App. E) illustrates these differences for reports of speech disturbance. As can be seen the mail responses of "Very often" range from 8% greater in Neighborhood 7 to 35% greater in Neighborhood 1. Likewise answers of "fairly often" differ from -4% to 15%. Table 38 (App. E) combines reports of very often and fairly often and compares reports of disturbances obtained by mail and personal interview. Finally, table 39 (App. E) combines all reports of disturbance into one category and compares mail and interview responses.

TABLE 36 (APP. E)
PERCENT OF HOUSEHOLDS PREVIOUSLY INTERVIEWED AND
NOT PREVIOUSLY INTERVIEWED THAT REPORTED
AIRCRAFT NOISE AND DISTURBANCE IN RESPONSE TO THE
MAIL QUESTIONNAIRE SURVEY

Reports	Households Previously Interviewed (486)	Households Not Previously Interviewed (474)
Say frequently hear ground engine run-ups	15%	19%
Say very often hear aircraft noise of all sorts	60	59
Say AC activity very often shakes house	33	40
Say AC activity very often distorts TV picture	32	37
Say AC activity very often interferes with speech communication	43	46
Say AC activity very often disturbs own sleep	19	26
Say AC activity very often disturbs sleep of others	17	21
Say AC activity very often frightens or disturbs (self)	11	15
Say AC activity very often frightens or disturbs (others)	13	17
Say consider AC activity to be fairly or very annoying to self .	53	58
Say consider AC activity to be fairly or very annoying to others	58	61

As the detailed analyses of the interview materials show, attitudes of fear, base importance, base considerateness, general satisfaction with area and other variables account for considerable variations in reports of disturbances. Consequently, it isn't surprising that the mail questionnaires which cannot be expected to gather data on these complex psychological variables, also show irregular variability.

TABLE 37 (APP. E)

REPORTS OF SPEECH DISTURBANCE OBTAINED ON MAIL SURVEY
AND PERSONAL INTERVIEW AT AN S.A.C. AIR BASE

Neighborhood	Frequency of Disturbance								
	Very Often			Fairly Often			Total Often		
	Mail	Interview	Difference	Mail	Interview	Difference	Mail	Interview	Difference
1	75%	40%	35%	20%	24%	-4%	95%	64%	31%
2	58	29	29	26	13	13	83	42	41
3	47	10	37	30	27	3	77	37	40
4	38	13	25	35	20	15	73	33	40
5	23	5	18	29	17	12	62	22	40
7	13	5	8	20	5	15	33	10	23

TABLE 38 (APP. E)

COMPARISON OF DISTURBANCES OCCURRING "OFTEN"
ON MAIL SURVEY AND PERSONAL INTERVIEW AT
AN S.A.C. AIR BASE

Neighborhood	Frequency of Disturbance									Speech				Listening			Sleep			Vibrations			TV Picture		
	Very Often			Fairly Often			Total Often																		
	Mail	Interview	Difference	Mail	Interview	Difference	Mail	Interview	Difference	Neigh- bor- hood	Mail	Interview	Difference	Mail	Interview	Difference	Mail	Interview	Difference	Mail	Interview	Difference	Mail	Interview	Difference
1	75%	40%	35%	20%	24%	-4%	95%	64%	31%	2	83	42	41	95	64	29%	71%	41%	32%	91%	55%	36%	83%	62%	21%
2	58	29	29	26	13	13	83	42	41	3	77	37	40	80	36	44	32	15	17	63	29	34	62	43	19
3	47	10	37	30	27	3	77	37	40	4	73	33	40	73	27	46	44	22	22	57	22	35	51	29	22
4	38	13	25	35	20	15	73	33	40	5	67	22	45	51	13	38	25	6	19	44	3	41	26	8	18
5	23	5	18	29	17	12	62	22	40	7	33	10	23	39	11	28	29	5	24	30	5	25	46	28	18
7	13	5	8	20	5	5	33	10	23																

TABLE 39 (APP. E)

COMPARISON OF DISTURBANCES REPORTED "OCCASIONALLY"
OR "OFTEN" ON MAIL SURVEY AND PERSONAL INTERVIEW
AT A S.A.C. AIR BASE

Neigh- bor- hood	Speech			Listening			Sleep			Vibrations			TV Picture		
	Mail	Interview	Difference	Mail	Interview	Difference	Mail	Interview	Difference	Mail	Interview	Difference	Mail	Interview	Difference
1	99%	86%	13%	100%	83%	17%	98%	74%	23%	100%	79%	21%	90%	85%	5%
2	97	77	20	97	80	17	86	61	25	90	61	29	87	74	13
3	90	75	15	97	69	28	80	31	49	97	63	34	90	72	18
4	94	74	20	95	72	23	81	50	31	91	55	36	55	63	-8
5	90	67	23	89	64	25	68	36	32	86	43	43	53	46	7
7	74	42	32	81	45	36	74	35	39	78	36	42	75	73	2

The general tendency for the mail questionnaires to show greater disturbance is probably due to the sponsorship of the study by the Air Force. In the covering letter of introduction, the base commander indicates that the study will be used to "assist scientists in their efforts to develop engineering means of controlling aircraft disturbances . . ." It is likely, therefore, that respondents exaggerated their reported disturbances in order to influence remedial action by the base.

Since it is expected that the development of valid analytical models will eliminate the necessity for obtaining detailed disturbance data for each air base, the necessity for developing a shortcut mail questionnaire is also less urgent. Consequently, it is our judgment that further efforts not be made to develop the inadequate mail questionnaire approach.

APPENDIX F

GLOSSARY

A number of terms used in this report to describe the physical characteristics of the airplane stimulus and the socio-psychological factors affecting human reactions to it are described below. More detailed descriptions of the various terms can generally be found in the text of the report itself.

Aircraft Sampled Noise Level (Aircraft SNL). This number provides a measure of the noise level on the ground for aircraft flying overhead. It is computed in two steps. The sound pressure levels that are exceeded by 25 percent of the aircraft in the 75-150, 300-600 and 1200-2400 cps frequency bands are determined, and an arithmetic average of these three levels in decibels is computed.

Air Base Area. All populated communities within a radius of 15 miles of a major air base are included in the airport area.

Annoyance Reactions (responses). These are the negative feelings of annoyance, bother, disturbance, dislike or discomfort in response to a given stimulus situation. These feelings may be openly expressed or covertly experienced; they may be conscious or unconscious.

Background Sampled Noise Level (Background or Ambient SNL). This number provides a measure of the background noise for a sampling sub-area. It is computed in two steps. An intensity average is determined for the background noise in the 75-150, 300-600, and 1200-2400 cps frequency bands, and an arithmetic average of the decibel levels in these bands is computed.

Complaint Reactions (Behavior). When feelings of annoyance are expressed to other people as a grievance, they are usually considered complaints. They may be stated to a member of the family, to a neighbor, or to the authorities who are responsible for the stimulus situation. The forms of complaint are varied and include conversations, letters, telephone calls, telegrams, petitions, personal visits, etc. In this study only expressions of annoyance conveyed to the authorities were considered as formal complaints.

Decibel (db). The decibel is a unit that is used to express relative sound pressure or relative sound intensity. The sound pressure level (SPL) in decibels is a measure of the sound pressure relative to a reference sound pressure of 0.0002 dyne/cm. The SPL is given by the formula

$$SPL = 20 \log_{10} \frac{P}{0.0002} \text{ db re } 0.0002 \text{ dyne/cm}^2.$$

Demographic. This term refers to such personal and social characteristics of the population as race, age, sex, education, family status, income, occupation, and group membership.

Direct Question. This question clearly states the factors about which an opinion or statement is requested. For example: "When the planes do pass here do they ever fly very low?" bluntly asks about the perceived altitude of planes passing overhead.

Duration of Peak. Length of time in seconds that the SPL for a peak in noise level (usually from a take-off or flyover) is within 5 decibels of the maximum SPL.

Free-Answer Question. (open, non-directive). The question is so phrased that the respondent must frame his own answer and the interviewer must write down the exact words used by the respondent in his reply. Usually the interviewer continues to question the respondent until a detailed answer is given. For example: "How do you feel about living here?" is a neutral question which requires the respondent to formulate in his own terms his feelings about his neighborhood.

Indirect Question. The general scope of a problem is stated but the specific aspects are not stated. These must be supplied by the respondent. For example: "What kinds of noise do you hear around here?" indicates an interest about noises, but does not mention whether the interviewer is concerned about airplane, traffic, industrial, or human noise. It is a direct question about noise, but an indirect one about any specific source of noise.

Leg. Equivalent continuous SPL in 300-600 cps octave band.

Precoded Questions. The question itself presents a choice of alternative answers and the interviewer circles the code number corresponding to the person's opinion. For example: "Well, in general, how do you like living in this part of (name of city or county) -- would you say you like it very much, that you like it a little, or that you don't like it?" The respondent is requested merely to choose one of the three precoded alternatives which are underlined above.

Projective type question. The objective of this type of question is not to enlist a substantive response to a specific question but rather to secure if possible an expression of a respondent's underlying feelings or attitudes. Usually a vague and ambiguous stimulus (series of words, phrases, pictures, etc.) is presented and the respondent is asked to describe or explain his immediate reaction to the stimulus. How he interprets the stimulus situation and how he reacts to it are considered indirect expressions of his basic attitudes and opinions. For example, a respondent is asked to complete a series of general phrases such as, "On Sunday I like to; Airplanes are". The words which he spontaneously chooses to complete these phrases are frequently believed to reflect basic psychological characteristics of the respondent.

Sampling Area. A group of adjacent city blocks or a contiguous rural area in which the aircraft stimulus is considered fairly homogeneous. For the sampling areas less than 2 miles from the end of a runway, the radius of the sampling area is 1/4 mile; at 4-6 miles, it is 1/2 mile; and at 10-12 miles, it is 1 mile.

Sampling Sub-Area. Within each sampling area there are clusters of blocks or sub-areas from which individual assignments of 5 interviews were made. The sub-area was the smallest sampling unit from which the respondents were selected and interviewed.

Speech Interference Level. The average in decibels of SPL's in the 600-1200, 1200-2400, and 2400-4800 cps octave bands. The speech interference level can be directly related to the degree with which intruding noise affects speech communication.

SIL. Speech Interference Level.

SPL. Sound pressure level in decibels are 0.0002 ubar.

Statistically Significant. The probability that a finding could have been reported by chance in only 5 cases out of 100. Tests used included the Chi-square tests of differences between attributes, binomial distributions with 95% confidence intervals, and "F" tests of mean differences (probability .05).

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National Opinion Research Center, University of Chicago, Chicago, Illinois
COMMUNITY REACTIONS TO AIR FORCE NOISE, Part II. Data on Community Studies and Their Interpretation, by Paul N. Borsky March 1961. 199 pp. incl. illus. (Proj. 7210; Task 77444)

(Contr AF41(657)-79) Unclassified report

To determine preliminary relationships between variations in acoustic situations and disturbance, annoyance, and complaint potentials, personal interviews were held with almost 2500 residents at different air bases. The detailed acoustic conditions at three of these bases were measured. From these studies, the instruments and procedures for assessing neighborhood reactions

(over)

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