COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITY AREA

Volume I: Major Findings

PAUL N. BORSKY

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COMMUNITY REACTIONS TO SONIC BOOMS

Oklahoma City Area

February-July 1964

Part 1. Major Findings

by

Paul N. Borsky
Senior Study Director

NATIONAL OPINION RESEARCH CENTER
University of Chicago

55 Fifth Avenue
New York 10003

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I. SUMMARY

A. Research Approach

Community reactions to sonic booms will influence the operating characteristics of commercial supersonic aircraft (SST). The planning of SST flight profiles, schedules, and routes over land will depend in part on the extent to which the general public accepts sonic booms resulting from such flights. The National Government's recognition of this problem and its desire to have the SST operate in a manner generally acceptable to the public interest has led to various sonic boom research programs. Among these programs was the Oklahoma City sonic boom study in which the community was repeatedly exposed to a simulated schedule of SST overflights and the reactions of the public to the sonic booms were ascertained.

A total of 1253 sonic booms were actually generated in the Oklahoma City area over a period of six months, from February to July 1964. The intensity of the booms was scheduled for 1.5 pounds per square foot (PSF) for most of the study and for 2.0 PSF during the latter stage. Atmospheric conditions and other practical problems, however, tended to reduce somewhat the actual average intensities of the booms under the flight track to 1.13 PSF during the first 11 weeks, 1.23 PSF during the next eight weeks and to 1.60 PSF during the final seven weeks of the program.

Almost 3000 adults representing a scientifically selected cross section of local residents were personally interviewed three times during the six months period to determine their reactions to the sonic booms. In addition, careful records were kept of all complaints received by the local Federal Aviation Agency representatives. The analyses of these representative interviews and local records are included in this report.

B. Reported Overall Reactions to Sonic Booms in Oklahoma City Area

Substantial numbers of residents reported interferences with ordinary living activities and annoyance with such interruptions, but the overwhelming majority felt they could learn to live with the numbers and kinds of booms experienced during the six month study.

1. Interference with Ordinary Living Activities

Some interferences or interruptions of ordinary living activities, principally house rattles and vibrations, were reported by almost all respondents. Startle and fear of booms were next in importance, being mentioned by 40% of all close residents and 30% of the more distant ones. Sleep, rest and conversation interference were mentioned by 10-15% of the close residents and about 5% of the distant residents during most of the program.

2. Annoyance with Sonic Booms

Serious or "more than a little" annoyance with sonic booms was generally reported by a minority of the residents during the first and second interviews, but increased to a slight majority by the end of the six months program.

After the first 11 weeks when the median boom level was 1.13 PSF, only 37% reported serious annoyance. This increased to 44% annoyed when the boom level rose to 1.23 PSF and to 56% annoyed when the booms averaged 1.60 PSF. This rise in annoyance over time is believed due primarily to the increase in the intensity of the sonic booms, but part of it also may be due to greater annoyance with continued exposure.

3. Desires to Complain and Actual Complaints About Sonic Booms

About half of all persons seriously annoyed with the sonic booms also felt like complaining to the authorities. Only a small fraction of these actually followed through and contacted the F.A.A. During the first interview, desires to complain about the booms were reported by only 16% of all residents. This number increased to 23% during the second period and remained at 22% during the final interview. Even fewer, less than 5% of all residents, actually called the F.A.A. office during the entire six month period. Thus, only one in every twelve annoyed persons actually expressed their feelings to the F.A.A. complaint center.

This relatively low complaint level in Oklahoma City was due primarily to three factors. First, there was widespread ignorance about where to complain; 70% of all respondents expressed such ignorance in the interview. Second, there was a general feeling of futility in the usefulness of complaining; only 4% felt there was a "very good" chance of doing something about the booms, and another 10% felt there was even a "good" chance to do something. Third, the general pattern of complaining about local problems was low in Oklahoma City; only about a fourth of all people felt like complaining about a serious local problem when they had one.

4. Long Range Acceptability of Sonic Booms

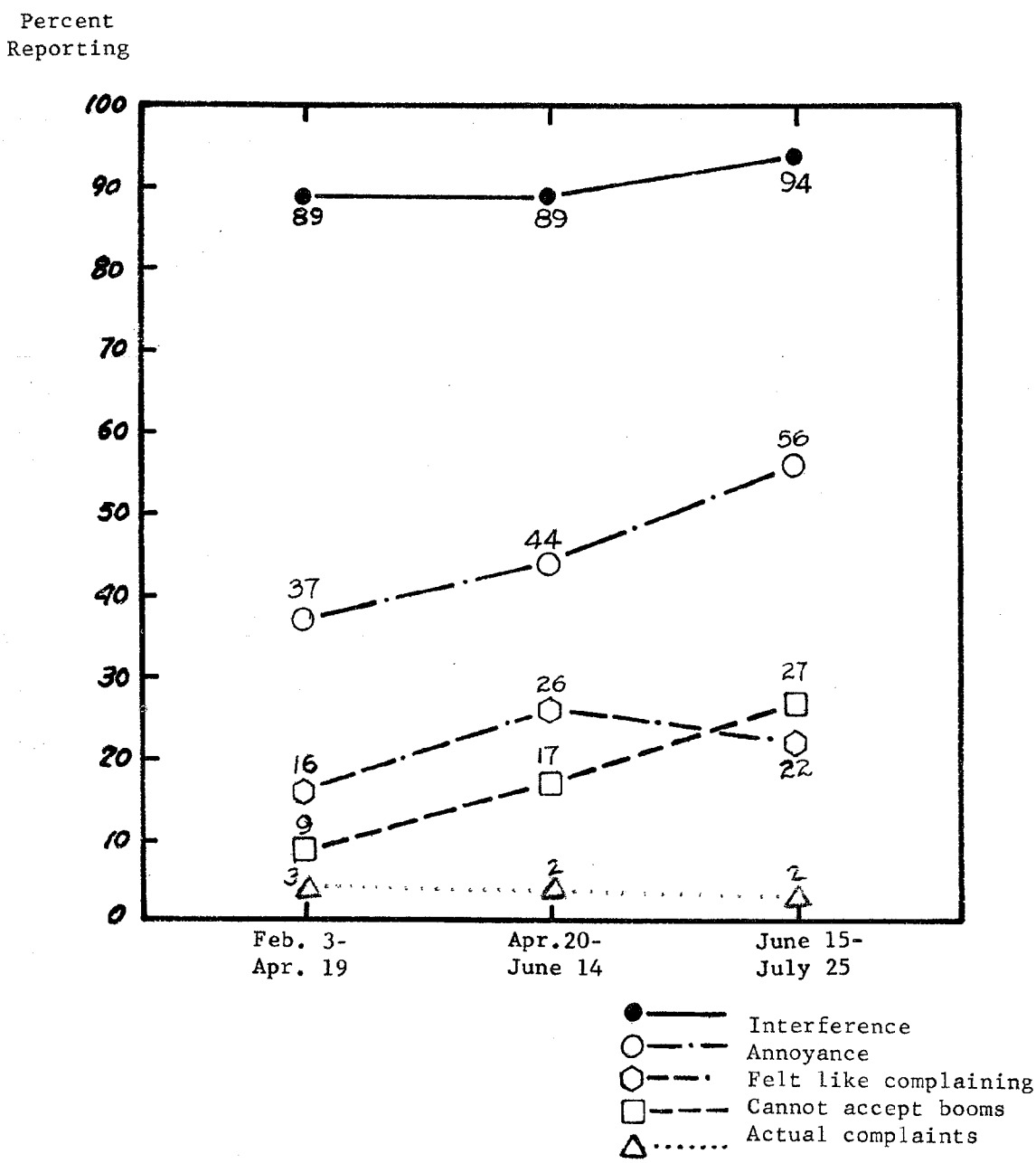
Respondents were asked to evaluate their own six month experience with the sonic booms and to report whether or not they felt they could learn to live with eight booms a day for an indefinite period. The overwhelming majority felt they could accept the booms under these conditions. During the first 11 weeks of the study, over 90% felt they could accept the eight daily booms. This number dropped to 81% during the following eight weeks and to 73% during the final seven weeks of the study. At the end of six months, about one-fourth of all people felt they could not learn to accept the booms.

Table 1 graphically summarizes the above major public reactions to the sonic booms.

Table 1

OVERALL REACTIONS TO SONIC BOOMS

Oklahoma City Area
February-July 1964



C. The Expected Range in Public Reactions to Sonic Booms

The range in reactions to sonic booms found among different types of residents in Oklahoma City offers guide lines on what kinds of reaction could be expected throughout the United States. Three different basic attitudes have been found to effect greatly the willingness of people to accept or reject sonic booms. When these attitudes are favorable, they tend to create maximum acceptability of booms, while the presence of opposite or unfavorable attitudes produces what might be considered a minimum acceptability level. Most areas in the U.S. would fall somewhere in between the two extremes depending on the particular combination of favorable and unfavorable attitudes in a specific community.

The three favorable attitudes are:

a) Belief that the SST is absolutely essential to the welfare of the United States.

b) Belief that sonic booms are unavoidable and are necessary locally.

c) Belief that sonic booms do not cause damage to persons and property.

The effects of these attitudes on reactions of Oklahoma City residents to sonic booms are shown below.

1. Range in Annoyance Reactions to Sonic Booms

Annoyance was reported by only 13% of all persons holding the most favorable attitudes during the first interview. This increased as the intensity of the boom increased to 26% annoyed during the second interview and remained at 25% annoyed at the end of the study. This is considered the minimum annoyance reaction that could be expected since it is reported by those persons holding the most favorable attitudes. In contrast, annoyance was reported by 57% of those persons with the least favorable attitudes during the first period, about the same during the second period, and a maximum of 76% reported annoyance at the end of six months.

Thus, at the end of the study, annoyance ranged from a minimum of 25% to a a maximum of 76%.

2. Range in Reported Desires to Complain and Actual Complaints About Sonic Booms

Practically none of the persons with the most favorable attitudes toward booms wanted to or actually did complain. Only 2% felt like complaining during the first period, 5% during the second period and 4% during the final interview. In contrast, those persons with the most unfavorable attitudes report that 34% wanted to complain during the first interview, 39% during the second and 37% during the final interview. The number actually complaining ranged from just over 1% for the most favorable to 11% for the least favorable attitude groups. The range in desires to complain at the end of the six months extended from a minimum of 4% to a maximum of 37%.

3. Range in Reported Long Range Acceptability of Sonic Booms

After six months exposure, over 90% of all persons with the most favorable attitudes felt they could accept eight daily booms indefinitely. Acceptability was 99% during the first interview, but this dropped to 94% during the second phase and finally leveled at 92% at the end of the study. The importance of these basic sonic boom attitude differences is most dramatically revealed in the reports of those with the least favorable attitudes. Only 78% felt they could accept the booms at the time of the first interview. This acceptability dropped sharply to 62% at the second period and fell further to 57% at the end of this program.

Thus, the maximum acceptability of booms was 92% and the minimum acceptability was only 57% at the end of the study.

D. Other Related Findings

1. General Factors Affecting Complaints in Oklahoma City

Residents of Oklahoma City have a very high attachment and satisfaction with their community. Only 3% report they dislike "many things" in their local areas, and 80% rate their area as an "excellent" or "good" place to live. This high satisfaction is coupled with general reluctance to complain about local problems. Only 28% of all residents felt there was a serious local problem and wanted to do something about the problem. Even fewer, only 10% said they actually wrote or telephoned an official about it. This local apathy may be due largely to feelings of futility in complaining. Only 12% felt complaining had even a "good" chance of accomplishing something.

2. Importance of Aviation to Oklahoma City

Almost a third of all Oklahoma City residents have had personal or family connections with the aviation industry. This extreme economic importance of local aviation is recognized by over 75% of all residents. It is this general recognition of the important role of local aviation which contributed to the generally favorable attitudes toward the SST development and, thus, to the reported acceptance of local sonic booms. Whether or not residents had direct ties with the aviation industry did not appear to bias their reactions to sonic booms. About the same proportions of those with and without direct ties felt it was proper to complain about booms if annoyed, that the SST was important and that local booms were unavoidable and necessary.

3. Importance of Belief that Sonic Booms Cause Damage

Direct scientific evidence indicates that the Oklahoma City booms did not cause any significant damage to the local test houses, which were instrumented by the FAA to measure physical effects of booms. Large numbers of residents, however, felt their houses had been damaged. Over 40% overall felt this way, while 50% of the annoyed and 86% of the actual complainers also felt this way. This clearly suggests that belief in alleged damage increased annoyance and complaint activity.

4. General Reliability of Interview Responses

All indications are that responses in this study are highly reliable. Most residents had heard or read about the general FAA boom study, but only 5% knew about the NORC personal interviews. Such a small number of knowledgeable persons could not greatly bias the overall findings. Independent samples of respondents, moreover, selected scientifically from Oklahoma City residents during each interview period, likewise revealed no significant differences in reactions to sonic booms. Finally, residents living in different communities and experiencing comparable boom intensities reported almost identical annoyance levels. The above and other technical tests give confidence in the reliability of the survey data.

5. Relation of Distance from SST Flight Track and Reactions to Sonic Boom

Most annoyance, reports of damage, desires to complain and actual complaints were reported by the closest residents living 0-8 miles from flight track. Residents in the middle distance group (8-12 miles) were next in order, followed by the most distant residents (12-16 miles away) who reported the least reaction to the sonic booms.

6. Reactions of Urban and Rural Populations

No significant differences in reaction to booms were found between urban and rural residents in the Oklahoma City area.

7. Effects of Night Booms on Community Reactions

No direct evaluation of this factor can be made since no night booms were generated during the study. Sleep interference reported by daytime sleepers, however, indicates that greater annoyance may be associated with sleep interference. Further study of night booms should determine whether annoyance with such booms also increases hostile reaction to daytime booms.

II. INTRODUCTION

Purpose of study: Community reactions to sonic booms will have an influence on operating characteristics of commercial supersonic aircraft, particularly for planning flight profiles, schedules, and route structures over land. The National Government's recognition of this problem and its interest in operating the SST in a manner acceptable to the general public has led to various sonic boom research programs. Among these programs was the Oklahoma City sonic boom study designed to provide a measure of the degree of community acceptance of sonic booms of varying intensities and to provide additional information which might assist SST managers and operators in making decisions regarding commercial supersonic operations.

Selection of test site: The metropolitan area of Oklahoma City, Oklahoma, was selected for study of community reactions to sonic booms because of many features favorable to such a study. Among them were some previous sonic boom experience, military and civilian propeller and jet operations, no irregular topographic features, structures and buildings of various types and ages, test aircraft staging area, as well as other technical characteristics considered necessary for the accomplishment of the program.

Flight schedule: The overall study program provided for a carefully simulated SST flight operation. Eight supersonic flights per day, during a six month period, were flown regularly during the morning and early afternoon over a predetermined flight track. The sonic booms thus generated were programmed at a given intensity by controlling the operations of the aircraft. The actual intensity or overpressure level of the boom was measured by engineers at various locations on the ground.

The flight track was established to cross densely populated areas, both urban and rural, both newly developed and established communities. Since the calculated overpressures diminish as a function of lateral distance from the flight track, the populated areas were stratified so that three different boom stimulus groups would be obtained. The boom intensities were approximately equal within each distance group.

Features of Boom Test: The full study program included the establishment of an FAA complaint center to receive any public responses, complaints or reports of damage, the evaluation by engineers of any alleged damage, and the instrumentation of test structures in the area and their controlled observation of any boom damage by engineers. The program also provided a public information program designed to explain the purposes of the study and the characteristics of sonic booms.

Sample Design: A representative sample of adult residents from all communities was selected from each of the three distance groups, up to 8 miles from flight track, from 8-12 miles and from 12-16 miles from flight or ground track. These same adult respondents were personally interviewed three times during the six month period. The first interview occurred after 11 weeks of boom exposure, the second after eight more weeks of booming and the last after six more weeks of booms.

Interview design: The interview did not at any time reveal the purpose of the study but was described as a broad community survey of how people felt about living in their areas. Questions about overall attitudes toward all kinds of local problems were included as well as specific probes about knowledge, beliefs, attitudes and reactions to the sonic boom exposures. Since the boom study was widely publicized, the respondent usually mentioned it voluntarily before direct questions were asked about it.

Organization of NORC report: This report will be structured primarily around the following four types of operationally defined community reactions:

1) Interference or the extent to which booms are reported as interfering with selected living activities.

2) Annoyance or the extent to which feelings of annoyance result from these interferences.

3) Complaints or the extent to which people feel like and actually do complain about the booms.

4) Long range acceptance or the extent to which people feel they can accept sonic booms over an indefinite period of time.

All of these reactions will be related to the measured differences in overpressure levels as determined by the distance of each resident's dewelling from the ground track of the sonic boom flight.

This report is the first of two documents which will comprise the NORC Final Report. It contains only the major findings of the study. The second document, to be available in the near future, will be much more detailed and complete.

III. CHARACTERISTICS OF THE ACTUAL SONIC BOOM EXPOSURES

Scheduled overpressures: During the first three weeks of the sonic boom study, the scheduled overpressure was increased gradually from 1.0 to 1.5 pounds per square foot (PSF), and from one per day to eight per day. From the fourth week to about the nineteenth week, this schedule of eight 1.5 PSF booms was maintained. During the last seven weeks of the study the scheduled overpressure was increased to 2.0 PSF, but the frequency was kept at eight per day. Table 2 presents a summary of actual measurements of sonic boom levels. The generally lower than calculated overpressure levels were due to atmospheric effects and other operational factors.

Actual overpressures first 11 weeks: During the first 11 weeks of the program, half of the booms measured only 1.13 PSF or less at the closest areas, up to 8 miles from ground track. Only 16% of the booms measured as much as the scheduled level of 1.5 PSF, and only 2% measured as much as 2 PSF or more. Dwellings 8-12 miles distant from the ground track and those 12-16 miles away experienced somewhat lower overpressure levels. The middle distance area had 50% of its booms at only 0.8 PSF or less, while the distant area reported half at 0.65 PSF or less.

Actual overpressures remainder of study: During the second time period (April 20-June 14) the actual overpressure levels were increased a little so the median values rose to 1.23 PSF for the 0-8 mile group, 1.10 for the middle group and .85 for the distant group. During this period only 3 out of 10 booms reached the scheduled 1.5 PSF at the closest areas. Only during the third phase of the study did the actual boom level in the close areas reach 1.5 PSF in 60% of the occurrences, while the scheduled 2.0 PSF was achieved in only 22% of the time.

It is interesting to note that the actual boom level for the closest areas during the first period is about equal to the level of the second distance group in the second time period and the third distance group during the third time period. As we shall see in Table 6, annoyance reactions were almost equal during these comparable boom stimulus exposures. This gives confidence to the reliability of the interview reports.

Table 2

ACTUAL MEASUREMENTS OF SONIC BOOM OVERPRESSURES
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

A. Median Overpressures

Time Period	No. Weeks	Miles from Ground Track: 0-8 Overpressure (PSF)	8-12 Overpressure (PSF)	12-16 Overpressure (PSF)
Feb. 3-April 19	11	1.13	0.80	0.65
April 20-June 14	8	1.23	1.10	0.85
June 15-July 25	6	1.60	1.35	1.00

B. Frequency of Occurrence of Programmed Overpressure Levels (PSF)

Time Period	Weeks	Miles from Ground Track: 0-8 1.5(PSF)	0-8 2.0(PSF)	8-12 1.5(PSF)	8-12 2.0(PSF)	12-16 1.5(PSF)	12-16 2.0(PSF)
Feb. 3-Apr. 19	11	16%	2%	6%	1%	2%	0%
April 20-June 14	8	30	9	25	8	10	2
June 15-July 25	6	60	22	40	15	21	7

IV. PERSONAL INTERVIEW FINDINGS

A. Number and Type of Interviews

Completed Interviews: The actual number of interviews completed in this study is summarized in Table 3. Almost 3000 adults were interviewed in all three time periods. About 300 persons who were interviewed in the first period were away, moved or could not be reached during the second or third time periods. Very few actually refused to be interviewed. An analysis of the initial responses of these 283 incomplete interviews reveals no significant differences from the answers of the 2852 complete interviews, indicating that very little bias was introduced by failure to secure these missing interviews.

Face-to-face and telephone interviews: It will also be noted that 745 of the first interviews were conducted by telephone and 2390 face-to-face. A careful comparison of answers by these two groups indicates no significant differences in response. Consequently, these two groups are merged in the tables that follow.

Urban-rural interviews: It is also of interest that a systematic study of answers by comparable urban and rural residents reveals no significant differences with regard to the sonic boom reactions. Consequently, these groups are also combined for the summary presentation of findings.

Control over bias in repeated interviewing: During the second and third interview periods different independent random samples of about 200 adults were interviewed each time to test for possible interview effects. The fact that each respondent had already been interviewed could affect his second and third interview responses. A careful comparison of answers reveals no significant differences between the regular sample and the special control samples, thus further supporting our confidence in the regular survey findings.

Importance of public information: One other characteristic about the sample of respondents is important for consideration before findings are presented. Extensive local and national publicity openly stressed that the sonic booms were part of a test of human tolerance of the booms. It was further emphasized that a major consideration in whether the government would support the continued development of an SST was whether the local population indicated it could accept the booms. Soon after the start of the booms, some groups organized to stop the booms and to encourage complaints, while others urged acceptance of the booms and sought to discourage complaints.

Controlling for possible bias: It has been found in other research that when respondents are aware of the purposes of the interview and feel that their answers may affect some administrative actions in which they have a personal interest, there is the possibility that answers will be slanted by the respondents to achieve the desired administrative actions. Since the object of this research was not to measure the biases of Oklahoma City residents per se, but to try to use their answers as representative of other communities in the United States, a special effort was made to measure and control for these possible biases. Special questions were included in the interviews to measure the extent to which respondents actually were aware of the purposes of the sonic

booms, had heard of the NORC study, were connected with the FAA or the aviation industry, and whether or not they felt people should complain about the booms if they were annoyed by them.

Heard of purposes: Almost 70% of all residents said they were aware of the purposes of the sonic boom tests at the time of the first interview. This knowledge did result in initially reported higher acceptance of the booms, but by the second and third interviews, the reported acceptance rates were about the same.

Heard of NORC study: Only 5% of the respondents said they knew about the NORC study before they were interviewed. Such a small knowledgeable group could not greatly bias the overall findings, and it can be concluded that the public release of an announcement about NORC did not greatly affect the study.

Direct connections to the aviation industry: About one-third of all residents had direct ties with the aviation industry, but such connections do not appear to have biased reactions to the sonic booms. Those with direct ties were more knowledgeable about the purposes of the tests, but were about the same as persons with no aviation connections with respect to other major sonic boom attitudes and reactions. About the same proportions felt people should complain about booms if annoyed (71% vs 72%). Likewise, almost equal numbers believed the SST was important (65% vs. 62%), and that local booms were necessary (45% vs. 42%). Finally, at the end of the study, almost the same numbers reported annoyance with the booms (53% vs. 50%).

Belief in appropriateness of complaint: About 29% of all residents felt it was improper for a person to complain even if he was annoyed. Such an attitude casts suspicion on the validity of such a person's own interview responses on sonic booms. There is a strong possibility that negative reactions which may be felt are not reported. This seems to be the case, since reports of interference, annoyance, desires to complain are lower for persons who feel complaining is improper than for those who feel people should complain if annoyed. Consequently, to remove the possible bias from the major findings, it was decided to eliminate the answers of these biased respondents from the analyses of this report, but to include them as a separate group in the more comprehensive part II of the full report. Thus, the major findings are confined to reports by 2033 respondents.

Table 3

INTERVIEWS COMPLETED

Oklahoma City Area

February-July 1964

		Totals
First interviews completed.		3135
Face to face	2390	
Telephone.	745	
Less: Incompletes-Second Interview.		- 125
Face to face	96	
Telephone.	29	
Second interviews completed		3010
Less: Incompletes-Third interview		- 158
Fact to face	122	
Telephone.	36	
Third interviews completed.		2852
Plus: Control sample-second interview		197
Control sample-third interview.		199
Total interviews completed.		9393

B. Some Basic Characteristics of the Oklahoma City Area

Local Problems: In order to judge fairly the reactions to sonic booms, it is necessary to get a brief overall picture of Oklahoma City's general attitudes and actions with respect to all kinds of local problems. In general, local residents have a high attachment to their communities. Over 8 out of 10 rate their area as an excellent or good place to live, with almost half giving an excellent rating. Only 3 out of 100 report many things they dislike about their residential environments. When asked to name the one thing disliked most, traffic danger was reported most frequently by 12.4% of all persons, with almost an equal number (12.0%) spontaneously mentioning sonic booms. Third in importance was inadequate transportation, mentioned by 8.6% of all residents. Almost one-third refused to mention any serious dislike, so that of those actually mentioning a serious dislike, almost one in five mentioned sonic booms.

General pattern of complaining: Few people in Oklahoma City feel like complaining when they believe they have a local problem. When those residents mentioning the one thing disliked most were asked if they ever felt like doing anything about their serious dislike, only 28% said they felt like doing something; 72% were completely passive.

As expected, even fewer, or only 10%, said they actually followed through and wrote or telephoned an official, and only about 5% signed a petition. As we shall see in Table 10, this low general complaint potential or desire to complain, partially explains the level of complaints about booms. A further explanation of low complaints is revealed by the feeling of futility about complaining. Only four out of 100 felt the chances of doing something about their problem were "very good," while only an additional eight out of 100 said the chances were even "good."

C. Reported Overall Reactions to Sonic Booms in Oklahoma City Area

Special problems in middle distance areas: Before discussing the findings a further word of explanation should be made about the 8-12 mile distance group. While over 90% of those residing in the 0-8 mile zone also work in the same close zone, only 54% of the 8-12 mile residents also work in the middle zone. Most of the others who live in the middle zone work in the close, 0-8 mile zone. An analysis of responses showed the cross-zone commuters had a higher annoyance and complaint response than the "stay-at-home" workers and this was obscuring differences between the 0-8 and 8-12 mile zones. Consequently, in computing the total responses for the area, all persons answering boom questions are included, but in showing differences by miles from ground track only those persons who work and reside in the middle zone are included. As a result the number of respondents for the three distance zones do not add to the total number of respondents. A fuller picture of all respondents will be shown in part II of the report.

1. Reports of Interference

As already mentioned, all respondents were divided into three groups according to the distance of their homes from the ground track. Table 3 showed the actual differences in the physical overpressure levels of the sonic booms in these distance groups. Table 4 shows the corresponding reports of interference by the booms.

Table 4

REPORTED TYPES OF INTERFERENCE BY SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Interference	Miles from Ground Track											
	Total*			0 - 8			8 - 12			12 - 16		
	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25
Number of respondents	2019	2026	1915	1037	1045	989	351	351	331	336	335	314
House rattles	89%	89%	94%	89%	90%	95%	91%	85%	92%	86%	83%	79%
Startles.	39	35	38	40	36	40	38	32	33	29	25	25
Interrupts sleep.	14	15	18	15	17	19	13	7	11	6	9	9
Interrupts rest	11	12	17	11	13	18	12	10	14	6	7	9
Interrupts conversation .	9	12	14	9	11	14	11	10	12	5	11	6
Interrupts radio-TV . . .	7	8	9	7	9	9	7	5	7	4	5	5

* Includes only persons who feel people should complain if annoyed.

Types of interference: Some interference is reported by practically all residents. Almost 9 out of 10 persons report house rattles and vibrations as the most frequent interference caused by booms. Being startled is next in importance, followed by sleep, rest interference and communications interference. Overall, reports of house rattles remains fairly stable during the first two time periods, especially in the close areas, but rises a little during the third and final interview period. Only in the distant areas are 4% less house rattles reported during the final interview. It should be noted that more sleep and rest interruptions are also reported at the end of the study than at the beginning.

Distance groups: While the responses by the first and second distance zones were not greatly different during the first interview, at the time of the third interview, when the actual differences in sonic boom levels were greater, the first zone residents clearly reported more interference than the middle or distant areas. The distant 12-16 mile group consistently reported less interference than the other distance groups, forming a gradient of response with the most intense interference reported by the closest areas and the least interference reported by the farthest areas.

2. Reports of Annoyance

Intensity of annoyance: Most residents are not seriously annoyed by the booms. Only those people reporting "more than a little annoyance" are included as significantly or seriously annoyed. An additional 21% report a "little" annoyance with house rattling and another 10% report a "little" annoyance with being startled. To be conservative in our projections, however, these little annoyance reports are excluded from Table 5 as not very serious.

Type of interference: Only about one in three persons who report house rattles in the first interview period, also report more than a little annoyance with this interference. About half of those who report being startled in period one, however, report more than a little annoyance. If people also report other kinds of interference, most of them also consider it a serious annoyance. The rank ordering of annoyances is the same as for the interferences, with one-third reporting serious annoyance with rattles, followed by one-fifth annoyed by being startled, and less than 10% reporting annoyance with sleep or rest interference, and 5% with interruption of conversation or radio and TV listening.

Intensity of booms: Annoyance increased steadily over the six month period. While reported interferences were stable during the first two periods and increased only a little in the last period, annoyance increases steadily from the first to the third interview. At the final interview over half of all persons were more than a little annoyed by house rattles, and 28% with being startled. This is believed primarily due to the increase in intensity of the booms.

Distance groups: Annoyance reports of the middle distance group are only a little less than the close areas during the first interview, but the differences become significantly greater during the second and third periods. In all periods, the most distant areas report less annoyance than the close or middle areas, thus forming a gradient of annoyance response by distance from ground track. It should be noted that even in the distant areas annoyance increases over time as the intensity of the boom increases.

Table 5

REPORTED MORE THAN A LITTLE ANNOYANCE
BY TYPE OF INTERFERENCE AND DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Interference	Miles from Ground Track											
	Total*			0 - 8			8 - 12			12 - 16		
	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25
Number of respondents	2019	2026	1915	1037	1045	989	351	351	331	336	335	314
House rattles.	33%	44%	54%	34%	46%	56%	30%	36%	46%	20%	31%	35%
Startles	20	22	28	20	23	29	18	18	20	9	13	16
Interrupts sleep	9	11	14	9	12	16	8	5	8	3	5	7
Interrupts rest.	8	11	14	8	11	15	7	10	11	4	5	8
Interrupts conversation.	5	7	10	4	7	10	5	6	8	2	6	5
Interrupts radio-TV. . .	4	5	6	4	6	6	3	3	6	1	2	5

* Includes only persons who feel people should complain if annoyed.

Interference and annoyance: Interference and annoyance reports are graphically presented in Table 6. Interference is defined as the most frequently mentioned activity which is interfered with, namely house rattle; while annoyance is defined as more than a little annoyance with any type of interference. As can be seen, reports of interference are always much greater than annoyance, although the proportion of annoyance to interference increases steadily over time. At the final interview, 58% of all close area residents report more than a little annoyance with booms.

Comparison of annoyance under equal boom intensity: As reported earlier in the discussion of Table 2, the actual boom levels for the following groups were comparable: the 0-8 mile group during the first period; the 8-12 mile group during the second period, and the 12-16 mile group during the third period. If we compare the annoyance levels of these groups we find all practically alike -- 38% for the 0-8 mile group, compared to 37% for the middle distance, and 38% for the distant group. Likewise the boom level of the 0-8 mile group during the second period was almost the same as the intensity of booms in the middle distance during the third period, and a glance at Table 6 reveals that 46% in both groups report more than a little annoyance. These comparisons suggest that most of the increase in annoyance over time is primarily due to the increase in boom levels rather than to cummulative growth in annoyance with the same booms.

3. Reports of Damage by Sonic Booms

Extent of alleged damage: One of the most important variables influencing people's annoyance and complaint potential appears to be their belief that sonic booms have damaged their homes. The relationship of such reports of damage and annoyance and complaints will be shown later. Table 7 merely shows the numbers of people who feel that some damage has resulted from the booms. Overall almost four out of 10 feel they sustained some damage from the booms during the six month period. About half of these people reported damage occurring only once during the study; 6% during the first period, another 6% during the second period, and 8% during the last period. Seven percent felt they had sustained damage during all three periods and another 11% felt they had experienced damage during two of the three periods. The number reporting alleged damage during each interview remained about the same, 2-3%.

As can be seen in Table 7, the three distance zones form a gradient of damage reports, with 46% reporting some damage in the close zreas, 36% in the middle distance and only 17% in the distant 12-16 mile zone.

Actual reports of damage to FAA: It should also be emphasized that only a fraction of those who felt their property had been damaged by the booms actually reported it to the FAA center. Roughly, only one in eight persons who reported damage on the interview, actually informed the FAA of their alleged damage. In part this low level of follow-through may be due to the widespread ignorance of where to complain. In answer to a direct question, "Do you happen to know where to call if you want to complain about the booms?" only 30% actually knew where to call. Another possible reason may have been the feeling that the amount of effort required to complain was greater than the possibilities of achieving something useful.

Table 6

REPORTED INTERFERENCE AND ANNOYANCE BY SONIC BOOMS

Oklahoma City Area

February-July 1964

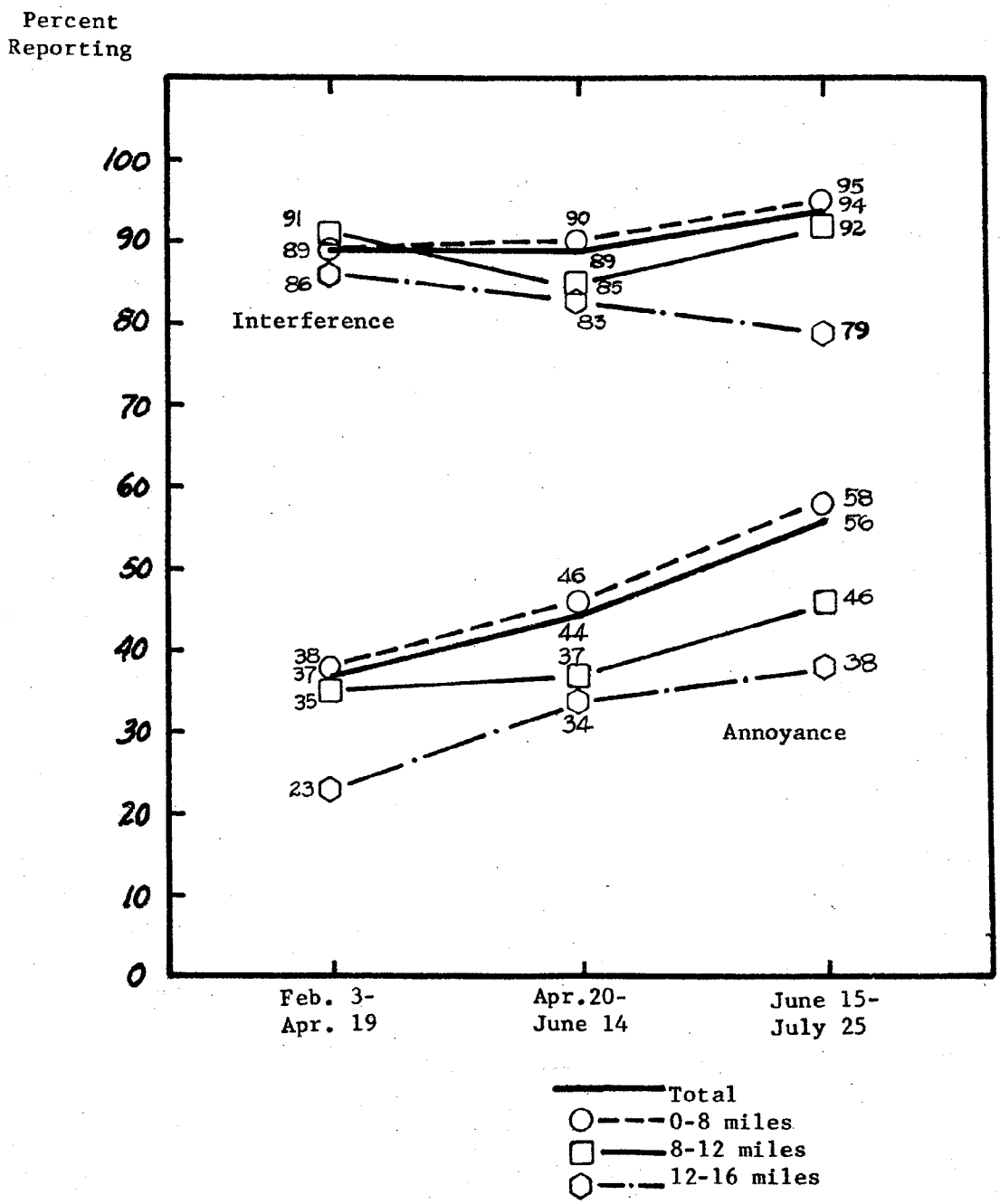


Table 7

NUMBER OF REPORTS OF DAMAGE BY SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Number Damage Reports	Miles from Ground Track			
	Total*	0 - 8	8 - 12	12 - 16
Number of respondents	2033	1048	352	337
Three.	7%	8%	8%	1%
Two.	11	15	7	5
One.	20	23	21	11
Some.	38	46	36	17
None.	62	54	64	83

* Includes only persons who feel people should complain if annoyed.

4. Reports of desires to complain and actual complaints about sonic booms

Desire to complain: Each respondent was asked directly whether or not he even felt like doing something to stop or reduce the booms. Only 16% overall felt like doing something in the first period. This rose to 23% during the second interview and remained at 22% during the final interview. Thus, while about 60% were more than a little annoyed at the end of the study, only about one in three annoyed persons felt like complaining; or to put it another way, for every person who felt like complaining, there were two others who were significantly annoyed and did not feel like complaining.

Actual complaints: As we shall see in Table 10, only one out of four who felt like complaining actually did, or in terms of annoyance, only one in 12 who was seriously annoyed actually complained. This ratio enables the administrator to guage the size of the "silent annoyance" from the number who actually registered complaints. Table 8 summarizes the readiness of residents to complain about the booms, or the complaint potential.

Distance areas: As can be seen in Table 8, the areas close to the flight track report the highest desires to complain followed in order by the middle and distant areas. This pattern is consistent with the gradient of responses already reported on interference and annoyance.

Calls to FAA: Very few residents actually called the FAA complaint center. Less than five out of every 100 residents said they called the FAA at some time during the study. The closest areas report the highest actual complaints, followed by the middle and distant areas. About 20% of all complainers said they called more than once and this tallies with an independent analysis of actual complaints received by the FAA center. In fact, if the complaint rates reported in Table 9 are extrapolated to the total estimate of 179,000 families living in the Oklahoma City area affected by the booms, the estimate of total calls amounts to about 13,000 calls compared to the actual recorded number by FAA of 12,400. This close agreement further confirms the accuracy of the interview reports. Table 9 presents a summary of actual reported complaints.

Boom complaints compared to general complaints: The magnitude of the sonic boom complaints should be compared to the general level of complaining about any serious local problem in order to achieve a valid perspective. Table 10 graphically presents these comparisons. As described previously in Section B, only 28% of those with a serious problem generally felt like doing something about it, and only 10% actually followed through -- a ratio of 1:3, actual to potential behavior. In the case of booms, 22% (a little less than the general level) felt like complaining, while only 5% actually did, a ratio of about 1:4, actual to potential. Thus we see the complaint behavior about booms is somewhat less than the generally expected complaint level in the Oklahoma area. By distance groups, the relation of actual boom complaints to potential is highest in the close areas, about 1:4, dropping to 1:5 in the middle area and to 1:11 in the distant areas.

5. Long Range Acceptability of Sonic Booms

Knowledge of test duration: The FAA boom test was publicized as a six month program, and almost four out of 10 actually knew this duration at the first interview. Almost all respondents knew that the booms would end after July, when asked about it on the last interview. Since the SST in actual commercial use would be expected to fly indefinitely, a question was added toward the end of each interview to measure expectations of indefinite boom exposure and self-appraisals of adaptation.

Table 8

COMPLAINT POTENTIAL FOR BOOMS - PERSONS FELT LIKE COMPLAINING

Oklahoma City Area

February-July 1964

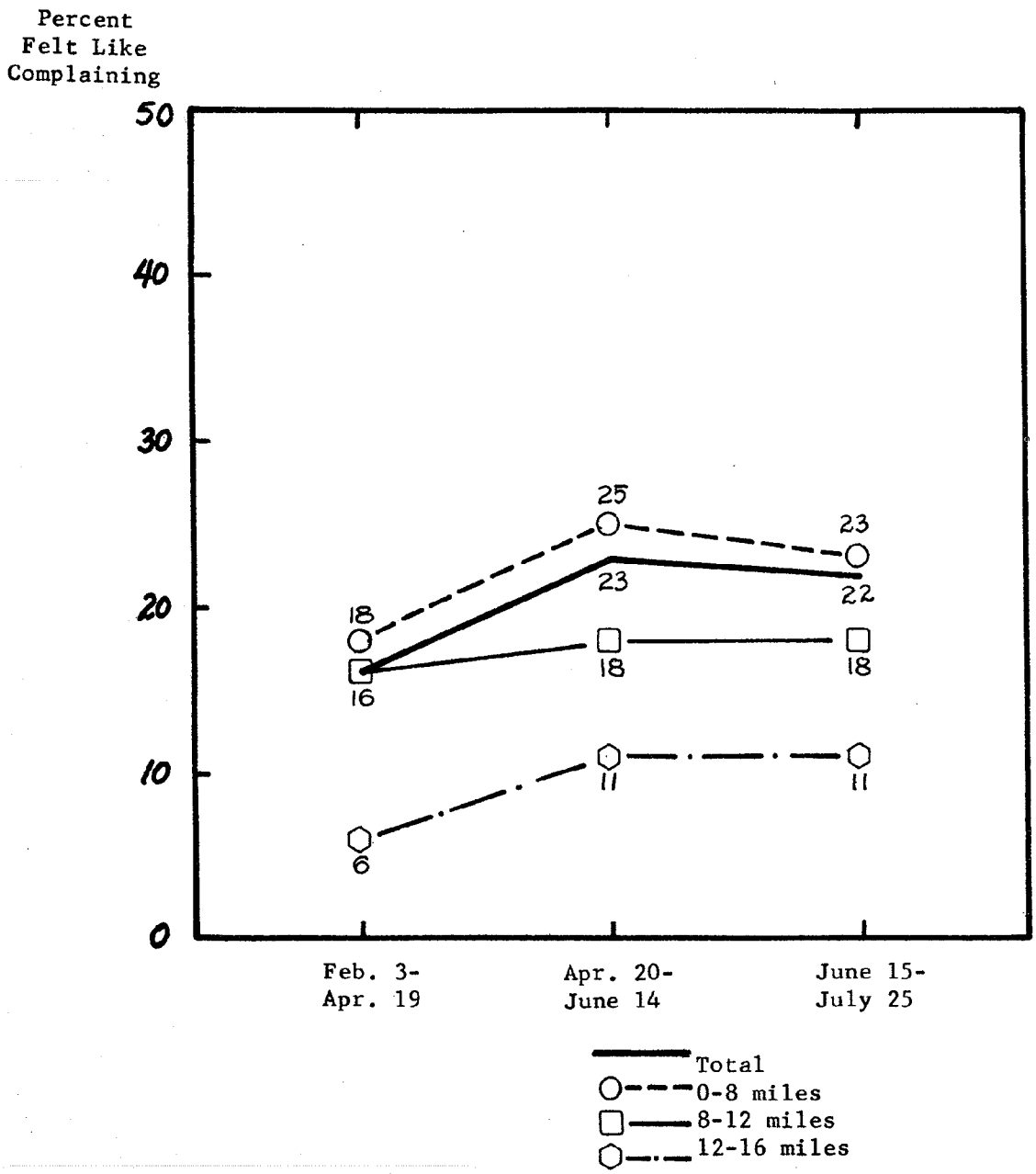


Table 9

NUMBER OF ACTUAL REPORTED COMPLAINTS ABOUT BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Number Actual Complaints	Miles from Ground Track			
	Total*	0 - 8	8 - 12	12 - 16
Number of respondents	2033	1048	648	337
Three.	.7%	1.0%	.3%	.3%
Two.	1.2	1.7	.6	.3
One.	3.0	3.8	3.1	.6
Some	4.9	6.5	4.0	1.2
None	95.1	93.5	96.0	98.8

*Includes only persons who feel people should complain if annoyed.

Table 10

COMPARISON OF GENERAL AND BOOM COMPLAINT POTENTIALS

Oklahoma City Area
February-July 1964

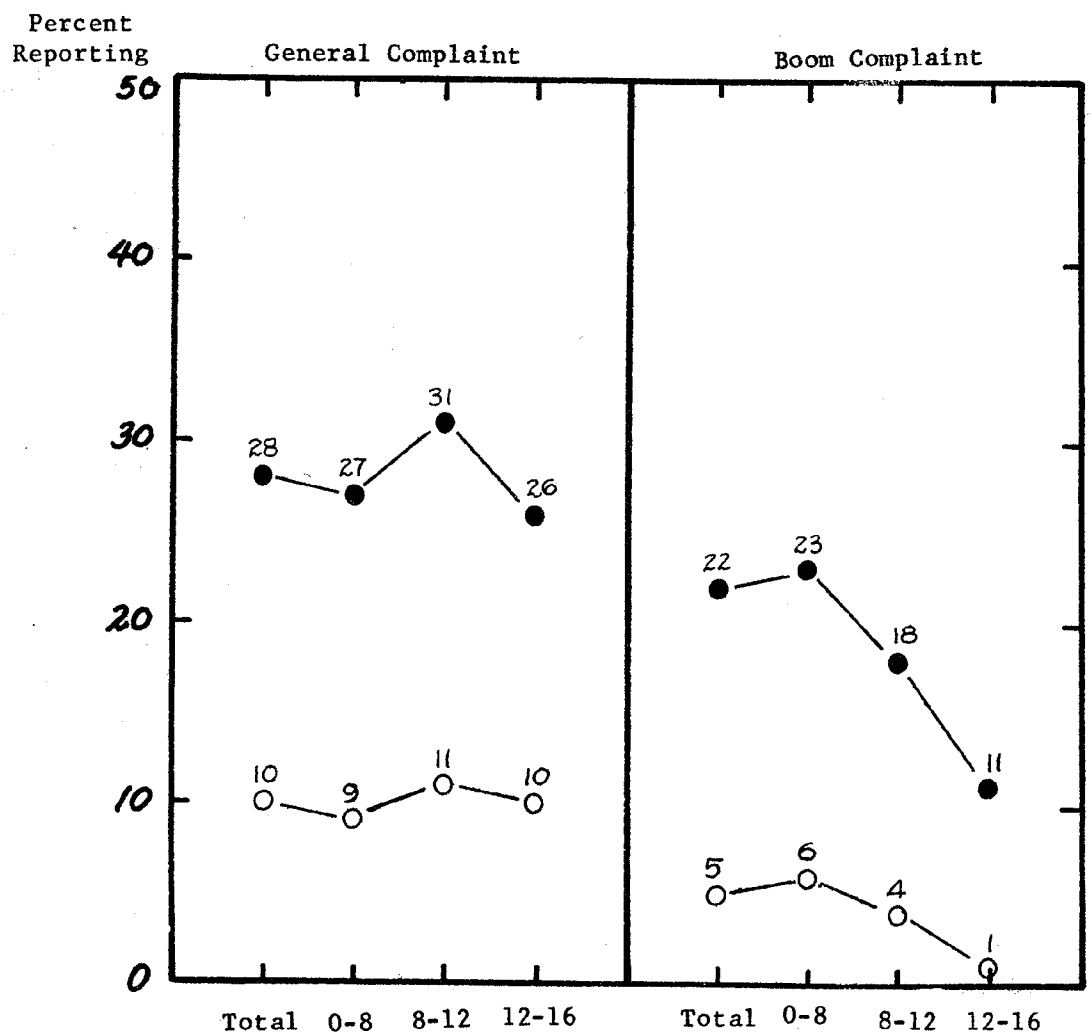
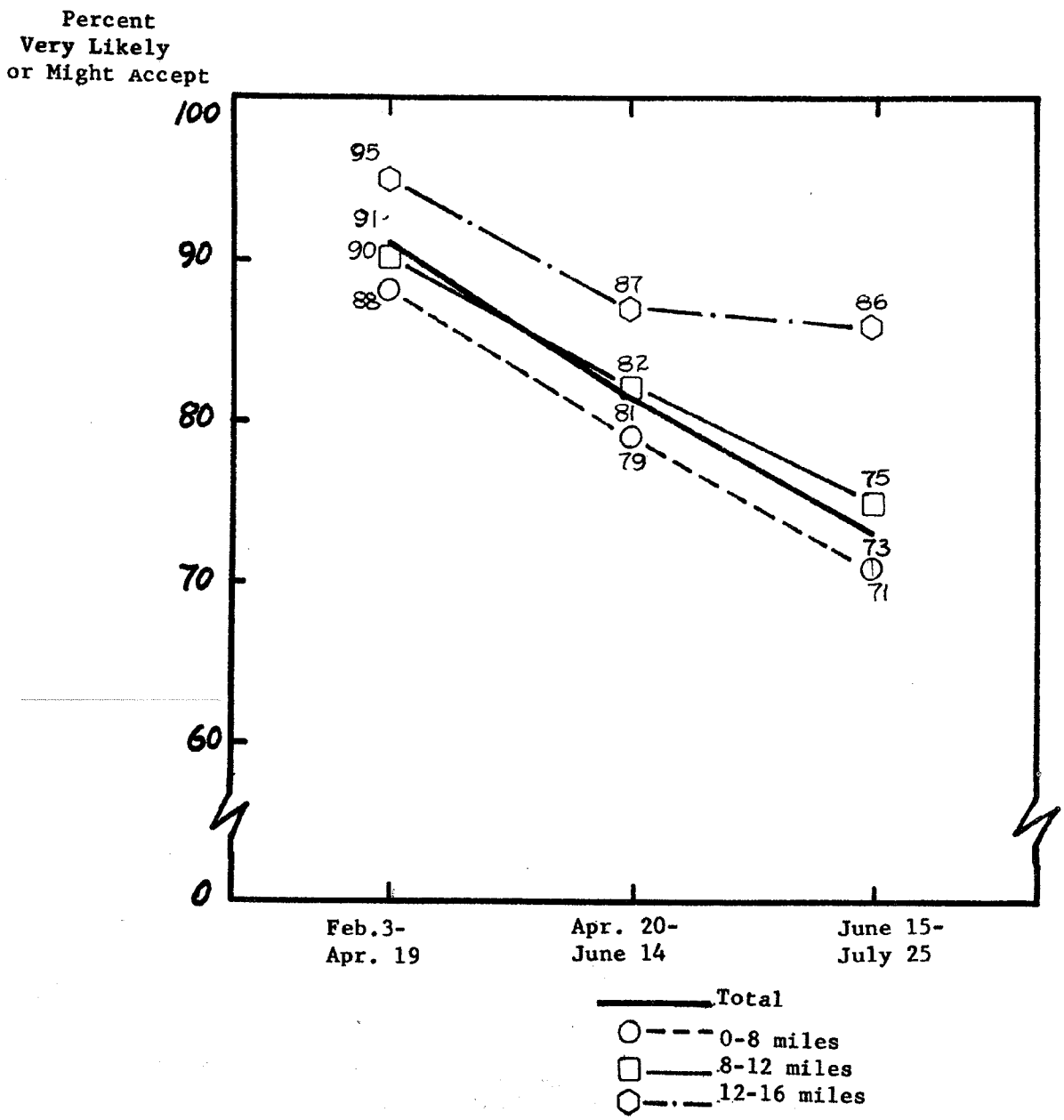


Table 11

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY

Oklahoma City Area
February-July 1964



Trend in acceptability: Expectation of adapting to the booms declined as the intensity of the booms increased during the six month period. While overall 91% felt they very likely or might accept eight booms a day like those experienced during the first interview, this rate drops to 81% during the second interview and 73% during the final interview. Thus, over one out of every four residents felt he could not put up with eight 1.5 PSF booms per day (scheduled at 2.0 PSF).

Distance areas: The gradient of response by distance group is seen again with 86% of the 12-16 mile group compared to 71% of the closest 0-8 mile group reporting ability to accept the 1.5 PSF booms.

In the succeeding sections the importance of several intervening variables on boom reactions will be discussed. These variables are subject to change by administrative programs and success in appropriate administrative actions could significantly increase the acceptability of sonic booms.

D. Effects of Belief in Importance of a Supersonic Transport and Feelings About the Absolute Necessity of Having Local Booms on Reactions to Sonic Booms

Approach for projection of Oklahoma City responses: The previous section presented the overall reactions of Oklahoma City residents to the sonic booms. Not all Oklahoma City residents obviously felt alike or reacted the same way toward the booms. Some of their attitudes tended to increase acceptability of booms and others tended to decrease adjustment toward the booms. A knowledge of those variables which facilitate adjustment will be helpful to SST managers in projecting the Oklahoma City overall responses to other communities throughout the United States. The particular combination of favorable and unfavorable attitudes will not be the same in all communities, and by knowing the range in reactions related to these attitudes, the effects on sonic boom reactions can be estimated from new combinations of basic attitudes. The range in reactions also suggest the expected maximum and minimum levels of reaction to the booms.

Two basic attitudes: The two attitudes which will be discussed first are belief in the absolute necessity of having an SST and belief that local booms are unavoidable and necessary in Oklahoma City. These attitudes, which might be influenced by proper public information programs, are extremely important in influencing reactions of annoyance, complaint, and long range acceptability of booms. In the tables that follow, it will be shown that favorable attitudes toward the SST and local booms establishes a minimum expected level of community annoyance and complaint, while negative attitudes set a maximum level of non-acceptability.

The overall Oklahoma City reactions discussed above are a product of generally favorable attitudes of a given magnitude found among local residents. With even more successful public information programs directed to more specific goals, however, an even more favorable overall response might be expected.

Importance of SST: Toward the end of the first interview all persons were asked, "As you probably know the recent booms around here are part of a government development program of a new airplane that will fly about 2000 miles an hour. Do you feel it is absolutely necessary for our country to have such a civilian plane, do you feel it is probably necessary, or do you feel it is not necessary?" About a third of all people in Oklahoma City felt it was absolutely necessary, an almost equal number felt it was probably necessary, and a like

number that it was not necessary or did not know if it was necessary. Thus two out of three were favorably disposed to the SST.

All those who did not answer absolutely necessary, were also asked the following question, "As you may know, the French, British, and the Russians are already building a commercial supersonic airplane. If these countries have such a plane, would you feel it absolutely necessary for Americans to make one too, would it probably be necessary, or would it not be necessary?" About 60% felt it was absolutely necessary to have an SST in such circumstances, and an additional 22% thought it was probably necessary -- further revealing the favorable attitudes of local residents.

1. Feelings About the Necessity of Local Booms

Relationship of two attitudes: The striking relationship between a favorable attitude toward the SST and feelings about the necessity of local booms is shown in Table 12. As will be seen, the latter attitude is crucial in shaping tolerance of the boom.

Overall, the relationship of these attitudes is practically the same in all distance groups. About three-fourths of all persons who feel the SST is absolutely necessary also feel local booms are necessary (during the first interview). As the intensity of the booms increases, feelings about the necessity of local booms drops to 55%. Those who feel the SST is probably necessary start with 57% believing local booms are necessary and drop to 44% by the end of six months. In sharp contrast, those who feel the SST is not necessary or are uncertain of its necessity, only 29% say the local booms are necessary during the first interview and even less, only 19%, feel favorable about local booms at the end of July.

2. Reports of Annoyance

Range in annoyance: The combination of belief in importance of the SST and necessity of local booms provides the maximum favorable effect on annoyance with booms. Overall, and in each distance group, those who feel the SST is absolutely necessary and local booms are also necessary report the lowest annoyance. Conversely, those who feel the SST is not necessary and that local booms are not necessary report the maximum annoyance. For example, overall only 13% of those with the most favorable attitudes are more than a little annoyed during the first interview, increasing to only 25% at the end of the study. In contrast, those with the least favorable attitudes start with 57% more than a little annoyed and end with 76% more than a little annoyed (three times greater than the most favorable attitude group).

Distance areas: Even in the closest 0-8 mile group, those with the most favorable attitudes toward the SST and feelings about necessity of local booms report only 30% are more than a little annoyed at the end of the study compared to 81% for the least favorable attitude group. If more people can be convinced of the importance of the SST and of the unavoidability of local booms, the total annoyance undoubtedly would be reduced to close to the 25% level shown in Table 13.

Table 12

REPORTED BELIEF IN THE ABSOLUTE NECESSITY OF LOCAL BOOMS
BY BELIEF IN THE NECESSITY FOR DEVELOPING AN SST

Oklahoma City Area
February-July 1964

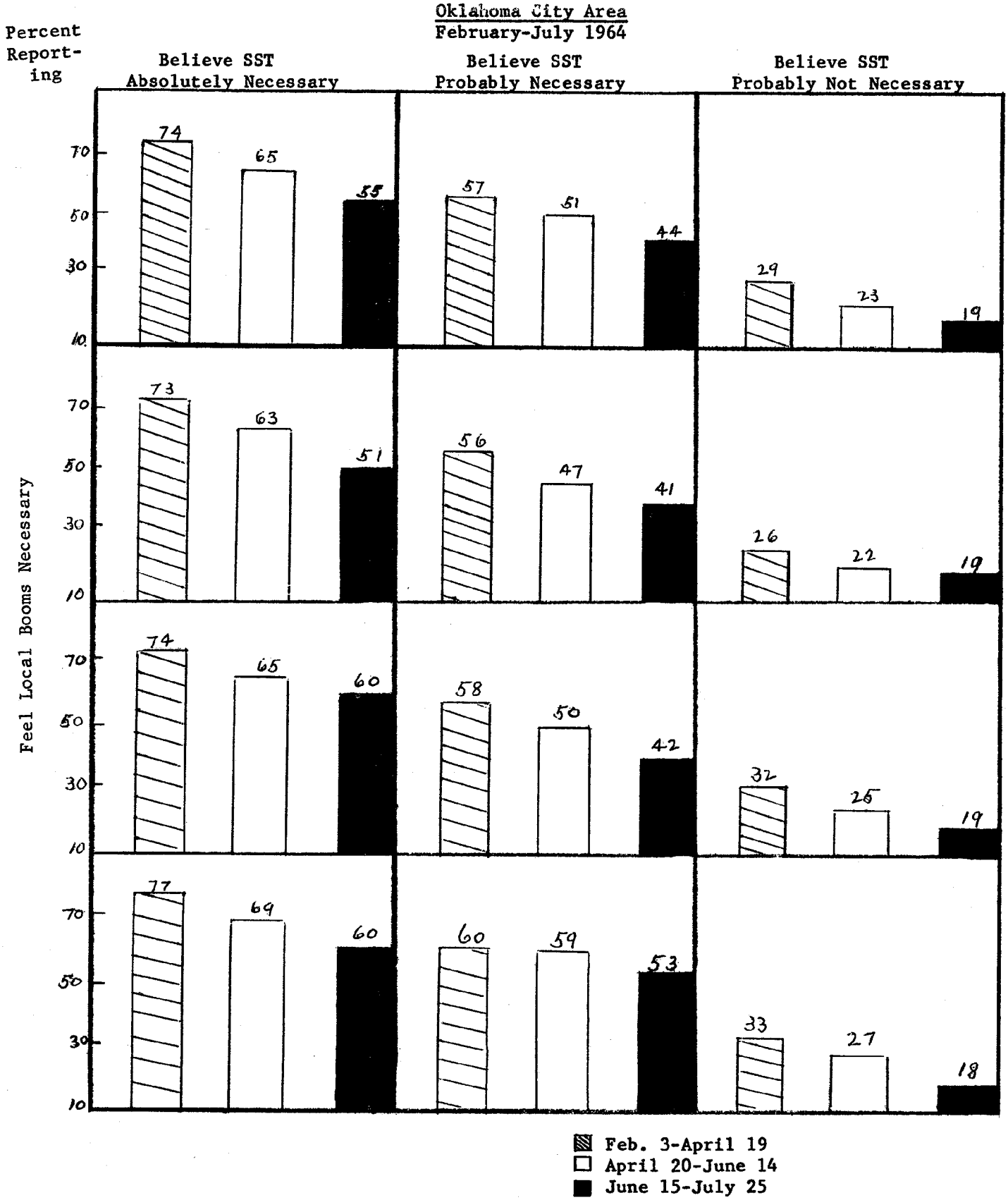
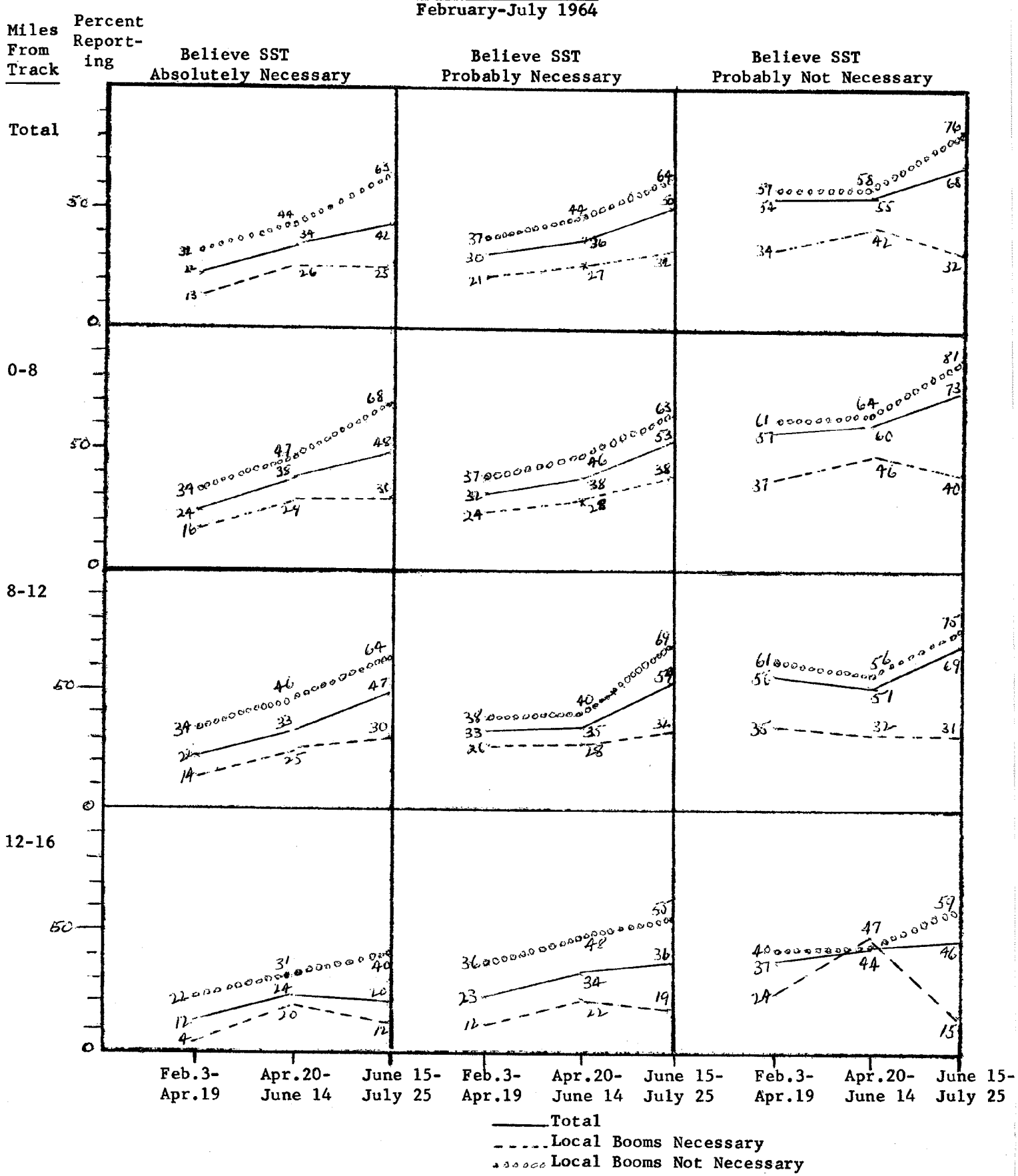


Table 13

REPORTED MORE THAN A LITTLE ANNOYANCE WITH BOOMS
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST AND NECESSITY OF MAKING BOOMS LOCALLY
Oklahoma City Area
February-July 1964



3. Desires to Complain About Booms

Range in desire to complain: The relationship of these favorable attitudes and the complaint potential or desire to complain about the booms is shown in Table 14. The same pattern of reactions is observed. While the most favorable attitude group reports that only 2-4% even feel like complaining, the least favorable group reports 34-37% feel like complaining. In the closest, 0-8 mile group, the range for these contrasting groups at the end of the study is from 3% to 42%.

4. Long Range Acceptability of Sonic Booms

Range in acceptability: The long range expectations of adaptability to the booms follows a direct relationship to the favorable attitudes toward the SST and the local booms. The most favorable group more often feels they can live with the booms, while the least favorable less often say they can tolerate them. Table 15 presents this range of responses. While 92% of the most favorable group, at the end of the study feel they can live with the boom, only 57% of the least favorable say they can adapt to it.

Importance of necessity of local booms: As can be seen, the group which feels the absolute necessity of the SST is not too different from those who only feel the SST is probably necessary. Whether or not they feel local booms are necessary appears to be more important in influencing long range adaptation to booms. Of course, as we have seen, the extent to which the SST is considered necessary strongly influences feelings about the necessity of local booms. The next section will examine the effects of feelings about necessity of local booms and annoyance, complaints and long range adaptability.

E. Effects of Feelings about Necessity of Local Booms and "More Than a Little" Annoyance on Reactions to Booms

1. Reports of Annoyance

Trends in annoyance: Respondents were grouped into four basic categories to study the changes over time of basic boom effects. First, they were divided by whether or not they felt local booms were necessary at the end of the study, then they were subdivided further into whether or not they were more than a little annoyed by booms at the end of the study. Table 16 shows the trend in feelings of annoyance for these analytical groups.

Decreases in annoyance: Almost one in five respondents who were initially annoyed by the booms can be considered as having adjusted to them by the end of the study. Overall, if a person ends the study feeling that local booms are necessary and is not annoyed with the booms, then only 12% of these respondents report they were more than a little annoyed during the first interview, and 18% during the second interview.

Increases in annoyance: In contrast, of those who end up feeling local booms are not necessary and are annoyed, almost half were not annoyed at the first interview and became annoyed as the intensity of the booms increased.

Table 14

REPORTED COMPLAINT POTENTIAL WITH BOOMS

Oklahoma City Area
February-July 1964

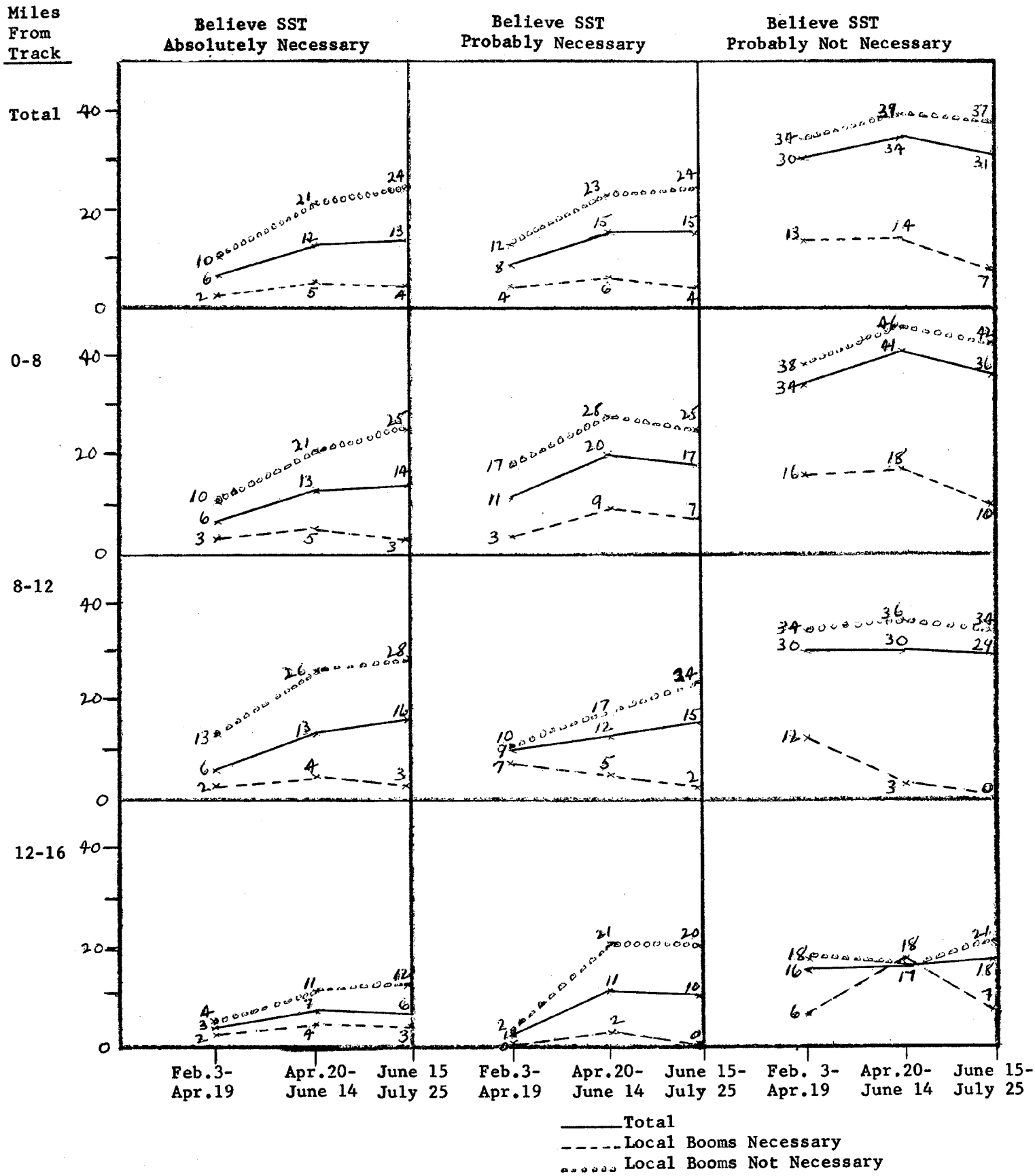


Table 15

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST
AND NECESSITY OF MAKING BOOMS LOCALLY
Oklahoma City Area
February-July 1964

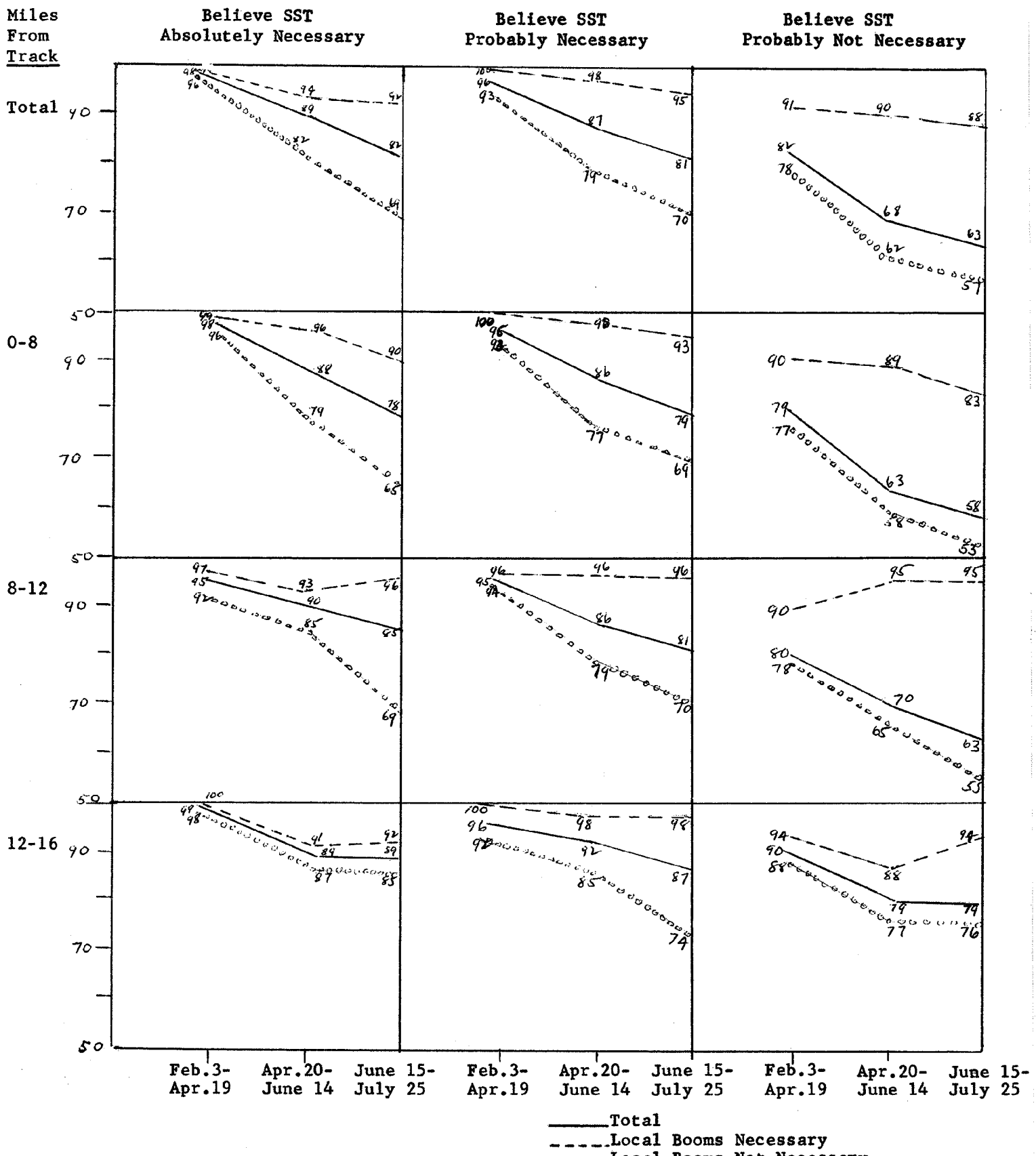
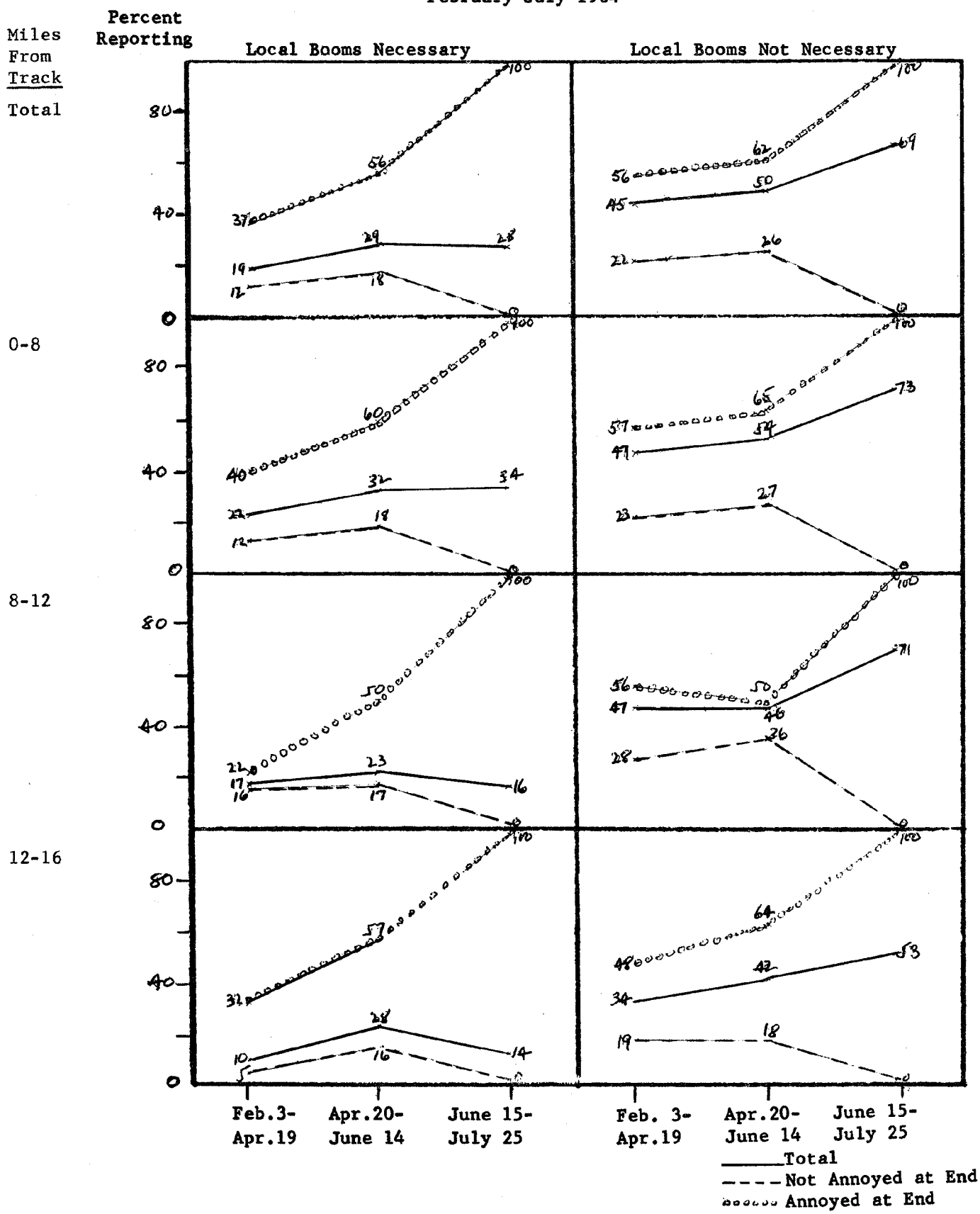


Table 16

REPORTED MORE THAN A LITTLE ANNOYANCE WITH BOOMS
BY FEELINGS OF NECESSITY AND ANNOYANCE WITH BOOMS AT END OF STUDY

Oklahoma City Area
February-July 1964



2. Desires to Complain

Range in complaints: A respondent who feels the booms are necessary also consistently is less likely to want to complain. If he also says he is not more than a little annoyed, in only 1% of the cases does he want to complain. In contrast, if he feels local booms are not necessary and is annoyed, his complaint potential rises from 28% to 41% at the final interview.

Distance areas: Differences by distance groups are much less than the variations among attitude groups. If a person is annoyed and feels that local booms are not necessary and lives in the distant areas, in 30% of the time he wants to complain, compared to 41% for the same type of person living in the close areas. Table 17 shows the relationship of the four attitude groups and desires to complain (complaint potential).

Actual complaints: Only 4% of the annoyed who live in close areas and felt the booms were necessary actually called the FAA, compared to 13% who were equally annoyed but did not feel the booms were necessary. Table 18 shows the actual reported complaint behavior of these four attitude groups.

3. Long Range Adaptability

Range in adaptability: A person who feels local booms are necessary even if annoyed, in at least 82% of the cases says he can live with the booms. In contrast, only 53% of annoyed persons who feel the local booms are not necessary say they can adjust to the booms. Table 19 graphically describes the changes in long range adaptability by these four groups.

Distance areas: In the 0-8 mile zone the range of these groups is 79% vs. 49%. If not annoyed, 97% who feel local booms are necessary say they can accept booms compared to 87% of those equally not annoyed but who feel local booms are not necessary. Note that the annoyed show a much sharper drop in acceptance of booms. Again note that the differences by distance groups are much less than the differences among attitude groups.

4. Reports of Damage

Range in damage reports: Those who feel local booms are necessary, in every case, less often report damage. Likewise, those who are not annoyed less often report damage. The combination of the two favorable attitudes is accompanied by the least amount of damage reports. Table 20 shows the strong relationship between feelings of having sustained damage and annoyance with booms and necessity of local booms.

Distance areas: In all cases, the close 0-8 mile group reports the most damage and the distant 12-16 mile group, the least. For example, two-thirds of those living in close areas who feel that local booms are not necessary and are annoyed report some boom damage. In contrast only 20% report damage although living in the same areas but who feel local booms are necessary and are not annoyed.

Influence of public information: It is possible that a thorough public information campaign could better inform people about what kinds of limited damage booms can actually be expected to produce. Such awareness could greatly reduce belief that booms cause damage,and thereby, further reduce antagonism to booms.

Table 17

COMPLAINT POTENTIAL FOR BOOMS
BY FEELINGS OF NECESSITY AND ANNOYANCE WITH BOOMS AT END OF STUDY

Oklahoma City Area
February-July 1964

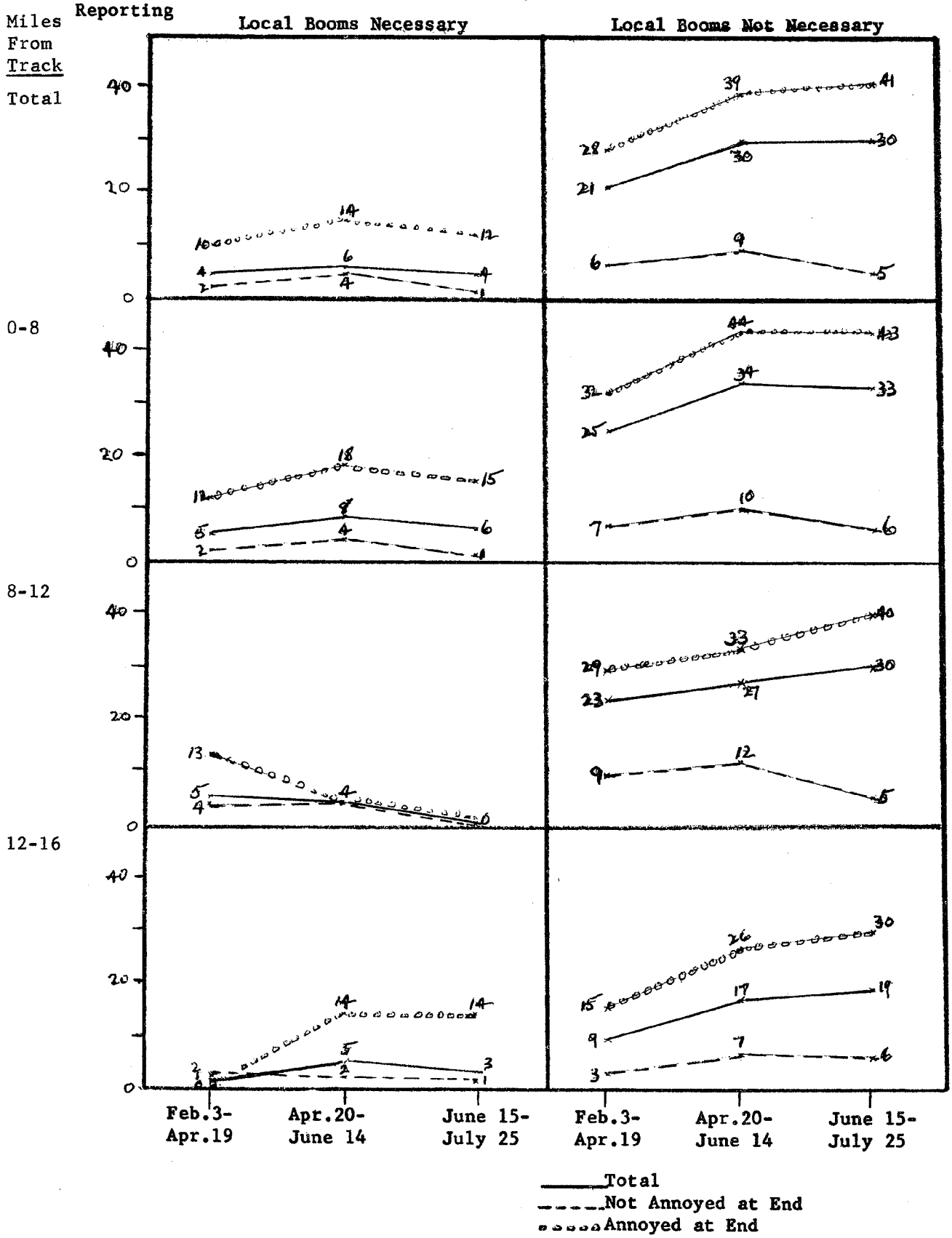


Table 18

ACTUAL COMPLAINTS ABOUT BOOMS
BY FEELINGS OF NECESSITY AND ANNOYANCE WITH BOOMS AT END OF STUDY

Oklahoma City Area

February-July 1964

	Miles from Ground Track			
	Total*	0 - 8	8 - 12	12 - 16
Feel Local Booms Necessary				
Total.	1%	2%	1%	1%
Annoyed at end	2	4	0	0
Not annoyed at end . . .	1	1	1	1
Feel Local Booms Not Necessary				
Total.	8%	10%	6%	2%
Annoyed at end	10	13	7	3
Not annoyed at end . . .	2	2	3	0

* Includes only persons who feel people should complain if annoyed.

Table 19

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY
BY FEELINGS OF NECESSITY AND ANNOYANCE WITH BOOMS AT END OF STUDY

Oklahoma City Area
February-July 1964

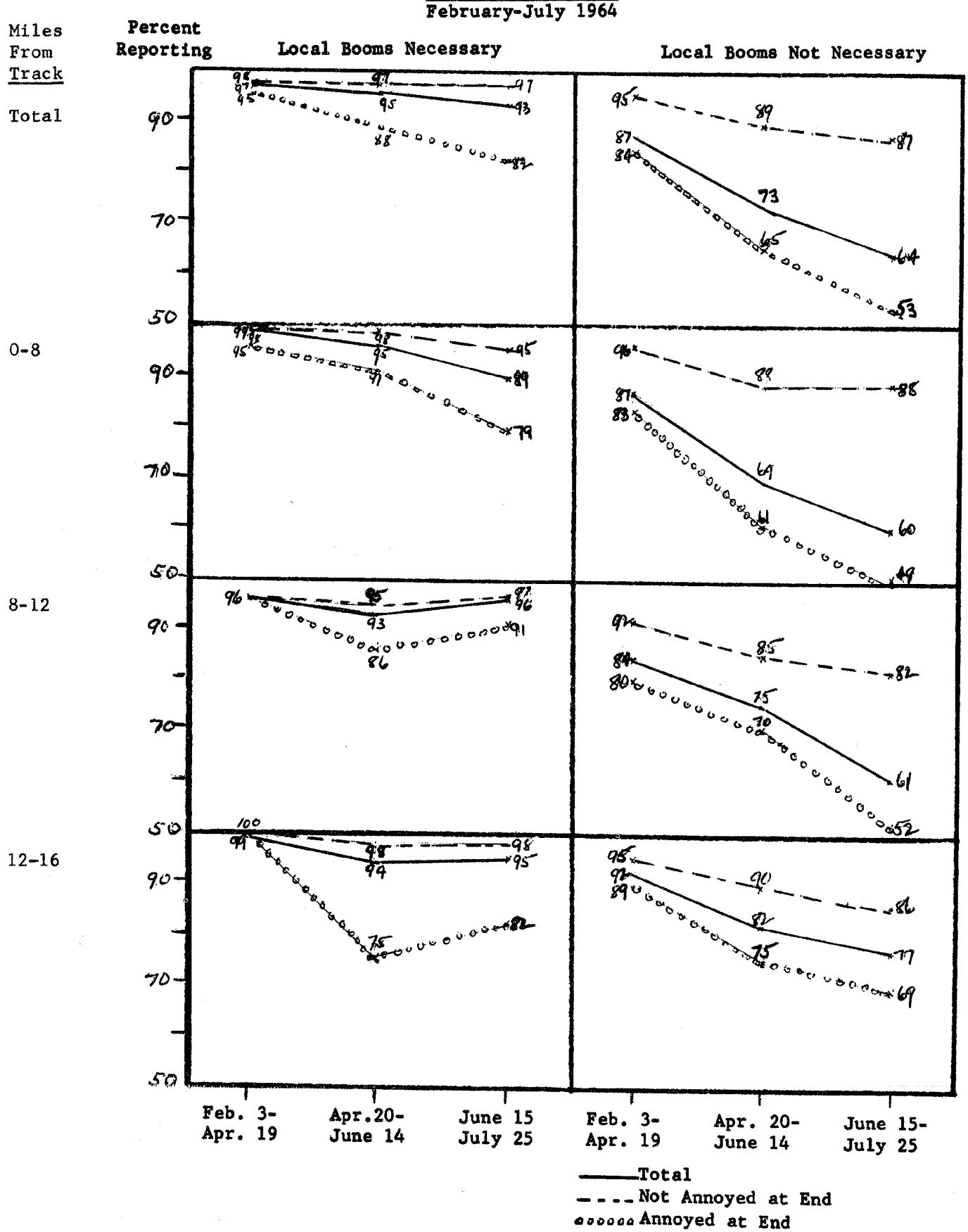
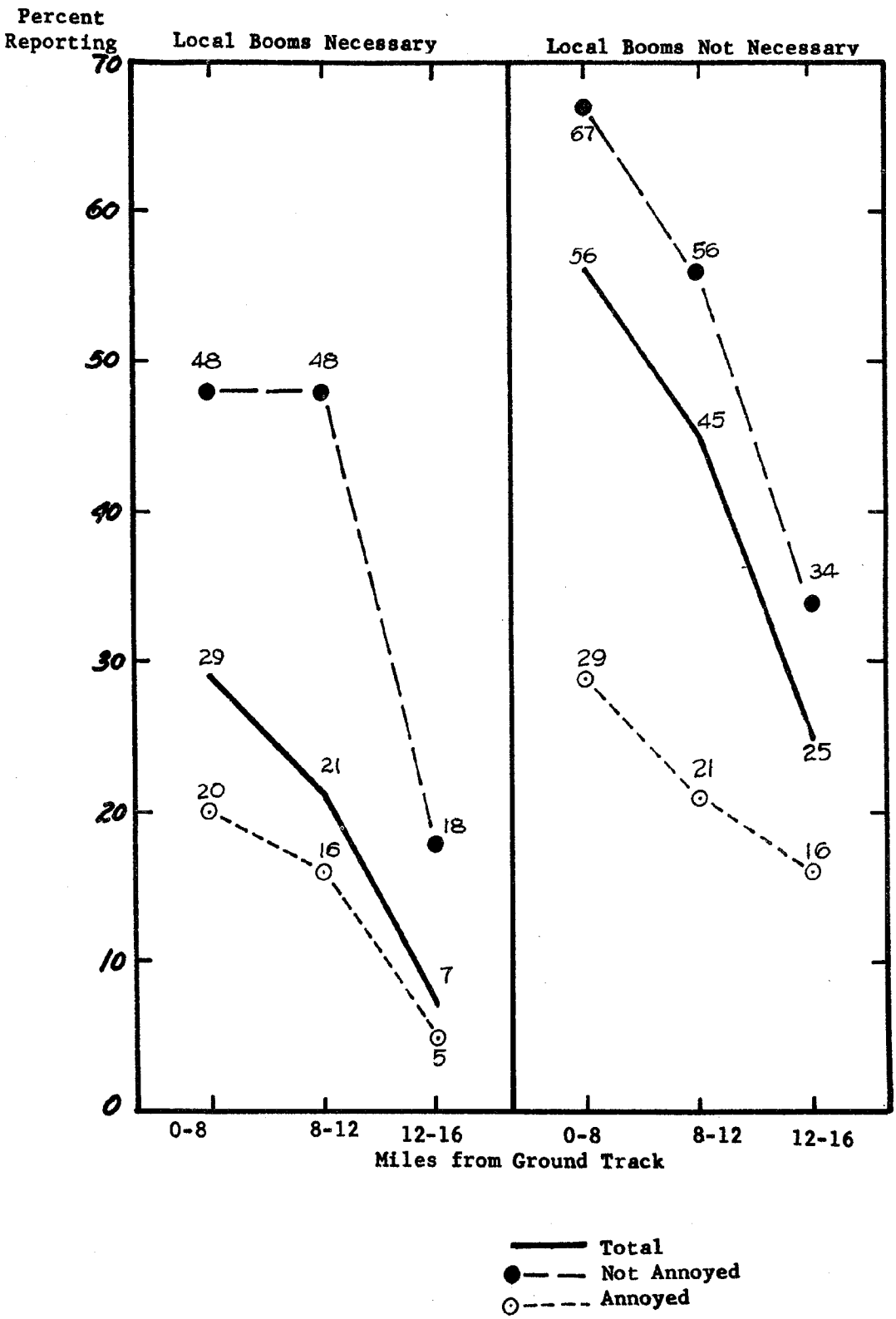


Table 20

REPORTS OF DAMAGE BY BOOMS
BY FEELINGS OF NECESSITY AND ANNOYANCE WITH BOOMS AT END OF STUDY

Oklahoma City Area
February-July 1964



F. Some Characteristics of Actual Complainers

This section of the report, deals with a description of 113 persons who said they actually contacted the FAA. In many ways they are the most intensely annoyed and disturbed group and their characteristics may be taken as typical of the hard core of those who oppose the booms.

1. Reports of Damage

Damage and complaining: About 86 percent of all complainers felt they had sustained some damage to their personal property. In contrast, only a third of the non-complainers felt this way. Moreover, 35% of the complainers report new damage during each separate interview compared to only 5% of the non-complainers. These comparisons are shown in Table 21.

2. Long Range Acceptability

Fewer complainers adapt: Some complainers are not completely hostile to eventual acceptance of the booms. Table 22 shows that almost 40% of the complainers feel they might be able to eventually get along with booms. Almost 70% felt this way at the first interview but subsequent experiences of alleged damage, changes in basic attitudes toward the booms, and changes in boom intensity reduced this favorable percentage. About eight out of 10 non-complainers end the study with the belief that they can live with the booms.

Night booms: The bottom of Table 22 presents some feelings about night booms. In this study no actual night booms were scheduled, so the area did not experience them. As part of the final questions (during the first interview) asking about expectations of long range adaptability everyone was asked, "And how about several civilian booms every night? Do you think you could very likely learn to live with it?" As can be seen in Table 22, only about a third of the complainers who feel they can accept day booms feel they can also live with night booms. Among non-complainers the percentage drops from 93% who say they can accept day booms to 71% for night booms. These relationships are in line with other studies that night disturbances which interfere with sleep are generally considered more serious than daytime disturbances. The levels of response, however, must be cautiously evaluated, since the answers are not based on actual experiences but are imaginative projections of beliefs. It is possible that expectations would change over time after actual interference with sleep is experienced.

Some evidence on sleep interference: Even in this study, as seen in Table 4, 18% reported some sleep interference and 17% rest interference. Such interference was found more than a little annoying by almost 80% of those reporting sleep interference. In contrast, only 57% who reported rattles and vibration interference also reported more than a little annoyance. These are indications that sleep interference may be regarded as more serious. The extent of annoyance and long range adaptability to night booms, however, will require more direct research with the actual situation.

3. Personal Characteristics

Finally, some of the personal characteristics of complainers, which generally represent those of annoyed persons as well, are shown in Table 23. In general, complainers are middle-aged females, with older children and smaller families. They have somewhat more education and have higher incomes. They also have a much greater general complaint potential, 54% vs. 25% for non-complainers. They less often feel the SST is even probably necessary,40% vs. 70% for non-complainers, and less often feel local booms are necessary, 19% vs. 58%.

Table 22

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY AND SEVERAL BY NIGHT BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

	Complainers			Non-Complainers		
	Feb. 3-Apr. 19	Apr. 20-June 14	June 15-July 25	Feb. 3-Apr. 19	Apr. 20-June 14	June 15-July 25
Eight per Day						
Could not accept. . .	24%	49%	57%	5%	12%	17%
Don't know.	7	2	4	2	2	3
Could accept.	69%	49%	39%	93%	86%	80%
Very likely. . . .	40	28	15	80	69	62
Might.	29	21	24	13	17	18
Several by Night						
Could not accept. . .	64%			21%		
Don't know.	7			8		
Could accept.	29%			71%		
Very likely. . . .	13			48		
Might.	16			23		

Table 23

SELECTED PERSONAL CHARACTERISTICS
OF COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

	Complainers	Non-Complainers
Number of respondents	113	2739
Family Composition		
Adults only	50%	48%
Children over 6	35	26
Children under 6.	15	26
Size of Family		
One person.	3%	10%
Two-three	62	49
Four or more.	35	41
Age		
Under 40.	28%	38%
40 - 64	53	40
65 or more.	16	21
Age not given	3	1
Sex		
Male.	26%	31%
Female.	74	69
Education		
Elementary school	16%	23%
High school	56	53
College	28	24
Income		
Under $8000	65%	73%
$8000 - 14,999.	19	17
$15,000 or more	4	4
Income not given.	12	6

G. Some Remaining Gaps in Knowledge About Community Reactions to Sonic Booms

List of gaps: A brief description of some of the remaining major gaps in knowledge about community reactions to sonic booms constitutes the final section of this report. Four of the major unresolved issues requiring additional research are:

1. The Effects of Nighttime Booms

No nighttime booms were experienced by Oklahoma City in this study. The limited daytime sleep interference reported in the findings suggests that such interference creates a serious reaction and should be studied more directly.

2. The Effects of Sonic Booms Above the Intensity of 1.5 PSF

Sonic booms in the final phase of this study actually averaged only slightly above 1.5 PSF, although programmed at 2.0 PSF. It is now known whether the SST, which will be heavier and larger than the Air Force planes flown in this test series, will also generate booms as far below the programed level as those experienced in Oklahoma City. Consequently, it may be desirable to test further public reactions to booms which actually measure closer to 2.0 PSF.

3. Effects of Time on Acceptability of Sonic Booms

A clear cut test of the effects of time on sonic boom reactions was not possible in this study. The intensity of the booms was increased over time consequently combining the effects of time and intensity of the boom. The effects of prolonged exposure to a constant sonic boom intensity should be studied further.

4. Effects of An Optimum Public Information Program

The important effects on acceptability of sonic booms have been shown for the following attitudes: the importance of the SST, the necessity of having local booms, and the lack of damage caused by booms. The development of these favorable attitudes or beliefs should be amenable to a vigorous public information program and should be tested in a real campaign.

COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITY AREA

PAUL N. BORSKY

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Volume II: Data on Community Reactions and Interpretations

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NATIONAL OPINION RESEARCH CENTER
University of Chicago

August 1965

AEROSPACE MEDICAL RESEARCH LABORATORIES
AEROSPACE MEDICAL DIVISION
AEROSPACE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

FOREWORD

This study was initiated and funded by the Office of Supersonic Transport Development, Federal Aviation Agency, Washington, D.C. 20553. The Biophysics Laboratory, Aerospace Medical Research Laboratories, Wright-Patterson Air Force Base, Ohio, served as technical monitor. The research was conducted under Contract AF 33(657)-11148 by the National Opinion Research Center, University of Chicago, 55 Fifth Avenue, New York, N.Y. 10003. Mr. Paul N. Borsky was the principal investigator for National Opinion Research Center. Dr. Charles W. Nixon of the Biodynamics and Bionics Division was the contract monitor for the Aerospace Medical Research Laboratories. The work was performed in support of Project No. 7231, "Biomechanics of Aerospace Operations," and Task No. 723103, "Biological Acoustics in Aerospace Environments". The research sponsored by this contract was started in April 1963 and completed in February 1965.

While many persons participated in this study, some of the more important contributors were:

Air Force - Lt. Col. Charles E. Fairbank, Major George Freeman, Lt. Col. Elizabeth Guild, and Major Edward Hilding.

Federal Aviation Agency - Gordon M. Bain, Lt. Col. David Lillard, Bascom Lockett, Kenneth Power, and Mark Weaver.

National Aeronautics and Space Administration - David Hilton and Harvey Hubbard.

National Opinion Research Center - J. Robert Banacki, Jean Johnson, Patrick Laviola, and Michael O. McCarry.

This report supplements AMRL-TR-65-37 (AD613620) dated February 1965. This report is cataloged by the National Opinion Research Center as Report No. 101 - Part 2.

This technical report has been reviewed and is approved.

J. W. Heim, Ph. D.
Technical Director
Biophysics Laboratory

ABSTRACT

During a period of six months from February to July 1964, the Oklahoma City, Oklahoma, area was repeatedly exposed to sonic booms generated to simulate overpressure levels that are expected for supersonic transport overflights. The schedule provided for eight sonic booms per day. During the six-month period, almost 3,000 local residents were interviewed three times to determine the nature and extent of their reactions to the sonic booms. This report contains a detailed description of the overall study design including the selection of households, selection of respondents, training and selection of interviewers and samples of questionnaires used during the interviews. Among the findings it was determined that ordinary living activities were often interrupted by sonic booms, but that a majority of the residents felt they could learn to live with the interruptions. A substantial number of residents felt they had sustained damages from the booms, although detailed engineering observations of structures in the area did not confirm most of these reports. As the intensity of the booms increased, acceptance of the booms by residents was reduced. Residents who felt that the development of a commercial supersonic airplane was important were more likely to accept the exposures to the sonic booms.

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I. INTRODUCTION

A. General Problem

Nature and origin of sonic booms: Aircraft in supersonic flight unavoidably generate pressure waves that are perceived along the ground as sonic booms. These sudden explosive "bangs" were first experienced by people in early 1950, when F-86 fighter aircraft while diving exceeded the speed of sound. As the Air Force and Navy developed ever faster aircraft capable of maintaining supersonic speeds in regular level flight, the problem of hostile community reactions to sonic booms became a matter of public concern. This interest in public reactions to sonic booms was intensified when the government initiated its development program for a commercial supersonic transport (SST).

Present concern about sonic booms: How the public reacts to sonic booms is of vital importance to the planners of the SST. The Government desires to design an aircraft that will operate in a manner generally acceptable to most people. It is essential in developing flight profiles, schedules and flight routes to know the probable effects of unavoidable sonic booms. It is important for planners to know what kinds of booms the public will accept and what kinds will generally create widespread annoyance and complaints.

This need to know how the public reacts to sonic booms has led to various research programs. Among these programs was the Oklahoma City sonic boom study, with which this report is concerned. This report provides the technical details of the design, development and findings of the Oklahoma City survey and supplements the earlier summary report /4/ released in February 1965.

B. Previous Related Research

1. The Nature of Sonic Booms

Sonic booms and the factors which influence their generation and propagation have been studied by the Air Force since 1950, and more recently by the National Aeronautics and Space Administration (NASA) /5, 7, 12, 13/. The magnitude and signature of sonic boom generally varies according to the aircraft configuration, flight profile and meteorological conditions. The aircraft design and flight profile (aircraft speed, altitude, and direction of flight) can be largely controlled. Meteorological conditions, however, can not be controlled and account for most of the variability between actual and programmed sonic booms.

2. The Effects of Sonic Booms on Structures

The Air Force and NASA have been responsible for much of the early accumulated knowledge about the effects of sonic booms on structures. In 1956, the Air Force and U.S. Army studied the effects of sonic booms on other aircraft. Later, a comprehensive document was prepared by the Air Force describing responses of structures to aircraft generated shock waves on the basis of theoretical and empirical findings /2/. In 1958-59 NASA studied the effects of sonic booms on buildings at Wallops Island /9, 10/. Since then a number of joint NASA-Air Force studies have been made of the effects of booms on structures /11/. Since 1961, the Federal Aviation Agency has also participated with NASA and the Air Force in a series of joint programs /1, 6/. In the most recent White Sands, New Mexico studies structures representative of various building materials, types of construction, and qualities of construction were subjected to sonic boom overpressures from two pounds per square foot (psf) to 24 psf /16/.

Complaint records: The United States Air Force and Navy have been flying supersonic missions over land for almost 15 years. During this time valuable information and experience have been accumulated on public reactions to sonic booms. It was learned that lack of advance notice and public explanation of the causes and effects of sonic booms generally resulted in widespread startle reactions and complaints about the booms. Complaint files and damage claim files maintained by the Air Force also revealed the kinds of things that concerned people about the sonic boom. In general, people complained about startle, fear of possible harmful effects, and lack of necessity of the booms. The most frequently mentioned kinds of damage alleged to have been caused by the booms involved plaster and breakage of glass.

Throughout the fifteen years of military supersonic flying, no direct personal injury has ever been known to have occurred as the result of the sonic booms generated by these military flights. In addition, several specific examples of experimental exposures of selected groups of individuals to intense sonic booms produced no apparent ill effects or injuries to the exposed /11, 14/. Thus, previous experience and studies have indicated that sonic booms of the magnitudes occurring in the past or likely to occur in the future by the SST are proven safe and are not expected to create direct personal injuries.

St. Louis study: In 1961-62, the National Opinion Research Center (NORC) under joint NASA, Air Force, and FAA sponsorship, conducted the first systematic study of public reactions to sonic booms in the St. Louis Metropolitan Area /3, 15/. A regular Strategic Air Command public information program was conducted in the St. Louis area about the nature and necessity of local sonic booms. Following this, about 40 sonic booms were generated by B-58 aircraft over a four-month period. Then, the St. Louis area was exposed to 13 additional booms over a one-week period. Personal interviews were conducted with a cross-section of residents to learn about their reactions to these booms.

This earlier study revealed that house vibrations and rattles were reported by practically all exposed persons. Alleged damage to property was reported by over 10% of all residents throughout a 32 mile wide flight corridor. Annoyance and complaints were generally reported by a minority of residents. A combination of favorable attitudes and experiences prevailed among local residents. Some of these favorable factors were a belief in the importance of Air Force operations, the necessity of local booms, familiarity with the booms, knowledge of the causes of booms, and feelings of futility about reducing the booms. These factors were found to maximize acceptance of the booms.

Some of the major issues remaining unresolved after the St. Louis study which were investigated in Oklahoma City were:

1) The relation of lateral distance from ground track or intensity of the boom, to reported interference, annoyance and complaint. The St. Louis study revealed only small differences in public reaction up to 16 miles from ground track.

2) The importance of frequency and regularity of boom occurrence on public reactions to the booms. SAC military operations were irregular and infrequent, while a commercial SST operation would undoubtedly be scheduled regularly at frequent intervals.

3) The importance of civilian operation vs. military sponsorship of aircraft flying at supersonic speeds over populated areas. Answers to some questions in the St. Louis study indicated that the public might be less tolerant of the booms if the SST was operated by a commercial group, rather than a military one.

C. Overall Study Design

1. Selection of Area

Factors affecting community selection: The following factors were used in selecting the Oklahoma City Metropolitan Area for the Sonic Boom Study Program:

1) Availability of a suitable base of operations and maintenance support for supersonic aircraft.

2) Availability of required air navigation aids.

3) Geographic area having variable weather conditions.

4) Flat terrain under flight track.

5) Availability of extensive meteorological data collecting and recording equipment.

6) Unpopulated area either side of the city for aircraft acceleration and deceleration during sonic boom run (where overpressures may be increased and focusing may occur).

7) Population diversification within area exposed under flight track.

8) Structural diversification.

9) Availability of a Federal Aviation Agency installation capable of providing administrative support.

Oklahoma City met the above criteria by providing an area familiar with the frequent operation of both military and commercial reciprocating and jet engine aircraft; limited sonic boom experience; desired topographical features; typical large city structures and buildings of various types and ages; a location economically and operationally beneficial for test aircraft staging out of Tinker Air Force Base; a well-equipped weather squadron at Tinker Air Force Base in a geographic area having characteristic rapidly changing weather conditions; adequate availability of radio and radar ground aids to air navigation, and the availability of FAA personnel and equipment support afforded by the Civil Aeronautical Research Institute.

2. Sonic Boom Program

Flight track: A 100-nautical-mile flight track was established, running from Minco to Arcadia, Oklahoma, and crossing the northwest portion of Oklahoma City. More precisely, the track began 40 miles out on the 227° radial of the Oklahoma City VORTAC antennae (radio range station) and extended to a point 60 miles out on the 047° radial. The sonic boom runs were from southwest to northeast, making a magnetic track of 051°. The aircraft was scheduled to reach a fixed altitude and supersonic speed about 10 miles prior to reaching Oklahoma City and continue at the same altitude and speed to Arcadia, where it decelerated to subsonic speed. Navigational accuracy was maintained through the use of the VORTAC with radar assistance. Radar beacon targets were recorded to verify track accuracy for each sonic boom flight.

Schedule of flights: Actual flights over the Oklahoma City flight track were begun on February 3, 1964, after widespread advance publicity. On the first day only one boom was generated at a scheduled overpressure of one pound per square foot (psf). In order to facilitate public familiarity with the boom, the build up of booms was very gradual. The cumulative number of booms was increased on successive days until there

were eight booms per day at the low intensity of 1 psf. Then the intensity was gradually raised until there were eight booms scheduled at 1.5 psf. Approximately three weeks were required for this initial schedule to be reached. From the fourth week to about the nineteenth week, this schedule of eight 1.5 psf booms was maintained. From the 20th to the 26th week, the scheduled overpressure was increased to 2.0 psf, but the frequency was kept at eight per day. To simulate the regularity of a commercial operation, the eight booms were scheduled at the same time each day: 7 A.M., 7:20 A.M., 9 A.M., 9:20 A.M., 11 A.M., 11:20 A.M., 1 P.M. and 1:20 P.M.

Measurement of sonic booms: Actual sonic boom overpressures were recorded by instruments at three test houses in Oklahoma City. Test House No. 1 was located directly under the flight track, Test House No. 3 was 5 miles, and Test House No. 4 was 10 miles to the right of the track. Additional recordings of sonic booms were made by mobile units at different locations. Figure 1 shows the location of the test houses.

3. Design of Household Sample

Dates of interview: Three personal interviews were scheduled with the same respondent during the six-month study. The first interview was scheduled during the 10th and 11th weeks, the second during the 17th and 18th weeks, and the third and final interview during the 23rd through 25th weeks.

Selection of households: The sample of households was selected according to a multi-stage random design. The total area substantially affected by the sonic booms was calculated to be 16 miles on either side of the flight track from Minco to Arcadia. Selected households within the 32 mile wide area were interviewed. This total area was stratified into three distance sub-areas. The width of each sub-area was based on engineering estimates of the rate at which the sonic boom intensity decreases as the lateral distance from the ground track increases. Within each distance sub-area, the magnitude of the boom was scheduled to be fairly uniform ($\pm$ 0.3 psf). The first distance sub-area was 0-8 miles from ground track, the second 8-12 miles, and the third 12-16 miles from ground track. Figure 2 shows the areas affected.

Urban and rural sub-groups were selected for interview within each distance area. Based on updated U.S. Census reports for 1960, 601 segments were randomly selected in the following design:

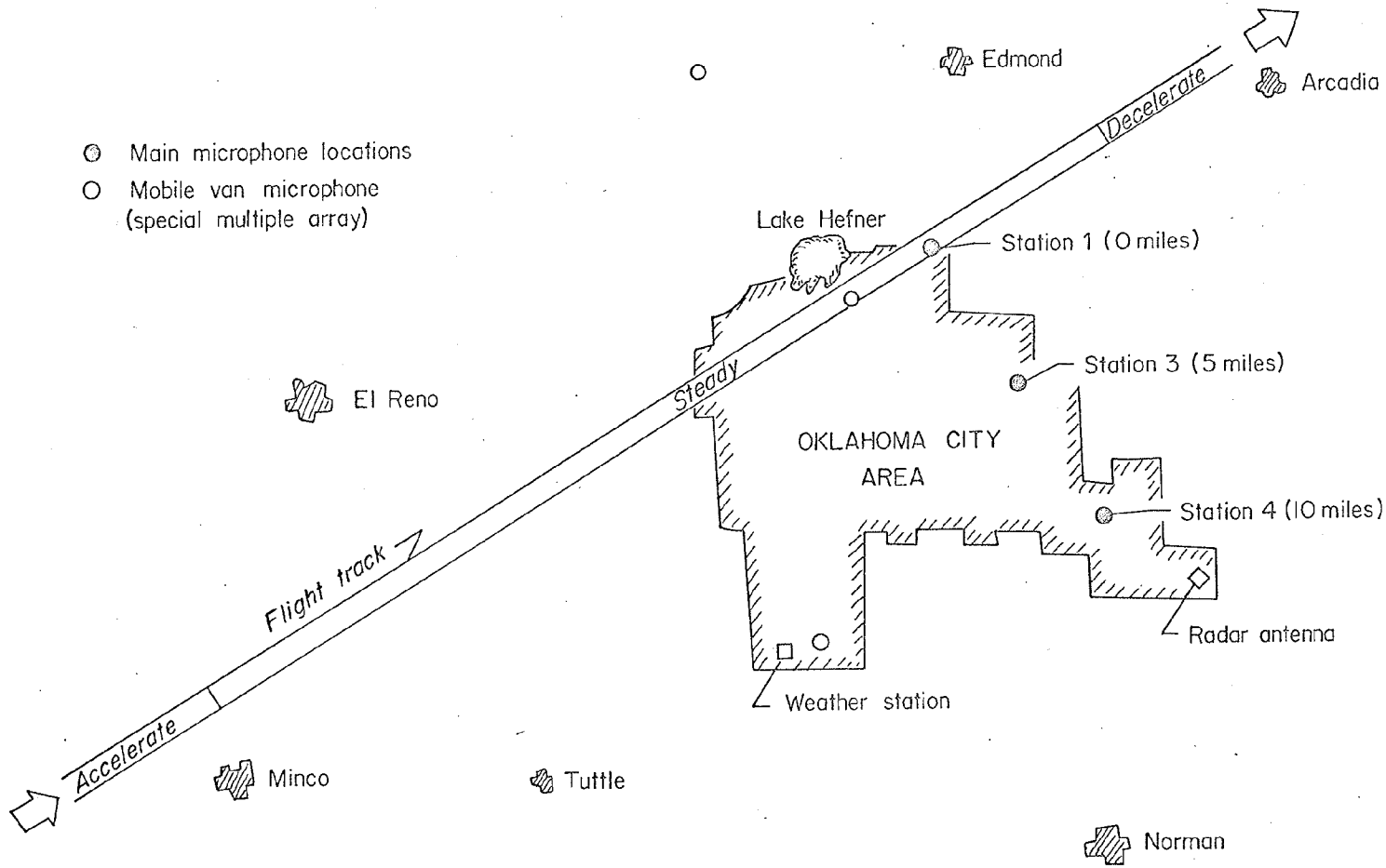


Figure 1.- Planview sketch of test area showing flight track, measuring stations, and facilities.

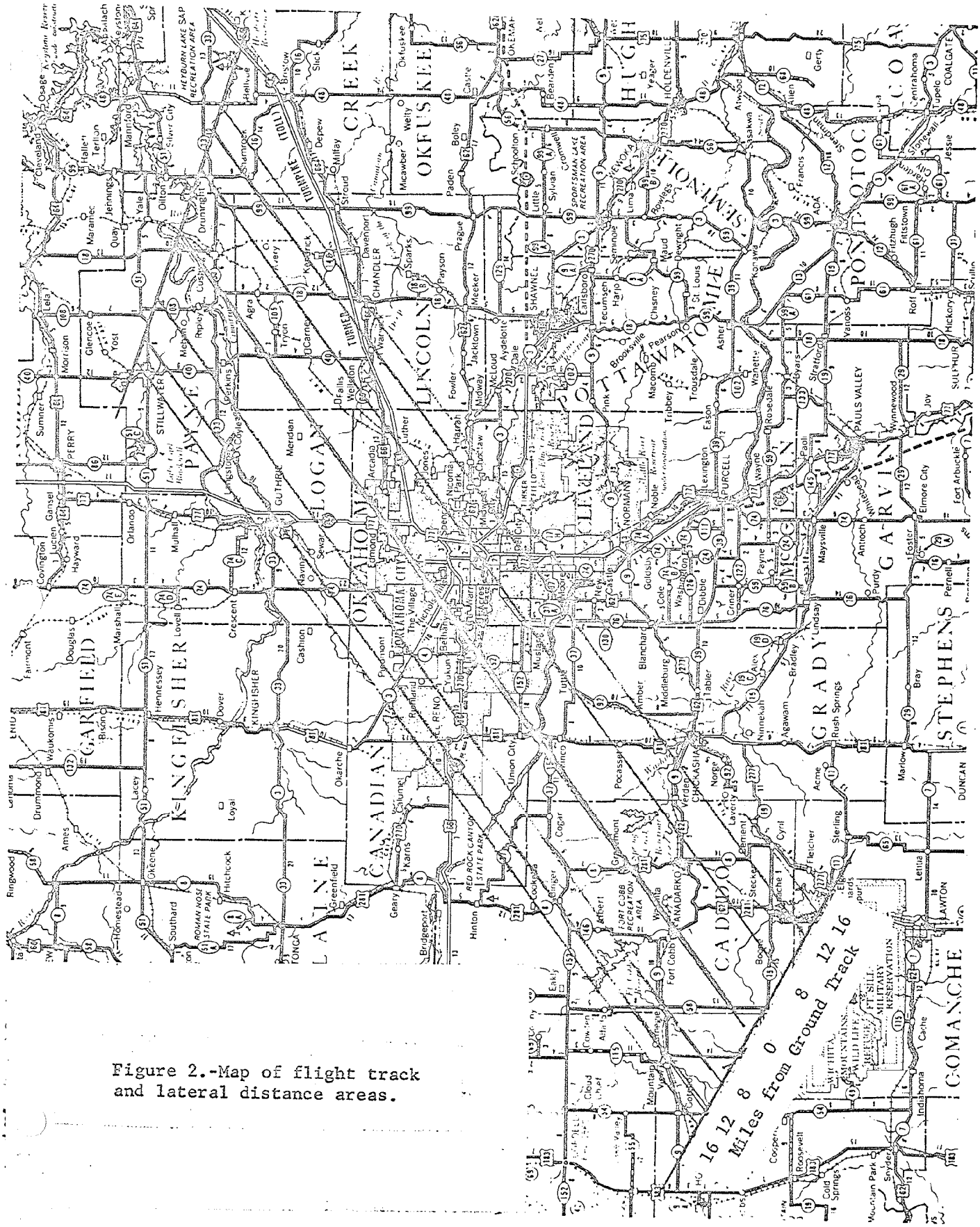


Figure 2.-Map of flight track and lateral distance areas.

	Total	Miles from Ground Track 0-8	8-12	12-16
Urban segments	421	155	180	86
Rural segments	180	60	60	60
Total	601	215	240	146

In addition to the above 601 segments based on Census reports, another 187 segments were selected from Oklahoma City and certain suburban communities. These additional segments were Census blocks adjacent to the first selections and constituted an independent random sample. Thus the total sample for the first interview included 788 segments randomly selected, of which 608 were urban and 180 were rural.

Selection of respondents: Four respondents were randomly selected from each segment so that each came from a different household. Every respondent was required to be 18 years old or more, to be a permanent resident of the sample segment, and to have adequate hearing and command of the English language. Evening and weekend interviewing was required when men would more likely be home. While no fixed quota was assigned for men and women respondents, interviewers were urged to select at least one male respondent out of every four interviews.

Special methodological features: Face-to-face personal interviews often involve considerable time and expense. The interviewer must travel to the sample area and physically locate the respondent. Telephone interviews are obviously less time consuming and, therefore, less expensive. There was a serious question, however, about the completeness of the telephone interview and the validity of the responses. In order to test for any significant differences between telephone and face-to-face interviewing, an independent random sample was utilized. A recent Polk Directory was used to select randomly four telephone numbers from each block that had been located next to a regular face-to-face sample block.

Since this was a panel study, with three successive interviews with the same respondents, the possibility existed that the effect of the first interview might bias subsequent interviews. To test for such possible "panel effects," 50 new segments adjacent to the originally selected Census segments were also chosen as independent control samples during the second and third interviews. With four respondents assigned to each segment, an additional 200 new control interviews were scheduled for the second and third interview periods.

In the first interview most of the respondents were seen face to face, with a smaller number contacted by telephone. During the second and third interviews, however, all respondents who had a telephone were contacted by phone. Those who had no telephone were visited in their homes.

4. Public Information Program

Normal FAA program: The FAA maintains a permanent large training and research center in Oklahoma City. As part of its normal public relations, it has a local public information staff and publications program. As a result, the local communications media are on the best of terms with the FAA center and the general public image of the FAA is very favorable.

Advance consultation with local leaders: Before the Oklahoma City area was selected for the test program, key Chamber of Commerce, public officials, and local "influentials" were informally advised of the FAA plans. Their reactions and support were solicited, and final decisions were made on a public information program.

Sonic boom demonstration: During the middle of January 1964, a sonic boom demonstration was conducted at Clinton-Sherman Air Force Base. This was designed to provide sonic boom education and experience for local community leaders. In attendance were representatives of the governor, local government, city hospitals, schools, zoos, insurance companies, and other businesses, local and national news media, church and other local organizations. A briefing was presented on the purposes of the Oklahoma City sonic boom test and the characteristics of the sonic boom phenomenon. This was followed by the actual generation of eight demonstration sonic booms, ranging in overpressure from 1.0 psf to 2.0 psf.

Official public briefing: Following the private demonstration at Clinton-Sherman Air Force Base, a large public press conference was held in Oklahoma City with local and national news media present. FAA representatives outlined the Oklahoma City program and distributed explanatory materials on the sonic boom. The program was officially designated as an FAA "Sonic Boom Test". Officials indicated that the acceptability of the sonic booms by local residents would be an important consideration in whether the government continued to support a commercial SST program. The six month duration of the test and the absence of night booms were announced. The plans for a public interview program by the National Opinion Research Center were mentioned in a news release and pamphlet distributed to school children.

Local news releases: Local newspapers, radio and TV stations gave the sonic boom program wide coverage. For days, articles appeared informing the public of the importance of the program. Following the actual start of the program, many articles concerning the progress of

the program were released to the press, radio and TV stations. In addition to FAA news releases, the press, radio and TV carried many stories concerning the sonic boom program which were not coordinated with the FAA before the stories were released to the public. When some groups tried to force the interruption of the sonic boom program, most local news media supported the FAA program.

5. Interviewer Selection and Training

Almost 100 applicants were carefully selected as potential interviewers. A rigorous training program was utilized to prepare these individuals for their roles in the study. Each applicant was given a standard NORC training kit and asked to conduct three trial interviews. The completed trial questionnaires were personally reviewed by a supervisor and discussed with the trainee. A full-day seminar was scheduled for 95 applicants who passed the first trial interviews. Interviewing techniques and sampling procedures were reviewed and a question-by-question evaluation was conducted of the actual questionnaire to be used in the boom study. Trainees then acted out an interview situation using a supervisor as a respondent. The supervisor purposely answered vaguely and incorrectly in order to provide the trainee with real problem situations. At the end of the seminar, each trainee was given a practice assignment to complete at least three interviews. These were carefully reviewed with the trainee and additional practice assignments were given until a satisfactory trainee performance was achieved. A total of 83 trainees successfully completed the training sessions and worked on the first interview. Due to illness, marginal performance and other commitments, only 64 of the original interviewers were employed on the second interview, and 47 on the third interview.

6. Questionnaire Design

Introduction: The interview was designed to embed the questions about sonic booms in a general context of local living conditions to secure as unbiased a response as possible about reactions to the booms. Respondents were told, "This is a community survey of how different people feel about living in different areas. It attempts to record systematically the kinds of things people like and dislike about their environments and the kinds of individual and group actions taken to improve undesirable situations.

Sponsorship: At no time was the respondent advised that the study was being made for the government as part of the sonic boom evaluation. If asked about sponsorship, a respondent was told that the National Opinion Research Center of the University of Chicago was conducting the study as part of its regular urban studies. This was done to avoid possible bias in response. A person believing the study was sponsored by the government might have exaggerated his feelings in order to influence the government's decisions. Results indicate that this

general approach was successful in over 90% of all interviews; only 8% voiced suspicion about the purposes or sponsorship of the survey.

Order of questions: The questionnaire was divided into five sequences, as follows:

1) General questions about likes and dislikes and overall rating of the area.

2) Direct questions outlining a pattern of local behavior in response to a major annoyance or dislike.

3) General reaction to perceived noise disturbances and behavior patterns in response to them.

4) Direct questions on topical sonic booms, including knowledge, interferences, annoyance, feelings of importance and necessity, and projected feelings toward civilian jet booms.

5) Background information on the characteristics of the respondent.

Control over respondent biases: As mentioned earlier, the public information program and the resulting news releases openly discussed the purposes of the study, suggested that local economic benefits would result from acceptance of the booms, stressed the daytime nature and 6 month duration of the booms and that NORC would study public reactions. To measure the extent to which the public actually became aware of these messages and to what extent this knowledge influenced reported reactions to the booms, special questions on these topics were incorporated in the personal interviews.

Face to Face and Telephone questionnaires: The telephone questionnaire was much shorter than the face-to-face questionnaire. In general, the telephone interview omitted the free-answer questions which required lengthy probing. The remaining questions included on the telephone questionnaire, however, were identical with questions on the face-to-face interview and followed a similar sequence.

Questionnaires used in these interviews were approved by the Bureau of the Budget. Sample questionnaires are included in the Appendix.

II. EVALUATION OF INTERVIEW RESPONSES BY SELECTED CHARACTERISTICS OF THE SAMPLE

A. Actual Sonic Boom Overpressures

1. Meteorological Effects

Program objectives: In establishing the sonic boom program, one of the broad objectives was to determine the effect of varying meteorological conditions upon the distribution of the wave pattern of the sonic boom. The meteorological conditions affecting the wave patterns include temperature, surface winds, winds aloft, cloud layers, ground turbulence, upperair turbulence, rain, etc.

According to the theories of generation and propogation of the sonic boom as developed for standard-day conditions, the greatest overpressures should be recorded directly under the flight track of the aircraft and the overpressures should diminish as the lateral distance from the flight track increases.

At a point approximately 25 miles either side of the flight track, the overpressures decrease to approximately zero for the flight profiles used in this study.

Overall distribution of boom levels: In general, there was not a uniform distribution of the overpressure pattern. On frequent occasions, overpressures were found to be higher at distances up to 10 miles from the flight track than they were under the flight track. In general, actual overpressure levels under the track were less than the expected program levels.

Variations due to weather: One of the primary concerns as to the effect of weather on the sonic boom distribution pattern was that there could be magnification of the boom due to varying meteorological conditions. On the basis of theoretical assumptions, it was believed that the predicted overpressures might be magnified from one to three times due to the influence of different meteorological conditions. The data resulting from the Oklahoma City program revealed no magnification on the order of three. On only two occasions where a boom was scheduled for 2 psf was there a recording of as much as 4.4 psf, and only five recordings of overpressures of 3.5 psf. Therefore, it seems reasonable to conclude that the maximum magnification was a factor in the order of one (i.e., doubling the boom overpressure), not two or three /8/.

Variations of programmed 2.0 psf: In 2597 overpressure recordings where the scheduled overpressure was calculated at 2 psf, 303 recorded overpressures, or 11.7 per cent, exceeded 2 psf.

In those 303 recordings scheduled at 2 psf where more than 2 psf was recorded, the average value of the actual overpressure was 2.42 psf. It was also characteristic of the overpressure distribution pattern that, when a two psf boom was scheduled, overpressures were less than 2 psf at locations in the city at various distances from the flight path.

Variations of programmed 1.5 psf: There were 2609 recordings of overpressures scheduled for 1.5 psf. Of this number, 15.6 per cent or 398 booms were recorded at levels above 1.5 psf.

The magnification results from the 1.5 psf booms were somewhat greater than for the 2 psf booms. In nine recordings of boom pressures scheduled for 1.5 psf, overpressures averaged 3.29 psf.

The average of 398 recorded overpressures in excess of 1.5 psf was 1.85 psf.

2. Sonic Boom Overpressures for Three Interviewing Periods

Program objective: One of the major study objectives was to determine the relationship between public reactions to the sonic boom and the intensity of the boom. Accordingly, the actual median sonic boom overpressures were calculated by NASA for each of the three interview periods.

Median overpressures: In general, the overpressure levels closest to ground track (0-8 miles) were greater than those farthest from ground track (12-16 miles). As Table 1 shows, these differences in overpressure levels were in general accord with the basic theory of sonic boom propagation. The average or median boom intensity was 1.13 psf in the closest areas during the first interview period. The boom level in the middle distance (8-12 miles) was 0.80 psf during this initial period and 0.65 psf in the farthest areas.

During the second interview period, the overpressure levels increased only slightly. In the closest areas the average boom rose to 1.23 psf, while in the middle areas it reached 1.10 psf, and 0.85 psf in the farthest areas.

The median boom values increased more substantially in the third interviewing period, as the programmed boom value was advanced from 1.5 psf to 2.0 psf. In the closest areas, the average boom reached 1.60 psf, followed by an average of 1.35 psf in the middle areas and 1.00 psf in the farthest areas.

It should be noted that the average boom value for the closest areas during the first period was about equal to the average for the middle areas during the second interview period and the farthest areas during the third period. Likewise, the average boom for closest areas during the second period was almost the same as the boom value in the middle areas during the third period. This similarity in boom exposures is indicated at this time because later comparisons of community reactions to the booms under these comparable physical conditions will show almost equal community reactions.

Table 1

MEDIAN SONIC BOOM OVERPRESSURES
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Time Period	No. Weeks	Miles from Ground Track 0-8 Overpressure (psf)	8-12 Overpressure(psf)	12-16 Overpressure(psf)
Feb.3-Apr.19	11	1.13	0.80	0.65
Apr.20-June 14	8	1.23	1.10	0.85
June 15-July 25	6	1.60	1.35	1.00

Frequency of occurrence of programmed overpressures: Actual average booms consistently fell below programmed levels. As Table 2 shows, only 16% of the booms reached the program level of 1.5 psf in the closest areas during the first interview period. In the second period, almost a third of all booms reached the program level of 1.5 psf, but when the program level was advanced to 2.0 psf during the third period, only 22% of the actual booms reached the program level. During this last period, however, over 60% of the booms equaled or exceeded 1.5 psf in the closest areas, thus permitting a valid test of public reactions to booms of this overpressure value.

Table 2

FREQUENCY OF OCCURRENCE OF PROGRAMMED OVERPRESSURE LEVELS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Time Period	Weeks	Miles from Ground Track: 0 - 8		8 - 12		12 - 16	
		1.5 psf	2.0 psf	1.5 psf	2.0 psf	1.5 psf	2.0 psf
Feb.3-April 19	11	16%	2%	6%	1%	2%	0%
April 20-June 14	8	30	9	25	8	10	2
June 15-July 25	6	60	22	40	15	21	7

Ranges in actual boom magnitudes: The complete distribution of overpressures measured in the three distance areas is shown in Figures 3, 4 and 5. From these curves, which were prepared by NASA, the actual frequency of occurrence of any boom value can be ascertained.

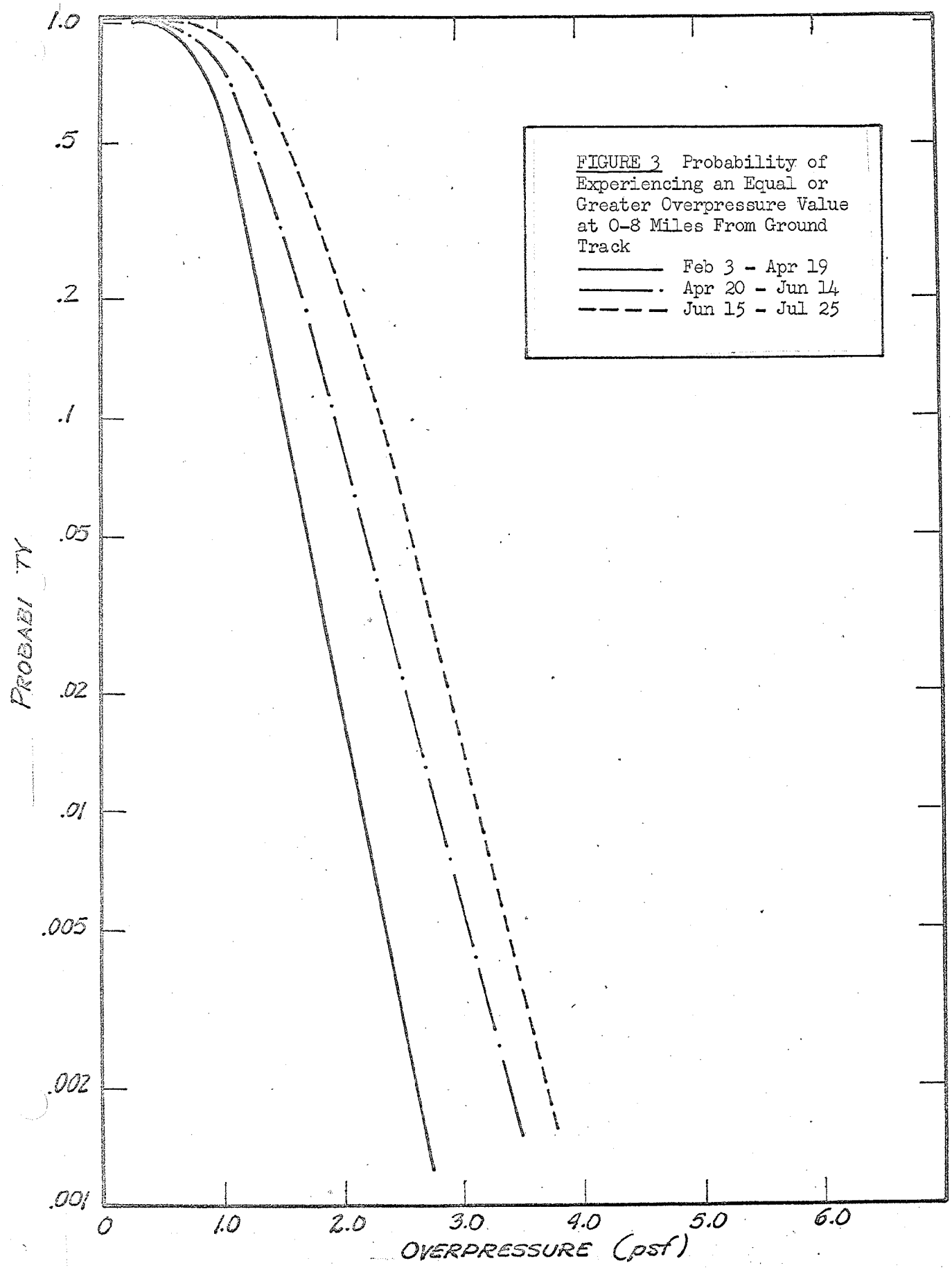
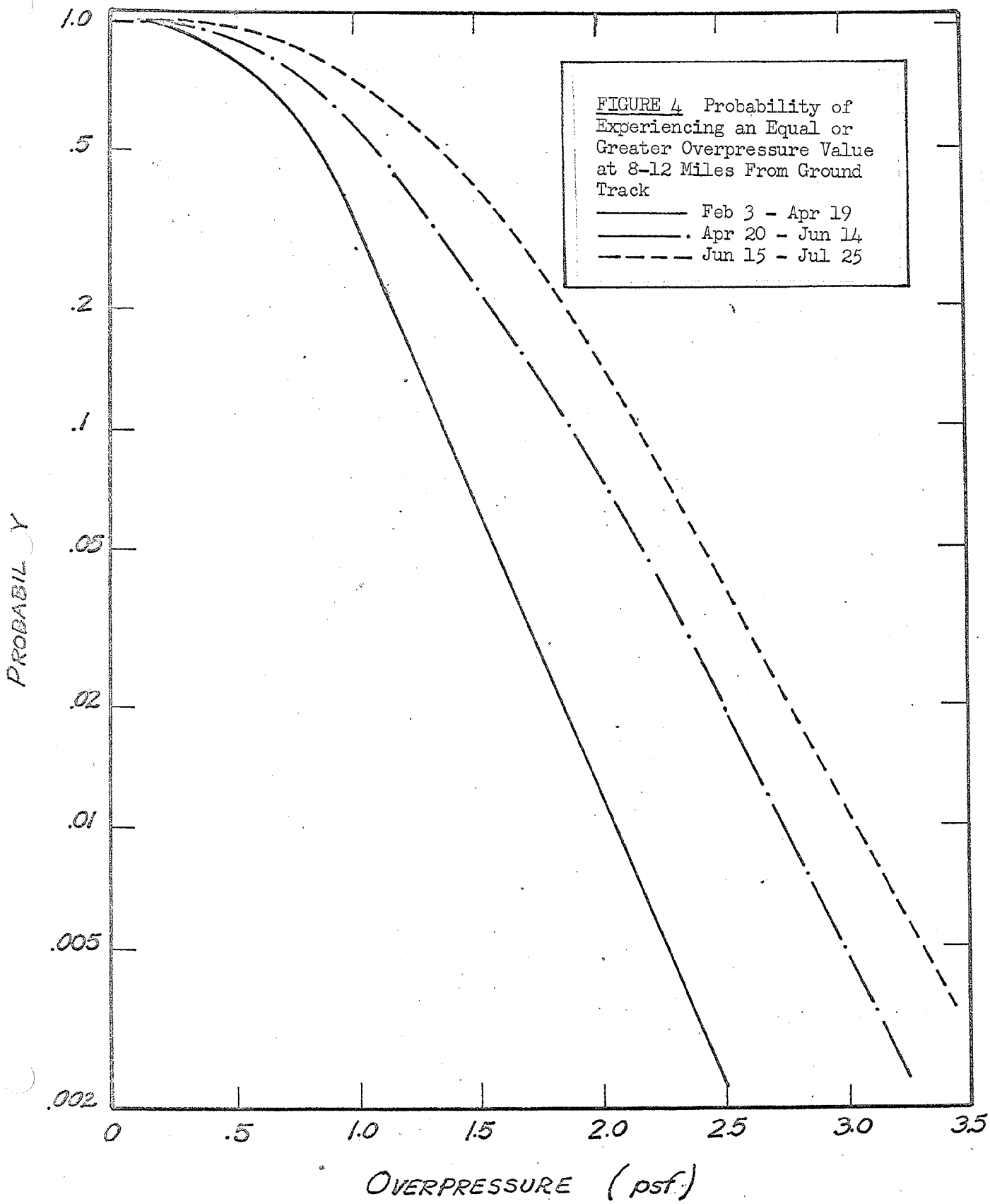


FIGURE 3 Probability of Experiencing an Equal or Greater Overpressure Value at 0-8 Miles From Ground Track


1.0
.5
.2
.1
.05
.02
.01
.005
.002
PROBABILITY
0
.5
1.0
1.5
2.0
2.5
3.0
3.5
OVERPRESSURE (psf)
FIGURE 4 Probability of Experiencing an Equal or Greater Overpressure Value at 8-12 Miles From Ground Track
Feb 3 - Apr 19
Apr 20 - Jun 14
Jun 15 - Jul 25

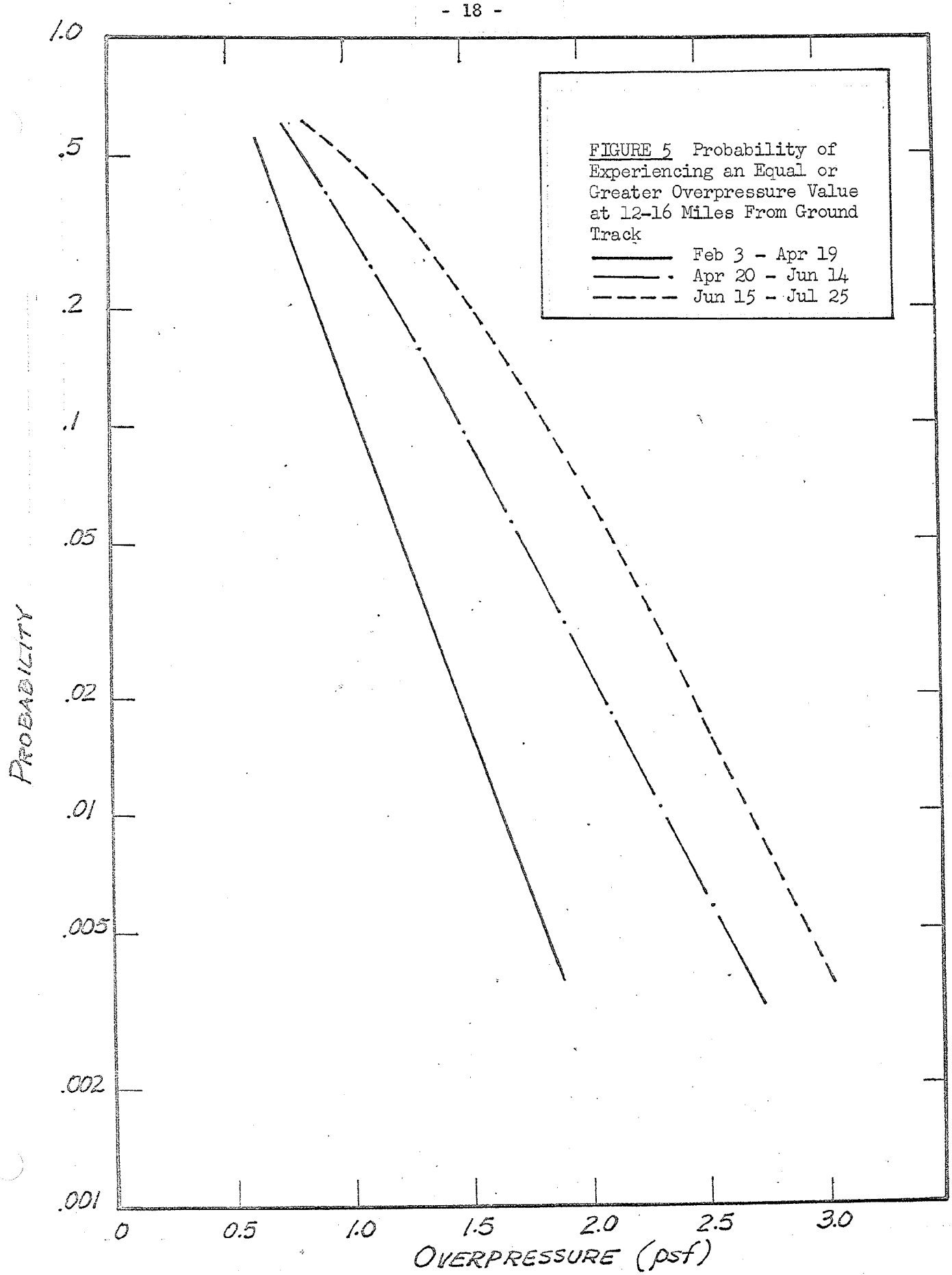


FIGURE 5 Probability of Experiencing an Equal or Greater Overpressure Value at 12-16 Miles From Ground Track

B. Number and Types of Interviews

1. Overall Completion Rates

Total assignment: Of a total 3152 assigned interviews (788 segments x 4 = 3152), 3135 were successfully completed on the first interview. The field procedure involved random contacts of households in randomly assigned blocks. When no one was home, a household was skipped and contacted again only if the four assigned interviews in the segment were not completed and the household was again reached in the random selection procedure.

Refusal and break-off rates: In order to complete the 3135 initial interviews, a total of 3711 interview contacts were required. As Table 3 indicates, over 15% of these initial contacts either refused to be interviewed or broke off the interview once it had begun. During the second and third interviews, only 1.8% additional refusals or break offs occurred, but almost 6% of the other respondents could not be reached for a variety of reasons. Thus, three complete sets of interviews were secured from 2852 respondents representing 77% of all initial contacts.

Table 3

INTERVIEW CONTACTS AND COMPLETIONS

Oklahoma City Area

February-July 1964

				Per Cent
First Interview:	Total contacts		3711	100.0
	Refusals and break offs	576		15.6
	Completed interviews	3135		84.4
Second Interview:	Total contacts		3135	
	Refusals and break offs	30		.8
	Not at home,moved,sick,etc.	95		2.5
	Completed interviews	3010		81.1
Third Interview:	Total contacts		3010	
	Refusals and break offs	41		1.0
	Not at home,moved,sick,etc.	117		3.1
	Completed interviews	2852		77.0

Little information is available on the 15.6% who refused the initial interview, but a comparison of answers by the 7.4% who completed the first interview but did not complete the other two interviews will indicate that very little bias was introduced by failure to complete these second and third interviews. In general, the completion rates are considered quite satisfactory.

As Table 3 indicates, a total of 8997 personal interviews was completed during the three interview periods. In addition, 197 control interviews were completed in the second period and 199 similar interviews in the third period. Thus, a grand total of 9393 interviews were completed in this study.

2. Face-to-Face and Telephone Completion Rates

Completions rates for face-to-face and telephone interviews were about the same for the three interview periods. Four per cent of the second interviews were incomplete, and an additional 5% were incomplete on the third interview. Thus 91% of all initial respondents also completed their second and third interviews. Table 4 presents these comparisons.

Table 4

FACE-TO-FACE AND TELEPHONE INTERVIEWS

Oklahoma City Area

February-July 1964

	Total		Face-to-Face		Telephone	
	No.	Percent	No.	Percent	No.	Percent
First interviews completed	3135	100.0	2390	100.0	745	100.0
Incompletes - 2nd interview	125	4.0	96	4.0	29	3.9
Second interviews completed	3010	96.0	2294	96.0	716	96.1
Incompletes - 3rd interview	283	9.0	218	9.0	65	8.7
Third interviews completed	2852	91.0	2172	91.0	680	91.3

3. Urban and Rural Completed Interviews

Face-to-face and telephone interviews are combined in the urban category. The number of urban and rural complete interviews by distance area is shown in Table 5.

Table 5

RESPONDENTS WITH THREE COMPLETE INTERVIEWS
BY URBAN-RURAL RESIDENCE AND DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Total		2852
Total Urban		2234
Distance from Ground Track:		
0-8 miles	1245	
8-12 miles	665	
12-16 miles	324	
Total Rural		618
Distance from Ground Track:		
0-8 miles	219	
8-12 miles	214	
12-16 miles	185	

4. Number of Interviews by Name of Locality

Table 6 indicates the number of initial interviews by name of locality and distance area.

Table 6

NUMBER OF INITIAL INTERVIEWS
BY NAME OF LOCALITY AND DISTANCE AREA

Oklahoma City Area

April 1964

Name of Locality	Total	Miles from Ground Track 0-8	8-12	12-16
Oklahoma City	1540	1128	412	--
Village, Nichols Hills, War Acres, Bethany	239	239	--	--
Guthrie	224	--	--	224
El Reno	308	--	308	--
Moore	121	--	--	121
Meridian	12	12	--	--
Luther	24	24	--	--
Jones	44	44	--	--
Mustang	12	12	--	--
Union City	16	16	--	--
Minco	52	52	--	--
Piedmont	8	--	8	--
Tuttle	48	--	48	--
McLemore	24	--	24	--
Valley Brook	24	--	24	--
Spencer	52	--	52	--
Langston	8	--	--	8
Coyle	12	--	--	12
Harrah	48	--	--	48
Choctaw	28	--	--	28
Scattered Farm	291	80	84	127
Total	3134	1607	960	568

5. Date of Interview

Over half of all the first interviews were completed during the first week of interviewing. The rest were completed in the following 10 days. On the second interview, almost all were completed during the first week of interviewing. On the third wave of interviewing, however, only 76% were completed on the first week, 21% on the second week and the remaining during the third week. Table 7 presents these results.

Table 7

DATE OF INTERVIEW FOR THREE COMPLETE SETS OF INTERVIEWS

Oklahoma City Area

February-July 1964

	Total		Miles from Ground Track					
			0 - 8		8 - 12		12- 16	
	No.	%	No.	%	No.	%	No.	%
First Interview								
Total	2852	100	1464	100	879	100	509	100
April 5 - 11	1535	54	765	52	494	56	276	54
April 12-21	1317	46	699	48	385	44	233	46
Second Interview								
Total	2852	100	1464	100	879	100	509	100
May 22-31	2750	97	1424	97	847	96	489	88
June 1-6	86	3	38	3	29	4	19	10
June 7-10	6	*	2	*	3	*	1	2
Third Interview								
Total	2852	100	1464	100	879	100	509	100
July 7-12	2210	78	1115	76	711	81	384	76
July 13-19	554	19	300	21	145	16	109	21
July 20-25	88	3	49	3	23	3	16	3

* Less than 1%

6. Duration of Interview

The median duration of the first interview was 40 minutes. The face-to-face interview required an average of almost 45 minutes, while the telephone interview averaged well under 30 minutes. In the second interview, an average of 15 minutes was required, while on the final or third interview only an average of 8 minutes was needed. Table 8 presents the full frequency distribution of duration of all three interviews.

Table 8

DURATION OF INTERVIEWS

Oklahoma City Area

February-July 1964

Duration in Minutes	Total	Face to Face	Telephone
First Interview			
Number of Respondents	(3135)	(2390)	(745)
-30	25.5%	10.0%	75.0%
30-39	24.1	25.7	18.9
40-49	21.8	27.7	2.6
50-59	15.5	19.8	1.6
60 +	12.8	16.6	1.4
Don't know	.3	.2	.5
Second Interview			
Number of Respondents	(3010)		
- 5	4.0%		
5-9	1.2		
10-14	42.8		
15-19	36.1		
20-24	10.8		
25-29	2.8		
30 +	1.1		
Don't know	1.2		
Third Interview			
Number of Respondents	(2852)		
- 5	11.3		
5-9	50.9		
10-14	23.9		
15-19	7.7		
20-24	2.3		
25-29	1.6		
30 +	.9		
Don't know	1.4		

C. Urban and Rural Respondents

Planning needs: SST planners need to know whether small town and rural residents react any differently to sonic booms than their large city counterparts. This information is needed to establish land routes for the SST across the country. The study design, therefore, selected representative samples of urban and rural respondents to determine and compare their reactions.

Urban and rural sonic boom reactions similar: Reactions of urban and rural residents to the sonic booms were essentially the same on virtually all major responses. The small differences which were reported were generally well within the range of sampling variability.

1. Reports of Interference with Living Activities by Sonic Booms

Types of interference: House rattles and vibrations were reported by virtually all residents. Having been startled or frightened by sonic booms was next in importance, being reported by over a third of all respondents. Interference with sleep or rest, radio or TV reception, and conversation were reported by about 10% of all persons.

Trends in interference: The types and patterns of interference reported in all three interviewing periods remained fairly stable. Startle and fear of booms decreased about 3% from the first to the last interview, while other types of interference increased only 2-4% over this period.

Urban-rural differences: Only very small differences in interference, ranging from 2-4%, were reported by urban and rural respondents. Details of these comparisons are presented in Table 9.

Table 9

REPORTED TYPES OF INTERFERENCE BY SONIC BOOMS
BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Types of Interference	Urban			Rural		
	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25
*Number Respondents	2210	2226	2085	616	614	596
House rattles	86.3%	85.8%	89.0%	89.6%	88.3%	91.1%
Startles	34.3	29.6	31.7	38.5	32.4	34.4
Interrupts sleep	12.3	11.8	14.1	8.9	9.4	11.9
Interrupts rest	9.2	9.9	12.9	7.8	11.7	14.4
Interrupts conversation	7.4	9.3	9.9	8.4	12.1	13.4
Interrupts radio-TV	6.4	6.3	6.3	9.3	8.8	9.7

* Number of total respondents does not equal 2852 because those persons who said they did not hear the sonic booms or were not at home during most of the period were not asked this question.

Scale of interference: A summary measure or Guttman scale of reported interference by booms was prepared from the answers shown in Table 9. Excluding radio and TV interference, because not all persons have radio or TV sets, all respondents were grouped according to the types of reported interference. A person reporting interference with conversation or rest also generally reported interference with sleep, as well as startle and vibration reactions. A person reporting sleep interference and startle, but not interference with rest or conversation also generally reported vibration interference. Thus, intensity of interference can be shown in three groups -- interference with 4-5 activities, interference with 2-3 activities, and interference with 0-1 activity. As Table 10 indicates, about 60% of all persons report only house vibrations or no interference, while about 16 report 4 or 5 types of interference. Urban-rural differences again were small in each interview period.

Table 10

SCALE OF REPORTED INTERFERENCE BY SONIC BOOMS
BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Number of Interferences	Urban			Rural		
	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25
Number Respondents	2234	2226	2085	618	614	596
4 - 5	16.3%	13.4%	16.9%	13.4%	14.2%	21.3%
2 - 3	24.4	25.2	21.5	30.9	26.1	18.8
0 - 1	59.3	61.4	61.6	55.7	59.8	59.9

2. Reports of Annoyance by Sonic Booms

Types of interference: Almost two-thirds of all persons said house rattles were somewhat annoying during the third interview. Only about 25%, however, said they were very annoyed, another 20% said they were moderately annoyed, and an equal number only a little annoyed. About a fourth of all residents reported some annoyance with being startled, with 12% on the final interview saying they were very annoyed and 10% saying moderately annoyed. Other types of interference resulted in 5-10% annoyance responses.

Trends in annoyance: The intensity of annoyance increased over time for all types of interference, with the largest gains reported in annoyance with house rattles.

Urban-rural differences: Only minor differences of 2-3% in annoyance with booms were generally reported by urban and rural residents. Table 11 presents these findings.

Table 11

REPORTED ANNOYANCE WITH SONIC BOOMS BY TYPE OF INTERFERENCE AND BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Type of Interference and Intensity of Annoyance	Urban			Rural		
	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25
Number respondents	2210	2226	2085	616	614	596
House Rattles:Total	47.8%	57.8%	63.4%	52.9%	62.0%	65.8%
Very annoyed	11.8	18.7	25.8	9.4	17.4	22.7
Moderately	15.5	17.1	18.6	16.6	19.2	19.8
Little annoyed	20.5	22.0	20.0	26.9	25.4	23.3
Startle:Total	24.6%	25.3%	28.4%	28.1%	27.2%	29.6%
Very annoyed	7.1	9.0	11.7	5.0	9.3	12.6
Moderately	8.2	8.0	9.6	9.1	8.6	9.6
Little annoyed	9.3	8.3	7.1	14.0	9.3	7.4
Sleep: Total	9.8%	10.3%	12.8%	6.7%	8.2%	10.7%
Very annoyed	4.0	5.1	7.0	1.5	3.3	6.0
Moderately	2.9	3.0	3.9	2.3	2.8	3.9
Little annoyed	2.9	2.2	1.9	2.9	2.1	.8
Rest: Total	7.9%	9.5%	12.2%	7.2%	11.1%	13.4%
Very annoyed	4.0	5.3	7.5	3.2	6.2	7.2
Moderately	2.5	3.0	3.2	2.4	2.8	4.5
Little annoyed	1.4	1.2	1.5	1.6	2.1	1.7
Conversation:Total	5.5%	7.5%	8.7%	5.8%	10.6%	12.1%
Very annoyed	2.0	2.5	3.9	1.3	4.4	4.5
Moderately	1.6	2.6	2.9	2.1	3.3	4.7
Little annoyed	1.9	2.4	1.9	2.4	2.9	2.9
Radio & TV: Total	4.8%	6.4%	5.4%	6.7%	7.5%	9.0%
Very annoyed	1.5	1.9	2.4	1.3	2.3	3.0
Moderately	1.4	2.2	1.8	1.8	1.8	3.5
Little annoyed	1.9	1.3	1.2	3.6	3.4	2.5

Intensity of annoyance: A measure of the intensity of annoyance can be secured by comparing the ratios of the number of persons reporting more than a little annoyance to the total number of persons reporting interference. Table 12 indicates that sleep and rest interference were the most serious types of interference. Over 50% of all persons reporting such interference also reported more than a little annoyance in the first interview and about 80% reported such annoyance in the final interview. In contrast only about 30% of all persons who reported some rattles in the first period were seriously annoyed by them. In the final period, almost half of all persons reporting rattles also

Table 12

COMPARISON OF MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS BY TYPE OF INTERFERENCE AND URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Type of Interference and Annoyance	Urban			Rural		
	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25
Number Respondents	2210	2226	2085	616	614	596
Rattle interference	86.3%	85.8%	89.0%	89.6%	88.3%	91.1%
Rattle annoyance	27.3	35.8	44.4	26.0	36.6	42.5
Ratio	.32	.42	.50	.29	.41	.47
Startles interfer.	34.3%	29.6%	31.7%	38.5%	32.4%	34.4%
Startles annoyance	15.2	17.0	21.3	14.1	17.9	22.2
Ratio	.44	.57	.67	.36	.55	.65
Sleep interference	12.3%	11.8%	14.1%	8.9%	9.4%	11.9%
Sleep annoyance	6.9	8.1	10.9	3.8	6.1	9.9
Ratio	.56	.69	.77	.43	.65	.83
Rest interference	9.2%	9.9%	12.9%	7.8%	11.7%	14.4%
Rest annoyance	6.5	8.3	10.7	5.6	9.0	11.7
Ratio	.71	.84	.83	.72	.77	.81
Conversation interf.	7.4%	9.3%	9.9%	8.4%	12.1%	13.4%
Conversation annoy.	3.6	5.1	6.8	3.4	7.7	9.2
Ratio	.49	.55	.69	.40	.64	.69
Radio & TV interfer.	6.4%	6.3%	6.3%	9.3%	8.8%	9.7%
Radio & TV annoy.	2.9	4.1	4.2	3.1	4.1	6.5
Ratio	.45	.65	.67	.33	.47	.67

reported more than a little annoyance with them. Of the very few persons reporting interference with conversation or radio and TV listening, almost 70% were seriously annoyed in the final period. It is significant to note that the ratio of annoyance to interference increased over time for each type of interference, and the urban and rural differences were consistently minor.

A summary measure of the intensity of annoyance is shown in Table 13. Respondents reporting more than a little annoyance with any type of interference are shown for each interview period. While only a third of all residents were thus seriously annoyed in the first period, the number increased to 46% more than a little annoyed by the booms in the third interview period. Urban-rural differences were again minor.

Table 13

REPORTED MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS
BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Intensity of Annoyance	Urban			Rural		
	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25
Number Respondents	2234	2226	2085	618	614	596
More than a little	34.3%	37.4%	46.0%	29.6%	39.1%	45.5%
Little or none	65.7	62.6	54.0	70.4	60.9	54.5

3. Reports of Damage by Sonic Booms

Overall alleged damage: About one third of all residents reported that some booms had caused some damage during the six month period. Slightly more urban residents (35.9%) than rural residents (29.4%) reported such damage. Most of this difference occurred during the second and third interviewing periods.

Table 14

REPORTED DAMAGE BY SONIC BOOMS
BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Interviewing Period	Urban	Rural
Number of Respondents	2234	618
Totals		
Period 1: Feb. 3-April 19	17.7%	15.2%
Period 2: April 20-June 14	20.2	14.8
Period 3: June 15-July 25	21.2	15.8
Number and Time of Damage Reports		
None	64.1%	70.6%
Some	35.9	29.4
All 3 periods	6.4%	4.5%
Period 1 and 2 only	3.8	2.8
Period 1 and 3 only	2.2	1.9
Period 1 only	5.3	6.0
Period 2 and 3 only	4.4	2.6
Period 2 only	5.6	4.9
Period 3 only	8.2	6.8

4. Reports of Desires to Complain and Actual Complaints About Sonic Booms

Felt like complaining: About 11% of all urban residents and 9.4% of all rural residents felt like calling or writing the FAA about the booms during the first interview period. By the third interview, the number desiring to call or write increased slightly to about 14% for both urban and rural groups. Fewer residents felt like signing petitions, visiting officials personally, or helping to set up a protest committee. As Table 15 shows, urban and rural differences were not significant.

Table 15

REPORTED DESIRES TO COMPLAIN AND ACTUAL COMPLAINTS ABOUT SONIC BOOMS BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Activity	Urban						Rural					
	2/3-4/19		4/20-6/14		6/15-7/25		2/3-4/19		4/20-6/14		6/15-7/25	
	Felt Like	Did	Felt Like	Did	Felt Like	Did	Felt Like	Did	Felt Like	Did	Felt Like	Did
Number of respondents	(2210)		(2226)		(2085)		(616)		(614)		(596)	
Write or telephone	11.0%	2.7%	13.9%	2.3%	14.2%	2.0%	9.4%	1.1%	13.0%	1.1%	13.6%	0.8%
Sign a petition	8.9	0.4	12.4	0.4	10.9	0.2	5.8	0.2	12.9	0.0	11.1	0.3
Visit an official	4.9	0.4	7.2	0.4	7.8	0.4	4.1	0.2	7.5	0.0	8.7	0.0
Help set up a committee	4.8	0.2	6.4	0.2	6.4	0.2	3.7	0.0	6.4	0.0	4.7	0.2

Actually complained: Only a fraction of those who felt like complaining actually voiced their feelings. Less than 3% of the urban residents compared to 1% of the rural residents actually called or wrote to the FAA during the first interview period. This number of actual complainers remained about the same, despite the increase in reported desires to complain. Table 15 compares these trends.

Summary scale of desires to complain: The four types of complaint activity shown in Table 15 can be combined into a Guttman scale of intensity of complaint feelings. If a person desired to visit an official or help set up a committee, he also generally felt like signing a petition and calling about the booms. This desire to do 3-4 things constituted a high complaint potential. The second group who did not feel like visiting an official or setting up a committee, but did feel like calling the FAA or signing a petition could be considered as having a moderate complaint potential. Those who did not feel like doing any of the four types of complaint activities can be classified as having a low or no complaint potential. As Table 16 shows, about 84% reported no complaint potential, about 9% a high complaint potential and 7% a moderate complaint potential. The urban-rural differences were minor.

Table 16

COMPLAINT POTENTIAL FOR BOOMS :
PERSONS FELT LIKE COMPLAINING BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Intensity of Complaint Potential	Urban			Rural		
	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25
Number Respondents	2228	2226	2085	618	614	596
None	87.3%	83.1%	84.3%	88.9%	83.4%	83.7%
Some	12.7	16.9	15.7	11.1	16.6	16.3
High	6.0	8.9	8.8	5.0	9.1	9.6
Moderate	6.7	8.0	6.9	6.1	7.5	6.7

5. Long Range Acceptability of Sonic Booms

Self-appraisal of adaptation to indefinite exposure of booms: Although about half of the rural residents and a third of the urban residents were aware of the six-month duration of the test program on the first interview, practically all reported on the third interview that the booms would end after July. Since the SST in actual operation would be expected to fly year in and year out and create sonic booms for an indefinite period, a question was added toward the end of each of the three interviews to measure self-appraisals of adaptation to an indefinite boom exposure. Each person was asked, "If your area regularly received booms from a civilian jet as often and as loud as the recent ones, do you think you yourself would very likely learn to live with it, you might or you probably wouldn't be able to live with it?"

Both urban and rural residents gave the same answers about the long range acceptability of the booms. While almost 80% felt they "very likely" would accept the booms on the first interview, only 60% felt this way on the third interview, when the intensity of the boom had increased. Only about 20% on the third interview, however, took the extreme position that they couldn't accept the booms or didn't know if they could accept them.

Table 17

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY FOR AN INDEFINITE PERIOD BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Ability to Accept Booms	Urban			Rural		
	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25
Number Respondents	2228	2226	2234	618	614	618
Very likely	79.4%	66.9%	60.6%	75.4%	67.1%	62.1%
Might	13.6	17.7	17.7	15.4	17.3	17.6
Couldn't	4.8	13.5	18.4	6.6	12.5	17.2
Don't know	2.2	1.9	3.3	2.6	3.1	3.1

6. Other Important Variables

While many additional tabulations were prepared for urban and rural respondents, a complete presentation of these findings would only add to the length of the report and reaffirm the consistent similarity in responses. It was decided, therefore, to present only the major sonic boom reactions and related attitudes in this section. Other tabulations which were prepared showed no significant differences between urban and rural residents.

Knowledge of the sonic boom test: About 60% of all respondents knew the purpose of the test program during the first interview. An additional 17% gave other answers which had been suggested in the press, i.e. the test would help local aviation industries or help get a new SST terminal for Oklahoma City. While 62% of the urban residents gave correct answers, only 50% of the rural residents were equally well informed.

Feel local booms absolutely necessary: All respondents were asked, "Do you yourself feel it is absolutely necessary for the jets to make these booms around here or not?" On the first interview, over half felt it was absolutely necessary, but by the final interview, only about 45% felt this way. The urban-rural responses were almost the same, as can be seen in Table 18.

Table 18

REPORTED BELIEF IN THE ABSOLUTE NECESSITY OF LOCAL BOOMS BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

Belief in Necessity	Urban			Rural		
	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25
Number Respondents	2210	2226	2234	616	614	618
Yes	57.6%	52.2%	45.7%	52.8%	49.8%	44.0%
No	24.6	29.2	33.0	26.3	27.5	31.2
Don't know	17.8	18.6	21.3	20.9	22.7	24.8

Feel residents should complain if annoyed: As reported in the discussion of the study design, some local groups urged residents to accept the booms without complaint. It was inferred that complaining might harm local aircraft interests. Since the purpose of the study was to record honest reactions to the booms, both favorable and unfavorable, a special question was added to the first and third interviews to measure any possible bias on this question. Respondents were asked, "Do you think people around here should complain about these booms if they find them annoying?" About equal numbers of urban and rural residents felt people should complain if annoyed at the beginning and end of the study. About 71% felt this way on the third interview, compared to 67-68% on the first interview. Table 19 presents these findings.

Table 19

REPORTED BELIEF PEOPLE SHOULD COMPLAIN IF ANNOYED
BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

	Urban		Rural	
Believe in Complaint	Feb. 3 April 19	June 15 July 25	Feb. 3 April 19	June 15 July 25
Number of Respondents	2210	2234	616	618
Yes	68.2%	71.3%	66.6%	71.2%
No	24.8	20.9	26.0	17.8
Don't know	7.0	7.8	7.4	11.0

Personal characteristics: Only in educational achievement and income are urban and rural residents different in personal characteristics. Urban residents have more education and higher incomes. Table 20 presents these comparisons.

Table 20

SELECTED PERSONAL CHARACTERISTICS
BY URBAN AND RURAL RESPONDENTS

Oklahoma City Area

February-July 1964

	Urban	Rural
Number of Respondents	2228	618
Family Composition		
Adults only	48.0%	47.0%
Children over 6	25.9	27.0
Children under 6	26.1	26.0
Size of Family		
One person	9.6%	9.1%
Two-three	50.2	47.6
Four or more	40.2	43.3
Age		
Under 40	37.7%	37.2%
40 - 64	41.8	38.7
65 or more	19.5	23.9
Age not given	1.0	.2
Sex		
Male	30.0%	32.4%
Female	70.0	67.6
Education		
Elementary school	19.2%	35.0%
High school	53.0	51.4
College	27.4	13.5
Not given	.4	.1
Income		
Under $8,000	69.7%	81.7%
$8,000-14,999	18.5	13.1
$15,000 or more	4.2	1.8
Income not given	7.6	3.4

D. Telephone and Face-to-Face Interviews

Methodological test: Part of the study design was to select two comparable samples of urban respondents and to interview one group face to face and the other by telephone. The face-to-face interviews were longer and included more introductory and free-answer-type interviewing. The questions which were included in both types of interviews, however, were the same.

Telephone and face-to-face sonic boom reactions similar: Reactions to sonic booms on both types of interviews were essentially the same. The telephone interviews were much shorter, yet yielded about the same sonic boom responses. Some of the more important reactions to the booms are presented in this section.

1. Reports of Interference with Living Activities by Sonic Booms

Type of interference: Virtually no differences in sonic boom interferences were reported by both types of interviews. The overall pattern of interference was also the same as the urban and rural responses. Vibrations and house rattles were most frequently reported, followed in order by startle, interrupted sleep, rest, conversation and radio and TV listening. Table 21 presents these findings.

Table 21

REPORTED TYPES OF INTERFERENCE BY SONIC BOOMS
BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-April 1964

Types of Interference	Face-to-Face	Telephone
Number of Respondents*	937	666
House rattle	86.4%	87.8%
Startle	36.4	33.8
Interrupt sleep	13.2	15.2
Interrupt rest	9.9	10.7
Interrupt conversation	8.1	8.4
Interrupt radio and TV	7.7	6.3

* Only respondents in matched adjacent blocks are included.

Scale of interference: Table 22 presents a summary scale of interference. As can be seen, no significant differences were reported by either type of interview.

Table 22

SCALE OF REPORTED INTERFERENCE BY SONIC BOOMS
BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-April 1964

Number of Interferences	Face-to-Face	Telephone
Number of Respondents	937	666
4-5	14.1%	15.0%
2-3	29.6	27.0
0-1	56.3	58.0

2. Reports of Annoyance by Sonic Booms

Kinds of interference: Virtually no differences were reported in annoyance responses by the different interview groups. Table 23 presents this similarity in response.

Table 23

REPORTED ANNOYANCE WITH SONIC BOOMS
BY TYPE OF INTERFERENCE AND BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-April 1964

Type of Interference and Intensity of Annoyance	Face to Face	Telephone
Number of Respondents	937	666
House Rattle: Total	49.9%	49.0%
Very annoyed	13.2	14.9
Moderately annoyed	17.2	14.7
Little annoyed	19.5	19.4
Startle: Total	26.3%	25.7%
Very annoyed	7.6	8.7
Moderately annoyed	9.8	7.2
Little annoyed	8.9	9.8
Sleep: Total	11.1%	11.9%
Very annoyed	4.4	5.1
Moderately annoyed	3.1	3.8
Little annoyed	3.6	3.0
Rest: Total	8.5%	9.6%
Very annoyed	5.0	4.1
Moderately annoyed	2.2	3.5
Little annoyed	1.3	2.0
Conversation: Total	6.5%	5.9%
Very annoyed	2.5	2.1
Moderately annoyed	1.8	1.5
Little annoyed	2.2	2.3
Radio & TV: Total	5.7%	4.7%
Very annoyed	2.5	.9
Moderately annoyed	1.3	2.0
Little annoyed	1.9	1.8

Summary of intensity of annoyance: A summary measure of annoyance with booms is presented in Table 24. Very little difference is again observed between face-to-face and telephone respondents.

Table 24

REPORTED MORE THAN A LITTEE ANNOYANCE WITH SONIC BOOMS BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-April 1964

Intensity of Annoyance	Face to Face	Telephone
Number of Respondents	937	666
More than a little	34.5%	32.6%
Little or none	65.5	67.4

3. Reports of Damage by Sonic Booms

Identical reports of damage by 20.6% of all respondents were made during the first interview on face-to-face and telephone interviews.

4. Reports of Desire to Complain and Actual Complaints About Sonic Booms

Types of complaint activity: Very small differences were reported by face-to-face and telephone respondents with respect to desires to complain and actual complaints. Table 25 presents the similarities in response.

Table 25

REPORTED DESIRES TO COMPLAIN AND ACTUAL COMPLAINTS ABOUT SONIC BOOMS BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-April 1964

Activity	Face-to-Face		Telephone	
	Felt Like	Did	Felt Like	Did
Number of Respondents	(937)		(666)	
Write or telephone	12.3	3.2	14.1	3.5
Sign petition	9.2	0.4	12.8	0.6
Visit official	4.8	0.2	7.5	0.8
Help set up committee	4.8	0.2	7.2	0.3

Summary scale of desire to complain: The summary scale on desire to complain indicated very small differences of about 2% between face-to-face and telephone interviews. Face-to-face respondents reported that 86% had no complaint potential compared to 83.7% of the telephone respondents. Table 26 presents these findings.

Table 26

COMPLAINT POTENTIAL FOR BOOMS: PERSONS FELT LIKE COMPLAINING BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-April 1964

Intensity of Complaint Potential	Face to Face	Telephone
Number of Respondents	944	680
None	86.0%	83.7%
Some	14.0	16.3
High	5.8	8.8
Moderate	8.2	7.5

5/ Long Range Acceptability of Sonic Booms

Virtually no differences were reported by face-to-face and telephone respondents in their expectations to accept eight booms per day for an indefinite period. Table 27 presents these findings.

Table 27

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY FOR AN INDEFINITE PERIOD BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-April 1964

Ability to Accept Booms	Face to Face	Telephone
Number of Respondents	944	680
Very likely	78.8%	79.0%
Might	14.0	13.2
Couldn't	4.8	5.4
Don't know	2.4	2.4

6. Other Important Variables

Knowledge of the sonic boom test: Telephone respondents were a little better informed of the valid purposes of the sonic booms. About 70% of the telephone respondents compared to 61% of the face-to-face respondents knew the real reason for the tests. However, more of the face-to-face respondents gave the incorrectly publicized reasons that the booms would help local aviation and help get an SST terminal. About 19% of the face-to-face respondents gave these latter reasons compared to 15% of the telephone respondents. When these latter answers are combined with the valid responses, the difference between the face-to-face and telephone responses narrows to only 5%.

Feel local booms absolutely necessary: Equal numbers of face-to-face and telephone respondents felt that local booms were absolutely necessary. The differences between the two groups ranged from 4-6%. Both groups reported declines of 10-12% in favorable attitudes from the first to third interviews. Table 28 presents these findings.

Table 28

REPORTED BELIEF IN THE ABSOLUTE NECESSITY OF LOCAL BOOMS BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-July 1964

Belief in Necessity	Face to Face			Telephone		
	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25	Feb. 3 Apr. 19	Apr. 20 June 14	June 15 July 25
Number Respondents	937	941	944	666	678	680
Yes	57.7%	52.5%	47.2%	53.6%	47.6%	41.5%
No	26.1	32.2	33.7	29.4	32.0	37.5
Don't know	16.2	15.3	19.1	17.0	20.4	21.0

Feel residents should complain if annoyed: Almost equal numbers of face-to-face and telephone respondents felt residents should complain if annoyed. The number of such unbiased feelings remained fairly stable throughout the six-month period. Table 29 presents these trends.

Table 29

REPORTED BELIEF PEOPLE SHOULD COMPLAIN IF ANNOYED
BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-July 1964

Belief in Complaint	Face to Face		Telephone	
	Feb. 3 Apr. 19	June 15 July 25	Feb. 3 Apr. 19	June 15 July 25
Number of Respondents	937	944	666	680
Yes	68.8%	71.9%	70.1%	71.8%
No	24.1	20.6	22.2	19.6
Don't know	7.1	7.5	7.7	8.6

Personal characteristics: Telephone respondents were more often adults with smaller families and middle aged. They also more often refused to give their income. None of these differences, however, apparently were significant variables with respect to sonic boom reactions. Table 30 presents these comparisons.

Table 30

SELECTED PERSONAL CHARACTERISTICS
BY FACE-TO-FACE AND TELEPHONE RESPONDENTS

Oklahoma City Area

February-July 1964

	Face to Face	Telephone
Number of Respondents	944	680
Family Composition:		
Adults only	43.4%	54.7%
Children over 6	26.8	26.6
Children under 6	29.8	18.7
Size of Family:		
One person	8.5%	10.6%
Two-three	48.8	53.5
Four or more	42.7	35.9
Age:		
Under 40	42.6%	29.9%
40-64	39.8	48.7
65 or more	17.1	19.7
Age not given	.5	1.7
Sex:		
Male	30.9%	27.5%
Female	69.1	72.5
Education:		
Elementary	20.1%	18.9%
High school	53.1	49.5
College	26.5	31.0
Not given	.3	.6
Income:		
Under $6,000	51.6%	46.1%
$6,000-7,999	19.4	18.7
$8,000-14,999	19.2	17.9
$15,000 or more	4.3	4.9
Not given	5.5	12.4

E. Incomplete Second and Third Interviews

Methodological test: Of the 3135 respondents completing their first interview, over 200 failed to complete the second or third interviews. While only a fourth of these incompletes were due to refusals or interview break offs, the question still may be raised of possible bias due to the failure to include these missing respondents. A comparison of the first interview answers by respondents with three complete interviews (completes) and those with only first interviews (incompletes) will test for such possible bias.

Comparisons of answers by respondents with three complete sets of interviews with those having incomplete sets of interviews indicated no significant differences on sonic boom reactions. This adds confidence that the complete sets of interviews were not greatly biased by the failure to secure the missing interviews. The section which follows documents the similarity in sonic boom reactions by the respondents with complete and incomplete sets of interviews.

1. Reports of Interference with Living Activities by Sonic Booms

Types of interference: The amount and types of reported interference by sonic booms were virtually the same for both complete and incomplete respondents. Table 31 presents the comparison.

Table 31

REPORTED TYPES OF INTERFERENCE BY SONIC BOOMS
BY RESPONDENTS WITH COMPLETE AND INCOMPLETE INTERVIEWS

Oklahoma City Area

February-April 1964

Type of Interference	Completes	Incompletes
Number of Respondents	2826	281
House rattles	87.0%	87.2%
Startles	35.2	36.7
Interrupts sleep	11.6	9.6
Interrupts rest	8.9	9.6
Interrupts conversation	7.6	11.7
Interrupts radio & TV	7.0	7.1

Scale of interference: The identical responses of respondents with complete and incomplete interviews are also shown in Table 32 which summarizes reports of interference.

Table 32

SCALE OF REPORTED INTERFERENCE BY SONIC BOOMS
BY RESPONDENTS WITH COMPLETE AND INCOMPLETE INTERVIEWS

Oklahoma City Area

February-April 1964

Number of Interferences	Completes	Incompletes
Number of Respondents	2852	281
4 - 5	15.7%	17.0%
2 - 3	25.8	25.1
0 - 1	58.5	58.0

2. Reports of Annoyance by Sonic Booms

Very small differences were reported in types and intensity of annoyance with booms by respondents with complete and incomplete interviews.

Table 33

REPORTED ANNOYANCE WITH SONIC BOOMS
BY RESPONDENTS WITH COMPLETE AND INCOMPLETE INTERVIEWS

Oklahoma City Area

February-April 1964

Type of Interference and Intensity of Annoyance	Completes	Incompletes
Number of Respondents	2826	281
House Rattle: Total	48.9%	47.7%
Very annoyed	11.3	12.8
Moderately annoyed	15.7	15.7
Little annoyed	21.9	19.2
Startle: Total	25.3%	27.8%
Very annoyed	6.6	10.3
Moderately annoyed	8.4	9.3
Little annoyed	10.3	8.2
Sleep: Total	9.2%	8.2%
Very annoyed	3.5	5.0
Moderately annoyed	2.8	2.1
Little annoyed	2.9	1.1
Rest: Total	7.8%	7.8%
Very annoyed	3.8	6.0
Moderately annoyed	2.5	1.4
Little annoyed	1.5	.4
Conversation: Total	5.6%	8.2%
Very annoyed	1.8	2.5
Moderately annoyed	1.7	2.5
Little annoyed	2.1	3.2
Radio & TV: Total	5.2%	4.6%
Very annoyed	1.5	1.4
Moderately annoyed	1.5	1.8
Little annoyed	2.2	1.4

Summary of intensity of annoyance: The closeness in annoyance responses is also shown in Table 34, which separates all persons with more than a little annoyance with any interference from those not greatly annoyed.

Table 34

REPORTED MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS BY RESPONDENTS WITH COMPLETE AND INCOMPLETE INTERVIEWS

Oklahoma City Area

February-April 1964

Intensity of Annoyance	Completes	Incompletes
Number of Respondents	2852	283
More than a little	33.3%	31.8%
Little or none	66.7	68.2

3. Reports of Damage by Sonic Booms

Only a small difference of less than 2% was reported by complete and incomplete respondents on alleged damage by sonic booms. Respondents with complete sets of interviews reported that 20.2% had sustained some damage while 21.7% of the incompletes gave this report.

4. Reports of Desires to Complain and Actual Complaints About Sonic Booms

The similarity in complaint reactions to sonic booms is also shown in Table 35. The answers of complete and incomplete respondents are within a few per cent of one another.

Table 35

REPORTED DESIRES TO COMPLAIN AND ACTUAL COMPLAINTS ABOUT SONIC BOOMS BY RESPONDENTS WITH COMPLETE AND INCOMPLETE INTERVIEWS

Oklahoma City Area

February-April 1964

Activity	Completes		Incompletes	
	Felt Like	Did	Felt Like	Did
Number of Respondents	(2826)		(283)	
Write or telephone	10.7%	2.3%	11.7%	2.8%
Sign petition	8.2	.4	10.0	-
Visit official	4.7	.4	6.4	.4
Help set up committee	4.5	.1	5.3	-

Summary scale of desire to complain: The closeness of response reflected in the summary scale on the complaint potential (Table 36) further underscores the uniform reactions to sonic booms by complete and incomplete respondents.

Table 36

COMPLAINT POTENTIAL FOR BOOMS: PERSONS FELT LIKE COMPLAINING BY RESPONDENTS WITH COMPLETE AND INCOMPLETE INTERVIEWS

Oklahoma City Area

February-April 1964

Intensity of Complaint Potential	Complete	Incomplete
Number of Respondents	2852	283
None	87.6%	86.6%
Some	12.4	13.4
High	5.8	7.4
Moderate	6.6	6.0

5. Long Range Acceptability of Sonic Booms

Practically no differences were reported by complete and incomplete respondents on their projected ability to accept sonic booms indefinitely. Table 37 shows differences of less than 2%.

Table 37

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY
FOR AN INDEFINITE PERIOD
BY RESPONDENTS WITH COMPLETE AND INCOMPLETE INTERVIEWS

Oklahoma City Area

February-April 1964

Ability to Accept Booms	Complete	Incomplete
Number of Respondents	2852	283
Very likely	78.5%	76.7%
Might	13.9	14.5
Couldn't	5.2	5.7
Don't know	2.4	3.1

6. Other Important Variables

Knowledge of sonic boom test: A difference of only 6% was reported by complete and incomplete respondents in their knowledge of the purposes of the sonic boom tests. The panel of complete respondents had 60% correct answers, while the incomplete respondents had 54% correct. In addition 17% of the complete and 13% of the incomplete respondents felt the tests would help local industry or help get an SST terminal for the city.

Feel local booms absolutely necessary: A difference of only 3% was reported by complete and incomplete respondents in their belief in the necessity of local booms. About 56% of all complete respondents felt local booms were absolutely necessary compared to 53% of the incompletes.

Feel residents should complain if annoyed: The same small differences were reported by complete and incomplete respondents with respect to their feelings about others complaining if annoyed. Almost 68% of the complete respondents felt people should frankly complain about booms if annoyed, compared to 70% of the incompletes.

Personal characteristics: Incompletes more often had older children and were male respondents. In all other personal characteristics, complete and incomplete respondents were the same.

Table 38

SELECTED PERSONAL CHARACTERISTICS
BY RESPONDENTS WITH COMPLETE AND INCOMPLETE INTERVIEWS

Oklahoma City Area

February-July 1964

	Complete	Incomplete
Number of Respondents	2852	283
Family Composition:		
Adults only	47.7%	49.2%
Children under 6	26.2	17.0
Children over 6	26.1	33.8
Size of Family:		
One person	9.4%	11.0%
Two - three	49.6	52.0
Four or more	41.0	37.0
Age:		
Under 40	37.6%	42.0%
40-64	41.1	35.0
65 or more	20.5	23.0
Not given	.8	--
Sex:		
Male	30.5%	39.2%
Female	69.5	60.8
Education:		
Elementary	22.6%	23.3%
High school	52.6	56.9
College	24.5	19.4
Not given	.3	.4
Income:		
Under $6,000	53.7	56.8
$5,000-7,999	18.7	15.9
$8,000-14,999	17.3	12.3
$15,000 or more	3.6	2.1
Not given	6.7	12.9

F. Panel Effects

Methodological test: As discussed in the section on study design, a panel effect is the possible influence of an initial interview on subsequent reinterviews with the same respondent. To test for such possible respondent bias, independent samples of new respondents were obtained during the second and third interviews. Answers by the independent samples were compared to those by the regular panel of interviews to determine whether significant differences existed.

Regular panel and independent sample reactions to sonic booms were similar: On all key questions, answers by the independent samples and by the regular panel of respondents were about the same. This gives further confidence in the unbiased and representative nature of the panel's reports on sonic boom reactions.

Overall rating of area: Control and panel respondents rated their residential areas about the same. Almost half gave an "excellent" rating, over one-third a "good" rating, and less than one-fifth a "fair" or "poor" rating. Table 39 presents these comparisons.

Table 39

OVERALL RATING OF AREA BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April 1964

Rating	Panel	Control
Excellent	45.9%	45.2%
Good	35.7	40.6
Fair	15.5	12.2
Poor	2.7	2.0
Don't know	.2	-

1. Reports of Interference with Living Activities by Sonic Booms

Types of interference: On virtually all types of interference, the sonic boom responses were about the same for both panel and control interviews. The panel, however, did report somewhat less startle than the control samples.

Table 40

REPORTED TYPES OF INFERFERENCE BY SONIC BOOMS
BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April-July 1964

Type of Interference	April 20-June 14		June 15-July 25	
	Panel	Control	Panel	Control
Number of Respondents	1619*	197	1521	199
House rattles	88.8%	93.9%	92.6%	95.0%
Startle	31.6	39.6	34.5	46.7
Interrupt sleep	14.1	11.7	16.5	20.1
Interrupt rest	11.8	6.6	15.3	21.6
Interrupt conversation	10.4	7.1	11.8	10.1
Interrupt radio & TV	7.5	7.1	7.0	6.0

* Represents the regular sample in Oklahoma City which is adjacent to the control sample.

2. Reports of Annoyance by Sonic Booms

Reports of annoyance with sonic booms were essentially the same for panel and control respondents. The small differences which occurred were generally within the range of sampling variability.

Table 41

REPORTED ANNOYANCE WITH SONIC BOOMS
BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April-July 1964

Types of Interference and Intensity of Annoyance	April 20-June 14		June 15-July 25	
	Panel	Control	Panel	Control
Number of Respondents	1619	197	1521	199
House Rattle: Total	62.6%	63.8%	69.2%	67.4%
Very annoyed	22.2	20.4	29.3	31.7
Moderately annoyed	18.0	19.9	20.4	20.6
Little annoyed	22.4	23.5	19.5	15.1
Startle: Total	27.7%	32.7%	31.8%	38.7%
Very annoyed	11.2	10.7	13.3	16.6
Moderately annoyed	8.5	13.3	11.4	15.1
Little annoyed	8.0	8.7	7.1	7.0
Sleep: Total	12.4%	10.8%	15.1%	18.5%
Very annoyed	6.3	4.1	8.5	9.0
Moderately annoyed	3.6	4.1	4.9	8.5
Little annoyed	2.5	2.6	1.7	1.0
Rest: Total	11.4%	5.6%	14.4%	20.6%
Very annoyed	6.5	4.1	8.9	12.1
Moderately annoyed	3.5	1.5	3.8	6.5
Little annoyed	1.4	--	1.7	2.0
Conversation: Total	8.3%	5.1%	10.4%	8.0%
Very annoyed	3.2	3.1	4.7	3.5
Moderately annoyed	2.7	1.5	3.5	1.5
Little annoyed	2.4	.5	2.2	3.0
Ratio & TV: Total	6.5%	5.1%	5.6%	5.5%
Very annoyed	2.2	2.6	2.4	2.5
Moderately annoyed	2.6	2.0	1.8	1.5
Little annoyed	1.7	.5	1.4	1.5

Intensity of annoyance: The small differences observed in Table 41 generally disappear when a summary of annoyance with all types of interference is analyzed. Table 42 shows that the panel reported less serious annoyance during the second and third interviews. Such variability, however, could occur by chance in 10% of the samples and, therefore, is not considered a significant difference.

Table 42

REPORTED MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April-July 1964

Intensity of Annoyance	April 20-June 14		June 15-July 25	
	Panel	Control	Panel	Control
Number of respondents	1619	197	1521	199
More than a little	40.5%	46.5%	51.3%	57.8%
Little or none	59.5	53.5	48.7	42.2

3. Reports of Damage by Sonic Booms

Reports of damage by panel and control samples of respondents were virtually the same. Table 43 presents these findings.

Table 43

REPORTS OF DAMAGE CAUSED BY SONIC BOOMS
BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April-July 1964

Report Damage	April 20-June 14		June 15-July 25	
	Panel	Control	Panel	Control
Number of Respondents	1619	197	1521	199
Yes	25.0%	24.5%	27.7%	28.1%
No	75.0	75.5	72.3	71.9

4. Report of Desires to Complain and Actual Complaints About Sonic Booms

No significant differences were reported by panel and control samples with respect to complaint activity. Chi-square tests indicated that the small differences shown in Table 44 may be due to sampling variability. It is interesting, however, that the control sample generally reports a slightly higher desire to complain.

Table 44

REPORTED DESIRES TO COMPLAIN AND ACTUAL COMPLAINTS ABOUT SONIC BOOMS BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April-July 1964

Activity	April 20-July 14		June 15-July 25	
	Panel	Control	Panel	Control
Number of Respondents	1619	197	1521	199
Desires to Complain:				
Write or telephone	16.6%	15.8%	16.9%	24.1%
Sign a petition	14.5	16.3	12.4	17.1
Visit an official	8.5	9.2	8.9	12.6
Help set up committee	7.2	9.2	7.2	11.6
Actual Complaints:				
Write or telephone	3.1%	5.6%	2.7%	6.5%
Sign a petition	.5	1.5	.3	2.0
Visit an official	.6	1.5	.5	.5
Help set up committee	.3	1.5	.3	--

Summary scale of desire to complain: No significant difference in complaint potential was reported between panel and control respondents during the second interview. On the third interview, however, the panel respondents did have a slightly lower complaint response than the control group.

Table 45

COMPLAINT POTENTIAL FOR BOOMS: PERSONS FELT LIKE COMPLAINING BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April-July 1964

Intensity of Complaint Potential	April 20-June 14		June 15-July 25	
	Panel	Control	Panel	Control
Number of Respondents	1619	197	1521	199
None	80.4%	81.6%	81.7%	73.8%
Some	19.6	18.3	18.3	26.2
High	10.3	11.2	10.2	15.1
Moderate	9.3	7.1	8.1	11.1

5. Long Range Acceptability of Sonic Booms

Only small differences were reported by the panel and control respondents with respect to their projected ability to accept sonic booms. Table 46 presents these comparisons.

Table 46

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY FOR AN INDEFINITE PERIOD BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April-July 1964

Ability to Accept Booms	April 20-June 14		June 15-July 25	
	Panel	Control	Panel	Control
Number of Respondents	1619	197	1624	199
Very likely	63.9%	64.0%	56.4%	57.8%
Might	18.8	23.9	18.7	25.1
Couldn't	15.6	8.6	21.2	16.1
Don't know	1.7	3.5	3.7	1.0

6. Other Important Variables

Knowledge of sonic boom test: While almost equal numbers of respondents said they knew the purposes of the boom (73% panel and 78% control) fewer panel members actually gave valid reasons. This discrepancy was largely due to the belief by panel members that the booms would help get an SST terminal for Oklahoma City.

Feel local booms are absolutely necessary: Both panel respondents and control respondents almost equally felt that local booms were necessary. The difference between the two groups was only about 4%. Table 47 presents these responses.

Table 47

REPORTED BELIEF IN ABSOLUTE NECESSITY OF LOCAL BOOMS BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April-July 1964

	April 20-June 14		June 15-July 25	
Belief in Necessity	Panel	Control	Panel	Control
Number of Respondents	1619	197	1624	199
Yes	50.5%	55.1%	44.8%	41.2%
No	32.1	25.5	35.3	43.7
Don't know	17.4	19.4	19.9	15.1

Feel residents should complain if annoyed: No significant differences were reported by panel and control respondents with respect to their beliefs in the appropriateness of complaining. While 72% of the panel felt people should complain if annoyed, 75% of the control sample felt this way.

Personal characteristics: In all key personal characteristics, the panel and control respondents were alike. In the case of income, the higher refusal rate by control respondents makes comparisons on separate items difficult.

Table 48

SELECTED PERSONAL CHARACTERISTICS
BY PANEL AND CONTROL SAMPLES

Oklahoma City Area

April-July 1964

	Panel	Control Sample	
		April 20-June 14	June 15-July 25
Number of Respondents	1624	197	199
Family Composition:			
Adults only	48.1%	45.2%	52.7%
Children under 6	26.7	29.4	26.6
Children over 6	25.2	25.4	20.7
Size of Family:			
One person	9.4%	8.1%	7.0%
Two-three	50.8	50.2	52.3
Four or more	39.8	41.7	40.7
Age:			
Under 40	37.2%	38.1%	37.7%
40-64	43.5	42.1	42.7
65 or more	18.2	14.2	16.6
Not given	1.1	5.6	3.0
Sex:			
Male	29.5%	31.0%	30.7%
Female	70.5	69.0	69.3
Education:			
Elementary	19.6%	14.7%	15.0%
High school	51.6	49.7	50.3
College	28.4	33.5	33.7
Not given	.4	2.1	1.0
Income:			
Under $6,000	49.3%	35.0%	32.2%
$6,000-7,999	19.1	22.8	19.6
$8,000-14,999	18.7	18.8	29.7
$15,000 or more	4.6	6.1	4.5
Not given	8.3	17.3	14.0

G. Possible Respondent Biases

1. Possible Biases

Effect of public information programs: The public information program outlined in the discussion of the study design may have introduced a number of possible respondent biases. It announced the true purpose of the sonic booms as a test of community acceptance of the booms. It mentioned that the National Opinion Research Center would conduct interviews evaluating public reactions to the test. It promised to limit the duration of the booms to a six-month period. It also stated that the future of the SST development program would be strongly influenced by local acceptance or non-acceptance of the booms. Local civic leaders and news media urged public acceptance and restraint in complaining for the good of aviation development in Oklahoma City. The importance of local aviation industries to the welfare of all Oklahoma City residents and the widespread connections of local residents with aviation industries were also considered as sources of possible respondent bias.

Effect of biases: If a respondent was aware that the sonic booms were of limited duration and that a favorable public response to NORC's questions could influence the government's decision to go ahead with the development of the SST and thus help Oklahoma City's prosperity, then, answers to NORC could be slanted to affect such an administrative decision. Since such biased answers would invalidate the representativeness of the Oklahoma City findings, the interviews included a series of questions to measure the extent of the above possible influences.

2. Extent of Presence of Possible Biases

Persons familiar with public information campaigns know that it is one thing to disseminate information and it is another thing to reach the public and make them aware of your message. Therefore, the first step in evaluating the possibility of biased responses is to determine the extent to which people were aware of the FAA test program.

Knowledge of the NORC survey: At the very end of the first interview all respondents were asked, "By the way, had you heard anything about this survey before this interview?" Only 5% or 142 respondents answered "Yes". The probable reason for this very small awareness of NORC's role is that the local news media never mentioned NORC by name in local releases. The only public mention was included in an FAA release handed out to school children. Fortunately this mention was buried in other sonic boom information and was remembered by very few respondents. Therefore, the possibility that the study was greatly biased by this announcement can be discounted.

Aware of purpose of FAA sonic boom test: Toward the middle of the interview, before specific questions were asked about reactions to the booms, each respondent was asked, "Do you happen to know why the jets making booms fly around here?" If a respondent answered in the affirmative, he was also asked, "Why is that?" and only volunteered reasons were recorded. Almost 78% said they knew the reasons for the local sonic booms, but only 60% gave valid answers that it was an FAA-SST sonic boom test. An additional 6% said the booms would help get a new local SST terminal. While this was not in reality a valid answer, it is considered valid within the scope of our study of possible biases, because of the widespread publicity that the tests would help Oklahoma City get an SST air terminal. Thus a total of 66% or two-thirds of all respondents could be considered to be actually aware of the purposes of the sonic booms.

Knowledge of six-month duration of the study: Three questions following the "awareness" question, all respondents were also asked, "Do you happen to know how long these booms are supposed to continue altogether?" If the answer was yes, they were also asked, "How long is that?" About half (47.5%) said they knew the duration of the tests, but only 37% further volunteered that the duration was six months. About 7% said it was less than six months, while 3.5% said it was more than six months. Thus, almost two-thirds of all respondents did not really know the duration of the tests; over half had no idea how long the booms would last. An evaluation of the significance of this possible bias will be given in answers to other questions about long-range acceptance of booms. These findings will be presented in subsequent sections.

Aviation connections: One of the last questions in the interview was, "Have you or your family ever worked for the Federal Aviation Agency or any civilian aviation company?" If the answer was in the affirmative, the respondent was also asked, "Are you (they) working there now?" If the answer to the first question was in the negative, the respondent was asked, "Have you or anyone in your family ever worked for the Air Force or any company that does much of its business with the aviation industry?" About 14% said they had direct ties with civil aviation, of which 7% were current ties. Another 18% said they had indirect ties. Thus about a third of all respondents reported some connection with the aviation industry.

Belief people should complain about booms if annoyed: After answering direct questions about their reactions to the booms, everyone was asked, "Do you think people around here should complain about these booms if they find them annoying?" The number of respondents who believed people should complain increased slightly from 68% on the first interview to 71% on the third and final interview. About three-fourths of those who believed in complaints at the end of the study also consistently believed in complaints on the beginning interview. Since one of the primary goals of this study is to measure long-range effects of booms, the views of respondents at the end of the study are considered most

important on the issue of possible bias in response. Consequently, the views reported at the end of the study are included in further analyses of this factor.

Interrelations of possible biases: Aviation connection did not appear to have any effect on whether or not people felt others should complain if annoyed. About 71% of aviation connected and non-aviation connected respondents felt people should complain if annoyed. Likewise, both aviation connected and non-aviation connected respondents, if they knew the purposes of the booms, also almost equally felt people should complain if annoyed. Surprisingly, however, both aviation connected and non-aviation connected respondents, if they were not aware of the purpose of the booms, less often equally felt people should complain if annoyed. On the other hand, aviation connected respondents more often were aware of the purposes of the booms (71% vs. 64%). Since this greater awareness has no significant effect on belief in honest respondent answers, i.e. complain if annoyed, it can be concluded that aviation connection and knowledge of the purposes of the boom did not affect belief in appropriateness of complaint. Table 49 presents these relationships.

Table 49

RELATIONSHIP OF POSSIBLE RESPONDENT BIASES

Oklahoma City Area

February-July 1964

	Total			Aviation Connection			No Aviation Connection		
	Total	Know Purpose	Do Not Know Purpose	Total	Know Purpose	Do Not Know Purpose	Total	Know Purpose	Do Not Know Purpose
No. Respondents	2852	1885	967	913	648	265	1939	1237	702
Believe in complaint	71.3%	73.4%	67.2%	70.5%	72.5%	65.6%	71.6%	73.9%	67.2%
Do not believe in complaint	28.7	26.6	32.8	29.5	27.5	34.4	28.4	26.1	32.7

Design of further analysis of possible bias: Since aviation connection and knowledge of purposes of booms do not appear to affect feelings about frank responses or appropriateness of complaint, all persons who do not feel people should complain will be combined into one analytical category. All persons who are aware of the purposes of the booms and report aviation connections will be grouped into a second category. In comparison all persons aware of the purposes of the booms who are not aviation connected will be grouped into a third category. The fourth category will consist of all persons not aware of the purposes of the study on the first interview. It will thus be possible to compare respondent reactions to booms with respect to belief in complaint, aviation connection and awareness of purposes of booms.

3. Effects of Possible Biases on Sonic Boom Response

Disbelief in the appropriateness for people to voice their honest annoyance with booms definitely appears to bias respondent reports of their own reactions to sonic booms. Reports by such disbelievers of their own reactions were 10-20% less negative than reports by persons who believed people should complain if annoyed. Such disbelievers reported 20% less interference and annoyance, 10% less damage and 10% less desire to complain. About 20% more such disbelievers felt local booms were absolutely necessary and that they very likely could accept eight booms a day indefinitely. These disbelievers were more often adults without children, over 65 years of age, with less education and lower incomes. Tables 67-73 present total responses for all residents including believers and disbelievers.

Aviation connection on the other hand, appears to have no significant affect on sonic boom reactions. Awareness of purpose of sonic booms also has little affect on respondent reactions. No differences were reported on amount of interference, annoyance, damage or complaint behavior. Only in long range acceptance of the booms and in related feelings about the necessity of the booms were respondents who were not aware of the purposes of the booms a little lower in their responses. As expected, the uninformed group were generally older, more often women, with less education and lower incomes.

a. Reports of Interference with Living Activities by Sonic Booms

Types of interference: Respondents who believed in no complaint, consistently reported about 10% less interference than those who believed in complaints. Only minor differences were reported by those who believed in complaining but who differed with respect to aviation connection or awareness of purposes of booms. Table 50 presents these findings.

Table 50

REPORTED TYPES OF INTERFERENCE BY SONIC BOOMS
BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

Type of Interference	No Complaint			Complaint: Aware Purpose, Aviation Connection			Complaint: Aware Purpose, No Aviation Connection			Complaint: Not Aware Purpose		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	807	814	766	470	674	438	910	913	863	639	646	614
House rattle	83%	81%	84%	91%	91%	93%	88%	88%	91%	88%	88%	91%
Startle	28	21	22	40	35	41	38	34	35	38	33	36
Interrupt sleep	8	7	8	12	14	17	14	13	16	13	13	16
Interrupt rest	6	7	6	9	12	16	10	10	15	11	13	17
Interrupt conversation	6	6	6	9	13	13	9	11	12	8	11	14
Interrupt radio & TV	7	5	4	6	6	7	6	6	7	10	11	11

Scale of interference: The summary scale of interference shown in Table 51 sharpens further the above differences. While those who believed in complaints reported about the same interference, those who did not believe in complaints reported about 20% less interference on the third interview.

b. Reports of Annoyance by Sonic Booms

Kinds of interference: Persons who believed in complaining reported about the same annoyance. This was generally 10-20% greater than the annoyance reported by those who did not believe in complaints. Table 52 presents these comparisons.

Table 51

SCALE OF REPORTED INTERFERENCE BY SONIC BOOMS
BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

Number of Interferences	No Complaint			Complaint: Aware Purpose: Aviation Connection			Complaint: Aware Purpose: No Aviation Connection			Complaint: Not Aware Purpose		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	819	814	766	470	467	438	914	913	863	649	646	614
4 - 5	12.2%	7.0%	9.0%	15.3%	16.9%	21.2%	17.5%	15.6%	20.3%	18.0%	16.6%	23.1%
2 - 3	21.6	18.3	16.6	29.4	27.8	25.8	27.7	26.7	22.9	25.6	30.8	20.0
0 - 1	66.2	74.7	74.4	55.3	55.2	53.0	54.8	57.7	56.8	56.4	52.6	56.8

Table 52

REPORTED ANNOYANCE WITH SONIC BOOMS
BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

Type of Interference & Intensity of Annoyance	No Complaint			Complaint: Aware Purpose: Aviation Connection			Complaint: Aware Purpose: No Aviation Connection			Complaint: Not Aware Purpose		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	807	814	766	470	467	438	910	913	863	639	646	614
House Rattle Total	37.0%	46.4%	49.7%	52.2%	66.2%	72.0%	52.2%	61.5%	68.5%	56.8%	65.9%	73.4%
Very annoyed	5.3	9.0	13.6	14.5	20.1	27.9	13.5	21.5	28.6	13.3	24.8	32.6
Moderately annoyed	11.6	13.8	14.4	15.1	22.1	22.6	17.4	17.9	19.0	19.1	18.7	21.7
Little annoyed	20.1	23.6	21.7	22.6	24.1	21.5	21.3	21.6	20.9	24.4	22.4	19.1
Startle Total	17.0%	16.1%	17.1%	28.9%	30.6%	38.1%	27.6%	28.6%	31.2%	29.8%	29.8%	32.9%
Very annoyed	2.7	4.2	4.4	7.7	10.7	14.8	8.1	10.8	14.0	8.6	11.6	16.0
Moderately annoyed	5.0	4.8	6.7	9.1	9.0	12.1	9.9	9.6	10.8	9.9	9.4	9.9
Little annoyed	9.3	7.1	6.0	12.1	10.9	11.2	9.6	8.2	6.4	11.3	8.8	7.0
Sleep Total	5.6%	5.5%	6.7%	10.2%	12.2%	16.0%	10.6%	11.2%	13.7%	10.6%	11.6%	15.0%
Very annoyed	1.4	1.7	2.7	3.6	6.4	8.0	3.6	5.5	7.9	5.8	6.2	9.4
Moderately annoyed	2.0	1.6	3.3	3.0	3.9	5.5	3.7	3.7	4.2	2.3	2.8	3.3
Little annoyed	2.2	2.2	.7	3.6	1.9	2.5	3.3	2.0	1.6	2.5	2.6	2.3
Rest Total	4.5%	6.4%	5.1%	8.1%	12.2%	15.3%	9.4%	9.9%	14.6%	9.3%	12.4%	16.6%
Very annoyed	1.5	3.3	2.2	4.7	6.9	9.1	3.8	5.5	9.0	6.1	7.3	10.4
Moderately annoyed	2.0	1.6	2.6	2.3	3.6	4.1	3.6	3.4	4.2	1.6	3.6	3.1
Little annoyed	1.0	1.5	.3	1.1	1.7	2.1	2.0	1.0	1.4	1.6	1.5	3.1

Conversation Total	5.6%	4.6%	4.2%	7.2%	10.4%	11.1%	6.4%	9.3%	10.9%	5.5%	9.3%	13.1%
Very annoyed	1.8	1.0	.7	2.3	3.9	5.9	2.1	3.1	4.6	2.5	4.3	6.2
Moderately annoyed	1.7	1.4	2.2	2.3	4.1	3.4	2.2	3.4	4.1	1.7	2.5	3.6
Little annoyed	2.1	2.2	1.3	2.6	2.4	1.8	2.1	2.8	2.2	1.3	2.5	3.3
Radio & TV Total	4.6%	3.6%	3.4%	4.1%	4.7%	6.0%	4.4%	5.8%	6.1%	7.6%	9.5%	9.6%
Very annoyed	.7	1.1	.8	1.3	1.7	2.1	1.5	2.0	3.0	2.5	3.3	4.2
Moderately annoyed	1.4	.7	1.6	1.1	1.7	1.8	1.3	2.5	2.1	2.0	3.4	3.3
Little annoyed	2.5	1.8	1.0	1.7	1.3	2.1	1.6	1.3	1.0	3.1	2.8	2.1

Summary of intensity of annoyance: The summary of annoyance, which combines all reports of more than a little annoyance with any type of interference into a single annoyance measure, highlights the similarity of responses among all persons who believed in complaints. It also contrasts the differences in response by those who believed in complaints from those who did not believe in complaints. This complaint-no complaint difference approximates 25% in the third interview, with those who believe in complaints reporting the greater annoyance.

TABLE 53

REPORTED MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS
BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

Intensity of Annoyance	No Complaint			Complaint: Aware Purpose, Aviation Connection			Complaint: Aware Purpose, No Aviation Connection			Complaint: Not Aware Purpose		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	819	814	766	470	467	438	914	913	863	649	646	614
More than a little	19.3%	27.3%	29.3%	33.0%	43.1%	52.9%	34.4%	40.3%	50.1%	36.7%	43.3%	55.7%
Little or none	80.7	72.7	70.7	67.0	56.9	47.1	65.6	59.7	49.9	63.3	56.7	44.3

c. Reports of Damage by Sonic Booms

Those persons who believed in complaining whether or not they were aviation connected or knew the purposes of the study generally reported about the same amount of damage by booms. Those persons who did not believe in complaints generally reported 6-10% less damage than those who believed in complaints. Table 54 presents these data.

TABLE 54

REPORTS OF DAMAGE BY SONIC BOOMS
BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

Reports of Damage	No Complaint			Complaint: Aware Purpose, Aviation Connection			Complaint: Aware Purpose, No Aviation Connection			Complaint: Not Aware Purpose		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	819	814	766	470	467	438	914	913	863	649	646	614
Yes	12.5%	13.6%	15.5%	18.9%	21.8%	25.3%	18.9%	19.2%	22.6%	19.6%	24.0%	23.9%
No	87.5	86.4	84.5	81.1	78.2	74.7	81.1	80.8	77.4	80.4	76.0	76.1

d. Reports of Desires to Complain and Actual Complaints About Sonic Booms

Desires to complain: Persons who believed others should complain if annoyed more often also felt like complaining themselves. More than three times as many believers in complaint felt like writing or calling an official than non-believers in complaint. Aviation connection and awareness of purpose of booms had very little effect on desires to complain. Table 55 presents these data.

TABLE 55

REPORTED DESIRES TO COMPLAIN ABOUT SONIC BOOMS
BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

	No Complaint			Complaint: Aware Purpose, Aviation Connection			Complaint: Aware Purpose, No Aviation Connection			Complaint: Not Aware Purpose		
Activity	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	807	814	766	470	467	438	910	913	863	639	646	614
Writing or telephoning	5.9%	5.9%	4.7%	12.8%	17.6%	19.2%	12.7%	16.9%	17.6%	12.1%	16.3%	17.3%
Signing a petition	3.6	5.5	4.2	8.7	15.6	14.6	10.7	15.2	14.0	10.3	15.3	12.4
Visiting an official	2.2	2.7	3.4	6.0	8.4	10.8	5.6	9.1	10.5	5.6	9.8	8.6
Helping set up committee	2.0	2.5	1.2	6.4	6.6	7.5	5.1	8.9	8.7	5.6	7.7	7.2

Actual complaints: The pattern of actual complaint behavior as shown in Table 56 is the same as the pattern on desires to complain. Those who believed in the appropriateness of complaining more often actually complained themselves. Aviation connections and awareness of purpose of booms had little effect on complaint behavior.

TABLE 56

REPORTED ACTUAL COMPLAINTS ABOUT SONIC BOOMS
BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

Activity	No Complaint			Complaint: Aware Purpose: Aviation Connection			Complaint: Aware Purpose: No Aviation Connection			Complaint: Not Aware Purpose		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	807	814	766	470	467	438	910	913	863	639	646	614
Wrote or telephoned	0.7%	0.7%	0.3%	4.0%	3.6%	2.7%	2.9%	2.2%	2.2%	2.3%	2.5%	2.3%
Signed petition	0.4	0.2	0.3	0.6	0	0.2	0.3	0.3	0.1	0.2	0.5	0.5
Visited official	0.4	0.2	0.1	1.1	0.2	0	0.2	0.3	0.3	0	0.5	0.8
Helped set up committee	0.1	0.1	0	0	0	0.2	0.2	0.2	0.2	0.2	0.3	0.5

Summary scale of desire to complain: The same patterns of complaint behavior are further emphasized by the summary scale shown in Table 57. Over 10% more persons with belief in no complaints had no personal desire to complain themselves.

TABLE 57

COMPLAINT POTENTIAL FOR SONIC BOOMS: PERSONS FELT LIKE COMPLAINING BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

Intensity of Complaint Potential	No Complaint			Complaint: Aware Purpose: Aviation Connection			Complaint: Aware Purpose: No Aviation Connection			Complaint: Not Aware Purpose		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	819	814	819	470	467	470	914	913	914	649	646	649
None	93.3%	92.1%	94.4%	84.7%	78.1%	79.6%	85.3%	79.9%	82.0%	86.0%	80.2%	81.8%
Some	6.7	7.9	5.6	15.3	21.9	20.4	14.7	20.1	18.0	14.0	19.8	18.2
High	2.4	3.6	3.2	8.1	10.1	10.2	6.7	11.3	11.5	6.9	11.6	9.6
Moderate	4.3	4.3	2.4	7.2	11.8	10.2	8.0	8.8	6.5	7.1	8.2	8.6

e. Long Range Acceptability of Sonic Booms

Persons who did not believe in complaints reported a belief in a significantly higher future acceptance of booms. Aircraft connections appeared to have little effect on long range acceptance of booms. Awareness of purpose of booms seemed to result in a slightly greater acceptance especially on the third interview. Table 58 presents these responses.

TABLE 58

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY FOR AN INDEFINITE PERIOD BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

Ability to Accept Eight Booms	No Complaint			Complaint: Aware Purpose, Aviation Connection			Complaint: Aware Purpose, No Aviation Connection			Complaint: Not Aware Purpose		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	819	814	819	470	467	470	914	913	914	649	646	649
Very likely	86.6%	79.1%	74.6%	77.4%	64.7%	56.4%	78.2%	65.1%	57.0%	69.6%	56.0%	50.8%
Might	8.9	13.8	11.4	15.5	17.1	22.8	14.3	18.2	20.5	18.5	22.1	18.3
Couldn't	2.7	5.8	9.2	4.9	16.3	18.9	5.8	14.8	20.2	7.9	18.4	27.3
Don't know	1.8	1.3	4.8	2.2	1.9	1.9	1.7	1.9	2.3	4.0	3.5	3.6

f. Other Important Variables

Feel local booms are absolutely necessary: From 10-20% more persons who did not believe in complaints felt local booms were absolutely necessary. Aviation connections seemed to have little effect on belief in the necessity of booms, but persons aware of the purposes of the boom more often believed in the necessity of local booms. Table 59 presents these findings.

TABLE 59

REPORTED BELIEF IN ABSOLUTE NECESSITY OF LOCAL SONIC BOOMS
BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

Belief in Necessity	No Complaint			Complaint: Aware Purpose, Aviation Connection			Complaint: Aware Purpose, No Aviation Connection			Complaint: Not Aware Purpose		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	807	814	819	470	467	470	910	913	914	639	646	649
Yes	64.1%	64.7%	59.7%	60.0%	48.0%	45.3%	59.5%	51.0%	42.0%	40.4%	38.9%	31.7%
No	17.3	16.0	15.1	24.7	34.3	41.1	26.5	32.9	39.9	32.6	35.3	38.2
Don't know	18.6	19.3	25.2	15.3	17.7	13.6	14.0	16.1	18.1	27.0	25.8	30.1

Personal characteristics: Those who were aware of the purposes of the study, regardless of aviation connection, had the same personal characteristics. Those who did not believe in complaints and those not aware of the purposes were more often young adults living alone, with less education and lower income. The unaware group also was more often women.

Table 60

SELECTED PERSONAL CHARACTERISTICS
BY POSSIBLE BIASES IN RESPONSE

Oklahoma City Area

February-July 1964

		Complaint		
		Aware Purpose		
	No Complaint	Aviation Connection	No Aviation Connection	Not Aware Purpose
Number Respondents	819	470	914	649
Family Composition				
Adults only	54.2%	41.1%	42.2%	52.0%
Children over 6	25.3	28.1	26.9	24.7
Children under 6	20.5	30.8	30.9	23.3
Size of Family				
One person	11.6%	6.8%	6.3%	12.9%
Two-three	51.4	47.9	49.1	49.2
Four or more	38.0	45.3	44.6	37.9
Age				
Under 40	30.4%	41.9%	43.4%	35.4%
40-64	42.9	44.6	41.6	35.9
65 or more	26.3	12.6	14.1	27.9
Not given	.4	.9	.9	.8
Sex				
Male	33.3%	36.0%	30.9%	22.2%
Female	66.7	64.0	69.1	77.8
Education				
Elementary	27.5%	18.1%	13.9%	31.8%
High school	49.6	54.2	53.7	53.8
College	22.6	27.7	32.0	13.8
Not given	.3		.4	.6
Income				
Under $6000	58.0%	46.6%	46.0%	64.0%
$6000-7999	16.7	23.6	20.8	14.6
$8000-14999	13.9	23.4	20.8	12.4
$15,000 or more	3.4	1.7	6.0	2.0
Not given	8.0	4.7	6.4	7.0

H. Place of Work and Place of Residence

Survey design: The household interview sample was selected on the basis of the respondent's residence. As discussed in the Introduction, the distance from each residence to the ground track of the sonic boom flight was determined and all residences were stratified into three area distance groups, viz. 0-8 miles, 8-12 miles and 12-16 miles from ground track. As Table 1 showed, the intensity of the boom generally decreased as the distance from ground track increased. Persons experiencing these different boom intensities can be compared for possible differences in boom reactions. A confounding factor, however, in such comparisons is the possible difference in a person's residence and place of work. If they are different, then, the intensity of booms experienced at work and at home will be different and overall reactions to the booms may be mixed reactions.

Comparison of place of work and place of residence: About 90% of the residents living 0-8 miles from ground track also work 0-8 miles from ground track. Thus, with only 10% working in a different distance area, only a minor effect is possible on total responses of the 0-8 mile group.

In the middle distance area (8-12 miles), however, only 54% work and live in the same distance area, and in the farthest distance group (12-16 miles) 70% work and live in the same distance areas. Table 61 shows these work residence comparisons.

Table 61

REPORTED PLACE OF WORK AND RESIDENCE OF RESPONDENTS
BY BELIEF IN APPROPRIATENESS OF COMPLAINT

Oklahoma City Area

February 1964

	Place of Residence (miles from ground track)								
	0-8			8-12			12-16		
Place of Work (miles from ground track)	Total	Complaint	No Complaint	Total	Complaint	No Complaint	Total	Complaint	No Complaint
Number Respondents	784*	560	224	879	648	281	509	337	172
0-8	90.3%	89.1%	93.3%	35.6%	36.3%	33.8%	21.4%	22.6%	19.2%
8-12	2.4	2.7	1.8	54.0	54.3	53.2	6.5	7.4	4.7
12-16	4.3	4.6	3.6	8.1	7.4	10.0	70.1	67.4	75.6
Not given	3.0	3.6	1.3	2.3	2.0	3.0	2.0	2.6	.5

* Does not include telephone sample because place of work was not obtained for this group.

Analysis plan: Respondents who believed people should not complain even if annoyed, have been shown to be biased in their own reports of sonic boom reactions. This section of the report which will evaluate the effects of mixed place of work and residence on sonic boom reactions, therefore, will exclude those biased respondents. Likewise, responses in only the middle and distant areas will be reviewed, since practically all residents in the close areas also work in their close areas.

The following comparisons show that the pure situations, i.e. respondents live and work in the same distance area, gave the most clear-cut distance trend. The reactions of residents who lived and worked in the same area were generally less intense than the totals for their group as a whole which included respondents with work situations in closer areas. This was true for reports of interference and annoyance, but not as evident in other sonic boom reactions.

1. Reports of Interference with Living Activities

The "pure" 8-12 mile respondent group reported 2-4% less interference than the total middle distance respondent group. The group working in the close area consistently reported more interference. Likewise the "pure" 12-16 mile respondent group reported 3-4% less interference than the total distant group. Table 62 presents these comparisons.

Table 62

SCALE OF REPORTED INTERFERENCE BY SONIC BOOMS
BY RESPONDENT'S PLACE OF WORK AND RESIDENCE

Oklahoma City Area
February-July 1964

Number of Interferences	Residence 8-12 Miles Place of Work				Residence 12-16 Miles Place of Work			
	Total	8-12	0-8	12-16	Total	12-16	8-12	0-8
A. First Interview 2/3-4/19								
Number of Respondents	634	351	235	48	327	226	25	76
4-5	15.5%	16.8%	14.0%	12.5%	8.9%	8.8%	4.0%	10.5%
2-3	31.9	28.2	38.3	27.1	25.4	22.6	28.0	32.9
0-1	52.6	55.0	47.7	60.4	65.7	68.6	68.0	56.6
B. Second Interview 4/20-6/14								
Number of Respondents	633	351	234	48	326	225	25	76
4-5	15.2%	12.8%	17.5%	20.8%	11.0%	8.9%	12.0%	17.1%
2-3	27.5	27.6	28.6	20.8	23.3	21.8	24.0	27.6
0-1	57.3	59.6	53.9	58.4	65.7	69.3	64.0	55.3
C. Third Interview 6/15-7/25								
Number of Respondents	600	331	223	46	308	213	24	71
4-5	21.3%	18.1%	25.1%	26.1%	12.7%	9.9%	25.0%	16.9%
2-3	22.0	20.8	25.1	15.2	16.9	15.5	8.3	23.9
0-1	56.7	61.1	49.8	58.7	70.4	74.6	66.7	59.2

2. Reports of Annoyance by Sonic Booms

The "pure" middle distance area respondents reported almost 4% less annoyance than the total for the entire group. The "pure" distant area respondents reported almost 5% less annoyance than the total for the distant group. Table 63 presents these comparisons.

Table 63

REPORTED MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS
BY RESPONDENT'S PLACE OF WORK AND RESIDENCE

Oklahoma City Area

February-July 1964

Interview Period*	Residence 8-12 Miles Place of Work				Residence 12-16 Miles Place of Work			
	Total	8-12	0-8	12-16	Total	12-16	8-12	0-8
2/3 - 4/19	36.1%	35.3%	37.9%	33.3%	22.3%	20.8%	20.0%	27.6%
4/20 - 6/14	39.9	36.8	44.0	41.7	33.4	31.1	24.0	43.5
6/15 - 7/25	49.2	45.8	52.4	58.4	34.8	29.9	32.0	50.0

* The number of respondents is the same as shown in Table 62.

3. Reports of Damage by Sonic Booms

Practically no differences were reported by mixed and "pure" distance respondents with respect to alleged damage by sonic booms. This was as expected since damage was defined in terms of effects on residences only. Table 64 presents these data.

Table 64

REPORTED DAMAGE BY SONIC BOOMS
BY RESPONDENT'S PLACE OF WORK AND RESIDENCE

Oklahoma City Area

February-July 1964

Interview Period *	Residence 8-12 Miles Place ofWork				Residence 12-16 Miles Place of Work			
	Total	8-12	0-8	12-16	Total	12-16	8-12	0-8
2/3 - 4/19	21.8%	20.8%	21.7%	29.2%	9.5%	10.2%	4.0%	9.2%
4/20 - 6/14	18.0	17.9	17.1	22.9	8.6	9.8	8.0	5.3
6/15 - 7/25	22.7	24.2	19.3	28.3	7.8	7.5	8.3	8.5

* The number of respondents is the same as shown in Table 62.

4. Complaint Potential - Persons Felt Like Complaining

Very little difference was reported by "pure" and mixed distance respondents with respect to their desires to complain. Table 65 presents these responses.

Table 65

COMPLAINT POTENTIAL FOR BOOMS: PERSONS FELT LIKE COMPLAINING
BY RESPONDENT'S PLACE OF WORK AND RESIDENCE

Oklahoma City Area

February-July 1964

Intensity of Complaint Potential	Residence 8-12 Miles Place of Work				Residence 12-16 Miles Place of Work			
	Total	8-12	0-8	12-16	Total	12-16	8-12	0-8
First Interview 2/3-4/19								
Number of Respondents	634	351	235	48	327	226	25	76
None	85.3%	84.0%	86.0%	91.6%	94.1%	93.4%	100.0%	94.8%
Some	14.7	16.0	14.0	8.4	5.9	6.6	0	5.2
High	7.3	7.7	7.2	4.2	2.8	3.5	0	1.3
Moderate	7.4	8.3	6.8	4.2	3.1	3.1	0	3.9
Second Interview 4/20-6/14								
Number of Respondents	633	351	234	48	326	225	25	76
None	82.1%	82.1%	82.0%	83.4%	88.4%	89.8%	100.0%	80.3%
Some	17.9	17.9	18.0	16.6	11.6	10.2	0	19.7
High	10.6	11.1	10.3	8.3	6.1	6.2	0	7.9
Moderate	7.3	6.8	7.7	8.3	5.5	4.0	0	11.8
Third Interview 6/15-7/25								
Number of Respondents	600	331	223	46	308	213	24	71
None	81.0%	82.1%	80.3%	76.1%	89.0%	89.7%	95.8%	84.5%
Some	19.0	17.9	19.7	23.9	11.0	10.3	4.2	15.5
High	11.2	10.0	12.1	15.2	4.5	3.3	4.2	8.5
Moderate	7.8	7.9	7.6	8.7	6.5	7.0	0	7.0

5. Long Range Acceptability of Sonic Booms

Mixed exposures to sonic booms apparently had little effect on judgements of long range acceptability of booms. Both "pure" and mixed distance respondents reported about the same willingness to live with the booms. Table 66 presents these data.

Table 66

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY FOR AN INDEFINITE PERIOD BY RESPONDENT'S PLACE OF WORK AND RESIDENCE

Oklahoma City Area

February-July 1964

Ability to Accept Booms	Residence 8-12 Miles Place of Work				Residence 12-16 Miles Place of Work			
	Total	8-12	0-8	12-16	Total	12-16	8-12	0-8
First Interview 2/3-4/19								
Number of Respondents	635	352	235	48	328	227	25	76
Very likely	74.0%	73.3%	74.5%	77.0%	80.8%	82.4%	72.0%	78.9%
Might	16.7	15.1	18.7	18.8	14.6	12.3	28.0	17.1
Couldn't	7.1	8.8	5.1	4.2	3.4	4.0	-	2.6
Don't know	2.2	2.8	1.7	-	1.2	1.3	-	1.4
Second Interview 4/20-6/14								
Number of Respondents	633	351	234	48	326	225	25	76
Very likely	65.6%	64.4%	68.8%	58.3%	68.4%	69.8%	76.0%	61.8%
Might	17.2	17.7	15.8	20.8	19.3	18.2	16.0	23.7
Couldn't	15.3	15.7	14.1	18.8	8.6	8.4	0	11.8
Don't know	1.9	2.2	1.3	2.1	3.7	3.6	8.0	2.7
Third Interview 6/15-7/25								
Number of Respondents	622	344	231	47	325	224	25	76
Very likely	58.7%	57.6%	61.4%	53.2%	65.9%	66.5%	68.0%	63.2%
Might	19.6	19.2	19.9	21.3	19.8	19.4	20.0	21.1
Couldn't	21.0	22.7	17.8	25.5	13.1	12.3	12.0	15.7
Don't know	.7	.5	.9	-	1.2	1.8	0	0

III. FINDINGS

A. Reports by Distance Group

1. Analysis Plan

Urban-Rural and Face to Face vs. Telephone interviews: The previous section showed that urban and rural and telephone and face to face respondents did not differ in their reactions to sonic booms. These groups of respondents, therefore, will be combined in all subsequent reports of findings.

Aviation connection and awareness of purpose of study: Likewise, it was shown in the previous section that aviation connection and awareness of the purpose of the sonic booms did not greatly affect reactions to sonic booms. Consequently, these possible sources of bias can be discounted and these respondents can also be combined in the analysis.

Validity of response: Belief in the appropriateness of complaining about booms if they are annoying, however, was found to be a potential source of serious bias. Those who did not believe people should tell the interviewer of their annoyance even if they were annoyed consistently understated by 10-20% their own reactions to the booms. To be conservative in our findings, it was decided to exclude these questionable and possibly biased respondents from the subsequent main analyses. Major findings will be based solely on those respondents who felt people should express their honest reactions and complain if annoyed.

Weighted total: The design of the survey sample purposely included proportionately more middle distance and far distance respondents than their numbers warranted, so that an optimum number of these groups could be included in the detailed analyses. In presenting major findings of overall totals for the Oklahoma City Area, however, a weighted total must be used. This will give proper proportionate weight to each distance group. These weights are .75 for the 0-8 mile group, .20 for the 8-12 mile group, and .05 for the 12-16 mile group.

Correction for mixed place of work and residence: Practically all of the close residents live and work in the same 0-8 mile zone. But only 54% of the middle distance and 70% of the far distance respondents also work in their residential distance areas. The previous section showed that those who worked and lived in the same distance area receiving a uniform intensity of the sonic booms, provided the most clear cut comparisons of reactions to the sonic booms. Although the differences in

response were not great, they did have a significant effect in some comparisons. It was decided, therefore, to include all respondents in the calculation of overall Oklahoma City totals, but to include only those residents in the middle distance group who also work in the 8-12 mile zone. In the case of the far distance zone, fewer respondents had mixed experiences and their exclusion would leave only 226 respondents in the reporting sample. In the more detailed analyses, where a number of sub groups are involved, 226 respondents may prove too small a group. It was decided, therefore, to include all distant respondents in the analyses of the 12-16 mile group. In any event, the correction for the mixed sonic boom experiences in the middle distance area will only change findings by a few percentage points in the major tables. It will, however, more validly represent resident reactions to uniform exposures of different sonic boom intensities.

The overall effect of the decision to exclude from the detailed analysis all persons who did not believe others should complain even if annoyed is to increase total negative sonic boom reactions by 2-5%. While this effect is not great, the exclusion is consistent with the objectivity of a scientific study. To demonstrate the minor effects of this decision, Tables 67-72 are presented for the major sonic boom responses. Subsequent tables exclude the potentially biased respondents who do not believe people should complain.

2. Reports of Overall Likes and Dislikes

General context: The introduction described the way the study was presented to respondents as a general community study. The first six questions of the face to face interview were open inquiries about likes and dislikes about local living conditions. No specific type of local condition was mentioned by the interviewer in any of these introductory questions. Only spontaneous comments about local problems volunteered by respondents were recorded. Consequently, those problems which are most often mentioned by respondents on their own accord can be considered most important, and a general rank ordering of local problems can be obtained.

Overall rating of satisfaction with area: In general, local residents were very satisfied with living conditions in their areas. Over 80% rated their areas as an excellent or good place to live. The smaller suburban communities 12-16 miles from ground track were the most satisfied, with almost 90% giving an excellent or good overall rating. Table 73 presents these findings.

Another measure of the overall satisfaction with the area was provided by the third question in the interview. All respondents were asked, "Now very few places are entirely perfect. So I'd like you to tell me if there are many things, a few things, or hardly anything you dislike about living around here?" Less than 4% said "many things";

Table 67

REPORTED TYPES OF INTERFERENCE BY SONIC BOOMS
BY RESPONDENT BELIEF IN APPROPRIATENESS OF COMPLAINT
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Interference	MILES FROM GROUND TRACK											
	Total			0-8			8-12			12-16		
	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint
A. Period: 2/3-4/19												
Number respondents	2826	807	2019	1443	406	1037	877	231	646	506	170	336
House rattles	87.6%	83.7%	89.0%	87.7%	84.0%	89.1%	88.0%	84.0%	89.5%	83.4%	78.2%	86.0%
Startles	36.3	28.4	39.2	36.2	27.3	39.6	39.2	35.1	40.7	25.3	18.2	28.9
Interrupts sleep	12.9	9.1	14.3	13.9	10.3	15.2	11.1	5.6	13.0	5.9	5.9	6.0
Interrupts rest	9.4	5.9	10.8	9.6	5.9	11.0	10.1	6.9	11.3	4.7	2.4	6.0
Interrupts conversation	8.3	6.2	9.0	8.5	6.7	9.2	8.3	5.2	9.4	4.2	2.9	4.8
Interrupts radio-TV	7.1	7.1	7.2	7.0	6.7	7.1	8.6	8.7	8.5	4.5	6.5	3.6

B. Period: 4/20-6/14

Number respondents	2840	814	2026	1459	414	1045	876	230	646	505	170	335
House rattles	87.4%	82.2%	88.5%	88.0%	82.9%	90.0%	86.8%	81.3%	88.7%	80.6%	75.9%	83.0%
Startles	31.7	22.4	33.8	32.6	22.9	36.4	30.9	21.7	34.2	22.4	17.1	25.1
Interrupts sleep	13.0	8.5	12.9	14.6	9.4	16.7	8.4	6.5	9.1	6.7	2.9	8.7
Interrupts rest	11.4	8.4	11.5	12.0	9.4	13.0	10.3	6.1	11.8	5.3	2.9	6.6
Interrupts conversation	10.1	6.7	11.5	10.1	7.2	11.3	10.3	5.7	11.9	8.7	4.1	11.0
Interrupts radio-TV	7.2	4.6	7.7	7.5	4.6	8.6	6.7	4.8	7.4	5.1	5.3	5.1

C. Period: 6/15-7/25

Number respondents	2681	766	1915	1371	382	989	832	220	612	478	164	314
House rattles	91.9%	87.3%	93.7%	92.9%	88.2%	94.6%	92.1%	88.6%	93.3%	75.5%	68.3%	79.3%
Startles	34.2	23.2	38.4	35.1	23.6	39.5	33.9	24.1	37.4	21.3	14.0	25.2
Interrupts sleep	15.3	9.2	17.6	16.7	10.7	19.0	12.1	5.0	14.7	7.3	4.3	8.9
Interrupts rest	14.6	7.6	17.4	15.6	8.4	18.4	13.2	6.4	15.7	6.5	1.2	9.2
Interrupts conversation	11.6	6.4	13.5	12.0	7.1	14.0	11.3	4.5	13.7	5.6	4.3	6.4
Interrupts radio-TV	7.5	4.2	8.9	7.9	4.2	9.3	7.0	4.1	8.0	4.8	3.7	5.4

Table 68

REPORTED MORE THAN A LITTLE ANNOYANCE
BY RESPONDENT BELIEF IN APPROPRIATENESS OF COMPLAINT
AND BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Interference	MILES FROM GROUND TRACK											
	Total			0-8			8-12			12-16		
	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint
A. Period: 2/3-4/19												
Number respondents	2826	807	2019	1443	406	1037	877	231	646	506	170	336
House rattles	29.1%	18.9%	33.1%	30.5%	20.2%	34.4%	27.6%	16.4%	31.6%	16.4%	10.0%	19.7%
Startles	16.4	8.4	19.5	17.1	8.8	20.3	15.8	7.8	18.7	7.3	4.7	8.7
Interrupts sleep	7.2	4.0	8.6	7.9	4.2	9.3	6.0	3.9	6.8	2.0	0.6	2.7
Interrupts rest	6.9	4.6	8.0	7.1	4.0	8.4	6.9	4.8	7.6	3.0	0.6	4.2
Interrupts conversation	3.9	1.9	4.6	3.8	2.2	4.5	4.4	1.3	5.4	1.4	0.6	1.8
Interrupts radio-TV	3.2	2.3	3.5	3.2	2.2	3.5	3.7	3.0	3.8	1.0	0.6	1.2

B. Period: 4/20-6/14

Number respondents	2840	814	2026	1459	414	1045	876	230	646	505	170	335
House rattles	38.7%	25.1%	44.0%	40.8%	26.8%	46.2%	34.3%	21.3%	38.9%	25.3%	14.7%	30.7%
Startles	18.5	10.1	21.8	19.2	10.6	22.6	17.9	9.6	20.9	9.9	4.1	12.9
Interrupts sleep	8.7	3.9	10.6	9.6	4.1	11.9	6.5	3.9	7.4	3.8	0.6	5.6
Interrupts rest	9.1	6.0	10.6	9.7	6.8	10.9	8.8	3.9	10.5	4.2	1.8	5.4
Interrupts conversation	5.8	2.7	6.8	5.6	2.9	6.6	6.4	2.2	7.9	4.4	1.2	6.0
Interrupts radio-TV	4.4	1.8	5.4	4.5	1.7	5.7	4.4	2.2	5.1	2.2	1.8	2.4

C. Period: 6/15-7/25

Number respondents	2681	766	1915	1371	382	989	832	220	612	478	164	314
House rattles	48.1%	30.4%	53.5%	49.0%	31.2%	55.9%	44.5%	30.9%	49.4%	28.9%	16.5%	35.4%
Startles	23.5	12.5	27.7	25.0	13.6	29.4	20.4	9.6	24.4	13.2	7.4	16.2
Interrupts sleep	12.2	7.4	14.1	13.6	8.7	15.5	9.0	3.6	10.9	5.4	3.0	6.7
Interrupts rest	12.1	5.8	14.4	12.8	6.3	15.3	10.8	5.0	12.9	5.4	1.2	7.6
Interrupts conversation	7.8	2.7	9.6	8.1	3.1	10.0	8.1	2.7	10.1	4.0	2.4	4.6
Interrupts radio-TV	4.7	2.3	5.7	4.7	2.1	5.7	5.0	3.2	5.7	3.8	1.8	4.8

Table 69

NUMBER OF REPORTS OF DAMAGE BY SONIC BOOMS
BY RESPONDENT BELIEF IN APPROPRIATENESS OF COMPLAINT
AND BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Number Damage Reports	MILES FROM GROUND TRACK											
	Total			0-8			8-12			12-16		
	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint
Number respondents	2852	819	2033	1464	416	1048	879	231	648	509	172	337
Three	6.0%	4.0%	6.8%	7.6%	5.8%	8.3%	6.5%	3.5%	7.6%	.6%	.6%	.6%
Two	9.7	6.6	11.1	13.1	9.6	14.7	7.2	4.4	8.4	4.4	2.4	5.4
One	18.8	15.3	20.2	21.3	16.8	23.1	18.7	15.1	20.0	11.3	11.7	11.4
Some	34.5%	25.9%	38.1%	42.0%	32.2%	46.1%	32.4%	23.0%	36.0%	16.3%	14.7%	17.4%
None	65.5	74.1	61.9	58.0	67.8	53.9	67.6	77.0	64.0	83.7	85.3	82.6

Table 70

COMPLAINT POTENTIAL FOR BOOMS: PERSONS FELT LIKE COMPLAINING
BY RESPONDENT BELIEF IN APPROPRIATENESS OF COMPLAINT
AND BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Number Actual Complaints	MILES FROM GROUND TRACK											
	Total			0-8			8-12			12-16		
	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint
A. Period: 2/3-4/19												
Number respondents	2852	819	2033	1158	416	1048	879	231	648	509	172	337
Some	14.1%	8.1%	16.4%	15.2%	9.1%	17.5%	12.4%	6.0%	14.7%	4.4%	1.8%	5.7%
None	85.9	91.9	83.6	84.8	90.9	82.5	87.6	94.0	85.3	95.6	98.2	94.3
B. Period: 4/20-6/14												
Number respondents	2840	814	2026	1159	414	1045	876	230	646	505	170	335
Some	18.9%	8.5%	22.8%	20.3%	8.7%	24.8%	15.6%	8.7%	17.9%	9.2%	4.7%	11.4%
None	81.1	91.5	77.2	79.7	91.3	75.2	84.4	91.3	82.1	90.8	95.3	88.6
C. Period: 6/15-7/25												
Number respondents	2681	766	1915	1371	382	989	832	220	612	478	164	314
Some	17.6%	7.0%	21.5%	18.8%	7.6%	23.0%	15.5%	5.9%	18.9%	7.9%	2.4%	10.9%
None	82.4	93.0	78.5	81.2	92.4	77.0	84.5	94.1	81.1	92.1	97.6	89.1

Table 71

NUMBER OF ACTUAL REPORTED COMPLAINTS ABOUT BOOMS
BY RESPONDENT BELIEF IN APPROPRIATENESS OF COMPLAINT
AND BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Number Actual Complaints	MILES FROM GROUND TRACK											
	Total			0-8			8-12			12-16		
	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint
Number respondents	2852	819	2033	1464	416	1048	879	231	648	509	172	337
Three	.5%	.0%	.7%	.8%	.0%	1.0%	.3%	.0%	.5%	.2%	.0%	.3%
Two	1.0	.4	1.2	1.5	.9	1.7	.6	.0	1.0	.2	.0	.3
One	2.4	.8	3.0	3.0	.7	3.8	2.6	1.3	3.0	.4	.0	.6
Some	3.9%	1.2%	4.9%	5.3%	1.6%	6.5%	3.5%	1.3%	4.5%	.8%	.0%	1.2%
None	96.1	98.8	95.1	94.7	98.4	93.5	96.5	98.7	95.5	99.2	100.0	98.8

Table 72

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY
BY RESPONDENT BELIEF IN APPROPRIATENESS OF COMPLAINT
AND DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

	MILES FROM GROUND TRACK											
	Total			0-8			8-12			12-16		
	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint	Total	No Complaint	Complaint
A. Period: 2/3-4/19												
Number respondents	2852	819	2033	1458	416	1048	879	231	648	509	172	337
Could	92.0%	95.0%	91.2%	91.8%	94.9%	90.6%	91.4%	94.8%	90.2%	96.1%	97.7%	95.2%
Could not	8.0	5.0	8.8	8.2	5.1	9.4	8.6	5.2	9.8	3.9	2.3	4.8
B. Period: 4/20-6/14												
Number respondents	2840	814	2026	1459	414	1045	876	230	646	505	170	335
Could	82.1%	91.9%	80.8%	82.2%	91.5%	78.6%	85.0%	92.2%	82.5%	90.7%	97.1%	87.2%
Could not	17.9	8.1	19.2	17.8	8.5	21.4	15.0	7.8	17.5	9.3	2.9	12.8
C. Period: 6/15-7/25												
Number respondents	2852	819	2033	1464	416	1048	879	231	648	509	172	337
Could	76.2%	84.5%	72.9%	74.6%	83.4%	71.1%	79.5%	87.2%	76.6%	86.0%	90.1%	85.5%
Could not	23.8	15.5	27.1	25.4	16.6	28.9	20.5	12.8	23.4	14.0	9.9	14.5

TABLE 73

REPORTED OVERALL RATING OF SATISFACTION WITH LIVING CONDITIONS BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Rating	Total	Miles from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Excellent	46.2%	47.4%	42.9%	49.0%
Good	37.0	34.0	40.7	39.4
Fair	13.9	15.6	13.3	10.1
Poor	2.7	3.0	2.8	1.5
Don't know	.2	-	.3	-

28% said hardly anything, and 67% said they disliked only a few things. Surprisingly, the most distant areas (12-16 miles) reported more few dislikes and less dislike of hardly anything than the other distance areas. Table 74 presents these findings.

Table 74

REPORTED NUMBER OF DISLIKES WITH LIVING CONDITIONS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Number Dislikes	Total	Miles From Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Many	3.5%	3.5%	4.0%	2.7%
Few	66.9	57.6	76.1	78.0
Hardly anything	27.8	37.0	18.2	17.5
Don't know	1.8	1.9	1.7	1.8

Kind of dislikes: After volunteering the number of dislikes, respondents were asked to name the kinds of things disliked. The inadequacy of roads topped the list of dislikes, with 18% of the responses, but sonic booms were close behind with 15.3% voluntary mentions. Third most frequently mentioned by 15.1% were inadequate community facilities, and almost tied for fourth place were traffic dangers and bad physical aspects such as high winds and humidity with 13% of the responses. Poor social relations was sixth in importance and received 12% of the answers.

It is interesting to note that the closest areas chose sonic booms as the number one dislike, while in the most distant areas sonic booms were only the eighth most frequently mentioned dislike. Table 75 presents these answers.

Major dislikes: Everyone was also asked, "Now of all the things you don't like -- things you may feel are nuisances, irritations, disturbances or bothersome conditions, which one thing do you dislike most?" Traffic dangers, mentioned by 12.4% of all respondents, leads the list of dislikes. Close behind, however, were sonic booms reported by 12% of all persons. Poor roads and transportation facilities was third in importance, being mentioned by 8.6% of all respondents.

Table 75

VOLUNTARY REPORTS OF DISLIKES ABOUT LIVING CONDITIONS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Kind of Dislike*	Total	Miles From Ground Track 0-8	8-12	12-16
Number of Respondents**	1514	546	637	331
Roads inadequate	18.1%	15.6%	18.7%	21.1%
Sonic booms	15.3	18.5	16.8	7.3
Community facilities	15.1	12.5	15.2	19.0
Physical aspects	13.4	12.5	13.3	15.1
Traffic dangers	13.1	11.2	14.3	13.9
Social relations	12.2	12.3	14.0	8.8
Economic problems	9.0	8.8	9.7	8.2
Dogs and animals	8.9	9.9	7.8	9.1
Poor appearance	6.9	7.9	7.5	3.9
Location poor	6.4	7.0	5.5	7.3
Other dangerous conditions	6.3	5.9	6.9	6.0
Other noises	5.2	4.9	5.8	4.5
Government poor	4.4	4.6	4.9	3.0
Sewerage poor	4.6	3.3	6.1	3.9
Traffic noises	4.2	4.4	4.9	2.7
Area congested	3.5	3.7	2.8	4.5
Schools poor	3.3	3.5	2.4	4.8
Zoning poor	2.9	4.8	2.2	1.2
Medical facilities	2.5	2.6	2.0	3.3
Transportation facilities	2.8	3.1	3.1	1.5
Jet planes	1.8	1.8	2.4	.6
Miscellaneous	1.9	1.9	2.3	1.2
No dislikes	13.3	12.6	13.5	13.9

* Percentages add to more than 100% because more than one answer was given.

** This question asked only of face to face respondents.

In the close, 0-8 mile group, sonic booms were most frequently listed as the most disliked local problem, with 13.9% of all persons making this selection. In the most distant areas, only 5.6% mentioned sonic booms.

Over one-third of all respondents (698) refused to make any choice but said there was really nothing they disliked that much. If only the 1335 persons who mentioned a major dislike are considered, then the 244 mentions of sonic boom dislikes represents 18.3% of dislikes mentioned. Table 76 presents these findings.

Table 76

REPORTED MAJOR DISLIKES BY RESPONDENTS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Major Dislike	Total	Miles from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Traffic dangers	12.4%	11.4%	13.3%	14.2%
Sonic booms	12.0	13.9	12.2	5.6
Transportation, roads poor	8.6	7.4	8.2	12.8
Community facilities poor	6.7	4.5	8.6	9.8
Social relations	6.1	7.7	5.6	2.1
Noise	3.3	4.0	2.7	2.4
Other dangers	2.7	2.1	4.2	1.8
Dogs	2.3	1.4	3.9	2.1
Economic problems	1.8	1.1	2.3	3.0
Zoning problems	1.5	1.9	1.2	.6
Area congested	1.4	1.6	1.2	.9
Government poor	1.4	1.1	2.0	.9
Schools poor	1.3	1.4	.2	3.0
Location poor	1.1	.9	.8	2.4
Taxes too high	1.0	.8	1.2	1.2
Unsightly neighborhood	.9	1.2	.3	.9
Miscellaneous	1.7	1.7	2.2	1.2
Nothing disliked	31.8	33.1	29.5	32.3
Don't know, vague	2.0	2.8	1.4	2.8

Overall noise rating: In introducing the problem of sonic booms, everyone was asked first to rate the overall noise level in his area. In general most people felt their area was quiet, with only 18.8% reporting their area as noisy. The closest areas were more frequently judged noisy, while the most distant areas more often were described as quiet. Table 77 presents these ratings.

Table 77

REPORTED OVERALL NOISE RATING
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Noise Rating	Total	Miles from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Very noisy	3.9%	4.7%	3.1%	3.0%
Fairly noisy	14.9	16.6	14.5	10.1
Fairly quiet	55.2	53.6	56.8	57.3
Very quiet	25.3	24.0	25.2	29.6
Don't know	.7	1.1	.4	-

Kinds of noises heard: Following the overall noise rating, everyone was asked what kinds of noise they sometimes heard around their areas. Almost everyone (99%) mentioned sonic booms, 74% reported cars and trucks, 70% ordinary airplane noise, and 40% noise from neighbors and children. Very little difference was reported by the different distance groups.

Table 78

REPORTED KINDS OF NOISES HEARD
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Noises Heard	Total	Miles from Ground Track 0-8	8-12	12-16
Sonic Booms	98.9%	98.6%	99.3%	99.4%
Cars and trucks	74.0	73.7	73.6	76.0
Ordinary planes	69.8	69.0	73.9	64.7
Neighbors and children	38.7	39.0	40.8	40.0

Noise avoidable: As will be discussed later, the belief that noise can be avoided generally increases annoyance with noise. As part of the general series of noise questions, each person was asked to judge for each noise heard whether the noise could be reduced. Most people had feelings of futility about all noises. Only 25% felt sonic booms could be reduced, 19% felt car noise could be reduced, and about 5% felt airplane and human noise could be lowered. Persons in the close and middle distance areas were usually a little more optimistic about reducing noise.

Table 79

REPORTED BELIEF IN ABILITY TO REDUCE NOISES
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Belief Noise Can Be Reduced	Total		Miles from Ground Track 0-8		8-12		12-16	
	No.	%	No.	%	No.	%	No.	%
Sonic Booms	1531	25	553	28	643	26	335	20
Cars and trucks	1151	19	418	22	477	20	256	13
Ordinary planes	1090	6	393	6	479	6	218	5
Neighbors and children	612	14	213	17	264	13	135	10

Noise annoyance: For each noise heard, a second question was asked, "Do any of these noises ever bother or annoy you or anyone in your family in any way?" About half of all persons said the booms bother or annoy; 25% said car noises bother; 14% said ordinary plane noise annoys, and only 12% said human noises bothered. Of all the noises heard, sonic booms were the most annoying. As Table 80 shows, the middle distance area reported the most annoyance on all types of noise.

Table 80

REPORTED ANNOYANCE WITH DIFFERENT NOISES
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Kind of Noise	Total	Miles from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Sonic booms	52.2%	51.5%	55.6%	48.1%
Cars and Trucks	25.4	21.6	30.6	27.3
Ordinary planes	13.5	10.6	18.2	13.4
Neighbors and children	11.5	11.4	11.7	11.6

Summary of free answer reports on sonic booms: To sum up our findings so far, about 15% showed evidence of serious annoyance with t the booms by their voluntary mentions of the sonic boom problem. About 15% spontaneously brought up this dislike of sonic booms on the third question, and an almost equal number selected sonic booms as the one thing disliked most. Relative to all other local problems, sonic booms ranked near the very top. Relative to all other noises, sonic booms were disliked most by about half of all residents.

3. Reports of Interference by Sonic Booms

Types of interference: Following the general questions about different kinds of noises, in which the respondent himself mentioned the sonic booms in 99% of the cases, it seemed natural for the interviewer to probe more directly about further reactions to the sonic booms. Everyone who said he heard the booms was asked, "Can you tell me if the recent booms ever interfere with -- (a list of specific activities)?" If any activity was reported as ever interfered with, the following question was also asked, "How often is that?"

House rattles and vibrations topped the list of reported interferences, with almost 90% reporting this disturbance. Almost 30% said they experienced this disturbance very often, and an almost equal number said fairly often. Thus, a majority of about 57% felt the the rattles occurred often.

Having been startled by the booms was next in importance, with 39% of all persons reporting this reaction. Only 17%, however, said this occurred often, and only 8% said very often. Interrupted sleep was reported by only 14% of all persons, and an even smaller minority reported interrupted rest, conversation and radio and TV listening.

Very little difference in type and overall interference was reported by close and middle distance respondents. The close area residents, however, consistently reported a little more frequent occurrence of the interferences, which suggests a slightly more intense experience. The distant area respondents reported similar patterns of interference but they always were reported by fewer persons and less often. Table 81 presents these comparisons.

Trends in types of interference: During the six month period of the sonic boom tests, the number of residents who reported interference with living activities remained fairly stable. House rattles were reported by 5% more residents at the end of the study than at the beginning, but practically all of this increase occurred in the close areas. The distant areas actually reported 7% fewer mentions of house rattles during this period. This is consistent with acoustic theory that as the altitude of the plane was lowered to increase the magnitude of the boom, the outer limits of the 12-16 mile areas were probably less affected by the booms.

Reports of interrupted sleep and rest showed the most consistent and largest gains over time. But even at the end of six months exposure, less than 20% reported such interference in the closest areas. It is also significant that a gradient effect appeared in the second and third interviews, with the close area residents reporting the most sleep and rest interference, followed by the middle area and distant area respondents.

The relationship of distance and interference was less clear cut in other types of reported interference. The close and middle distance area respondents were not greatly different but in every type of interference, the middle distance reported a consistent

Table 81

REPORTED TYPES AND FREQUENCY OF INTERFERENCE BY SONIC BOOMS BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Type and Frequency of Interference	Total	Miles from Ground Track 0-8	8-12	12-16
Number of Respondents	2019	1037	351*	336
House rattles-Total	89.0%	89.1%	90.6%	86.0%
Very often	29.5	36.4	22.8	15.5
Fairly often	27.1	27.8	29.1	22.3
Occasionally	32.4	24.9	38.7	48.2
Startles-Total	39.2%	39.6%	38.2%	28.9%
Very often	8.1	11.0	5.1	2.7
Fairly often	8.9	9.6	9.4	5.1
Occasionally	22.2	19.0	23.7	21.1
Interrupts Sleep-Total	14.3%	15.2%	13.4%	6.0%
Very often	3.3	4.2	2.6	1.8
Fairly often	3.1	4.3	2.8	-
Occasionally	7.9	6.7	8.0	4.2
Interrupts Rest-Total	10.8%	11.0%	11.5%	6.0%
Very often	3.2	4.0	2.8	1.5
Fairly often	2.7	3.1	3.0	1.2
Occasionally	4.9	3.9	5.7	3.3
Interrupts Conversation-Total	9.0%	9.2%	9.3%	4.8%
Very often	1.8	2.2	1.9	.6
Fairly often	1.5	1.5	1.9	.9
Occasionally	5.7	5.5	5.5	3.3
Interrupts Radio & TV-Total	7.2%	7.1%	6.6%	3.6%
Very often	1.6	1.8	1.4	.3
Fairly often	1.4	1.4	2.0	.6
Occasionally	4.2	3.9	3.2	2.7

* Includes only persons living and working in some distance areas.

Table 82

REPORTED TYPES OF INTERFERENCE BY SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Interference	Miles from Ground Track											
	Total			0 - 8			8 - 12			12 - 16		
	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25
Number of respondents	2019	2026	1915	1037	1045	989	351	351	331	336	335	314
House rattles	89%	89%	94%	89%	90%	95%	91%	85%	92%	86%	83%	79%
Startles.	39	35	38	40	36	40	38	32	33	29	25	25
Interrupts sleep.	14	15	18	15	17	19	13	7	11	6	9	9
Interrupts rest	11	12	17	11	13	18	12	10	14	6	7	9
Interrupts conversation .	9	12	14	9	11	14	11	10	12	5	11	6
Interrupts radio-TV . . .	7	8	9	7	9	9	7	5	7	4	5	5

pattern of a little less disturbance by sonic booms. Both close and middle distance respondents, however, reported significantly more interference than the distant area residents. Table 82 presents these trends in interference.

Scale of interference: The summary scale of interference shown in Table 83 reflects the rise in rest and sleep disturbance. About 15% reported interference with 4-5 activities in the first interview compared to 23% on the third interview. Most of this increase occurred in the close areas. The number reporting only rattles or no interference (0-1 interferences) remained fairly stable over the six month period.

4. Reports of Annoyance with Sonic Booms

Subjective nature of annoyance: Reports of interference with living activities by sonic booms are largely objective respondent reactions as to the occurrence of certain events. How people feel about such interferences and whether or not they are annoyed by them, involves more complex subjective processes. As the analyses will show, many people are aware of interferences but for a variety of reasons accept the disturbances and are not annoyed.

Types of interference: The rank ordering of reported total annoyances by type of interference is the same as the rank ordering of the types of interference themselves. House rattles headed the list with 54% reporting annoyance with this interference on the first interview. Annoyance with being startled was next in importance with 30% reporting it. Annoyance with sleep and rest interference was mentioned by about 10% of all respondents while annoyance with interruptions of conversation and radio radio and TV was reported by about 5% of all residents.

Trends in annoyance: As the intensity of the sonic booms increased from the first interview to the last, so the total reported annoyance with the booms also increased. Reports of annoyance with house rattles increased by 19%; annoyance with other interferences increased about 5%.

Distance groups: During the first interview period, the close and middle distance area respondents reported about the same overall amount of annoyance. During the second and third periods, however, the close area residents consistently reported more annoyance than the middle distance group. In all three interviews, the distant area residents were the least annoyed. All distance groups, however, showed increased annoyance over time, as can be seen in Table 84.

Table 83

REPORTED SUMMARY SCALE OF INTERFERENCE BY SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Number of Interferences	Total			Distance from Ground Track: 0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of respondents	2033	2026	1915	1048	1045	989	351	351	331	337	335	314
4-5	15.2%	17.6%	23.4%	15.6%	18.7%	24.4%	16.8%	12.8%	18.1%	8.9%	11.0%	12.7%
2-3	30.6	29.5	23.4	31.0	30.5	24.4	28.2	27.6	20.8	24.6	23.0	17.8
0-1	54.2	52.9	53.2	53.4	50.8	51.2	55.0	59.6	61.1	66.5	66.0	69.5

Table 84

REPORTED ANNOYANCE WITH SONIC BOOMS
BY TYPE OF INTERFERENCE AND DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Interference and Intensity of Annoyance	Total			Distance from Ground Track: 0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	2019	2026	1915	1037	1045	989	351	351	331	336	335	314
House rattles-Total	54.3%	66.0%	73.1%	54.3%	68.2%	74.8%	56.6%	55.3%	67.7%	46.2%	56.7%	60.6%
Very annoyed	15.4	24.4	32.8	16.6	25.9	35.3	12.5	19.4	25.4	5.1	11.0	16.9
Moderately annoyed	17.7	19.6	20.7	17.8	20.3	20.6	17.9	16.8	20.8	14.6	19.7	18.5
Little annoyed	21.2	22.0	19.6	19.9	22.0	18.9	26.2	19.1	21.5	26.5	26.0	25.2
Startles-Total	30.0%	31.1%	35.4%	30.6%	32.2%	37.0%	28.4%	26.7%	29.1%	20.3%	21.3%	22.3%
Very annoyed	9.2	12.0	16.1	9.8	12.5	16.8	7.1	9.1	12.7	3.3	4.5	7.6
Moderately annoyed	10.3	9.8	11.6	10.5	10.1	12.6	10.5	9.1	7.3	5.4	8.4	8.6
Little annoyed	10.5	9.3	7.7	10.3	9.6	7.6	10.8	8.5	9.1	11.6	8.4	6.1
Interrupts Sleep-Total	12.0%	13.1%	16.2%	12.7%	14.9%	17.5%	10.8%	6.0%	10.2%	4.8%	7.5%	8.3%
Very annoyed	4.9	6.7	9.2	5.2	7.3	9.9	4.6	4.0	5.7	1.2	2.1	4.5
Moderately annoyed	3.7	3.9	4.9	4.1	4.6	5.6	3.1	1.4	1.8	1.5	3.3	2.2
Little annoyed	3.4	2.5	2.1	3.4	3.0	2.0	3.1	.6	2.7	2.1	2.1	1.6
Interrupts Rest-Total	9.7%	12.2%	16.6%	10.1%	12.8%	17.7%	9.4%	10.0%	13.6%	4.8%	6.6%	8.6%
Very annoyed	5.2	6.8	10.6	5.3	6.9	11.5	4.3	6.0	8.2	1.8	3.3	5.1
Moderately annoyed	2.8	3.8	3.8	3.1	4.0	3.8	2.8	3.7	2.7	2.4	2.1	2.5
Little annoyed	1.7	1.6	2.2	1.7	1.9	2.4	2.3	.3	2.7	.6	1.2	1.0

Type of Interference and Intensity of Annoyance	Total			Distance from Ground Track								
				0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Interrupts Conversation-Total	6.5%	9.5%	12.2%	6.4%	9.4%	12.5%	8.2%	8.6%	10.8%	3.0%	9.0%	6.0%
Very annoyed	2.5	3.4	5.8	2.5	3.0	6.2	2.8	4.0	4.8	.3	2.1	2.5
Moderately annoyed	2.1	3.4	3.8	2.0	3.6	3.8	2.6	2.0	3.3	1.5	3.9	2.2
Little annoyed	1.9	2.7	2.6	1.9	2.8	2.5	2.8	2.6	2.7	1.2	3.0	1.3
Interrupts Radio & TV-Total	5.5%	7.2%	7.4%	5.4%	7.5%	7.6%	4.9%	5.4%	6.9%	3.0%	4.2%	5.4%
Very annoyed	1.9	2.4	3.3	1.8	2.4	3.4	2.3	2.0	3.0	0	1.5	2.9
Moderately annoyed	1.6	3.0	2.4	1.7	3.3	2.3	.9	1.4	2.7	1.2	.9	1.9
Little annoyed	2.0	1.8	1.7	1.9	1.8	1.9	1.7	2.0	1.2	1.8	1.8	.6

Intensity of annoyance: Total reports of annoyance shown in Table 84 include substantial numbers of persons with only a "little" annoyance. Such persons are not believed to be seriously annoyed but rather are saying that they'd rather not have the booms if they had a choice. If only persons reporting more than a little annoyance are considered seriously annoyed, then as Table 85 shows more moderate trends become apparent.

The rank ordering of annoyance by type of interferences does not change. House rattles continue to dominate the amount of serious annoyance, with about half of all respondents reporting more than a little such annoyance in the last interview. About a fourth of all residents also report serious annoyance with being startled, and 10-15% with other types of interferences.

Relation of more than a little annoyance to amount of reported interference: Another measure of the intensity of annoyance is provided by the proportion of all people who report a type of interference and who feel more than a little annoyed by it. In the previous tables, the small numbers reporting sleep and rest interferences may have obscured the seriousness of such disturbances when they do occur. Table 86 highlights these relationships.

Although house rattles were reported by almost 90% of all persons on the first interview, only one out of every three such persons were greatly annoyed by the rattles. Likewise, while less than 10% said their sleep or rest was interrupted, three out of every four rest interruptions and two out of every three such sleep interruptions were considered serious annoyances. By the third interview, while six out of ten who reported rattles considered it a serious annoyance, eight out of ten who felt their sleep or rest was disturbed considered it a serious annoyance.

The general pattern was for sleep and rest interference to be most annoying, followed by being startled, having conversation or radio or TV interrupted and last, having the house rattle. Although fewer residents in the distant areas reported interference by sonic booms, when they did report such disturbance they were usually more annoyed at conversation, rest, and radio and TV interference, but less annoyed at house rattles or being startled.

Intensity of annoyance: Total reports of annoyance shown in Table 84 include substantial numbers of persons with only a "little" annoyance. Such persons are not believed to be seriously annoyed but rather are saying that they'd rather not have the booms if they had a choice. If only persons reporting more than a little annoyance are considered seriously annoyed, then as Table 85 shows more moderate trends become apparent.

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Relation of more than a little annoyance to amount of reported interference: Another measure of the intensity of annoyance is provided by the proportion of all people who report a type of interference and who feel more than a little annoyed by it. In the previous tables, the small numbers reporting sleep and rest interferences may have obscured the seriousness of such disturbances when they do occur. Table 86 highlights these relationships.

Although house rattles were reported by almost 90% of all persons on the first interview, only one out of every three such persons were greatly annoyed by the rattles. Likewise, while less than 10% said their sleep or rest was interrupted, three out of every four rest interruptions and two out of every three such sleep interruptions were considered serious annoyances. By the third interview, while six out of ten who reported rattles considered it a serious annoyance, eight out of ten who felt their sleep or rest was disturbed considered it a serious annoyance.

The general pattern was for sleep and rest interference to be most annoying, followed by being startled, having conversation or radio or TV interrupted and last, having the house rattle. Although fewer residents in the distant areas reported interference by sonic booms, when they did report such disturbance they were usually more annoyed at conversation, rest, and radio and TV interference, but less annoyed at house rattles or being startled.

Table 85

REPORTED MORE THAN A LITTLE ANNOYANCE
BY TYPE OF INTERFERENCE AND DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Interference	Miles from Ground Track											
	Total			0 - 8			8 - 12			12 - 16		
	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25
Number of respondents	2019	2026	1915	1037	1045	989	351	351	331	336	335	314
House rattles.	33%	44%	54%	34%	46%	56%	30%	36%	46%	20%	31%	35%
Startles	20	22	28	20	23	29	18	18	20	9	13	16
Interrupts sleep	9	11	14	9	12	16	8	5	8	3	5	7
Interrupts rest.	8	11	14	8	11	15	7	10	11	4	5	8
Interrupts conversation.	5	7	10	4	7	10	5	6	8	2	6	5
Interrupts radio-TV. . .	4	5	6	4	6	6	3	3	6	1	2	5

Table 86

RATIO OF MORE THAN A LITTLE ANNOYANCE TO TOTAL REPORTED INTERFERENCE BY SONIC BOOMS BY TYPE OF INTERFERENCE AND DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Interference	Total			Distance from Ground Track: 0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Rest interrupted	.73	.92	.82	.73	.85	.83	.58	1.00	.64	.67	.71	.89
Sleep	.64	.73	.78	.60	.71	.84	.61	.71	.73	.50	.55	.78
Startle	.51	.63	.74	.50	.64	.73	.47	.56	.61	.31	.52	.64
Conversation interrupted	.55	.58	.71	.44	.64	.71	.45	.60	.67	.40	.55	.83
Radio & TV interrupted	.57	.62	.67	.57	.67	.67	.43	.60	.86	.25	.40	1.00
House rattles	.37	.49	.57	.38	.51	.59	.33	.42	.50	.23	.37	.44

Summary measure of annoyance: Table 87 presents a summary measure of serious annoyance with booms. Answers shown on Table 85 are combined into a single measure, i.e., if a person is more than a little annoyed with any type of interference, he is considered seriously annoyed. As Table 87 shows, more than a little annoyance rose from 37% on the first interview to 44% on the second interview to 56% on the third interview. Annoyance in the close areas was significantly greater than in the middle distance or distant areas. Likewise, the middle distance respondents reported more annoyance than the far distance residents.

Comparison of annoyance under equal boom intensity: As reported earlier, the actual boom intensities were almost equal in the close areas during the first interview, in the middle distance areas during the second period, and in the far distance areas during the third period. Likewise, the actual boom levels were almost equal in the close areas during the second period and in the middle distance during the third period. Comparisons of annoyance reported in Table 87 show that these independent samples of respondents reported almost equal annoyance levels under equal boom intensities. The 0-8 mile group reported 38% greatly annoyed in the first period, compared to 37% for the middle distance and 38% for the comparable far distance group. Likewise, in the second comparison, both the close and middle distance areas reported 46% more than a little annoyed. These comparisons strongly suggest that the increase in annoyance over time was primarily due to the comparable increase in boom intensity.

Subjective comparisons of loudness of sonic booms during the second and third interviews: Confirmation of the increase in perceived loudness and in annoyance with the booms during the second and third interviews was provided by a series of direct probes. Everyone was asked, "Were the booms you heard recently louder than usual, about the same, or not as loud as usual?" Over 82% said the booms were louder during the second period, with 87% of the close residents, 79% of the middle distance and 76% of the far distance residents feeling this way.

On the third interview, the same question was asked and 77% reported that the third period booms were louder than those of the second period. The close area residents had 84% feeling this way, the middle distance 77%, and the far distant area only 57%. Table 88 presents these subjective reports on boom loudness.

Table 87

REPORTED MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

	Total			Distance from Ground Track								
				0-8			8-12			12-16		
Reported Annoyance	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	2019	2026	1915	1037	1045	989	351	351	331	336	335	314
More than a little	36.9%	44.1%	55.6%	38.0%	45.9%	57.7%	35.3%	36.8%	45.8%	23.3%	33.7%	37.6%
Little or none	63.1	55.9	44.4	62.0	54.1	42.3	64.7	63.2	54.2	73.7	66.3	62.4

Table 88

REPORTED COMPARATIVE LOUDNESS OF SONIC BOOMS
DURING SECOND AND THIRD PERIODS BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

April 20-July 25,1964

Comparative Loudness	Total		Distance from Ground Track 0-8		8-12		12-16	
	4/20 6/14	6/15 7/25	4/20 6/14	6/15 7/25	4/20 6/14	6/15 7/25	4/20 6/14	6/15 7/25
Number of Respondents	2026	1915	1045	989	646	612	335	314
Louder	82.4%	77.4%	87.0%	84.3%	78.5%	76.6%	75.8%	57.3%
Same	14.7	19.3	11.4	14.8	17.2	20.3	20.3	31.5
Not as loud	2.3	2.9	1.1	.6	3.7	2.6	3.3	10.5
Don't know	.6	.4	.5	.3	.6	.5	.6	.7

Comparative annoyance with intensities of sonic booms during the second and third interviews: All respondents were also asked directly "Would you say these recent booms are much more annoying, a little more annoying, or not as annoying as the other ones?" Almost 60% said they were more annoyed by the booms during the second period than during the first period. About 31% said they were much more annoyed, 26% a little more annoyed, 25% equally annoyed and 18% not as annoyed. The close area residents reported the greatest annoyance and the distant area residents the least change.

On the third interview, about 58% said they were more annoyed, 37% said they were equally annoyed, but only 5% said the third period booms were less annoying than the second period booms.

Table 89

REPORTED COMPARATIVE ANNOYANCE OF SONIC BOOMS
DURING SECOND AND THIRD PERIODS BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

April 20-July 25, 1964

Comparative Annoyance	Total		Distance from Ground Track 0-8		8-12		12-16	
	4/20 6/14	6/15 7/25	4/20 6/14	6/15 7/25	4/20 6/14	6/15 7/25	4/20 6/14	6/15 7/25
Number of Respondents	2026	1915	1045	989	646	612	335	314
Much more	30.8%	34.3%	34.3%	40.1%	29.1%	32.4%	23.6%	19.7%
Little more	25.7	23.3	25.8	23.3	25.1	23.5	26.3	23.2
Same	24.9	37.1	25.4	33.9	23.2	39.2	26.9	43.3
Less	17.5	5.0	13.0	2.6	21.4	4.7	23.2	12.7
Don't know	1.1	.3	1.5	.1	1.2	.2	-	1.1

5. Reports of Damage by Sonic Booms

Trends over time: About a fifth of all residents believed they had received damages from the sonic boom during the first two interview periods. During the third period, the number of damage reports increased by 5% to 24% of all residents.

Distance groups: The distance groups form a gradient in damage reports. The closest residents reported the most damage, followed by the middle distance and far distance groups. During the third interview 29% of the close residents reported damage compared to 8% of the most distant group.

Multiple reports of damage: Overall, 38% of all residents felt they had sustained some damage during the six month test. By distance group this ranged from 46% in the close areas to 17% in the far distance ones. Respondents who reported damage in each of the three interviews numbered 7%; those reporting damage twice numbered 11%, and only once, 20%. These findings are presented in Table 90.

Table 90

REPORTED DAMAGE BY SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	352	337
Interview Period				
2/3-4/19	19.1%	22.4%	18.3%	7.7%
4/20-6/14	21.3	27.3	18.0	9.0
6/15-7/25	23.7	29.2	22.8	7.6
Number Damage Reports				
Three	6.8%	8.3%	8.0%	.6%
Two	11.1	14.7	7.1	5.4
One	20.2	23.1	20.8	11.4
Some	38.1%	46.1%	35.9%	17.4%
None	61.9	53.9	64.1	82.6

Damage reported in prior years: Only 12 respondents, or 0.5% believed they had sustained damages during the 1957 air show or SAC flights during 1962-1963. Thus, prior damage experience was negligible.

Kinds of damage reported: Cracked walls or plaster was the most frequent type of alleged damage being reported by 17% of all residents. Damage to structures such as cracks in wood framing, brick, chimneys and garage floors as reported by about 4% of all persons. Lesser numbers of persons reported glass breakage and other types of damage. Table 91 presents these findings.

Table 91

TYPES OF REPORTED DAMAGE BY SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Damage*	Total			Distance from Ground Track								
				0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	2033	2026	1915	1048	1045	989	351	351	331	337	335	314
Walls, plaster	16.8%	16.3%	17.2%	19.8%	20.7%	21.7%	16.2%	14.8%	16.6%	5.9%	6.3%	6.1%
Structures	3.6	3.7	4.3	5.0	5.0	4.7	2.0	2.0	7.3	1.2	1.2	1.0
Moveable objects	2.2	2.4	2.1	2.2	3.5	2.6	2.3	.6	2.4	.9	.3	0
Windows	1.8	2.6	3.6	2.2	3.7	4.2	.6	.9	2.7	1.5	1.5	2.2
Fixed objects	1.6	1.7	1.6	1.8	2.2	2.4	1.1	1.7	1.2	.6	.3	.3
Personal injury	0	-	.2	0	.1	.4	0	0	0	0	0	0
Other damage	.4	.4	.7	.4	0	.6	.9	.9	.3	.9	0	.3
No damage	80.9	78.7	76.3	77.6	72.7	70.8	81.7	82.0	77.2	92.3	91.0	92.4

* Damage reports add to more than 100% because more than one type of damage can be reported.

6. Reports of General Desires to Complain and Actual Complaints About Any Serious Local Problem

Context of general complaint behavior: Before reviewing reported complaint reactions to sonic booms, it is desirable to get a picture of the typical pattern of general complaint behavior in the Oklahoma City area. At the beginning of the first interview, after naming the one thing disliked most, respondents were asked, "Did you ever feel like doing something about this? For example, did you ever feel like writing or telephoning an official about it?", etc. Answers to these questions indicate the general willingness of Oklahoma City residents to complain about a problem they consider serious. Reactions to the boom problem can then be compared to this general level of complaint and a proper perspective obtained.

Low desires to complain: In general the complaint potential or desire to complain about a local problem was quite low. Less than one fourth of all respondents felt like writing or telephoning about their problem. Only 17% felt like using a petition; 12% felt like visiting an official and 10% like setting up a committee to handle the problem. Only small differences were reported by the different distance groups. The more distant residents living in smaller communities more often felt like visiting an official or setting up a local committee.

Lower actual complaints: The actual complaint behavior, as expected, is much lower than the complaint potential. Only 10% overall actually followed up their desire to write or telephone and actually did communicate with an official. Thus, there were 2.3 persons who felt like calling or writing for every one who actually did communicate. Likewise, less than 5% actually signed a petition, which represented only one in every 3.6 persons who felt like it. Actually visiting an official was reported by almost 5% and helping set up a committee by 2%. The ratios of desired activity to actual activity were about the same in all distance areas with the exception that the far distant areas reported relatively more visiting and local committee organization. Table 92 presents these relationships.

Table 92

REPORTED DESIRES AND ACTUAL COMPLAINTS ABOUT SERIOUS LOCAL PROBLEM BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Complaint Activity	Total		0-8		8-12		12-16	
Number Respondents	(2033)		(1048)		(648)		(337)	
	Felt Like	Did	Felt Like	Did	Felt Like	Did	Felt Like	Did
Write or telephone	23.5%	10.0%	22.5%	9.4%	26.5%	10.8%	20.5%	10.1%
Sign petition	17.0	4.7	16.2	4.5	19.0	5.1	15.7	4.5
Visit an official	12.5	4.9	10.3	3.2	14.8	5.7	15.1	8.3
Help set up committee	10.1	2.0	9.9	1.9	9.9	1.2	11.3	3.6

Summary scale of complaint: A summary scale of the general complaint potential is presented in Table 93. A person who felt like visiting an official or helping to set up a committee generally also felt like calling an official and signing a petition. Such a person is classified as having a "high" complaint potential. A person who only felt like calling an official or signing a petition was classified as having a "moderate" complaint potential. A person who felt like doing nothing about voicing his complaints was designated as having a "low" complaint potential. As Table 93 shows, only 14% had a "high" complaint potential, and an equal number a "moderate" complaint potential. Almost three-quarters of all residents had no desire at all to complain about their problem. The differences among the distance groups were small and could be due to sampling variability.

Table 93

GENERAL COMPLAINT POTENTIAL: PERSONS FELT LIKE COMPLAINING BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Complaint Potential	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	351	337
High	14.5%	13.4%	18.2%	18.1%
Moderate	13.6	13.8	12.5	8.0
Low	71.9	72.8	69.3	73.9

Widespread sense of futility: One basic reason why the general complaint potential was so low in the Oklahoma City area was the widespread sense of futility in complaining. Respondents were asked, "And what do you think the chances are to do something about this (serious problem mentioned) -- very good, good, fair or poor?" Only 4% felt the chances were very good; another 8% felt they were good, and only 12% felt the chances were even fair. As can be seen in Table 94, 30% who said there was no serious local problem weren't asked this question. If only persons with a serious problem are considered, then the number who felt there as a good or very good chance to accomplish something by complaining increases to only 17.7%. The most distant areas were slightly more optimistic in their views.

Table 94

REPORTED GENERAL BELIEF IN CHANCES TO DO SOMETHING ABOUT LOCAL PROBLEMS BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Chances to Do Something	Total	Distance from Ground Track 0-8	8-12	12-16
All Respondents	2033	1048	648	337
Very good	4.2%	3.4%	3.4%	8.3%
Good	8.2	7.1	9.0	10.1
Fair	11.7	10.2	13.3	13.4
Poor	33.7	35.0	35.2	26.7
Don't know	10.4	11.2	9.6	9.2
No problem	31.8	33.1	29.5	32.3
Respondents with Problem	1420	719	467	234
Very good	6.0%	5.0%	4.7%	12.0%
Good	11.7	10.3	12.4	14.6
Fair	16.7	14.9	18.4	19.2
Poor	48.2	51.1	48.9	38.4
Don't know	17.4	18.7	15.6	15.8

7. Reported Desires to Complain and Actual Complaints about Sonic Booms

Pattern of complaint desires: Respondent reports of desires to complain about booms during the first interview were about half as great as their general complaint potential. Only 14% even felt like writing or calling an official about the booms, compared to 28% who felt like doing this on a general problem. Likewise, only 12% felt like signing a petition, and 6% like visiting an official or helping to set up a committee. From the first to the third interviews, desires to complain about the booms increased from 2-6%, but still remained well below the general complaint potential. The biggest increase occurred in desires to telephone or write, which totaled 20% on the third interview.

In general, the closest area residents had the highest desire to complain about the booms. The middle distance residents were next in their desire to complain, followed by the distant residents. Table 95 presents these trends.

Table 95

REPORTED DESIRES TO COMPLAIN ABOUT SONIC BOOMS
BY TYPE OF COMPLAINT AND DISTANCE FROM GROUND TRACK

Type of Complaint	Total			Distance from Ground Track								
				0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	2019	2026	1915	1037	1045	989	351	351	331	336	335	314
Writing or telephoning	13.9%	19.0%	19.7%	14.7%	20.9%	21.4%	14.0%	15.4%	15.1%	5.1%	8.7%	8.9%
Signing a petition	11.5	16.8	15.0	12.6	17.9	16.0	10.8	14.0	13.0	2.7	8.1	7.0
Visiting an official	6.3	10.1	10.8	6.8	11.0	11.5	5.7	9.4	9.4	2.4	4.2	3.8
Helping set up a committee	6.3	8.4	8.7	6.8	8.7	9.1	6.0	8.5	7.9	1.8	5.7	3.5

Pattern of actual complaint activity: From 2-3% of all residents said they actually called or wrote the FAA during each interview period. As shown in Table 97, this cumulatively represented about 5% of all residents who called one or more times during the six month period. Only very small numbers of residents did other things to complain about the booms. These reported complaints are shown in Table 96.

Pattern of actual contacts with FAA: During the six month period, almost 5% of all residents said they contacted the FAA about the booms. Less than one per cent called three or more times, about 1% called twice, and 3% called only once. Thus, about a third of all persons who contacted the FAA said they called more than once. Table 97 shows that the close area residents called most often and the far distant residents the least often. Almost 7% of the close residents called compared to 1% of the distant area residents.

Comparison of estimate of total calls to FAA based on interviews and actual calls recorded by FAA: According to the FAA records, a total of 12,400 calls were received during the six month period. If the total number of calls reported on the interviews (sum of calls for three interview periods) of 7.5% is multiplied by the 179,000 estimated total number of families in the Oklahoma City area, the estimated number of calls totals 13,400, or only 8% more than the actual number. This close approximation of total number of calls received by the FAA offers independent evidence of the validity of answers reported on the survey. In fact, part of the discrepency may be due to an over estimate in the population base rather than in the interview data.

Table 96

REPORTED ACTUAL COMPLAINT ACTIVITY ON SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Complaint	Total			Distance from Ground Track								
				0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	2019	2026	1915	1037	1045	989	351	351	331	336	335	314
Wrote or telephoned	2.9%	2.5%	2.1%	3.8%	3.6%	2.8%	2.0%	1.2%	2.0%	1.2%	.6%	.3%
Signed petition	.3	.3	.3	.5	.6	.3	.3	0	.3	0	0	0
Visited official	.3	.3	.4	.4	.5	.4	.3	.3	.3	.3	0	.3
Set up committee	.1	.2	.3	.2	.4	.5	0	0	0	0	0	0

Table 97

REPORTED ACTUAL CALLS OR LETTERS ABOUT SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	351	337
Interview Period				
2/3-4/19	2.9%	3.8%	2.0%	1.2%
4/20-6/14	2.5	3.6	1.2	.6
6/15-7/25	2.1	2.8	2.0	.3
Number Contacts				
Three	.7%	1.0%	.3%	.3%
Two	1.2	1.7	.6	.3
One	3.0	3.8	3.1	.6
Some	4.9	6.5	4.0	1.2
None	95.1	93.5	96.0	98.8

Summary scale of complaint potential on sonic booms: As described previously, a summary scale can be prepared for the answers shown in Table 95 so that the following categories can be compared:

high complaint potential -- felt like doing 3-4 things

moderate complaint potential -- felt like doing 1-2 things

low complaint potential -- felt like doing nothing.

As Table 98 shows, the sonic boom complaint potential advanced from 16.5% during the first interview to 21.5% on the third interview. This low desire to complain about booms at the end of the study is over 6% below the general complaint potential shown in Table 93. The close areas reported the highest boom complaint potential, followed by the middle distance area.

Table 98

REPORTED COMPLAINT POTENTIAL FOR SONIC BOOMS: PERSONS FELT LIKE COMPLAINING BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Complaint Potential	Total			Distance from Ground Track								
				0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	2033	2026	1915	1048	1045	989	351	351	331	337	335	314
High	7.9%	12.2%	12.4%	8.4%	13.1%	13.4%	7.7%	11.1%	10.0%	2.7%	6.0%	4.5%
Moderate	8.5	10.6	9.1	9.1	11.7	9.6	8.3	6.8	7.9	3.0	5.4	6.4
Low	83.5	77.2	78.5	82.5	75.2	77.0	85.0	82.1	82.1	94.3	88.6	89.1

Desire to complain about booms if asked by local organization: The complaint analysis thus far has dealt with individual desires to complain based on self appraisal of annoyance. To test for the possible effects on respondent behavior of an organized community campaign to complain, the following question was asked, " If a local organization wanted to stop or reduce the booms and asked you to write or telephone an official . . . , do you think you would very likely do it, that you might but you're not sure, or that you probably wouldn't?" From the answers to this question, an organizational complaint potential scale was prepared, comparable in structure to Table 98. The answers for the second and third interview periods were based on the control samples only, since the question was not repeated for the basic panel. Thus, Table 99 presents only totals for the entire area, since the control samples were not separated into distance groups.

Local residents are more ready to complain if asked by a local organization to do so. In the first interview, about 6% of the respondents who had not felt like doing anything on their own initiative, said they probably would complain. This difference increases to about 12% on the third interview. As Table 99 also shows, most of the respondents who had only a moderate complaint potential on an individual initiative complaint (felt like calling or signing a petition only) said they would also visit officials or help set up a committee (high potentials) if they were asked to do so.

Table 99

COMPARISON OF INDIVIDUAL AND ORGANIZATIONAL COMPLAINT POTENTIALS ON SONIC BOOMS

Oklahoma City Area

February-July 1964

Complaint Potential	2/3-4/19		4/20-6/14		6/15-7/25	
	Individual	Organizational	Ind.	Org.	Ind.	Org.
Number Respondents	2033	2033	2026	198	1915	196
High	7.9%	20.1%	12.2%	26.0%	12.4%	30.2%
Moderate	8.5	2.4	10.6	1.0	9.1	3.0
Low	83.5	77.5	77.2	73.0	78.5	66.8

Some reasons for low boom complaint potential: Aside from the general low complaint potential in the area and feelings of annoyance about the booms, a number of local factors probably reduced the actual number of complaints. Feelings of futility about the effects of complaining and ignorance about where to complain were probably two of the major reasons for very low complaints.

Feelings of futility: All respondents were asked, "On the whole, what do you think the chances are for doing anything about reducing the booms?" Only 4% answered that there was a very good chance; another 10% said there was a good chance, and 18% said the chances were fair. Thus, less than one-third of all residents felt the chances were even fair to accomplish anything by complaining. These answers are shown in Table 100.

These feelings of futility were further reinforced by the experience of actual complainers. When those who complained were asked, "Did it do any good?" only about 10% felt it had done some good.

Table 100

REPORTED BELIEF IN CHANCES FOR DOING SOMETHING TO REDUCE BOOMS BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Chances for Doing Something	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2019	1037	646	336
Very good	4.3%	4.3%	4.6%	3.6%
Good	9.5	9.0	9.9	10.1
Fair	18.2	16.8	19.3	20.2
Hardly any	51.8	52.8	51.2	49.4
Don't know	16.2	17.1	15.0	16.7

Know where to complain: Although there had been extensive publicity, only 38% of all respondents said they knew where to complain, but only 31% were even close to really knowing. Table 101 presents the answers to the question, "Do you happen to know where to call if you want to complain about the booms? Where is that?"

Table 101

REPORTS ABOUT WHERE TO COMPLAIN ABOUT BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Where to Complain	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents*	1538	556	646	336
Do not know	62.5%	61.0%	60.7%	68.5%
Think they know	37.5	39.0	39.3	31.5
FAA center	28.3	32.2	28.9	20.8
Complaint center	1.3	2.2	.8	.9
Will Rogers Airport	1.5	.7	2.2	1.5
Tinker AFB	2.0	1.6	1.7	3.0
Local government	4.7	3.8	5.4	4.8
State or Federal Govt.	1.0	.6	1.1	1.8
Insurance company	.4	.4	.6	-
Other	1.6	1.3	1.9	1.8

* Telephone sample not asked this question.

8. Long Range Acceptability of Booms

Research objective: A primary objective of the Oklahoma City research program was to ascertain the long range effects of sonic boom exposure. As indicated in the Introduction, public announcements were made by the FAA that the local booms were scheduled for only a limited period of six months. About half of all the residents reported an awareness of the limited duration of the booms. It was considered possible, therefore, that this knowledge could encourage respondents to accept current booms only because it was for a limited time period. To test this hypothesis, the following question was asked of all respondents on the initial interview: "If this area received eight booms every day throughout the year from a civilian supersonic airplane, do you think you very likely could learn to live with it after a while, that you might but you're not sure, or do you think you probably couldn't learn to live with it?" If the respondent answered "couldn't" or "don't know", he was asked about 5-6 booms per day and 1-2 booms per day to establish his threshold of acceptability. If he thought he could accept eight booms per day, he was asked about 10-12 booms per day. On the second and third interviews, every respondent was asked again, "If your area received booms from a civilian jet as often and as loud as the recent ones, do you think most people around here would very likely learn to live with it, that they might or that they probably wouldn't learn to live with it?" Respondents were also asked, "And how about yourself -- would you very likely learn to live with it, you might or you probably wouldn't be able to live with it?" Since the actual number of "recent" booms was eight per day, a comparison was possible of answers for all three periods.

Reported threshold of acceptability on first interview: The number of booms per day did not seem too important a variable in influencing long range acceptability of sonic booms. Only 12% more residents felt they could accept 1-2 booms per day than felt they could accept 10-12 booms per day. Most residents felt they could live with sonic booms.

About 84% of all respondents felt they could accept as many as 10-12 daily booms. Almost two-thirds were firm in their convictions, saying they "very likely could accept it," while 20% thought "they might but weren't sure." The close and middle distance respondents held almost the same views, while about 10% more of the distant residents felt they could accept 10-12 booms per day.

Over 91% of all respondents said they could accept 8 booms per day on the first interview, a gain of 7% over the acceptance of 10-12 booms. Less than 2% additional respondents said they could accept 5-6 booms per day and another 3% felt they could accept a minimum of 1-2 booms per day. Thus, a hard core of 4% felt uncertain about accepting even 1-2 booms per day. Table 102 presents these first interview responses.

Table 102

REPORTED THRESHOLDS OF ACCEPTABILITY OF SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Number of Booms Acceptable	Total	Distance from Ground Track 0-8	8-12	12-16
Number of respondents	2033	1048	352	337
10-12 Booms per Day				
Very likely	64.1%	63.4%	63.4%	70.9%
Might	19.7	19.6	17.9	19.6
Could	83.8%	83.0%	81.3%	90.5%
Couldn't	14.1	14.8	17.0	7.7
Don't know	2.1	2.2	1.7	1.8
8 Booms per Day				
Very likely	75.3%	74.8%	73.3%	80.4%
Might	15.9	15.8	15.1	14.8
Could	91.2%	90.6%	88.4%	95.2%
Couldn't	6.2	6.5	8.8	3.6
Don't know	2.6	2.9	2.8	1.2
5-6 Booms per Day				
Could accept 8	91.2%	90.6%	88.4%	95.2%
Very likely	.3	.4	.3	.3
Might	1.2	1.5	1.4	.6
Could accept 5-6	92.7%	92.5%	90.1%	96.1%
Could not	5.1	5.1	6.8	3.6
Don't know	2.2	2.4	3.1	.3
1-2 Booms per Day				
Could accept 5-6	92.7%	92.5%	90.1%	96.1%
Very likely	.7	.8	.9	-
Might	2.3	2.3	2.6	1.8
Could accept 1-2	95.7%	95.6%	93.6%	97.9%
Could not	3.0	3.4	4.3	1.8
Don't know	1.3	1.0	2.1	.3

Acceptability of night booms: Although Oklahoma City residents had no actual experiences with night booms, respondents were asked to speculate about their reactions to such booms. Respondents were asked, "And how about several civilian booms every night? Do you think you could learn to live with it, that you might but you're not sure, or that you probably couldn't learn to live with it?" Only 66% of all respondents felt they could accept night booms compared to over 90% who said they could live with day booms. In terms of certainty of feelings, only 43% felt they "very likely" could live with night booms. This clearly indicates that night booms will probably be less acceptable than day booms and this finding is consistent with the previous conclusion that sleep interference was considered more serious than house rattles, etc. The reported level of acceptability of night booms, however, must be cautiously evaluated because it was not based on actual experience. After actually living through a series of night booms, respondent answers about their acceptability might be changed. Table 103, however, gives a rough approximation of night boom reactions.

Table 103

REPORTED EXPECTATIONS OF ACCEPTABILITY OF SEVERAL NIGHT BOOMS BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Acceptability	Distance from Ground Track			
	Total	0-8	8-12	12-16
Number Respondents	2033	1048	352	337
Very likely	42.6%	42.2%	40.6%	46.0%
Might	23.0	22.6	22.4	25.2
Could	65.6%	64.8%	63.0%	71.2%
Couldn't	25.9	27.1	28.7	19.6
Don't know	8.5	8.1	8.3	9.2

Trends in long range acceptability of eight booms per day: As the intensity of actual boom experiences increased, respondent expectations of boom acceptability decreased. On the third interview, 73% of all residents felt they could live with the booms compared to 91% on the first interview. Respondents living in the close areas reported the lowest acceptability, while those living in the most distant areas reported the highest acceptability of the booms. In all distance areas and in all time periods, the vast majority of the respondents felt they could live with the booms they were experiencing.

Some possible decrease in boom acceptability over time is suggested by the comparison of answers by different distance groups under equal boom intensities. Reported acceptability of booms during the first interview was a little higher than during the other two periods. For example, 91% of the close residents during the first interview felt they could accept the booms compared to 82% of the middle distance residents during the second interview and 86% of the far distance residents during the third interview.

In evaluating first interview responses it should be noted that the wording of the question on the first interview was slightly different from the other interviews. On the first interview, the number of booms was specified, while on the other interviews, the question was in terms of "recent booms", which also happened to be eight per day.

Very little difference was reported by the comparable groups during the second and third interviews. About 79% of the close residents on the second interview felt they could live with the booms compared to 75% of the middle distance group on the third interview.

Another interesting comparison is provided by the projective answers about the ability of others to accept the booms, shown in Part B of Table 104. When asked to speculate during the second interview about other people accepting the booms, respondents generally judged others to be about 10% less able to accept the booms. On the third interview, reports about other people's tolerance of booms more closely approximated self appraisal to accept the booms. It is interesting to note that the projective answers on the second interview were almost equal to the self appraisals on the third interview. This suggests a possible reluctance on the second interview to admit one's own inability to accept the booms.

Table 104

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

	Total			Distance from Ground Track 0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	2033	2026	2033	1048	1045	1048	352	351	352	337	335	337
Own Acceptability												
Very likely	75.3%	61.1%	52.3%	74.8%	58.2%	50.2%	73.3%	64.4%	56.3%	80.4%	68.1%	65.0%
Might	15.9	19.7	20.6	15.8	20.4	20.9	15.1	17.7	18.8	14.8	19.1	20.5
Could	91.2%	80.8%	72.9%	90.6%	78.6%	71.1%	88.4%	82.1%	75.1%	95.2%	87.2%	85.5%
Couldn't	6.2	17.9	24.3	6.5	19.2	25.9	8.8	15.7	22.8	3.6	8.4	13.4
Don't know	2.6	1.3	2.8	2.9	2.2	3.0	2.8	2.2	2.1	1.2	4.4	1.1
Acceptability of Others												
Very likely	-	44.5%	41.3%	-	39.6%	37.5%	-	47.9%	44.6%	-	51.9%	51.0%
Might	-	27.4	28.0	-	28.1	28.1	-	28.2	25.6	-	24.8	26.7
Could	-	71.9%	69.3%	-	67.7%	65.6%	-	76.1%	70.2%	-	76.7%	77.7%
Couldn't	-	15.5	19.7	-	17.9	22.4	-	14.5	19.9	-	10.7	13.6
Don't know	-	12.6	11.0	-	14.4	12.0	-	9.4	9.9	-	12.6	8.7

9. Some of the Factors that Might Influence Annoyance and Acceptability of Sonic Booms

In this section of the report, the variability of the factors which might influence boom reactions will be presented by distance from ground track. In a subsequent section, their relationships to annoyance will be shown.

a. Knowledge About the Survey

Heard or read about recent sonic booms: The public information program appears to have been very successful in reaching residents. When asked on the first interview, "Have you heard or read anything about the recent sonic booms around here?" over 90% answered "yes". When asked where they had heard about the booms, over 80% mentioned the newspapers and TV, over half mentioned the radio and almost 60% friends and neighbors. The question about where they had heard about the booms was asked first as an open question ("Where did you hear about it?") and then as a direct probe for the four primary sources shown in Table 105, if the source was not voluntarily mentioned ("Did you hear anything about it from . .?"). As Table 105 shows, newspapers and TV were voluntarily reported by almost two-thirds of all respondents compared to only 21% freely mentioning radio and 17% friends and neighbors. Thus, the first two sources can be considered the primary channels of communication on the sonic boom program.

Causes of sonic boom: The public information program stressed that sonic booms were a natural phenomenon caused by planes flying faster than the speed of sound, creating a pressure wave which was heard on the ground as a sonic boom. To measure the extent to which people actually received this message, everyone was asked, "Could you tell me what causes the jets to make a boom?" About 70% of all respondents volunteered completely correct answers, and an additional 6% gave partly correct responses. "Breaking the sound barrier" was the most popular explanation given by over half of all persons. "Traveling faster than the speed of sound" was reported by a fourth of all respondents and mention of pressure or shock waves was made by 13%. Overall, all distance groups were equally well informed of the causes of sonic booms.

Table 105

REPORTED SOURCES OF INFORMATION ABOUT SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

	Total	Distance from Ground Track 0-8	8-12	12-16
Heard About Recent Booms				
Number of Respondents	2026	1042	647	337
Yes	93.6%	93.9%	93.5%	92.3%
No	5.0	5.1	4.5	5.9
Not asked	1.4	1.0	2.0	1.8
Source of News				
Number of Respondents*	1538	556	646	336
TV-Total	86.2%	84.9%	86.9%	87.2%
Yes-spontaneous	63.9	58.3	68.3	64.9
Yes-probed	22.3	26.6	18.6	22.3
Newspapers-Total	82.2%	82.4%	83.0%	80.7%
Yes-spontaneous	64.3	62.8	66.9	61.9
Yes-probed	17.9	19.6	16.1	18.8
Radio-Total	56.2%	57.2%	54.7%	57.4%
Yes-spontaneous	21.0	20.1	20.3	23.8
Yes-probed	35.2	37.1	34.4	33.6
Friends & Neighbors-Total	57.9%	64.2%	55.2%	52.7%
Yes-spontaneous	17.0	19.2	17.3	12.8
Yes-probed	40.9	45.0	37.9	39.9
Magazines-Pamphlets	2.8%	4.5%	2.2%	1.5%
At Work	2.6%	2.9%	3.1%	1.2%
Family	1.3%	1.2%	1.3%	1.2%
All others	1.4%	1.6%	1.1%	1.5%

*Telephone sample not asked this subquestion.

Table 106

REPORTED CAUSES OF SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Reported Causes	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2019	1037	646	336
Accuracy of Answers				
All answers correct	70.4%	70.2%	71.1%	69.6%
Answers partly correct	5.9	5.8	5.6	7.1
All answers incorrect	23.7	24.0	23.3	23.3
Detailed Causes				
Breaking sound barrier	55.2%	54.4%	55.1%	57.7%
Travel faster than sound	26.4	23.3	31.0	27.4
Create shock waves	12.6	14.5	11.8	8.3
Place causes vacuum	5.0	4.1	6.3	5.1
Physically break sound	1.8	1.5	2.2	1.8
High altitude	1.0	1.4	.5	.9
Electrical charges	1.0	.9	1.4	.9
Sound bouncing	.6	.8	.3	.6
Hit air pockets	.5	.6	.6	-
Reentry into atmosphere	.4	.5	.3	.3
Misc. incorrect	1.7	1.9	.9	2.7
Don't know, vague	18.3	18.8	17.3	18.8

Recognition of booms: Over 80% of all respondents said they could always distinguish a sonic boom from other noises. The close area residents recognized booms most frequently, followed by the middle and far distance groups. Most of the people who can't always recognize a boom said they thought it was either an explosion or a thunder storm. It is interesting to note that the distant area residents most often failed to recognize the boom and wondered if it was a storm or explosion. Table 107 presents these data.

Table 107

REPORTED RECOGNITION OF SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2160*	777	877	506
Recognition				
Can always tell	83.1%	88.0%	83.6%	74.7%
Somtimes wonder	14.4	9.3	13.6	23.9
Don't know	2.5	2.7	2.8	1.4
Sometimes Sound Like:				
Explosion outside	5.8%	3.8%	6.3%	8.1%
Thunderstorm	4.6	1.1	3.2	12.2
War, bombs	.6	.6	.7	.2
Earthquake	.6	.1	.6	1.2
Cars crashing	.4	.4	.2	.6
Backfire autos	.4	.4	.3	.4
Explosion inside	.4	.3	.5	.4
Guns shooting	.4	.3	.6	.4
Crash of planes	.2	.1	.2	.2
Miscellaneous	.6	.3	.8	1.0
Don't know, vague	2.3	2.4	2.4	1.8

* Includes only face-to-face interviews.

Awareness of boom schedule: The actual daily time schedule of sonic booms was widely advertised in newspapers and radio and TV. When asked, "Do you usually hear the booms about the same time each day or do they happen at different times each day?" over 80% said they were aware of a regular schedule. The close areas again showed greater knowledge of the boom program, with 87% expressing awareness of the boom schedule compared to 74% for the middle distance and 80% for the far distant residents. Table 108 presents these answers.

Table 108

REPORTED AWARENESS OF BOOM SCHEDULE
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

		Distance from Grounnd Track		
Booms Occur:	Total	0-8	8-12	12-16
Number of Respondents	2019	1037	646	336
Same time	81.6%	86.6%	74.5%	79.8%
Different times	12.4	8.2	18.4	13.7
Don't know	6.0	5.2	7.1	6.5

Awareness of purpose of sonic booms: Almost 80% said they knew the purpose of the sonic boom tests, but only 62% actually had the correct information on the first interview. Most of the false answers, however, were based on erroneous newspaper stories that the tests would help Oklahoma City get an SST terminal. Thus, in a sense, 80% received the message about the tests. The close area residents, with the most intense sonic boom exposure, were the best informed with 65% knowing the real purpose of the tests.

On the third interview, the same question about purposes of the test was repeated. In addition, one of the questions on the first interview actually told the respondent about the SST development program. Yet, in answer to the question on purpose of the booms on the third interview, only 71% said they knew the reasons for the booms and only 58% actually gave correct answers. Apparently in the six month interval, some of the respondents forgot what they had read about the purposes of the booms. Table 109 presents these findings.

Table 109

REPORTED KNOWLEDGE OF THE PURPOSES OF THE SONIC BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

	Total		Distance from Ground Track 0-8		8-12		12-16	
Purpose of Test*	2/3 4/19	6/15 7/25	2/3 4/19	6/15 7/25	2/3 4/19	6/15 7/25	2/3 4/19	6/15 7/25
Number of Respondents	2019	2033	1037	1048	646	648	336	337
Don't know	20.3%	29.4%	14.0%	27.8%	26.9%	29.0%	26.8%	35.0%
Do Know	79.7	70.6	86.0	72.2	73.1	71.0	73.2	65.0
FAA-SST Test	29.0	24.9	30.2	26.0	26.5	24.7	30.4	22.0
Sonic boom test	32.6	33.4	34.7	34.0	31.0	33.2	29.2	32.0
Help aviation	2.3	1.2	1.8	1.0	2.3	1.4	3.9	1.5
Help get SST terminal	15.3	11.3	14.1	11.9	16.4	11.9	16.7	8.0
Air Force practice	5.6	1.0	4.6	1.0	5.4	1.0	9.2	1.2
Near civilian airport	9.2	.1	9.4	-	9.3	.2	8.3	.3
In a flight path	2.5	.2	2.2	.2	3.7	.3	.9	.3
Test speed	1.4	.2	1.5	.1	1.1	.3	1.5	.6
To accustom people	2.0	.2	1.7	.2	2.3	-	2.1	.6
Area has special advantages	5.7	.6	5.3	.9	6.3	.3	5.7	.3
To accustom towar	.8	-	.5	-	1.5	-	.3	-
Population unique	1.6	-	1.3	-	2.0	-	1.8	-
Miscellaneous	1.8	.3	2.2	.6	1.4	.2	1.2	-
Don't know	5.4	.2	9.3	.2	1.4	.3	1.2	.3

* Reasons do not add to percent who say they know because multiple answers could be given.

Knowledge of duration of sonic boom tests: Although the public was informed that the sonic boom test would last only six months, only half actually could report this information on the first interview. About two-thirds said they knew the duration but seven per cent said it was less than six months and 6% said it was more than six months. The close residents were again the best informed and the most distant residents were the least informed. Table 110 presents these findings.

Table 110

DURATION OF SONIC BOOM TESTS REPORTED ON FIRST INTERVIEW BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February 3--April 19, 1964

Report Duration	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2019	1037	646	336
Yes, think know duration	66.8%	72.0%	64.1%	55.7%
One month or less	.2	.3	.3	-
Two months	1.6	1.7	1.4	1.5
Three months	3.9	4.0	4.2	3.3
Four months	2.1	2.2	2.2	1.8
Five months	1.3	1.6	1.1	.9
Six months	52.0	56.6	50.0	41.4
Seven months or more	5.5	5.5	4.8	6.6
Don't know	0.2	0.1	0.1	0.2

On the third interview the question about duration of the study was repeated. Since the third interviews were held from July 7-July 25, any answer 1-4 weeks could be considered correct. Over two-thirds said they knew the duration of the study, but about 6% had wrong information about the length of the study. As Table 111 indicates, the close residents were again somewhat better informed.

Table 111

DURATION OF THE SONIC BOOM TESTS REPORTED ON THE THIRD INTERVIEW BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

July 7-25, 1964

Reported Duration	Total	Distance from Ground Track 0-8	8-12	12-16
Number of respondents	0233	1048	648	337
Yes, think know duration	67.9%	74.4%	63.0%	57.0%
Less than 1 week	.5	.5	.8	-
One week	.5	.6	.3	.6
Two weeks	3.7	4.1	3.5	.30
Three weeks	26.2	30.6	25.8	13.4
Four weeks	30.5	32.9	25.2	33.5
Five or more weeks	5.5	4.6	6.6	5.9
Don't know, vague	1.0	1.1	.8	.6

b. Belief in the Necessity of Local Booms

Belief in the necessity for having local booms appears to be inversely related to the intensity of the boom. As the boom intensity increased, the number who said they felt local booms were absolutely necessary decreased from 52% on the first interview to 38% on the third interview. The most distant residents who experienced the lowest intensities of sonic booms, most often felt that local booms were necessary.

On the first interview, all respondents were also asked to judge, "From what you've heard or read, do you think most other people around here feel it (sonic booms) is absolutely necessary, or not?" Less than one-third of all residents felt other people considered the local booms necessary, with all distance groups reporting almost identical answers. Thus respondents reported themselves almost twice as tolerant of the booms as they believed others to be. Especially since respondents later reduced their own reports of tolerance and belief in the necessity of local booms, there is reason to believe that they may have understated their own views on the first interview.

Why local booms are necessary: On the first face-to-face interviews, everyone was asked why they felt the booms were necessary or not necessary. Reasons most often given to explain why the booms were necessary were: 1) booms are part of progress and inevitable; 2) Oklahoma City is as good as any area, so why not here; 3) everyone should trust the authorities, they chose this area; 4) Oklahoma City will benefit from the SST plane, and 5) Oklahoma City will eventually be exposed to the SST, so why not now.

Less than 10% felt there were special features about the area that required the tests locally. Most of the favorable reasons involved general support of aviation progress.

Why local booms are not necessary: Almost half of the respondents with negative feelings could give no specific reasons for their belief that the booms were not necessary. Those who did express themselves, however, generally felt the tests or the SST were not important, or the area did not have any unique features that required the tests locally. Moreover, dislike for the disturbance by booms and the fear of damage were also cited as reasons why booms weren't necessary locally. Table 113 presents these findings.

Should boom test be made locally: Corroboration of feelings about the necessity of local booms was provided by answers to the following question which was asked toward the end of the first interview, "From what you know about the government's study of supersonic airplanes around here, do you definitely feel the study should be made around here, that it probably should be or that it should not be made around here?" Only about one third answered "definitely should", an equal number "probably should", and the rest "should not or don't know". All distance groups felt about the same way.

Table 112

REPORTED BELIEF IN THE ABSOLUTE NECESSITY OF LOCAL BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

	Total			Distance from Ground Track								
				0-8			8-12			12-16		
	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25	2/3 4/19	4/20 6/14	6/15 7/25
Number of Respondents	2019	2026	2033	1037	1045	1048	646	646	648	336	335	337
Own Views												
Yes	52.3%	44.9%	38.2%	51.1%	43.6%	37.0%	55.3%	47.4%	40.6%	57.7%	53.4%	45.1%
No	30.1	36.2	42.5	31.8	37.6	44.8	26.5	34.5	37.3	19.0	21.5	28.2
Don't know	17.6	18.9	19.3	17.1	18.8	18.2	18.2	18.1	22.1	23.3	25.1	26.7
View of Others												
Yes	31.5%	-	-	31.4%	-	-	31.1%	-	-	32.4%	-	-
No	29.9	-	-	32.6	-	-	30.2	-	-	21.1	-	-
Don't know	38.6	-	-	36.0	-	-	38.7	-	-	46.5	-	-

Table 113

REPORTED REASONS WHY LOCAL BOOMS ARE NECESSARY OR NOT
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

	Total	Distance from Ground Track 0-8	8-12	12-16
Reasons Booms Necessary				
Number of Respondents*	852	295	361	196
Booms part of progress	26%	23%	28%	27%
Area as good as any	22	21	22	24
Trust authorities	20	21	19	20
Area will benefit	20	17	22	19
Area will be exposed to SST	17	18	17	17
Special facilities in area	9	10	9	9
Special geographic features	9	12	8	9
Promotes national security	6	4	7	5
Near Air Force base	5	4	5	5
Vague answers	7	8	7	5
Reasons Booms Not Necessary				
Number of Respondents	686	261	285	140
Area not special	17%	18%	17%	15%
Test not important	12	14	12	7
Test over open areas	8	10	8	3
Vibrations disturb	7	7	7	6
SST not needed	7	4	8	8
Fear damage	6	7	5	6
Miscellaneous	3	3	3	2
Vague	45	43	44	51

* Only face-to-face respondents asked this question

At the time of the third and final interview there was considerable publicity about a possible court injunction to stop the booms. To measure sentiment about this case, the following question was asked at the end of the third interview, "Do you feel the booms should be stopped right away or do you feel they should be continued until they have served their purpose?" Even though only 38% had previously said they felt the booms were absolutely necessary, 67% said the booms should be continued in answer to the above question. This shows a great trust and tolerance of the authorities. Table 114 presents these answers.

Table 114

REPORTED SUPPORT OF THE SONIC BOOM TEST
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

		Distance from Ground Track		
A. First Interview Should Study be Made Locally:	Total	0-8	8-12	12-16
Number of Respondents	1545	560	648	337
Definitely should	36.9%	38.6%	36.9%	34.2%
Probably should	36.4	32.5	37.3	41.1
Should not	10.7	11.6	11.0	8.6
Don't know	16.0	17.3	14.8	16.1
B. Third Interview Should Booms be Stopped:				
Number of Respondents	2033	1048	648	337
Yes	26.0%	29.8%	25.2%	15.7%
No	66.8	63.5	68.5	73.9
Don't know	7.2	6.7	6.3	10.4

Concern of aviation officials: Further confirmation that about two-thirds of the respondents had tolerant feelings toward the booms was provided by answers to the following questions: "The way things are now (first interview) would you say the aviation officials responsible for the booms care about the feelings and comfort of residents like yourself -- do you think they care very much, moderately, only a little, or don't they care at all?" Almost two-thirds said "very much" or "moderately", with 37% saying "very much". The far distant residents, as Table 115 shows, were again the most tolerant with 70% saying the officials cared "very much" or "moderately" about their feelings and comfort.

Table 115

REPORTED CONCERN OF AVIATION OFFICIALS FOR LOCAL FEELINGS BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Extent of Concern	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	1538	556	646	336
Very much	36.8%	37.6%	35.0%	39.0%
Moderate	27.7	24.6	28.6	31.0
Little	11.7	11.7	11.9	11.3
None	14.3	14.9	16.3	9.5
Don't know	9.5	11.2	8.2	9.2

c. Importance of Aviation Industries

Since local aviation industries were known to be very important in the Oklahoma City economy, a number of questions were asked to measure awareness of this fact.

Feelings about aviation industry in general: When asked to judge the general importance of the commercial air transportation industry almost 80% said it was "extremely important". Another 15% felt aviation was moderately important, while only 5% felt it had little or no importance or didn't know its importance. Residents in all distance groups had about the same feelings toward the importance of aviation, as shown in Table 116.

Table 116

REPORTED GENERAL IMPORTANCE OF AVIATION INDUSTRY
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Degree of Importance	Total	Distance from Ground Track		
		0-8	8-12	12-16
Number of respondents	2033	1048	648	337
Extremely important	78.8%	80.2%	78.1%	76.0%
Moderately important	15.4	13.6	16.5	18.7
A little important	1.9	1.7	2.3	1.8
Not very important	1.2	1.2	1.1	1.5
Don't know	2.7	3.3	2.0	2.0

Feelings about aviation industry in Oklahoma City: Following the general question cited above, a specific question was asked about local aviation, "How about the importance of civilian aviation to the welfare of Oklahoma City and surrounding towns -- Do you feel it is extremely important, moderately important, a little important, or not very important?" About 93% of all residents said they regarded local aviation as moderately or extremely important, with almost 75% saying extremely important. This overwhelming recognition of the importance of local aviation industries undoubtedly provided a favorable climate for the sonic boom tests and contributed towards its acceptance.

Table 117

REPORTED IMPORTANCE OF AVIATION TO OKLAHOMA CITY
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Degree of Importance	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Extremely important	74.0%	76.0%	72.2%	71.5%
Moderately important	18.9	16.5	20.2	24.0
A little important	2.7	2.7	2.9	2.1
Not very important	1.2	1.1	1.5	.6
Don't know	3.2	3.7	3.2	1.8

Feelings about the importance of the SST: Following the above general questions about aviation, a specific series of questions was asked about the SST. First, everyone was asked, "As you probably know the recent booms around here are part of a government development program of a new supersonic airplane that will fly about 2,000 miles per hour. Do you feel it is absolutely necessary for our country to have such a civilian plane, do you feel it is probably necessary or do you feel it is not necessary?" The answers were similar to those given about the necessity of local booms. About a third of all residents felt the SST was absolutely necessary, while another third felt it was probably necessary. All persons who didn't feel the SST was absolutely necessary were asked the following question, "As you may know, the French, British and Russians are already building a commercial supersonic airplane. If these countries have such a plane would you feel it absolutely necessary for Americans to have one too, would it probably be necessary, or would it not be necessary?" This question was designed to measure the influence of national competition and pride, and about half of those who previously felt the SST was not necessary changed their minds. About 61% felt the SST was absolutely necessary on its own merits or if other countries have it, 22% felt it was probably necessary if others have it, and only 17% felt it was not necessary or couldn't make up their minds about it.

A further measure of hard core resistance to the SST was given by the next question. If the respondent only felt the SST was probably necessary or not necessary when others have it, he was asked, "If the sonic boom could be reduced, would you feel it desirable for us to have a commercial plane that travels 2,000 miles an hour, or don't you feel we need such a plane?" Only 16% felt the SST would be desirable, while 23% remained negative or uncertain of their feelings. Thus, 23% do not believe the SST is necessary or desirable even if the sonic booms could be reduced, but over three-fourths of all residents have some favorable feelings about the SST. Table 118 summarizes these findings, and shows that all distance groups reported about the same answers to these questions.

Table 118

REPORTED FEELINGS ABOUT NECESSITY OF HAVING AN SST
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
A. Necessity of SST on its Own:				
Absolutely necessary	35.3%	35.6%	35.8%	33.5%
Probably necessary	31.3	28.8	31.6	38.3
Not necessary	24.7	26.0	24.5	20.8
Don't know	8.7	9.6	8.1	7.4
B. If Others Have SST:				
Absolutely Necessary*	60.6%	60.6%	61.6%	59.0%
Probably necessary	22.5	21.9	23.1	22.8
Not necessary	12.2	12.8	11.4	11.9
Don't know	4.7	4.7	3.9	6.3
C. If Boom Reduced:				
Desirable**	77.0%	77.6%	77.8%	74.1%
Not desirable	13.5	14.4	13.4	11.0
Don't know	9.5	8.0	8.8	14.9

* Includes "absolutely necessary" responses of Part A.

** Includes"absolutely necessary" responses of Parts A & B.

d. Personal Characteristics of Respondents

Although the different distance area groups were alike on most personal characteristics, the close area residents differed slightly in the following ways. They were more often persons living with only adults. They were slightly older persons with more education and white collar jobs. They also reported less ties with the aviation industry but had a little more flying experience as passengers.

Family characteristics: Almost half of all residents lived in households with only adults present. About a fourth of all residents had families with children under 6 years of age and an equal number had families with older children. The close area residents lived more often in exclusively adult households, and fewer older children. They also more often were one or two person families. The middle and far distant area residents had about the same kind and size families, as can be seen in Table 119.

Table 119

REPORTED FAMILY CHARACTERISTICS OF RESPONDENTS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

	Distance from Ground Track			
	Total	0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Family Composition:				
Adults only	45.1%	50.0%	39.7%	40.3%
Children over 6	26.5	25.3	28.5	26.1
Children under 6	28.4	24.7	31.8	33.6
Size of Family:				
One person	8.6%	10.0	7.3	6.5
Two persons	30.1	32.2	27.3	29.1
Three persons	18.7	19.3	18.5	17.5
Four persons	19.7	18.8	20.7	20.8
Five persons	11.7	10.4	12.7	13.9
Six or more	11.2	9.3	13.5	12.2

Age: The close area residents were generally older than the middle or far distant area residents. About 10% more close area residents were over 40 years of age than respondents in the other two groups. Table 120 shows the age distribution.

Table 120

AGE DISTRIBUTION OF RESPONDENTS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Age	Total	Distance from Ground Track 0-8	8-12	12-16
Number of respondents	2033	1048	648	337
18-29	19.7%	16.3%	23.0%	23.8%
30-39	20.8	18.7	22.4	24.4
40-54	26.1	28.4	24.1	23.4
55-64	14.3	16.6	12.1	11.8
65 +	18.2	18.8	18.4	15.7
Don't know	.9	1.2	-	.9

Sex: About 71% of the respondents were women and 29% men. The different distance groups were all essentially alike on this factor.

Table 121

SEX OF RESPONDENTS
BY DISTANCE FROM GROUND TRACK

Sex:	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Male	29.3%	28.1%	30.4%	30.9%
Female	70.7	71.9	69.6	69.1

Education: The close area residents more often had some college education and less often had only high school education. The middle and far distant groups had about the same educational background overall -- about 21% had only an elementary school education, 54% a high school education and 25% some college. Table 122 presents these data.

Table 122

EDUCATIONAL ACHIEVEMENT OF RESPONDENTS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Highest Educational Achievement	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Elementary school	20.7%	19.8%	21.7%	21.4%
High school	53.9	50.1	58.2	57.3
College	25.1	29.8	19.9	21.1
Don't know	.3	.3	.2	.2

Income: Only small differences in income distributions were reported by the different distance groups. About half of all residents said they earned less than $6,000 per year; 20% from $6,000 - 7,999; 19% from $8,000 - 14,999; and 4%, $15,000 or over.

Table 123

REPORTED FAMILY INCOME OF RESPONDENTS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Income	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
Under $6000	51.9%	50.1%	53.4%	54.9%
$6000-7999	19.5	17.7	22.4	19.3
$8000-14,999	18.7	19.8	17.2	18.1
$15,000 or more	3.7	4.9	2.8	2.1
Income not given	6.2	7.5	4.2	5.6

Occupation of main earner: The main earner of close area families was more often a professional, managerial, clerical or sales person. Far distant area families more often were farmers and both middle and far distance families more often had factory workers as main earners. Table 124 presents these data.

Table 124

REPORTED OCCUPATION OF MAIN EARNER IN RESPONDENT'S FAMILY
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Occupation	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents*	1545	560	648	337
Professional and semi-professional	9.5%	11.3%	8.3%	8.9%
Farmers	8.7	6.1	7.6	15.4
Proprietors and Managers	13.6	15.2	12.3	13.4
Clerical and sales	13.7	17.3	11.7	11.3
Craftsmen, foremen	21.4	17.1	24.5	22.6
Operatives	14.0	10.4	17.4	13.4
Service	8.3	10.5	7.6	5.9
Laborers	4.2	3.4	5.1	3.9
Not given	6.6	8.7	5.5	5.2

* Question asked only of face to face respondents.

Noise sensitivity: Although residents in all distance groups see themselves as about equally sensitive to noise, the middle distance group reports a little more noise sensitivity on a detailed battery of noise annoyance questions. When asked directly, "Would you say you were more sensitive or less sensitive than most people are to noise?", about 15% said "more sensitive," 44% said "less sensitive" and 38% said "about the same". All distance groups had about the same pattern of answers, as can be seen in Table 125.

Table 125

REPORTED OVERALL SENSITIVITY TO NOISE
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Comparative Sensitivity	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents*	1545	560	648	337
More than others	14.8%	15.4%	14.2%	14.9%
Less than others	44.3	43.6	46.0	42.3
Same as others	38.4	38.8	37.2	40.2
Don't know	2.5	2.2	2.6	2.6

* Question asked only if face-to-face respondents

Respondents were also asked to indicate whether eight different kinds of noises ever annoyed them. A cumulative index of noise annoyance was prepared from the answers to these questions and is shown in Table 126. As can be seen, 25% of the close and far distant area residents reported two or less noise annoyances compared to only 19% for the middle distance group. Likewise, the middle distance group reported a little more, 3-4 noise annoyances. Thus, by the four noises or less category, all distance groups were about the same. This slightly greater noise sensitivity is consistent with previous findings that this group reports more annoyance with area noises (Table 80).

Table 126

NOISE SENSITIVITY INDEX FOR RESPONDENTS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area
February-July.1964

Cumulative Number Noises Bother	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	1545	560	648	337
None	6.9%	9.3%	4.5%	7.4%
One	12.1	14.5	9.3	13.3
Two	22.8	25.2	19.0	25.8
Three	40.9	41.8	38.4	43.6
Four	60.9	61.1	61.2	59.3
Five	78.8	79.7	76.6	80.7
Six	89.9	90.6	88.5	90.8
Seven	97.3	98.6	96.5	96.1
Eight	100.0	100.0	100.0	100.0

Experience with flying as a passenger: About half of all respondents said they had ever flown in an airplane. Close area residents, however, said they flew a little more often and more recently. Table 127 presents these comparisons.

Table 127

REPORTED FLYING EXPERIENCES AS PASSENGER
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	1545	560	648	337
Number of Times Flown				
None	48.5%	46.4%	49.1%	51.0%
Some	51.5	53.6	50.9	49.0
1-2	20.6	18.2	22.5	21.1
2-4	8.3	9.1	7.6	8.3
5+	20.3	24.3	18.4	17.2
Don't know	2.3	2.0	2.4	2.4
Last Time Flew	51.5%	53.6%	50.9%	49.0%
Less than 1 year	9.2	11.8	7.9	7.4
1-3 years ago	11.5	13.9	9.9	10.7
4 or more years ago	27.8	25.2	29.5	29.1
Don't know	3.0	2.7	3.6	1.8

Ties with aviation: Only small differences were reported by different distance groups with respect to their direct ties with the aviation industry. The closest area residents, however, reported slightly less connections with the aviation industry. About 32% said they had some connection with the aviation industry, of which 14% said they had personal ties and 18% said members of their families had such connections. Only 7% said they were presently employed by the aviation industry. Table 128 presents these reports.

Table 128

RESPONDENT TIES WITH THE AVIATION INDUSTRY
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Types of Ties with Aviation	Total	Distance from Ground Track 0-8	8-12	12-16
Number of Respondents	2033	1048	648	337
No ties	68.2%	71.0%	64.0%	67.4%
Some ties	31.8	29.0	36.0	32.6
Personal	14.0	11.6	16.7	16.3
Family	17.8	17.4	19.3	16.3

B. Effects of Belief in Importance of a Supersonic Transport and Feelings about the Absolute Necessity of Having Local Booms on Reactions to Sonic Booms

1. Guides for Projecting Oklahoma City Responses to Other Areas --

General approach: The previous section presented the overall reactions to sonic booms by residents of the Oklahoma City Area. It would be desirable to combine such information with reports from a number of the other geographic areas throughout the United States in order to obtain a representative picture of public reactions for the country as a whole. Such a standard approach, however, is not possible, since limitations of time and expense do not permit the repetition of this comprehensive study in a nationwide sample of communities. An alternative approach for developing broader generalizations of sonic boom reactions may be found in the analysis of factors which help explain the wide range of responses among Oklahoma City residents.

Not all Oklahoma City residents, obviously, felt alike or reacted the same way toward the sonic boom exposures. Some residents had favorable attitudes which fostered greater acceptance of the boom disturbances, while others had opposite feelings which encouraged hostility toward the booms. A knowledge of such attitudinal variables which influence adjustment to booms can be used to establish the upper and lower limits of average community reactions to the booms. The extent of favorable and unfavorable sonic boom attitudes will differ from community to community, but by establishing the reactions associated with these different attitudes, it will be possible to estimate the sonic boom responses for any particular combination of favorable and unfavorable attitudes in any particular area. It is thus possible to derive more general information about tolerance of sonic booms from the single sample of responses in the Oklahoma City area.

Two basic attitudes: The two attitudes which will be discussed first are the belief in the absolute necessity of having an SST and belief that local booms are unavoidable and necessary in Oklahoma City. These attitudes, which might be influenced by proper public information programs, are extremely important in influencing reactions of annoyance, complaint, and long range acceptability of booms. In the analyses that follow, it will be shown that favorable attitudes toward the SST and local booms establish a minimum expected level of community annoyance and complaint, while negative attitudes set a maximum level of non-acceptability.

2. Relationship between Feelings about the Importance of the SST and Belief in the Necessity of Having Local Booms

Extent of these attitudes: In the previous section (Table 118) it was shown that in Oklahoma City, 35% felt the development of the SST was absolutely necessary, 31% felt it was probably necessary and 34% either did not think it was necessary or were uncertain of their views. Likewise, it was shown in Table 112 that 52% of all residents felt that local booms were absolutely necessary on the first interview, but only 38% felt as favorable on the third interview.

Relationship of two attitudes: The more certain a person felt about the importance of the SST the more likely he was to believe that local booms were also necessary and unavoidable. This inter-relationship was almost the same in every distance group, as can be seen in Table 129. During the first interview period, about 74% of those who felt more positively that the SST was absolutely necessary also felt local booms were necessary. Forming a gradient in response, only 57% who had their doubts and felt that the SST was probably necessary also believed that local booms were unavoidable. Likewise, showing the greatest unfavorable attitudes, only 29% who did not believe the SST was necessary also believed local booms were necessary. Thus, differences in belief about the necessity of the SST account for a spread of 45% in favorable attitudes toward the necessity of local booms, i.e., from 74% to 29%.

During each interview period the basic pattern of inter-relationships remained the same, but as the intensity of the boom exposures increased, the number who continued to feel that local booms were necessary decreased. Overall, on the third interview, only 55% who had said the SST was absolutely necessary continued to feel local booms were also necessary in Oklahoma City. In contrast, only 19% of those persons with completely negative feelings about the SST also felt that local booms were unavoidable.

It is significant to note that if residents had the same views about the necessity of the SST, their views about the local necessity of the booms were also similar, despite the differences in the distances of their homes from the ground track. For example, during the third interview period, if they believed the SST was absolutely necessary, 51% of the closest residents compared to 60% of the most distant residents believed local booms were necessary. In contrast, if they did not believe in the SST, only 19% of the closest residents compared to 18% of the most distant residents felt the booms were necessary.

Table 129

REPORTED BELIEF IN THE ABSOLUTE NECESSITY OF LOCAL BOOMS
BY BELIEF IN THE NECESSITY FOR DEVELOPING AN SST
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Distance from Ground Track	Necessity for Developing an SST: Absolutely Necessary 2/3 4/19	4/20 6/14	6/15 7/25	Probably Necessary 2/3 4/19	4/20 6/14	6/15 7/25	Not Necessary 2/3 4/19	4/20 6/14	6/15 7/25
A. Total:									
No. respondents	711	715	711	633	635	633	675	676	675
Feel booms necessary	74%	65%	55%	57%	51%	44%	29%	23%	19%
B. 0-8 miles:									
No. respondents	367	372	367	299	301	299	371	372	371
Feel booms necessary	73%	63%	51%	56%	47%	41%	26%	22%	19%
C. 8-12 miles:									
No. respondents	232	232	232	205	205	205	209	209	209
Feel booms necessary	74%	65%	60%	58%	50%	42%	32%	25%	19%
D. 12-16 miles:									
No. respondents	112	111	112	129	129	129	95	95	95
Feel booms necessary	77%	69%	60%	60%	59%	53%	33%	27%	18%

3. Reports of Interference by Sonic Booms

Effects of attitudes toward boom: Even reports of interference by booms, which should be objective experiences, appeared to be affected by subjective attitudes toward the boom. The amount of reported interference varies inversely with the extent to which there were favorable attitudes toward the boom. Persons who believed the SST was absolutely necessary reported the smallest amount of interference, followed by those who felt the SST was probably necessary. Persons who were opposed to the SST and felt it was not necessary consistently reported the most interference. This pattern was maintained in all interview periods, but on the third interview the differences narrowed between the two favorable attitude groups, i.e., those who felt the SST was absolutely or probably necessary. On the first interview, 65% of those who believed the SST absolutely necessary reported only vibrations or no interference compared to 56% for those who felt the SST was only probably necessary and 43% for those who felt the SST was not necessary. On the third interview, the "absolutely necessary" group reported 63% with only one or no interferences, compared to 62% for the "probably necessary" and 42% for the "not necessary" group.

Range in reported interference: The combination of favorable attitudes toward the SST resulted in the least amount of reported interference while the opposite or hostile combination of attitudes resulted in the most reported disturbance. On the third interview, 73% of those who felt the SST was absolutely necessary and that local booms were necessary reported only vibrations or no interference. In contrast, only 36% or half as many, reported the same low interference if they did not believe the SST was necessary or that local booms were necessary. The average for all residents in Oklahoma City, regardless of attitudes toward the booms and SST, was 54% (Table 83) with only one or no interferences, or in the middle of the range of 36% to 73%.

Distance groups: The same patterns of response were reported by residents in all distance groups. While the most interference was consistently reported by the closest residents and the least by the most distant, the gradient of response was most marked in the second and third interviews when the boom intensities were highest. On the third interview, the closest residents with the most favorable boom attitudes reported 68% with only one or no interferences, compared to 70% for the middle distance and 85% of the farthest distance groups with the same favorable attitudes. In contrast, the closest residents with the least favorable attitudes reported only 33% with one or no interference, compared to 36% for the middle distance and 47% for the farthest distance groups. Table 130 presents these findings.

Table 130

REPORTED SUMMARY SCALE OF INTERFERENCE BY SONIC BOOMS
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST
AND NECESSITY OF LOCAL BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Number Activities Interfered by Distance Group and Time Period	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
A. Total: 2/3-4/19									
Number of respondents	711	393	318	633	276	357	675	128	547
4-5	8.4%	5.6%	11.9%	11.8%	10.5%	12.9%	23.6%	12.5%	26.2%
2-3	26.2	24.4	28.3	31.8	30.4	32.7	33.0	30.5	33.6
0-1	65.4	70.0	59.8	56.4	59.1	54.4	43.4	57.0	40.2
Total: 4/20-6/14									
Number of respondents	715	394	321	635	278	357	676	126	550
4-5	10.1%	6.3%	14.6%	13.9%	7.5%	18.8%	24.9%	11.1%	28.0%
2-3	21.7	16.2	30.6	28.0	18.0	35.9	34.4	22.2	37.3
0-1	68.2	77.5	54.8	58.1	74.5	45.3	40.7	66.7	34.7
Total: 6/15-7/25									
Number of respondents	667	369	298	598	263	335	650	126	524
4-5	16.1%	8.5%	25.5%	18.4%	9.9%	25.1%	30.5%	9.5%	35.5%
2-3	20.4	18.5	22.5	20.6	15.2	24.8	27.4	21.5	28.8
0-1	63.5	73.0	52.0	61.6	74.9	50.1	42.1	69.0	35.7

Number Activities Interfered by Distance Group and Time Period	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
B. 0-8 miles: 2/3-4/19									
Number of respondents	367	188	179	299	123	176	371	71	300
4-5	9.8%	6.9%	12.8%	12.0%	11.4%	12.5%	24.8%	11.3%	28.0%
2-3	27.5	23.4	31.8	33.8	31.7	35.2	33.2	25.4	35.0
0-1	62.7	69.7	55.4	54.2	56.9	52.3	42.0	63.4	37.0
0-8 miles: 4/20-6/14									
Number of respondents	372	190	182	301	125	176	372	71	301
4-5	11.6%	7.4%	15.9%	16.3%	9.6%	21.0%	27.7%	12.7%	31.2%
2-3	24.5	16.3	33.0	28.9	18.4	36.4	37.9	21.1	41.9
0-1	63.9	76.3	51.1	54.8	72.0	42.6	34.4	66.2	26.9
0-8 miles: 6/15-7/25									
Number of respondents	346	176	170	286	119	167	357	70	287
4-5	20.2%	10.2%	30.6%	21.0%	11.8%	27.5%	32.2%	12.9%	36.9%
2-3	24.0	22.2	25.9	21.7	13.4	27.5	27.7	17.1	30.3
0-1	55.8	67.6	43.5	57.3	74.8	45.0	40.1	70.0	32.8
C. 8-12 miles: 2/3-4/19									
Number of respondents	232	138	94	205	85	120	209	40	169
4-5	7.8%	5.1%	11.7%	14.1%	12.9%	15.0%	25.4%	17.5%	27.2%
2-3	27.2	27.5	26.6	30.7	34.1	28.3	36.4	42.5	34.9
0-1	65.0	67.4	61.7	55.2	53.0	56.7	38.2	40.0	37.9
8-12 miles: 4/20-6/14									
Number of respondents	232	138	94	205	85	120	209	40	169
4-5	8.6%	5.8%	12.8%	13.7%	7.1%	18.3%	23.0%	5.3%	26.9%
2-3	22.8	18.1	29.8	26.8	18.8	32.5	33.0	26.3	34.5
0-1	68.6	76.1	57.4	59.5	74.1	49.2	44.0	68.4	38.6

8-12 miles: 6/15-7/25

Number of respondents	177	89	88	188	80	108	196	29	167
4-5	13.6%	6.7%	20.5%	19.7%	13.8%	24.1%	32.7%	6.9%	37.1%
2-3	20.3	23.6	17.0	17.6	13.8	20.4	27.0	27.6	26.9
0-1	66.1	69.7	62.5	62.7	72.4	55.5	40.3	65.5	35.9

D. 12-16 miles: 2/3-4/19

Number of respondents	112	67	45	129	68	61	95	17	78
4-5	5.4%	3.0%	8.9%	7.8%	5.9%	9.8%	14.7%	5.9%	16.7%
2-3	19.6	20.9	17.8	28.7	23.5	34.4	25.3	23.5	25.6
0-1	75.0	76.1	73.3	63.5	70.6	55.7	60.0	70.6	57.7

12-16 miles: 4/20-6/14

Number of respondents	111	66	45	129	68	61	95	17	78
4-5	8.1%	4.5%	13.3%	8.5%	4.4%	13.1%	17.9%	17.6%	17.9%
2-3	16.2	12.1	22.2	27.9	16.2	41.0	24.2	17.6	25.6
0-1	75.7	83.3	64.4	63.6	79.4	45.9	57.9	64.8	56.5

12-16 miles: 6/15-7/25

Number of respondents	144	104	40	124	64	60	97	27	70
4-5	9.0%	6.7%	15.0%	10.5%	1.6%	20.0%	19.6%	3.7%	25.7%
2-3	11.8	8.7	20.0	22.6	20.3	25.0	26.8	25.9	27.1
0-1	79.2	84.6	65.0	66.9	78.1	55.0	53.6	70.4	47.2

4. Reports of Annoyance by Sonic Booms

Effect of attitudes toward booms: Annoyance with sonic booms appears to be more affected by the attitudes people have toward the booms than by the differences in physical intensities of the booms. Residents who believed the SST was absolutely necessary reported less annoyance than those who felt the SST was only probably necessary. Those who did not feel the SST was necessary reported the most annoyance. All attitude groups showed an increase in annoyance as the intensity of the boom increased over time, but the pattern of annoyance among attitude groups remained the same. In the first interview, 22% of those who believed the SST was necessary were more than a little annoyed. During the third interview, the number of annoyed persons was greater for all attitude groups, with 42% of those who felt the SST was absolutely necessary reporting more than a little annoyance compared to 68% for those who did not believe in the SST.

Range in reported annoyance: As in the case of reported interference, the combination of favorable attitudes toward the SST and local booms resulted in the least annoyance and the opposite combination of unfavorable attitudes resulted in the most annoyance. In the third interview, for example, only 25% of the people with most favorable attitudes were annoyed compared to 76% of those with the least favorable attitudes -- a spread in annoyance of over 50%.

In the same interview, the overall differences in annoyance between the closest and most distant residents was only 20% (Table 87). Thus, for the magnitudes of the sonic booms studied in Oklahoma City, the combination of attitudinal differences accounted for two-and-a-half times more annoyance variance than the distance from ground track or intensity of the boom.

Distance groups: As can be seen in Table 131, for equal attitude groups, the closest residents were generally more annoyed and the most distant residents were the least annoyed. For example, on the third interview, the closest residents with the most favorable attitudes reported that 30% were annoyed compared to 12% for the comparable most distant group. Likewise, the closest least favorable attitude group reported 81% annoyed, compared to 59% for the comparable most distant group.

Table 131

REPORTED MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST
AND NECESSITY OF LOCAL BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Reported Annoyance by Distance Groups and Time Period	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
A. Total: 2/3-4/19									
Number of respondents	711	393	318	633	276	357	675	128	547
More than a little	21.7%	13.0%	32.4%	30.3%	21.4%	37.3%	53.6%	34.4%	57.4%
Little or none	78.3	87.0	67.6	69.7	78.6	62.7	46.4	65.6	52.6
Total: 4/20-6/14									
Number of respondents	715	394	321	635	278	357	676	126	550
More than a little	34.1%	25.9%	44.2%	36.4%	26.6%	44.0%	55.3%	42.1%	58.4%
Little or none	65.9	74.1	55.8	63.6	73.4	56.0	44.7	57.9	41.6
Total: 6/15-7/25									
Number of respondents	667	369	298	598	263	335	650	126	524
More than a little	41.7%	24.7%	62.8%	49.7%	31.6%	63.9%	67.7%	32.5%	76.1%
Little or none	58.3	75.3	37.2	50.3	68.4	36.1	32.3	67.5	23.9

Reported Annoyance by Distance Groups and Time Period	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
B. 0-8 miles: 2/3-4/19									
Number of respondents	367	188	179	299	123	176	371	71	300
More than a little	24.5%	15.5%	34.0%	31.5%	23.6%	37.0%	56.6%	36.7%	61.3%
Little or none	75.5	84.5	66.0	68.5	76.4	63.0	43.4	63.3	38.7
0-8 miles: 4/20-4/14									
Number of respondents:	372	190	182	301	125	176	372	71	301
More than a little	37.6%	29.0%	46.7%	38.2%	28.0%	45.5%	60.5%	46.5%	63.8%
Little or none	62.4	71.0	53.3	61.8	72.0	54.5	39.5	53.5	36.2
0-8 miles: 6/15-7/25									
Number of respondents	346	176	170	286	119	167	357	70	287
More than a little	48.2%	29.5%	67.6%	52.8%	37.8%	63.4%	72.8%	40.0%	80.8%
Little or none	51.7	70.5	32.4	47.2	62.2	36.6	27.2	60.0	19.2
C. 8-12 miles: 2/3-4/19									
Number of respondents	232	138	94	205	85	120	209	40	169
More than a little	22.0%	13.8%	34.1%	33.2%	25.8%	38.3%	56.0%	35.0%	61.0%
Little or none	78.0	86.2	65.9	66.8	74.2	61.7	44.0	65.0	39.0
8-12 miles: 4/20-6/14									
Number of respondents	232	138	94	205	85	120	209	38	171
More than a little	33.2%	24.6%	45.8%	35.1%	28.2%	40.0%	51.2%	31.6%	55.5%
Little or none	66.8	75.4	54.2	64.9	71.8	60.0	48.8	68.4	44.5

8-12 miles: 6/15-7/25									
Number of respondents	177	89	88	188	80	108	196	29	167
More than a little	46.9%	30.3%	63.6%	53.7%	32.5%	69.4%	68.9%	31.0%	75.4%
Little or none	53.1	69.7	36.4	46.3	67.5	30.6	31.1	69.0	24.6
D. 12-16 miles: 2/3-4/19									
Number of respondents	112	67	45	129	68	61	95	17	78
More than a little	11.6%	4.5%	22.3%	23.3%	11.8%	36.1%	36.8%	23.5%	39.7%
Little or none	88.4	95.5	77.7	76.7	88.2	63.9	63.2	76.5	60.3
12-16 miles: 4/20-6/14									
Number of respondents	111	66	45	129	68	61	95	17	78
More than a little	24.3%	19.7%	31.2%	34.2%	22.1%	47.6%	44.3%	47.0%	43.6%
Little or none	75.7	80.3	68.8	65.8	77.9	52.4	55.7	53.0	56.4
12-16 miles: 6/15-7/25									
Number of respondents	144	104	40	124	64	60	97	27	70
More than a little	19.5%	11.5%	40.0%	36.3%	18.8%	55.0%	46.4%	14.8%	58.6%
Little or none	80.5	88.5	60.0	63.7	81.2	45.0	53.6	85.2	41.4

5. Reports of Damage by Sonic Booms

Effect on attitudes: Respondents' belief that they have sustained damage from sonic booms appears to be directly related to hostile attitudes toward the booms. Those persons with the most negative feelings about the boom consistently reported the most damage. About 27-28% of all persons who felt the SST was not necessary reported some damage by booms during each interview period. In comparison, only 15% of those who felt the SST was necessary reported damage during the first period, but this number increased to 17-21% on the third interview. Almost half of all persons who felt the SST was not necessary reported some damage during the six months period, compared to only about a third of those residents who felt favorable toward the SST. Moreover, almost a fourth of the residents hostile to the SST said they had been damaged more than once, compared to only 14% for the residents with favorable attitudes.

Range in reported damage: The combination of hostile attitudes toward the booms, i.e., SST not necessary and local booms not necessary, consistently reported the most damage, while those with a combination of friendly attitudes reported the least damage. Almost a third of the most hostile residents reported some damage each interview period, compared to only about 10% of the most favorable group. Overall, 56% of the most hostile residents reported some damage during the six month period, compared to only 25% of the most favorably disposed residents -- a range of 31%.

Distance groups: Identical patterns of reported damage are found in Table 132 for each of the distance groups. The closest residents reported the most damage, followed by the middle distance and far distance groups. Almost two-thirds of the closest residents who were most hostile to the booms reported some damage during the six months study, compared to about one-third of the most friendly group. Likewise, 22% of the most hostile residents in the most distant areas reported damage compared to less than 10% of the most friendly distant residents.

Effect of feeling about local booms: It is significant to note that if respondents felt local booms were necessary, but that the SST was not necessary, the amount of damage reported was almost the same as that reported by the most favorable group. Of course, only 20% of those who felt the SST was not necessary felt that local booms were necessary. But when they had one negative and one positive attitude, they also felt less often that they had sustained any damage from the booms. This clearly indicates the importance of belief in sonic boom damage on attitudes toward the sonic booms.

Table 132

REPORTED DAMAGE BY SONIC BOOMS
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST
AND NECESSITY OF LOCAL BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Reports Of Damage	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
A. TOTAL									
Number of Respondents	718	396	322	636	279	357	679	128	551
Period: 2/3-4/19	14.9%	10.6%	20.2%	15.1%	7.5%	21.0%	27.4%	7.8%	31.9%
4/20-6/14	17.3	11.9	23.9	18.2	8.2	26.1	28.3	12.5	31.9
6/15-7/25	20.9	12.6	31.0	17.3	9.3	23.5	28.4	11.7	32.2
Number Reports: Three	5.2%	2.5%	8.4%	5.4%	1.4%	8.4%	9.9%	1.6%	11.8%
Two	8.9	5.3	13.3	9.4	4.7	13.2	14.9	5.5	17.0
One	19.8	16.9	23.3	15.7	11.5	19.1	24.7	16.4	26.7
None	66.1	75.3	55.0	69.5	82.4	59.3	50.5	76.5	44.5
B. 0-8 miles									
Number of Respondents	373	191	182	302	126	176	373	71	302
Period: 2/3-4/19	16.5%	12.1%	21.4%	17.8%	9.6%	24.9%	31.9%	9.8%	37.1%
4/20-6/14	22.1	16.2	28.5	22.6	12.0	30.2	35.8	16.8	30.4
6/15-7/25	25.7	17.5	36.7	21.9	14.3	27.4	33.0	16.8	36.7
Number Reports: Three	5.6%	2.6%	8.8%	6.3%	2.4%	9.1%	12.6%	2.8%	14.9%
Two	12.2	8.4	16.4	12.9	6.4	17.7	18.2	8.4	20.5
One	24.1	21.0	27.4	17.6	15.9	18.8	26.5	18.2	28.5
None	58.1	68.0	47.4	63.2	75.3	54.4	42.7	70.6	36.1

C. 8-12 miles

Number of Respondents	232	138	94	205	85	120	211	40	171
Period: 2/3-4/19	17.2%	13.7%	22.4%	15.6%	7.1%	21.6%	26.6%	5.0%	31.6%
4/20-6/14	14.6	9.3	22.4	16.5	8.3	22.5	23.3	7.5	26.8
6/15-7/25	17.2	9.3	28.7	18.0	8.3	25.0	29.9	7.5	35.7
Number Reports: Three	6.9%	3.6%	11.7%	6.3%	1.2%	10.0%	9.5%	--	11.7%
Two	5.1	2.1	9.6	7.8	3.6	10.8	12.4	2.5	14.6
One	18.1	17.3	19.2	15.6	12.9	17.5	26.5	12.5	29.8
None	69.9	77.0	59.5	70.3	82.3	61.7	51.6	85.0	43.9

D. 12-16 miles

Number of Respondents	113	67	46	129	68	61	95	17	78
Period: 2/3-4/19	4.5%	--	10.8%	7.9%	4.5%	11.5%	11.6%	5.9%	12.8%
4/20-6/14	6.3	4.5	8.7	11.0	1.5	21.3	9.5	5.9	10.3
6/15-7/25	7.9	6.0	13.1	5.6	1.5	9.9	7.4	5.9	7.7
Number Reports: Three	--	--	--	1.6%	--	3.3%	--	--	--
Two	5.4%	3.0%	8.7%	4.0	3.0%	4.9	7.4%	--	9.0%
One	8.9	4.5	15.2	11.7	1.5	23.0	13.7	17.7	12.8
None	85.7	92.5	76.1	82.7	95.5	68.8	78.9	82.3	78.2

6. Reports of Desires to Complain and Actual Complaints About the Booms

General complaint potential: As expected, only small differences were reported on the general complaint potential by respondents with different sonic boom attitudes. It is interesting that those who believed in the importance of the SST usually had a lower general complaint potential than those who did not believe in the SST. About 75% of those favorably disposed toward the SST had no general complaint desires compared to 66% of those hostile to the SST. This pattern of response was reported by all distance groups, with the closest residents reporting a slightly larger differential between persons favorable and unfavorable to the SST.

Summary scale of individual complaint potential on sonic booms: Desires to complain about sonic booms were directly related to favorable and unfavorable attitudes toward the SST and feelings about the necessity of local booms. Persons who felt favorable toward the SST were less likely to have a desire to complain than persons who were hostile to the SST. This pattern persisted in each distance group and in each interview period. While only 6% of all persons who felt the SST was absolutely necessary felt like complaining about the booms during the first interview, 30% of those who did not feel the SST was necessary felt like complaining.

Desires to complain remained surprisingly stable over the six months study, despite the increases in annoyance already reported. Those with favorable attitudes toward the SST reported only a 7% increase in desires to complain while persons with hostile attitudes reported only a 1% change.

The combination of hostile attitudes toward the SST and local booms produced the greatest desire to complain. Over a third of all persons with the most hostile attitudes felt like complaining compared to only 2-3% of those with the most favorable attitudes toward the booms -- producing a difference of 33% in desires to complain between the extreme attitude groups.

The close and middle distance groups were alike in response for persons with favorable attitudes toward the SST, but the close groups with hostile feelings toward the SST were a little more desirous of complaining than the comparable middle distance groups. The most distant groups, however, were consistently lowest in their desires to complain in all interview periods. While about 15% of the close and middle distance respondents with favorable attitudes toward the SST felt like complaining, only about 8% in the most distant groups felt this way. Close residents with hostile attitudes toward the SST reported that 36% were complaint prone on the third interview, compared to 29% of the comparable middle distance and 17% of the farthest distance groups. In the close distance groups, persons with the most favorable attitudes toward the SST and local booms reported only 3% felt like complaining at the end of the study compared to 42% of the close residents with the most hostile attitudes -- a spread of 39% in complaint potentials.

Table 133

GENERAL COMPLAINT POTENTIAL -- PERSONS FELT LIKE COMPLAINING
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST
AND NECESSITY OF LOCAL BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Complaint Potential	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
A. TOTALS									
Number of Respondents	711	393	318	633	276	357	675	128	547
High	13.3%	13.3%	13.5%	14.8%	14.1%	15.4%	18.4%	15.6%	19.0%
Moderate	11.2	9.4	13.5	12.5	12.0	12.9	15.3	11.0	16.3
Low	75.5	77.3	73.0	72.7	73.9	71.7	66.3	73.4	64.7
B. 0-8 miles									
Number of Respondents	367	188	179	299	123	176	371	71	300
High	10.9%	12.2%	9.5%	12.0%	10.6%	13.1%	17.0%	14.1%	17.7%
Moderate	12.3	9.6	15.1	12.0	9.8	13.6	17.3	12.7	18.3
Low	76.8	78.2	75.4	76.0	79.6	73.3	65.7	73.2	64.0
C. 8-12 miles									
Number of Respondents	232	138	94	205	85	120	209	40	169
High	16.8%	12.3%	23.4%	17.6%	17.6%	17.5%	18.2%	12.5%	19.5%
Moderate	11.2	10.9	11.7	14.6	18.8	11.7	16.3	10.0	17.8
Low	72.0	76.8	64.9	67.8	63.6	70.8	65.5	77.5	62.7
D. 12-16 miles									
Number of Respondents	112	67	45	129	68	61	95	17	78
High	14.3%	17.9%	8.9%	17.1%	16.2%	18.0%	24.2%	29.4%	23.1%
Moderate	8.0	6.0	11.1	10.1	7.4	13.1	5.3	5.9	5.1
Low	77.7	76.1	80.0	72.8	76.4	68.9	70.5	64.7	71.8

Summary scale of organizational complaint potential on sonic booms: Readiness to complain if the complaint activity is organized was directly related to residents attitudes toward the SST and the boom. About 10% of those persons who felt the SST was absolutely necessary said they would complain if asked, compared to 17% who felt the SST was probably necessary and 38% who did not feel the SST was necessary. Only 3% of the most favorable attitude group (felt the SST was absolutely necessary and local booms were also necessary) said they would complain if asked compared to 42% of the most hostile group.

It is interesting to note that the difference between readiness to complain on one's own personal initiative (Table 134) and under organized pressure was relatively small. Only 4-9% more residents said they would complain if asked to do so by a local organization. This larger organizational complaint potential reported on the first interview generally corresponds closely to the reported personal readiness to complain on the third interview. Thus, for the magnitudes of the booms studied, it is likely that the third interview represents the maximum personal complaint potential in the Oklahoma City area. Table 135 presents these data.

Reported actual complaints about sonic booms: Only a small minority of residents actually called or wrote the FAA about the sonic booms. Only 3% of the residents with favorable SST attitudes said they contacted the FAA, compared to 8% of those with hostile attitudes. About 2% of those persons with the combinations of favorable boom attitudes actually called compared to 12% of the most negative group -- a spread of only 10%.

The same patterns of behavior were reported for all distance groups, with the closest residents with hostile attitudes reporting the most complaints and the most distant residents reporting the least complaints. About 15% of the most hostile residents living 0-8 miles from ground track said they complained to the FAA, compared to only 1% of the most distant residents with favorable boom attitudes -- a spread of 14%.

While over 80% of the actual complainers with the most favorable attitudes only called once, over half of the complainers with the most hostile attitudes called more than once. Thus, those with hostile basic attitudes toward the SST and local booms, not only called more often but more of them called at least once.

Feelings of futility in complaining about booms: Widespread feelings of futility in complaining about booms partly explains the low levels of complaint. Less than 4% felt there was a "very good" chance to do something about the booms; another 10% felt there was a "good" chance to accomplish something by complaining. Thus, only a small minority felt it might be useful to complain. It is interesting to note that only 10% of the most hostile group, who most often felt like complaining, thought there was even a good chance to accomplish something by complaining. Likewise, the closest residents, who were most intensly affected by the booms, reported the greatest feelings of futility. Table 137 presents these findings.

Table 134

REPORTED INDIVIDUAL COMPLAINT POTENTIAL FOR SONIC BOOMS
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST
AND NECESSITY OF LOCAL BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Complaint Potential	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
A. TOTAL: 2/3-4/19									
Number of Respondents	711	393	318	633	276	357	675	128	547
High	2.4%	1.3%	3.8%	3.8%	1.4%	5.6%	15.3%	7.2%	17.2%
Moderate	3.4	2.0	6.3	4.6	2.2	6.4	14.8	6.1	16.4
Low	94.2	96.7	89.9	91.6	96.4	88.0	69.9	86.7	66.4
TOTAL: 4/20-6/14									
Number of Respondents	715	394	321	635	278	357	676	126	550
High	6.2%	1.8%	10.5%	7.7%	2.2%	11.8%	19.7%	5.6%	22.9%
Moderate	5.7	2.8	10.4	7.7	3.6	11.2	14.3	7.9	15.8
Low	88.1	95.4	79.1	84.6	94.2	77.0	66.0	86.5	61.3
TOTAL: 6/15-7/25									
Number of Respondents	667	369	298	598	263	335	650	126	524
High	6.6	1.1	13.4	8.0	1.5	13.1	18.9	3.2	22.7
Moderate	6.3	2.4	11.1	7.1	2.3	10.8	12.2	3.9	14.1
Low	87.1	96.5	75.5	84.9	96.2	76.1	68.9	92.9	63.2

Complaint Potential	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
B. 0-8 miles: 2/3-4/19									
Number of Respondents	367	188	179	299	123	176	371	71	300
High	1.9%	1.6%	2.2%	5.7%	.8%	9.1%	17.3%	7.0%	19.7%
Moderate	4.4	1.1	7.8	5.7	2.4	8.0	16.7	8.5	18.7
Low	93.7	97.3	90.0	88.6	96.8	82.9	66.0	84.5	61.6
0-8 miles: 4/20-6/14									
Number of Respondents	372	190	182	301	125	176	372	71	301
High	6.5%	1.6%	11.5%	9.6%	3.2%	14.2%	22.6%	7.0%	26.2%
Moderate	6.2	3.2	9.3	10.3	5.6	13.6	18.3	11.3	19.9
Low	87.3	95.2	79.2	80.1	91.2	72.2	59.1	81.7	53.9
0-8 miles: 6/15-7/25									
Number of Respondents	346	176	170	286	119	167	357	70	287
High	7.8%	1.7%	14.1%	8.0%	3.4%	11.4%	23.2%	5.7%	27.5%
Moderate	6.4	1.7	11.2	9.4	3.4	13.8	12.9	4.3	15.0
Low	85.8	96.6	74.7	82.6	93.2	74.8	63.9	90.0	57.5
C. 8-12 miles: 2/3-4/19									
Number of Respondents	232	138	94	205	85	120	209	40	169
High	3.9%	.7%	8.5%	2.9%	3.5%	2.5%	15.3%	7.5%	17.2%
Moderate	2.6	1.4	4.3	5.9	3.5	7.5	14.4	5.0	16.6
Low	93.5	97.9	87.2	91.2	92.9	90.0	70.3	87.5	66.2
8-12 miles: 4/20-6/14									
Number of Respondents	232	138	94	205	85	120	209	40	169
High	6.5%	2.2%	12.8%	6.3%	2.4%	9.2%	19.1%	2.6%	22.8%
Moderate	6.5	2.2	12.8	5.4	2.4	7.5	10.5	--	12.9
Low	87.0	95.6	74.4	88.3	95.2	83.3	70.4	97.4	64.3

8-12 miles: 6/15-7/25									
Number of Respondents	177	89	88	188	80	108	196	29	167
High	7.9%	--	15.9%	8.5%	--	14.8%	18.4%	--	21.6%
Moderate	8.5	4.5	12.5	6.4	2.5	9.3	10.2	--	12.0
Low	83.6	95.5	71.6	85.1	97.5	75.9	71.4	100.0	66.4
D. 12-16 miles: 2/3-4/19									
Number of Respondents	112	67	45	129	68	61	95	17	78
High	.9%	1.5%	--	.8%	--	1.6%	7.4%	5.9%	7.7%
Moderate	1.8	--	4.4	--	--	--	8.4	--	10.3
Low	97.3	98.5	95.6	99.2	100.0	98.4	84.2	94.1	82.0
12-16 miles: 4/20-6/14									
Number of Respondents	111	66	45	129	68	61	95	17	78
High	4.5%	1.5%	8.9%	4.7%	--	9.8%	9.5%	5.9%	10.3%
Moderate	2.7	3.0	2.2	6.2	1.5	11.5	7.4	11.8	6.4
Low	92.8	95.5	88.9	89.1	98.5	78.7	83.1	82.3	83.3
12-16 miles: 6/15-7/25									
Number of Respondents	111	66	45	124	64	60	97	27	70
High	2.1%	1.0%	5.0%	7.3%	--	15.0%	4.1%	--	5.7%
Moderate	3.5	1.9	7.5	2.4	--	5.0	13.4	7.4	15.7
Low	94.4	97.1	87.5	90.3	100.0	80.0	82.5	92.6	78.6

Table 135

REPORTED ORGANIZATIONAL COMPLAINT POTENTIAL FOR SONIC BOOMS
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST
AND NECESSITY OF LOCAL BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Complaint Potential	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
A. TOTAL									
Number of Respondents	711	393	318	633	276	357	675	128	547
High	8.6%	2.5%	16.0%	15.0%	8.7%	19.9%	34.6%	14.8%	39.1%
Moderate	1.0	.8	1.3	2.2	.7	3.4	3.3	3.9	3.1
Low	90.4	96.7	82.7	82.8	90.6	76.7	62.1	81.3	57.8
B. 0-8 miles									
Number of Respondents	367	188	179	299	123	176	371	71	300
High	9.0%	2.1%	16.2%	17.4%	11.4%	21.6%	35.0%	12.7%	40.3%
Moderate	1.4	.5	2.2	1.3	--	2.3	5.1	7.0	4.7
Low	89.6	97.4	81.6	81.3	88.6	76.1	59.9	80.3	55.0
C. 8-12 miles									
Number of Respondents	232	138	94	205	85	120	209	40	169
High	10.3%	3.6%	20.2%	14.1%	8.2%	18.3%	37.8%	17.5%	42.6%
Moderate	.4	.7	--	3.9	2.4	5.0	1.0	--	1.2
Low	89.3	95.7	79.8	82.0	89.4	76.7	61.2	82.5	56.2
D. 12-16 miles									
Number of Respondents	112	67	45	129	68	61	95	17	78
High	3.6%	1.5%	6.7%	10.9%	4.4%	18.0%	25.3%	17.6%	26.9%
Moderate	.9	1.5	--	1.6	--	3.3	1.1	--	1.3
Low	95.5	97.0	93.3	87.5	95.6	78.7	73.6	82.4	71.8

C. 8-12 miles

Number of Respondents	232	138	94	205	85	120	211	40	171
Three	.9%	--	2.1%	--	--	--	.5%	--	.6%
Two	.4	.7	--	.5	--	.8	1.9	--	2.4
One	2.2	.7	4.3	3.0	--	5.0	4.2	2.5	4.8
Some	3.5%	1.4%	6.4%	3.5%	--	5.8%	6.6%	2.5%	7.8%
None	96.5	98.6	93.6	96.5	100.0	94.2	93.4	97.5	92.2

D. 12-16 miles

Number of Respondents	113	67	46	129	68	61	95	17	78
Three	--	--	--	--	--	--	1.1%	--	1.3%
Two	--	--	--	--	--	--	1.1	--	1.3
One	.9	1.5	--	.8	--	1.6	--	--	--
Some	.9%	1.5%	--	.8%	--	1.6%	2.2%	--	2.6%
None	99.1	98.5	100.0	99.2	100.0	98.4	97.8	100.0	97.4

7. Long Range Acceptability of Booms

Relation to attitude toward SST: Self appraisals of long range acceptability of eight booms per day for an indefinite period are directly related to favorable attitudes toward the SST and local booms. While persons who believed the SST was absolutely necessary and those who only felt it was probably necessary equally felt they could accept eight booms on a long term basis, the former group were more certain in their convictions that they could accept the booms. Both favorable groups, however, were more willing to accept the booms than those unfavorable to the SST. In the first interview, 98% of all persons who believed the SST absolutely necessary also felt they could accept the indefinite booms, with 90% saying they could very likely accept them. Those who felt the SST was only probably necessary said 96% could accept the indefinite booms, but only 79% thought they very likely could accept them. In contrast, only 82% of those who did not believe the SST was necessary thought they could learn to accept the booms, but only 57% felt they very likely could accept them.

Relation to intensity of booms over time: As the intensity of the actual booms increased, the self appraisals of long range acceptability decreased. This trend was evident in all attitude groups. By the third interview, 82% of the group most favorable to the SST felt they could live with the booms, compared to 81% of the next most favorable group and 63% of those who did not believe the SST was necessary. In terms of certainty of conviction, those who believed the SST absolutely necessary were also most certain they could accept the booms. About 65% of them said they "very likely" could accept the booms compared to 60% of those who felt the SST was only probably necessary and 39% who felt the SST was not necessary.

Wide range in reactions: The combination of favorable SST and local boom attitudes again produced the most long range acceptance of the booms. On the third interview, 92% of those with the most favorable attitudes felt they could accept the booms, and 82% felt they "very likely" could accept them. In contrast, only 57% of those with the most hostile attitudes toward the SST and local booms felt they could learn to live with the booms, and only 31% felt they "very likely" could accept them. This is a spread of 35% in overall acceptance between the extremes in attitude groups and 51% in certainty of acceptance. It is significant to note, however, that a majority of even the most hostile groups felt they could learn to live with the booms.

Table 138

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST
AND NECESSITY OF LOCAL BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Acceptability	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
A. TOTAL: 2/3-4/19									
Number of Respondents	711	393	318	633	276	357	675	128	554
Very likely	89.9%	93.9%	84.9%	79.2%	90.2%	70.9%	57.2%	77.3%	51.9%
Might	7.6	4.8	11.0	16.9	9.4	22.4	24.3	13.3	26.4
Could	97.5%	98.7%	95.9%	96.1%	99.6%	93.3%	81.5%	90.6%	78.3%
Couldn't	2.0	.8	3.5	3.0	.4	4.8	13.9	4.7	15.9
Don't know	.5	.5	.6	.9	--	1.9	4.6	4.7	5.8
TOTAL: 4/20-6/14									
Number of Respondents	715	394	321	635	278	357	676	126	550
Very likely	76.0%	86.6%	62.6%	65.2%	83.8%	50.7%	44.7%	68.3%	39.2%
Might	12.7	7.6	19.3	22.2	14.0	28.6	23.1	22.2	23.3
Could	88.7%	94.2%	81.9%	87.4%	97.8%	79.3%	67.8%	90.5%	62.5%
Couldn't	9.5	3.8	16.5	11.2	1.8	18.5	30.2	10.3	34.8
Don't know	1.8	3.0	1.6	1.4	1.4	2.2	3.0	9.2	2.7

TOTAL: 6/15-7/25									
Number of Respondents	718	396	322	636	279	357	679	128	551
Very likely	65.2%	81.8%	44.7%	59.8%	81.7%	42.5%	39.3%	75.8%	30.8%
Might	16.7	10.6	24.2	21.3	13.6	27.5	23.3	12.5	25.8
Could	81.9%	92.4%	68.9%	81.1%	95.3%	70.0%	62.6%	88.3%	56.6%
Couldn't	15.9	5.3	28.9	16.5	4.0	26.4	34.2	10.2	39.8
Don't know	2.2	2.3	3.2	2.4	.7	3.6	3.2	1.5	4.6
B. 0-8 miles: 2/3-4/19									
Number of Respondents	370	189	181	301	125	176	373	71	302
Very likely	89.5%	93.1%	85.6%	78.4%	91.2%	69.3%	57.1%	80.3%	51.7%
Might	8.1	5.8	10.5	17.6	8.8	23.9	22.3	9.9	25.2
Could	97.6%	98.9%	96.1%	96.0%	100.0%	93.2%	79.4%	90.2%	76.9%
Couldn't	1.4	.5	2.2	3.0	--	5.1	14.5	4.2	16.9
Don't know	1.0	.6	1.7	1.0	--	1.7	6.1	5.6	6.2
0-8 miles: 4/20-6/14									
Number of Respondents	372	190	182	301	125	176	372	71	301
Very likely	72.6%	87.4%	57.1%	63.5%	81.6%	50.6%	39.5%	62.0%	34.2%
Might	15.1	8.4	22.0	22.6	16.8	26.7	23.9	26.8	23.3
Could	87.7	95.8	79.1	86.1	98.4	77.3	63.4	88.8	57.5
Couldn't	10.8	2.6	19.2	12.3	1.6	19.9	33.3	9.9	38.9
Don't know	1.5	1.6	1.7	1.6	--	2.8	3.3	1.3	3.6
0-8 miles: 6/15-7/25									
Number of Respondents	373	191	182	302	126	176	373	71	302
Very likely	60.3%	79.1%	40.7%	55.3%	75.4%	40.9%	35.9%	73.2%	27.2%
Might	17.2	10.5	24.2	23.5	17.5	27.8	22.5	9.9	25.5
Could	77.5%	89.6%	64.9%	78.8%	92.9%	68.7%	58.4%	83.1%	52.7%
Couldn't	20.1	7.9	33.0	18.2	5.6	27.3	37.8	14.1	43.4
Don't know	2.4	2.5	2.1	3.0	1.5	4.0	3.8	2.8	3.9

Acceptability	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
C. 8-12 miles: 2/3-4/19									
Number of Respondents	232	138	94	205	85	120	211	40	171
Very likely	88.4%	93.5%	80.9%	75.6%	83.5%	70.0%	55.0%	80.0%	49.1%
Might	6.5	3.6	10.6	19.5	12.9	24.2	25.1	10.0	28.7
Could	94.9%	97.1%	91.5%	95.1%	96.4%	94.2%	80.1%	90.0%	77.8%
Couldn't	3.4	1.4	6.4	3.9	2.4	5.0	14.7	5.0	17.0
Don't know	1.7	1.5	2.1	1.0	1.2	.8	5.2	5.0	5.2
8-12 miles: 4/20-6/14									
Number of Respondents	232	138	94	205	85	120	209	38	171
Very likely	78.4%	86.2%	67.0%	64.9%	83.5%	51.7%	51.2%	81.6%	44.4%
Might	11.6	7.2	18.1	21.5	12.9	27.5	19.1	13.2	20.5
Could	90.0%	93.4%	85.1%	86.4%	96.4%	79.2%	70.3%	94.8%	64.9%
Couldn't	9.1	5.8	13.8	13.2	3.6	2.0	25.4	5.2	29.8
Don't know	.9	.8	1.1	.4	--	.8	4.3	--	5.3
8-12 miles: 6/15-7/25									
Number of Respondents	232	138	94	205	85	120	211	40	171
Very likely	70.3%	87.0%	45.7%	58.5%	83.5%	40.8%	41.7%	80.0%	32.7%
Might	15.1	9.4	23.4	22.4	12.9	29.2	20.9	15.0	22.2
Could	85.4%	96.4%	69.1%	80.9%	96.4%	70.0%	62.6%	95.0%	54.9%
Couldn't	12.9	2.2	28.7	16.1	3.6	25.0	34.1	5.0	40.9
Don't know	1.7	1.4	2.2	3.0	--	5.0	3.3	--	4.2
D. 12-16 miles: 2/3-4/19									
Number of Respondents	113	67	46	129	68	61	95	17	78
Very likely	91.2%	95.5%	84.8%	85.3%	94.1%	75.4%	61.1%	58.8%	61.5%
Might	8.0	4.5	13.0	10.9	5.9	16.4	28.4	35.3	26.9
Could	99.2	100.0	97.8%	96.2%	100.0%	91.8%	89.5%	94.1%	88.4%
Couldn't	.8	--	2.2	1.6	--	3.3	9.5	5.9	10.3
Don't know	--	--	--	2.2	--	4.9	1.0	--	1.3

12-16 miles: 4/20-6/14									
Number of respondents	111	66	45	129	68	61	95	17	78
Very likely	81.1%	84.8%	75.6%	69.8%	88.2%	49.2%	50.5%	64.7%	47.4%
Might	8.1	6.1	11.1	22.5	10.3	36.1	28.4	23.5	29.5
Could	89.2%	90.9%	86.7%	92.3%	98.5%	85.3%	78.9%	88.2%	76.9%
Couldn't	6.3	3.0	11.1	5.4	--	11.5	14.7	11.8	15.4
Don't know	4.5	6.1	2.2	2.3	1.5	3.2	6.4	--	7.7
12-16 miles: 6/15-7/25									
Number of respondents	113	67	46	129	68	61	95	17	78
Very likely	70.8%	79.1%	58.7%	72.9%	92.6%	50.8%	47.4%	76.5%	41.0%
Might	18.6	13.4	26.1	14.0	5.9	23.0	31.6	17.6	34.6
Could	89.4%	92.5%	84.8%	86.9%	98.5%	73.8%	79.0%	94.1%	75.6%
Couldn't	8.0	4.5	13.0	13.1	1.5	26.2	20.0	5.9	23.1
Don't know	2.6	3.0	2.2	--	--	--	1.0	--	1.3

Distance groups: The same patterns of long range acceptance of booms were reported in all distance groups. Overall acceptance was greatest in the most distant areas, followed by the middle and close distance groups. During the first two interviews, the close and middle distance groups were alike in overall acceptance of the booms, but the middle distance residents were more certain of their convictions. The far distant group, however, was consistently highest in its acceptance of the booms. During the first interview, 98% of the close residents with the belief that the SST was absolutely necessary felt they could accept the indefinite booms compared to 95% of the comparable middle distance and 99% of the far distance groups. In contrast, those living in the close areas who believed the SST was not necessary reported that 79% could accept the booms compared to 80% of the middle distance and 90% of the equally hostile far distance groups. On the third interview, the number who believed they could live with the booms dropped to 78% for the close residents who were favorable to the SST, compared to 85% for the favorable middle distance and 89% for the favorable far distant residents. In the close areas, on the third interview, about 53% of the residents who did not believe in the SST or the necessity of local booms, felt they could live with the booms. This was the lowest amount of acceptance reported by any group and still represented a small majority of the residents in that group.

Night booms: Respondents anticipated that they would be less able to live with several booms per night. Those who were favorably disposed toward the SST reported that 75-80% felt they could learn to live with night booms compared to 98% who said they could accept day booms. In contrast, only 44% who were hostile to the SST said they could accept day booms. Differences in response by the different distance groups were small. The most favorable attitude group reported that 84% could accept night booms, while the least favorable group reported that only 40% could accept them -- a range of 44% in expected night boom acceptance.

These answers are the best available evidence of night boom reaction. However, since the respondents didn't actually experience any night booms and since the answers were based on speculations and actual day time experience, they should be viewed with caution.

Table 139

REPORTED ABILITY TO ACCEPT SEVERAL BOOMS PER NIGHT
BY BELIEF IN NECESSITY FOR DEVELOPING AN SST
AND NECESSITY OF LOCAL BOOMS
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-April 1964

Acceptability	SST Absolutely Necessary			SST Probably Necessary			SST Not Necessary		
	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.	Total	Boom Nec.	Boom Not Nec.
A. TOTAL									
Number of Respondents	711	393	318	633	276	357	675	128	554
Very likely	60.0%	66.0%	52.8%	44.5%	53.6%	37.3%	23.1%	35.2%	20.0%
Might	19.2	17.6	20.8	30.2	32.3	28.5	20.7	20.3	20.3
Could	79.2%	83.6%	73.6%	74.7%	85.9%	65.8%	43.8%	55.5%	40.3%
Couldn't	14.6	9.4	21.1	18.0	9.4	24.7	45.7	32.0	48.4
Don't know	6.2	7.0	5.3	7.3	4.7	9.5	10.5	12.5	11.3
B. 0-8 miles									
Number of Respondents	370	189	181	301	125	176	373	71	302
Very likely	62.2%	73.0%	50.8%	43.2%	53.6%	35.8%	21.2%	32.4%	18.5%
Might	17.3	15.9	18.8	31.6	32.8	30.7	20.9	19.7	21.2
Could	79.5%	88.9%	69.6%	74.8%	86.4%	66.5%	42.1%	52.1%	39.7%
Couldn't	14.1	6.3	22.1	19.3	10.4	25.6	46.6	36.6	49.0
Don't know	6.4	4.8	8.3	5.9	3.2	7.9	11.3	11.3	11.3

C. 8-12 miles

Number of Respondents	232	138	94	205	85	120	211	40	171
Very likely	56.0%	58.0%	53.2%	43.9%	51.8%	38.3%	23.7%	42.5%	19.3%
Might	21.1	21.0	21.3	27.8	29.4	26.7	18.5	22.5	17.5
Could	77.1%	79.0%	74.5%	71.7%	81.2%	65.0%	42.2%	65.0%	36.8%
Couldn't	17.7	13.8	23.4	17.6	9.4	23.3	47.4	20.0	53.8
Don't know	5.2	7.2	2.1	10.7	9.4	11.7	10.4	15.0	9.4

D. 12-16 miles

Number of Respondents	113	67	46	129	68	61	95	17	78
Very likely	59.3%	61.2%	56.5%	47.3%	54.4%	39.3%	28.4%	29.4%	28.2%
Might	20.4	16.4	26.1	30.2	33.8	26.2	24.2	17.6	25.6
Could	79.7%	77.6%	82.6%	77.5%	88.2%	65.5%	52.6%	47.0%	53.8%
Couldn't	9.7	9.0	10.9	15.5	7.4	24.6	36.8	41.2	35.9
Don't know	9.6	13.4	6.5	7.0	4.4	9.9	10.6	11.8	10.3

C. Effects on Reactions to Sonic Booms by Feelings About Necessity of Local Booms and "More Than A Little" Annoyance with Booms

1. Analysis Plan

This section of the report will present the relationships between annoyance with sonic booms and feelings about its necessity with reports of interference, desires to complain, long range adaptability and other related reactions. It will be shown that belief in the necessity of local booms minimizes negative responses to the booms, while belief that the booms are not necessary coupled with annoyance feelings produces the maximum hostility toward the booms.

Four basic analytic groups: Respondents were grouped into four basic analytical groups, according to their reported attitudes at the end of the study. Persons were grouped according to whether or not they believed local booms were absolutely necessary and then whether or not they were more than a little annoyed by the booms at the end of the six month exposure.

2. Trends in Belief in the Necessity of Local Booms

Extent of shifts in belief: Those who ended the study with the belief in the necessity of local booms usually held this view from the beginning of the study. Over 76% of such persons started the study with this favorable view and kept it throughout the six months. Less than one fourth of all persons who ended the study with a favorable view started the study with a hostile attitude. In contrast, only 61% of those persons who ended the survey with the negative belief that local booms were not necessary started with this negative view; 39% changed from a favorable attitude to an unfavorable one during the six month period. Thus, there were more shifts to hostile feelings than to favorable feelings during the course of the study.

Effects of favorable and unfavorable combinations of attitudes: Persons who were not annoyed with booms at the end of the study and who felt they were necessary locally, showed the greatest consistency in favorable attitudes. About 80% of them felt local booms were necessary throughout the six month period. The opposite combination of attitudes also showed stable hostile feelings toward the booms. Only 34% of all persons who ended the study both annoyed and feeling that local booms were not necessary felt the booms were necessary at the beginning of the study.

Distance groups: All distance groups were very much alike in both patterns and extent of feelings about the necessity of local booms. Table 140 presents these trends.

Table 140

REPORTED TRENDS IN BELIEF IN NECESSITY OF LOCAL BOOMS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Believe Booms Necessary	Belief at End of Study					
	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL: 2/3-4/19						
Number of Respondents	797	222	575	1222	835	387
Yes	76.7%	68.9%	79.7%	38.5%	34.4%	47.5%
No	11.7	18.5	9.0	38.5	43.8	27.1
Don't know	11.6	12.6	11.3	23.0	21.8	25.4
TOTAL: 4/20-6/14						
Number of Respondents	799	221	578	1229	836	393
Yes	76.2%	65.2%	80.4%	27.1%	20.1%	42.0%
No	10.0	16.7	7.4	49.5	57.5	32.3
Don't know	13.8	18.1	12.2	23.4	22.4	25.7
B. 0-8 miles: 2/3-4/19						
Number of Respondents	382	131	251	655	470	185
Yes	76.2%	64.9%	82.1%	36.5%	32.1%	47.6%
No	13.1	22.1	8.4	42.7	48.7	27.6
Don't know	10.7	13.0	9.5	20.8	19.2	24.8

0-8 miles: 4/20-6/14						
Number of Respondents	386	130	256	659	472	187
Yes	73.8%	61.5%	80.1%	25.9%	17.6%	47.1%
No	10.9	16.9	7.8	53.3	61.7	32.1
Don't know	15.3	21.6	12.1	20.8	20.7	20.8
C. 8-12 miles: 2/3-4/19						
Number of Respondents	138	23	115	212	147	65
Yes	79.7%	78.3%	80.0%	38.7%	35.4%	46.2%
No	9.4	13.0	8.7	40.6	42.2	36.9
Don't know	10.9	8.7	11.3	20.7	22.4	16.9
8-12 miles 4/20-6/14						
Number of Respondents	137	22	115	214	148	66
Yes	79.6%	72.7%	80.9%	26.2%	19.6%	40.9%
No	8.8	13.6	7.8	49.1	54.7	36.4
Don't know	11.6	13.7	10.4	24.7	25.7	22.7
D. 12-16 miles: 2/3-4/19						
Number of Respondents	152	28	124	184	96	88
Yes	75.0%	71.4%	75.8%	43.5%	42.7%	44.3%
No	7.2	10.7	6.5	28.8	30.2	27.3
Don't know	17.8	17.9	17.7	27.7	27.1	28.4
12-16 miles: 4/20-6/14						
Number of Respondents	151	28	123	184	96	88
Yes	78.8%	67.9%	81.3%	32.6%	31.3%	34.1%
No	4.6	17.9	1.6	35.3	40.6	29.5
Don't know	16.6	14.2	17.1	32.1	28.1	36.4

3. Reported Interference with Sonic Booms

Relations to belief in necessity of booms: Persons who believed in the necessity of local booms reported less interference by the booms. In fact, they reported less interference on the third boom series than on the first. In comparison, persons who felt local booms were not necessary, reported more interference at the end of the study. About 64% of those persons who felt local booms were necessary reported only one (vibration) or no interferences on the first interview compared to 50% of those persons with hostile views. On the third interview, 73% of those with favorable feelings reported only one or no interferences compared to 44% of those who did not feel the booms necessary.

Effects of favorable and unfavorable combinations of attitudes: The least amount of interference was reported by persons with the most favorable attitudes toward the booms, and the most interference was reported by persons with the opposite combination of views. Over 85% of all persons who believed local booms were necessary and were not annoyed reported only minimal interference on the third interview (0-1 activities), compared to only 28% of those who felt local booms were not necessary and were also annoyed -- a spread of 57% in interference responses.

Distance groups: Similar patterns of response were reported by all distance groups, with the close area residents reporting the most interference, followed in order by the middle and far distance groups. This gradient in response was especially evident during the third interview for the most hostile group. Only 24% of the close residents who did not believe booms necessary and were annoyed, reported minimum interference compared to 36% of the similar middle distance group and 38% of the far distance group.

4. Reported More Than A Little Annoyance with Sonic Booms

Relation to feelings about necessity of booms: Annoyance was inversely related to feelings about the necessity of local booms. Only 28% of those who felt the booms were necessary were also annoyed by them at the end of the study, compared to 69% who were annoyed and felt the booms were not necessary -- a spread of 41% in response.

Trend in annoyance: Those not annoyed who felt local booms necessary and those annoyed who felt booms were not necessary reported the least change in annoyance. Only 12% of those who felt the booms were necessary and were not annoyed at the end of the study reported annoyance on the first interview, compared to 18% on the second interview. Likewise, of those who felt the booms were not necessary, but were not annoyed at the end of the study, 22% reported annoyance on the first interview and 26% on the second interview. These respondents reflect the amount of adaptation or decreases in annoyance over time.

Table 141

REPORTED SUMMARY SCALE OF INTERFERENCE BY SONIC BOOMS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Number Activities Interfered	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL: 2/3-4/19						
Number of Respondents	803	222	581	1230	837	393
4-5	8.3%	13.5%	6.4%	18.5%	22.8%	9.2%
2-3	27.3	33.3	25.0	31.8	35.2	24.4
0-1	64.4	53.2	68.6	49.7	42.0	66.4
TOTAL: 4/20-6/14						
Number of Respondents	799	221	578	1229	836	393
4-5	7.6%	19.9%	2.9%	21.8%	30.0%	4.3%
2-3	17.8	35.7	10.9	35.1	41.0	22.4
0-1	74.6	44.4	86.2	43.1	29.0	73.3
TOTAL: 6/15-7/25						
Number of Respondents	758	215	543	1157	800	357
4-5	9.1%	26.5%	2.2%	29.9%	40.8%	5.6%
2-3	17.9	31.2	12.7	26.0	31.3	14.3
0-1	73.0	42.3	85.1	44.1	27.9	80.1

TABLE 141 (Continued)

Number Activities Interfered	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
B. 0-8 miles: 2/3-4/19						
Number of Respondents	382	131	251	655	470	185
4-5	9.2%	15.3%	6.0%	19.7%	23.8%	9.2%
2-3	26.4	28.2	25.5	34.2	36.8	27.6
0-1	64.4	56.5	68.5	46.1	39.4	63.2
0-8 miles: 4/20-6/14						
Number of Respondents	386	130	256	659	472	187
4-5	9.1%	20.8%	3.1%	24.3%	32.2%	4.3%
2-3	17.9	36.9	8.2	37.9	43.0	25.1
0-1	73.0	42.3	88.7	37.8	24.8	70.6
0-8 miles: 6/15-7/25						
Number of Respondents	365	125	240	624	453	171
4-5	11.2%	28.8%	2.1%	32.7%	42.2%	7.6%
2-3	18.4	28.0	13.3	28.4	34.0	13.5
0-1	70.4	43.2	84.6	38.9	23.8	78.9
C. 8-12 miles: 2/3-4/19						
Number of Respondents	138	23	115	212	147	65
4-5	8.0%	4.3%	8.7%	22.6%	27.9%	10.8%
2-3	27.5	43.5	24.3	28.8	29.3	27.7
0-1	64.5	52.2	67.0	48.6	42.8	61.5
8-12 miles: 4/20-6/14						
Number of Respondents	137	22	115	214	148	66
4-5	4.4%	9.1%	3.5%	18.2%	23.6%	6.1%
2-3	19.7	50.0	13.9	32.7	37.2	22.7
0-1	75.9	40.9	82.6	49.1	39.2	71.2

8-12 miles: 6/15-7/25						
Number of Respondents	134	22	112	197	140	57
4-5	3.7%	9.1%	2.7%	28.4%	37.1%	7.0%
2-3	18.7	40.9	14.3	22.3	27.1	10.5
0-1	77.6	50.0	83.0	49.3	35.8	82.5
D. 12-16 miles: 2/3-4/19						
Number of Respondents	152	28	124	184	96	88
4-5	4.6%	10.7%	3.2%	12.5%	14.6%	10.2%
2-3	22.4	28.6	21.0	26.6	36.5	15.9
0-1	73.0	60.7	75.8	60.9	48.9	73.9
12-16 miles: 4/20-6/14						
Number of Respondents	151	28	123	184	96	88
4-5	6.0%	21.4%	2.4%	15.2%	25.0%	4.5%
2-3	14.6	39.3	8.9	29.9	36.5	22.7
0-1	79.4	39.3	88.7	54.9	38.5	72.8
12-16 miles: 6/15-7/25						
Number of Respondents	195	28	167	170	90	80
4-5	4.6%	21.4%	1.8%	21.2%	33.3%	7.5%
2-3	14.9	42.9	10.2	24.7	28.9	20.0
0-1	80.5	35.7	88.0	54.1	37.8	72.5

Increases in annoyance over time were reported more often than decreases in annoyance. Persons who felt local booms necessary but were annoyed at the end of the study showed the greatest increase in annoyance over time. Only one-third of them were annoyed on the first interview, and only 56% on the second interview. Thus, almost half became annoyed between the second and third interviews. In contrast, 56% of those who felt the booms were not necessary and who were annoyed at the end of the study, were also annoyed on the first interview, and 62% were annoyed on the second interview. Thus, about one-third of these hostile residents increased their annoyance from the second to third periods.

Distance groups: Similar patterns of response were reported by all distance groups. The closest residents generally reported the most annoyance at the end of the study, followed by the middle and distant groups. Of those who felt local booms were necessary, 34% of the close residents were annoyed compared to 16% of the middle distance and 14% of the far distant groups. Of those who felt the booms were not necessary, 73% of the close residents were annoyed, compared to 80% of the middle distance and 53% of the far distant groups. Table 142 presents these findings.

Table 142

REPORTED MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Reported Annoyance	Booms Necessary --			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL: 2/3-4/19						
Number of Respondents	803	222	581	1230	837	393
More than a little	19.2%	37.4%	12.2%	45.1%	55.9%	21.9%
Little or none	80.8	62.6	87.8	54.9	44.1	78.1
TOTAL: 4/20-6/14						
Number of Respondents	799	221	578	1229	836	393
More than a little	28.7%	55.7%	18.3%	50.4%	61.9%	26.0%
Little or none	71.3	44.3	81.7	49.6	38.1	74.0
TOTAL: 6/15-7/25						
Number of Respondents	758	215	543	1157	800	357
More than a little	28.4%	100.0%	--	69.2%	100.0%	--
Little or none	71.6	--	100.0	30.8	--	100.0
B. 0-8 miles: 2/3-4/19						
Number of Respondents	382	131	251	655	470	185
More than a little	22.0%	40.5%	12.4%	47.3%	57.0%	22.7%
Little or none	78.0	59.5	87.6	52.7	43.0	77.3

Table 142 (Continued)

Reported Annoyance	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
0-8 miles: 4/20-6/14						
Number of Respondents	386	130	256	659	472	187
More than a little	31.8%	60.0%	17.6%	54.1%	64.9%	27.3%
Little or none	68.2	40.0	82.4	45.9	35.1	72.7
0-8 miles: 6/15-7/25						
Number of Respondents	365	125	240	624	453	171
More than a little	34.3%	100.0%	--	72.6%	100.0%	--
Little or none	65.7	--	100.0%	27.4	--	100.0%
C. 8-12 miles: 2/3-4/19						
Number of Respondents	138	23	115	212	147	65
More than a little	17.3%	21.7%	16.5%	47.1%	55.8%	27.7%
Little or none	82.7	78.3	83.5	52.9	44.2	72.3
8-12 miles: 4/20-6/14						
Number of Respondents	137	22	115	214	148	66
More than a little	22.6%	50.0%	17.4%	45.8%	50.0%	36.4%
Little or none	77.4	50.0	82.6	54.2	50.0	63.6
8-12 miles: 6/15-7/25						
Number of Respondents	134	22	112	197	140	57
More than a little	16.4%	100.0%	--	80.0%	100.0%	--
Little or none	83.5	--	100.0	20.0	--	100.0

D. 12-16 miles: 2/3-4/19						
Number of Respondents	152	28	124	184	96	88
More than a little	9.9%	32.1%	4.8%	34.2%	47.9%	19.3%
Little or none	90.1	67.9	95.2	65.8	52.1	80.7
12-16 miles: 4/20-6/14						
Number of Respondents	151	28	123	184	96	88
More than a little	23.8%	57.1%	16.3%	41.8%	63.6%	18.2%
Little or none	76.2	42.9	83.7	58.2	36.4	81.8
12-16 miles: 6/15-7/25						
Number of Respondents	195	28	167	170	90	80
More than a little	14.4%	100.0%	--	52.9%	100.0%	--
Little or none	85.6	--	100.0	47.1%	--	100.0

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5. Reports of Damage by Sonic Booms

Relation to attitudes toward booms: Reports of damage were directly related to unfavorable attitudes toward the booms. Residents who felt the booms were not necessary reported some damage twice as often as persons who felt the booms were necessary. Annoyed persons reported damage three times more often than not annoyed persons. Residents with the combination of hostile boom attitudes reported damage most frequently, while the opposite favorable combination of attitudes was related to the least damage reports. Almost half of all persons who felt the booms were not necessary reported some damage, with one-fourth reporting damages two or three times during the study. In comparison, only 22% of the residents who felt the booms were necessary reported some damage, and only 7% reported damage two or three times. Almost 60% of the annoyed persons who also felt local booms were unnecessary reported some damage compared to only 15% of the residents with the opposite most favorable attitudes -- a spread of 45% in alleged damage reports.

Distance groups: All distance groups manifested the same patterns of damage reports, but the closest residents reported the most damage, followed by the middle and far distance groups. In the closest areas, two-thirds of the most hostile attitude group reported some damage, compared to only 20% of the most favorable attitude group.

Table 143

REPORTED DAMAGE BY SONIC BOOMS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Number Reports of Damage	Boom Necessary			Boom Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	803	223	580	1230	836	394
Three	1.9%	5.4%	.7%	9.9%	13.2%	2.8%
Two	5.1	10.3	3.1	15.0	19.5	5.3
One	15.0	25.1	11.0	23.6	27.2	16.0
Some	22.0%	40.8%	14.8%	48.5%	59.9%	24.1%
None	78.0	59.2	85.2	51.5	40.1	75.9
B. 0-8 miles:						
Number of Respondents	388	131	257	660	472	188
Three	2.6%	6.9%	.4%	11.7%	15.0%	3.2%
Two	7.7	13.0	5.1	18.7	23.2	7.5
One	18.8	28.3	14.0	25.6	28.4	18.7
Some	29.1%	48.2%	19.5%	56.0%	66.6%	29.4%
None	70.9	51.8	80.5	44.0	33.4	70.6

C. 8-12 miles:

Number of Respondents	138	23	115	214	148	66
Three	2.2%	4.3%	1.7%	11.7%	14.2%	6.1%
Two	2.8	4.3	2.7	9.8	13.6	1.5
One	15.9	39.1	11.3	23.9	28.4	13.6
Some	20.9%	47.7%	15.7%	45.4%	56.2%	21.2%
None	79.1	52.3	84.3	54.6	43.8	78.8

D. 12-16 miles:

Number of Respondents	152	28	124	185	96	89
Three	--	--	--	1.1%	1.0%	1.1%
Two	2.7	10.7	.8	7.6	11.5	3.3
One	4.6	7.2	4.0	16.7	21.9	11.2
Some	7.3%	17.9%	4.8%	25.4%	34.4%	15.6%
None	92.7	82.1	95.2	74.6	65.6	84.4

6. Reports of Desires to Complain and Actual Complaints about the Booms

General complaint potential: Respondents who did not believe local booms were necessary and were annoyed by the booms also had a slightly higher general complaint potential. About 76% of those who were favorable to the booms had no desire to complain about a general problem compared to 69% who felt local booms were not necessary, and 65% who also were annoyed by the booms. Identical patterns of general readiness to complain were reported by all distance groups. Thus, about one-fourth of those who were favorable to the sonic booms had some general complaint potential compared to about one-third of those who were hostile to the booms. Complaint activities related to sonic booms must be compared to these general complaint patterns. Table 144 presents these general complaint responses.

Table 144

GENERAL COMPLAINT POTENTIAL: PERSONS FELT LIKE COMPLAINING
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Complaint Potential	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL						
Number of Respondents	803	222	581	1230	837	393
High	13.9%	15.3%	13.4%	16.4%	18.0%	13.0%
Moderate	10.5	10.8	10.3	14.5	16.7	9.7
Low	75.6	73.9	76.3	69.1	65.3	77.3
B. 0 - 8 Miles						
Number of Respondents	382	131	251	655	470	185
High	12.0%	13.0%	11.6%	14.2%	16.4%	8.6%
Moderate	10.2	11.5	9.6	16.2	18.9	9.2
Low	77.8	75.5	78.8	69.6	64.7	82.2
C. 8 - 12 Miles						
Number of Respondents	138	23	115	213	147	66
High	15.9%	13.0%	16.5%	19.2%	20.4%	16.7%
Moderate	10.1	8.7	10.4	14.1	15.0	12.1
Low	74.0	78.3	73.1	66.7	64.6	71.2
D. 12 - 16 Miles						
Number of respondents	152	28	124	184	96	88
High	18.4%	21.4%	17.7%	17.9%	19.8%	15.9%
Moderate	6.6	7.1	6.5	9.2	10.4	8.0
Low	75.0	71.5	75.8	72.9	69.8	76.1

Summary scale of individual complaint potential on sonic booms: Effect of feelings about necessity of booms: This section will examine the respondent's own desires to complain independent of any organized encouragement. Individual desires to complain about the booms were directly related to the belief that booms were not necessary and that they annoyed the resident. About 21% of all who felt the booms were not necessary also felt like complaining about them on the first interview, compared to only 4% who felt the booms were necessary. By the end of the study, 30% with hostile feelings felt like complaining compared to only 4% of those with favorable feelings.

Effect of annoyance and feelings about lack of necessity of local booms: About 28% with the combination of most hostile feelings felt like complaining about the booms during the first interview. By the third interview, the number of most hostile residents desiring to complain increased to 41%. In comparison, the residents most friendly to the booms reported that only 2% wanted to complain on the first interview and only 1% on the third interview -- a spread of 40% between the two extreme groups.

It is interesting to note that if residents were not annoyed but felt local booms were not necessary, their desire to complain was much less than the comparable annoyed group. On the third interview, only 5% of the not annoyed who felt local booms were not necessary also wanted to complain compared to 41% for the annoyed who were hostile to local booms.

Distance groups: All of the distance groups reported the same pattern of responses. The most hostile close residents reported a little more desire to complain, with 43% of them having a complaint potential on the third interview, compared to 40% for the middle distance group and 30% for the most distant group. Table 145 presents these findings.

Table 145

REPORTED INDIVIDUAL COMPLAINT POTENTIAL FOR SONIC BOOMS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS AT END OF STUDY

Oklahoma City Area

February-July 1964

Complaint Potential	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL: 2/3-4/19						
Number of Respondents	803	222	581	1230	837	393
High	2.2%	4.1%	1.5%	10.2%	13.3%	3.8%
Moderate	2.2	5.9	.9	11.0	15.1	2.3
Low	95.6	90.0	97.6	78.8	71.6	93.9
TOTAL: 4/20-6/14						
Number of Respondents	803	222	581	1230	837	393
High	2.5%	4.5%	1.7%	16.7%	22.8%	3.6%
Moderate	4.0	9.9	1.8	12.8	16.1	5.6
Low	93.5	85.6	96.5	70.5	61.1	90.8
TOTAL: 6/15-7/25						
Number of Respondents	758	215	543	1157	800	357
High	1.6%	4.7%	.4%	17.5%	24.3%	2.5%
Moderate	2.6	7.4	.7	12.4	16.8	2.5
Low	95.8	87.9	98.9	70.1	58.9	95.0

Table 145 (Continued)

Complaint Potential	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
B. 0 - 8 Miles: 2/3-4/19						
Number of Respondents	382	130	252	655	472	183
High	2.4%	5.4%	.8%	12.1%	15.0%	4.4%
Moderate	2.9	6.9	.8	12.8	16.7	2.7
Low	94.7	87.7	98.4	75.1	68.3	92.9
0 - 8 Miles: 4/20-6/14						
Number of Respondents	386	130	256	659	472	187
High	3.1%	6.2%	1.6%	19.0%	25.0%	3.7%
Moderate	5.4	11.5	2.3	15.3	19.1	5.9
Low	91.5	82.3	96.1	65.7	55.9	90.4
0 - 8 Miles: 6/15-7/25						
Number of Respondents	365	125	240	624	453	171
High	3.0%	8.0%	.4%	19.6%	26.0%	2.3%
Moderate	2.7	7.2	.4	13.6	17.4	3.5
Low	94.3	84.8	99.2	66.8	56.6	94.2
C. 8 - 12 Miles: 2/3-4/19						
Number of Respondents	138	23	115	213	148	65
High	2.9%	4.3%	2.6%	10.8%	12.8%	6.2%
Moderate	2.2	8.7	.9	12.2	16.2	3.1
Low	94.9	87.0	96.5	77.0	71.0	90.7
8 - 12 Miles: 4/20-6/14						
Number of Respondents	137	22	115	214	148	66
High	2.9%	4.5%	2.6%	16.4%	22.3%	3.0%
Moderate	1.5	-	1.7	10.3	10.8	9.1
Low	95.6	95.5	95.7	73.3	66.9	87.9

8 - 12 Miles: 6/15-7/25						
Number of Respondents	134	22	112	197	140	57
High	- %	- %	- %	16.8%	22.1%	3.5%
Moderate	-	-	-	13.2	17.9	1.8
Low	100.0	100.0	100.0	70.0	60.0	94.7
D. 12 - 16 Miles: 2/3-4/19						
Number of Respondents	152	28	124	183	96	87
High	1.3%	- %	1.6%	3.8%	5.2%	2.3%
Moderate	-	-	-	5.5	9.4	1.1
Low	98.7	100.0	98.4	90.7	85.4	96.6
12 - 16 Miles: 4/20-6/14						
Number of Respondents	151	28	123	184	96	88
High	1.3%	- %	1.6%	9.8%	16.7%	2.3%
Moderate	3.3	14.3	.8	7.1	9.4	4.5
Low	95.4	85.7	97.6	83.1	73.9	93.2
12 - 16 Miles: 6/15-7/25						
Number of Respondents	195	28	167	170	90	80
High	.5%	-	.6%	8.8%	14.4%	2.5%
Moderate	2.1	14.3	-	10.0	15.6	3.8
Low	97.4	85.7	99.4	81.2	70.0	93.7

Comparison of general and boom complaint potentials: For all groups who believed local booms were necessary, the boom complaint potential was much less than the general complaint potential. Only the annoyed who felt booms were not necessary had a boom complaint potential in excess of the general complaint potential. Table 146 presents these comparisons for all distance groups combined for the third period only. Other similar comparisons can be made for other periods and groups by relating Tables 144 and 145.

Table 146

COMPARISON OF GENERAL AND BOOM COMPLAINT POTENTIAL
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS

Oklahoma City Area

June 15 - July 25, 1964

Some Complaint Potentials	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
Number of Respondents	803	222	581	1230	837	393
General	24.4%	26.1%	23.7%	30.9%	34.7%	22.7%
Boom	4.2	12.1	1.1	29.9	41.1	5.0
Difference	20.2%	14.0%	22.6%	1.0%	-6.4%	17.7%

Organizational complaint potential: On the first interview, residents were asked about their readiness to complain about the booms if asked by a local organization to do so. As Table 147 shows, residents who were not annoyed or who felt local booms necessary were a little more ready to complain if urged to do so by an organized campaign. Annoyed residents, however, by the third interview were equally ready to complain on their own initiative. This finding may be due to the fact that local groups were in fact urging individual complaint.

Table 147

REPORTED ORGANIZATIONAL COMPLAINT POTENTIAL FOR SONIC BOOMS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-April 1964

Complaint Potential	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL						
Number of Respondents	803	222	581	1230	837	393
High	6.6%	11.7%	4.6%	27.4%	33.8%	13.7%
Moderate	1.2	1.8	1.0	2.7	2.9	2.3
Low	92.2	86.5	94.4	69.9	63.3	84.0
B. 0 - 8 Miles						
Number of Respondents	382	130	252	655	472	183
High	7.1%	12.3%	4.4%	28.7%	35.0%	12.6%
Moderate	1.6	1.5	1.6	3.4	3.6	2.7
Low	91.3	86.2	94.0	67.9	61.4	84.7
C. 8 - 12 Miles						
Number of Respondents	138	23	115	213	148	65
High	8.7%	13.0%	7.8%	35.2%	41.9	20.0
Moderate	1.4	4.3	.9	2.3	2.7	1.5
Low	89.9	82.7	91.3	62.5	55.4	78.5
D. 12 - 16 Miles						
Number of Respondents	152	28	124	183	96	87
High	4.6%	7.1%	4.0%	18.6%	20.8%	16.1%
Moderate	.7	-	.8	1.6	1.0	2.3
Low	94.7	92.9	95.2	79.8	78.2	81.6

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Actual complaints about sonic booms: As expected, the extent of actual complaining to the FAA about the booms was directly related to the combination of hostile attitudes toward the booms. While almost 8% of those who felt the booms were unnecessary said they contacted the FAA, only 1% with the opposite favorable view complained about the booms. The number complaining increased to 10% if those who were annoyed by the booms also felt them unnecessary. The opposite, most favorable group, reported that less than 1% actually complained.

All distance groups had the same pattern of complaints, with the close area residents reporting the most complaining, followed by the middle and far distance groups. In the close areas, 13% of the most hostile residents said they complained compared to less than 1% of the most friendly residents -- a spread of 12% in actual complaint activities.

A comparison of Tables 148 and 146 indicates that about four persons felt like complaining about the booms for every one who actually followed through and complained. Surprisingly, this ratio of potential to actual complaint was about the same for both persons who believed local booms were necessary or not necessary.

Table 148

REPORTED ACTUAL COMPLAINTS ABOUT BOOMS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS

Number of Complaints	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL						
Number of Respondents	803	223	580	1230	836	394
Three	- %	- %	- %	1.2%	1.6%	- %
Two	*	*	*	1.9	2.8	-
One	1.2	2.2	.9	4.4	5.9	1.5
Some	1.2%	2.2%	.9%	7.5%	10.3%	1.5%
None	98.8	97.8	99.1	92.5	89.7	98.5
B. 0 - 8 Miles						
Number of Respondents	388	131	257	660	472	188
Three	- %	- %	- %	1.7%	2.1%	.5%
Two	.3	.8	-	2.7	3.6	-
One	1.6	3.0	.8	5.3	7.0	1.1
Some	1.9%	3.8%	0.8%	9.7%	12.7%	1.6%
None	98.1	96.2	99.2	90.3	87.3	98.4
C. 8 - 12 Miles						
Number of Respondents	263	64	199	385	268	117
Three	- %	- %	- %	.8%	1.1%	- %
Two	.4	-	.5	1.3	1.8	-
One	.8	-	1.0	4.6	5.6	2.6
Some	1.2%	- %	1.5%	6.7%	8.5%	2.6%
None	98.8	100.0	98.5	93.3	91.5	97.4

D. 12 - 16 Miles

Number of Respondents	152	28	124	185	96	89
Three	- %	- %	- %	.5%	1.0%	- %
Two	-	-	-	.5	1.0	-
One	.7	-	.8	.5	1.0	-
Some	0.7%	- %	0.8%	1.5%	3.0%	- %
None	99.3	100.0	99.2	98.5	97.0	100.0

Belief in chances to reduce booms: As Table 149 shows, all attitude groups were almost equally pessimistic about being able to do something about the booms. Only 15% of the favorable attitude group and 13% of the hostile group felt there was even a good chance to reduce the booms. Perhaps this pervasive sense of futility explains the similarity in ratios between potential and actual complaint activities.

Table 149

REPORTED BELIEF IN THE CHANCES FOR DOING SOMETHING
TO REDUCE THE BOOMS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS

Oklahoma City Area

February-April 1964

Chance for doing something	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Not Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	803	222	581	1230	837	393
Very good	4.7%	9.9%	2.8%	4.0%	3.8%	4.3%
Good	10.5	12.6	9.6	8.7	8.0	10.2
Fair	17.9	18.5	17.7	18.2	18.5	17.6
Hardly any	50.7	46.4	52.3	52.3	54.0	48.6
Don't know	16.2	12.6	17.6	16.8	15.7	19.3
B. 0-8 miles:						
Number of Respondents	382	130	252	655	472	183
Very good	5.8%	13.1%	2.0%	3.5%	4.0%	2.2%
Good	10.5	13.1	9.1	8.1	7.8	8.7
Fair	15.4	16.9	14.7	17.6	16.5	20.2
Hardly any	50.8	44.6	54.0	54.0	55.3	50.8
Don't know	17.5	12.3	20.2	16.8	16.4	18.1
C. 8-12 miles:						
Number of Respondents	263	64	199	383	267	116
Very good	4.6%	4.7%	4.5%	4.7%	3.4%	7.8%
Good	10.6	10.9	10.6	9.4	9.7	8.6
Fair	20.2	25.0	18.6	18.8	21.3	12.9
Hardly any	49.8	48.4	50.3	52.2	52.8	50.9
Don't know	14.8	11.0	16.0	14.9	12.8	19.8

D. 12-16 miles:

Number of Respondents	152	28	124	183	96	87
Very good	2.6%	7.1%	1.6%	4.4%	4.2%	4.6%
Good	10.5	14.3	9.7	9.3	4.2	14.9
Fair	21.1	10.7	23.4	19.7	20.8	18.4
Hardly any	52.0	50.0	52.4	47.5	52.1	42.5
Don't know	13.8	17.9	12.9	19.1	18.7	19.6

7. Long Range Acceptability of Booms

Relation to feelings of necessity of booms: Expectations of long range acceptability of sonic booms were directly related to favorable attitudes toward the boom. Persons who felt the booms were necessary reported on the first interview that 97% felt they could live with eight booms per day. By the third interview, these same persons said that only 93% could accept the booms. In contrast, only 87% of those who felt the booms were not necessary said they could accept the booms indefinitely on the first interview and only 64% felt they could accept them on the third interview.

Relation to feelings of annoyance: It is interesting to note that 83% of annoyed persons on the third interview who felt booms necessary said they could accept the booms. This was only 14% less than the comparable persons who were not annoyed by the booms. In contrast, only 53% of annoyed persons on the third interview who felt local booms were not necessary said they could live with the booms. In comparison, 97% of those not annoyed who felt the booms necessary said they could accept the booms -- a spread of 44% in expected acceptance of booms.

Distance groups: Very small differences were reported by different distance groups in their expected acceptance of indefinite booms. Only the most distant hostile residents reported somewhat greater acceptance than comparable close and middle distance residents.

Table 150

REPORTED PERSONAL ABILITY TO ACCEPT EIGHT BOOMS PER DAY
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Acceptability	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL: 2/3-4/19						
Number of Respondents	803	222	581	1230	837	393
Very likely	89.7%	78.4%	94.0%	65.9%	59.3%	80.2%
Might	7.7	16.2	4.5	21.3	24.4	14.8
Could	97.4%	94.6%	98.5%	87.2%	83.7%	95.0%
Couldn't	1.4	3.2	.7	9.4	12.4	3.1
Don't know	1.2	2.2	..8	3.4	3.9	1.9
TOTAL: 4/20-6/14						
Number of Respondents	799	221	578	1229	836	393
Very likely	82.5%	65.6%	88.9%	48.6%	37.6%	72.0%
Might	12.1	21.7	8.5	23.8	27.4	16.0
Could	94.6%	87.3%	97.4%	72.4%	65.0%	88.0%
Couldn't	4.0	9.0	2.1	24.3	31.8	8.4
Don't know	1.4	3.7	.5	3.3	3.2	3.6

Acceptability	Booms Necessary			Booms Not Necessary		
TOTAL: 6/15-7/25	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
Number of Respondents	803	222	581	1230	837	393
Very likely	80.9%	60.4%	88.8%	37.9%	25.9%	63.4%
Might	11.8	22.1	7.9	25.9	26.9	23.7
Could	92.7%	82.5%	96.7%	63.8%	52.8%	87.1%
Couldn't	5.6	14.9	2.1	33.0	43.5	10.7
Don't know	1.7	2.6	1.2	3.2	3.7	2.2
B. 0-8 miles: 2/3-4/19						
Number of Respondents	388	130	258	660	474	186
Very likely	90.2%	80.8%	95.0%	65.8%	59.3%	82.3%
Might	7.5	13.8	4.3	20.8	23.4	14.0
Could	97.7%	94.6%	99.3%	86.6%	82.7%	96.3%
Couldn't	1.0	2.3	.4	9.7	12.2	3.2
Don't know	1.3	3.1	.3	3.7	5.1	.5
0-8 miles: 4/20-6/14						
Number of Respondents	386	130	256	659	472	187
Very likely	80.8%	66.9%	87.9%	44.9%	34.1%	72.2%
Might	14.5	23.8	9.8	23.8	27.1	15.5
Could	95.3%	90.7%	97.7%	68.7%	61.2%	87.7%
Couldn't	3.6	6.9	2.0	28.4	35.4	10.7
Don't know	1.1	2.4	.3	2.9	3.4	1.6
0-8 miles: 6/15-7/25						
Number of Respondents	388	131	257	660	472	188
Very likely	76.8%	58.8%	86.0%	34.5%	23.1%	63.3%
Might	12.6	20.6	8.6	25.8	26.3	24.5
Could	89.4%	79.4%	94.6%	60.3%	49.4%	87.8%
Couldn't	8.2	18.3	3.1	36.2	46.4	10.6
Don't know	2.4	2.3	2.3	3.5	4.2	1.6

C. 8-12 miles: 2/3-4/19

Number of Respondents	138	23	115	214	148	66
Very likely	92.0%	91.3%	92.2%	61.2%	52.7%	80.3%
Might	3.6	4.3	3.5	22.4	27.0	12.1
Could	95.6%	95.6%	95.7%	83.6%	79.7%	92.4%
Couldn't	1.4	4.3	.9	13.6	18.2	3.0
Don't know	3.0	.1	3.4	2.8	2.1	4.6

8-12 miles: 4/20-6/14

Number of Respondents	137	22	115	214	148	66
Very likely	87.6%	72.7%	90.4%	49.5%	41.9%	66.7%
Might	5.8	13.6	4.3	25.2	28.4	18.2
Could	93.4%	86.3%	94.7%	74.7%	70.3%	84.9%
Couldn't	5.8	13.6	4.3	22.0	27.7	9.1
Don't know	.8	.1	1.0	3.3	2.0	6.0

8-12 miles: 6/15-7/25

Number of Respondents	138	23	115	214	148	66
Very likely	85.5%	60.9%	90.4%	37.4%	25.7%	63.6%
Might	10.9	30.4	7.0	23.8	26.4	18.2
Could	96.4%	91.3%	97.4%	61.2%	52.1%	81.8%
Couldn't	2.9	4.3	2.6	34.6	43.9	13.6
Don't know	.7	4.4	--	4.2	4.0	4.6

D. 12-16 miles: 2/3-4/19

Number of Respondents	152	28	124	184	96	88
Very likely	90.8%	75.0%	94.4%	71.7%	64.6%	79.5%
Might	8.6	25.0	4.8	20.1	24.0	15.9
Could	99.4%	100.0%	99.2%	91.8%	88.6%	95.4%
Couldn't	.6	--	.8	6.0	8.3	3.4
Don't know	--	--	--	2.2	3.1	1.2

Acceptability	Booms Necessary			Booms Not Necessary		
12-16 miles: 4/20-6/14	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
Number of Respondents	151	28	123	184	96	88
Very likely	84.1%	57.1%	90.2%	54.9%	42.7%	68.2%
Might	9.9	17.9	8.1	27.2	32.3	21.6
Could	94.0%	75.0%	98.3%	82.1%	75.0%	89.8%
Couldn't	2.6	10.7	.8	13.0	20.8	4.5
Don't know	3.4	14.3	.7	4.9	4.2	5.7
12-16 miles: 6/15-7/25						
Number of Respondents	152	28	124	185	96	89
Very likely	84.9%	60.7%	90.3%	48.6%	37.5%	60.7%
Might	10.5	21.4	8.1	28.6	31.3	25.8
Could	95.4%	82.1%	98.4%	77.2%	68.8%	86.5%
Couldn't	3.3	14.3	.8	21.6	31.2	11.2
Don't know	1.3	3.6	.8	1.2	--	2.3

Expectations about accepting night booms: Residents felt less optimistic about accepting night booms. Those who were favorable toward booms more often felt they could live with several night booms. About 80% of them said they could accept night booms compared to only 57% of those who felt local booms were not necessary. Those who were also annoyed by daytime booms indicated that only 49% of them or less than half, felt they could tolerate night booms. In contrast, the most favorable group said that 83% could accept the night booms, a spread of 34% in self-appraised acceptance of night booms.

Table 151

REPORTED ABILITY TO ACCEPT SEVERAL BOOMS PER NIGHT
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Acceptability	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Not Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	803	222	581	1230	837	393
Very likely	56.5%	38.7%	63.3%	33.6%	26.6%	48.3%
Might	23.0	31.1	20.0	22.9	21.9	25.2
Could	79.5%	69.8%	83.3%	56.5%	48.5%	73.5%
Couldn't	13.0	21.6	9.6	34.4	42.4	17.3
Don't know	7.5	8.6	7.1	9.1	9.1	9.2
B. 0-8 miles:						
Number of Respondents	388	130	258	660	474	186
Very likely	59.3%	38.5%	69.8%	32.1%	27.2%	44.6%
Might	21.9	30.0	17.8	23.0	20.5	29.6
Could	81.2%	68.5%	87.6%	55.1%	47.7%	74.2%
Couldn't	13.1	23.8	7.8	35.3	42.8	16.1
Don't know	5.7	7.7	4.6	9.6	9.5	9.7

C. 8-12 miles:

Number of Respondents	138	23	115	213	148	65
Very likely	56.5%	39.1%	60.0%	30.4%	20.3%	53.0%
Might	23.2	43.5	19.1	22.0	22.3	21.2
Could	79.7	82.6	79.1	52.4	42.6	74.2
Couldn't	12.3	13.0	12.2	39.3	48.6	18.2
Don't know	8.0	4.4	8.7	8.3	8.8	7.6

D. 12-16 miles:

Number of Respondents	152	28	124	183	96	87
Very likely	54.6%	39.3%	58.1%	38.6%	31.3%	46.6%
Might	24.3	28.6	23.4	26.1	31.3	20.5
Could	78.9%	67.9%	81.5%	64.7%	62.6%	67.1%
Couldn't	11.8	25.0	8.9	26.1	30.2	21.6
Don't know	9.3	7.1	9.6	9.2	7.2	11.3

8. Personal Characteristics of Respondents

Persons hostile to booms were more often older women, with less education and lower income, living in one or two-person families without any children. They were equally sensitive to noise as persons with favorable attitudes toward booms.

Family composition: Persons who did not believe in the necessity of local booms, whether or not annoyed by them, more often lived with other adults only in one or two-person families. As Table 152 shows, 51% of those hostile to local booms lived with adults only compared to 36% of those who believed booms necessary. Likewise, 45% of those hostile to booms lived in one or two-person families compared to 29% of those with favorable attitudes. The pattern in each distance group was the same.

Table 152

REPORTED FAMILY CHARACTERISTICS OF RESPONDENTS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	803	222	581	1230	837	393
FAMILY COMPOSITION						
Adults only	35.7%	33.8%	36.4%	51.2%	52.0%	49.6%
Children over 6	28.5	24.8	29.9	25.1	25.6	24.2
Children under 6	35.8	41.4	33.7	23.7	22.4	26.2
SIZE OF FAMILY						
One	5.2%	6.8%	4.6%	10.7%	9.6%	13.2%
Two	24.0	21.2	25.1	34.1	35.7	30.5
Three	18.8	18.9	18.8	18.7	19.4	17.3
Four	23.2	23.4	23.1	17.5	18.2	16.0
Five	14.6	15.8	14.1	9.8	9.2	11.2
Six and over	14.2	13.9	14.3	9.2	7.9	11.8

	Booms Necessary			Booms Not Necessary		
B. 0-8 miles:	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
Number of Respondents	388	130	258	660	474	186
FAMILY COMPOSITION						
Adults only	42.5%	43.8%	41.8%	54.4%	54.7%	53.8%
Children over 6	26.8%	23.1%	28.7%	24.4%	25.3%	22.0
Children under 6	30.7	33.1	29.5	21.2	20.0	24.2
SIZE OF FAMILY						
One	7.2%	10.0%	5.8%	11.7%	10.8%	14.0%
Two	26.8	24.6	27.9	35.3	35.7	34.4
Three	20.1	23.8	18.2	18.8	20.7	14.0
Four	22.7	18.5	24.8	16.5	16.9	15.6
Five	11.1	10.0	11.6	10.0	9.9	10.2
Six and over	12.1	13.1	11.7	7.7	6.0	11.8
C. 12-16 miles:						
Number of Respondents	263	64	199	385	267	118
FAMILY COMPOSITION						
Adults only	28.2%	20.3%	30.6%	47.5%	47.9%	46.6%
Children over 6	31.6	29.7	32.2	26.5	27.3	24.6
Children under 6	40.2	50.0	37.2	26.0	24.8	28.8
SIZE OF FAMILY						
One	2.7%	3.1%	2.5%	10.4%	8.6%	14.4%
Two	20.9	15.6	22.6	31.7	34.8	24.6
Three	19.8	15.6	21.1	17.7	16.5	20.3
Four	22.1	26.6	20.6	19.7	21.7	15.3
Five	17.5	21.9	16.1	9.4	7.5	13.6
Six and over	17.0	17.2	17.1	11.1	10.9	11.9

D. 12-16 miles

Number of Respondents	152	28	124	184	96	88
FAMILY COMPOSITION						
Adults only	31.6%	17.9%	34.6%	47.3%	50.1%	44.3%
Children over 6	27.6	21.4	29.0	25.0	21.9	28.4
Children under 6	40.8	60.7	36.4	27.7	28.0	27.3
SIZE OF FAMILY						
One	4.6%	--	5.6%	8.2%	6.3%	10.2%
Two	22.4	17.9	23.4	34.2	38.5	29.5
Three	13.8	3.6	16.1	20.7	20.8	20.5
Four	26.3	39.3	23.4	16.3	14.6	18.2
Five	18.4	28.6	16.1	10.3	10.4	10.2
Six and over	14.5	10.6	15.4	10.3	9.4	11.4

Age: Persons hostile to the booms were more often older residents. While 50% of those who felt local booms were necessary were under 40 years old, only 34% of those with hostile views were as young. Likewise, while 23% of those with favorable attitudes were 55 years old or more, 39% of those hostile to the booms were as old.

Table 153

AGE DISTRIBUTION OF RESPONDENTS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Ages	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	803	222	581	1230	837	393
18-29	25.9%	29.3%	24.6%	15.6%	14.6%	17.8%
30-39	23.7	23.0	23.9	18.9	18.1	20.6
40-54	26.8	26.1	27.0	25.8	27.1	22.9
55-64	11.8	11.3	12.1	16.0	16.2	15.3
65 and over	11.1	9.0	11.9	22.8	22.8	22.6
Don't know	.7	1.3	.5	.9	1.2	.8
B. 0-8 miles:						
Number of Respondents	388	130	258	660	474	186
18-29	22.2%	25.4%	20.6%	12.9%	12.1%	15.0%
30-39	21.4	20.8	21.8	17.1	16.8	17.7
40-54	28.6	29.2	28.3	28.1	29.3	25.3
55-64	13.4	12.4	14.0	18.4	17.7	19.9
65 and over	13.1	10.8	14.3	22.1	22.8	20.4
Don't know	1.3	1.4	1.0	1.4	1.3	1.7

Sex: Those unfriendly to the booms were more often women. While 74% of those who did not believe booms necessary were women, only 66% of those who believed booms were necessary were women. The same pattern was present in all distance groups.

Table 154

SEX OF RESPONDENTS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Sex	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	803	222	581	1230	837	393
Male	33.5%	28.4%	35.5%	26.5%	24.9%	30.0%
Female	66.5	71.6	64.5	73.5	75.1	70.0
B. 0-8 miles:						
Number of Respondents	388	130	258	660	474	186
Male	32.5%	29.2%	34.1%	25.5%	23.6%	30.9%
Female	67.5	70.8	65.9	74.5	76.4	69.1
C. 8-12 miles:						
Number of Respondents	263	64	199	385	267	118
Male	35.4%	28.1%	37.7%	27.0%	25.5%	30.5%
Female	64.6	71.9	62.3	73.0	74.5	69.5
D. 12-16 miles:						
Number of Respondents	152	28	124	184	96	88
Male	32.9%	25.0%	34.7%	29.3%	29.2%	29.5%
Female	67.1	75.0	65.3	70.7	70.8	70.5

Education: Residents hostile to the booms more often had only elementary education. About 25% of those who did not believe local booms were necessary had only an elementary school education, compared to 15% for those favorable to local booms. Likewise, while only 28% of the hostile group had some college, 33% of the favorable attitude group had some college education.

Table 155

EDUCATIONAL ACHIEVEMENT OF RESPONDENTS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Highest Educational Achievement	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	803	222	581	1230	837	393
Elementary	14.7%	12.2%	15.6%	24.5%	23.3%	27.2%
High School	56.4	55.0	57.0	52.2	53.8	48.9
College	28.5	32.5	27.0	23.0	22.8	23.4
Don't know	.4	.3	.4	.3	.1	.5
B. 0-8 miles:						
Number of Respondents	388	130	258	660	474	186
Elementary	12.6%	10.1%	14.0%	23.9%	22.4%	28.0%
High School	53.4	51.5	54.3	48.2	50.0	43.5
College	33.3	37.7	31.0	27.7	27.4	28.5
Don't know	.7	.7	.7	.2	.2	--
C. 8-12 miles:						
Number of Respondents	263	64	199	385	267	118
Elementary	16.7%	15.7%	17.1%	25.2%	25.9%	23.7%
High School	58.9%	61.0%	58.3%	57.6%	58.1%	56.8%
College	24.4	23.3	24.6	16.8	16.0	18.6
Don't know	--	--	--	.4	--	.9
D. 12-16 miles:						
Number of Respondents	152	28	124	184	96	88
Elementary	16.5%	14.3%	16.9%	24.9%	20.9%	29.5%
High School	59.8	57.1	60.5	55.4	60.4	50.0
College	23.7	28.6	22.6	19.0	18.7	19.3
Don't know	--	--	--	.7	--	1.2

Income: Those hostile to the booms also had lower family incomes. While 55% of those not believing in the necessity of local booms reported incomes of under $6,000 a year, only 47% of the favorable group were in this category. Likewise, while only 20% of the hostile group had incomes of $8,000 or more, 26% of the favorable group had such incomes.

Table 156

REPORTED FAMILY INCOME OF RESPONDENTS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Income	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	803	222	581	1230	837	393
Under 6,000	47.2%	46.4%	47.5%	55.1%	53.5%	58.3%
6,000 - 7,999	22.7	24.3	22.0	17.4	17.4	17.3
8,000 - 14,999	22.2	22.6	22.0	16.4	16.6	16.0
15,000 or more	4.2	3.6	4.5	3.4	3.8	2.5
Don't know	3.7	3.1	4.0	7.7	8.7	5.9
B. 0-8 miles:						
Number of Respondents	388	130	258	660	474	186
Under 6,000	46.4%	43.9%	47.7%	52.2%	50.6%	56.4%
6,000 - 7,999	19.6	20.8	19.0	16.7	15.8	18.8
8,000 - 14,999	23.7	26.9	22.1	17.4	17.7	16.6
15,000 or more	4.9	3.8	5.4	4.8	5.7	2.7
Don't know	5.4	4.6	5.8	8.9	10.2	5.5

C. 8-12 miles:						
Number of Respondents	263	64	199	385	267	118
Under 6,000	48.3%	50.0%	47.8%	56.8%	55.1%	61.0%
6,000 - 7,999	26.6	28.1	26.1	19.5	21.3	15.3
8,000 - 14,999	20.5	20.4	20.6	15.0	15.3	14.4
15,000 or more	3.0	1.5	3.5	2.6	1.9	4.2
Don't know	1.6	--	2.0	6.1	6.4	5.1
D. 12-16 miles:						
Number of Respondents	152	28	124	184	96	88
Under 6,000	47.4%	50.0%	46.8%	60.8%	63.5%	58.0%
6,000 - 7,999	23.7	32.1	21.8	15.8	14.6	17.0
8,000 - 14,999	21.0	7.1	24.2	15.8	14.6	17.0
15,000 or more	4.6	7.1	4.0	--	--	--
Don't know	3.0	3.7	3.2	7.6	7.3	8.0

Noise sensitivity: Very small differences were reported in noise sensitivity. Those who were not annoyed more often indicated a tendency to be annoyed by fewer noises, but the differences were not great. Those not annoyed said that 57-59% were sensitive to three or fewer noises compared to 48-51% for those annoyed by the booms.

Table 157

NOISE SENSITIVITY INDEX FOR RESPONDENTS
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Cumulative Number Noises Bother	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	626	174	452	919	604	315
None	5.0%	2.3%	6.0%	5.3%	5.3%	5.4%
One	16.2	9.8	18.6	15.6	15.1	16.8
Two	32.8	23.0	36.5	34.6	33.5	37.1
Three	55.8	47.7	58.8	52.6	50.7	56.5
Four	72.9	70.1	73.8	71.0	68.7	75.5
Five	83.6	80.4	84.6	82.4	80.8	85.7
Six	91.9	91.3	91.9	89.3	89.4	89.2
Seven	94.3	94.2	94.1	92.0	92.5	91.1
Eight	100.0	100.0	100.0	100.0	100.0	100.0
B. 0-8 miles:						
Number of Respondents	211	82	129	349	241	108
None	5.2%	2.4%	7.0%	5.2%	4.6%	6.5%
One	14.2	8.5	17.9	17.2	16.6	18.5
Two	27.0	20.7	31.1	36.1	34.4	39.8
Three	49.3	46.3	51.3	53.6	52.7	55.5
Four	70.2	68.3	71.5	70.8	68.1	76.8
Five	82.0	78.1	84.7	81.1	78.5	87.0
Six	91.0	89.1	92.5	88.5	88.0	89.8
Seven	91.5	90.3	92.5	90.2	90.1	90.7
Eight	100.0	100.0	100.0	100.0	100.0	100.0

C. 8-12 miles:

Number of Respondents	263	64	199	385	267	118
None	4.6%	1.6%	5.5%	4.9%	6.0%	2.5%
One	15.2	9.4	17.1	14.0	14.2	13.5
Two	33.8	23.5	37.2	34.0	34.1	33.8
Three	60.0	50.1	63.3	54.5	53.6	56.7
Four	74.1	70.4	75.4	70.9	69.7	73.6
Five	84.4	84.5	84.4	83.9	83.2	85.5
Six	92.4	95.4	91.4	93.0	92.2	91.4
Seven	95.4	98.5	94.4	96.4	96.3	93.1
Eight	100.0	100.0	100.0	100.0	100.0	100.0

D. 12-16 miles:

Number of Respondents	152	28	124	184	96	88
None	5.3%	3.6%	5.6%	6.5%	5.2%	8.0%
One	21.1	14.3	22.5	16.3	13.5	19.4
Two	39.5	28.6	41.9	33.7	29.1	38.7
Three	57.9	46.5	60.4	47.3	37.4	58.0
Four	75.0	75.1	74.9	72.3	67.6	77.3
Five	84.9	78.7	86.2	82.6	80.1	85.3
Six	92.8	89.4	93.5	85.9	85.3	86.4
Seven	96.7	96.5	96.7	89.2	88.4	89.8
Eight	100.0	100.0	100.0	100.0	100.0	100.0

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Ties with aviation industry: Very small differences were reported by all groups with respect to respondent ties with the aviation industry. Surprisingly, the least ties were reported by those hostile to local booms but not annoyed by them. While the difference in aviation ties between annoyed and not annoyed with hostile views was only 5%, such a difference could occur by chance in five cases out of 100 samples.

Table 158

RESPONDENT TIES WITH THE AVIATION INDUSTRY
BY BELIEF IN NECESSITY AND ANNOYANCE WITH BOOMS
AT END OF STUDY

Oklahoma City Area

February-July 1964

Ties to Aviation	Booms Necessary			Booms Not Necessary		
	Total	Annoyed	Not Annoyed	Total	Annoyed	Not Annoyed
A. TOTAL:						
Number of Respondents	803	222	581	1230	836	394
No ties	66.7%	65.3%	67.2%	69.2%	67.5%	72.8%
Some ties	33.3	34.7	32.7	30.8	32.5	27.2
Personal	15.7%	17.6%	15.0%	13.3%	13.6%	12.7%
Family	17.6	17.1	17.7	17.5	18.9	14.5
B. 0-8 miles:						
Number of Respondents	388	149	239	660	494	166
No ties	70.2%	73.1%	68.2%	71.7%	70.7%	74.7%
Some ties	29.8	26.9	31.8	28.3	29.3	25.3
Personal	14.9%	14.1%	15.5%	9.8%	9.7%	10.2%
Family	14.9	12.8	16.3	18.5	19.6	15.1
C. 8-12 miles:						
Number of Respondents	263	64	199	385	267	118
No ties	60.4%	56.2%	61.8%	66.5%	64.0%	72.0%
Some ties	39.6	43.8	38.2	33.5	36.0	28.0
Personal	19.4%	21.9%	18.6%	15.8%	18.4%	10.2%
Family	20.2	21.9	19.6	17.7	17.6	17.8

D. 12-16 miles:

Number of Respondents	152	28	124	184	96	88
No ties	69.1%	67.8%	69.3%	65.7%	67.7%	63.6%
Some ties	30.9	32.2	30.7	34.3	32.3	36.4
Personal	11.2%	14.3%	10.5%	20.7%	17.7%	23.9%
Family	19.7	17.9	20.2	13.6	14.6	12.5

D. Characteristics of Actual Complainers

1. Introduction

A little over 100 respondents said they actually called the FAA to complain about the sonic booms. What kinds of people were these complainers? To answer these questions, a detailed comparison will be made of complainers and non-complainers. It will be shown that complainers were the most intensely annoyed and the most hostile to sonic booms. As a group they reflected the attitudes of the much larger annoyed population and can be considered the hard core of the opposition to the booms.

Complainers about sonic booms were not chronic gripers, but liked their areas as well as the non-complainers. Complainers were equally sensitive to noises in general, but reported more than 3-4 times as much sonic boom interference, four times as much annoyance, 6-9 times as much desire to complain, and three times as much damage from the booms. They equally heard of the boom test, recognized the boom, and were aware of the boom schedule, and knew the physical reasons for the boom. They more often knew where to complain and the reasons for the boom test. But, they less often believed in the necessity of local booms, that officials were concerned about their welfare, that aviation was very important or that the SST was necessary.

Not all of these actual complainers, however, were completely and irreversably opposed to the booms. Almost 40% at the end of the study felt they could learn to live with eight booms per day over an indefinite period of time. Very few felt their complaints would affect the boom test, but most felt it was their right and duty to express themselves.

Complainers were more often middle-aged females, with older children and smaller families. They had more education, a little more income, had flown in airplanes more often and had more family ties with the aviation industry.

2. Reports of Overall Likes and Dislikes

Overall rating of satisfaction with area: Complainers and non-complainers were about the same in overall satisfaction with their residential environments. About half felt their areas were excellent places to live, and another one-third felt it was a good place to live; less than 15% felt their area was only a fair or poor place to live. In other words, complainers about booms were not chronic gripers who were generally unhappy about everything, as can be seen in Table 159.

Table 159

REPORTED OVERALL RATING OF SATISFACTION WITH LIVING CONDITIONS BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

Rating	Complainers	Non-Complainers*
Number of Respondents	113	2739
Excellent	50.4%	45.6%
Good	35.4	37.7
Fair	9.7	14.1
Poor	4.4	2.4
Don't know	.1	.2

* Includes all residents including those who do not believe in complaint.

Number of dislikes: Complainers did dislike more things about their living conditions than non-complainers. When asked how many things they disliked, 20% of the complainers said "many things" compared to only 4% of the non-complainers. Table 160 presents these answers.

Table 160

REPORTED NUMBER OF DISLIKES WITH LIVING CONDITIONS BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

Number of Dislikes	Complainers	Non-Complainers
Number of respondents	113	2739
Many	20.4%	3.5
Few	71.6	77.1
Hardly anything	8.0	17.4
Don't know	-	2.0

Kinds of dislikes: When asked to mention the kinds of things disliked, almost half of the complainers (48.4%) mentioned booms compared to only 13% of the non-complainers. In other respects, both groups were not too different in their dislikes, as can be seen in Table 161.

Table 161

VOLUNTARY REPORTS OF DISLIKES ABOUT LIVING CONDITIONS BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

Kinds of Dislikes	Complainers	Non-Complainers
Number of respondents*	64	2064
Sonic booms	48.4%	12.8%
Socially unpleasant	18.8	11.9
Roads inadequate	15.6	17.2
Traffic danger	12.5	12.1
Other noises	10.9	5.2
Other dangerous conditions	10.9	6.1
Zoning problems	10.9	2.7
Physical aspects	10.9	13.1
Poor appearance	10.9	6.5
Sewerage inadequate	7.8	4.0

* Question asked only of face-to-face respondents.

Major dislikes: When asked to pick the one thing disliked the most, 37% of the complainers voluntarily mentioned the booms compared to only 10% of the non-complainers. In most other aspects, complainers and non-complainers were alike, except that 23% of the complainers compared to 36% of the non-complainers refused to select any dislike. Table 162 presents these answers.

Table 162

REPORTED MAJOR DISLIKES
BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

Major Dislikes	Complainers	Non-Complainers
Number of respondents	113	2739
Sonic booms	37.2%	9.5%
Traffic danger	9.7	11.4
Transportation; roads poor	6.2	8.2
Social aspects	6.2	5.8
Other noise	2.7	3.1
Zoning problems	2.7	1.3
Dogs annoy	2.7	2.4
Other dangers	1.8	3.0
Community facilities inadequate	1.8	7.6
Area congested	.9	1.4
Taxes too high	.9	1.1
Economic problems	.9	1.8
Unsightly neighborhood	.9	.8
Miscellaneous	-	2.2
Nothing disliked	23.0	35.7
Don't know	1.5	2.7

Overall noise rating: Complainers were a little more sensitive to noise than non-complainers. About 27% of the complainers rated their areas as noisy compared to only 18% of the non-complainers. While equal numbers reported hearing the same kinds of noise in their areas, complainers were more often annoyed by them.

Table 163

REPORTED OVERALL NOISE REACTIONS
BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

	Complainers	Non-Complainers
Number of respondents	113	2739
A. Overall Noise Rating		
Very noisy	3.5%	3.9%
Fairly noisy	23.9	13.9
Fairly quiet	40.7	55.0
Very quiet	30.1	26.5
Don't know	1.8	.7
B. Kinds of Noise Heard		
Cars or trucks	72.5	72.8
Neighbors or children	38.1	39.1
Sonic booms	100.0	98.5
Ordinary planes	72.6	69.2
C. Noise Annoyance		
Cars and trucks	30.1	23.4
Neighbors or children	10.6	10.8
Sonic booms	80.5	46.2
Ordinary planes	21.2	11.8

3. Reports of Interference by Sonic Booms

Complainers were much more sensitive to sonic booms. From three to four times as many complainers reported interference by sonic booms than non-complainers. About half the complainers reported 4-5 types of interference by booms compared to only 12-16% of the non-complainers. Likewise, only about 20% of the complainers reported only one or no types of interference compared to 60% of the non-complainers. Over the six-month test period, reports of interference were fairly stable for both groups.

Table 164

REPORTED SUMMARY SCALE OF INTERFERENCE BY SONIC BOOMS
BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

Number of Interferences	Complainers 2/3-4/19	Complainers 4/20-6/14	Complainers 6/15-7/25	Non-Complainers 2/3-4/19	Non-Complainers 4/20-6/14	Non-Complainers 6/15-7/25
Number of respondents	113	113	108	2727	2727	2573
4 - 5	49.6%	49.6%	49.1%	11.5%	12.1%	16.5%
2 - 3	27.4	33.6	27.8	28.8	25.1	20.5
0 - 1	23.0	16.8	21.3	59.7	62.8	62.0

4. Reports of Annoyance by Sonic Booms

As expected, complainers were more than 3-4 times as annoyed as non-complainers. About 79% of the complainers were more than a little annoyed on the first interview and 85% on the third interview, compared to 29% of the non-complainers on the first period and 44% on the third period.

Table 165

REPORTED MORE THAN A LITTLE ANNOYANCE WITH SONIC BOOMS
BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

Reported Annoyances	Complainers 2/3-4/19	Complainers 4/20-6/14	Complainers 6/15-7/25	Non-Complainers 2/3-4/19	Non-Complainers 4/20-6/14	Non-Complainers 6/15-7/25
Number of respondents	113	113	108	2713	2727	2573
More than a little	78.8%	72.6%	85.2%	28.7%	36.2%	44.0%
Little or none	21.2	27.4	14.8	71.3	63.8	56.0

5. Reports of Damage by Sonic Booms

The very close correlation between complaining and reports of alleged damage can be seen in Table 166, where 86% of the complainers said they had sustained some damage compared to only 32% of the non-complainers. Moreover, about one-third of the complainers said they had been damaged in each of the three periods compared to only 5% of the non-complainers. Further underscoring the more frequent damage claimed by complainers, 32% of them said they were damaged twice by the booms compared to only 9% of the non-complainers.

Table 166

REPORTED DAMAGE BY SONIC BOOMS
BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

Number of Damage Reports	Complainers	Non-Complainers
Number of respondents	113	2739
Three	34.5%	4.8%
Two	31.8	8.8
One	19.4	18.7
Some	85.7%	32.3%
None	14.3	67.7

6. Reports of Desires to Complain and Actual Complaints About Sonic Booms

About half of all actual complainers felt like complaining in each period, compared to only about 10% of all respondents. When those who did not believe in complaining (814) were deducted from the non-complainers, the percentage who desired to complain was increased only 2-3%. Thus, only about 15% of the non-complainers at the end of the study even felt like complaining.

Of those who actually complained at some time during the study, the ratio of actual complaints to felt like complaining dropped from .81 during the first period to .64 in the third period.

The bulk of the actual complainers (61%) only complained once; only 13% complained on all three periods and 26% on two of the three periods.

Table 167

REPORTS OF DESIRES TO COMPLAIN
AND ACTUAL COMPLAINTS ABOUT SONIC BOOMS
BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

	Complainers			Non-Complainers	
Number of Respondents	113			2739	
A. Time Periods	Felt like	Did	Ratio	Felt like	Did
Period 2/3-4/19					
Yes	72.6%	58.4%	.81	8.1%	-- %
No	27.4	41.6	--	91.9	100.0
Period 4/20-6/14					
Yes	71.7	52.2	.73	11.3	--
No	28.3	47.8	--	88.7	100.0
Period 6/15-7/25					
Yes	67.6	43.5	.64	11.9	--
No	32.4	56.5	--	88.1	100.0

B. Number of Actual Complaints	Complainers
Three	13.3%
Two	25.7
One	61.0

Feelings of futility in complaining: As already seen in other sections of this report, there were widespread feelings of futility in complaining. Surprisingly, complainers were slightly more pessimistic than non-complainers. None of the complainers felt there was a "very good" chance to reduce the booms, and only 6% felt there was even a "good" chance. In comparison, 13% of the non-complainers felt there was a "good" or "very good" chance to reduce the booms.

Table 168

REPORTED BELIEF IN CHANCES FOR DOING SOMETHING TO REDUCE BOOMS BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

Chances for Doing Something	Complainers	Non-Complainers
Number of respondents	113	2713
Very good	- %	3.9%
Good	6.2	9.1
Fair	15.0	16.8
Hardly any	60.2	53.3
Don't know	18.6	16.9

Know where to complain: Only 70% of the complainers said they knew where to complain on the first interview, but only 61% actually knew where to go. In contrast, 34% of the non-complainers claimed knowledge of where to complain and 27% actually knew the correct place. Apparently 40% of the complainers when motivated to do so during the six month test discovered the correct place to complain.

Should others complain if annoyed: Almost 94% of the complainers felt other people should complain if annoyed, compared to 67% of the non-complainers. When asked why people should complain, almost half of the complainers said it was their right to complain or to provide a public reaction to the booms. The others felt they should complain if bothered enough or if they had damage. This also suggests why they actually complained themselves, even though they were pessimistic of success. When the actual complainers were asked why they didn't feel others should complain, almost all said "It won't do any good" or "People shouldn't gripe."

7. Long Range Acceptability of Booms

Daytime booms: Even if people complained about booms, some of them felt they could eventually get accustomed to them over time. About 70% of the complainers felt they could learn to live with eight daytime booms on the first interview, and almost 40% still felt this way on the third interview. In comparison, 93% of the non-complainers on the first interview and 80% on the third interview felt they could live with the booms.

Nighttime booms: Nighttime booms were considered more difficult to live with by both complainers and non-complainers. Only 29% of the complainers felt they could accept several booms per night, compared to 71% of the non-complainers. Table 169 presents these long-range acceptability trends.

Table 169

REPORTED ABILITY TO ACCEPT EIGHT BOOMS PER DAY AND SEVERAL BY NIGHT BY COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area

February-July 1964

	Complainers			Non-Complainers		
	2/3-4/19	4/20-6/14	6/15-7/25	2/3-4/19	4/20-6/14	6/15-7/25
Number of respondents	113	113	108	2713	2727	2573
A. Eight per day						
Could not accept	23.9%	48.7%	56.6%	4.5%	11.8%	16.9%
Don't know	7.1	2.6	4.5	2.1	2.1	3.2
Could accept	69.0	48.7	38.9	93.4	86.1	79.9
Very likely	39.8	28.3	15.0	80.1	68.6	62.4
Might	29.2	20.4	23.9	13.3	17.5	17.5
B. Several by night						
Could not accept	63.7%	-	-	21.3%	-	-
Don't know	7.1			7.3		
Could accept	29.2			71.4		
Very likely	13.3			48.1		
Might	15.9			23.3		

8. Some of the Factors That Might Influence Annoyance

a. Knowledge about the survey: Both complainers and non-complainers almost equally heard about the boom test. About 96% of the complainers and 92% of the non-complainers said they knew about the test. Most of those who were informed about the test said they read about it in the papers or saw a program on TV.

b. Know physical causes of sonic booms: Complainers were only a little better informed than non-complainers about the physical causes of booms. About 73% of the complainers gave completely correct explanations and 6% gave partially correct statements. Thus, almost 80% of the complainers knew what caused a sonic boom. In comparison, 67% of the non-complainers gave fully correct reasons, and 6% gave partial reasons, for a total of 73% knowledgeable responses.

c. Recognition of booms: Both groups equally said they always recognize a boom when they hear it. About 81% of the complainers compared to 83% of the non-complainers gave this answer.

d. Awareness of boom schedule: Both complainers and non-complainers were about equally aware of the regular boom schedule. About 81% of both groups said the booms occurred at the same time each day.

e. Awareness of purpose of booms: Slightly more complainers said they knew the reason why the booms were occurring locally, but about the same number actually knew the reasons. About 85% of the complainers and 77% of the non-complainers said they knew the reasons, but only 62% of the complainers and 60% of the non-complainers knew the real reasons. An additional 20% of the complainers and 17% of the non-complainers gave the false reasons that local booms would help local aviation or get an SST terminal for Oklahoma City.

f. Belief in the necessity of local booms: Very few complainers felt local booms were absolutely necessary. Only 19% felt they were necessary on the first interview, 10% on the second, and 12% on the third interview. In contrast, 58% of the non-complainers felt local booms were necessary on the first interview, 53% on the second and 47% on the last interview. As has been shown, this factor is also closely related to annoyance and long-range tolerance of booms.

g. Concern of aviation officials: Only a minority of the complainers felt that local officials were concerned about their welfare. Only 14% of the complainers felt the officials were very much concerned, another 16% felt they were moderately concerned and 17% only a little concerned. More than half said they were not concerned or didn't know whether they cared. In contrast, 40% of the non-complainers said the officials were very concerned, 26% moderately concerned, 11% a little concerned and only 22% not concerned or uncertain of their views.

h. Importance of commercial aviation: Complainers less often felt commercial aviation was very important, that it was extremely important to Oklahoma City or that the SST was necessary. Only 66% of the complainers compared to 80% of the non-complainers felt aviation was very important. Likewise, only 54% of the complainers compared to 76% of the non-complainers felt aviation was extremely important to Oklahoma City.

When asked about the SST itself, a minority of the complainers felt it was necessary. Only 20% felt the SST was absolutely necessary and another 20% felt it was probably necessary. In comparison, 38% of the non-complainers felt the SST was absolutely necessary and 32% felt it was probably necessary -- an overall difference of 30% between the two groups.

9. Personal Characteristics

Complainers were more often middle-aged females, with older children and smaller families. They had more education, a little higher incomes, and were about equally sensitive to noise. More often, the complainers also had flown in airplanes and had family connections with the aviation industry. Table 170 summarizes these characteristics.

Table 170

SELECTED PERSONAL CHARACTERISTICS
OF COMPLAINERS AND NON-COMPLAINERS

Oklahoma City Area
February-July 1964

	Complainers	Non-Complainers
Number of respondents	113	2739
Family Composition		
Adults only	50%	48%
Children over 6	35	26
Children under 6	15	26
Size of Family		
One person	3%	10%
Two-three	62	49
Four or more	35	41
Age		
Under 40	28%	38%
40 - 64	53	40
65 or more	16	21
Age not given	3	1
Sex		
Male	26%	31%
Female	74	69

	Complainers	Non-Complainers
Education		
Elementary school	16%	23%
High school	56	53
College	28	24
Income		
Under $8000	65%	73%
$8000 - 14,999	19	17
$15,000 or more	4	4
Income not given	12	6
Cumulative Number Noises Bother		
None	9.4%	7.5%
One	15.7	13.5
Two	28.2	25.7
Three	45.4	43.7
Four	64.2	63.8
Five	76.7	80.9
Six	93.9	91.3
Seven	97.0	97.5
Eight	100.0	100.0
Flying Experience		
Never flown	40.6%	51.7%
Flown once-twice	21.9	20.4
Flown three-four times	9.4	7.7
Flown five or more times	25.0	19.3
Don't know	3.1	.9
Aviation Connections		
None	61.0%	68.1%;
Some	39.0	31.9
Personal	13.3	14.3
Family	25.7	17.6

E. Actual Calls Received by the FAA

1. Types of Calls Received

The FAA had a message center centralize all complaints received during the six-month test. As Table 171 indicates, 12,389 calls and letters were received during the test from February-July, of which 86.7% were from close residents, 12.7% from middle distance residents and .6% from distant residents.

About 75% of all residents lived in the close areas, 20% in the middle distance and 5% in the distant areas. The greater concentration of calls in the close areas may be partly due to the fact that the phoning from middle and far-distant areas involved toll calls in most cases.

Damage reports: About 69% of all calls involved damage reports, 28% annoyance and about 3% simple inquiries. The same pattern was maintained in all distance groups, but the distant residents more often called only when they had damage reports. About 85% of all damage reports came from close residents, 14% from middle distance and 1% from distant residents.

Annoyance calls: Over 90% of all annoyance calls were concentrated in close areas, with the rest coming from middle-distance areas.

Table 171

TYPES OF CALLS RECEIVED BY THE FAA

Oklahoma City Area

February-July 1964

Types	Total	Miles from Ground Track 0 - 8	8 - 12	12 - 16	16 or more
Number of reports	12,389	10,740	1,574	60	15
A. By distance					
Damage	69.0%	67.5%	78.0%	83.3%	93.3%
Annoyance	28.4	29.9	18.7	13.3	-
Other	2.6	2.6	3.3	3.4	6.7
B. By type					
Total	100.0%	86.7%	12.7	.5	.1
Damage	100.0%	84.9%	14.4	.6	.1
Annoyance	100.0%	91.4%	8.4	.2	-
Other	100.0%	83.0%	16.1	.6	.3

2. Types of Damage Reports

Over three-quarters of all damage reports involved alleged plaster or paint cracks. Glass breakage accounted for an additional 11% of the calls and foundation damage about 13%. All distance groups reported the same pattern of damage.

Table 172

TYPES OF DAMAGE REPORTED TO FAA
BY DISTANCE FROM GROUND TRACK

Oklahoma City Area

February-July 1964

Type of Damage	Total	Distance from Ground Track 0 - 8	8 - 12	12 - 16
Number of calls	8531	7254	1227	50
Plaster, paint cracks	76.1%	76.9%	72.4%	54.0%
Glass - regular	8.7	8.9	7.3	12.0
Glass - plate	2.0	2.0	2.0	-
Automobile glass	.4	.4	.5	-
Green house glass	.1	.1	.1	-
Appliances	1.6	1.6	1.3	8.0
Mirrors cracked	.7	.7	.6	-
Fixed objects	8.4	8.5	8.0	8.0
Moveable objects	2.7	2.8	2.1	2.0
Foundations, walls	12.6	11.7	17.9	14.0
Roof	.6	.6	.5	-
Chimney	1.0	1.1	.2	-
Other structural	5.1	4.9	6.0	10.0
Animal injury	.1	.1	.1	-
Human injury	.6	.7	.2	-
All other damage	*	.1	-	-

* Less than 0.1 per cent.

3. Relation of Calls to Overpressure Level

The median overpressure level for each day's booms was calculated for the close and middle-distance areas. The number and type of calls were then cumulated for each median overpressure level. As Table 173 indicates, all types of calls fall into a random pattern with the peak toward the middle of the range. This clearly indicates that calls were not the spontaneous result of a single stimulus but rather the result of cumulative exposures and other personal variables.

Table 173

TYPES OF REPORTS TO FAA
BY MEDIAN OVERPRESSURE ON DAY OF REPORT

Oklahoma City Area

February-July 1965

Daily Median Overpressure (psf)	Total	Damage	Annoyance	Other
Number of calls	11,823	8,048	3,474	301
.30 - .39	.2%	.2%	.2%	- %
.40 - .49	.6	.7	.5	-
.50 - .59	.8	.8	.8	.7
.60 - .69	2.1	2.2	1.9	.7
.70 - .79	5.5	4.9	6.8	8.0
.80 - .89	6.7	4.3	8.7	12.3
.90 - .99	11.8	6.2	7.7	9.0
1.00 -1.09	24.2	13.0	9.2	9.3
1.10 -1.19	19.0	22.1	28.5	32.2
1.20 -1.29	7.4	19.9	16.4	23.2
1.30 -1.39	5.5	8.0	6.4	1.3
1.40 -1.49	3.7	6.3	4.0	1.0
1.50 -1.59	3.3	4.3	2.5	-
1.60 -1.69	1.9	1.9	2.8	.7
1.70 -1.79	.6	.4	2.0	1.6
1.80 -1.89	.8	1.0	1.1	-
1.90 -1.99	-	-	-	-
2.00 -2.09	.1	*	.5	-
2.10 -2.19	*	-	*	-

* Less than 0.1 per cent.

F. Conclusions

The greatest acceptability of sonic booms was reported by persons with the most favorable attitudes toward the SST and the FAA sonic boom test. Those who believed that the development of the SST was absolutely necessary and that local booms were also necessary reported the greatest acceptance of sonic booms. In contrast, the least acceptability of sonic booms was reported by persons with the opposite hostile views toward the SST and the necessity of local booms. In the major conclusions which follow, the average population reactions will be presented as well as the range in reactions reported by those with the most favorable and most hostile sonic boom views.

1. Almost all residents (94%) reported that sonic booms caused house rattles and vibrations. Other sonic boom interferences with living activities were: being startled (38%); interruptions of sleep (18%), rest (17%), conversation (14%), and radio and TV (9%). Over half (54%) of all persons reported only house rattles or no interferences at all. Persons with the most favorable views reported only 36% had rattles or no interferences, compared with 73% of those with the most hostile views -- a range of 37%.

2. More than a little annoyance with sonic boom interference increased from 37% of all people during the first interview to 56% on the third interview. Most of the increase was due to more intense sonic boom exposure during the last six weeks of the study. On the third interview, 25% with the most favorable views reported more than a little annoyance with booms compared to 76% for the most hostile group -- a range in reactions of 51%.

3. About one-fifth of all residents felt they had sustained damages by the booms during the first and second interview periods. On the third interview, almost one-fourth reported such alleged damage. During the six-month test, 38% overall felt they had been damaged by the booms, with plaster cracks most frequently reported. Only 7% reported damages three times, 11% twice, and 20% only once. Only 25% of persons with the most favorable views reported damages, compared to 56% for the most hostile group -- a spread of 31% in alleged damage reports. Persons who felt that local booms were not necessary and were also annoyed by the booms reported that 60% had received damages. Persons who actually complained to the FAA about the booms reported that 86% had sustained damages.

4. Oklahoma City residents generally have a low general complaint potential. Only 24% even felt like writing or calling an official about a serious local problem, and less than half (10%) actually followed through and actually did call. Those with the most favorable views on the sonic booms reported that 25% felt like calling on a general problem compared to 34% of the residents with the most hostile views on the booms.

5. Only 22% of all residents felt like complaining about the sonic booms at the end of the study, and only 5% actually did. Those with the most favorable attitudes toward booms reported that only 3% ever felt like complaining about the booms and only 2% actually did. In contrast, 37% of the most hostile group felt like complaining and 12% actually did. Thus, there was a 34% range in desires to complain and a 10% range in actual complaints.

6. Widespread feelings of futility in complaining probably contributed to the low levels of complaint. Only 4% felt that complaining had a "very good" chance of reducing the booms, and another 10% felt that complaining had even a "good" chance of accomplishing something.

7. The vast majority of residents felt they could learn to live with sonic booms. Over 90% felt they could accept eight booms per day indefinitely on the first interview, and 73% felt this way at the end of the six month period. About 92% of persons with the most favorable views said they could accept the booms at the end of the study compared to 57% of the most hostile group -- a range in acceptance of 35%. Even 40% of the persons who actually complained to the FAA said they could probably learn to live with the booms.

8. The FAA public information program was very successful in reaching residents. About 75% knew the physical causes of sonic booms, 83% believed they could always recognize the boom, 82% were aware of the regular schedule, two-thirds knew the purposes of the boom test, and half knew the six-month duration of the test.

9. Most residents were favorably disposed toward the sonic boom test. Over half (52%) felt the local booms were absolutely necessary on the first interview, and 38% felt this way on the last interview. Almost three-fourths of all residents felt that aviation was extremely important to local welfare and two-thirds of all persons felt the development of the SST was necessary. About one-third of all residents had personal or family connections with the aviation industry.

10. Respondents who had personal or family connections with the aviation industry reported the same sonic boom reactions as persons with no aviation connections.

11. Respondents who did not believe others should report their complaints about the booms even if annoyed by them, generally reported 10-20% less hostile reactions toward the booms. The exclusion of these potentially biased respondents from the computations of total area responses increased hostile sonic boom reactions by 2-5%.

12. Reactions of urban and rural residents to sonic booms were essentially the same.

13. The actual sonic boom overpressures experienced by Oklahoma City residents during the six month test were generally less than the programmed levels. During the last six weeks of the test, however, over 60% of the booms equaled or exceeded 1.5 psf in the closest areas.

14. Answers to speculative types of questions suggest that fewer residents think they can accept night booms. More direct research on this problem is needed before firm findings can be made.

15. Persons who actually complained to the FAA were the most intensely annoyed and most hostile toward the SST. They were not chronic gripers and liked their areas as well as non-complainers. They were equally sensitive to noise in general, but reported 3-4 times more sonic boom interference, four times more annoyance, 6-9 times more desire to complain and 3 times more damage by booms. They less often believed in the importance of aviation in general, the necessity of the SST, or the necessity of local booms. About 40% of the complainers, however, felt they could learn to live with eight sonic booms per day. Complainers were more often middle aged females, with older children, and smaller families. They generally had more education and income, and more often had ties with the aviation industry.

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1- 2- 3- 4- 5- 6- 7- 8-

CONFIDENTIAL
Survey 470
Form 1
3-1-64

NATIONAL OPINION RESEARCH CENTER
University of Chicago

Assignment No.: _____ - _____ - _____ Time Interview Began: _____

Telephone No.: _____ Time Interview Ended: _____

Date: _____ 9-

Name on
Telephone List: _____

Description
Respondent (Q. 22): _____

Address: _____

Hello. (Is this the home of_____ at _____?) I'm from the opinion research center at the University of Chicago. We are doing a study of how people feel about living in different places and I'd like to get some of your views.

---

1. The first question is: In general, how do you like living in your area? Do you rate it as an excellent, good, fair, or poor place to live?

Excellent	10-1
Good.	2
Fair.	3
Poor.	4
Don't know.	5
NORC use.	Y

---

2. Now, very few places are entirely perfect. So I'd like you to tell me if there are many things, a few things or hardly anything you dislike about living around here?

Many things	11-1
Few things.	2
Hardly anything	3
Don't know.	4
NORC use.	Y

D. And what did you think the chances were to do something about that situation -- very good, good, fair or poor?

Very good	19-1
Good.	2
Fair.	3
Poor.	4
Don't know.	5
NORC use.	Y

IF SOMETHING DISLIKED IN Q. 3, ASK E - G

E. Have you yourself ever felt like doing something about this? For example, have you ever felt like:

	E			F		
	Yes	No	NORC	Yes	No	NORC
1) Writing or telephoning an official?. .	20-1	2	3	4	5	Y
2) Visiting an official?.	21-1	2	3	4	5	Y
3) Signing a petition?.	22-1	2	3	4	5	Y
4) or helping to set up a citizens' committee to do something?	23-1	2	3	4	5	Y

ASK F AFTER FINISHING PART E, AND CIRCLE YES OR NO CODES ABOVE FOR EACH OF THE THE FOUR ITEMS

F. Did you or anyone in your family ever actually do any of these things? (Which?)

G. And what do you think the chances are to do something about this -- very good, good, fair or poor?

Very good	24-1
Good.	2
Fair.	3
Poor.	4
Don't know.	5
NORC use.	Y

---

4. On the whole would you rate this area as very noisy, fairly noisy, fairly quiet, or very quiet?

Very noisy.	25-1
Fairly noisy.	2
Fairly quiet.	3
Very quiet.	4
Don't know.	5
NORC use.	Y

9. A. Do you yourself feel it is absolutely necessary for the jets to make these booms around here or not?

B. From what you've heard or read, do you think most other people around here feel it is absolutely necessary or not?

	A Self	B Others
Necessary	33-1	34-1
Not necessary	2	2
Don't know.	3	3
NORC use.	Y	Y

---

10. Do you usually hear the booms about the same time each day, or do they happen at different times each day?

Same time	35-1
Different times	2
Don't know.	3
NORC use.	Y

---

11. Do you happen to know how long these booms are supposed to continue altogether? How long?

Don't know.	36-0
One month or less	1
2 months.	2
3 months.	3
4 months.	4
5 months.	5
6 months.	6
7 months.	7
Indefinitely.	8
NORC use.	Y

14. Have you yourself ever felt like doing something about the booms? For example have you ever felt like writing or telephoning an official? (Ask each item in A before asking B, etc.)

A. (Ever felt like --	ITEMS			
	Writing or telephoning an official?	Visiting an official?	Signing a petition?	Helping to set up a citizens' committee?
Yes	46-1	47-1	48-1	49-1
No	2	2	2	2
NORC use	3	3	3	3
B. Have you or anyone in your family actually done any of these things? (Which?)				
Yes	4*	4*	4*	4*
No	5	5	5	5
NORC use	6	6	6	6

*C. IF YES TO ANY ITEM IN "B", ASK: Did it do any good?

Yes	50-1
No	2
Don't know	3
NORC use	Y

D. If a local organization asked you, do you think you would very likely (insert item), that you might but you're not sure, or that you probably wouldn't?	Write or telephone an official	Visit an official	Sign a petition	Help set up a committee
Very likely	51-1	52-1	53-1	54-1
Might	2	2	2	2
Wouldn't	3	3	3	3
Don't know	4	4	4	4
NORC use	Y	Y	Y	Y

---

15. On the whole, what do you think the chances are for doing anything about the booms? Would you say there was a very good chance, a good chance, only a fair chance, or hardly any chance at all to improve the situation?

Very good chance	55-1
Good chance	2
Fair chance	3
Hardly any chance	4
Don't know	5
NORC use	Y

---

16. Do you think people around here should complain about these booms if they find them annoying?

Yes	56-1
No	2
Don't know	3
NORC use	Y

1- 2- 3- 4- 5- 6- 7- 8-

CONFIDENTIAL
Survey 470
Form 10
7/1/64

NATIONAL OPINION RESEARCH CENTER
University of Chicago

Assignment No. ____ - ____ - ____ Time for Callback _____

Telephone No. _____ First Interviewer _____

Name of Respondent _____ Date of 1st Interview _____

Address _____

9-

Re-interview assigned to: Time Began _____

Time Ended _____

==========

Hello. This is _____ from the opinion research center. About _____ weeks ago we talked to (you, your wife, your husband) on a survey we are doing here. (Is (he, she) home now?) Well we're finishing up our survey here this week and I thought I'd just check a few things before we leave.

---

1. First, have you been at home most of the last month or so, or have you been away?

At home 10-1
Away 2*
NORC use. . . . . y

*IF AWAY, ASK Q. 6 ON PAGE 4

2. A. Were the booms you heard recently louder than usual, about the same, or not as loud as usual?

Louder	11-1
Same	2
Not as loud	3
Don't know	X
NORC use	y

B. Would you say these recent booms are much more annoying, a little more annoying, or not as annoying as the other ones?

Much more annoying	12-1
A little more	2
Same	3
Not as annoying	4
Don't know	X
NORC use	y

---

3. Did any of the recent booms -- (ask each item below)

*IF YES TO Q.3, ASK "A" BEFORE GOING ON TO NEXT ITEM

A. And how annoyed did this make you feel --

	Yes	No	NORC	Very Annoyed	Moderately Annoyed	Only a little Annoyed	Or not at all Annoyed	DK NORC
1) Interfere with your radio or TV?	13-1*	2	3	4	5	6	7	y
2) Startle or frighten anyone in your family?	14-1*	2	3	4	5	6	7	y
3) Disturb your family's sleep?	15-1*	2	3	4	5	6	7	y
4) Make your house rattle or shake?	16-1*	2	3	4	5	6	7	y
5) Interfere with your family's rest or relaxation?	17-1*	2	3	4	5	6	7	y
6) Interfere with your conversation?	18-1*	2	3	4	5	6	7	y

4. Since I talked to you last time, did any of the recent booms hurt or do any new damage to anything in your house?

Yes.	19-1*
No	2
NORC	y

*IF YES, ASK A

A. Just what did they do? (Probe for specific damage)

Cracked walls or plaster	20-1
Cracked, broke windows	2
Cracked, damaged structures. . . .	3
Broke tiles or fixed objects . . .	4
Broke, knocked down moveable objects	5
Person injured	6
Person fell - not injured	7
Person dropped something	8
Other types of damage	9
Don't know	X
NORC use	y

---

5. And did you feel like doing something about stopping or reducing the recent booms? For example, did you feel like writing or telephoning an official? (Ask each item in A before asking B, etc.)

	ITEMS			
A. Felt like --	Writing or telephoning an official?	Visiting an official?	Signing a petition?	Helping to set up a citizens committee?
Yes.	21-1	22-1	23-1	24-1
No	2	2	2	2
NORC use	3	3	3	3
B. Have you or anyone in your family here actually done any of these things about stopping or reducing the recent booms? (Which?)				
Yes.	4	4	4	4
No	5	5	5	5
NORC use	6	6	6	6

6. Do you happen to know why the jets making booms have been flying around here?

Yes (ASK A)	25-1*
No	2
NORC use	y

*IF YES, ASK A:

A. Why is that?

Sonic boom test	26-1
FAA-SST test	2
Air Force Practice	3
For SST Air Terminal	4
Other (Specify)	5
NORC use	y

---

7. Do you yourself feel it is absolutely necessary for the jets to make these booms around here or not?

Yes	27-1
No	2
Don't know	X
NORC use	y

---

8. Do you have any idea how much longer these booms are supposed to continue around here?

Yes (ASK A)	28-1*
No	2

*IF YES, ASK A:

A. How much longer?

Less than 1 week	29-0
One week	1
Two weeks	2
Three weeks	3
Four weeks	4
Five or more weeks	5
Don't know	X
NORC use	y

---

9. Do you feel the booms should be stopped right away or do you feel they should be continued until they have served their purpose?

Stopped	30-1
Continued	2
Don't know	X
NORC use	y

10. A. Do you think people around here should complain about the booms if they find them annoying?

Yes.	31-1
No	2
Don't know	X
NORC use	y

B. Why do you say that? 32-

---

11. A. If your area received booms from a civilian jet as often and as loud as the recent ones for an indefinite period of time, do you think most people around here would very likely learn to live with it, that they might, or that they probably wouldn't learn to live with it?

B. And how about yourself -- would you very likely learn to live with it, you might, or you probably wouldn't be able to live with it?

	A Most People	B Self
Very likely . . .	33-1	34-1
Might	2	2
Would not	3	3
Don't know . . .	X	X
NORC use	y	y

Well I guess that's it. Thanks again for all your help.

Interviewer's Signature _____

Date _____

AMRL-TR-65-37
VOL. III
AD 637563

COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITY AREA

VOLUME III. QUESTIONNAIRES
APPENDIX TO VOLUME II

PAUL N. BORSKY

NATIONAL OPINION RESEARCH CENTER

MARCH 1966

AEROSPACE MEDICAL RESEARCH LABORATORIES
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

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COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITY AREA

VOLUME III. QUESTIONNAIRES
APPENDIX TO VOLUME II

PAUL N. BORSKY

FOREWORD

This study was initiated and funded by the Office of Supersonic Transport Development, Federal Aviation Agency, Washington, D.C. 20553. The Biophysics Laboratory, Aerospace Medical Research Laboratories, Wright-Patterson Air Force Base, Ohio, served as technical monitor. The research was conducted under Contract AF 33(657)-11148 by the National Opinion Research Center, University of Chicago, 55 Fifth Avenue, New York, N.Y. 10003. Mr. Paul N. Borsky was the principal investigator for National Opinion Research Center. Dr. Charles W. Nixon of the Biodynamics and Bionics Division was the contract monitor for the Aerospace Medical Research Laboratories. The work was performed in support of Project No. 7231, "Biomechanics of Aerospace Operations," and Task No. 723103, "Biological Acoustics in Aerospace Environments." The research sponsored by this contract was started in April 1963 and completed in February 1965. This report is the appendix to AMRL-TR-65-37, Volume II, dated October 1965.

J. W. HEIM, PhD
Technical Director
Biomedical Laboratory
Aerospace Medical Research Laboratories

ABSTRACT

This appendix contains samples of questionnaires used during the interviews that took place from February to July 1964 in the Oklahoma City, Oklahoma, area. That area was repeatedly exposed to sonic booms generated to simulate overpressure levels that are expected for supersonic transport overflights. The schedule provided for eight sonic booms per day. During the 6-month period, almost 3,000 local residents were interviewed three times to determine the nature and extent of their reactions to the sonic booms.

QUESTIONNAIRE DESIGN

The interview was designed to embed the questions about sonic booms in a general context of local living conditions to secure as unbiased a response as possible about reactions to the booms. Respondents were told, "This is a community survey of how different people feel about living in different areas. It attempts to record systematically the kinds of things people like and dislike about their environments and the kinds of individual and group actions taken to improve undesirable situations."

Sponsorship

At no time was the respondent advised that the study was being made for the government as part of the sonic boom evaluation. If asked about sponsorship, a respondent was told that the National Opinion Research Center of the University of Chicago was conducting the study as part of its regular urban studies. This was done to avoid possible bias in response. A person believing the study was sponsored by the government might have exaggerated his feelings in order to influence the government's decisions. Results indicate that this general approach was successful in over 90% of all interviews; only 8% voiced suspicion about the purposes or sponsorship of the survey.

Order of Questions

The questionnaire was divided into five sequences, as follows:

1. General questions about likes and dislikes and overall rating of the area.

2. Direct questions outlining a pattern of local behavior in response to a major annoyance or dislike.

3. General reaction to perceived noise disturbances and behavior patterns in response to them.

4. Direct questions on topical sonic booms, including knowledge, interferences, annoyance, feelings of importance and necessity, and projected feelings toward civilian jet booms.

5. Background information on the characteristics of the respondent.

3. A. Now, very few places are entirely perfect. So I'd like you to tell me if there are many things, a few things or hardly anything you dislike about living around here?

Many things	13-1
A few things.	2
Hardly anything	3
Don't know.	4
NORC use.	Y

B. Would you tell me some of the things you <u>don't like</u> -- things you may feel are <u>nuisances</u>, <u>irritations</u>, or are <u>unpleasant</u> and <u>bothersome conditions</u>? (Anything else?)

14-

15-

16-

C. Have we overlooked anything that may recently have bothered or disturbed your everyday living -- even little annoyances that you just take for granted because nothing much can be done about them?

---

4. Are there any dangerous conditions affecting this area that sometimes concern you?

Yes	17-1*
No.	2
NORC use.	Y

*A. <u>IF YES</u>: What are they? (Anything else?)

5. Now of all the things you don't like (there must be some) -- things you may feel are nuisances, irritations, disturbances, or bothersome conditions, which one thing do you dislike the most?

Nothing disliked	18-1*
Sonic booms, big booms	2
Noise - airplane	3
Noise - other	4
Danger - traffic, no sidewalks	5
Danger - other conditions	6
Location poor, inconvenient to facilities, jobs	7
Transportation, roads, highways, buses inadequate	8
Schools - buildings, instruction, transportation inadequate	9
Community facilities - other inadequate	0
Social aspects, dislike people, unfriendly	X
Zoning problems, mixed residence-business	19-1
Overcrowded, not enough privacy, space	2
Taxes too high, earnings tax unfair	3
Economic problems, no jobs, prices too high	4
Government poor, corrupt, pressure for annexation	5
All other reasons	6
Don't know	X*
NORC use	Y

IF SOMETHING DISLIKED MENTIONED, ASK E-G ON THE NEXT PAGE

*IF NOTHING DISLIKED OR DON'T KNOW, ASK A

A. At any time in the past, was there ever anything around here that you felt was a public problem or a nuisance, an irritation, a disturbance, or a bothersome condition?

Yes	20-1**
No	2
NORC use	Y

**IF YES, ASK B - D

B. Did you ever feel like doing something about this? For example, did you ever feel like:

	B			C		
	Yes	No	NORC	Yes	No	NORC
1) Writing or telephoning an official about it?	21-1	2	3	4	5	Y
2) Visiting an official?	22-1	2	3	4	5	Y
3) Signing a petition?	23-1	2	3	4	5	Y
4) or helping to set up a citizens' committee to do something?	24-1	2	3	4	5	Y

ASK C AFTER FINISHING PART B, AND CIRCLE YES OR NO CODES ABOVE FOR EACH OF THE FOUR ITEMS.

C. Did you or anyone in your family ever actually do any of these things? (Which?)

D. And what did you think the chances were to do something about that situation -- very good, good, fair or poor?

Very good	25-1
Good	2
Fair	3
Poor	4
Don't know	5
NORC use	Y

IF SOMETHING DISLIKED MENTIONED IN Q. 5, ASK E - G

E. Have you yourself ever felt like doing something about this? For example, have you ever felt like:

	E			F		
	Yes	No	NORC	Yes	No	NORC
1) Writing or telephoning an official?	26-1	2	3	4	5	Y
2) Visiting an official?	27-1	2	3	4	5	Y
3) Signing a petition?	28-1	2	3	4	5	Y
4) or helping to set up a citizens' committee to do something?	29-1	2	3	4	5	Y

ASK F AFTER FINISHING PART E, AND CIRCLE YES OR NO CODES ABOVE FOR EACH OF THE FOUR ITEMS.

F. Did you or anyone in your family ever actually do any of these things? (Which?)

G. And what do you think the chances are to do something about this -- very good, good, fair or poor?

Very good	30-1
Good	2
Fair	3
Poor	4
Don't know	5
NORC use	Y

---

6. On the whole, would you rate this area as very noisy, fairly noisy, fairly quiet, or very quiet?

Very noisy	31-1
Fairly noisy	2
Fairly quiet	3
Very quiet	4
Don't know	5
NORC use	Y

7. And what are some of the different kinds of noises you sometimes hear around here? (Any others?) (Circle Code 1 for each of the noises listed below which are mentioned spontaneously. Then prompt for any of these noises not mentioned by asking, "Do you ever hear noise from. . .?")

	Cars or trucks going by?	Neighbors or children?	Sonic booms from jets?	Ordinary noise from airplanes?
Mention spontaneously	32-1*	36-1*	40-1*	44-1*
Yes (prompted)	2*	2*	2*	2*
No, never hear	3	3	3	3
NORC use	4	4	4	4

*ASK A THROUGH F FOR EACH TYPE OF NOISE CODED 1 OR 2

A. How often do you hear the (kind of noise) --

Very often	32-5	36-5	40-5	44-5
Fairly often, or	6	6	6	6
Only occasionally?	7	7	7	7
Don't know	8	8	8	8
NORC use	9	9	9	9

B. Would you say this noise is usually --

Extremely loud	33-1	37-1	41-1	45-1
Fairly loud, or	2	2	2	2
Not so loud?	3	3	3	3
Don't know	4	4	4	4
NORC use	5	5	5	5

C. Would you say this noise could be reduced, or not?

Yes, could be reduced	33-6	37-6	41-6	45-6
No, couldn't be	7	7	7	7
Don't know	8	8	8	8
NORC use	9	9	9	9

	Cars or trucks going by?	Neighbors or children?	Sonic booms from jets?	Ordinary noise from airplanes?
D. Does this noise bother or annoy you --				
Very much.	34-1**	38-1**	42-1**	46-1**
Moderately	2**	2**	2**	2**
Only a little, or.	3**	3**	3**	3**
Not at all?	4*	4*	4*	4*
Don't know.	5	5	5	5
NORC use.	6	6	6	6
*IF NOT AT ALL, ASK E.				
E. Was it ever unpleasant, or did it ever bother you at all in the past?				
Yes	34-7	38-7	42-7	46-7
No.	8	8	8	8
Don't know.	9	9	9	9
NORC use.	Y	Y	Y	Y
**IF 1, 2 or 3 CODED ON D, ASK F				
F. How often does it bother you --				
Very often.	35-1	39-1	43-1	47-1
Fairly often, or.	2	2	2	2
Only occasionally	3	3	3	3
Don't know	4	4	4	4
NORC use	Y	Y	Y	Y

ASK Q. 8 ONLY IF RESPONDENT DOES NOT HEAR BOOMS (Q. 7, CODE 40-3)

8. As far as you know, have the jets recently caused any sonic booms while flying near here?

Yes	48-1*
No	2**
NORC use	Y

**IF NO, SKIP TO Q. 23

*ASK Qs. 9-22 IF RESPONDENT HEARS BOOMS (Q. 7, CODES 40-1 or 2) OR KNOWS OF BOOMS (Q. 8, CODE 48-1)

9. Have you heard or read anything about the recent sonic booms around here?

Yes	49-1*
No	2
NORC use	Y

*IF YES, ASK "A"

A. Where did you hear about it? (Any place else?) (Circle all codes mentioned spontaneously, then ask for each not mentioned: Did you hear anything about it from ____?)

	YES Spontaneous	YES Probed	NO	NORC
Newspapers	50-1	2	3	Y
TV	51-1	2	3	Y
Radio	52-1	2	3	Y
Neighbors or friends	53-1	2	3	Y
Other (Specify)	54-1	2	3	Y

10. A. Could you tell me what causes the jets to make a boom?

55-

B. (When you hear the boom) can you always tell it's from a jet, or do you sometimes wonder what the boom is?

Can tell	56-1
Sometimes wonder	2
Don't know	3
NORC use	Y

*C. IF "SOMETIMES WONDER": What do you think it might be?

57-

D. Do you usually hear the booms about the same time each day or do they happen at different times each day?

Same time	58-1
Different times	2
Don't know	3
NORC use	Y

11. Do you happen to know why the jets making booms fly around here?

Yes	59-1*
No	2
NORC use	Y

*A. IF YES: Why is that?

60-

---

12. A. Do you yourself feel it is absolutely necessary for the jets to make these booms around here, or not?

Yes	61-1
No	2
Don't know	3
NORC use	Y

B. Why is that?

62-

63-

---

13. From what you've heard or read, do you think most other people around here feel it is absolutely necessary, or not?

Necessary	64-1
Not necessary	2
Don't know	3
NORC use	Y

---

14. The way things are now would you say the aviation officials responsible for the booms, care about the feelings and comfort of residents like yourself -- do you think they care very much, moderately, only a little, or don't they care at all?

Very much	65-1
Moderately	2
A little	3
Not at all	4
Don't know	5
NORC use	Y

---

15. Do you happen to know how long these booms are supposed to continue altogether?

Yes	66-1*
No	2
NORC use	Y

*A. IF YES: How long is that?

1 month or less	67-1
2 months	2
3 months	3
4 months	4
5 months	5
6 months	6
7 months or more	7
Indefinitely	8
NORC use	Y

*IF YES TO ANY ITEM ON Q. 16, ASK A & B BEFORE GOING ON TO NEXT ITEM

16. Can you tell me if the recent booms ever (Ask each item below) (Do they ever. . .)	Yes	No	NORC	A. How often is that. . . very often	fairly often	or only occasionally?	DK NORC	B. And how annoyed does this make you feel. . . very annoyed	moderately annoyed	only a little annoyed	or not at all annoyed?	DK NORC
Interfere with your radio or TV?	68-1*	2	3	4	5	6	7	8	9	0	X	Y
Startle or frighten anyone in your family?	69-1*	2	3	4	5	6	7	8	9	0	X	Y
Disturb your family's sleep?	70-1*	2	3	4	5	6	7	8	9	0	X	Y
Make your house rattle or shake?	71-1*	2	3	4	5	6	7	8	9	0	X	Y
Interfere with your family's rest or relaxation?	72-1*	2	3	4	5	6	7	8	9	0	X	Y
Interfere with your conversation?	73-1*	2	3	4	5	6	7	8	9	0	X	Y
				74-	75-	76-		77-	78-	79-	80-1	

17. Have the booms ever hurt or damaged anything in your house?

Yes 9-1*
No. 2
NORC use. 3

*IF YES, ASK A & B

A. Just what did they do? (Probe for specific damage) (Anything else?)

Cracked walls or plaster	10-1
Cracked, broke windows	2
Cracked, damaged structures	3
Broke tiles or fixed object	4
Broke, knocked down moveable objects	5
Person injured	6
Person fell-not injured	7
Person dropped something	8
Other types of damage	9
Don't know	0
NORC use	Y

B. About when did that happen? (Circle as many as apply)

1956 Air Show	11-1
1957-1963	2
1964	3
Don't know	4
NORC use	Y

1- 2- 3- 4- 5- 6- 7- 8-

18. Have you yourself ever felt like doing something about the booms. For example have you ever felt like writing or telephoning an official? (Ask each item in A before asking B, etc.)

A. (Ever felt like --	Writing or telephoning an official?	Visiting an official?	Signing a petition?	Helping to set up a citizens' committee?
	ITEMS			
Yes	12-1	13-1	14-1	15-1
No	2	2	2	2
NORC use	3	3	3	3
B. Have you or anyone in your family actually done any of these things? (Which?)				
Yes	4*	4*	4*	4*
No	5	5	5	5
NORC use	6	6	6	6

*C. IF YES TO ANY ITEM IN B, ASK: Did it do any good?

Yes	16-1
No	2
Don't know	3
NORC use	Y

D. If a local organization asked you, do you think you would very likely (insert item), that you might but you're not sure, or that you probably wouldn't?	Write or telephone an official	Visit an official	Sign a petition	Help set up a committee
Very likely	17-1	18-1	19-1	20-1
Might	2	2	2	2
Wouldn't	3	3	3	3
Don't know	4	4	4	4
NORC use	Y	Y	Y	Y

19. On the whole, what do you think the chances are for doing anything about the booms? Would you say there was a very good chance, a good chance, only a fair chance, or hardly any chance at all to improve the situation?

Very good chance	21-1
Good chance	2
Fair chance	3
Hardly any chance	4
Don't know	5
NORC use	Y

20. Do you happen to know where to call if you want to complain about the booms?

Yes	22-1*
No.	2
NORC use.	3

*A. IF YES: Where is that?

23-

---

21. Do you happen to know which group is responsible for having the booms here?

Yes	24-1*
No.	2
NORC use.	3

*A. IF YES: Which one is that?

FAA	24-4
Air Force	5
Other (Specify) . . .	6
NORC use.	Y

---

22. A. Do you think people around here should complain about these booms if they find them annoying?

Yes	25-1
No.	2
Don't know.	3
NORC use.	Y

B. Why is that?

26-

ASK EVERYBODY

ASK EVERYBODY

23. As you (probably know)(already told me) the recent booms around here are part of a government development program of a new supersonic airplane that will fly about 2000 miles an hour. Do you feel it is absolutely necessary for our country to have such a civilian plane, do you feel it is probably necessary, or do you feel it is not necessary?

Absolutely necessary.	27-1
Probably necessary. .	2*
Not necessary	3*
Don't know.	4*
NORC use.	Y

*IF PROBABLY, NOT, OR DON'T KNOW, ASK A

A. As you may know, the French, British and the Russians are already building a commercial supersonic airplane. If these countries have such a plane, would you feel it absolutely necessary for Americans to make one too, would it probably be necessary, or would it not be necessary?

Absolutely necessary.	28-1
Probably necessary. .	2**
Not necessary	3**
Don't know.	4**
NORC use.	Y

**IF PROBABLY, NOT, OR DON'T KNOW ON "A", ASK B

B. If the sonic boom could be reduced, would you feel it desirable for us to have a commercial plane that travels about 2,000 miles an hour, or don't you feel we need such a plane?

Desirable	29-1
Not necessary	2
Don't know.	3
NORC use.	Y

---

24. From what you know about the government's study of supersonic airplanes around here, do you definitely feel the study should be made around here, that it probably should be, or that it should not be made around here?

Definitely should	30-1
Probably should	2
Should not.	3
Don't know.	4
NORC use.	Y

---

25. How about civilian airplanes and the commercial air transporation industry in general -- How important do you feel <u>they</u> are to our national welfare -- extremely important, moderately important, a little important or not very important?

Extremely important	31-1
Moderately.	2
A little.	3
Not very important.	4
Don't know.	5
NORC use.	Y

26. How about the importance of civilian aviation to the welfare of Oklahoma City and surrounding towns -- Do you feel it is extremely important, moderately important, a little important or not very important?

Extremely important . . .	32-1
Moderately.	2
A little.	3
Not very important. . . .	4
Don't know.	5
NORC use.	Y

---

27. A. If this area received eight booms every day throughout the year from a civilian supersonic airplane, do you think you very likely could learn to live with it after a while, that you might but you're not sure, or do you think you probably couldn't learn to live with it?

Very likely	33-1#
Might	2#
Couldn't.	3*
Don't know.	4*
NORC use.	Y

* IF COULDN'T OR DON'T KNOW TO "A", ASK B

B. How about 5 or 6 civilian booms every day? (Do you think you very likely could learn to live with that, that you might, or that you probably couldn't learn to live with it?)

Very likely	34-1
Might	2
Couldn't.	3**
Don't know.	4**
NORC use.	Y

** IF COULDN'T OR DON'T KNOW TO "B", ASK C

C. How about 1 or 2 civilian booms every day? (Do you think you very likely could learn to live with that, that you might, or that you probably couldn't learn to live with it?)

Very likely	35-1
Might	2
Couldn't.	3
Don't know.	4
NORC use.	Y

\# IF VERY LIKELY OR MIGHT TO "A", ASK D

D. How about 10-12 civilian booms every day? (Do you think you could very likely learn to live with it, that you might but you're not sure, or that you probably couldn't learn to live with it?

Very likely	36-1
Might	2
Couldn't.	3
Don't know.	4
NORC use.	Y

28. And how about several civilian booms every night? (Do you think you could very likely learn to live with it, that you might but you're not sure, or that you probably couldn't learn to live with it?)

Very likely	37-1
Might	2
Couldn't.	3
Don't know.	4
NORC use.	Y

Now we have what we call background information and we'll be through.

29. 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:	
Respondent	M F		38-
	M F		39-
	M F		
	M F		
	M F		
	M F		

---

30. Have you ever felt like moving away from this area?

Yes	40-1*
No.	2
NORC use.	3

*A. IF YES: Have you taken any definite steps to find another place?

Yes	4
No.	5
NORC use.	Y

---

31. Now what is the highest grade of school you've completed?

Completed 0-4 years of grade school . . .	41-1
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

32. (HAND RESPONDENT CARD) Now for statistical purposes, we need to know something about family incomes. Would you just tell me which of the following six categories comes closest to the amount all members of your family earned all together last year. I mean, how much did they get all together from all sources before taxes and other deductions? (Read categories)

A. Less than $4,000	42-1
B. $4,000 but less than $6,000	2
C. $6,000 but less than $8,000	3
D. $8,000 but less than $10,000	4
E. $10,000 but less than $15,000	5
F. $15,000 or more	6
Refused	7
NORC use	Y

---

33. Now here's a different kind of question. I have a list of noises which sometimes annoy people. Do these ever annoy you when you hear them? (Read list)

	Annoy		Never	
	Yes	No	Hear	
A. The noise of a lawn mower	43-1	44-1	45-1	
B. A dripping faucet	2	2	2	
C. A dog barking continuously	3	3	3	
D. The sound of a knife grating on a plate	4	4	4	
E. Somebody whistling out of tune	5	5	5	
F. Somebody switching on the radio or TV when you want to be quiet	6	6	6	
G. A pneumatic drill	7	7	7	
H. A banging door	8	8	8	
				46-

---

34. Would you say you were more sensitive or less sensitive than most people are to noise?

More sensitive	47-1
Less sensitive	2
Same	3
Don't know	4
NORC use	Y

---

35. Would you say you were more sensitive or less sensitive than most people are to things in general?

More sensitive	48-1
Less sensitive	2
Same	3
Don't know	4
NORC use	Y

---

36. How far would you agree or disagree with people who say "noise is one of the biggest nuisances of modern times" -- Would you agree strongly, agree, disagree, or disagree strongly?

Agree strongly	49-1
Agree	2
Disagree	3
Disagree strongly	4
Don't know	5
NORC use	Y

37. By the way, have you ever flown in a plane?

Yes	50-1*
No	2**
Don't know	3
NORC use	Y

*IF YES, ASK A & B

A. About how many times?

Once or twice - a few	51-1
Three or four	2
Five or more	3
Don't know	4
NORC use	Y

B. When was the last time?

12 months ago or less	52-1
One to 3 years ago	2
Four or more years ago	3
Don't know	4
NORC use	Y

**IF NO, ASK C

C. Has anyone in your family ever flown in one?

Yes	53-1
No	2
Don't know	3
NORC use	Y

---

38 A. Could you tell me who is the main earner in this family?

B. What sort of work does (main earner in the family) do?

Job:

Industry:

Place: 54-

IF RESPONDENT IS NOT MAIN EARNER, ASK C - E

C. Do you have a job away from home?

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

*IF YES TO C, ASK D

D. What sort of work is that?

Job:

Industry:

Place: 55-

**IF NO TO C, ENTER STATUS BELOW: (Student, Housewife, Retired, etc.)

39. Have you or anyone in your family ever worked for the Federal Aviation Agency or any civilian aviation company?

Yes	56-1*
No.	2**
Don't know.	3
NORC use.	Y

*A. IF YES: Are you (they) working there now?

Yes	57-1
No.	2
Don't know.	3
NORC use.	Y

**B. IF NO: Have you or anyone in your family ever worked for the Air Force or any company that does much of its business with the aviation industry?

Yes.	58-1
No.	2
Don't know.	3
NORC use.	Y

---

40. (Casually) By the way, had you heard anything about this survey before this interview?

Yes	59-1*
No.	2
NORC use.	3

*A. IF YES: What have you heard? (Who was doing the survey? For what purpose?)

60-

---

41. A. Now in case the office finds I've left something out, what would be the best time to call you? (Enter on first page)

B. And what is your phone number? (Enter on first page)

42. Is there anything else you'd like to tell me, that I haven't already asked you? 61-

62-

63-

64-

65-

66-

67-

68-

69-

70-

71-

72-

Well, I guess that's it. Thanks for all your help. 73-

74-

TO BE COMPLETED BY THE INTERVIEWER AFTER THE INTERVIEW 75-

1. Was the respondent suspicious of the stated purpose of the interview or the interviewer? 76-

Yes ( ) No ( ) 77-

IF YES, EXPLAIN: 78-

79-

80-2

2. Was the respondent always relaxed and willing to answer all questions frankly, or was he sometimes tense, defensive, uncooperative?

Always frank -- yes ( ) No ( )

IF NO, EXPLAIN:

1- 2- 3- 4- 5- 6- 7- 8- Pink

NATIONAL OPINION RESEARCH CENTER
University of Chicago

Second Interview (First Callback)

Assignment No._____-_____-_____ Time for Callback_____

Telephone No. _____ First Interviewer_____

Name of Respondent_____ Date of 1st Interview_____

Respondent Description_____

Address_____

9-

Re-interview assigned to: Time Began_____

Time Ended_____

Hello. This is_____ from the opinion research center. About ___ weeks ago we interviewed (you, your wife, your husband) on a survey we are doing around here. /Is (he,she) home now?/ I'd like to thank you again for your help and I've been asked to check a few additional things with you.

---

1. First, during the last few weeks, have you heard any booms from the jets flying near here?

Yes	10-1
No.	2*
NORC use.	Y

*IF NO, ASK "A" THEN END INTERVIEW

A. Have you been at home during most of the last month or so, or have you been away?

At home	11-1
Away.	2
NORC use.	Y

2. Were the booms you heard recently louder than usual, about the same, or not as loud as usual?

Louder.	12-1*
Same.	2
Not as loud	3
Don't know.	4
NORC use.	Y

*IF LOUDER, ASK A

A. Would you say these louder booms are much more annoying, a little more annoying, or not as annoying as the other ones?

Much more annoying. .	13-1
A little more	2
Same.	3
Not as annoying . . .	4
Don't know.	5
NORC use.	Y

---

3. A. In the last month or so, during the morning hours, have you heard more booms than usual, about the same, or less than usual?

B. How about the late afternoon? (Have you heard more booms, about the same, or less than usual?)

	Morning	Late Afternoon
More.	14-1*	15-1
Same.	2	2
Less.	3	3
Practically none. . . .	4	4
Don't know.	5	5
NORC use.	Y	Y

*IF MORE IN MORNING, ASK C

C. Would you say having more booms during the morning is much more annoying, a little more annoying, or not as annoying as before?

Much more annoying. .	16-1
A little more	2
Same.	3
Not as annoying . . .	4
Don't know.	5
NORC use.	Y

4. Did any of the recent booms -- (ask each item below)

*IF "YES" TO Q. 4, ASK "A" BEFORE GOING ON TO NEXT ITEM

A. And how annoyed did this make you feel --

	Yes	No	NORC	Very Annoyed	Moderately Annoyed	Only a little Annoyed	Or Not at all Annoyed	DK NORC
1) Interfere with your radio or TV?	17-1*	2	3	4	5	6	7	Y
2) Startle or frighten anyone in your family?	18-1*	2	3	4	5	6	7	Y
3) Disturb your family's sleep?	19-1*	2	3	4	5	6	7	Y
4) Make your house rattle or shake?	20-1*	2	3	4	5	6	7	Y
5) Interfere with your family's rest or relaxation?	21-1*	2	3	4	5	6	7	Y
6) Interfere with your conversation?	22-1*	2	3	4	5	6	7	Y

---

5. Did any of the recent booms during the last month or so hurt or damage anything in your house?

Yes	23-1*
No	2
NORC	Y

*IF YES, ASK A

A. Just what did they do? (Probe for specific damage)

Cracked walls or plaster	24-1
Cracked, broke windows	2
Cracked, damaged structures	3
Broke tiles or fixed object	4
Broke, knocked down moveable objects	5
Person injured	6
Person fell - not injured	7
Person dropped something	8
Other types of damage	9
Don't know	X
NORC use	Y

6. And did you feel like doing something about stopping or reducing the recent booms? For example, did you feel like writing or telephoning an official? (Ask each item in A before asking B, etc.)

	ITEMS			
A. Felt like --	Writing or telephoning an official?	Visiting an official?	Signing a petition?	Helping to set up a citizens committee?
Yes	25-1	26-1	27-1	28-1
No	2	2	2	2
NORC use	3	3	3	3
B. Have you or anyone in your family here actually done any of these things about stopping or reducing the recent booms? (Which?)				
Yes	4	4	4	4
No	5	5	5	5
NORC use	6	6	6	6

7. A. If your area regularly received booms from a civilian jet as often and as loud as the recent ones, do you think most people around here would very likely learn to live with it, that they might, or that they probably wouldn't learn to live with it?

B. And how about yourself -- would you very likely learn to live with it, you might, or you probably wouldn't be able to live with it?

	A Most People	B Self
Very likely	29-1	30-1
Might	2	2
Would not	3	3
Don't know	4	4
NORC use	Y	Y

8. Do you yourself feel it is absolutely necessary for the jets to make these booms around here, or not?

Yes	31-1
No	2
Don't know	3
NORC use	Y

Well, I guess that's it. Thanks again for all your help.

32-	33-	34-	35-	36-	37-	38-

Interviewer's Signature:_____ Date:_____

White

1- 2- 3- 4- 5- 6- 7- 8-

19-1
2
3
4
5
Y

NATIONAL OPINION RESEARCH CENTER
University of Chicago

First Interview (Telephone)

(Also Used for Control Interview at Time of First Callback)

Assignment No.: _____ - _____ - _____

Time Interview Began: _____

Telephone No.: _____

Time Interview Ended: _____

Date: _____ 9-

Name on
Telephone List: _____

Description
Respondent (Q. 22): _____

Address: _____

Hello. (Is this the home of_____ at _____?) I'm from the opinion research center at the University of Chicago. We are doing a study of how people feel about living in different places and I'd like to get some of your views.

---

1. The first question is: In general, how do you like living in your area? Do you rate it as an excellent, good, fair, or poor place to live?

Excellent	10-1
Good.	2
Fair.	3
Poor.	4
Don't know.	5
NORC use.	Y

---

2. Now, very few places are entirely perfect. So I'd like you to tell me if there are many things, a few things or hardly anything you dislike about living around here?

Many things	11-1
Few things.	2
Hardly anything	3
Don't know.	4
NORC use.	Y

RC
Y
Y
Y
Y
THE

24-1
2
3
4
5
Y

25-1
2
3
4
5
Y

5. A. And what are some of the different kinds of noise you sometimes hear around here? For example, do you ever hear noise from --

	A			B		
	Yes	No	NORC	Yes	No	NORC
1) Cars, trucks or trains going by?	26-1*	2	3	4	5	Y
2) Neighbors or children?	27-1*	2	3	4	5	Y
3) Sonic booms from jets?	28-1*	2**	3	4	5	Y
4) Ordinary airplane noise?	29-1*	2	3	4	5	Y

*IF YES TO ANY NOISE, ASK B, AND CIRCLE YES OR NO CODE FOR EACH NOISE HEARD

B. Do any of these noises ever bother or annoy you or anyone in your family in any way? (Which noises?)

**IF NO TO "BOOMS" (DO NOT HEAR BOOMS), SKIP TO Q. 17.

ASK Qs. 6-16 ONLY IF YES TO BOOMS (DO HEAR BOOMS)

---

6. Now I'd like to get a better idea of how you feel about some of these noises. First, have you heard or read anything about the recent sonic booms around here?

Yes	30-1
No.	2
NORC use.	Y

---

7. Could you tell me what causes the jets to make a boom?

Break sound barrier	31-1
Create pressure waves	2
Planes fly faster than sound. . . .	3
Other (Specify)	4
Don't know.	5
NORC use.	Y

---

8. Do you happen to know why the jets making booms fly around here? (Why is that?)

Don't know.	32-0
Sonic boom test	1
FAA-SST test.	2
Air Force Practice. . . .	3
Other (Specify)	4

9. A. Do you yourself feel it is absolutely necessary for the jets to make these booms around here or not?

B. From what you've heard or read, do you think most other people around here feel it is absolutely necessary or not?

	A Self	B Others
Necessary	33-1	34-1
Not necessary	2	2
Don't know.	3	3
NORC use.	Y	Y

---

10. Do you usually hear the booms about the same time each day, or do they happen at different times each day?

Same time	35-1
Different times	2
Don't know.	3
NORC use.	Y

---

11. Do you happen to know how long these booms are supposed to continue altogether? How long?

Don't know.	36-0
One month or less	1
2 months.	2
3 months.	3
4 months.	4
5 months.	5
6 months.	6
7 months.	7
Indefinitely.	8
NORC use.	Y

*IF YES TO ANY ITEM IN Q. 12, ASK A & B BEFORE GOING ON TO NEXT ITEM

12. Can you tell me if the recent booms ever (Ask each item below) (Do they ever. . .)	Yes	No	NORC	A. How often is that. . . very often	fairly often,	or only occasionally?	DK NORC	B. And how annoyed does this make you feel. . . very annoyed	moderately annoyed	only a little annoyed	or not at all annoyed?	DK NORC
Interfere with your radio or TV?	37-1*	2	3	4	5	6	7	8	9	0	X	Y
Startle or frighten anyone in your family?	38-1*	2	3	4	5	6	7	8	9	0	X	Y
Disturb your family's sleep?	39-1*	2	3	4	5	6	7	8	9	0	X	Y
Make your house rattle or shake?	40-1*	2	3	4	5	6	7	8	9	0	X	Y
Interfere with your family's rest or relaxation?	41-1*	2	3	4	5	6	7	8	9	0	X	Y
Interfere with your conversation?	42-1*	2	3	4	5	6	7	8	9	0	X	Y

13. Have the booms ever hurt or damaged anything in your house?

Yes 43-1*
No. 2
NORC use. 3

*IF YES, ASK A & B

A. Just what did they do? (Probe for specific damage) (Anything else?)

Cracked walls or plaster. 43-1
Cracked, broke windows. 2
Cracked, damaged structures 3
Broke tiles or fixed object 4
Broke, knocked down moveable objects. 5
Person injured. 6
Person fell-not injured 7
Person dropped something. 8
Other types of damage 9
Don't know. 0
NORC use. . . . . Y

B. About when did that happen? (Circle as many as apply)

1956 Air Show. 44-1
1957-1963. 2
1964 3
Don't know 4
NORC use . . . . . Y

14. Have you yourself ever felt like doing something about the booms? For example have you ever felt like writing or telephoning an official? (Ask each item in A before asking B, etc.)

	ITEMS			
A. (Ever felt like --	Writing or telephoning an official?	Visiting an official?	Signing a petition?	Helping to set up a citizens' committee?
Yes	46-1	47-1	48-1	49-1
No	2	2	2	2
NORC use	3	3	3	3
B. Have you or anyone in your family actually done any of these things? (Which?)				
Yes	4*	4*	4*	4*
No	5	5	5	5
NORC use	6	6	6	6

*C. IF YES TO ANY ITEM IN "B", ASK: Did it do any good?

Yes	50-1
No	2
Don't know	3
NORC use	Y

D. If a local organization asked you, do you think you would very likely (insert item), that you might but you're not sure, or that you probably wouldn't?	Write or telephone an official	Visit an official	Sign a petition	Help set up a committee
Very likely	51-1	52-1	53-1	54-1
Might	2	2	2	2
Wouldn't	3	3	3	3
Don't know	4	4	4	4
NORC use	Y	Y	Y	Y

---

15. On the whole, what do you think the chances are for doing anything about the booms? Would you say there was a very good chance, a good chance, only a fair chance, or hardly any chance at all to improve the situation?

Very good chance	55-1
Good chance	2
Fair chance	3
Hardly any chance	4
Don't know	5
NORC use	Y

---

16. Do you think people around here should complain about these booms if they find them annoying?

Yes	56-1
No	2
Don't know	3
NORC use	Y

ASK EVERYBODY

ASK EVERYBODY

17. As you(probably know)(already told me) the recent booms around here are part of a government development program of a new supersonic airplane that will fly about 2000 miles an hour. Do you feel it is absolutely necessary for our country to have such a civilian plane, do you feel it is probably necessary, or do you feel it is not necessary?

Absolutely necessary. . .	57-1
Probably necessary. . . .	2*
Not necessary	3*
Don't know.	4*
NORC use.	Y

*IF PROBABLY, NOT, OR DON'T KNOW, ASK A

A. As you may know, the French, British and Russians are already building a commercial supersonic airplane. If these countries have such a plane, would you feel it absolutely necessary for Americans to have one too, would it probably be necessary, or would it not be necessary?

Absolutely necessary. . .	58-1
Probably necessary. . . .	2**
Not necessary	3**
Don't know.	4**
NORC use.	Y

**IF PROBABLY, NOT, OR DON'T KNOW ON "A", ASK B

B. If the sonic boom could be reduced, would you feel it desirable for us to have a commercial plane that travels about 2,000 miles an hour, or don't you feel we need such a plane?

Desirable	59-1
Not necessary	2
Don't know.	3
NORC use.	Y

---

18. How about civilian airplanes and the commercial air transportation industry in general -- How important do you feel they are to our national welfare -- extremely important, moderately important, a little important or not very important?

Extremely important . . .	60-1
Moderately.	2
Little.	3
Not very important. . . .	4
Don't know.	5
NORC use.	Y

---

19. How about the importance of civilian aviation to the welfare of Oklahoma City and surrounding towns -- Do you feel it is extremely important, moderately important, a little important or not very important?

Extremely important . . .	61-1
Moderately	2
Little.	3
Not important	4
Don't know.	5
NORC use.	Y

20. A. If this area received eight booms every day throughout the year from a civilian supersonic airplane, do you think you could very likely learn to live with it after a while, that you might but you're not sure, or do you think you probably couldn't learn to live with it?

Very likely	62-1#
Might	2#
Couldn't.	3*
Don't know.	4*
NORC use.	Y

*IF COULDN'T OR DON'T KNOW TO "A", ASK B

B. How about 5 or 6 civilian booms every day? (Do you think you very likely could learn to live with that, that you might, or that you probably couldn't learn to live with it?)

Very likely	63-1
Might	2
Couldn't.	3**
Don't know.	4**
NORC use.	Y

**IF COULDN'T OR DON'T KNOW TO "B", ASK C

C. How about 1 or 2 civilian booms every day? (Do you think you very likely could learn to live with that, that you might, or that you probably couldn't learn to live with it?)

Very likely	64-1
Might	2
Couldn't.	3
Don't know.	4
NORC use.	Y

#IF VERY LIKELY OR MIGHT ON "A", ASK D

D. How about 10-12 civilian booms every day? (Do you think you could very likely learn to live with it, that you might but you're not sure, or that you probably couldn't learn to live with it?

Very likely	65-1
Might	2
Couldn't.	3
Don't know.	4
NORC use.	Y

---

21. And how about several civilian booms every night? (Do you think you very likely could learn to live with that, that you might, or that you probably couldn't learn to live with it?)

Very likely	66-1
Might	2
Couldn't.	3
Don't know.	4
NORC use.	Y

Now we have what we call background information and we'll be through.

22. 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	67-
Respondent	M F		
	M F		68-
	M F		
	M F		
	M F		
	M F		

23. Now what is the highest grade of school you completed?

Completed 0-4 years of grade school . . .	69-1
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

24. Now for statistical purposes, we need to know something about family incomes. Would you just tell me which of the following six categories comes closest to the amount all members of your family earned all together from all sources before taxes and other deductions? (Read categories)

A. Less than $4,000	70-1
B. $4,000 but less than $6,000.	2
C. $6,000 but less than $8,000.	3
D. $8,000 but less than $10,000	4
E. $10,000 but less than $15,000.	5
F. $15,000 or more.	6
Refused	7
NORC use.	Y

25. A. Are you usually at home during the morning hours?

B. How about the afternoon? (Are you usually at home?)

C. And the evening hours?

	At Home	Not At Home	NORC
A. Morning (7AM-12 Noon). . . .	71-1	2	Y
B. Afternoon (Noon-6 PM)... . .	72-1	2	Y
C. Evening (6PM-11PM)	73-1	2	Y

---

26. Have you or anyone in your family worked for the Federal Aviation Agency or any civilian aviation company?

Yes	74-1*
No.	2**
Don't know.	3
NORC use.	Y

*A. IF YES: Are you (they) working there now?

Yes	75-1
No.	2
Don't know.	3
NORC use.	Y

**B. IF NO: Have you or anyone in your family ever worked for the Air Force or any company that does much of its business with the aviation industry?

Yes	76-1
No.	2
Don't know.	3
NORC use.	Y

---

27. (Casually) By the way, had you heard anything about this survey before this interview?

Yes	77-1*
No.	2
NORC use.	3

*A. IF YES: What have you heard? (Who was doing the survey? For what purpose?)

78-

---

28. Now in case the office finds I've left something out, what would be the best time to call you?

Well, I guess that's it. Thanks for all your help.

TO BE COMPLETED BY THE INTERVIEWER AFTER THE INTERVIEW

1. Was the respondent suspicious of the stated purpose of the interview or the interviewer?

Yes ( ) No ( )

IF YES, EXPLAIN:

---

2. Was the respondent always relaxed and willing to answer all questions frankly, or was he sometimes tense, defensive, uncooperative?

Always frank -- Yes ( ) No ( )

IF NO, EXPLAIN:

79-

80-3

Interviewer's Signature: _____

Green (Form 10)

1- 2- 3- 4- 5- 6- 7- 8-

NATIONAL OPINION RESEARCH CENTER
University of Chicago

Third Interview (Second Callback)

Assignment No. ____ - ____ - ____ Time for Callback _____

Telephone No. _____ First Interviewer _____

Name of Respondent _____ Date of 1st Interview _____

Address _____

9-

Re-interview assigned to: Time Began _____

Time Ended _____

==========

Hello. This is _____ from the opinion research center. About _____ weeks ago we talked to (you, your wife, your husband) on a survey we are doing here. (Is (he, she) home now?) Well we're finishing up our survey here this week and I thought I'd just check a few things before we leave.

---

1. First, have you been at home most of the last month or so, or have you been away?

At home 10-1
Away 2*
NORC use. . . . . y

*IF AWAY, ASK Q. 6 ON PAGE 4

6. Do you happen to know why the jets making booms have been flying around here?

		as
Yes (ASK A)	25-1*	1-1
No	2	2
		3
NORC use	y	X
		y

*IF YES, ASK A:

A. Why is that?

Sonic boom test	26-1	
FAA-SST test	2	
Air Force Practice	3	
For SST Air Terminal	4	2-1
Other (Specify)	5	2
		3
		4
NORC use	y	X
		y

---

7. Do you yourself feel it is absolutely necessary for the jets to make these booms around here or not?

Yes	27-1	
No	2	
Don't know	X	
NORC use	y	

---

8. Do you have any idea how much longer these booms are supposed to continue around here?

Yes (ASK A)	28-1*	DK
No	2	NORC

*IF YES, ASK A:

A. How much longer?

Less than 1 week	29-0	y
One week	1	
Two weeks	2	
Three weeks	3	
Four weeks	4	y
Five or more weeks	5	
Don't know	X	
NORC use	y	y

---

9. Do you feel the booms should be stopped right away or do you feel they should be continued until they have served their purpose?

Stopped	30-1	y
Continued	2	
Don't know	X	
NORC use	y	y

10. A. Do you think people around here should complain about the booms if they find them annoying?

Yes	31-1
No	2
Don't know	X
NORC use	y

B. Why do you say that? 32-

---

11. A. If your area received booms from a civilian jet as often and as loud as the recent ones for an indefinite period of time, do you think most people around here would very likely learn to live with it, that they might, or that they probably wouldn't learn to live with it?

B. And how about yourself -- would you very likely learn to live with it, you might, or you probably wouldn't be able to live with it?

	A Most People	B Self
Very likely	33-1	34-1
Might	2	2
Would not	3	3
Don't know	X	X
NORC use	y	y

Well I guess that's it. Thanks again for all your help.

Interviewer's Signature _____

Date _____

3. Now of all the things you don't like (there must be some) -- things you may feel are nuisances, irritations, disturbances, or bothersome conditions, which <u>one thing</u> do you dislike the most?

Nothing disliked.	12-1*
Sonic booms, big booms.	2
Noise - airplane.	3
Noise - other	4
Danger - traffic, no sidewalks.	5
Danger - other conditions	6
Location poor, inconvenient to facilities, jobs	7
Transportation, roads, highways, buses inadequate	8
Schools - buildings, instruction, transportation inadequate .	9
Community facilities - other inadequate	0
Social aspects, dislike people, unfriendly.	X
Zoning problems, mixed residence-business	13-1
Overcrowded, not enough privacy, space.	2
Taxes too high, earning tax unfair.	3
Economic problems, no jobs, prices too high	4
Government poor, corrupt, pressure for annexation	5
All other reasons	6
Don't know.	X
NORC use.	Y

<u>IF SOMETHING DISLIKED MENTIONED, ASK E - G ON THE NEXT PAGE</u>

*<u>IF NOTHING DISLIKED OR DON'T KNOW, ASK A</u>

A. At any time in the past, was there ever anything around here that you felt was a public problem or a nuisance, an irritation, a disturbance, or a bothersome condition?

Yes	14-1**
No.	2
NORC use.	Y

**<u>IF YES, ASK B - D</u>

B. Did you ever feel like doing something about this? For example, did you ever feel like:

	B			C		
	<u>Yes</u>	<u>No</u>	<u>NORC</u>	<u>Yes</u>	<u>No</u>	<u>NORC</u>
1) Writing or telephoning an official about it?.	15-1	2	3	4	5	Y
2) Visiting an official?	16-1	2	3	4	5	Y
3) Signing a petition?	17-1	2	3	4	5	Y
4) or helping to set up a citizens' committee to do something?.	18-1	2	3	4	5	Y

<u>ASK C AFTER FINISHING PART B, AND CIRCLE YES OR NO CODES ABOVE FOR EACH OF THE FOUR ITEMS</u>

C. Did you or anyone in your family ever actually do any of these things? (Which?)

D. And what did you think the chances were to do something about that situation -- very good, good, fair or poor?

Very good	19-1
Good.	2
Fair.	3
Poor.	4
Don't know.	5
NORC use.	Y

IF SOMETHING DISLIKED IN Q. 3, ASK E - G

E. Have you yourself ever felt like doing something about this? For example, have you ever felt like:

	E			F		
	Yes	No	NORC	Yes	No	NORC
1) Writing or telephoning an official?. .	20-1	2	3	4	5	Y
2) Visiting an official?.	21-1	2	3	4	5	Y
3) Signing a petition?.	22-1	2	3	4	5	Y
4) or helping to set up a citizens' committee to do something?	23-1	2	3	4	5	Y

ASK F AFTER FINISHING PART E, AND CIRCLE YES OR NO CODES ABOVE FOR EACH OF THE THE FOUR ITEMS

F. Did you or anyone in your family ever actually do any of these things? (Which?)

G. And what do you think the chances are to do something about this -- very good, good, fair or poor?

Very good	24-1
Good.	2
Fair.	3
Poor.	4
Don't know.	5
NORC use.	Y

---

4. On the whole would you rate this area as very noisy, fairly noisy, fairly quiet, or very quiet?

Very noisy.	25-1
Fairly noisy.	2
Fairly quiet.	3
Very quiet.	4
Don't know.	5
NORC use.	Y

5. A. And what are some of the different kinds of noise you sometimes hear around here? For example, do you ever hear noise from --

	A			B		
	Yes	No	NORC	Yes	No	NORC
1) Cars, trucks or trains going by?	26-1*	2	3	4	5	Y
2) Neighbors or children?	27-1*	2	3	4	5	Y
3) Sonic booms from jets?	28-1*	2**	3	4	5	Y
4) Ordinary airplane noise?	29-1*	2	3	4	5	Y

*IF YES TO ANY NOISE, ASK B, AND CIRCLE YES OR NO CODE FOR EACH NOISE HEARD

B. Do any of these noises ever bother or annoy you or anyone in your family in any way? (Which noises?)

**IF NO TO "BOOMS" (DO NOT HEAR BOOMS), SKIP TO Q. 17.

ASK Qs. 6-16 ONLY IF YES TO BOOMS (DO HEAR BOOMS)

---

6. Now I'd like to get a better idea of how you feel about some of these noises. First, have you heard or read anything about the recent sonic booms around here?

Yes	30-1
No.	2
NORC use.	Y

---

7. Could you tell me what causes the jets to make a boom?

Break sound barrier	31-1
Create pressure waves	2
Planes fly faster than sound. . . .	3
Other (Specify)	4
Don't know.	5
NORC use.	Y

---

8. Do you happen to know why the jets making booms fly around here? (Why is that?)

Don't know.	32-0
Sonic boom test	1
FAA-SST test.	2
Air Force Practice. . . .	3
Other (Specify)	4

9. A. Do you yourself feel it is absolutely necessary for the jets to make these booms around here or not?

B. From what you've heard or read, do you think most other people around here feel it is absolutely necessary or not?

	A Self	B Others
Necessary	33-1	34-1
Not necessary	2	2
Don't know.	3	3
NORC use.	Y	Y

---

10. Do you usually hear the booms about the same time each day, or do they happen at different times each day?

Same time	35-1
Different times	2
Don't know.	3
NORC use.	Y

---

11. A. Do you have any idea how much longer these booms are supposed to continue around here?

Yes (ASK B then C). . . .	36-6
No (ASK C).	7

B. How much longer?

Less than 1 week.	36-0
One week.	1
Two weeks	2
Three weeks	3
Four weeks.	4
Five or more weeks. . . .	5
Don't know.	X
NORC use.	Y

C. Do you feel the booms should be stopped right away or do you feel they should be continued until they have served their purpose?

Stopped	37-1
Continued	2
Don't know.	X
NORC use.	Y

*IF YES TO ANY ITEM IN Q. 12, ASK A & B BEFORE GOING ON TO NEXT ITEM

12. Can you tell me if the recent booms ever (Ask each item below) (Do they ever. . .)	Yes	No	NORC	A. How often is that. . . very often	fairly often,	or only occasionally?	DK NORC	B. And how annoyed does this make you feel. . . very annoyed	moderately annoyed	only a little annoyed	or not at all annoyed?	DK NORC
Interfere with your radio or TV?	38-1*	2	3	4	5	6	7	8	9	0	X	Y
Startle or frighten anyone in your family?	39-1*	2	3	4	5	6	7	8	9	0	X	Y
Disturb your family's sleep?	40-1*	2	3	4	5	6	7	8	9	0	X	Y
Make your house rattle or shake?	41-1*	2	3	4	5	6	7	8	9	0	X	Y
Interfere with your family's rest or relaxation?	42-1*	2	3	4	5	6	7	8	9	0	X	Y
Interfere with your conversation?	43-1*	2	3	4	5	6	7	8	9	0	X	Y

13. Have the booms ever hurt or damaged anything in your house?

Yes 44-1*
No. 2
NORC use. 3

*IF YES, ASK A & B

A. Just what did they do? (Probe for specific damage) (Anything else?)

Cracked walls or plaster. 45-1
Cracked, broke windows. 2
Cracked, damaged structures 3
Broke tiles or fixed object 4
Broke, knocked down moveable objects. 5
Person injured. 6
Person fell-not injured 7
Person dropped something. 8
Other types of damage 9
Don't know. 0
NORC use. . . . . Y

B. About when did that happen? (Circle as many as apply)

1956 Air Show. 44-4
1957-1963. 5
Feb-May 1964 6
June-July 1964 7
Don't know X
NORC use . . . . . Y

14. Have you yourself ever felt like doing something to stop or reduce the booms? For example have you ever felt like writing or telephoning an official? (Ask each item in A before asking B, etc.)

	ITEMS			
A. (Ever felt like --	Writing or telephoning an official?	Visiting an official?	Signing a petition?	Helping to set up a citizens' committee?
Yes	46-1	47-1	48-1	49-1
No	2	2	2	2
NORC use	3	3	3	3
B. Have you or anyone in your family actually done any of these things? (Which?)				
Yes	4*	4*	4*	4*
No	5	5	5	5
NORC use	6	6	6	6

*C. IF YES TO ANY ITEM IN "B", ASK: Did it do any good?

Yes	50-1
No	2
Don't know	3
NORC use	Y

D. If a local organization wanted to stop or reduce the booms and asked you to (insert item), do you think you would very likely do it, that you might but you're not sure, or that you probably wouldn't.	Write or telephone an official	Visit an official	Sign a petition	Help set up a committee
Very likely	51-1	52-1	53-1	54-1
Might	2	2	2	2
Wouldn't	3	3	3	3
Don't know	4	4	4	4
NORC use	Y	Y	Y	Y

15. On the whole, what do you think the chances are for doing anything about reducing the booms? Would you say there was a very good chance, a good chance, only a fair chance, or hardly any chance at all to improve the situation?

Very good chance	55-1
Good chance	2
Fair chance	3
Hardly any chance	4
Don't know	5
NORC use	Y

16. Do you think people around here should complain about these booms if they find them annoying?

Yes	56-1
No	2
Don't know	3
NORC use	Y

ASK EVERYBODY

ASK EVERYBODY

17. As you(probably know)(already told me) the recent booms around here are part of a government development program of a new supersonic airplane that will fly about 2000 miles an hour. Do you feel it is absolutely necessary for our country to have such a civilian plane, do you feel it is probably necessary, or do you feel it is not necessary?

Absolutely necessary. . .	57-1
Probably necessary. . . .	2*
Not necessary	3*
Don't know.	4*
NORC use.	Y

*IF PROBABLY, NOT, OR DON'T KNOW, ASK A

A. As you may know, the French, British and Russians are already building a commercial supersonic airplane. If these countries have such a plane, would you feel it absolutely necessary for Americans to have one too, would it probably be necessary, or would it not be necessary?

Absolutely necessary. . .	58-1
Probably necessary. . . .	2**
Not necessary	3**
Don't know.	4**
NORC use.	Y

**IF PROBABLY, NOT, OR DON'T KNOW ON "A", ASK B

B. If the sonic boom could be reduced, would you feel it desirable for us to have a commercial plane that travels about 2,000 miles an hour, or don't you feel we need such a plane?

Desirable	59-1
Not necessary	2
Don't know.	3
NORC use.	Y

---

18. How about civilian airplanes and the commercial air transportation industry in general -- How important do you feel <u>they</u> are to our national welfare -- extremely important, moderately important, a little important or not very important?

Extremely important . . .	60-1
Moderately.	2
Little.	3
Not very important. . . .	4
Don't know.	5
NORC use.	Y

---

19. How about the importance of civilian aviation to the welfare of Oklahoma City and surrounding towns -- Do you feel it is extremely important, moderately important, a little important or not very important?

Extremely important . . .	61-1
Moderately	2
Little.	3
Not important	4
Don't know.	5
NORC use.	Y

20. A. If this area received eight booms from a civilian jet as often and as loud as the recent ones for an indefinite period of time, do you think you could very likely learn to live with it after a while, that you might but you're not sure, or do you think you probably couldn't learn to live with it?

Very likely	62-1#
Might	2#
Couldn't.	3*
Don't know.	4*
NORC use.	Y

*IF COULDN'T OR DON'T KNOW TO "A", ASK B

B. How about 5 or 6 civilian booms every day? (Do you think you very likely could learn to live with that, that you might, or that you probably couldn't learn to live with it?)

Very likely	63-1
Might	2
Couldn't.	3**
Don't know.	4**
NORC use.	Y

**IF COULDN'T OR DON'T KNOW TO "B", ASK C

C. How about 1 or 2 civilian booms every day? (Do you think you very likely could learn to live with that, that you might, or that you probably couldn't learn to live with it?)

Very likely	64-1
Might	2
Couldn't.	3
Don't know.	4
NORC use.	Y

#IF VERY LIKELY OR MIGHT ON "A", ASK D

D. How about 10-12 civilian booms every day? (Do you think you could very likely learn to live with it, that you might but you're not sure, or that you probably couldn't learn to live with it?

Very likely	65-1
Might	2
Couldn't.	3
Don't know.	4
NORC use.	Y

---

21. And how about several civilian booms every night? (Do you think you very likely could learn to live with that, that you might, or that you probably couldn't learn to live with it?)

Very likely	66-1
Might	2
Couldn't.	3
Don't know.	4
NORC use.	Y

Now we have what we call background information and we'll be through.

22. 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	67-
Respondent	M F		
	M F		68-
	M F		
	M F		
	M F		
	M F		

23. Now what is the highest grade of school you completed?

Completed 0-4 years of grade school . . .	69-1
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

24. Now for statistical purposes, we need to know something about family incomes. Would you just tell me which of the following six categories comes closest to the amount all members of your family earned all together from all sources before taxes and other deductions? (Read categories)

A. Less than $4,000	70-1
B. $4,000 but less than $6,000.	2
C. $6,000 but less than $8,000.	3
D. $8,000 but less than $10,000	4
E. $10,000 but less than $15,000.	5
F. $15,000 or more.	6
Refused	7
NORC use.	Y

25. A. Are you usually at home during the morning hours?

B. How about the afternoon? (Are you usually at home?)

C. And the evening hours?

	At Home	Not At Home	NORC
A. Morning (7AM-12 Noon). . . .	71-1	2	Y
B. Afternoon (Noon-6 PM)... . .	72-1	2	Y
C. Evening (6PM-11PM)	73-1	2	Y

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26. Have you or anyone in your family worked for the Federal Aviation Agency or any civilian aviation company?

Yes	74-1*
No.	2**
Don't know.	3
NORC use.	Y

*A. IF YES: Are you (they) working there now?

Yes	75-1
No.	2
Don't know.	3
NORC use.	Y

**B. IF NO: Have you or anyone in your family ever worked for the Air Force or any company that does much of its business with the aviation industry?

Yes	76-1
No.	2
Don't know.	3
NORC use.	Y

---

27. (Casually) By the way, had you heard anything about this survey before this interview?

Yes	77-1*
No.	2
NORC use.	3

*A. IF YES: What have you heard? (Who was doing the survey? For what purpose?)

78-

---

28. Now in case the office finds I've left something out, what would be the best time to call you?

Well, I guess that's it. Thanks for all your help.

TO BE COMPLETED BY THE INTERVIEWER AFTER THE INTERVIEW

1. Was the respondent suspicious of the stated purpose of the interview or the interviewer?

Yes ( ) No ( )

IF YES, EXPLAIN:

---

2. Was the respondent always relaxed and willing to answer all questions frankly, or was he sometimes tense, defensive, uncooperative?

Always frank -- Yes ( ) No ( )

IF NO, EXPLAIN:

79-

80-3

Interviewer's Signature: _____

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13. ABSTRACT

This appendix contains samples of questionnaires used during the interviews that took place from February to July 1964 in the Oklahoma City, Oklahoma, area. That area was repeatedly exposed to sonic booms generated to simulate overpressure levels that are expected for supersonic transport overflights. The schedule provided for eight sonic booms per day. During the 6-month period, almost 3,000 local residents were interviewed three times to determine the nature and extent of their reactions to the sonic booms.

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14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Bioacoustics Sonic boom Reaction (physiology) Community response Public opinion Noise, impulse type Sounds, supersonic transport						

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