

IMPLICATIONS FOR THE DESIGN OF HOUSING,  
FOR MILITARY FAMILIES AS DETERMINED  
THROUGH A PILOT STUDY OF OWNERSHIP  
PATTERNS AND THE SPACES DISPLACED  
BY SELECTED ITEMS OF FURNITURE  
AND EQUIPMENT

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## PREFACE

The positive aspects of housing, that is securing greater livability in houses, have been given increasing emphasis in recent years by housing specialists. The purpose of this pilot study is to design an instrument for obtaining data and to choose appropriate methods for analyzing data, obtaining design implications and using them as a basis for designing houses which will offer greater livability to military families.

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## CHAPTER I

### INTRODUCTION

Multiple forces are contributing to the housing problems which exist in the United States today. Some of the major forces recognized by leading housing authorities are: the population explosion, the move from rural to urban areas, the rising standard of living, and the increasing mobility of people. These forces have created many problems: inadequate housing, housing shortages in some areas of the country coupled with excesses in other areas, insufficient housing for people of some economic levels and races, and a growth of slum areas. Each of these in turn has been found to be potentially detrimental to physical and mental health and to family well-being. All of these factors have made housing a problem for public concern in addition to its being a personal problem for millions of people in the United States. Mobility is the force which is the most obvious cause of housing problems for the group being studied here -- the military family. The other forces which create housing problems cannot be overlooked, however, because they help to create housing shortages which often force the military family to accept inadequate housing in order to avoid separation. Unfortunately, inadequate housing is a problem

for the military family not only when there is insufficient housing available, but also in apparently adequate housing when the design does not fit the family's needs. Little is known, however, about the housing needs of military families. When more is known concerning their specific needs, then the design and production of housing for military families can be effected more efficiently.

Housing which is designed to fit a family's needs is most important to physical and mental health and to family well being. Lemkau refers to the importance of house design upon mental health in his statement:

There are situations directly related to housing which are important factors in mental ill health of individuals and of the family unit. Crowding makes irritations and interruptions inevitable, causing personality clashes which can grow into the deep seated and repressed bitternesses that are conceded to be of importance in some mental diseases.

Irritations lead to the non-productive expenditure of energy which in turn ends in over-fatigue, feelings of frustration and eventually to an attitude of giving up. The refrigerator which can be placed in only one position in a badly planned room is an example. If its door opens the wrong way, each time it is opened, there are useless resented and fatiguing extra steps involved in walking or squeezing around it to get at the contents. Irritability thus induced is not confined to the refrigerator, but is likely to spread into a mood of irascibility to be touched off by other situations. Such series of events are common enough to indicate that wherever the sequence can be interrupted it is advisable to interrupt it for the sake of the mental health of the family. In this sense, the design of houses and furniture becomes a mental technique of great importance.<sup>1</sup>

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<sup>1</sup>Dr. Paul V. Lemkau, Professor of Mental Hygiene, Johns Hopkins School of Public Health, quoted in Planning the Home for Occupancy, American Public Health Association, Committee on the Hygiene of Housing, (Chicago, 1950), p. 1.

In his book on housing and family life, J. M. Mackintosh said:

Recent work in social and preventive medicine has laid a new emphasis on the importance of the family in the promotion of health as well as in the prevention and treatment of sickness. The house is the temple of the family life and its soundness is closely interlocked with the family health.<sup>2</sup>

It has been recognized for some time that a house is more than just a shelter; it is a place to relax after a day of work; it is a place of work; it is the setting for the foundation of tomorrow's citizens -- a home. Obst has said:

In every area of existence we recognize that the home and its atmosphere either build and recreate or tear down morale.<sup>3</sup>

Many authorities contend that housing has a positive or a negative effect upon physical and mental health. Some believe that the effect housing has on physical and mental health is in direct proportion to how well or how poorly housing meets a family's needs. Much has been written concerning the negative effects of poor housing; however, little has been written about the positive effects of good housing. Perhaps, as Pickering points out, this dearth is because the approach used has not led to houses designed

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<sup>2</sup>J. M. Mackintosh, Housing and Family Life (London, 1952), p. ix.

<sup>3</sup>Frances M. Obst, "The Importance of Art in Home Economics: A Philosophy," Journal of Home Economics, LI (1950), p. 563.

for families. Few have used the needs approach and the old traditional approaches are inadequate for the contemporary way of life. In regard to this he said:

Too often in recent years the plans of houses have not been adapted to the interests of families. Houses have been built from patterns which conformed to established arrangements based on tradition, popular taste, resale devices, and stereotyped plan layouts. Families have had to adjust their ways of living to English, Colonial, or Spanish houses, with their typical, inflexible arrangements. Progress in house design has been resultingly slow. The design of a dwelling should be approached with a different point of view. Houses should develop as the logical out-growth of an effort to shelter man's activities efficiently and pleasantly.<sup>4</sup>

Such an approach to house design requires knowledge of individual families. In order to create such houses research must be done to identify family needs, values, preferences, and possessions.

Some research has been conducted with emphasis on special groups whose members have characteristics in common and thus have some common housing needs. The most widely known of these studies are those concerning the physically handicapped, the aged, students, low-income families, and farm families.<sup>5</sup> These studies have been very beneficial

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<sup>4</sup>Ernest Pickering, Shelter for Living (New York, 1941), pp. 51-53.

<sup>5</sup>Beltsville Energy-Saving Kitchen Design No. 2, (Washington, 1961); F. C. Salmon and C. F. Salmon, Rehabilitation Center Planning; An Architectural Guide (University Park, 1959); W. Donahue, ed., Housing the Aged (Ann Arbor, 1954); G. H. Beyer, Economic Aspects of Housing for the Aged (Ithaca, 1961); Housing of Students (Washington, 1950); L. K. Frank, "Housing for Married Students," Journal of Home Economics, LL (1957), pp. 347-350; F. S. Chapin,



in providing insights regarding the identification of needs and the subsequent planning of houses to fit the needs of a particular group. It is recognized, however, that a great deal more research is necessary in order to design homes that will fit the needs of a wider variety of people.

One group often mentioned for possible study is that of the mobile family. According to Rossi:

About one person in every five shifts residences over a year's time. About three quarters of our urban citizens were living in 1950 in places in which they did not reside in 1940.<sup>6</sup>

Families are mobile either from preference or because of occupation. Among those who are mobile because of occupation, the largest single group is probably the military. In the writer's opinion a study of military families similar to Rossi's study, would show that almost one hundred per cent of military families change residence at least once in a ten-year period. Most of these would be what Rossi refers to as "forced" moves, or moves outside a fifty-mile radius. Many, however, would be for the purpose of finding housing that better meets the needs of the family. In a statement concerning the function of mobility for individual families

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"Some Housing Factors Related to Mental Hygiene," Journal of Social Issues, VII (1951), pp. 164-171; G. H. Gray, Housing and Citizenship; A Study of Low-Cost Housing (New York, 1946); G. H. Beyer and J. H. Rose, Farm Housing (New York, 1957); P. Nickell, et al., Farm Family Housing Needs and Preferences in the North Central Region (Ames, 1951).

<sup>6</sup>P. H. Rossi, Why Families Move (Glencoe, Illinois, 1955), p. 1.

as revealed by his research, Rossi describes such moves as:

...the mechanism by which a family's housing is brought into adjustment to its housing needs.<sup>7</sup>

The military family is mobile for two reasons: by choice in order to secure more adequate housing and by necessity because of occupation. If housing which would fulfill the needs of the families could be made available, the first of these reasons for mobility could be removed, or at least ameliorated. It is the writer's hope that this study will reveal some insights into the types of houses which military families need; insights which would be especially meaningful in planning houses for military families.

#### Statement of the Problem

It is characteristic of military families that they must be mobile. This mobility necessitates frequent adjustments to new housing situations. Houses which meet the needs of military families are often not readily available, resulting in additional moves and additional adjustments when more adequate housing is found at a later time.

Tension and frustration somewhat similar to those felt by a woman trying to get into a dress that is a size too small are encountered when a family tries to fit into a house that does not satisfy its needs. Both situations

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<sup>7</sup>Ibid, p. 178.

are unnecessary, for just as the correctly sized dress will fit the woman, the correctly designed house will fit the family.

In order to design houses which will fit a family's needs, one must first identify the needs. One technique currently used in social research for determining family housing needs is the collection of information concerning family possessions. The findings which result from this research can be translated in terms of space displacement and, hence, provide one basis for determining the amount of space needed in each room of a house as well as the total number and types of rooms needed.

This study will, of necessity, be only a pilot study because limited time and funds preclude research of a large or widespread sample which would be necessary in order for the sample to be representative of military families. The writer hopes, within the limitations imposed, to be able to devise an instrument, methods of analyses, and methods for application of the data, which can be used later for a larger study of the spaces displaced by possessions of military families.

If certain spatial needs in housing for military families can be identified through a study of the amount of space displaced by their possessions, the resulting data can be of help to military families in their search for houses, to the government in planning housing projects for military personnel, and to builders who build with

military families as a potential market.

### Purposes of the Study

The purposes of this study are threefold. The first is to determine if certain furnishings and household equipment which must be provided for "service-wise" and "space-wise," in and about the house, are owned by a large percentage of military families. In this category are included all large items (household and otherwise) which would require that space and facilities be provided for use, storage, or service in or about the house.

The second purpose is to determine to what degree the possession or non-possession of certain items, as well as certain attributes of the possessions, vary according to selected social characteristics of the family, e.g., military rank, family size and composition, and stage in the family life cycle.

The third purpose is to determine the approximate space displacement of these possessions, and the resulting implications for designing and organizing space (i.e., number, type, and size of rooms) in military housing.

### Hypothesis

Certain items of household equipment and furnishings, which by virtue of size and dimensions of the items affect space requirements of housing, will be possessed by a large proportion of military families; and possession or

non-possession of these items will vary according to military rank, family size and composition, and stage in the family life cycle.

### Assumptions

There are several basic assumptions which underlie this study of the housing needs of military families. They are that:

1. One aspect of housing needs can be determined through a study of the space displacement of possessions.
2. The space displacement of possessions can be determined through research.
3. The resulting findings can be useful in planning housing which meets the space needs of military families.
4. Housing design based on family needs will lead to better family life and to improved mental and physical health.

### Limitations of the Study

Limited time and funds preclude a large and widespread sampling of military families; therefore, the current study will be in the form of a pilot study, with the objectives of devising an instrument, determining methods of analyses, and determining implications for applying the findings to the design of houses.

The sample consists of all military families living in the Stillwater, Oklahoma, area. This includes a small group of Army, Navy and Marine Corps personnel, and a relatively large group of Air Force personnel.

Questionnaires were submitted to the wives only, rather than to the complete family, since the wives usually know more about the furnishings of the home than do other family members.

All ranks which were available were included in the study. This includes from staff sergeant through colonel; it is the writer's understanding that there are no lower grade enlisted personnel or general officers stationed in the Stillwater area.

#### Need For The Study

According to the noted sociologist, Riemer:

Housing involves a problem of social adjustment. The modern family is confronted with the task of fitting the routine of its private life into the physical shelter of its residential home. The problems arising are of a somewhat different order than other adjustment problems such as crime and insanity. It is not a matter of reaching conformity between the behavior of the individual and the standards accepted by his environment. Nevertheless, the process of home adjustment is dependent upon a complicated framework of socio-psychological interactions. The physical structure of the home is apt to have its bearing upon family solidarity as well as the individual's need<sup>8</sup> for community institutions outside the family home.

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<sup>8</sup>S. Riemer, "Sociological Theory of Home Adjustment," American Sociological Review, VIII (1943), p. 272.

Whenever a family changes residence, it must make adjustment to its new housing, including the structure and the neighborhood. Such adjustments vary considerably according to the total size of the house, the number, size, kind, and placement of rooms, the presence or absence of outside living areas, the facilities within and outside the house, the community in which the house is situated and the facilities which it offers, the kind of house which the family lived in prior to the move, and the number, type and size of family possessions.

For highly mobile families, such as those in military service, the continuing adjustments to different houses, together with the difficulty of finding adequate housing, make housing one of their major problems. Family composition, needs, preferences, furniture and equipment change very little during the short period of time between changes in residence, and they must be fitted into whatever house can be found. Houses, however, often do not have storage adequate in space or arrangement for the family possessions. Room arrangements frequently are such that they do not facilitate the type of living and entertaining which the family prefers. Such things as play space for children and a quiet place for the father to study or work are also generally absent in today's houses.

Problems of space and arrangement can lead to frustrations and tensions which are unnecessary since they can be prevented by proper planning. Demerath has said:

...there are the frictions of too little space or too poorly arranged space, especially in small apartments and small houses. These space frictions seem to be a factor in interpersonal tension and conflict. The life of any family, it seems, is shaped in part by what the members can or cannot do, given the design and equipment of their dwellings -- by the facilities for entertaining friends, for permitting parents to get away from an infant, for privacy, or for contacts of different kinds at different times. And 'peace of mind' may in many instances prove in real part to be a function of all these things and more that are dependent on the housing facility.<sup>9</sup>

If houses which fit a family's needs were available, the problems of adjustment could be lessened to a considerable degree. To design houses which will fit a family needs, it is necessary to first determine what the needs are. Beyer states:

Greater livability can be achieved if we know what design features might satisfy families most in their homes. This means that we must know more about families themselves, the way they live, the things they hold important, their attitudes and prejudices ----in short, the values they hold with respect to shelter.<sup>10</sup>

The values which Beyer and his colleagues list are but a few of the many facets of housing which need to be studied before a comprehensive picture can be developed of military housing needs. This study could be a beginning for it could serve to focus attention upon the need for specialized research concerning the military family and its housing problems. The end result of such research could be improved

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<sup>9</sup>N. J. Demerath, "The Housing of Psyche," Mental Hygiene, XXXV (July, 1951), p. 414.

<sup>10</sup>H. Beyer, T. W. Mackesey and J. E. Montgomery, Houses Are For People (Ithaca, 1955), p. 1.



living conditions for over one million American families.

The writer feels that a study of possessions is a good starting point for gaining basic knowledge concerning military families since possessions take up space in a house, and space is an extremely important aspect of housing. Many studies have shown that space is extremely important to various aspects of health and family life.<sup>11</sup> Space standards which are used for construction of military housing are a help in setting up minimum standards for space itself, but they in no way control the adequacy or usability of the space.<sup>12</sup> Space is of little value unless it is usable space and space where the family needs it.

Many problems related to military housing are generally recognized by both military and civilian officials who work constantly to improve the standards of housing on or near military installations. Some of the post war problems of

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<sup>11</sup>M. Perry, "Relationship of Space in Housing to Attitudes Toward Family Life" (unpub. Ph.D. dissertation, Cornell University, 1958); F. Chapin, "The Psychology of Housing," Social Forces, XXX (October, 1951), pp. 11-15 and "Some Housing Factors Related to Mental Health," Journal of Social Issues, VII (1951), pp. 164-171; D. M. Wilner, et al. "The Effects of Housing Quality on Morbidity," American Journal of Public Health, XLVIII (December, 1958), pp. 1607-1615 and "Housing as an Environmental Factor in Mental Health: The Johns Hopkins Longitudinal Study," American Journal of Public Health, L (January, 1960), pp. 55-63; J. L. Whitrow and V. Y. Trotter, "Space for Leisure Activities of Teen Aegers," Journal of Home Economics, LIII (1961), pp. 359-362.

<sup>12</sup>Design Standards for Construction of Permanent Family Housing for Federal Personnel, Housing and Home Finance Agency, Budget Circular A-18 (Washington, revision 1957).

military housing were identified by Grey; and recent research has been instigated on such things as the number of houses that are needed, the size range of military families, and the amount of money military families are able to pay for housing.<sup>13</sup> Recent issues of the Air Force Times report the results of several studies about military families. One such study gives the following comprehensive summary of families in the various services:<sup>14</sup>

<u>Service</u>	<u>% of Men Married</u>	<u>No. of Wives</u>	<u>No. of Children</u>
Air Force	63.2	543,478	1,052,583
Army	45.4	430,486	751,424
Navy	42.1	272,263	468,446
Marine Corps	37.2	70,619	115,546

Another report concerns a study of the actual housing conditions in which some military families are forced to live. This study includes pictures as well as statistics which were used by Secretary of Defense, Robert S. McNamara, when he presented to Congress a proposed military housing program. The program included plans for 12,000 units to be built in 1964 as the first step in a five-year plan to provide 62,100 units.<sup>15</sup> Many other studies of a related nature have been conducted which help to focus attention

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<sup>13</sup>G. H. Grey, Housing and Citizenship; a Study of Low Cost Housing (New York, 1946).

<sup>14</sup>"Air Force Leads in the Field of Percentage of Married," Air Force Times, XXIII (May 8, 1963), p. 23.

<sup>15</sup>"DOD to Crusade for Housing Bill," Air Force Times, XXIII (May 8, 1963), p. 1.

on the size and extent of the military housing problem. The information gathered in these studies can also be of help to those who work in fields concerned with military housing: i.e., researchers, builders, architects, home economists, interior designers, etc. To the writer's knowledge, however, there has been no research focused specifically on identifying housing needs which can serve as guides in the actual planning of housing for military families. It is the writer's hope that the present study may help to fill this gap by offering a method of securing information concerning the possessions of military families, as well as methods of analyzing the findings in order to secure implications for housing design.

While military and civilian officials are aware of the many housing problems faced by military families and are working to improve them, the ones who must live with the problems and are, therefore, closest to them are the military wives themselves. Having been the wife of an Air Force Officer for nine years, the writer has made nine houses into homes at five bases in the United States and at one overseas base and, therefore, feels very close to the problems concerning military housing. As an interior designer, the writer has worked with many military families and has had the opportunity to professionally observe their housing needs as well as their problems of adjustment and resulting tensions and frustrations which often

stem from houses not meeting needs. It is her hope that she may provide some of the encouragement referred to by Bolduan in her statement:

Builders are able to provide safe, durable housing units at a reasonable cost. With a little encouragement from the professionally trained homemaker, they might also provide a more emotionally satisfying home.<sup>16</sup>

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<sup>16</sup>M. F. Bolduan, "Home Economists and the Housing Industry," Journal of Home Economics, LI (1959), p. 464.

## CHAPTER II

### REVIEW OF LITERATURE

The field of housing has benefited in recent years from increased interests of home economists, sociologists, and psychologists. In a 1959 report on research conducted by home economists within the past fifty years, McCullough states that 65% of the 387 housing research projects reported were undertaken in the period after 1946.<sup>1</sup> Research concerning housing is also being conducted by psychologists and sociologists. Much of the data they present and the techniques they used can be helpful to the home economist in her research.

Although literature relative to housing is widely diversified in subject matter, the present study has been limited to material pertaining to the physical, psychological, and sociological aspects of housing; and to the various approaches used in designing houses.

#### The Physical, Psychological and Sociological Aspects of Housing

The physical, psychological, and sociological aspects

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<sup>1</sup>Helen E. McCullough, "Housing Research in Home Economics," Journal of Home Economics, LI (1959), p. 853.

of housing are closely related subjects because a housing situation which creates problems in one of these areas will very often create problems in one or both of the other areas. For many years it has been recognized that housing could be detrimental to physical health, but the psychological and sociological aspects of housing have not been recognized until recently.

Although most of the early research was centered around slum housing, it yielded minimum standards for healthful housing. The investigators, interpreting housing as more than just a house, attempted to set standards which might be considered "positively good."<sup>2</sup> Much of the research conducted after 1946 covered a broader scope of housing problems and a wider range of the population. In describing the concerns of those investigating housing in its broadest sense, Bauer said:

We are therefore concerned today not only with restrictive housing standards and the elimination of slums, but also with the provision of homes and neighborhoods that are positively good - a residential environment that promotes mental and social well-being as well as physical health per se.<sup>3</sup>

Concerning the scope of housing sanitation, Pond said:

The scope of housing sanitation is broad. Virtually

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<sup>2</sup>Catherine Bauer, "The Provision of Good Housing," American Journal of Public Health, XXXIX (1949), p. 462.

<sup>3</sup>Ibid.

no ordinary problem in environmental sanitation is missing from the realm of hygiene of housing, and there are problems in housing that are new, if not obscure, in health department practice. To the usual problems may be added those relating to functional design, materials of construction, noise control, illumination, aerobiology, and environmental hazards to mental and emotional health.<sup>4</sup>

Many recent studies dealing with the physical health aspects of housing are related to the functional design of houses. Panero's study of human anatomy and its relationship to interior design has produced data on house planning, furniture arrangement, and storage design which will be invaluable to designers, architects and housing specialists.<sup>5</sup>

The University of Illinois Small Homes Council has conducted a number of studies pertaining to various aspects of the home. Many of these studies, designed to find ways of making homemaking easier and less fatiguing, are related to the physical and mental health of the homemaker. One study resulted in a scoring sheet, "Kitchen Planning Standards," to be used in evaluating kitchen design. This study included analysis of the good and bad features of the kitchens contained in 103 small houses. The study revealed that:

Storage space, particularly in base cabinets, was insufficient.

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<sup>4</sup>M. Allen Pond, "Sanitary Aspects of the Dwelling," American Journal of Public Health, XXXIX (1949), p. 454.

<sup>5</sup>Julius Panero, Anatomy For Interior Designers (New York, 1962).

Too little counter space was provided.

The assembly of equipment in most cases was poorly planned.

The rooms themselves were not well planned.<sup>6</sup>

In a study which compared homemaker satisfaction with ratings secured through use of the "Kitchen Planning Standards" check list, Pickett found that homemakers frequently were satisfied with less than optimum amounts of counter and storage space.<sup>7</sup> Cowles, Steele, and Kishler show it is possible to reduce fatigue by reorganizing storage and work space so that the amount of walking necessary to perform kitchen tasks is minimized.<sup>8</sup>

At present, very little is known concerning the psychological and sociological aspects of housing, but much is being learned through research. Demerath propounds the thesis that:

Good standards of healthful housing and sound public-health practice must recognize the social-psychological needs of persons and family groups no less than their biological and sanitary requirements.<sup>9</sup>

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<sup>6</sup>Elizabeth M. Ranney, Kitchen Planning Standards, University of Illinois Small Homes Council Circular C5.32 (Urbana, 1949), pp. 1-8.

<sup>7</sup>Mary S. Pickett, "Evaluating Storage and Counter Space" (unpub. Master's thesis, Iowa State University, 1958).

<sup>8</sup>M. L. Cowles, S. M. Steele, and M. B. Kishler, "Savings in Distance Walked Through Reorganization of Storage and Work Space," Journal of Home Economics, L (1958), pp. 169-174.

<sup>9</sup>N. J. Demerath, "The Housing of Psyche," Mental Hygiene, XXXV (1951), pp. 410-417.



He also states that we have no such standards today but that through research a new kind of standard can be possible:

The biosocial housing standard, based on a reliable knowledge of the relationships between the community, the dwelling unit, and the whole person, psyche and soma. That is to say, we may look for housing standards predicated on a more rounded scientific understanding of the relationships between houses and persons, in social and psychological as well as in biological terms. More particularly I think these studies point to standards that we might conceivably call standards of privacy, social facility, group formation; standards of community morale; and standards that recognize the special needs of young and old, introverted and extroverted, and so on.<sup>10</sup>

Chapin defines "psychology of housing" as:

The relationship within the dwelling, between such specific factors as sheltered space for privacy, light, noise, convenience and aesthetic values, and the responses of people to these factors.<sup>11</sup>

He further states that:

Expressed as attitudes, feelings of inferiority, humiliation or resentment, frustration, anxieties about safety and sanitation, as desires, morale, in emotional states of depression or elation, or in mental states of phantasy versus realistic awareness of life, all may be reactions to housing conditions which can be observed, and in the case of certain traits such as morale and the general adjustment of personality, they have been measured.<sup>12</sup>

Many of the studies regarding the psychological and sociological aspects of housing were focused on slum housing and the degrees of change that become apparent when

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<sup>10</sup>Ibid., pp. 410-417.

<sup>11</sup>F. Stuart Chapin, "The Psychology of Housing," Social Forces, XXX (1951), pp. 11-15.

<sup>12</sup>Ibid.

one leaves slum housing for better housing.

In several studies regarding "use-crowding," Chapin found positive gains with regard to both "use-crowding" and participation in community activities when families were moved from slum areas into public housing projects.<sup>13</sup> In a longitudinal study of the effects of housing quality on morbidity, Wilner and his colleagues found that a move from slum housing to a public housing project resulted in an improvement in many facets of social and personal life. Among the areas of improvement were: lowered illness and disability rate in the under 35 age group, lowered death rate, increased interactions between neighbors and among family members, improved reactions to housing and space and to discipline of children by the mother, increased pride in the neighborhood, improved general morale and perception of social status, and increased school attendance and normal promotions.<sup>14</sup>

Recently sociologists and psychologists have begun to investigate housing as a positive factor in mental health. Such studies have been classified as:

1. Studies of "livability" (design, equipment, uses of the dwelling unit in relation to personal and household needs and behavior).

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<sup>13</sup>F. Stuart Chapin, "Some Housing Factors Related to Mental Hygiene," Journal of Social Issues, VII (1951), pp. 164-171.

<sup>14</sup>Daniel M. Wilner, et al., The Housing Environment and Family Life (Baltimore, 1962).

2. The social psychology of the dwelling area (site plan, communal facilities, and location of dwellings in relation to inter-household and community behavior).<sup>15</sup>

Whyte's essay, The Organization Man, is focused upon the second of Demerath's classifications, i.e., the positive factors of housing in relation to mental health. In his analysis of the organization man in suburbia, Whyte delves into many aspects of home and family life and the resulting sociological and psychological effects on the individual.<sup>16</sup> Among these is the relationship between the house, its architecture and location, and the family, its social relationships and patterns of behavior. Some mental health problems, for example, may be caused or aggravated by financial difficulties resulting from excessive house payments or from "keeping up with the Joneses." Other problems may be caused or aggravated by tension and frustration resulting from a poorly designed and arranged house, from the location of a house in relation to neighboring houses, or from the distance a residence is from the household head's place of work which determines the amount of time he or she is away from home. Rossi, the Gordon's and their associate, and others, identify housing as a factor in mobility and hence as a factor in social and mental health

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<sup>15</sup>Demerath, p. 413.

<sup>16</sup>William H. Whyte, Jr., The Organization Man (New York, 1956).

problems generated by mobility. Rossi's studies found that inadequate housing was the primary cause of mobility, and that inadequacy was defined in terms of insufficient or poorly planned space.<sup>17</sup> The Gordon's and their associate related a variety of mental health problems to mobility. Their report also shows that inadequate housing is often a factor which aggravates mental health problems.<sup>18</sup> In all three of these studies the issue was not slum housing, it was instead "inadequate" housing -- or housing which does not fit the needs of the family, regardless of its cost.

Charlton's study of the effect of patterns in wall-paper on an individual's sense of space delves into the psychological aspects of interior design. Her study revealed that most of the subjects condemned patterns which had medium to strong contrasts of light and dark and which were loosely organized. The patterns considered most acceptable had only one design element in common, the absence of strong light and dark contrast.<sup>19</sup>

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<sup>17</sup>Peter H. Rossi, Why Families Move (Glencoe, Ill., 1955).

<sup>18</sup>R. E. Gordon, K. K. Gordon, and M. Gunther, The Split-Level Trap (New York, 1960).

<sup>19</sup>Mary Polson Charlton, "Effect of Pattern on Sense of Space," Journal of Home Economics, LIII (1961), pp. 112-115.

## Approaches to House Design

Montgomery offers several implications for those who teach housing and household equipment, which are equally important as a basis for the design of houses. He states that those who teach need to help the student and families to:

1. Evaluate housing and equipment alternatives and make wise decisions in terms of basic needs and values.
2. See that it is possible for them to meet and successfully solve some of the problems of housing and household equipment and that there are still others which individuals can never hope to solve without working as members of groups or organizations.
3. See that housing is an on-going process, that there is eternally a need for making adjustment between families and their housing environment.<sup>20</sup>

In the design of housing it is also advisable to keep in mind the stage in the family life cycle, as this is one of the prime reasons for the need of an adjustment between families and their housing to which Montgomery refers. Gutheim divides the family life cycle into four periods, each having its own health, economic, welfare, psychological, and management problems. He classifies them as the "Early Years," usually about the first three years of marriage, or until the first baby is born; the

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<sup>20</sup>James E. Montgomery, "Current Developments and a Look Ahead in Housing and Household Equipment," Journal of Home Economics, LI (1959), pp. 581-586.

"Crowded Years," usually from the third until the fourteenth year, or from the time the first baby is born until the youngest child has entered school; the "Peak Years," usually lasts until the twenty-fifth year, or from the time the youngest child enters school until he is eighteen years old; and the "Later Years," usually up to fifteen years, or all the time that the couple is alone.<sup>21</sup>

To secure basic knowledge regarding families and housing, sociologists and home economists in recent years have used three approaches studying families: (1) individual needs, preferences, values and images; (2) experimentation; and (3) activities or use. A fourth approach to house design is that used by the architect which in many respects parallels the three approaches listed above.

#### The Needs, Preference, Values and Image Approach

Studies concerned with needs, preferences, values, and images vary greatly in method of research and in content. In a study of rural families in Garfield County, Oklahoma, Montgomery, Sutker and Nygren delved into various aspects of housing processes, images and values.<sup>22</sup> They found that

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<sup>21</sup>Frederick Gutheim, Houses For Family Living (New York, 1948).

<sup>22</sup>J. E. Montgomery, S. S. Sutker, and M. Nygren, Rural Housing in Garfield County, Oklahoma: A Study of Processes, Images, and Values, Oklahoma State University Publication, Vol. 56, No. 2 (Stillwater, 1949), pp. 1-47.

most home improvement was of a modest nature, performed in many cases by the homemaker and seldom under the advice or supervision of a professional. The least satisfaction with the home and the clearest housing images were held by the younger, better educated women. The values held most important were comfort, economy and family-centeredness, and those held least important were privacy, social prestige and beauty. The image which these women have of the house that would be "just right" for their families is:

one-story brick ranch,  
with basement,  
one or more porches,  
an entry hall,  
three or more bedrooms,  
more than one bath,  
a utility room,

To a lesser degree the women felt that the house "just right" for their families would have:

a family or recreation room,  
dining space in the kitchen,  
a place to eat out of doors,  
central heating,  
air conditioning,  
a fireplace.<sup>23</sup>

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<sup>23</sup>Ibid., p. 34.

A later study by Nygren concerned the housing images of selected groups of secondary school freshmen and seniors living in Oklahoma.<sup>24</sup> The purposes of her study were to determine the nature of their housing images, to compare the images of the freshmen with those of the seniors, and to determine if the variables of sex, socio-economic status, peer-group contacts, and the parental home were associated with the respondent's housing image.<sup>25</sup> A questionnaire was used for obtaining data from 1,084 students in both rural and urban schools located within a radius of approximately 75 miles from Stillwater, Oklahoma. The findings indicate that both groups have definite images which they hold in regard to housing and that some differences exist between images held by the two groups. The house which is visualized by both groups varies very little; it is:

- ranch-type, split-level, or modern architecture;
- built of brick, stone, or cement block;
- one-story (seniors) or more than one story (freshmen);
- in an urban or suburban community.<sup>26</sup>

It has the following features and equipment:

a porch,

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<sup>24</sup>Maie Anabel Nygren, "The Housing Images of Selected Freshman and Senior Secondary School Students in Certain Communities in Oklahoma," (unpub. Ed.D. dissertation, Oklahoma State University, 1961).

<sup>25</sup>Ibid., p. 4.

<sup>26</sup>Ibid., p. 80.



a basement,  
a two-car garage,  
a place to eat out-of-doors,  
separate living room,  
a separate family recreation room,  
a separate dining room,  
an eating area in the kitchen,  
more than one bath,  
a separate utility room,  
an entry hall,  
a fireplace,  
wall-to-wall carpeting,  
four or more bedrooms (freshmen) or two or three  
bedrooms (seniors),  
separate hobby room (freshmen more than seniors),  
separate sewing room (freshmen more than seniors),  
central heat,  
air-conditioning,  
a home freezer,  
an automatic washer and dryer,  
a garbage disposal,  
a dishwasher,  
a built-in oven.<sup>27</sup>

Other findings indicate differences in the images held  
by the students which appear to be associated with sex,

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<sup>27</sup>Ibid., p. 80.

socio-economic status, location of the parental home and peer-group contacts.

In an early value study conducted by Cutler, ten values were studied in relation to the house.<sup>28</sup> The ten values were: beauty, comfort, convenience, location, health, personal interests, privacy, safety, friendship activities, and economy. Subjects were asked to first list the values in order of importance. Then they made a number of choices, each involving choosing between two values that had been paired together. Each value was compared with every other value. All members of a family were used as subjects. The results of the questionnaires completed by each family member were compiled into a family profile which revealed the values deemed important by the family as a whole. The findings show that both sex and socio-economic level are related to the values which individuals regard as important.

A study by Beyer, Mackesey, and Montgomery reveals that research into family housing values would be useful in obtaining greater livability in house designs. The investigators demonstrated the translation of a basic value

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<sup>28</sup>Virginia Cutler, Personal and Family Values in the Choice of a Home, Cornell University Agricultural Experiment Station Bulletin 840 (Ithaca, 1947); Make It Your House: Fit the House to the Family, Cornell University Agricultural Experiment Station Extension Bulletin 718 (Ithaca, 1947).

orientation into the design of a dwelling unit.<sup>29</sup>

Nine values were studied: economy, family centrism, physical health, aesthetics, leisure, equality, freedom, mental health, and social prestige. The analysis of the data showed that these nine values tended to cluster. For the purpose of analysis and design the nine values were grouped into four basic value orientations:

'Economy' Value Group: families who emphasize economy.

'Family' Value Group: families who emphasize the health and well-being of the family.

'Personal' Value Group: families who emphasize personal enjoyment, self-expression, and aesthetics.

'Prestige' Value Group: families who emphasize social prestige and a formal social life.<sup>30</sup>

Interviews were conducted with 1,032 families, consisting of 773 home owners and 259 renters in Buffalo, New York, during 1952. From three to five questions or statements were used for each of the nine values being studied. Each question was answered on a scale of five levels from "strongly agree" to "strongly disagree." By using a scale for the answers, it was possible for the investigators to determine not only what values were held by the families, but also to rank the families according

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<sup>29</sup>G. H. Beyer, T. W. Mackesey, and J. E. Montgomery, Houses Are For People (Ithaca, 1955).

<sup>30</sup>Ibid., p. 2-5.

to the extent to which they emphasized a particular value. The data concerning the "Prestige" group were insufficient for analysis; however, the percentage breakdowns for the other three value groups are as follows: "Personal" - owners 13.6%, renters 8.5%; "Family" - owners 30.1%, renters 37.1%; "Economy" - owners 30.3%, renters 36.3%; not classified - owners 26.0%, renters 18.1%.<sup>31</sup> The findings resulting from the research were then used as bases for designing four houses, each of which incorporated the values held by a specific value group. The designs are intended only to be illustrative of principles; not to be taken as definitive. They were planned to be mass-produced houses, costing from below \$14,000 to \$15,000 and having from 800 to 1,100 square feet of floor space, and with a carport as an integral part of the house.<sup>32</sup>

In a later study of these nine values, Beyer used the forced-answer technique and the scale-analysis technique to test the validity of the methods.<sup>33</sup> In his first comparison based on rank correlations, the significant finding was that the four values ranking highest under the forced-answer technique usually ranked among the first four values

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<sup>31</sup>Ibid., p. 56.

<sup>32</sup>Ibid., pp. iii, 7.

<sup>33</sup>Glenn H. Beyer, Housing and Personal Values, Cornell University Agricultural Experiment Station Memoir 364 (Ithaca, 1959).

under the scale-analysis technique, sometimes in practically the same order. In a second comparison, the highest-ranked forced-answer statements were compared with individual items of the value scales. The results were generally positive when compared in this manner but to varying degrees. In only a few instances were negative results obtained. For this study a total of 694 rural families and 1066 urban families from the Triple Cities area of New York were interviewed.

Dean hypothesized that among the many different types of value patterns found in today's family life, the following type-clusters are frequently discernible:

Familistic type: Strong in-group feelings and identification with the family name, family traditions. The integration of individual activities for the attainment of family objectives. Money and possessions conceived as family property, with understanding they may be used for the support of individual needs. Concern for family perpetuation and defense of members from outside attack.

Integrated Individualized type: Cooperative furtherance of member's self-realization of his potentialities and objectives. Coordination of family activities for the attainment of individual ends. Some property family oriented, but also some emphasis on individual possessions. Individual rights given in return for individual responsibilities. Mutual concern for individual happiness.

Emancipated type: Personal pursuit of individual goals to the exclusion of (or conflict with) other family members. Coordination, if any, from individual realization of personal benefits from cooperation. Individual property with little or no obligation to family welfare. Heavy concern for self-interest, with the troubles of others conceived as their own responsibility.

Status-striving type: Pursuit of career success and secure social position, and the accoutrements of status and prestige. Activities of individual family members are scanned with an eye to how they reflect upon the family status, strong encouragement to competitive success in community affairs.<sup>34</sup>

Preferences appear as part of many investigations, but very seldom form the entire basis for a study. One such study conducted by Nolan was concerned with the preferences a selected group of rural women have for household equipment and furniture.<sup>35</sup> In addition to ascertaining what women, using budgets first of \$1,200 and then of \$1,800, would purchase to furnish an empty house, she also compared the items which they would purchase with the furnishings and equipment they actually had in their homes. She found a definite correlation between items owned by the homemakers and those which they would purchase to furnish an empty house.

A poll of preferences conducted in Wichita, Kansas, at the 1954 Parade of Homes revealed three major preferences desired in a home.<sup>36</sup> They were:

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<sup>34</sup>John P. Dean, "Housing Design and Family Values," Land Economics, XXIX (1953), pp. 128-141.

<sup>35</sup>Francena Nolan, Factors Associated With Preferences for Household Equipment and Furniture by 351 Rural Families, Pennsylvania State College Agricultural Experiment Station Bulletin 591 (State College, 1955).

<sup>36</sup>Doretta Schlaphoff, "The 'Study House' in the Wichita Parade of Homes," Journal of Home Economics, XLVIII (1956), pp. 100-102.

Flexibility to meet changes in the normal family,  
A good house to last a lifetime,  
1800 square feet of floor space for \$18,000 or  
less in Wichita.

For this study, a house plan was developed through the co-operative effort of two home economists, a residential architect, a cost-conscious project builder, and a quality conscious custom builder-architect. A house was built according to the plan and exhibited in the 1955 Wichita Parade of Homes. To demonstrate its flexibility, the house was redecorated four times during the week of display, each redecoration keyed to a different stage in the family life cycle.

#### The Experimental Approach

The experimental method has been used in only limited areas for housing research. The most common area in which this method has been used is the planning of kitchens and storage spaces. A recent study of this nature resulted in plans known as the Beltsville ENERGY-SAVING KITCHEN, Design No. 1, Design No. 2, and Design No. 3.<sup>37</sup>

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<sup>37</sup>Beltsville Kitchen-Workroom, United States Department of Agriculture Home and Garden Bulletin 60 (Washington, 1959); Beltsville Energy-Saving Kitchen Design No. 2, United States Department of Agriculture Leaflet 463 (Washington, 1961); and Beltsville Energy-Saving Kitchen Design No. 3, United States Department of Agriculture Leaflet 518 (Washington, 1963).

The University of Illinois Small Homes Council has also used the experimental method in conducting housing research.<sup>38</sup> A "space laboratory," 24 x 36 feet, was designed to have an interior floor plan which could be completely changed by three men in a period of two to three days. Both the interior and exterior of the laboratory had the appearance of a normal house. Families lived in the house, arranged according to six different plans for a period of one month each. Actual use of the rooms was determined by means of an "activity log." All data were analyzed according to three levels of adequacy: physiological, psychological, and social. The main merit of this type of laboratory research stems from being able to hold constant such variables as neighborhood, furniture, and room size and arrangement. The major difficulties encountered were high cost and the amount of time consumed. It was found that one month was not sufficient time for analysis, and that two to three months would be preferable. The investigators believed it might be possible to reduce costs by using five or six houses having different floor plans, but of a more permanent nature.

#### The Activities or Use Approach

The activities or use approach to housing is perhaps one of the techniques used most frequently today. An

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<sup>38</sup>Byron E. Munson, "An Experimental Approach to Housing Research," Journal of Home Economics, L (1958), pp. 99-101.



extensive study of this nature was conducted on a regional basis by the United States Department of Agriculture.<sup>39</sup>

The survey technique was used in determining housing uses and preferences of farm families. The regions studied were: Southern, Western, North Central, and Northeastern. Data obtained through interviews were used later in laboratory research to determine more specifically the kinds and amounts of space needed by farm families. Final step in the program was designing houses which would fit special needs of the families studied. Findings from the studies show that housing preferences of the families studied were related to such factors as the family's socio-economic level, region of residence, size and composition, and the age and education of the homemaker respondent.

Withrow's and Trotter's research into the leisure activities of teen-agers is one of the more recent "activity-type" studies.<sup>40</sup> Through interviews with 30 families in Lincoln, Nebraska, the investigators ascertained the activities carried on by families with teen-age children

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<sup>39</sup> Glenn H. Beyer, Farm Housing in the Northeast (Ithaca, 1949); Paulena Nickell, et al., Farm Family Housing Needs and Preferences in the North Central Region, Iowa State College Agricultural Experiment Station Research Bulletin 378 (Ames, 1951); A. Woolrich, E. Beveridge, M. Wilson, Housing Needs of Western Farm Families, Western Regional Research Report No. 1, (1952); Farm Housing in the South, Southern Cooperative Series, Bulletin No. 14.

<sup>40</sup> Jerre L. Withrow and Virginia Y. Trotter, "Space for Leisure Activities of Teen Agers," Journal of Home Economics, LIII (1961), pp. 359-362.

and the resulting needs regarding space and storage requirements. Withrow and Trotter concluded that the activities which were participated in by over twenty per cent of the families could be arranged into three distinct zones to improve livability of houses and increase enjoyment of the activities. These are:

Quiet or Private: Study, magazines, books, handiwork, radio, and models.

Social: Guests for meals, snacks, cards, and visiting, quiet games, music, TV, records, magazines, radio, books, and handiwork.

Active: Dancing, photography, models, painting, carpentry, games, records, and sewing.<sup>41</sup>

A report of uses and design of the kitchen-family room by Hinson lists the main activities carried on in this room as being:

Meal preparation, serving and clean-up,

TV viewing,

Reading,

Letter writing and keeping of family records by the mother,

Reading and daytime resting by the father,

Ironing by household help,

Play and study by the children,

Play with the children and TV viewing by baby sitters.<sup>42</sup>

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<sup>41</sup>Ibid., pp. 359-362.

<sup>42</sup>Thelma Hinson, "The Kitchen-Family Room: Its Use and Design," Journal of Home Economics, LII (1960), pp. 107-108.

Findings of the study revealed also that storage was seldom sufficient for the equipment needed for multiple activities carried on in a room. The following implications were offered for the design of kitchen-family rooms:

At least 14 feet wide.

Outside entrance.

Wall-finish to allow for ease in maintenance.

An acoustical ceiling for noise reduction.

A hard floor covering that is easy to clean, does not show soil readily, and is resistant to marks, dents, and scratches.

The provision of sufficient natural and artificial light to offset the low reflection of natural wood tones when used for walls and woodwork.

A fireplace for family pleasure.

The provision of sufficient and convenient storage space for meal preparation and service equipment, toys, laundry supplies, family records, writing materials, iron and ironing board, sewing supplies, card table, and hobby materials.

The provision of built-in and multi-purpose furniture.

An acceptable form of room divider that partially or completely conceals the kitchen area from the remainder of the room.

The use of color for a cheerful, cordial atmosphere.

Comfortable, durable and easy-to-care-for furnishings.<sup>43</sup>

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<sup>43</sup>Ibid., p. 108.

## The Architectural Approach

Concepts of contemporary architecture were developed around the turn of the century by such men as Frank Lloyd Wright, Le Corbusier, Mies Van der Rohe, Alvar Aalto, and Walter Gropius. Although the approaches used by these architects differ greatly, each in his own way used or uses methods of converting space from a static element into a dynamic, vital element of contemporary life. Because Wright and Le Corbusier have had significant impacts on American architecture, only their philosophies and work will be considered here. In order to describe the architectural approach to housing, which cannot be done with words alone, illustrations of Wright's and Le Corbusier's work, as well as several recent examples of design for special groups are included.

Frank Lloyd Wright was one of the first, and most vocal of contemporary architects. His ideas of organic architecture were, and in many respects still are, revolutionary and controversial. His designs represent, however, an uniquely American style of architecture which differs from that of the other leading architects who are all European. In an early statement concerning housing, Wright expressed his feelings concerning the place of housing in our culture:

To thus make of a human dwelling-place a complete work of art, in itself expressive and beautiful, intimately related to modern life and fit to live in, lending itself more freely and suitably to the

individual needs of the dwellers is itself an harmonious entity, fitting in color, pattern and nature the utilities and be really an expression of them in character, -- this is the tall modern American opportunity in Architecture. True basis of a true Culture. An exalted view to take of the 'property instinct' of our times? But once founded and on view I believe this Ideal will become a new Tradition: a vast step in advance of the prescribed fashion in a day when a dwelling was a composite of cells arranged as separate rooms: chambers to contain however good aggregations of furniture, utility comforts not present: a property-interest chiefly. An organic-entity, this modern building, as contrasted with that former insensate aggregation of parts. Surely we have here the higher ideal of unity as a more intimate working out of the expression of one's life in one's environment. One great thing instead of a quarreling collection of so many little things.<sup>44</sup>

Wright believed that a house should contain more than just static four-wall enclosures. He contended that a house should play a vital role in the lives of its inhabitants and that it should reflect the best facets of their personalities and improve upon them. Scully seems to have grasped this rather illusive part of Wright's philosophy in his statement:

The prose of architecture -- the background buildings which attempt only a little and are content to serve as neutral settings for any kind of human thought and action -- did not interest him. Instead, it was his life-long intention to form human life into rhythmic patterns which seemed to him poetic and to embody those patterns in buildings which were in every case specific and unique poetic works themselves. In this double need he was the child of his time, but his extraordinary ability to carry his intentions

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<sup>44</sup> Frank Lloyd Wright: Writings and Buildings, Selected by Edgar Kaufmann and Ben Raed (USA, 1960), p. 106.

through made him in fact its 'great original interpreter.'<sup>45</sup>

The following examples of Wright's work show his unique handling of space and form, as well as his mastery of unifying buildings into the surrounding landscape and his plasticity of design. Neither Taliesin West nor the Jester project are typical of the usual form of housing. Both illustrate Wright's unique division and integration of interior and exterior spaces. The effect is one of total form and integrated spatial areas which flow from one to another, yet accommodate different types of activities.

Plate I Taliesin West, Maricopa Mesa, Wright's home near Phoenix, Arizona.<sup>46</sup>

Plate II Ralph Jester (Martin Pence) Project, illustrated with the Villa of the Emperor Hadrian, Tivoli.<sup>47</sup>

Le Corbusier is many things: architect, city planner, painter, furniture designer and writer. His unusual solution to architectural and planning problems have often been unacceptable to people when first proposed, but later generations have frequently found them stimulating and inspirational. The following excerpt from a speech given in 1959

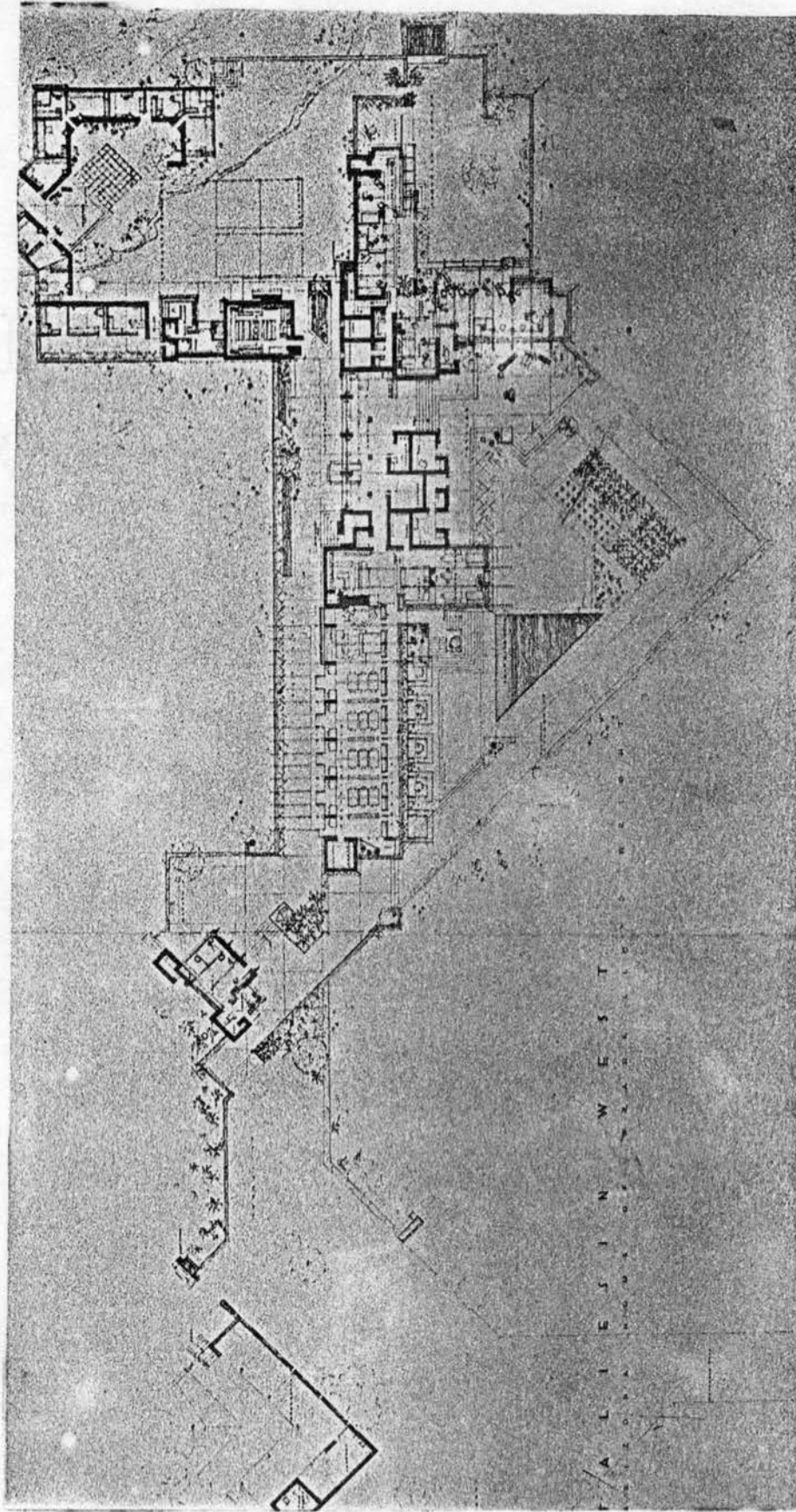
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<sup>45</sup>Vincent Scully, Jr., Frank Lloyd Wright (New York, 1960), p. 11.

<sup>46</sup>Ibid., figure 91.

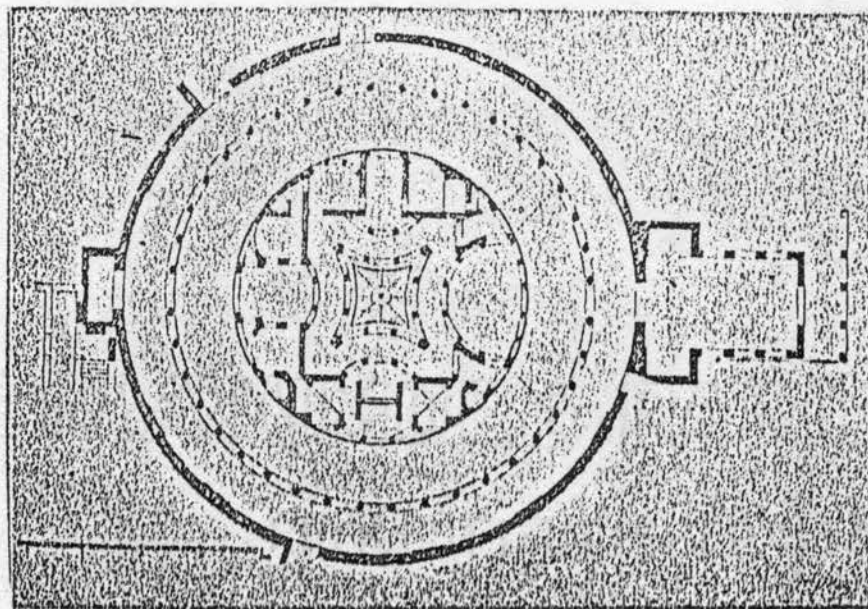
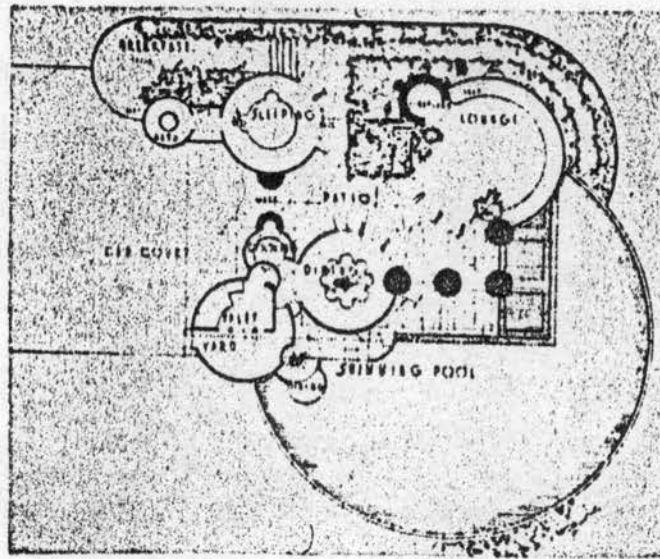
<sup>47</sup>Ibid., figures 107, 108, and 109.

Plate I. Taliesin West



91. Taliesin West, Maricopa Mesa, near Phoenix, Arizona, 1938-1959. Plan.

Plate II. Ralph Jester (Martin Pence) Project





expresses much of Le Corbusier's philosophy of housing:

I am a visual man, a man working with eyes and hands,  
animated by plastic endeavour.

All that makes true architecture  
true painting

true planning for town and country.

I have invented the word 'Ville-Radieuse,' which  
cannot be translated in English perhaps, it is told  
to me! But architecture and urbanism (or planning  
for town and country) are, in fact, one problem only  
and are not separate questions. They demand one  
solution only and this is the work of one profession  
only.

My cities are green cities.

My houses give: sun  
space  
and green.

But to obtain such richness of life: sun, space and  
green, you must take 2,000 people together, build a  
big house with one entrance only for 2,000 people.  
So they will be quickly in their own home where they  
will find total silence and total solitude...though  
they are 2,000 together. They will never hear them  
and never see them because it is possible to have  
one vertical road that is four rapid lifts (for 20  
persons each), seven internal horizontal streets,  
one above the other, and four sets of neighbours:  
one above, two beside (left and right) and one below.  
That is the reason which brings to the modern man  
individual liberty and the benefit of communal re-  
sources.<sup>48</sup>

In an essay about Le Corbusier and architecture,  
Joseph Hudnut gives great insight into Le Corbusier as a  
man and as an architect:

No designer is more inventive than Le Corbusier. It  
has been said of him, and with little exaggeration,  
that he gave architects a new vocabulary. He freed  
buildings from weight -- the greatest single in-  
novation of modern architecture -- and gave us  
volume as the essential material of our designs. He  
showed us how to exploit crystalline space and trans-  
plant surface, flat roof, suspended wall, asymmetrical

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<sup>48</sup>Le Corbusier, Creation is a Patient Search (New  
York, 1960), p. 300.

plan, and the forms of windows, balconies, ramps and screens which the new structure provokes. His resourcefulness, not in forms merely, but in relationship and pattern, is inexhaustible.<sup>49</sup>

The houses of Le Corbusier are beautiful essays in an art of abstractions, but they are important only as they state the problem of modern architecture in its relation to the life of our society and the eager progress of our technologies. They tell us that modern structure enveloping a modern life may be capable of emotional content; the world had waited long for that message, and yet, I think, that message would have been less persuasive had not Le Corbusier found the means to extend his principle into a wider social complex.<sup>50</sup>

In 1942 Le Corbusier began working on "The Modulor," a mathematical scale of dimensions to be used in building for man's use. This plan served as the basis for much of Le Corbusier's later work.

The following examples of Le Corbusier's work illustrate his geometric- and his people-centered approaches to architecture as well as his interest in form, shape and proportion. The Marsielles "city in a building" is designed completely on the Modulor principle. The rooftop illustrates Le Corbusier's mastery of making even the most commonplace item, in this case a chimney, aesthetically pleasing. His focus on people is illustrated in the following plates which show an "adult-sized" portion of the building and a room scaled for children.

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<sup>49</sup>Stamo Papadaki, ed., Le Corbusier, (New York, 1948), p. 11.

<sup>50</sup>Ibid., p. 13.

Plate III Rooftop of Marsielles "city in a building"<sup>51</sup>

Plate IV Child-sized room in the Marsielles building.<sup>52</sup>

Great interest has been focused in recent years on the design of houses, hospitals, etc., which will fulfill the needs of special groups. Both physical and psychological needs were considerations in the development of these specialized designs. The following illustrations show how special physical and psychological needs can be incorporated into the design of space and facilities.

Plate V illustrates how kitchen and bath design which give a wheel chair occupant maximum freedom and independence are achieved by the use of specially designed cabinets, fixtures and accessories.

Plate V Housing for the Handicapped - illustrations pertinent to the design of houses from a book on rehabilitation center planning.

Architects: F. Cuthbert Salmon and Christine F. Salmon.<sup>53</sup>

The "village" concept of housing for the elderly (Plate VI) can provide the solitude which many desire as well as the services and facilities they need. Connected by

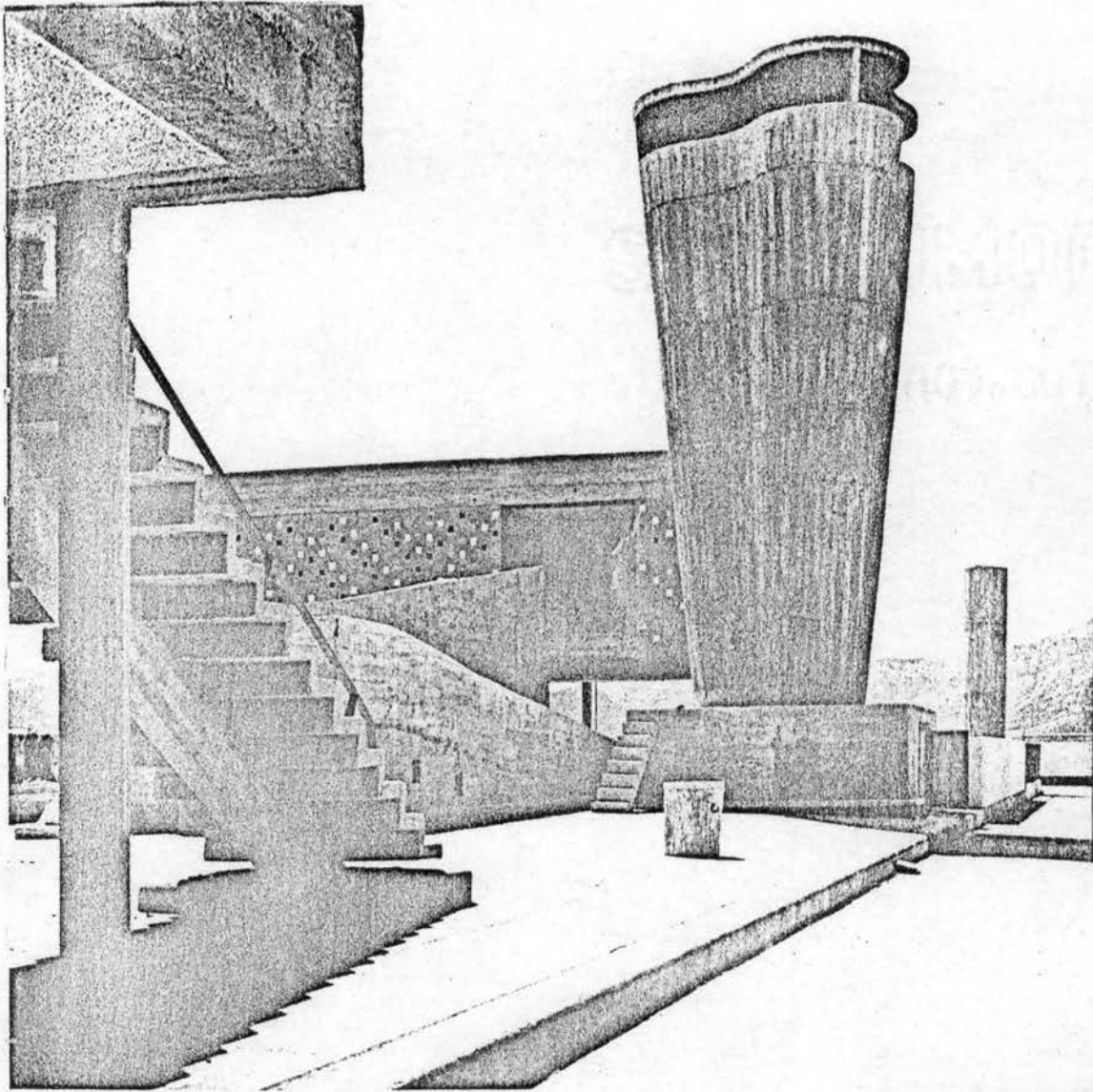
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<sup>51</sup>Le Corbusier, p. 165.

<sup>52</sup>Ibid., p. 170.

<sup>53</sup>F. Cuthbert Salmon and Christine F. Salmon, Rehabilitation Center Planning An Architectural Guide (Pennsylvania, 1959).

## Plate III. Rooftop of Marseilles "City in a Building"



The roof, and a landscape worthy of Homer. 800,000 inhabitants of Marseilles do not see the Marseilles landscape. Here, from each of the 700 loggias there is a view of the mountains and the sea. The inhabitants go up to the roof, and the children play there .... When it was all finished, as has been said earlier, a society for the preservation of the French countryside sued L-C for 20 million francs damages for ruining the landscape of France.



Plate IV. Child-Sized Room in the Marsielles Building

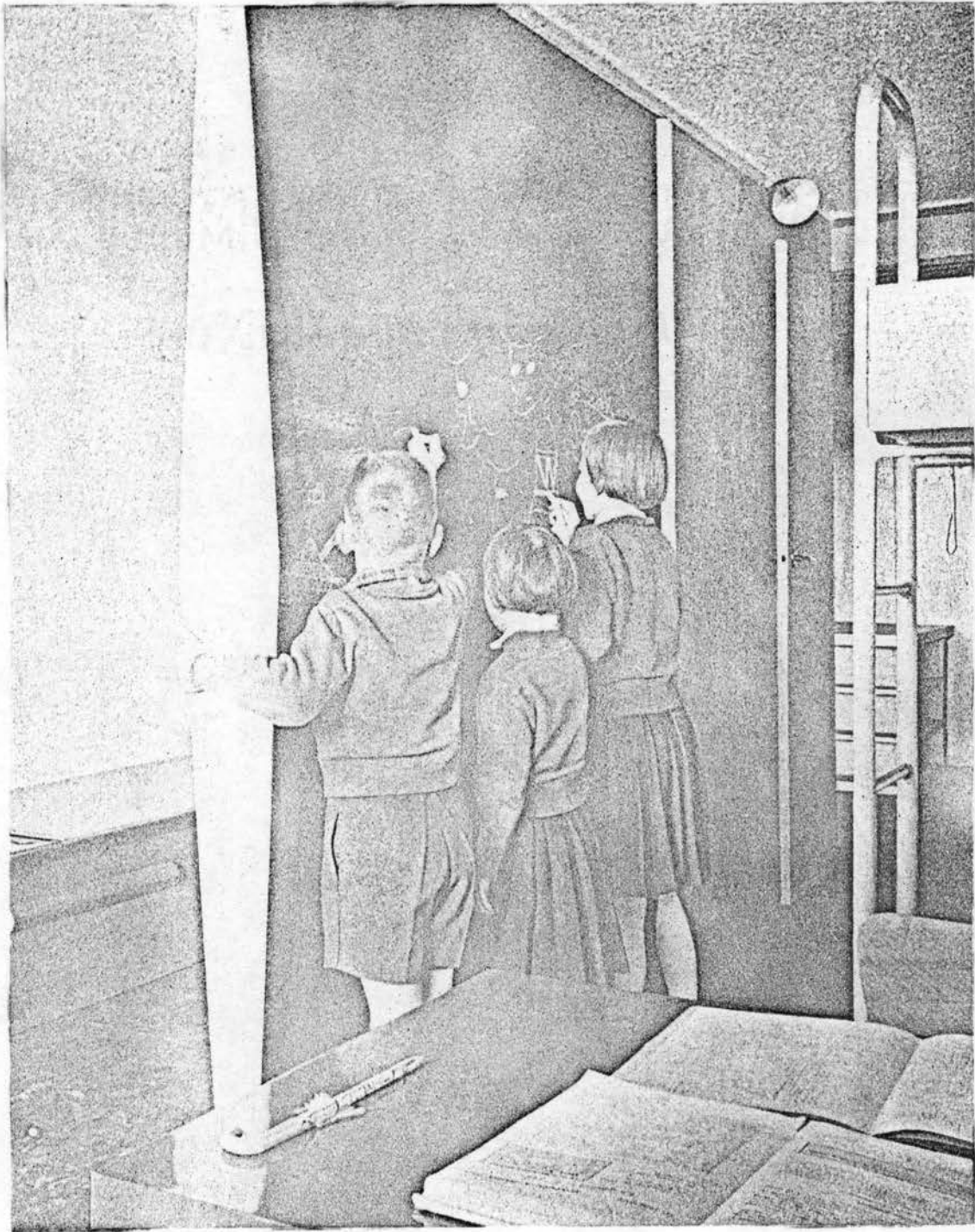
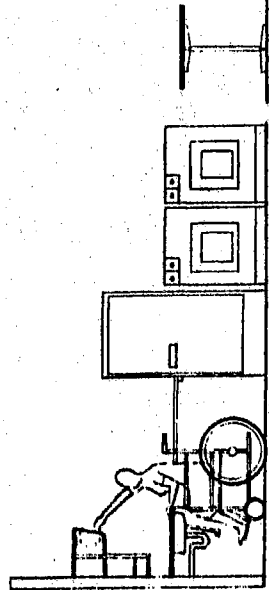
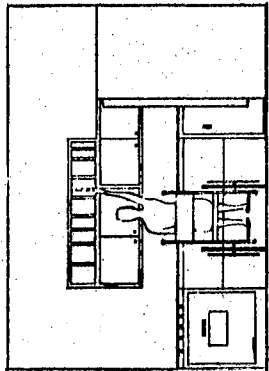
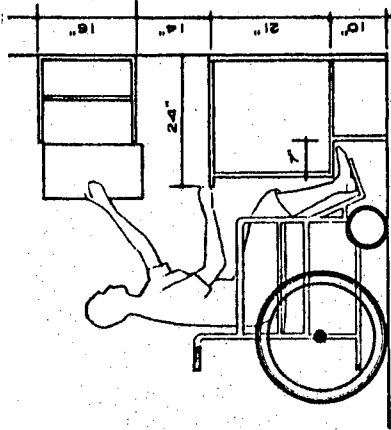
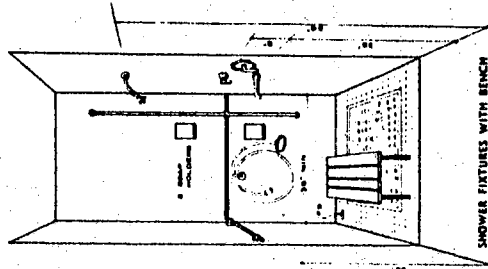


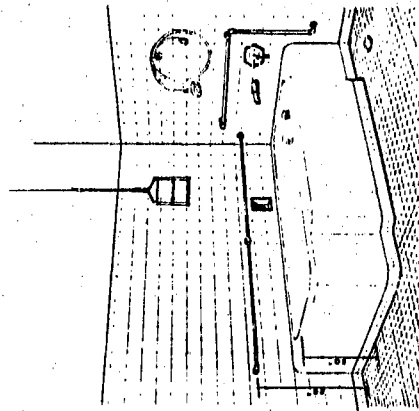
Plate V. Housing the Handicapped



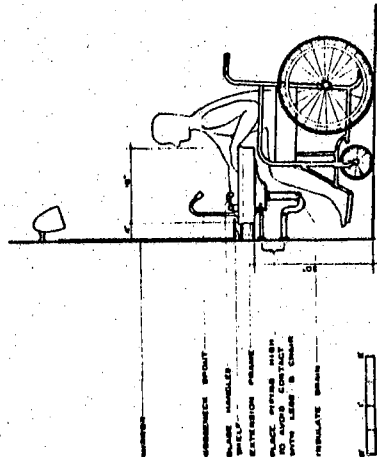
ACTIVITIES OF DAILY LIVING



SHOWER FIXTURES WITH BENCH



BATHTUB WITH ACCESSORIES



LAVATORY FOR WHEEL CHAIR PATIENTS (ADULT)

- CONTOURED SEAT
- SHOCK ABSORBER
- WHEEL
- EXTENSION FRAME
- PLACE SEAT ON WHEEL CHAIR WITH SEAT IN CHAIR
- PERMANENT BRACE

covered walks without steps to a central core of services and facilities are individual houses which vary in size. Special lighting designed for nighttime illumination of the walks and courtyards provides added safety.

Plate VI Housing for the Elderly - Carmel Valley  
Manor, Carmel Valley, Calif. Architects:  
Skidmore, Owings and Merrill.<sup>54</sup>

The homelike atmosphere which children need has been achieved in the Menninger plan (Plate VII) by the division of each building into "little houses" for from four to ten children each. Each "little house" has its own entry and recreation room on the lower level and patients' rooms, baths and a dayroom on the upper level.

Plate VII Housing for the Mentally Ill - Children's  
Psychiatric Hospital, Topeka, Kansas.  
Architects: Ekdahl, Davis and Depew.<sup>55</sup>

College housing takes many forms, some related to the desired effect which is to be achieved upon students (Plate VIII). Such is a plan developed at Washington University to promote maximum interaction of small groups. In contrast to this, the University of Missouri plan, by dividing nine-story buildings into four two-story "houses,"

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<sup>54</sup>"Retirement Village," Progressive Architecture, XLV (April, 1964), p. 139.

<sup>55</sup>"Menninger Builds Houses for Children," Architectural Record, XXXIV (November, 1963), p. 171.

Plate VI. Housing for the Elderly

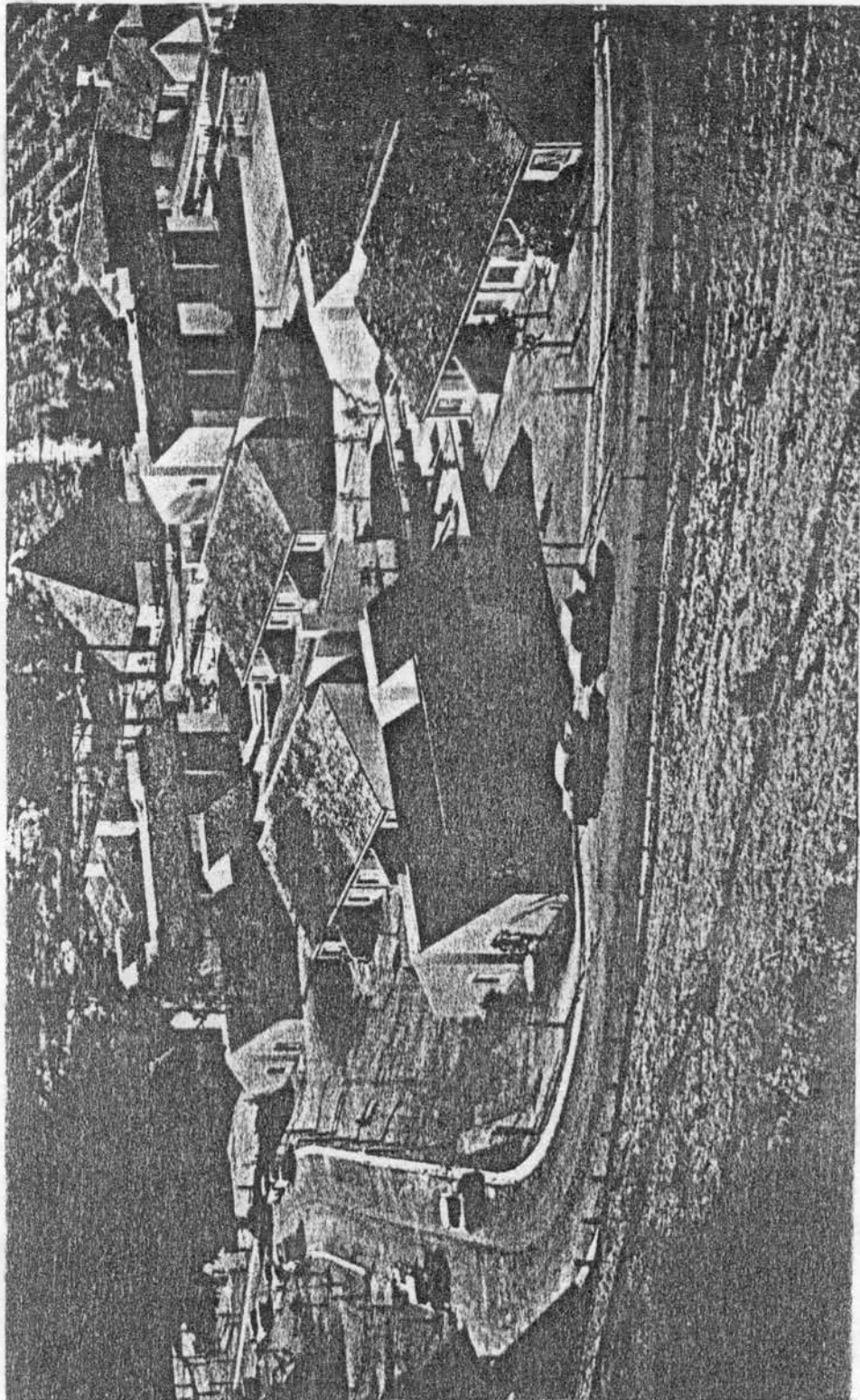
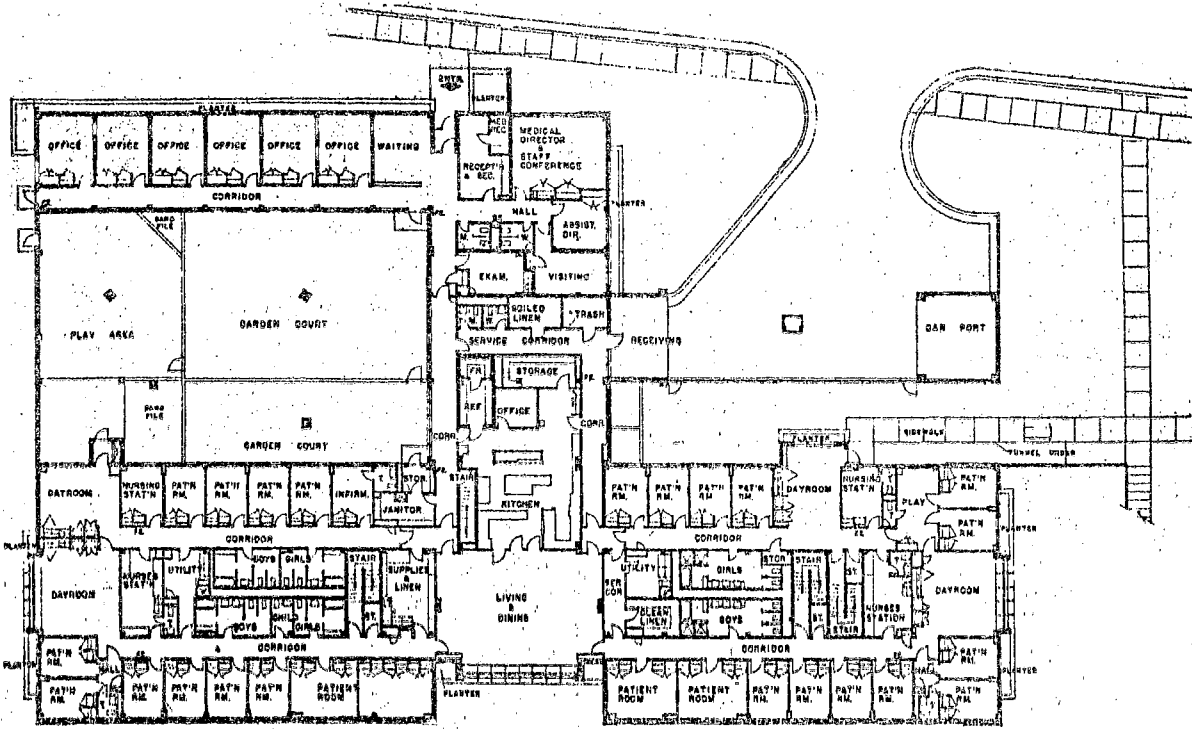
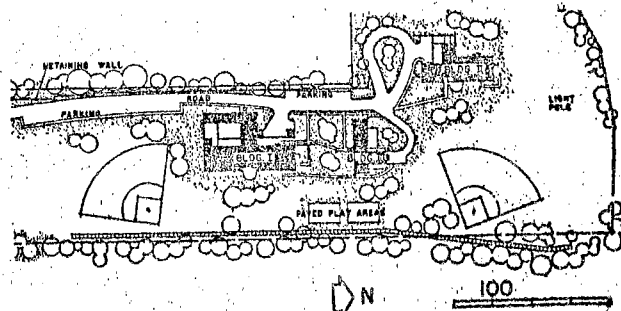




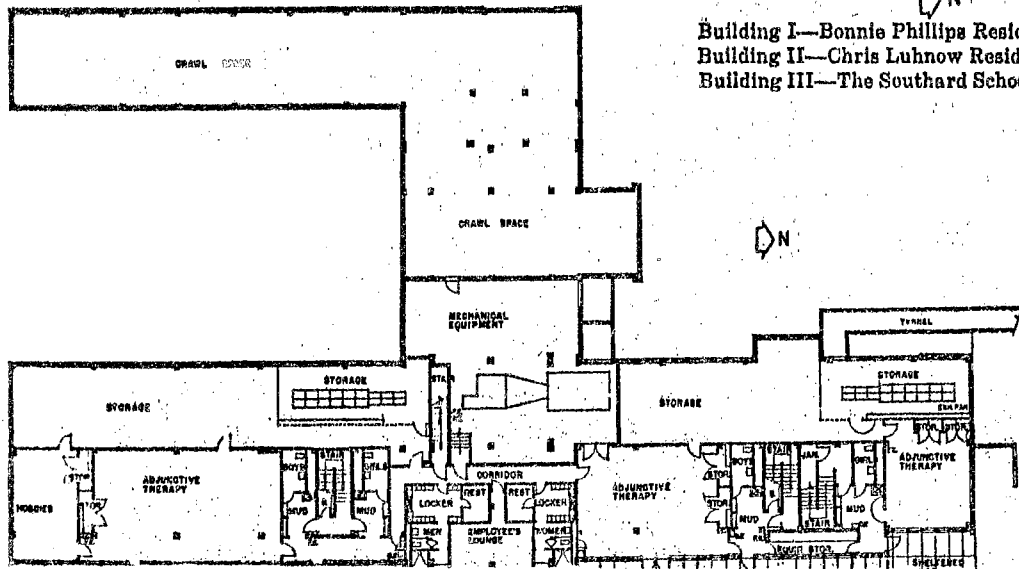
Plate VII. Housing for the Mentally Ill



BUILDING I UPPER LEVEL



Building I—Bonnie Phillips Residence  
 Building II—Chris Luhnnow Residence  
 Building III—The Southard School



each accommodating 62 women, provides for large group interaction.

Plate VIII Housing for College Students - Washington University. Architects: Hellmuth, Obata and Kassabaum.<sup>56</sup>

In a report on housing for married college students, Frank offers many ideas and concepts which are especially adaptable to a study of military housing. He states that:

Too much emphasis cannot be put on the opportunity to design houses specifically for a semi-permanent, identifiable population, as contrasted with the usual anonymous random population in urban housing, ordinarily viewed in terms of a few large classes in income, socio-economic status, and varying demands for a number of rooms.<sup>57</sup>

He also says:

The aim of student housing is, or should be, to provide for a way of living commensurate with the needs and the aspirations of students, incorporating in the housing whatever may be conducive to these purposes.<sup>58</sup>

The need for housing research on special portions of the population has led to the formulation of the current study concerning the space needs of military families. The writer feels her beliefs concerning housing for military families are parallel to those stated by Frank concerning student housing:

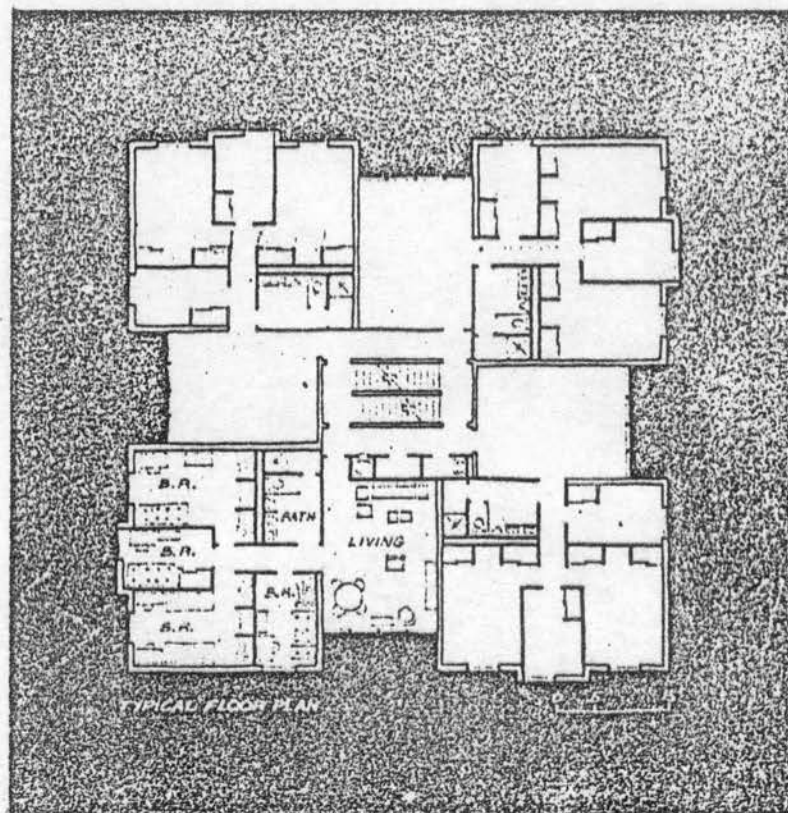
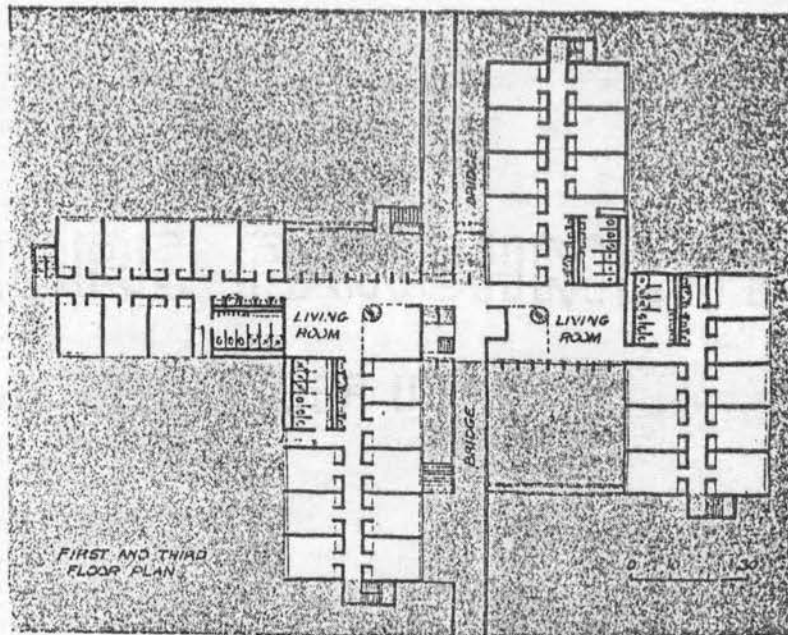
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<sup>56</sup>"Dormitories: Designs for Campus Life," Architectural Forum, XVI (February, 1962), pp. 71, 73.

<sup>57</sup>Lawrence K. Frank, "Housing for Married Students," Journal of Home Economics, XXXIX (1957), p. 347.

<sup>58</sup>Ibid.

Plate VIII. Housing for College Students



The common tasks, activities, needs and requirements of families, especially families of a special, identifiable group such as married students, offer possibilities for imaginative planning to provide a way of living that will be more conducive to an enhanced family living and child rearing than contemporary housing ordinarily is.<sup>56</sup>

### Summary

Many aspects of housing and approaches to house design have been and are being studied. The aspects of housing most frequently investigated can be classified as: (1) the physiological, (2) the psychological, and (3) the sociological. The approaches to house design most commonly used are: (1) needs, preference, values and images, (2) experimentation, (3) activities or use, and (4) architectural approaches to house design. Several aspects of housing and approaches to house design remain wholly or partly unexplored. Further investigations are needed in areas previously studied to: (1) validate findings, (2) cover a wider range of the population, and (3) probe deeper into the problems. Much more information is needed, for example, regarding the interrelationship between people and their housing, both from the standpoint of how housing can be designed to meet the needs and fulfill the values of people and of the interaction between people and housing.

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<sup>59</sup>Ibid., p. 350.

## CHAPTER III

### METHODOLOGY

Because of the size and diversity of the military population, it was deemed advisable to limit the present study to a pilot study with the aim of constructing an instrument and choosing appropriate methods for analyzing data. It is anticipated that the instrument and methods of analyzing the data will be used at a later date to survey a representative sample of military families.

#### Securing Authorization For the Study

To secure authorization for the study, the writer submitted a proposal consisting of two parts to the Department of Defense. The first section contained a statement of the problem and purposes of the study, the hypothesis, assumptions, limitations, and a justification of need for the study. The second section described the over-all procedure planned for the study, as well as ideas concerning selection of the sample, preparation of the questionnaire, the pre-test, and collection and treatment of the data. The proposal was submitted to Mr. John J. Reed, Deputy Assistant Secretary of Defense for Family Housing, in the Department of Defense (see letter, Appendix A). A letter granting

authorization for the study was received on November 5, 1963 (Appendix A).

Permission to conduct the study among the individual service members in Stillwater was obtained from each of the Commanders and liaison officers. Permission was secured through personal interviews with the Commanders of the Air Force and Army ROTC units and through telephone interviews with the AFIT and Marine liaison officers and the Commanders of the Army and Navy Reserve units.

#### Developing the Questionnaire

A questionnaire which could be administered to a number of people in a group interview situation or mailed to individual respondents was deemed to be the most appropriate technique for collecting data. A trial instrument was developed which contained questions concerning ownership of selected large items -- furniture, appliances, equipment, etc. -- requiring space in or about the house for use or for storage. Where pertinent, additional questions were included concerning the number, size and formality or informality of the items. Questions devoted to obtaining information concerning service branch and rank of household head, family size and composition, and stage in the family life cycle were also a part of the instrument. The last section of the questionnaire contained three "fill-in" questions concerning: (1) hobby items owned, (2) items purchased or sold because of some special living situation encountered in

Stillwater and/or at the respondent's last assignment, and (3) items the respondent would purchase if space and/or facilities in the present dwelling permitted use of the items.

Most of the questions were a "checklist" type, requiring the respondent to merely place a check in the appropriate space to indicate: (1) ownership of an item, number owned, and size or sizes and/or (2) plans to purchase an item, and number and size or sizes the homemaker plans to purchase. The following questions are typical of those included in the questionnaire.

Q. HOBBY EQUIPMENT that takes floor space (specify items owned after each listing)

Ham radio equipment (specify) \_\_\_\_\_  
Darkroom equipment (specify) \_\_\_\_\_

Q. Item	Own							Plan to Buy						
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
BABY EQUIPMENT														
Baby carriage														
Stroller														

#### Pre-Testing the Questionnaire

To obtain a sample population for pre-testing the instrument, a listing of married reserve officers whose wives had accompanied them on active duty was secured from the Stillwater Army reserve unit. Because none of the enlisted personnel had been married at the time they served on active duty they were not included in the pre-test sample. Six names were randomly selected and appointments for

interviews were made by telephone with the wife of each of the six reserve officers selected. The reserve ranks represented in the pre-test sample were captain (2), major (1), lieutenant colonel (2), and colonel (1).

The pre-test instrument was administered individually to the six women. After completion of the questionnaire, each respondent was encouraged to comment on any aspect of the questionnaire or the study, especially regarding ways the instrument could be improved. Following analysis of the pre-test data and findings, and of the respondent's comments, minor changes were made in the instrument. The final questionnaire used for gathering the data is presented in Appendix B.

#### Selecting the Sample

The sample consists of all military families living in the Stillwater, Oklahoma, area. This sample was chosen because it was accessible, and it included members of all service branches. The military population in the Stillwater area consisted of between two and three hundred families from the Air Force, Army, Navy and Marine Corps. All military ranks represented in the sample were included in the study; however, only the responses from the officer group were analyzed statistically because of the small number and atypical nature of the enlisted group.



## Collecting the Data

Questionnaires were administered at meetings of the Officers' Wives Club and the NCO Wives Club in Stillwater, Oklahoma. Women who did not attend the meetings were sent questionnaires through the mail. In this manner it was possible to contact all military families in the Stillwater area. Analysis of the returns according to the method of obtaining the data is included in the Characteristics of the Sample, p. 63.

## Treating the Data

### The Independent Variables

The major independent variable by which the data were analyzed is the military rank of the husband. Rank was chosen as the main independent variable for three reasons:

1. Base housing is designed and assigned by rank.
2. Rank is related to income and, therefore, determines to some extent the housing which military personnel are able to acquire in a given community.
3. Rank designates to a large degree the socio-economic standing of military families.

The second independent variable by which the data were analyzed is family size and composition, e.g. age and sex of children. Family size and composition were chosen as the second independent variable for four reasons:

1. Family size and composition have a direct effect upon the amount and types of space needed by a

family.

2. Family size and composition have a direct effect upon the amount, size, and number of some items of furniture owned by a family.
3. Family composition has a direct effect upon the number of bedrooms needed by a family.
4. Family composition may have some effect upon the amount and types of spaces needed by a family.

The third independent variable is the stage in the family life cycle. This was chosen for three reasons:

1. The stage in the family life cycle affects the type of activities carried on within the house.
2. The stage in the family life cycle determines special needs of certain family members.
3. The stage in the family life cycle affects the type of space needed in the house, as well as some items of furniture, appliances, and equipment.

#### The Dependent Variables

The dependent variables are ownership of or plans for owning furniture and equipment requiring consideration when planning activity and storage space in and around a house, and when planning the size and types of rooms needed in a house. The possessions considered are all large items of furniture, appliances, and equipment, and large miscellaneous items which the families might own or plan to buy.

### Statistical Tests

Where frequency distributions permitted, Chi-square test was used in determining association between the independent variables: rank, family size and composition, and stage in the family life cycle, and the dependent variables: ownership of selected items of furniture or household equipment. Frequencies, percentages, and Chi-square values were obtained by means of a high speed electronic computer in the Computing Center at Oklahoma State University.

### Characteristics of the Sample

The description of the characteristics of the sample is divided into two parts: the first an analysis of the total married military population of Stillwater, Oklahoma, as of January, 1964, and the second a more detailed analysis of the officer group. Because of its small size and unusual distribution of rank, the enlisted group will not be used for detailed analysis regarding possessions. The writer believes that this omission will not detract too greatly from the study since the methods are the main consideration rather than the resulting data.

### The Total Married Population

Because all officers and enlisted personnel in Stillwater have been especially selected for their assignments

as students in such programs as AFIT, or for ROTC, recruiting, or reserve duty, they form a very atypical military group. The resulting distribution of ranks -- more officers than enlisted personnel and more O3 officers than O1 and O2 -- is also quite atypical. The group has served as a good sample for a pilot study, however, because of its interest in the study and their availability.

The high percentage of returns, sixty per cent, may indicate a great deal of interest in housing on the part of military wives, hence their willingness to participate in any way to improve their over-all housing conditions. Sixteen of the people who did not return questionnaires were known to have graduated and left Stillwater one week after the questionnaires were mailed. If those graduating who did not return questionnaires are not included in the population figure of 273, then the 167 responses would constitute a return of sixty-five per cent or almost two-thirds of the resulting population number of 257.

The military population in Stillwater consists mainly of Air Force personnel and of officers. The resulting sample used for analysis consists mainly of Air Force families. The data regarding distribution of rank, response to the questionnaire, returns from each branch of service, and per cent of sample usable according to the branch of service are presented in Table I.

TABLE I

MARRIED MILITARY POPULATION OF STILLWATER, OKLAHOMA,  
 BY RANK, RESPONSE TO QUESTIONNAIRE,  
 AND BRANCH OF SERVICE

Branch of Service	Rank			Number and Per Cent Responding to Questionnaire		Per Cent of Return from Each Branch of Service	Per Cent of Usable Sample (166) from Each Branch of Service
	Officer	Enlisted	Total	Number	Per Cent		
Air Force	181	47	228	143*	52.4	62.7	85.6
Navy	1	0	1	1	0.366	100.0	0.6
Army	29	9	38	19	6.96	50.0	11.4
Marine Corps	6	0	6	4	1.46	66.7	2.4
Total	217	56	273	167*	61.2		100.0
Total - 16 who graduated			257		65.0		

\* One questionnaire unusable - no rank given

Of the 167 returned questionnaires, 166 were usable. They were fairly evenly divided between those distributed by mail and those distributed at meetings, approximately three-fifths by mail and two-fifths from meetings. Almost one-half of the mailed questionnaires were returned. Data regarding response to the questionnaire according to the method of collection are presented in Table II.

TABLE II

RESPONSE TO QUESTIONNAIRE, BY  
METHOD OF OBTAINING DATA

Method of Obtaining Data	Number of Schedules		Per Cent of Respondents Returning Questionnaires	Per Cent of Returns by Method of Obtaining Data
	Distrib- uted	Returned		
Meeting	75	71	94.7	42.8
NCO Wives Club	19	19	100.0	
Officers Wives Club	56	52	92.9	
Mail	<u>208*</u>	<u>95**</u>	<u>45.6</u>	<u>57.2</u>
Total	283	167**	61.2	100.0

\* Questionnaires sent by mail to everyone not returning one at meetings; therefore, four received questionnaires both at meetings and by mail.

\*\* One unusable questionnaire -- no rank given by respondent.

To simplify the discussion of rank throughout the remainder of this report only the grade classification, i.e., O1, O2, etc., will be used since the title, i.e., captain, major, etc., for some grade classifications

varies with the branch of service. The following list of grade classifications and titles is given to assist the reader. Where titles differ, the Air Force title is listed first, followed by the Army, the Navy and then the Marine titles.

Officer grades and titles:

Company Grade Officers

- O1 - 2nd lieutenant, ensign
- O2 - 1st lieutenant, lieutenant junior grade
- O3 - Captain, lieutenant

Field Grade Officers

- O4 - Major, lieutenant commander
- O5 - Lieutenant colonel, commander
- O6 - Colonel, captain
- O7 - Brigadier general, commodore

Warrant officer grades and titles:

- W1 - Warrant officer
- W2 - Chief warrant officer
- W3 - Chief warrant officer
- W4 - Chief warrant officer

Enlisted grades and titles:

E1, E2, or E3

- (E1 - Airman basic, recruit, seaman recruit, private)
- (E2 - Airman 3rd class, private, apprentice seaman, private 1st class)
- (E3 - Airman 2nd class, private 1st class, seaman, lance corp.)

E4, E5, or E6

- (E4 - Airman 1st class, corporal or specl. 4, petty officer 3rd class, corporal)
- (E5 - Staff sgt., sgt. or specl. 5, petty officer 2nd class, sgt.)
- (E6 - Tech sgt., sgt. or specl. 6, petty officer 1st class, sgt.)

E7, E8, or E9

- (E7 - Master sgt., platoon sgt. or sgt. 1st class or specl. 7, chief petty officer, gunnery sgt.)
- (E8 - Sr. master sgt., 1st sgt. or specl. 8, sr. chief petty officer, 1st sgt.)
- (E9 - Chief master sgt., sgt. major or specl. 9, master chief petty officer, sgt. major)

Four-fifths of the 166 usable questionnaires were from

officers, and one-fifth from enlisted personnel. Company grade officers make up three-fifths of the sample and field grade officers one-fifth. The questionnaire from the wife of one warrant officer who responded was placed with the company grade officer group for analysis.

The enlisted respondents were almost entirely from one group; E7, E8 and E9. They are very atypical of their rank because almost all were under the Airman Education and Commissioning Program and will become officers upon completion of their college work and the Officer Training School. Data showing the distribution of respondents according to their husbands' rank are presented in Table III.

TABLE III

## DISTRIBUTION OF RESPONDENTS ACCORDING TO RANK OF HOUSEHOLD HEAD

Officer			Warrant Officer			Enlisted		
Grade	No.	%	Grade	No.	%	Grade	No.	%
01	2	1.2	W1	0	0.0	E1,2,3	0	0.0
02	3	1.8	W2	0	0.0	E4,5,6	32	19.3
03	93	56.0	W3	1	0.6	E7,8,9	2	1.2
04	24	14.5	W4	0	0.0			
05	7	4.2						
06	2	1.2						
07	0	0.0						
Total*	131	78.9	Total*	1	0.6	Total	34	20.5

*Total Officer	No.	%
Company Grade and Warrant Officer	98	59.0
Field Grade	34	20.5

The Officer Group

Field grade officers comprise one-fourth of the group



and company grade officers three-fourths. This should not be construed as a biased sample, however, since the services do have more company grade than field grade officers.

To facilitate analysis by family size and composition each family was assigned to one of four classifications according to the number of bedrooms needed to comply with arbitrarily established minimum health standards -- no more than two persons in a bedroom. Only four classifications were used since few houses today have more than four bedrooms. By thus limiting the classifications some large families in the four-bedroom category actually need more than four bedrooms to meet the desired standard of two persons to a bedroom. To have the information correspond somewhat to current military practices the minimum number of bedrooms was arbitrarily established as one bedroom per each of the persons or pairs listed below:

Husband and wife.

Single adult or adult couple living with the family.

Single child one year or over (children under one year can be housed in parents' room).

Two children of the same sex with less than five years difference in age.

Two children of different sexes when both are under four years of age.

It should be remembered that these are minimum needs and not necessarily the ideal number of bedrooms nor the

number desired by the individual families. It should also be remembered that this is an analysis of military officers, the majority of whom are college graduates making an adequate thought not an ample salary. It is reasonable to assume, therefore, that many of this group will not accept minimum level housing unless forced to by extenuating circumstances. The delineation of needs which follow must be considered therefore, as an interpretation of minimum needs based upon size and composition of family as defined above.

The group as a whole, according to size and composition of the families, needs two, three, and four bedroom units. Less than one-tenth of the group need a minimum of one bedroom. Almost one-half need a minimum of three bedrooms, one-fourth a minimum of two bedrooms and one-fourth a minimum of four bedrooms. A marked difference exists between the needs of company grade and field grade officers. Among the field grade group, one-third need three bedrooms and one-third need four bedroom units. In contrast to this, one-half of the company grade group require three bedrooms and only one-fifth need four bedrooms. Although the group needing only one bedroom is small, there is a difference by rank. While one-tenth of the field grade officers need a minimum of one bedroom, a unit of this size would meet the needs of only one-twentieth of the company grade officers. Approximately one-fourth of both groups need two bedrooms.

A majority of the families, over two-thirds, is in the expanding stage of the family life cycle. One-fourth are in the expanded stage, and less than one-tenth are in the beginning, contracting, and contracted stages. A majority of the company grade group, four-fifths, is in the expanding stage, while three-fifths of the field grade group are in the expanded stage. Only one per cent of the company grade group is in the contracting and contracted stages of the family life cycle compared to fifteen per cent of the field grade group. Few company grade and no field grade officers are in the beginning stage of the family life cycle.

Of the families needing a minimum of one bedroom, as defined in this study, two-fifths are in the beginning stage and three-fifths are in the contracted stage of the family life cycle. The majority of families needing from two to four bedrooms are in the expanding or expanded stages of the family life cycle. The families in these two stages comprise two-thirds of those needing two bedrooms, seven-tenths of those needing three bedrooms and three-fourths of those needing four bedrooms.

One-fourth of those needing two bedrooms, three-tenths of those needing three bedrooms, and one-fifth of those needing four bedrooms are in the expanded stage of the family life cycle. Only a small proportion of those needing two or four bedrooms, and no one needing one or three bedrooms, are in the contracting stage of the family life

cycle. The previous information also could be stated in the following way: beginning families need one or two bedrooms, expanding and expanded families need two, three, or four bedrooms, contracting families need two or four bedrooms and contracted families need one bedroom. The characteristics of the officer group according to the independent variables are presented in Table IV.

Nearly all, ninety-four per cent, of the families in the total group have children. Almost two-thirds have either two or three children, slightly over one-fifth of the group have four, five, or six children, and less than one-tenth have only one child. None of the families has over six children. The number of children living at home corresponds almost exactly with the total number of children comprising the families. In other words, very few families have children who live away from home because of marriage, illness, etc.

More field grade than company grade officers are childless, one-tenth compared to one-twentieth. A difference also occurs with families having three children; in this case, ten per cent more of the company grade than the field grade group have three children. While three per cent of the company grade group have six children, none of the field grade group has this number.

Data in Table V show comparison of the officers' families according to sex of the children. Since many families have children of both sexes these figures

TABLE IV

CHARACTERISTICS OF THE OFFICER GROUP ACCORDING TO THE INDEPENDENT VARIABLES

		Rank		Family Size and Composition				Totals
		Co. Grade	Field Grade					
Family Size and Composition	1	4 (4.0)*	3 (9.1)					
	2	2 (27.3)	8 (24.2)					
	3	48 (48.5)	11 (33.3)					
	4	20 (20.2)	11 (33.3)					
Stage in the Family Life Cycle	beginning	4 (4.0)	0 (0.0)	3 (42.8)	1 (2.8)	0 (0.0)	0 (0.0)	4 (3.0)
	expanding	81 (81.8)	8 (24.2)	0 (0.0)	24 (68.6)	41 (68.5)	24 (77.4)	89 (67.4)
	expanded	13 (13.1)	20 (60.6)	0 (0.0)	9 (25.7)	18 (30.5)	6 (19.4)	33 (25.0)
	contracting	0 (0.0)	2 (6.2)	0 (0.0)	1 (2.8)	0 (0.0)	1 (3.2)	2 (1.5)
	contracted	1 (1.0)	3 (9.1)	4 (57.1)	0 (0.0)	0 (0.0)	0 (0.0)	4 (3.0)
Totals		99 (75.0)	33 (25.0)	7 (5.3)	35 (26.5)	59 (44.7)	31 (23.5)	132 (100.0)

\*Per Cent

TABLE V

## PER CENT OF CHILDREN PER FAMILY BY RESIDENCE, SEX AND AGE

No. of Children	none	1	2	3	4	5	6
<b>Per Family</b>							
Co. Grade	5.05	10.10	29.29	37.37	8.08	7.07	3.03
Field Gr.	9.09	9.09	30.30	27.27	15.15	9.09	0.00
Total	6.06	9.84	29.54	34.84	9.84	7.57	2.27
<b>At Home</b>							
Co. Grade	5.05	10.10	30.30	36.36	8.08	7.07	3.03
Field Gr.	9.09	12.12	30.30	27.27	15.15	6.06	0.00
Total	6.06	10.60	30.30	34.09	9.84	6.81	2.27
<b>Boys</b>							
Co. Grade	13.13	46.46	25.25	13.13	2.02	0.00	0.00
Field Gr.	24.24	27.27	30.30	15.15	0.00	3.03	0.00
Total	15.90	41.66	26.51	13.63	1.51	0.75	0.00
<b>Girls</b>							
Co. Grade	26.26	35.35	32.32	2.02	4.04	0.00	0.00
Field Gr.	30.30	36.36	24.24	9.09	0.00	0.00	0.00
Total	27.27	35.60	30.30	3.78	3.03	0.00	0.00
<b>Preschool</b>							
Co. Grade	17.17	27.27	32.32	20.20	3.03	0.00	0.00
Field Gr.	69.69	24.24	3.03	3.03	0.00	0.00	0.00
Total	30.30	26.51	25.00	15.90	2.27	0.00	0.00
<b>Grade Sch.</b>							
Co. Grade	42.42	32.32	20.20	5.05	0.00	0.00	0.00
Field Gr.	21.21	54.54	15.15	6.06	3.03	0.00	0.00
Total	37.12	37.87	18.93	5.30	0.75	0.00	0.00
<b>Teenage</b>							
Co. Grade	89.89	7.07	3.03	0.00	0.00	0.00	0.00
Field Gr.	33.33	39.39	24.24	3.03	0.00	0.00	0.00
Total	75.75	15.15	8.33	0.75	0.00	0.00	0.00
<b>Adult</b>							
Co. Grade	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Field Gr.	93.93	6.06	0.00	0.00	0.00	0.00	0.00
Total	98.48	1.51	0.00	0.00	0.00	0.00	0.00

indicate the largest number of each sex, not the total number of children, in the families.

The majority of the group, two-thirds, have "pre-schoolers" and grade school children. Approximately one-fourth have teen-agers and only one per cent have children who are adults. A marked difference exists between the families of company grade and field grade officers when they are compared according to the age and compositions of their children. Data showing the number of children per family and the number of children according to residence, sex and school age are presented in Table V.

In addition to the information concerning number of children, the following information relative to composition of the families also was obtained. Almost two-thirds of the group have children of both sexes; one-tenth have only one child, and one-fifth have two or more children who are all of one sex. In one-fourth of the families, all of the children are under five years of age, and in over two-fifths of the families all of the children are under 13. In only one-twentieth of the families are all of the children over 13, while one-fifth of the families have children both under 13 and over 13.

Very few of the respondents reported other people living in the household. Several persons who did not return questionnaires stated they were unable to participate in the study because a parent living with them was ill. It might be assumed, therefore, that the actual percentage

of families having others living with them is in reality greater than the returns from this questionnaire show.

Only six, or less than one-twentieth of the group, have individuals other than immediate family members living with them. These individuals are predominantly females, four females as compared to only two males. They are also predominantly adults. Only two families have extra-familial teen-agers living with them and no one reported having extra-familial children living in the household. No family reported more than one individual who is not an immediate family member living with them. Data showing the number of families, by rank, having children or other individuals living with them, according to sex and age group are presented in Table VI.

#### Summary

Authorization to conduct the study was secured from the Department of Defense following submission of a proposal for review.

A questionnaire was developed for obtaining data concerning the independent variables: rank, family size and composition, and stage in the family life cycle, and the dependent variables, major equipment and furnishings which the family owns or plans to buy.

A survey was conducted which included all military families in the Stillwater, Oklahoma, area. This group was



TABLE VI

PER CENT OF FAMILIES, BY RANK, HAVING CHILDREN  
OR OTHER INDIVIDUALS LIVING WITH  
THEM, ACCORDING TO SEX AND AGE  
GROUP

	Co. Grade Per Cent	Field Grade Per Cent	Total Officers Per Cent
<u>Sex</u>			
All children same sex	19.19	27.27	21.23
All children different sex	65.65	54.54	62.87
Only one child	10.10	9.09	9.84
No Children	5.05	9.09	6.06
<u>Age Group</u>			
All children under 5	34.34	0.00	25.75
All children under 13	50.50	21.21	43.18
Some children under 13, some over 13	8.08	57.57	20.45
All children over 13	2.02	12.12	4.54
<u>Other Individuals</u>			
<u>Living With Family</u>			
Per Cent of Families with other individ-			
uals	4.04	6.06	4.54
couple	0.00	0.00	0.00
adult male	1.01	0.00	0.75
adult female	1.01	6.06	2.27
teenage male	1.01	0.00	0.75
teenage female	1.01	0.00	0.75
grade and preschool	0.00	0.00	0.00

chosen because it was comprised of individuals having various ranks and service affiliations, who were interested in the study and were accessible to the writer, thus providing good possibility for obtaining an adequate sample for a pilot study. Two hundred and seventy-three military families were included in the study. A total of 167 questionnaires were returned, one of which was not usable. All usable questionnaires were analyzed to determine the characteristics of the sample, and all officer questionnaires were used for detailed analysis of possible relationships between the independent and dependent variables.

The Chi-square test was used to determine association between the independent and dependent variables. Computations were made on an electronic high speed computer in the Computing Center at Oklahoma State University.

The sample included a large proportion of officers and only a small proportion of enlisted personnel. The officer group consisted primarily of company grade officers which could be expected since in the service there are normally more company grade than field grade officers. Almost all of the families have children; however, a difference exists between the company grade and field grade officers in regard to family size and composition, and stage in the family life cycle. There is a slight difference in number of children according to rank and a marked difference in the ages of the children. Families in the company grade group have pre-school and grade school

children primarily, while the children in the field grade group are of grade school age or older. Few families have other individuals living with them. Extra-familial individuals living with these military families are predominantly adults and females.

## CHAPTER IV

### FINDINGS RELATED TO OWNERSHIP OF AND/OR PLANS TO PURCHASE SELECTED ITEMS OF FURNITURE AND HOUSEHOLD EQUIPMENT

In this chapter the findings regarding ownership of selected items of furniture and household equipment are analyzed and an effort is made to draw implications regarding the design of housing for military families. These design implications are intended to illustrate how data concerning ownership of furniture and household equipment can be analyzed and used as one basis for designing houses.

Relatively few persons indicated plans to purchase items of furniture or household equipment; therefore, the data related to purchase plans is presented in descriptive tables and is neither discussed nor further analyzed. One is probably safe in assuming from the small number planning to buy that the majority of families already own most of the items they need, hence their space needs relative to furnishings and equipment can be ascertained fairly accurately.

The findings of this study are presented in the following order: (1) description of the items which the total officer group own or plan to buy, (2) analysis of findings

where significant differences in ownership exist according to rank, (3) description of items purchased or sold because of some special living condition in Stillwater and/or at the respondent's last assignment, (4) description of items the respondents would purchase if housing space and facilities were currently available.

Ownership of only a few items of furniture or equipment was analyzed by rank because the sample population was small and, in many instances, frequency distributions did not warrant statistical analysis. Analysis by family size and composition, or stage in the family life cycle was not attempted because the distribution of the sample was not sufficiently large in some of the size and life cycle classifications to warrant a complete analysis by these variables. The same type of analysis as that used for analysis by rank could be used, however, with data from a large representative sample.

It was hoped that analysis of "don't know" answers concerning the sizes of ranges, refrigerators and freezers might give some indication as to differences in completeness of information concerning sizes obtained by questionnaires filled out at home and that obtained when questionnaires were filled out in a group situation. It was hoped that this information could shed some light upon the relative desirability of the two techniques of obtaining data. No analysis of this type was possible, however, because, contrary to expectations, most respondents knew the sizes of

their appliances and hence there were few "don't know" responses.

Because of the very frequent turnover of military personnel, housing (both on- and off-base) needs to be flexible. It, therefore, was decided arbitrarily to consider ownership by one out of every four families, i.e. one-fourth of the group, to be significant for design purposes.

The approach to space which involves thinking and planning according to use or activities rather than by specific rooms is used in organizing the presentations of the findings. The analyses and discussions are presented according to the following areas of use or activities: recreation and entertainment, food preparation and service, household equipment and storage, rest and personal care, and outdoor living.

#### Items Owned by the Total Officer Group: Recreation and Entertainment

Although the data do not reveal the number of families owning both formal living room and informal family room furniture, the data do show that ninety-two per cent of the families own a living room sofa, and that forty-four per cent of the families own a family room sofa. These figures substantiate the writer's observation that many officer families own both types of furnishings. It would seem desirable, therefore, to provide areas designed to accommodate both types of furnishings. Since almost nine-tenths

of the families own a medium or large formal living room sofa, and almost two-fifths own a medium or large informal family room sofa, the space provided in each of these rooms for placing them should be at least 14 feet long to accommodate a large sofa and two end tables.

Since almost all officer families have young children it is desirable to plan space where play can be carried on with a degree of freedom -- the family room is perhaps the most popular current answer to this need. Furthermore, provision of a family room where children can play and entertain their friends enables parents to keep the living room in a presentable condition for entertaining their own friends.

The following analysis of space needs for recreation and entertaining is divided into two units. The discussion of a formal living room includes both living room furniture (Table VII) and musical instruments (Table VIII), while the discussion of an informal family room includes furniture suitable for family living (Table IX), music (Table VIII), and hobbies (Table X).

#### Planning Implications for Formal Recreation and Entertainment Area

Space is requisite for at least one large sofa and two medium-sized end tables. Additional space is needed in the room for at least three lounge chairs, a large coffee table and a large table which is neither a coffee table nor an end table.

TABLE VII

## OWNERSHIP OF AND/OR PLANS FOR BUYING FORMAL LIVING ROOM FURNITURE

Item	Own					Plan to Buy			
	0	1	2	3	4 or more	0	1	2	3 or more
	Per Cent					Per Cent			
Sofa									
small (under 5 ft.)	94.7	4.5	0.8			97.0	3.0		
medium (5 to 7 ft.)	43.2	50.8	6.1			94.0	6.0		
large (over 7 ft.)	70.4	28.8	0.8			93.9	6.1		
Lounge chairs (upholstered)									
regular type (with upholstered arms)	41.7	36.4	16.7	3.8	1.5	87.1	4.5	3.3	
regular type (armless)	87.1	7.6	4.5	0.8		99.2		0.8	
recliner	89.4	10.6				92.4	6.1	1.5	
contour	92.4	4.5	2.3	0.8		98.5	0.8	0.8	
rocker (wood or upholstered)	64.4	31.8	3.0	0.8		96.2	3.8		
Occasional chairs (upholstered or not)									
armless	81.1	12.9	5.3		0.8	94.7	3.8	1.5	
with arms	75.8	11.4	11.4	1.5		94.7	3.0	2.3	
Rugs or carpeting (approx. sizes)									
12 x 15 ft.	75.8	23.5	0.8			87.1	10.6	2.3	
12 x 12 ft.	92.4	6.8	0.8			97.0	1.5	1.5	
9 x 12 ft.	63.6	22.7	9.1	2.3	2.3	94.7	3.0	2.3	
8 x 10 ft.	96.2	3.0	0.8			98.5	1.5		
6 x 9 ft.	88.6	9.1	2.3			100.0			
(other)	69.7	23.5	3.8	1.5	1.5	98.5	1.5		
Card table	52.3	37.9	6.8	1.5	1.5	94.7	4.5	0.8	
Card table chairs	70.5	3.0	2.3	0.8	23.5	92.4	0.8		6.8



TABLE VII (Continued)

Item	Own					Plan to Buy			
	0	1	2	3	4 or more	0	1	2	3 or more
	Per Cent					Per Cent			
Television console	57.6	38.7	3.8			95.4	4.5		
portable	63.6	35.0	0.8			95.4	4.5		
Coffee table (square or round)									
small (3 to 4 ft.)	82.6	12.9	2.3	1.5	0.8	98.5	1.5		
medium (4 to 5 ft.)	78.0	21.2	0.8			97.7	2.3		
large (over 5 ft.)	91.7	8.3				97.7	2.3		
Coffee table (rectangular)									
small (3 to 4 ft.)	85.6	14.4				97.0	3.0		
medium (4 to 5 ft.)	81.8	15.9	2.3			97.0	3.0		
large (over 5 ft.)	84.8	14.4	0.8			98.5	1.5		
End table									
small (2 ft. or under)	76.5	12.1	9.8	0.8	0.8	95.4	2.3	2.3	
medium (2 to 4 ft.)	42.4	25.8	28.0	3.0	0.8	93.2	1.5	5.3	
large (over 4 ft.)	93.2	3.8	2.3	0.8		97.7		2.3	
Other living room tables									
small (2 ft. or under)	84.1	12.1	2.3	1.5		97.7	2.3		
medium (2 to 4 ft.)	83.3	14.4	1.5	0.8		97.7	1.5	0.8	
large (over 4 ft.)	93.2	4.5	2.3			99.2	0.8		
Desk									
child's size	94.7	3.0	2.3			97.0	2.3	0.8	
adult size									
3 to 4 ft.	82.6	15.2	2.3			99.2	0.8		
4 to 5 ft.	87.0	17.4	4.5			94.7	5.3		
5 to 6 ft.	92.4	6.1	0.8	0.8		99.2	0.8		
6 ft. or larger	97.0	3.0				100.0			
Secretary	94.7	3.8		1.5		98.5	1.5		
Bookcase	50.8	27.3	10.6	6.1	5.3	93.2	3.0	3.0	0.8
Other living room furniture (formal)	72.0	14.4	6.8	3.0	3.8	98.5	1.5		

N = 132

Floor and wall space for a four- to five-foot desk and at least two bookcases is needed and supplemental space should be available for setting up a card table and four chairs.

Both wall and floor space and facilities are needed for a console television and a hi-fi stereo console. Floor space is needed for a small piano or organ. Acoustical control is an important consideration in the design of this room.

TABLE VIII

## OWNERSHIP OF AND/OR PLANS FOR BUYING MUSICAL INSTRUMENTS

Item	Own				Plan to Buy	
	0	1	2	3	0	1
	Per Cent				Per Cent	
Piano						
spinet	77.3	22.7			91.7	8.3
grand	100.0				98.5	1.5
baby grand	99.2	0.8			97.0	3.0
Organ						
small (spinet - 40 to 50 in.)	97.0	3.0			99.2	0.8
medium (console - 50 to 60 in.)	99.3	0.8			97.7	2.3
large (concert - 60 to 65 in.)	100.0				100.0	
Hi-fi, stereo, combination sets, etc.						
portable	65.2	34.1		0.8	99.2	0.8
console	47.0	49.2	3.8		85.6	14.4
Other space consuming musical instruments	79.5	12.1	5.3	3.0	98.5	1.5
N = 132						

Planning Implications for Informal Recreation and Entertainment Area

Both wall and floor space for an informal recreation and entertainment area should accommodate a medium-sized

TABLE IX

## OWNERSHIP OF AND/OR PLANS FOR BUYING INFORMAL FAMILY ROOM FURNITURE

Item	Own					Plan to Buy		
	0	1	2	3	4 or more	0	1	2 or more
	Per Cent					Per Cent		
Sofa								
small (under 5 ft.)	93.2	6.8				99.2	0.8	
medium (5 to 7 ft.)	68.9	28.8	2.3			94.7	5.3	
large (over 7 ft.)	93.9	6.1				99.2	0.8	
Lounge chairs (upholstered)								
regular type (with upholstered arms)	83.3	10.6	4.5	1.5		97.0	0.8	2.3
regular type (armless)	93.2	3.0	3.0		0.8	98.5	1.5	
recliner	32.4	7.6				98.5	1.5	
contour	97.7	2.3				100.0		
rocker (wood or upholstered)	84.8	13.6	1.5			98.5	1.5	
Occasional chairs (upholstered or not)								
armless	80.3	11.4	5.3	0.8	2.3	96.2	3.0	0.8
with arms	86.4	8.3	3.8	0.8	0.8	97.7	0.8	1.5
Rugs (approx. sizes)								
12 x 15 ft.	93.2	6.1	0.8			98.5	0.8	0.8
12 x 12 ft.	98.5	1.5				96.2	3.8	
9 x 12 ft.	81.8	12.9	3.0	1.5	0.8	97.7	1.5	0.8
8 x 10 ft.	96.2	3.0		0.8		97.2	2.3	
6 x 9 ft.	92.4	5.3	1.5	0.8		99.2	0.8	
Card table and chairs	75.8	21.2	1.5	1.5		97.0	3.0	
Television								
console	83.3	16.7				99.2	0.8	
portable	81.8	18.2				98.5	1.5	

TABLE IX (Continued)

Item	Own					Plan to Buy		
	0	1	2	3	4 or more	0	1	2 or more
	Per Cent					Per Cent		
Coffee table (square or round)								
small (3 to 4 ft.)	97.0	3.0				98.5	1.5	
medium (4 to 5 ft.)	95.4	4.5				99.2	0.8	
large (over 5 ft.)	100.0					100.0		
Coffee table (rectangular or oval)								
small (3 to 4 ft.)	93.2	6.8				99.2	0.8	
medium (4 to 5 ft.)	93.9	5.3	0.8			98.5	0.8	0.8
large (over 5 ft.)	97.7	2.3				100.0		
End table								
small (2 ft. or under)	91.7	3.8	4.5			97.7	1.5	0.8
medium (2 to 4 ft.)	81.8	9.1	7.6	0.8	0.8	97.7	0.8	1.5
large (over 4 ft.)	99.2	0.8				99.2		0.8
Other family room tables								
small (2 ft. or under)	93.2	1.5	1.5	2.3	1.5	99.2	0.8	
medium (2 to 4 ft.)	93.9	6.1				99.2	0.8	
large (over 4 ft.)	97.0	2.3	0.8			100.0		
Desk								
child's size	89.4	9.8	0.8			99.2		0.8
adult size								
3 to 4 ft.	83.3	14.4	2.3			99.2	0.8	
4 to 5 ft.	87.1	11.4	1.5			99.2	0.8	
5 to 6 ft.	97.0	3.0				98.5	1.5	
6 ft. or larger	95.4	4.5				100.0		
Secretary	99.2			0.8		99.2	0.8	
Bookcase	62.9	18.2	10.6	6.1	2.3	96.2	2.3	1.5
Other TV, Family Room, Playroom, etc. furniture - (casual)	74.2	12.9	6.1	1.5	5.3	99.2	0.8	
N = 132								

sofa and one or two medium-sized end tables. Floor space is needed also for at least two lounge or occasional chairs, an adult desk from three to five feet long, or a child's desk, and at least two bookcases.

Space and facilities ought to be provided for some of the following items: (1) a console or portable hi-fi, (2) a console or portable television set, or (3) a small piano or organ. Acoustical control is also an important consideration in the design of this room.

Although no one "inside" hobby was mentioned a significant number of times, "inside" hobbies, in general, were mentioned frequently enough to make them significant for space consideration. Space to perform hobbies is important because hobbies are means to both relaxation and morale.

TABLE X

## OWNERSHIP OF HOBBY EQUIPMENT

Hobby	Do Not Own	Own
Ham radio equipment	91.7	8.3
Darkroom equipment	92.4	7.6
Painting equipment	94.7	5.3
Fishing equipment	72.7	27.7
Hunting equipment	77.2	22.7
Camping equipment	75.8	24.2
Flower arranging equipment	92.4	7.6
Gourmet cooking equipment	96.2	3.8
Model building equipment	98.5	1.5
Woodworking equipment	79.5	20.5
Craft equipment	93.9	6.1
Other hobby equipment	63.6	36.4
N = 132		

Items Owned by the Total Officer Group: Food  
Preparation and Service

Both a formal and an informal eating area are called for in housing to be occupied by families of military officers. The following analysis of space needs for food preparation and service is treated as two separate units. The discussion of food service pertains to both formal dining room furniture (Table XI) and informal "breakfast" furniture (Table XII). The discussion of food preparation includes both kitchen (Tables XII and XIV) and outdoor preparation (Table XIII).

Planning Implications for Food Service Area

Space is needed for a dining table which seats up to eight persons, a buffet and a sideboard. Between the table and the kitchen, space ought to be sufficient for using a serving cart. The space provided for formal dining could be one of the following: an integral part of the living room, part of a living room which can be closed off when desired, or a separate room.

Space is needed either in or adjacent to the kitchen for a breakfast ensemble seating at least six persons. Consideration should also be given to space needed for using a serving cart between the table and the kitchen work areas.

TABLE XI

OWNERSHIP OF AND/OR PLANS FOR BUYING DINING ROOM FURNITURE						
Item	Own			Plan to Buy		
	0	1	2 or more	0	1	2 or more
	Per Cent			Per Cent		
Dining table and chairs						
seats 4	86.4	13.6		94.7	5.3	
seats 6	63.6	34.1	2.3	93.2	6.0	0.8
seats 8	84.1	15.9		92.4	7.6	
seats 10 or more	83.3	16.7		95.5	4.5	
Buffet	62.9	37.1		80.7	19.7	
China cabinet	72.7	26.5	0.8	84.8	15.2	
Sideboard	88.6	11.4		94.7	5.3	
Corner cupboard	99.2	0.8		100.0		
Other dining room furniture	84.1	12.9	3.0	97.0	2.2	0.8
N = 132						

#### Planning Implications for Food Preparation Area

Space ought to be planned in a kitchen for storing both a serving cart and a stationary step stool when they are not in use. A space at least 42 inches wide and both gas and electrical facilities are requisite for a range. There needs also to be allowed space for placing a refrigerator as large as 15 cubic feet, a freezer having a capacity of 20 cubic feet, and a portable dishwasher. An important consideration in designing space for a dishwasher is ease of movement to and from the place of storage, the sink, and the dining and breakfast tables.

The popularity of out-door cooking is evidenced by the number of families owning patio equipment. This suggests need for a patio located within easy access of the kitchen to facilitate movement of food and equipment. For comfort of use, its location should be shielded from prevailing breezes, the hot afternoon sun, and from the view of neighbors.

TABLE XII

OWNERSHIP OF AND/OR PLANS FOR BUYING KITCHEN EQUIPMENT					
Item	Own			Plan to Buy	
	0	1	2 or more	0	1 or more
	Per Cent			Per Cent	
Breakfast set					
seats 2	97.0	3.0		100.0	
seats 4	67.0	31.8	0.8	98.5	1.5
seats 6 or more	74.2	24.2	1.5	96.2	3.8
Serving cart	64.4	34.8	0.8	97.7	2.3
Step Stool					
stationary	64.4	34.8	0.8	98.5	1.5
folding	79.5	18.9	0.8	96.2	3.8
Metal cabinets (storage)	82.6	13.6	3.8	100.0	
Stove					
gas	47.0	53.0		96.2	3.8
electric	86.4	13.6		97.0	3.0
Stove					
apartment size, 20 in.	97.0	3.0		100.0	
compact size, 30 in.	84.8	15.2		100.0	
regular size, 40 in.	68.9	30.3	0.8	98.5	1.5
other	95.4	4.5		99.2	0.8
don't know size	97.0	3.0		98.5	1.5
Refrigerator or combination					
one-door freezer-refrig.					
9 cu. ft. or under	91.7	8.3		100.0	
9 to 12 cu. ft.	73.5	25.0	1.5	98.5	1.5
12 to 15 cu. ft.	86.4	13.6		98.5	1.5
over 15 cu. ft.	99.2	0.8		99.2	0.8
don't know size	97.7	2.3		99.2	0.8
Two-door freezer-refrig.					
9 to 12 cu. ft.	92.4	7.6		99.2	0.8
12 to 15 cu. ft.	79.5	20.4		100.0	
15 to 20 cu. ft.	92.4	7.6		98.5	1.5
don't know size	98.5	1.5		99.2	0.8
Freezer-type					
upright	55.3	44.7		87.9	12.1
chest	92.4	7.6		97.0	3.0
other	100.0			100.0	



TABLE XII (Continued)

Item	Own			Plan to Buy	
	0	1	2 or more	0	1 or more
	Per Cent			Per Cent	
Freezer - capacity					
under 10 cu. ft.	97.7	2.3		100.0	
10 to 15 cu. ft.	84.4	15.2		97.7	2.3
15 to 20 cu. ft.	81.8	18.2		98.5	1.5
over 20 cu. ft.	92.4	7.6		98.5	1.5
don't know size	97.7	2.3		99.3	0.8
Other kitchen furnishings and equipment	95.4	3.0	1.5	100.0	
N = 132					

TABLE XIII

OWNERSHIP OF AND/OR PLANS FOR BUYING OUTDOOR LIVING FURNITURE AND EQUIPMENT

Item	Own						Plan to Buy				
	0	1	2	3	4	5	0	1	2	3	4
	Per Cent						Per Cent				
Patio table	81.1	16.7	1.5			0.8	93.2	6.8			
Patio chairs	29.5	6.8	22.7	17.4	16.7	6.8	92.4	2.3	3.8		1.5
Picnic table	73.5	25.8	0.8				88.6	11.4			
Picnic benches	80.3	6.1	10.6	0.8	2.3		89.4	6.1	4.5		
Bar-B-Q	15.9	78.8	4.5	0.8			94.7	5.3			
Other outdoor living furnishings	84.1	10.6	4.5	0.8			100.0				
N = 132											

Items Owned by the Total Officer Group: Household  
and Miscellaneous Equipment

Well designed space for using and storing household equipment and miscellaneous items is important to both the mental and the physical health of the homemaker. The physical work-load of the homemaker can be increased when space and storage is not well designed or it can be decreased when space and storage are well thought out and carefully planned. Rossi<sup>1</sup> and others have pointed out that a lack of adequate and well-arranged storage space is one of the prime factors in a homemaker's dissatisfaction with a house. To improve the morale of military homemakers, which in the end ought to result in improved morale of the whole family, the greatest care must be exercised in planning and arranging storage and in placing household equipment.

The following analysis of space needs for household equipment and storage is treated in two parts. The discussion of household equipment includes the items listed in Table XIV and the discussion of miscellaneous equipment encompasses those listed in Table XV.

Planning Implications for Household Equipment Area

Houses which do not have central air-conditioning should have at least two 220-volt outlets for window air

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<sup>1</sup>Peter H. Rossi, Why Families Move (Glencoe, 1955).

TABLE XIV

## OWNERSHIP OF AND/OR PLANS FOR BUYING HOUSEHOLD EQUIPMENT

Item	Own			Own		
	0	1	2 or more	0	1	2 or more
	Per Cent			Per Cent		
Washer						
automatic						
front loading	85.6	14.4		100.0		
top loading	22.0	76.5	1.5	97.0	3.0	
wringer type	100.0			100.0		
Washer-dryer combination						
gas	99.2	0.8		100.0		
electric	91.7	8.3		100.0		
Dryer						
gas	87.1	12.9		93.9	6.1	
electric	43.2	56.8		94.7	5.3	
Dishwasher						
portable	63.6	36.4		81.8	18.2	
built-in	94.7	5.3		97.7	2.3	
Ironer - elec.						
standard	93.9	6.1		99.2	0.8	
portable	96.2	3.8		100.0		
Sewing machine						
portable	40.2	57.5	2.3	100.0		
cabinet	70.4	28.8	0.8	97.0	3.0	
Vacuum cleaner						
upright	75.8	24.3		96.2	3.8	
cannister	18.2	81.1	0.8	97.7	2.3	
other	99.2	0.8		100.0		
Floor polisher	58.3	41.7		90.9	9.1	
Air conditioner						
110 volt	76.5	22.0	1.5	97.0	3.0	
220 volt	40.9	50.0	9.1	97.0	3.0	
Air conditioner room						
window model	43.9	43.2	12.9	96.2	3.0	0.8
portable	98.5	1.5		100.0		
central	90.9	9.1		98.2	1.5	
Air cooler						
window	93.9	5.3	0.8	99.2	0.8	
portable	95.5	4.5		100.0		
Other household equipment	91.7	5.3	3.1	100.0		
N = 132						

conditioners. Facilities, as well as space, are needed for an automatic washer and a dryer, either gas or electric. In conjunction with these space needs is the necessity for adequate counter space nearby upon which clothes can be folded and space for the storage and use of an ironing board. Other design considerations for laundry areas are: proximity to dirty clothes -- most come from the bedroom area -- access to a sink for spot removal and hand laundry, and access to an outdoor drying area.

Storage space is needed for either a portable or a console sewing machine when it is not in use as well as an activity area large enough to accommodate use of the machine and other equipment. It is desirable to have this area and the ironing area in proximity to avoid unnecessary trips between the two areas.

In addition to the space required for storing small items used in the care of the house, storage space is needed to accommodate a floor polisher and either an upright or a cannister type vacuum cleaner. A central location will enhance the convenience of such storage spaces.

#### Planning Implications for Miscellaneous Equipment

Either inside or adequately protected outside storage is requisite for at least four footlockers, one wardrobe or steamer trunk, three small suitcases, three medium suitcases and four large suitcases. Storage space ought to be provided also for at least one table fan. Somewhere in the

TABLE XV

## OWNERSHIP OF AND/OR PLANS FOR BUYING MISCELLANEOUS EQUIPMENT

Item	Own							Plan to Buy				
	0	1	2	3	4	5	6	0	1	2	3	4
	Per Cent							Per Cent				
Typewriter table	82.6	17.4						98.5	1.5			
Electric fan												
table size	62.9	27.3	7.6	1.5	0.8			100.0				
floor size	77.3	18.9	3.8					100.0				
window model	81.1	15.2	3.0	0.8				100.0				
Foot locker	23.5	15.9	18.2	11.4	12.1	4.5	14.4	98.5	0.8			0.8
Wardrobe trunk	81.8	13.6	3.0	0.8		0.8		99.2	0.8			
Steamer trunk	81.8	11.4	5.3	1.5				100.0				
Suitcases												
small (cosmetic, hat, etc.)	15.9	31.8	30.3	12.1	6.1	2.3	1.5	98.5	0.8	0.8		
medium (overnight, etc.)	15.9	11.4	35.6	20.4	10.0	2.3	3.8	98.5	0.8	0.8		
large (pullman, 2 or 3 suiter, etc.)	11.4	16.7	23.5	24.2	12.9	5.3	6.1	99.2	0.8			
Standing hair dryer	94.7	5.3						99.2	0.8			
File cabinet	68.9	25.8	4.5	0.8				97.0	3.0			
Other misc. equip.	70.4	18.9	3.8		5.3	0.8	0.8	100.0				
N = 132												

house there should be space to accommodate at least one file cabinet. The most feasible location would be near the desk in the family room.

#### Items Owned by the Total Officer Group:

##### Rest and Personal Care

Every person, young and old, needs a spot to call his own, a place to keep his personal belongings and a place where he can get away from the world. This spot is generally the bedroom, especially for children. When viewed in this light, it is important that a bedroom offer more than just a place to sleep and dress. Many design ideas advanced in recent years can be used to achieve the privacy desired, even in large families. One idea for accommodating a number of children is a "dorm" like room with several small cubicles affording privacy for each child yet opening into a large space usable by all of the children. Another design idea is to divide an average-sized bedroom with a full-length movable partition, thereby offering either space or privacy for two children, whichever is desired at the time. Ideas such as these can be used to make space more flexible and therefore of greater use to families of different sizes and compositions which probably will occupy the housing space.

The analysis of space needs for rest and personal care is presented in two parts. The first discussion concerns rest areas (Table XVI) and the second focuses on personal

care, including infant care (Table XVII) and special health care (Table XVIII).

#### Planning Implications for Rest Area

Ideally, two of the bedrooms in each house ought to have wall and floor space to accommodate adequately a double bed and two bedside tables. One room should be large enough for a king or queen-sized bed. Space is needed also for a chair, primarily a rocker, in at least two bedrooms and a varying number of chests, dressers, etc., in each bedroom. Children's rooms need to have space for a twin or bunk bed, dressers, toys, play furniture and the miscellaneous paraphernalia used by children.

#### Planning Implications for Personal Care Area

Activities involving the rest and personal care of infants are usually assigned to a bedroom. To facilitate ease of infant care one bedroom at least ought to be located near the parents' bedroom and near a bathroom so that water is readily available. Storage space is needed by families "between babies" for the numerous items such as cribs, bathinettes, toilet seats, etc., which families are reluctant to discard.



TABLE XVI

## OWNERSHIP OF AND/OR PLANS FOR BUYING BEDROOM FURNITURE

Item	Own					Plan to Buy				
	0	1	2	3	4 or more	0	1	2	3	4 or more
	Per Cent					Per Cent				
Double bed - regular size	6.8	68.9	19.7	3.8	0.8	97.0	3.0			
Double bed - king size	94.7	5.3				93.2	6.8			
Double bed - queen size	93.9	6.1				97.7	2.3			
3/4 bed	90.2	8.3	0.8		0.8	98.5	0.8	0.8		
Single or twin size bed	40.2	9.8	40.9	4.5	4.5	91.7	3.8	3.8	0.8	
Bunk or trundle beds	64.4	20.4	13.6		1.5	96.2	3.0	.8		
Baby bed	47.7	48.5	3.8			99.2	0.8			
Youth bed	92.4	6.8	0.8			97.7	2.3			
Single dresser	48.5	28.8	12.1	10.6		95.5	4.5			
Double dresser	39.4	33.3	25.8	0.8	0.8	91.7	6.1	2.3		
Triple dresser	70.4	25.0	3.8	0.8		96.2	3.0	0.8		
Mr. & Mrs. chests	81.8	14.4	3.8			94.7	3.8	1.5		
Chest of drawers	21.2	25.8	26.5	15.9	10.6	88.6	7.6	3.0		0.8
Bedside tables	43.2	24.2	16.7	8.3	7.6	90.9	3.0	4.5		1.5
Chairs										
small boudoir	72.7	15.2	9.1	2.3	0.8	93.9	3.8	1.5	0.8	
rocker	73.5	22.0	4.5			99.2	0.8			
chaise lounge	95.5	3.8	0.8			95.5	4.5			
Dressing table	84.1	15.1	0.8			96.2	3.8			
Other bedroom furniture	59.8	14.4	12.1	3.8	9.8	98.5	0.8	0.8		
N = 132										

TABLE XVII

OWNERSHIP OF AND/OR PLANS FOR BUYING BABY EQUIPMENT						
Item	Own				Plan to Buy	
	0	1	2	3 or more	0	1
	Per Cent				Per Cent	
Baby carriage	89.4	10.6			98.5	1.5
Stroller	62.1	37.9			95.5	4.5
Bathinette	78.0	22.0			98.5	1.5
Play pen	65.2	34.1	0.8		98.5	1.5
Other baby equipment	72.0	14.4	6.8	6.8	99.2	0.8
N = 132						

TABLE XVIII

OWNERSHIP OF AND/OR PLANS FOR BUYING  
SPECIAL HEALTH EQUIPMENT

Item	Own			Plan to Buy	
	0	1	2	0	1
	Per Cent			Per Cent	
Vibrators	90.2	8.3	1.5	99.2	0.8
Exercisors	98.5	0.8	0.8	100.0	
Relaxicizors	94.7	5.3		100.0	
Wheel chair	100.0			100.0	
Iron lung	100.0			100.0	
Walker	100.0			100.0	
Other special health or medical equipment	98.5	1.5		100.0	
N = 132					

Items Owned by the Total Officer Group:

Outdoor Living Furniture and Equipment

Adequate outdoor storage is very important in the maintenance of lawns and in keeping out of sight, items which tend to clutter the yard. Space designed specifically for items owned by a significant number of families, such as bicycles, lawn mowers, etc., facilitate both ease of access

and ease of storage. If an item can be easily put away after use, it is less likely to be left out to clutter the yard or driveway.

The analysis of space needs for outdoor storage is divided into four units. The units are: yard equipment (Table XIX), travel equipment (Table XX), hobby equipment (Table X), and children's equipment (Tables XVII and XXI).

#### Planning Implications for Yard Equipment Area

Storage space is needed for a gas powered lawnmower, an edger, a spreader or cart, and at least six large and six small hand tools. If possible, the storage ought to be on a level with the ground or carport to eliminate lifting large items such as a lawnmower.

#### Planning Implications for Transportation Facilities

A two-car carport or garage or a single garage and carport combined is needed since more than one out of every three officers has two or more cars. Families owning two or more cars, by rank, are fifty-five per cent field grade and thirty per cent company grade. Other mobile items, such as boats, are owned by only a few persons and are therefore not significant for design consideration. In specific locations, however, where recreational facilities are nearby, a study might reveal that such items need to be given consideration.

TABLE XIX

## OWNERSHIP OF AND/OR PLANS FOR BUYING YARD EQUIPMENT

Item	Own							Plan to Buy	
	0	1	2	3	4	5	6	0	1
	Per Cent							Per Cent	
Lawn mower									
gasoline powered (push type)	29.5	69.7	0.8					91.7	8.3
gasoline powered (riding type)	97.7	2.3						99.2	0.8
electric powered	95.4	4.5						100.0	
hand mower	83.3	16.7						100.0	
Edger									
electric	93.9	6.1						96.2	3.8
gasoline	97.7	2.3						100.0	
hand	83.3	16.7						99.2	0.8
Spreader or cart	76.5	22.0	1.5					95.4	4.5
Large size hand tools (rake, etc.)	21.2	19.7	6.1	11.4	12.9	6.8	20.0	97.7	2.3
Small size hand tools (trowel, etc.)	28.0	22.0	5.3	11.4	11.4	4.5	17.4	99.2	0.8
Other yard equipment	78.8	9.8	5.3	5.3		0.8		99.2	0.8
N = 132									

TABLE XX

## OWNERSHIP OF AND/OR PLANS FOR BUYING TRAVEL EQUIPMENT

Item	Own				Plan to Buy	
	0	1	2	3	0	1
		Per Cent			Per Cent	
Cars	6.8	56.8	35.6	0.8	93.2	6.8
Motor cycles	94.0	4.5	1.5		98.5	1.5
Boat						
rowboat	100.0				100.0	
sailboat	98.5	1.5			98.5	1.5
motor boat	94.7	5.3			97.0	3.0
house boat	99.2	0.8			100.0	
Boat trailer	96.2	3.8			99.2	0.8
Camping trailer	95.4	4.5			97.0	3.0
Other traveling	93.9	6.1			98.5	1.5
N = 132						

Planning Implications for Hobby Area

Storage space ought to be provided for hunting, fishing and camping equipment. Storage is needed also for large items of woodworking equipment and an activity area is needed sufficient in size to encourage use of such equipment. This activity area could be an integral part of a garage, a storage area or carport, or a portion of the house.

Planning Implications for Children's Toys and Equipment Area

Outdoor play areas are a necessity, especially spaces for a swing set and a wading pool. It would be desirable to have this area shaded and easily viewed from several rooms in the house.

Storage space is needed for at least two bicycles, two tricycles, one wagon and one stroller or baby carriage. Protection from the weather would be desirable but such a

TABLE XXI

## OWNERSHIP OF AND/OR PLANS FOR BUYING CHILDREN'S LARGE TOYS

Item	Own						Plan to Buy			
	0	1	2	3	4	5 or more	0	1	2	3
	Per Cent						Per Cent			
Bicycle	25.8	25.8	31.1	9.1	6.1	2.3	90.9	5.3	2.3	1.5
Tricycle	40.2	34.1	19.7	3.8	1.5	0.8	96.2	3.8		
Wagon	47.7	49.2	3.0				97.0	3.0		
Go-cart	85.6	12.9	0.8	0.8			100.0			
Swing set	56.8	41.7	1.5				91.7	8.3		
Climbing apparatus	94.7	5.3					95.5	4.5		
Sandbox	76.5	23.5					96.2	3.8		
Wading pool										
small (inflatable plastic)	68.2	31.8					99.2	0.8		
medium (inflatable or rigid sides)	81.1	18.9					96.2	3.8		
large (rigid sides)	88.6	11.4					99.2	5.8		
Other children's large toys	6.8	14.4	9.8	9.1	5.3	1.5	99.2	0.8		
N =	132									

storage area need not be completely enclosed.

#### Items Owned According to Rank

Frequency distributions for most items listed on the questionnaire did not warrant a Chi-square analysis.<sup>1</sup> Statistical analysis of the remaining items revealed that for some items ownership varied according to rank of the household head. Data regarding ownership of items for which the Chi-square values were statistically significant according to rank are presented in Tables XXI through XXX.

Factors other than rank per se, undoubtedly affect ownership of many items. These factors, however, are to some degree highly related to rank. Rank, therefore, is probably the most comprehensive social characteristic related to the ownership of furniture and equipment. For example:

Socio-economic level - Field grade officers have a higher income and social level than company grade officers. They are able, therefore, to afford larger and more expensively furnished homes. They also entertain more frequently, both formally and informally.

Age - Both field grade officers and their wives are usually older than company grade officers and their wives.

Education - More company grade officers and their wives than field grade officers and their wives have a college education.

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<sup>1</sup>Chi-square analysis was used for all items which showed a frequency distribution of ten or more in each cell.

Family size - Company grade officers have somewhat larger families than field grade officers. In a few years, however, those officers who are now in the company grade classification will become field grade officers and the statistics will probably change.

Age of children - Company grade officers usually have younger children than field grade officers. Children of company grade officers are primarily infants through age 12, while children of field grade officers are primarily aged five to nineteen.

Length of married life - Field grade officers have usually been married longer than company grade officers, and have, therefore, traveled more widely. This usually results in a collection of many pieces of furniture and miscellaneous items from one or more foreign countries.

Significantly more field grade than company grade officers own 12 x 15 foot rugs. Frequency distributions of the other rug sizes did not warrant a Chi-square analysis; however, they did show that company grade more than field grade officers own 9 x 12 foot rugs. It appears, therefore, that ownership of rugs by size is probably related to socio-economic level, primarily income.



TABLE XXII  
 OWNERSHIP OF 12' x 15' RUG FOR LIVING ROOM  
 ACCORDING TO RANK

Item Living Room - 12' x 15' Rug	Company Grade	Field Grade	Chi-square Value
	Per Cent		
Own 1 or more	18.7	42.5	7.3920 > 6.63
Do not own	81.3	57.5	at .01 1df
	N = 96	N = 33	

Chi-square analysis revealed that more field grade than company grade officers own a card table which they prefer to use in the living room. Although the frequency distribution for ownership of a card table for the family room did not warrant further statistical analysis it did show that ownership was almost identical in both groups. Ownership of a card table used in the living room, therefore, appears to be related to the rank of the household head moreso than is ownership of a card table for the family room.

TABLE XXIII  
 OWNERSHIP OF CARD TABLE FOR LIVING ROOM ACCORDING TO RANK

Item Card Table	Company Grade	Field Grade	Chi-square Value
	Per Cent		
Own 1 or more	41.7	66.7	5.5220 > 5.02
Do not own	58.3	33.3	at .025 1df
	N = 96	N = 33	

Significantly more field grade than company grade officers own one or more portable hi-fi sets. This is not unexpected in view of the fact that field grade officers have higher incomes and their children are more apt to be of the teen-age group. The frequency distribution did not warrant a Chi-square analysis of console hi-fi sets; however, it shows that ownership was approximately the same for both groups.

TABLE XXIV

## OWNERSHIP OF PORTABLE HI-FI SETS ACCORDING TO RANK

Item	Company Grade	Field Grade	Chi-square value
Portable hi-fi	Per Cent		
Own 1 or more	30.2	51.5	4.8720 > 3.84
Do not own	69.8	48.5	at .05 ldf
	N = 96	N = 33	

Company grade, more than field grade, officers own one or more baby beds. Frequency distributions did not warrant a Chi-square analysis of other baby equipment; however, they do show that more company grade than field grade officers own baby equipment. This reflects the finding which indicates that children of company grade officers tend to be younger than those of field grade officers, hence, there is a greater need for baby equipment.

TABLE XXV  
OWNERSHIP OF BABY BED ACCORDING TO RANK

Item	Company Grade	Field Grade	Chi-square value
Baby Bed	Per Cent		
Own 1 or more	61.4	21.2	15.9332 > 7.88
Do not own	38.6	78.8	at .005 ldf
	N = 96	N = 33	

Small boudoir chairs are owned significantly more often by families in which the household head is a field grade officer than by those in which his rank is company grade. Frequency distributions did not warrant a Chi-square analysis of other bedroom chairs; however, they show that field grade, more than company grade, officers own one or more rockers, chaise lounges, and dressing tables with accompanying chairs or stools.

TABLE XXVI  
OWNERSHIP OF SMALL BOUDOIR CHAIR ACCORDING TO RANK

Item	Company Grade	Field Grade	Chi-square value
Small boudoir chair	Per Cent		
Own 1 or more	21.9	45.5	6.7996 > 6.63
Do not own	78.1	54.5	at .01 ldf
	N = 96	N = 33	

Families in which the household head is a field grade officer own one-door refrigerators with a capacity of 9 to

12 cubic feet significantly more often than company grade officers. Frequency distributions did not warrant further analysis of other sized refrigerators, either one-door or two-door; however, they do indicate that the per cent of ownership of all other sizes of one-door refrigerators was approximately the same, but that more company grade than field grade officers owned two-door refrigerators in all three of the listed sizes, 9 to 12, 12 to 15, and 15 to 20 cubic feet. Because company grade officers have larger families, younger homemakers and a higher educational level, ownership of large-sized refrigerators, therefore, appears to be related to income less than to such factors as family size, education, and age of homemaker. More families owned two-door, 12 to 15 cubic foot refrigerators than any other size. The data show also that considerably more field grade officers own chest type freezers while company grade officers tend to own freezers of the upright type.

TABLE XXVII

OWNERSHIP OF 9 TO 12 CUBIC FOOT REFRIGERATOR  
ACCORDING TO RANK

Item 9 - 12 Cu.Ft. Refrigerator	Company Grade	Field Grade	Chi-square value
	Per Cent		
Own 1 or more	20.8	39.4	4.4567 > 3.84
Do not own	79.2	60.6	at .05 ldf
	N = 96	N = 33	

Cannister type vacuum cleaners are owned by families in which the household head is a company grade officer significantly more often than those in which he is a field grade officers. Frequency distributions for upright vacuum cleaners show that field grade more than company grade officers own upright vacuum cleaners. Storage space, therefore, ought to be designed primarily for cannister type cleaners in company grade housing, while storage in field grade housing should accommodate either a cannister or an upright type cleaner.

TABLE XXVIII  
OWNERSHIP OF CANNISTER TYPE VACUUM CLEANERS  
ACCORDING TO RANK

Item	Company Grade	Field Grade	Chi-square Value
Cannister type Vacuum			
	Per Cent		
Own 1 or more	85.4	69.7	4.0196 > 3.84
Do not own	14.6	30.3	at .05 ldf
	N = 96	N = 33	

Company grade officers significantly more often than field grade officers own one or more children's wagons. The difference in ownership of this item is highly significant. Frequency distributions of other large toys show that the majority of both groups own one or more bicycles, and that more company grade than field grade officers own

tricycles, swing sets, sandboxes, and wading pools. These are not unexpected findings in view of the fact that company grade officers have larger families and more children in the pre-school age group than do field grade officers.

TABLE XXIX

## OWNERSHIP OF CHILDREN'S WAGONS ACCORDING TO RANK

Item Children's Wagons	Company Grade	Field Grade	Chi-square value
	Per Cent		
Own 1 or more	61.5	21.2	14.4759 > 7.88
Do not own	38.5	78.8	at .005 ldf
	N = 96	N = 33	

Families in which the household head is a field grade officer own a picnic table more often than do those in which his rank is company grade. The data regarding outdoor furniture and equipment show that almost everyone owns a Bar-B-Q and that most other items are owned by about the same proportion of families in each group. Ownership of a picnic table, therefore, appears to be related to socio-economic level which is contingent upon rank and income.

TABLE XXX  
OWNERSHIP OF PICNIC TABLES ACCORDING TO RANK

Item Picnic Table	Company Grade	Field Grade	Chi-square value
	Per Cent		
Own 1 or more	21.9	39.4	3.8956 > 3.84
Do not own	78.1	60.6	at .05 1df
	N = 96	N = 33	

Hobby items, other than those listed on the questionnaire, are owned significantly more often by families in which the household head is a field grade officer than by those in which his rank is company grade. Observation of the "other" responses shows that the two items specified most frequently were water-ski equipment and electronic equipment.

TABLE XXXI  
OWNERSHIP OF OTHER HOBBY ITEMS ACCORDING TO RANK

Item Other hobby items	Company Grade	Field Grade	Chi-square value
	Per Cent		
Own 1 or more	31.2	54.5	5.7169 > 5.02
Do not own	68.8	45.5	at .025 1df
	N = 96	N = 33	

Frequency distributions indicated that a Chi-square analysis was warranted for the items listed below; however,

the analyses revealed no significant difference in ownership of the items according to rank. The items are:

**Formal Living Room:**

sofa, medium-sized,  
sofa, large-sized,  
rocker,  
card table chairs,  
portable TV,  
square or round coffee table,  
end table, medium,  
adult desk, 4 - 5 foot,  
bookcase,

**Informal Living Room:**

sofa, medium-sized,

**Music:**

spinet piano,  
console hi-fi,

**Dining Room:**

buffet,  
china cabinet,

**Bedroom:**

dresser, single,  
rocker,

**Kitchen:**

serving cart,  
gas stove,  
upright freezer,



**Household Equipment:**

electric dryer,  
portable diswasher,  
portable sewing machine,  
cabinet model sewing machine,  
upright vacuum,  
220 volt air conditioner,  
window model air conditioner,

**Yard Equipment:**

spreader or cart,  
hand tools, small-sized,  
other yard equipment,

**Children's Large Toys:**

swing set,

**Miscellaneous Equipment:**

table fan,  
file cabinet,  
other miscellaneous equipment,

**Hobby Equipment:**

camping.

Some items were not considered for statistical analysis because the majority of families in both officer groups owned the item. These items, therefore, should be given special consideration in the design of all houses to be occupied by military families having an officer as the household head.

TABLE XXXII

## ITEMS OWNED BY THE MAJORITY OF OFFICERS

Item	Company Grade	Field Grade
	Per Cent	
Bicycles	72.7	78.8
Bar-B-Q	82.8	87.9
Footlockers	75.8	78.8
Suitcases, small	83.8	84.8
Suitcases, medium	82.8	87.9
Suitcases, large	86.9	93.9
Cars, one or more	93.9	90.9
	N = 96	N = 33

Items Purchased or Sold Because of Some Special Living  
Condition in Stillwater or at the Respondent's  
Last Assignment

Because of varying housing conditions, families are sometimes forced to repeatedly buy and sell the same type of item during the course of several assignments. This poses one of the biggest and most unexpected financial problems relative to housing which military families must face when making a move, in that a family must either purchase special furniture or equipment needed in order to make a home both comfortable and efficient or sell or store items already owned which cannot be accommodated by the space and/or facilities of new housing. This is especially true when assignments include both a stateside

and a foreign tour, or two or more successive stateside tours where base housing is furnished at one base and not furnished at another. Some of the community and housing factors listed by the respondents, or observed by the writer, as primary causes of forced buying and selling are the presence or lack of:

public transportation in the community coupled with  
location relative to work,  
commissary in the community,  
both gas and electric facilities for ranges and  
dryers,  
space for both washer and dryer,  
220 volt wiring for air conditioners, ranges and  
dryers,  
both formal and informal eating areas,  
both formal and informal recreation and entertaining  
areas,  
central air conditioning.

Equipment listed by the respondents as having been purchased because of inadequate housing facilities were primarily wringer-type washers, transformers, and heating stoves. Many of the respondents specified that these items were purchased because of a foreign assignment. Items listed as having been repeatedly purchased and sold because of varying housing and community conditions were cars, air conditioners, refrigerators, freezers, washers, dryers, ranges, and dining room and family room furniture.

Data presented in Tables XXXIII and XXXIV were obtained from free response questions concerning items purchased or sold because of some special living condition in Stillwater or at the respondent's last assignment. The items listed in Table XXXIV were named most frequently or were selected because the respondent specified that the family owned one type of item but was required to buy another similar item because the housing space and/or facilities would not accommodate the item already owned, i.e.

electric dryer vs. gas dryer,

gas range vs. electric range,

110 volt air conditioner vs. 220 volt air conditioner

washer-dryer combination vs. a separate washer and  
dryer,

window air conditioners vs. central air conditioning.

The data presented in Tables XXXII and XXXIII were secured from the total sample including both officer and enlisted respondents.

If housing designed to fit a family's needs were available at each assignment, then families would no longer be forced to buy and sell furniture and equipment. The financial savings realized by military families would result in improved morale because of a decreased dread of the high cost of mobility.

TABLE XXXIII

NUMBER OF ITEMS PURCHASED OR SOLD BECAUSE OF SOME SPECIAL  
LIVING CONDITION IN STILLWATER OR AT THE  
RESPONDENT'S LAST ASSIGNMENT

Number of Items	Number of Items								
	0	1	2	3	4	5	6	7	8
	Per Cent								
Purchased - Stillwater	48.8	16.9	13.8	6.0	7.2	5.4		0.6	1.2
Sold - Stillwater	82.5	11.4	2.4	1.2	0.6		0.6	0.6	0.6
Purchased - Last Assignment	73.6	14.1	3.7	1.8	5.5		1.2		
Sold - Last Assignment	83.4	8.6	2.4	2.4	1.2	1.2		0.6	
N = 166									

TABLE XXXIV

NUMBER OF FAMILIES LISTING SELECTED LARGE ITEMS OF FURNITURE  
OR EQUIPMENT AS HAVING BEEN PURCHASED OR SOLD BECAUSE OF  
SOME SPECIAL HOUSING SITUATION IN STILLWATER OR AT  
RESPONDENT'S LAST ASSIGNMENT

Item	Stillwater		Last Assignment	
	Bought	Sold	Bought	Sold
Freezer	26	-	4	1
Air Conditioner	47	5	9	4
Range	15	5	6	6
Desk	18	-	-	-
Car	8	7	7	3
Air Cooler	8	1	2	1
Washer	12	-	6	6
Dryer	6	1	6	4

TABLE XXXIV (cont.)

Item	Stillwater		Last Assignment	
	Bought	Sold	Bought	Sold
Refrigerator	13	2	5	4
Refrigerator-freezer	4	-	-	-
Washer-dryer combination	-	-	1	-
N = 166				

Items of Furniture or Equipment Respondents Would  
Purchase if Space and/or Facilities were  
Available in Present Dwelling

Almost one-half of the respondents, including both officers and enlisted personnel, would purchase items of furniture or equipment if space and/or facilities permitted using them in the current dwelling. The number of items listed by any one respondent ranged from one to eight. Items named most frequently as ones which would be purchased if space and facilities permitted were: washer; dryer; dishwasher; freezer; dining room furniture; family, den or TV room furniture; bedroom suites; desk or piano.

Summary

The data and statistical analyses used in this chapter are intended to serve as an example of how data concerning ownership of furniture and household equipment can be analyzed and used to draw design implications. Only the responses obtained from wives in the officer group were

used for analysis. The small size and atypical nature of the enlisted group rendered analysis of the responses obtained from that group impractical. It is anticipated that a study will be conducted later with a representative sample of military families to determine valid implications for the design of military housing.

Because of the high mobility rate typical of military families and the resulting high rate of occupant turnover in military housing, it was decided arbitrarily to consider an item owned by at least one out of four families as being significant for design purposes.

Data presented in descriptive tables concerning ownership of items by the total officer group show a significant number of officer families own the following items:

- formal living room furniture,
- informal family room furniture,
- formal dining room furniture,
- informal "breakfast" furniture,
- a range,
- a large-sized refrigerator,
- a freezer,
- a dishwasher,
- an automatic washer,
- a dryer, and
- two cars.

The limited sample and the resulting low frequency distributions precluded statistical analysis by rank of

all but a few items. Chi-square analyses show, however, that ownership of some items varies according to rank. The items owned significantly more often by each of the officer groups are:

Company Grade: baby bed, cannister vacuum cleaner, and child's wagon.

Field Grade: 12' x 15' rug, living room card table, portable hi-fi, small boudoir chairs, 9 - 12 cubic foot refrigerator, picnic table, and other hobby equipment.

The frequency distributions did not warrant analysis of ownership by families needing a minimum of one bedroom, or by families in the beginning, contracting or contracted stages of the family life cycles; therefore, analysis was not attempted by either family size and composition or stage in the family life cycle.



## CHAPTER V

### APPLICATION OF DESIGN IMPLICATIONS FOR MILITARY HOUSING

In this chapter an effort is made to show, in both written and illustrated form, how design implications drawn from research data can be used in designing houses. This is done to provide future research workers with an example for other investigations concerned with space needs. The descriptions and illustrations which follow are based primarily on data from the descriptive tables VIII through XX showing ownership of items by the total officer group. The limited sample precluded full descriptions regarding ownership of items according to rank, and according to family size and composition, or stage in the family life cycle. Because rank is interrelated with each of these variables, other investigations on a large sample population need to be conducted to provide greater specificity regarding ownership according to these factors. In general company grade officers and their wives are younger, have younger children and are in the beginning, expanding or expanded stages of the family life cycle. Field grade officers and their wives, by comparison, are older, have older children, and are in the expanded, contracting or

contracted stages of the family life cycle (Tables IV through VI). Field grade officers have incomes which enable them to purchase or rent larger and more elaborate houses and furnish them more elaborately, and to entertain more frequently and more formally than company grade officers. It is probably safe to assume, because of changed commissioning requirements relative to education, that company grade officers and their wives have a higher educational level than field grade officers and their wives. All of these factors are related to housing needs, values and preferences, and to effective demands for housing. Analysis of ownership of items according to these variables is requisite, therefore, to secure the comprehensive data necessary for designing houses to be occupied by military families. Examples of possible family types, based on one group, the company grade officer family are as follows:

Company Grade Officer Family Types	Minimum Number of Bedrooms	Stage in the Family Life Cycle
A	1	Beginning
B	2	Expanding
C	2	Expanded
D	3	Expanding
E	3	Expanded
F	4	Expanding
G	4	Expanded

Such information could show, for example, whether or not in housing built for officer families, provision should be

made for both formal and informal entertaining and relaxing areas, and/or eating areas, as the data in this study reveal or whether or not only certain groups would need all four of these areas. It is unlikely, for example, that many beginning officer families need or can afford all four areas, but very likely that a large proportion of expanding and expanded officer families need and can afford such areas. The effective purchasing power of military families is an important consideration when designing houses, since it determines quality of housing and amount of space they can purchase, and to some degree the qualities a house must have to attract buyers or renters. It is the writer's desire to offer a few suggestions, based on information concerning military families, which will stimulate the interest of designers.

Designing for the "total officer group" is all that is possible in this study because of limited data concerning ownership of furniture and appliances according to rank. The feasibility of including design features similar to those presented herein in designs of houses for different groups is dependent upon the findings of research concerning housing needs of the designated groups.

The design illustrations which follow permit comparisons between designs currently used for military housing and revisions suggested for achieving greater livability. The amount of space used for the revised designs is, wherever possible, equal to that used for the current designs.

A comparative approach was used, rather than presentation of completely new designs, on the assumption that presentations in this manner would be more meaningful to planners, architects and builders. When respondents did not specify sizes of items the dimensions were obtained from the Sears, Roebuck and Co. 1964 Fall-Winter Catalog and Architectural Graphic Standards. Information regarding space for use of items was secured from a variety of sources.<sup>1</sup> Organization of the discussions concerning specific designs follows the pattern used in Chapter IV in presenting design implications for the areas devoted to: Recreation and Entertainment, Food Preparation and Service, Household equipment and Storage, Rest and Personal Care, and Outdoor Living and Storage. Designs relating to each area are presented with the discussions except as follows: the design for a formal food service area is presented with that for a formal living room; the informal food service design is presented with the designs for both the food preparation area and the informal family room area; and the utility and interior storage areas are treated separately.

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<sup>1</sup>Planning the Home for Occupancy, American Public Health Association (New York, 1959); Catherine Sleeper and Harold Sleeper, The House for You (New York, 1958); Planning Guides for Southern Rural Homes, Georgia Experiment Station, Southern Cooperative Series Bulletin No. 58 (Experiment, 1960); Home Improvement Plans, Midwest Plann Service, Iowa State University, MWPS - 4 (Ames, 1962); Julius Panero, Anatomy for Interior Designers (New York, 1962); and C. G. Ramsey and H. R. Sleeper, Architectural Graphic Standards (New York, 1963).

## Recreation and Entertainment Areas

In general, the design of recreation and entertainment areas of houses for military families has not been fully explored because, traditionally, military housing has been designed by architects or constructed by builders who have not viewed military families as different from the general population.

Recreation and entertainment areas of a house are important to interpersonal family relationships and to interpersonal relationships with friends and neighbors. Many possibilities exist for designing greater livability into the recreation and entertainment areas of a house. Space which fits a family's needs, makes it easier for a given family to fit into and enjoy its housing. Adequate space and facilities for both "togetherness" and "apartness" are necessary to facilitate good interpersonal relationships. Findings regarding family size and composition, stage in the family life cycle, and possession of furniture indicate that space in these areas of a house should be arranged to permit simultaneous conduct of several forms of entertainment or play.

Storage space is needed in these areas for a variety of items, such as a card table and chairs, games, toys, etc. The charts which follow include: (1) items of furniture and equipment owned by a significant number of officer families, (2) approximate dimensions which should be considered in

designing recreation and entertainment spaces, and (3) implications for designing these areas to accommodate specific furnishings and the activities implied by the furnishings.

### Formal Living Area

When both formal and informal living areas are provided in a house, the formal living area tends to be utilized primarily for adult activities and quiet or formal family activities. This area should be designed to accommodate either small or large groups of people for such things as: buffet luncheons or dinners, cocktail parties, card parties, coffees and teas. It should also be adaptable to more personal activities such as conversation, piano playing, listening to music, reading, studying, viewing television, and playing quiet games such as cards or chess.

Storage space provided in this area should be sufficient for the items of equipment and supplies essential to such varied activities, e.g., a card table and chairs, cards and games, books and magazines, records, tea services, etc.

Placement of the formal living area so that it is not part of the traffic pattern directing people through the house, yet is accessible from the front entry, the kitchen, and the dining room, is an important functional design principle to be observed in designing this area of the house. Acoustical control of sounds generated in the kitchen and family room also is an important factor to consider in the design of formal living areas.

TABLE XXXV

FORMAL LIVING ROOM FURNITURE OWNED BY A SIGNIFICANT NUMBER OF FAMILIES  
AND RELEVANT DESIGN IMPLICATIONS

Item (Not owned)	Dimensions			Approx. Area (sq. ft.)	Dimensions For Use		Approx. Area for Use (sq. ft.)	Design Implications See Note
	Length	Depth	Height		Length	Depth		
Large Sofa (1)	7'-9'	2'9"	2'9"	21-27	7'6"-9'6"	5'6"	40-50	1
Tables End (2)	2'-4'	2'-4'	21"	4-16 (8-32)	2'6"-4'6"	3'3"- 5'3"	9-25 (18-50)	1
Coffee (Sq. or Rec.) (1)	5'+	2'-5'	1'6"	10+ - 25+	8'+	5' - 8'+	26+ - 64+	2
Card(1) and Chairs (4)	2'11"	2'11"	2'4"	36	10'4"	10'4"	110	3
Other (1)	4'+	2'-4'	2'	8+ - 16+	4'6"+	3'3"- 5'3"+	15+ - 25+	4
Lounge chairs(3)	2'4"	2'9"	2'9"	6(18)	2'10"	5'6"	15(45)	5
Desk and Chair (1)	4'-5'	3'	2'6"	12-15	4'6"-5'6"	6'3"	30-36	6
Bookcases (2)	2'2"	1'4"	2'7"	4(8)	2'8"	4'1"	12(24)	6
Console TV(1)	3'4"	1'6"	2'5"	9	4'	5'3"	20	7
Hi-Fi Stereo Con.(1)	4'2"	1'3"	2'4"	12	4'8"	5'2"	25	7
Small piano or Organ (1)	3'4"- 4'2"	2'4"	4'3"	9-12	4'-4'8"	6'	24-30	7
<b>Total</b>				151+- 210+			377+- 479+	

TABLE XXXV (cont.)

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Design Implications

- Note 1 - 12 to 16-foot wall space, uninterrupted, to accommodate sofa and end tables.  
Note 2 - Space over five feet in front of sofa with allowance for circulation.  
Note 3 - Space to set up for use and space for storage.  
Note 4 - Space for a lounge chair to form a reading area.  
Note 5 - Space near sofa for two chairs to form conversation group.  
Note 6 - Wall space ten-feet long for desk and bookcase.  
Note 7 - Space to accommodate one or more of these items, each space from  
3 1/2 to 4 1/5 feet long.
-



## Analysis of Formal Living and Dining Areas

Current Design (Entry, 4' x 13', 52□'; L.R., 14' 6" x 24', 348□'; D. R. 3' x 12', 36□'; Total, 436□')

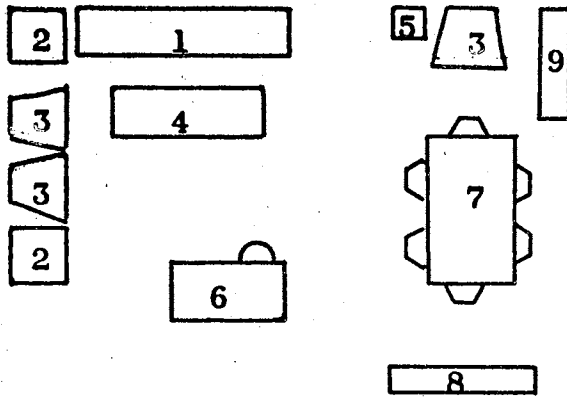
1. Furniture crowded, cannot accommodate all items.
2. Room not large enough to accommodate multiple activities.
3. Dining alcove insufficient (3' x 12'), apparent size decreased by circulation (3' x 9').
4. Uninterrupted wall space for large sofa and two end tables insufficient.
5. Window and door placement does not facilitate furniture arrangement.
6. Heater room opens into entry hall (homemaker must be at home for workmen to enter for repairs).
7. Unattractive entry, tunnel effect directly into living room.

Revised Design (Entry, 6' x 7'6", 45□'; L. R. 23' x 15' + 4' x 7'6", 375□'; D. R., 15' x 10', 150□'; Total 23' x 25', 575□')

1. Space for variety of furniture items is ample and flexible, hence can accommodate a piano, hi-fi, etc.
2. "Use" crowding eliminated by space zoning for activities (including circulation), and by provision of family room.
3. Space for dining furniture ample.
4. Uninterrupted wall space for large sofa and two end tables is sufficient.
5. Window and door placement facilitates furniture arrangements.
6. Heater room opens on outside of house (homemaker does not have to be at home for workmen to make repairs).
7. Attractive entry, living areas out of sight.

Plate IX

FORMAL LIVING AND  
DINING ROOM  
FURNITURE



1. Sofa
2. End Tables
3. Lounge Chair
4. Coffee Table
5. Other Table
6. Desk
7. Dining Table
8. China Cabinet
9. Buffet
10. Piano, Hi-fi, etc.

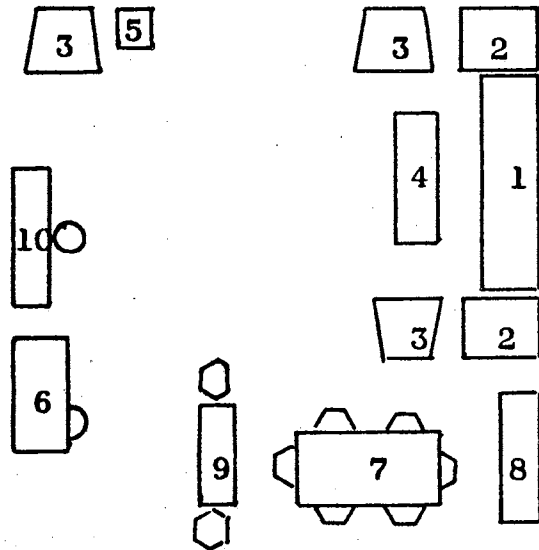
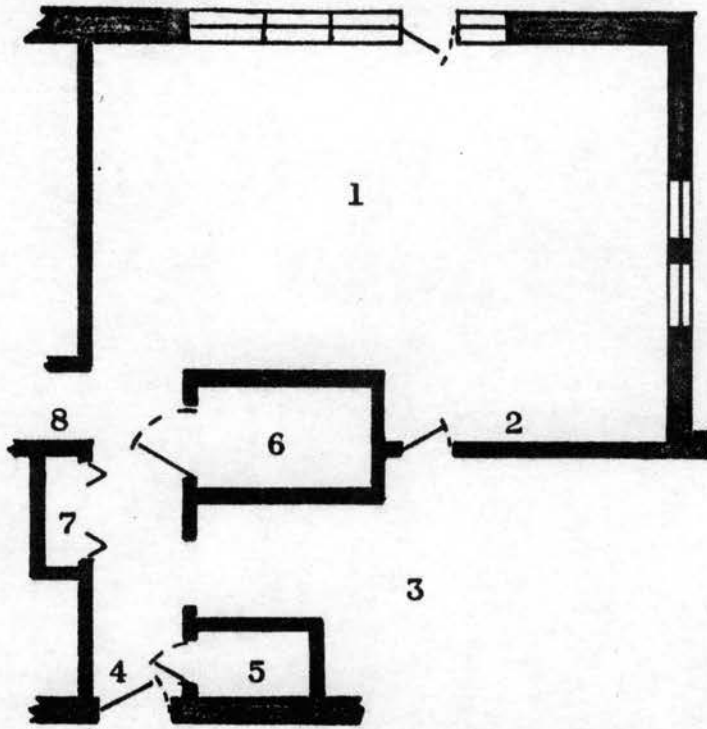


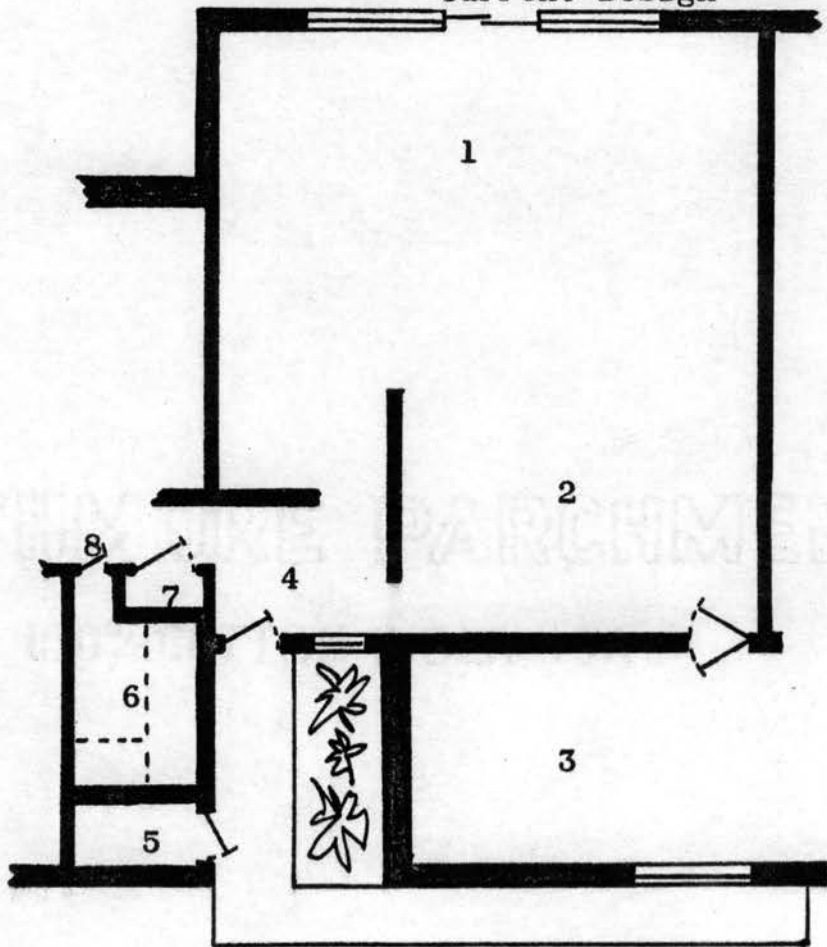
Plate X

FORMAL LIVING AND  
FOOD SERVICE AREAS

- 1. Living Area
- 2. Dining Area
- 3. Kitchen
- 4. Entry
- 5. Heater Room
- 6. Storage Room
- 7. Coat Closet
- 8. Hall to Bedroom  
Area



Current Design



Revised Design

Scale 1/8" = 1'

### Informal Living Area

When both formal and informal living areas are provided in a house the informal area tends to be utilized for activities which are primarily child-centered or for family activities which are noisy or informal. This area should be designed to accommodate either large or small groups for such things as; children's play alone and with siblings or friends, girl scout or boy scout meetings, children's and teen-ager's parties, and dancing. It also should permit usage for more personal activities such as reading, conversing, viewing television, playing both quiet and noisy games and participating in hobbies such as painting, photography, working with electronic equipment, model making, and crafts.

Storage spaces provided in this area ought to accommodate items of equipment and supplies needed for varied activities, such as; card table and chairs, medium and large-sized games, and hobby equipment for one or more hobbies. Careful planning is required to insure that storage areas are effective and contribute to the reduction of "clutter".

The informal living area should have direct access to the outside and be near the kitchen and front entries. The nature of activities carried on in this area makes it important that great care be taken to prevent transmission of sounds generated in this area to other parts of the house.

All wall and floor surfaces should be as easily cleaned and as "child-proof" as possible. Safety glass should be used for floor-length windows and for glass doors.

TABLE XXXVI

INFORMAL FAMILY ROOM FURNITURE OWNED BY A SIGNIFICANT NUMBER OF FAMILIES AND  
RELEVANT DESIGN IMPLICATIONS

Item (No. owned)	Dimensions			Approx. Area (sq. ft.)	Dimensions For Use		Approx. Area for Use (sq. ft.)	Design Implica- tions See Note
	Length	Depth	Height		Length	Depth		
Medium Sofa (1)	5'-7'	2'9"	2'9"	15-21	5'6"-7'6"	5'6"	30-40	1
Tables								
End (2)	2'-4'	2'-4'	1'9"	4-16 (8-32)	2'6"-4'6"	3'3"- 5'3"	9-25 (18-50)	1
Coffee (1)	2'-4'	2'-4'	1'6"	4-16	5'-7'	5'-7'	25-49	
Lounge or Occa- sional Chairs (1)	2'4"	2'9"	2'9"	6(12)	2'10"	5'6"	15(30)	2
Desk (1)	3'-5'	3'	2'6"	9-15	3'6"-5'6"	6'3"	24-36	3
File Cabinet (1)	1'6"	1'4"	3'11"	2	1'10"	6'4"	12	3
Bookcases (2)	2'2"	1'4"	2'7"	4(8)	2'9"	4'1"	12(24)	3
TV, console or portable (1)	3'4"	1'6"	2'5"	9	3'10"	5'3"	20	4
Hi-Fi, console or portable (1)	4'2"	1'3"	2'4"	12	4'8"	5'2"	25	4
Small piano or Organ (1)	3'4"- 4'2"	2'2"	4'2"	9-12	4'-4'8"	6'	24-30	4
Card table (1) and Chairs (4)	2'11"	2'11"	2'4"	36	10'4"	10'4"	110	5
Hobbies								
Ham Radio, Paint- ing, Crafts, Photography, Flower Arranging								6
<b>Total</b>				<b>120-159</b>			<b>342-396</b>	

TABLE XXXVI (cont.)

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Design Implications

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- Note 1 - Uninterrupted wall space at least 12 feet long to accommodate sofa and end tables.
  - Note 2 - Space near sofa for two chairs to form conversation group.
  - Note 3 - Space adjacent to one another for these items to form a study-work area.
  - Note 4 - Space to accommodate one or more of these items, each space from 3 1/2 to 4 1/2 feet long.
  - Note 5 - Space to set up for use and space for storage.
  - Note 6 - Flexible space which can accommodate some of these activities and the necessary equipment.
- 
-

## Analysis of Informal Family Living and Dining Areas

Current Design (Family room 0' x 9', 36'²; Breakfast area of kitchen 4' x 9', 36'²; Total, 36'²)

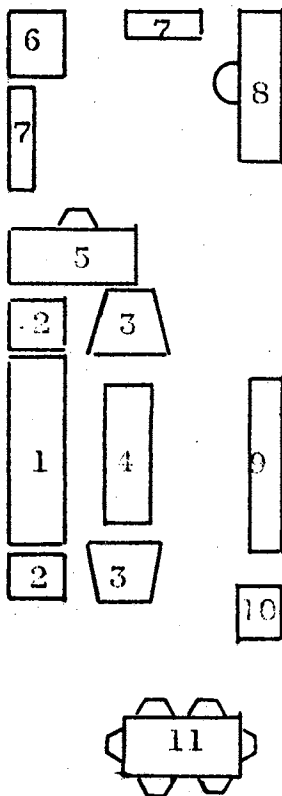
1. No provision for a family room.
2. Families owning family room furniture must:
  - a. store the furniture (an impractical solution to the problem, both from the standpoint of cost and family needs);
  - b. combine it with the living room furniture (an impractical solution because of crowding and because of probable differences in style and quality); or
  - c. Use one bedroom as a family room (most frequently used but highly undesirable solution to the problem, because of resultant crowding of children into other bedroom or bedrooms.).
3. Insufficient to accommodate breakfast set.

Revised Design (Family room, 12' x 25', 300'²; Breakfast area, 9' x 10', 90'²; Total, 390'²)

1. A family room provided.
2. Space for items of furniture owned by a significant number of families is adequate.
3. Access to yard facilitates indoor-outdoor living
4. Zoning of activities is possible.
5. Multiple-use of space possible.
6. Isolation of homemaker is minimized.

Plate XI  
 INFORMAL LIVING AND  
 "BREAKFAST" FURNITURE

1. Sofa
2. End Tables
3. Lounge Chair
4. Coffee Table
5. Desk
6. File Cabinet
7. Bookcase
8. Piano or Hi-fi
9. TV
10. High Chair or Play Table
11. "Breakfast" Set

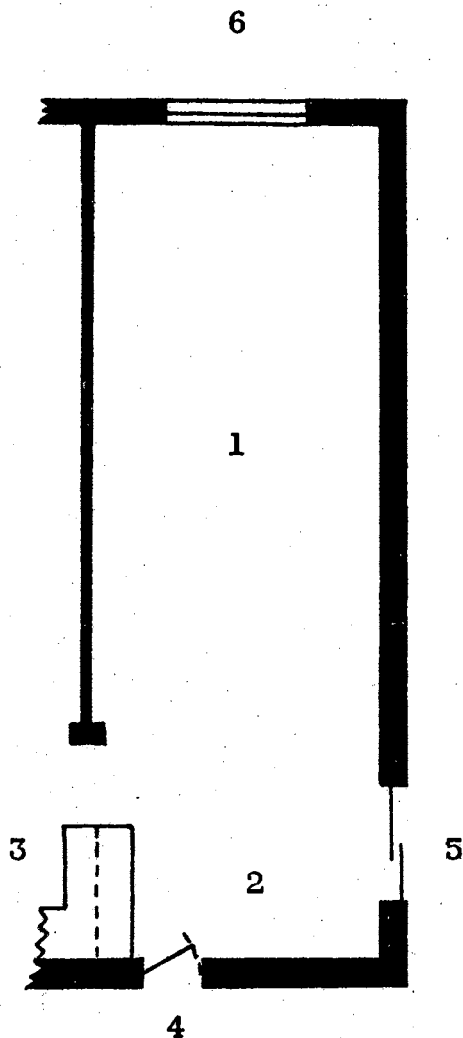




Current Design - None

Plate XII

INFORMAL LIVING AND  
FOOD SERVICE AREAS



1. Informal Living Area
2. Informal Dining Area
3. Kitchen
4. Garage
5. Patio
6. Children's Play Yard

Revised Design

Scale 1/8" = 1'

## Food Preparation and Service Areas

Well planned and arranged areas for food preparation and service are extremely important to the health and morale of the homemaker. These areas are also important for the affect they have on the homemaker's interpersonal relations with her family, the relations between individual family members, and between family members and friends.

Well-designed and organized food preparation and service areas foster efficient work patterns and demand a minimum of effort on the part of the homemaker. Fortunately, for the homemaker, these areas of the house have received widespread attention from research-minded home economists. Of particular value is the work on kitchen design conducted by investigators at the United States Department of Agriculture Beltsville laboratory.<sup>2</sup> Research studies such as those carried on at Beltsville furnish designers with a wealth of material concerning efficient kitchen design. Unfortunately for the homemaker, however, designers do not always make use of research information; hence, many of the kitchens built today are models of inefficiency instead of efficiency.

The areas for food preparation and service should be designed to contain efficiently the items of furniture and

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<sup>2</sup>Beltsville Energy Saving Kitchen, Design No. 1, Design No. 2, and Design No. 3.

equipment owned by a family, or similar items furnished by the government, as well as the activities carried on within these areas. The charts which follow include; (1) items of furniture and equipment owned by a significant number of officer families, (2) approximate dimensions to be considered in designing food preparation and service areas, and (3) implications for designing these areas to accommodate specific items and the activities implied by the furnishings or equipment. The suggestions for kitchen designs which follow are adaptations of design ideas yielded by studies conducted at the Beltsville research center.

#### Food Preparation Area

The kitchen is perhaps the most important area of the house to the majority of homemakers because it is in this area that she spends the largest portion of her working time. Emphasis, therefore, should be placed on efficiency. To be efficient, a kitchen must have well organized work and storage areas. Although each homemaker has her own selection of kitchen utensils, research studies show similarities in ownership of many items and that such similarities make it possible to plan kitchen storage which will conveniently accommodate the items owned by a significant number of families.

The food preparation area should be placed so that packages can be carried from the car to the kitchen with a minimum of effort; however, it should not be a major traffic lane to other parts of the house. The area should have

counter or table space for placement of packages during unpacking as well as counter and storage space beside each major appliance for items placed at the point of first or most frequent use. The floor and counter tops should have coverings which are easily cleaned, and resistant to grease, acid, alkali, heat and marring and offer comfort and ease of walking.

Adequate space is needed for both use and storage of a portable dishwasher, a step stool, and a serving cart. Space and facilities ought to be provided also for the placement and for the use of a large freezer, a large refrigerator, and a medium-sized gas or electric range. If a built-in range is provided in the house, some arrangement may need to be provided for storing a regular range which may be owned by a number of military families.

Widespread interest in outdoor living makes it desirable for the food preparation area to be in close proximity to the outdoor living area so that outdoor cooking can be facilitated. A door between the two areas or a "pass-through" window are two easy ways to expedite the transportation of food, equipment and supplies.

TABLE XXXVII

FOOD PREPARATION EQUIPMENT OWNED BY A SIGNIFICANT NUMBER OF FAMILIES  
AND RELEVANT DESIGN IMPLICATIONS

Item (No. owned)	Dimensions			Approx. Area (sq. ft.)	Dimensions For Use		Approx. Area for Use (sq. ft.)	Design Implica- tions See Note
	Length	Depth	Height		Length	Depth		
Range (1)	2'6"- 3'4"	2'4"	3'3"	6-8	3'4"-4'2"	6'4"	21-30	1
Refrigerator (1)	2'3"	2'8"	5'	6	2'7"	6'8"	18	2
Freezer (1)	2'8"	2'8"	5'7"	6+	3'2"	6'8"	24	3
Dishwasher (1)	2'3"	2'6"	3'3"	6	2'7"	2'7"	6	4
Serving Cart (1)	1'4"	2'	1'6"	2	1'10"	2'3"	4	5
Step Stool (stat.)(1)	1'10"	1'8"	1'11"	4	2'4"	2'	4	6
Sink Area								7
Mix area								8
Total				30+ - 32+			77 - 86	

Design Implications

- Note 1 - Gas and electric facilities, adjacent counter top should be heat resistant, 24" counter top to right or left.
- Note 2 - At least 15" counter space adjacent to side which opens.
- Note 3 - At least 15" counter space adjacent to side which opens.
- Note 4 - Space for storage and for use at sink.
- Note 5 - Space for use and storage.
- Note 6 - Space for storage and for use at sink.
- Note 7 - At least 36" counter space to right and 30" to left of sink.
- Note 8 - At least 36" counter space for mix area.

## Analysis of Food Preparation Area

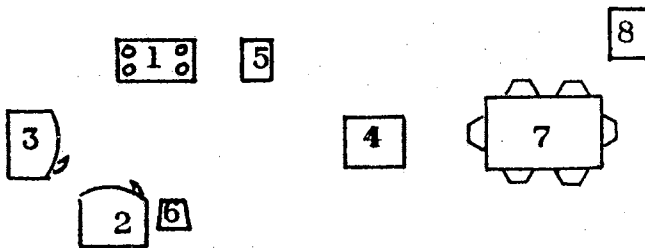
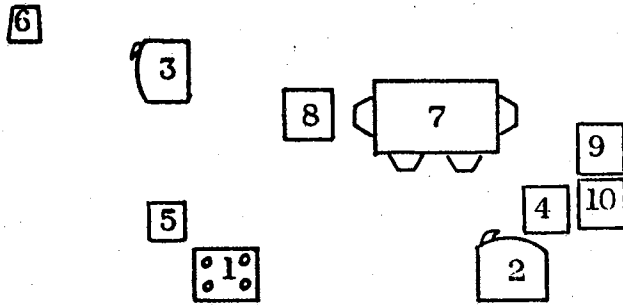
Current Design (given dimensions, 20'6" x 9'6", 194 3/4' ; actual dimensions, 9'6" x 17'6" + 3' x 7'6" + 3'6" x 5'6"; Total, 207 1/2' including hall to front entry, eating space and laundry space)

1. Insufficient space to accommodate a portable dishwasher, freezer, or child's high chair or feeding table.
2. Clothes must be laundered in cooking area.
3. Table space adequate for only 4 persons, and possibility of conducting other activities at table area very limited.
4. Requires left opening refrigerator (not standard).
5. Placement of doors directs circulation through kitchen.
6. Over-counter storage units less than minimum length recommended and minimum length base counters provided.

Revised Design (adaptation of Beltsville Energy-Saving Kitchen Design #3, Arrangement B) (9' x 17', 153' , does not include eating or laundry space; Break-fast space, 9' x 10', 90' ; Total, 9' x 27', 243' .

1. Space provided for portable dishwasher, freezer, and a child's high chair or feeding table.
2. Laundry area removed from kitchen.
3. Table space adequate for 6 or more persons and flexibility of space makes other uses (hobbies, study, etc.) possible.
4. Space provision permits right opening refrigerator (standard).
5. No traffic route through kitchen.
6. Over-counter storage units greater than minimum length recommended (13 1/2 ft. provided); base counters greater than minimum length recommended (10 1/2 ft.); corner base counter provided by freezer.

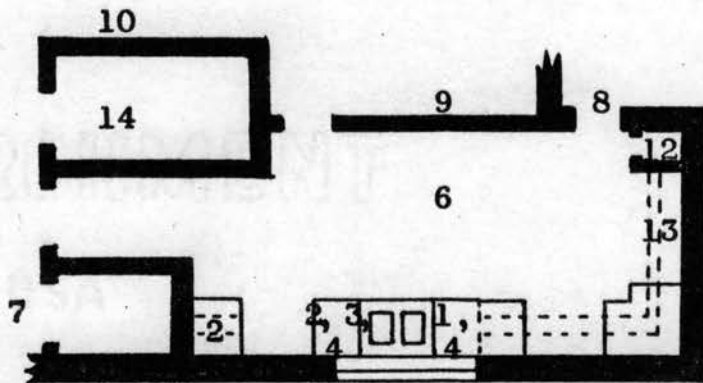
## Plate XIII



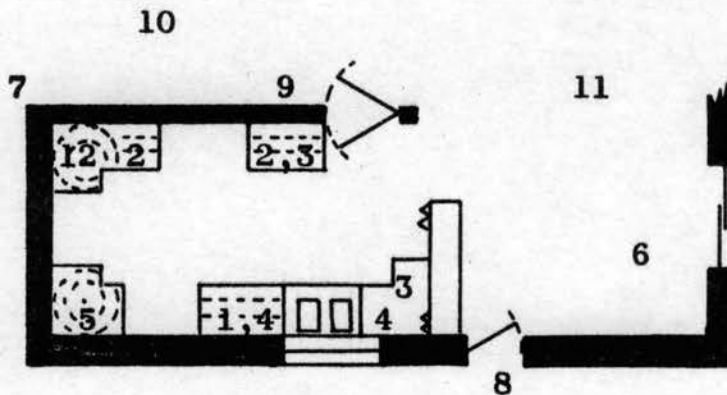
FOOD PREPARATION EQUIPMENT AND  
 INFORMAL "BREAKFAST"  
 FURNITURE

1. Range
2. Refrigerator
3. Freezer
4. Dishwasher
5. Serving Cart
6. Step Stool
7. Breakfast Set
8. High Chair or Play Table
9. Washer
10. Dryer

Plate XIV



Current Design



Revised Design

### FOOD PREPARATION AND INFORMAL FOOD SERVICE AREA

- |                     |                     |
|---------------------|---------------------|
| 1. Mix Center       | 8. Rear Entry       |
| 2. Range Center     | 9. Dining Room      |
| 3. Serve Center     | 10. Living Room     |
| 4. Sink Center      | 11. Family Room     |
| 5. Freezer Center   | 12. Cleaning Closet |
| 6. "Breakfast" Area | 13. Laundry Area    |
| 7. Front Entry      | 14. Storage         |

Scale 1/8" = 1'



### Formal Food Service Area

Space adjoining or near the food preparation area is needed for formal food service. Traffic patterns should not cross this area, however, movement should be easy between this area and the formal living area. In the formal dining area ample space is needed to accommodate a large dining table, a buffet and a sideboard. Consideration ought to be given to the provision of space to allow the use of a serving cart around the table and between the table and the kitchen.

The area for formal food service could be planned as a separate area or as part of the formal living area. When designed as part of the living area, consideration should be given to methods of closing off the dining area when it is not in use or when in use for other activities such as studying.

### Informal Food Service Area

Space for informal family meals and snacks in or adjacent to the food preparation area should have for design purposes and ease of cleaning the same floor covering as that used in the food preparation area. Space needs to be provided for placing a high chair near the table during feeding time and against a wall, out of traffic ways, when not in use. The design of this area ought to permit its use for other activities such as: children's crafts, adult hobbies, studying, visiting with neighbors, cub scout and girl scout meetings, etc.

TABLE XXXVIII

FORMAL AND INFORMAL DINING FURNITURE OWNED BY A SIGNIFICANT NUMBER OF FAMILIES  
AND RELEVANT DESIGN IMPLICATIONS

Item (No. owned)	Dimensions			Approx. Area (sq. ft.)	Dimensions For Use		Approx. Area for Use (sq. ft.)	Design Implica- tions See Note
	Length	Depth	Height		Length	Depth		
<b>Formal</b>								
Dining Table (1) (seats 8 or more)	8'	4'	2'6"	32	14'	10'	140	1
Buffet (1)	3'8"	1'9"	6'	8	3'8"	4'6"	16	1
Sideboard (1)	3'6"	1'9"	3'	6	3'6"	4'6"	16	1
Total				46			172	
<b>Informal</b>								
Breakfast Set (1) (seats 6 or more)	5'	3'	2'6"	15	11'	9'	99	2
High Chair or Feeding Table (1)	2'	2'	2'	4	2'6"	4'9"	10	2
Total				19			109	

Design Implications

- Note 1 - Space should be adjacent to food preparation area and adequate to accommodate these items.
- Note 2 - Space should be in or adjacent to food preparation area and adequate for these items.

## Analysis of Food Service Area

### Current Design

#### Formal Dining Area ( 3' x 12', 36 □')

1. Space insufficient for furniture or activity.
2. Circulation interferes with furniture placement.

#### Informal Dining Area (9' x 4', 36 □')

1. Space sufficient to accommodate 4 persons only.
2. Limited counter space for food preparation diminishes possibility of using area for multiple activities.

### Revised Design

#### Formal Dining Area (15' x 10', 150 □')

1. Space is ample for furniture and activity.
2. Circulation zoned to facilitate furniture placement.

#### Informal Dining Area (9' x 10', 90 □')

1. Space is ample to accommodate 6 or more persons.
2. Space and furnishings permit multiple activities.

## Analysis of Food Service Area

### Current Design

Formal Dining Area ( 3' x 12', 36 □' )

1. Space insufficient for furniture or activity.
2. Circulation interferes with furniture placement.

Informal Dining Area (9' x 4', 36 □' )

1. Space sufficient to accommodate 4 persons only.
2. Limited counter space for food preparation diminishes possibility of using area for multiple activities.

### Revised Design

Formal Dining Area (15' x 10', 150 □' )

1. Space is ample for furniture and activity.
2. Circulation zoned to facilitate furniture placement.

Informal Dining Area (9' x 10', 90 □' )

1. Space is ample to accommodate 6 or more persons.
2. Space and furnishings permit multiple activities.

## Utility Area

One of the tasks which is most unpopular with homemakers is laundering. The unpopularity of this task may be attributed in part to the poorly designed laundry areas found in most houses. With a wealth of information available regarding special needs for laundering, it seems unreasonable that houses continue to be constructed which provide only for the spatial needs of a washer and dryer and fail to accommodate the multitude of activities involved in laundering.

Most houses designed today have laundry space and facilities either in or adjacent to the kitchen. Little consideration has been given to the facts that: (1) clothes and food are not compatible items to be handled in the same work areas, and (2) the largest number, usually, and the bulkiest items of soiled clothing and linens are generally amassed in the bedroom area rather than in the food preparation area of the house. When these facts are considered, it appears most logical to locate laundry activities in the bedroom area of a house to facilitate usage and provide maximum conditions of good hygiene.

Facilities needed in the laundry area, in addition to water, gas, and electrical connections for a washer and a dryer and ventilation for the dryer, include; a sink, counter space for sorting and folding clothes, space for storage of household cleaning equipment, space for storage and use of an ironing board, and access to the yard for hanging clothes not dried in the dryer.

Spaces to accommodate a sewing machine, sewing equipment, and the activity of sewing are logical companions to the laundry area because mending and repair are a part of laundering, and laundering facilities and equipment are essential to sewing. The charts which follow include: (1) items of equipment owned by a significant number of families, (2) approximate dimensions to be considered in designing laundry and sewing space, and (3) implications for designing laundry and sewing areas to accommodate specific items and to facilitate storage of the equipment when not in use.

TABLE XXXIX

LAUNDRY AND SEWING EQUIPMENT OWNED BY A SIGNIFICANT NUMBER OF FAMILIES  
AND RELEVANT DESIGN IMPLICATIONS

Item (No. owned)	Dimensions			Approx. Area (sq. ft.)	Dimensions For Use		Approx. Area for Use (sq. ft.)	Design Implica- tions See Note
	Length	Depth	Height		Length	Depth		
Washer (1)	2'5"	2'2"	3'	6	2'11"	5'2"	15	1
Dryer (1)	2'5"	2'2"	3'	6	2'11"	5'2"	15	1
Ironer (1)	5'	2'9"	3'5"	15	6'2"	4'3"	24	1
Ironing Board (1)	4'6"	1'3"	3'	8	5'6"	4'	22	1
Sewing Machine (1)								
portable	1'4"	10"	1'2"	2	3'10"	4'10"	20	2
cabinet model	3'4"	1'7"	2'7"	6	3'10"	4'10"	20	2
Total				37 - 41			96	

Design Implications

Note 1 - Space organized for complete laundry activity performed in proper sequence. Recommended space is 60 or more square feet plus 24 square feet for use of ironer.

Note 2 - Space for sewing activity and storage for machine and supplies as combines well with laundry area.

## Analysis of Utility Area

**Current Design (5' x 5', 25 □' at end of kitchen, no provision for sewing)**

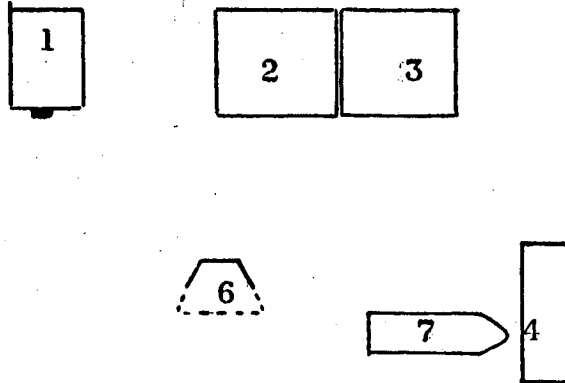
1. Provision for laundry in kitchen (clothes and food are not compatible items to be handled in the same space).
2. No provisions for sorting or folding laundry.
3. No planned space anywhere in the house for sewing.

**Revised Design (8' x 12' minus linen and cleaning closets, 86 1/2 □', for laundry and sewing)**

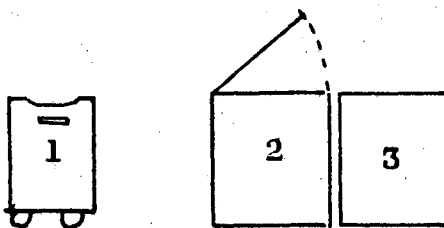
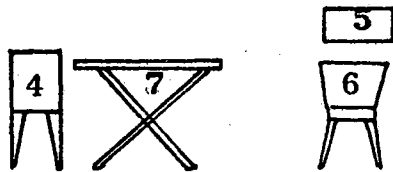
1. Laundry facilities provided in bedroom area near source of dirty laundry and storage of clean laundry.
2. The design establishes the proper sequence for laundering.
3. The activity of laundering is facilitated by:
  - a. portable clothes hamper in linen closet,
  - b. sink with hanging space for drip-dry items,
  - c. fold-down board to convert sink into sorting table,
  - d. folding table,
  - e. space for ironing board and ironer,
  - f. direct access to linen closet.
4. Space and facilities (e.g. cutting table) provided for sewing, storage of sewing machine and supplies.
5. Storage for miscellaneous items provided above washer and dryer.
6. Multiple use of space is possible.



## Plate XV

LAUNDRY AND SEWING  
EQUIPMENT

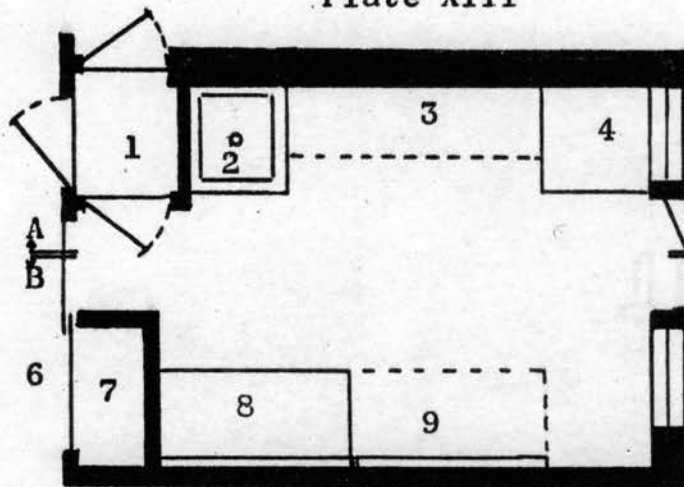
1. Clothes Hamper
2. Washer
3. Dryer
4. Space for Ironer  
or Cabinet Model  
Sewing Machine
5. Portable Sewing  
Machine
6. Chair for Sewing  
or Ironing
7. Ironing Board



Current Design - Part  
of Kitchen, see  
Plate XIII

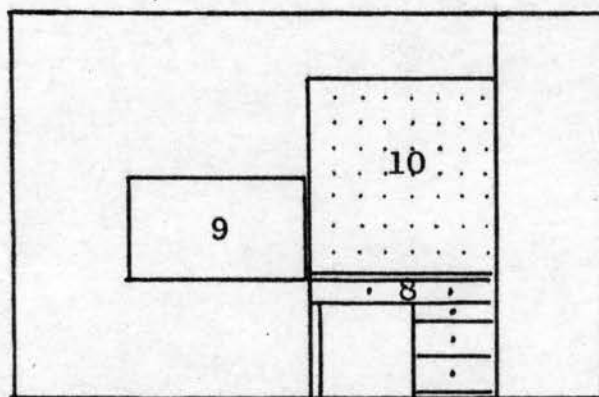
Plate XVI

UTILITY AREA

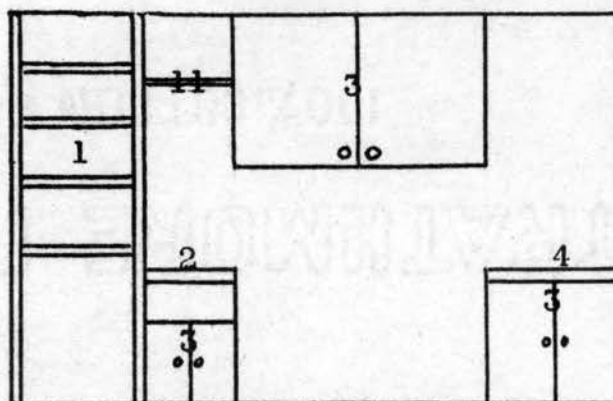


1. Linen Closet
2. Sink
3. Storage
4. Folding Table
5. Rear Yard
6. Hall
7. Central Cleaning Closet
8. Sewing Table
9. Fold-down Cutting Table
10. Peg-board for Supplies
11. Rod for Drip-dry Clothes

Revised Design



Elevation B-B



Elevation A-A

Scale 1/4" = 1'

## Interior Storage Areas

Storage areas are important factors in the organization of a household, in the efficiency of household cleaning, and in the general over-all neatness fostered by having a place for everything. Designs of storage closets for household equipment and for miscellaneous items are usually given little consideration. Although information concerning the design of these storage areas is not as abundant as is that for kitchen, laundry and sewing areas, a considerable number of publications regarding design of storage areas are available.

Closets designed to accommodate household cleaning equipment are most commonly placed in the kitchen. Unless the kitchen is in a central location within a house, the homemaker must take many unnecessary steps each day getting and returning items to the closet. Although a kitchen closet is needed for those items used most often in the kitchen, e.g. mop, broom, etc., a centrally located closet is more efficient for items used most often in other parts of the house, e.g. vacuum cleaner, furniture polish, etc. Space and design of the central cleaning closet should be flexible so that either a canister or an upright vacuum cleaner can be accommodated in addition to a variety of dust mops, cleaning rags, polishes, etc. If located in the laundry area, this storage area could also be designed to accommodate an iron and ironing board.

General storage space, either in the house or in a protected outside location, is needed for a table fan and for a variety of footlockers, trunks and suitcases. Interior storage space is needed for the storage of out-of-season clothing and bedding. The charts which follow include:

(1) equipment and miscellaneous items owned by a significant number of families, (2) approximate dimensions to be considered in designing storage spaces, and (3) implications for designing storage areas to accommodate specific items and to facilitate use of storage.

TABLE XL

HOUSEHOLD EQUIPMENT AND MISCELLANEOUS ITEMS OWNED BY A SIGNIFICANT NUMBER OF FAMILIES AND RELEVANT DESIGN IMPLICATIONS

Item (No. owned)	Dimensions			Approx. Area (sq. ft.)	Approx. Area for Storage (cu. ft.)	Design Implications See Note
	Length	Depth	Height			
Vacuum (1)						
Cannister, or upright	1'-1'11"	1'	1'1"	2	2	1
Floor Polisher (1)	1'2"	1'1"	3'7"	1	4	1
	1'	6"	4'	1/2	2	1
	Total			3 1/2	8	
Footlockers (4)	2'8"	1'3"	1'6"	4 (16)	20	2
Wardrobe or Steamer Trunk(1)	1'10"	1'10"	3'4"	4	12	2
Small Suitcases(3)	1'10"	6"	1'6"	1 (3)	1 1/2	2
Medium Suitcases (3)	2'	7"	1'6"	1 (3)	1 1/2	2
Large Suitcases(4)	2'2"	8"	1'7"	2 (8)	3	2
Table Fan (1)	1'4"	1'	1'9"	1	2	2
	Total			35	40	

Design Implications

Note 1 - Centrally located closet to accommodate a vacuum cleaner, floor polisher, and typical cleaning supplies.

Note 2 - Either interior or protected exterior space for storage. These items, stored on shelves one above another, require a storage space of at least 44 cu. ft.

## Analysis of Household Equipment Area and Miscellaneous Storage Area

### Current Design

Cleaning closets (Kitchen 1' x 2', 2 □'; no central closet; Total 2 □')

1. Kitchen closet insufficient for normal cleaning supplies.
2. No centrally located closet for vacuum cleaner, floor polisher, etc.
3. No storage space in bathrooms.

Storage room (5' x 8', 40 □' usable space)

1. Space adequate but unplanned.
2. Lack of kitchen space necessitates placement of freezer and stepstool in this area, remaining space ineffective for storage.

### Revised Design

Cleaning closets (revolving kitchen closet, approx. 2' x 2', 4 □'; central closet 1' 6" x 3', 4 1/2 □'; Total, 8 1/2 □')

1. Kitchen closet ample for mops, brooms, etc.
2. Centrally located closet ample for vacuum cleaner, floor polisher, etc.
3. Storage space provided in bathrooms for cleaning supplies and linens.

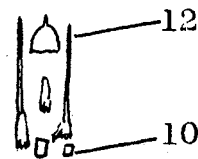
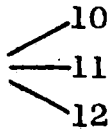
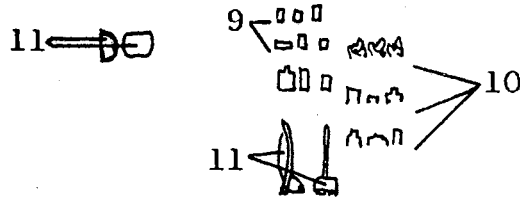
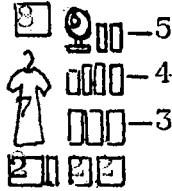
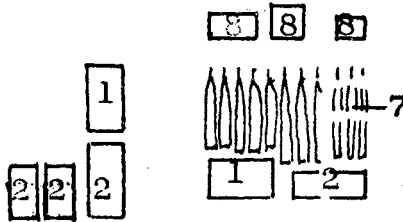
Storage room (6' x 7', 42 □' usable space)

1. Spatial area and design can accommodate items owned by a significant number of families.
2. Ample space for storing out-of-season clothing.

Plate XVII

Household Equipment  
and  
Miscellaneous Items

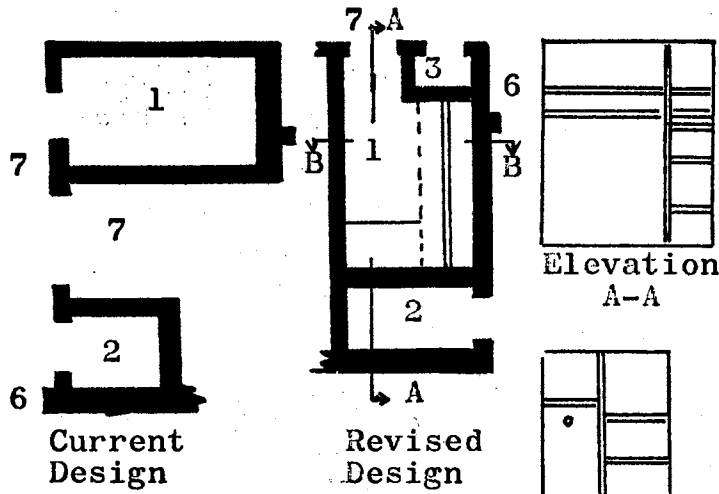
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5,6,7,8



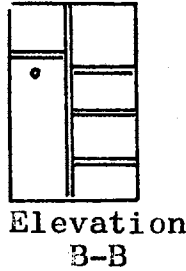
1. Steamer or Wardrobe Trunk
2. Footlocker
3. Large Suitcases
4. Medium Suitcases
5. Small Suitcases
6. Fan
7. Out-of-Season Clothing
8. Miscellaneous Items (e.g. Xmas Decorations)
9. Shelves for Poisonous Materials
10. Wax, Polish, etc. (tray-shelves on door)
11. Vacuum, Floor Polisher
12. Mops, Brooms, etc.

Plate XVIII

INTERIOR STORAGE AREA

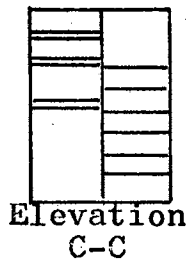
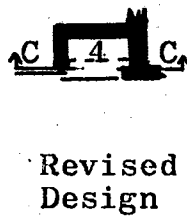
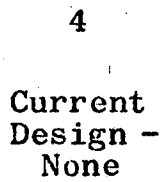


Elevation  
A-A

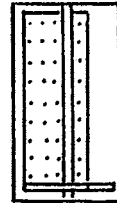
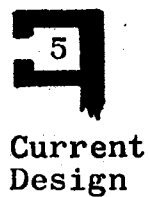


Elevation  
B-B

- 1. Storage Room
- 2. Heater Room
- 3. Coat Closet
- 4. Central Cleaning Closet
- 5. Kitchen Cleaning Closet
- 6. Entry
- 7. Hall



Elevation  
C-C



Elevation  
D-D

Scale 1/8" = 1'



## Rest and Personal Care Areas

The concept which most people have relative to the rest and personal care area of a house is quite limited, and usually includes only two types of rooms--the bedrooms and baths--and three types of activities--sleeping, dressing and bathing. A broader concept of the rest and personal care area of the house includes also a laundry--sewing area and a wider variety of activities such as:

caring for infants,

caring for the ill and infirm,

playing and studying by children,

resting by infants, small children, adults, ill or infirm persons,

cleaning,

laundering and caring for clothing, and

sewing.

Generally speaking, the rest and personal care area is seen as a part of the house in which many people spend large portions of nights and days. Because of the personal nature of many activities carried on in this area it is extremely important that it be planned to provide as much privacy as possible for each family member. Circulation patterns should be designed so that privacy is not violated by through traffic, yet they ought to permit ready movement between this area and other areas of the house. The rest and personal care area

of the house is one where opportunity for "togetherness" away from the children is extremely desirable for the parental couple; where children are concerned, however, problems of sibling scrapping, fighting and arguing may be engendered unless they have opportunity for "apartness".

Floor coverings in the children's area should be of a material which is easily cleaned and resistant to stain. A covering similar to that used for the kitchen and family room is highly desirable.

The rest and personal care area should be designed to be as flexible as possible in order to comfortably accommodate a succession of families of different sizes and compositions. Consideration should be given in this area, as well as others of the house, to the inclusion of special spatial design and equipment features which can make life easier for crippled or infirm persons and the homemaker who must care for them. A number of houses on each military base, perhaps one house of every size in each grade classification, could be so equipped. Such arrangements would surely make life easier for all concerned. Perhaps the inclusion of "special" design features along with standard design features would give added meaning to and foster the CHAPS program (Children Have Potential), in progress currently at many bases and supported strongly by the military.

The provision of planned storage space instead of the usual unplanned closet in each room supplemented by a large

general purpose storage area, should be given a high priority by planners and builders in view of the potential it offers for elimination of "wasted" space and for maximum usage of all spatial areas. Storage in the rest and personal care area of the house ought to accommodate "in-season" clothing, linens, and bedding. The chart which follows includes: (1) items of furniture and equipment owned by a significant number of families, (2) approximate dimensions of these furnishings and equipment, and (3) implications for designing these areas to accommodate specific items and the activities implied by the furnishing items.

TABLE XLI

BEDROOM FURNITURE OWNED BY A SIGNIFICANT NUMBER OF FAMILIES AND  
RELEVANT DESIGN IMPLICATIONS

Item (No. owned)	Dimensions			Approx. Area (sq. ft.)	Dimensions For Use		Approx. Area for Use (sq. ft.)	Design Implica- tions See Note
	Length	Depth	Height		Length	Depth		
<b>Beds</b>								
Dbl.-reg. } (1)	6'10"	4'10"	3'	33	9'3"	10'6"	99	1,6
Dbl.-king } (1)	7'3"	6'4"	3'	45	9'9"	12'	120	1,6
Twin (2)	6'10"	3'4"	3'	21(42)	9'1"	9'	81(162)	2,6
Bunk (1)	6'10"	3'3"	5'7"	21	9'1"	8'11"	72	6
Baby (1)	4'2"	2'3"	3'8"	8	4'5"	5'6"	25	3,6
<b>Dresser</b>								
Single (4)	3'	1'9"	2'8"	6(24)	3'6"	4'6"	16 (64)	4
Double (2)	4'	1'9"	2'8"	8(16)	4'6"	4'6"	20 (40)	4
Triple (1)	5'	1'9"	2'8"	10	5'6"	4'6"	25	4
<b>Chest of Drawers</b>								
(3)	3'4"	1'9"	4'	6(18)	3'10"	4'6"	16 (48)	4
<b>Chairs</b>								
Boudoir (1)	1'10"	1'8"	2'6"	2	2'4"	4'	8	5
Rocker (1)	1'10"	2'8"	3'6"	4	2'4"	6'	12	5
<b>Bedside Tables(3)</b>								
	1'6"	1'5"	1'10"	2 (6)	2'	3'2"	6 (12)	1
<b>Total</b>				<b>229</b>			<b>687</b>	

Design Implications

Note 1 - Uninterrupted wall space to accommodate a king size bed and two bedside tables in master bedroom, if possible a second bedroom which has wall and floor space to accommodate a double bed and two bedside tables.

Note 2 - One bedroom to accommodate two twin beds.

Note 3 - One bedroom for infant near master bedroom and near a bath.

### Design Implications (Cont.)

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Note 4 - Space for one or more dressers or chests in each bedroom. Minimum space should provide for one dresser per person in a room, preferable to provide for two chests per person.

Note 5 - Space for chair or rocker in each room.

Note 6 - 46" minimum on one side of bed to clean, 22" minimum on other side to make.

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## Analysis of Rest and Personal Care Area

Current Design (Bdrm. 1, 11' x 13', 143 □'; Bdrm. 2, 11' x 13', 143 □'; Bdrm. 3, 12' x 10', 120 □'; Total of Bdrm. Wing, 26' x 27', 704 □')

1. Room arrangement inflexible, cannot be adapted to families of various sizes and compositions.
2. Master bath, which is easier to keep clean and in order than children's bath, is not accessible to guests. Only two persons can use bathrooms simultaneously.
3. Limited closet space, especially in the master bedroom.
4. Privacy possible for parents and two other individuals.
5. Insufficient uninterrupted wall space for furniture arrangement.
6. Laundry must be carried through the house in going between rest and personal care area and kitchen-laundry.

Revised Design (Master Bdrm., 11' x 12', 132 □'; children's Wing, 26'6" x 12', 318 □'; Total of Bdrm. wing including laundry-sewing area, 776 □')

1. Room arrangements flexible, can be adapted to families of various sizes and compositions.
2. Master bath, which is generally easier to keep clean and in order than children's bath, is accessible to guests. Bathroom space and organization permits simultaneous use by four persons.
3. Closet space ample. Closet in master bedroom is designed according to research findings.
4. Privacy possible for parents and at least three other individuals.
5. Maximum amount of uninterrupted wall space facilitates convenient furniture arrangements.
6. Collection, laundry and storage of clothing and household linens is possible within the area.

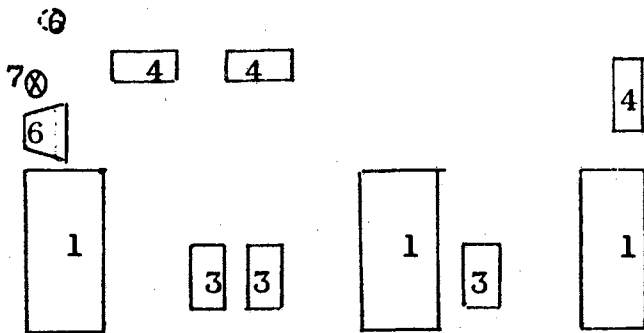
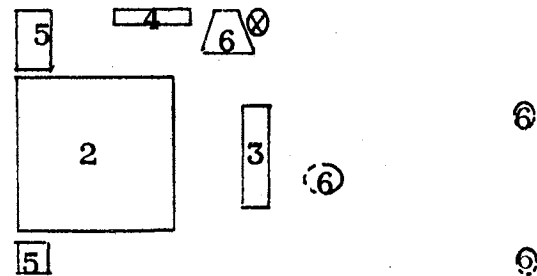
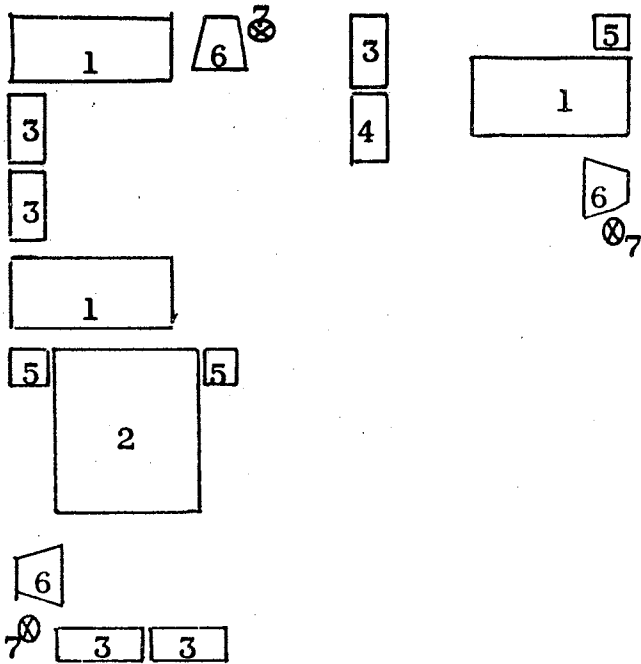
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<sup>6</sup>Julius Panero, Anatomy for Interior Designers (New York, 1962).

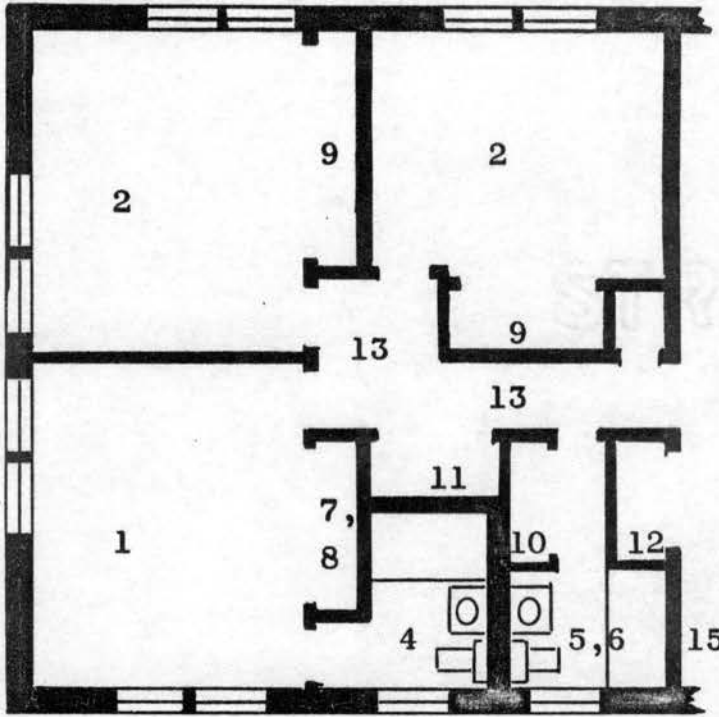
Plate XIX

BEDROOM FURNITURE

1. Twin or Bunk Beds
2. Double Bed - King Size
3. Chest of Drawers or Dressers
4. Extra Chest, Bookcase, Toy Box, etc.
5. Bedside Table
6. Boudoir Chair or Dresser Seat
7. Lamp

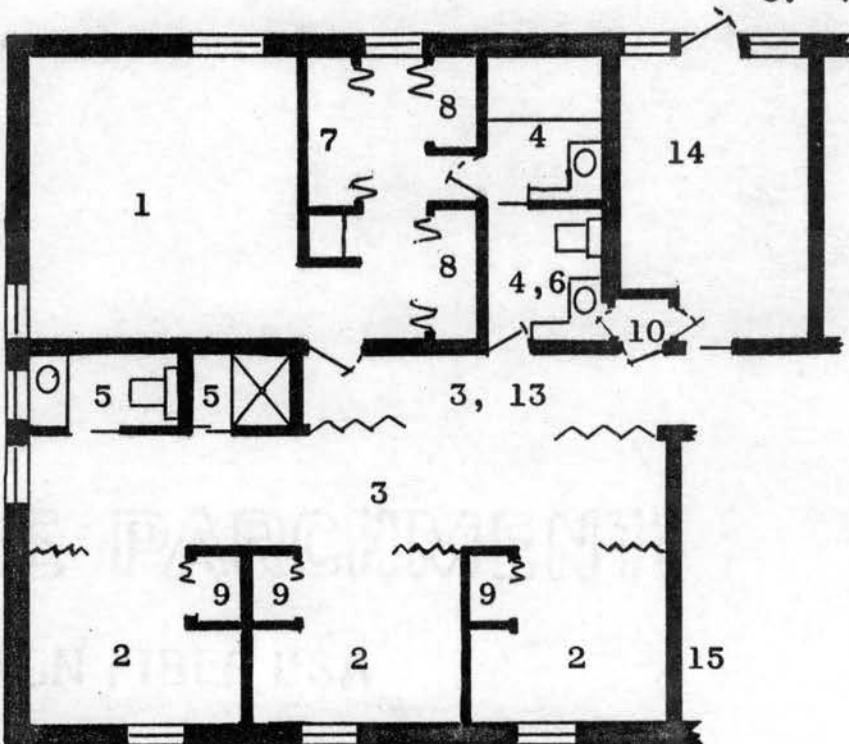


REST AND PERSONAL CARE AREA



Current Design

- 1. Master Bedroom
- 2. Children's Bedrooms
- 3. Children's Play Space
- 4. Master Bath
- 5. Children's Bath
- 6. Guest Bath
- 7. Husband's Closet
- 8. Wife's Closet
- 9. Children's Closet
- 10. Linen Closet
- 11. Storage Closet
- 12. Coat Closet
- 13. Hall
- 14. Laundry-Sewing Room
- 15. Entry



Revised Design

Scale 1/8" = 1'



## Outdoor Living and Storage Areas

The casual life so popular in America today places demands upon designers to incorporate outdoor living areas into the overall plan of a house. To permit adequate supervision of small children, their play areas ought to be easily seen from the kitchen and several other parts of the house. The equipment that must generally be accommodated by such areas are: a swing set, and a sand box. If possible, play areas should be located to take advantage of both sun and shade. Paved spaces, such as drives, sidewalks or patios, used by children when riding tricycles, pulling wagons, and roller-skating, are important to the homemaker's peace of mind. The charts which follow includes: (1) items of furniture and equipment, owned by a significant number of families, (2) approximate dimensions of these furnishings and equipment, and implications for designing these areas to accommodate specific items and the activities implied by the items.

### Outdoor Living Area

Outdoor living space for school age children is needed for basketball, football and baseball, for make-believe "cops and robbers" and "cowboys and indians", for clubhouses and tree climbing, for patio and yard parties, for digging and building, and for hundreds of other activities. Implications for the designer are therefore rather nebulous;

however, features which appear important are: space, trees, and shrubs. Size is most important in regard to trees and shrubs since large ones are fine for climbing and hiding in, while small ones break easily and result in scoldings from parents. Preserving existing greenery when designing houses and during construction processes is, therefore, of prime importance.

Adult outdoor activities are more limited than those of children. They generally include sunbathing, conversation, gardening and eating. Situating an outdoor food preparation and service area near the kitchen facilitates movement of food and supplies, however, prevailing winds, time of use, and preferences regarding sun or shade are other important design considerations for outdoor living areas.

TABLE XLII

OUTDOOR FURNITURE AND CHILDREN'S LARGE TOYS OWNED BY A SIGNIFICANT NUMBER OF FAMILIES AND RELEVANT DESIGN IMPLICATIONS

Item (No. owned)	Dimensions			Approx. Area (sq.ft.)	Dimensions for use		Approx. Area for use (sq.ft.)	Design Implications See Note
	Length	Depth	Height		Length	Depth		
Swing Set (1)	10'	6'	8'	60	16'	34'	544	1
Sand Box (1)	6'	6'	6"	36	12'	12'	144	1
Wading Pool (1) (medium to large)	9'	6'	12"	54	15'	12'	180	1
<b>Total</b>				150			668	
Patio Chairs (4)	2'4"	2'9"	3'	6	2'10"	5'6"	15	2
Picnic Table (1)	9'	4'	2'6"	36	15'	10'	150	2
Bar-B-Q (1)	3'	2'	4'	6	5'	6'	30	2
Chaise Lounge (1)	2'1"	5'	3'	10	4'	6'	24	2
<b>Total</b>				58			219	

Design Implications

Note 1 - Yard space for play area visible from several rooms of the house, (especially kitchen and laundry). Some hard surfaces for wheeled-toys. Both shade and sun areas.

Note 2 - Provisions for visual privacy. Space for dining, conversation, sunning, etc. Provision for controlling sun, shade, sound.

## Analysis of Outdoor Living Areas

### Current Design (cement area - 271 □')

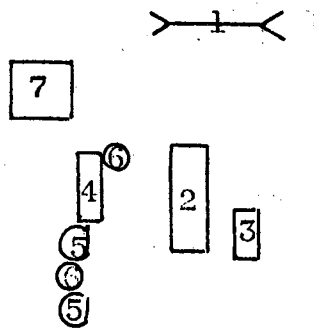
1. Patio not wide enough to permit suitable furniture arrangement (6' x 17'6", 105 □' provided, however, only 6' x 14', 84 □' usable space).
2. No provisions for privacy.
3. Entry porch attractive, however, larger than necessary but too narrow for other uses (Cement area 37' x 4'6", 166 □').

### Revised Design (cement area 267 □')

1. Patio adequate for suitable furniture arrangement (12' x 14', 168 □' usable space).
2. Fencing and shrubs provide privacy and protection from wind.
3. Small entry designed for attractive effect without waste of materials (Cement Area, - 3' x 12', 36 □' and 3' x 21', 63 □'; Total - 99 □'; Garden Area 4' x 12', 58 □').
4. Garage at NW corner will offer protection from winter winds.
5. Play area located away from traffic artery, visible from kitchen (through living-dining area), living room, dining room, laundry, family room and master bedroom.

Plate XXI

OUTDOOR FURNITURE AND CHILDREN'S LARGE TOYS



1. Swing Set
2. Picnic Table
3. Bar B-Q
4. Chaise Lounge
5. Patio Chair
6. Patio Table
7. Sand Box

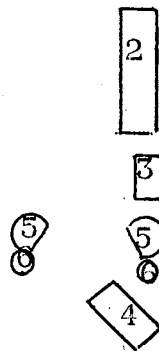
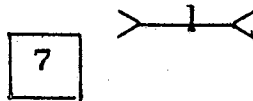
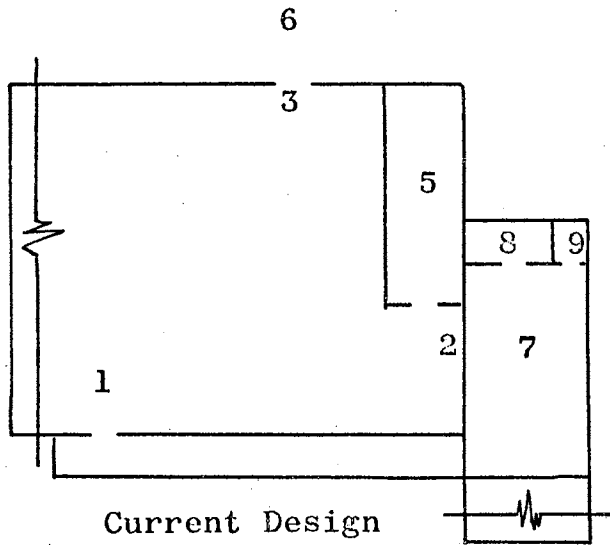
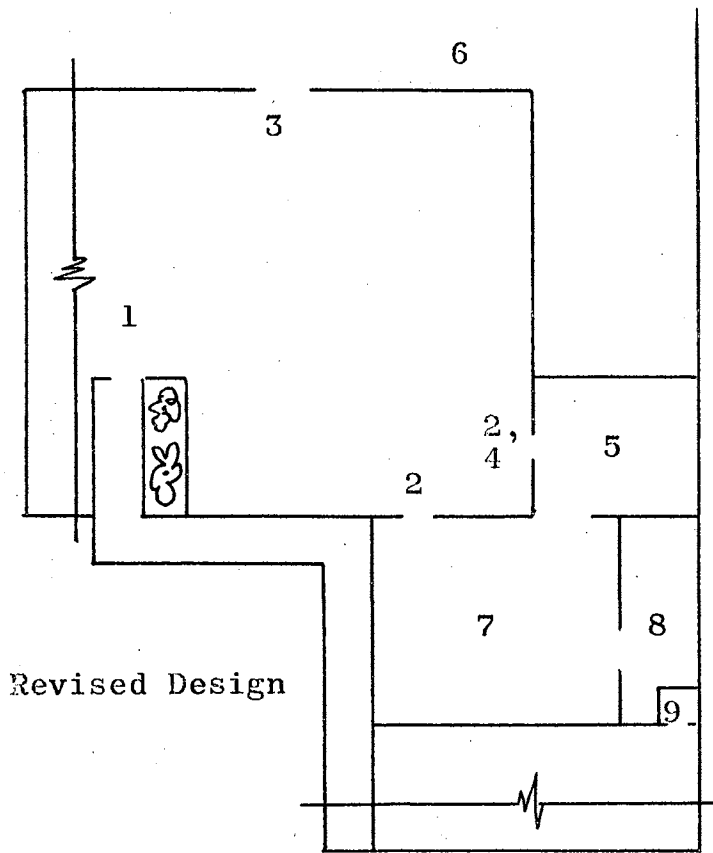


Plate XXII  
 OUTDOOR LIVING  
 AREA



1. Front Entry
2. Kitchen Entry
3. Living Room Entry
4. Family Room Entry
5. Patio
6. Play Yard
7. Car Port or Garage
8. Outdoor Storage
9. Trash



Scale 1/16" = 1'

### Outdoor Storage Area

Because of the emphasis given neat yards on all military bases, the design of outdoor storage areas should facilitate the task of keeping yards and walks neat. Designers have neglected this aspect of housing for military families, probably because they lack knowledge concerning the number and type of items which generally must be stored. If storage of items is easily accomplished, most individuals, including children, will put things away. If storage is inadequate and/or inaccessible, however, items are much more likely to be left out to clutter the yard, driveway or sidewalk. Special attention should be given to accommodating those items which the storage area will most likely contain; e.g. bicycles, tricycles, wagons, lawnmowers, spreaders, hand tools, and woodworking handyman tools.

TABLE XLIII

OUTDOOR EQUIPMENT AND CHILDREN'S LARGE TOYS OWNED BY A SIGNIFICANT NUMBER  
OF FAMILIES AND RELEVANT IMPLICATIONS FOR DESIGN OF STORAGE SPACE

Item (No. owned)	Dimensions			Approx. Area for Storage		Design Implica- tions See Note
	Length	Depth	Height	(sq. ft.)	(cu. ft.)	
Gas powered lawnmower (1)	2'6"	2'6"	3'1"	6	18	1
Edger (1)	9"	2'10"	3'	3	9	1
Spreader or cart (1)	2'6"	3'8"	3'6"	9	31 1/2	1
Large hand tools (6 or more)	6"-1'3"	5"	5'	1/2 (3)	15	2
Small hand tools (6 or more)						2
Bicycles (2)	6'	1'10"	3'3"	12 (24)	72	3
Tricycles (2)	2'2"	3'	2'2"	6	12	3
Wagon (1)	3'6"	1'4"	2'8"	6	14	3
Stroller or baby carriage(1)	4'4"	1'9"	3'9"	8	32	3
Wading pool (1)	12'	2'	9'	4	36	3
	Total			64	289 1/2	
Cars (2)	6'8"	20'4"				4
Hunting, fish- ing and camp- ing equipment						5
Woodworking equipment						5



### Design Implications

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- Note 1 - Garage or outdoor storage room should accommodate most of the items on this table
  - Note 2 - Hanging space provided by a pegboard would facilitate storage of these items.
  - Note 3 - Rack insert in storage space for 2 bicycles. Space for folded wading pool in winter.
  - Note 4 - Two car garage or carport.
  - Note 5 - Flexible storage space is needed to accommodate a variety of hobby and sport items. Forty-two sq. ft. recommended for work bench.
-

## Analysis of Outdoor Storage Areas

Current Design (Storage, 3' x 7', 21 □'; Trash, 3' x 3', 9 □'; Total, 3' x 10', 30 □').

1. Space insufficient for a variety of items.
2. One undivided space provided to accommodate children's outside toys, bicycles, etc., and gardening materials some of which may be poisonous.
3. Space not planned for specific items which must be accommodated.

Revised Design (Storage 6' x 15'6" + 3' x 3', 42 □'; Trash, 3' x 3', 9 □'; Total, 6' x 18' 6", 111 □')

1. Space sufficient for items owned by a significant number of families.
2. Storage areas for outside toys, bicycles, etc., separated from storage for gardening materials some of which may be poisonous.
3. Space designed to efficiently accommodate specific items owned by a significant number of families.

Plate XXIII

OUTDOOR EQUIPMENT  
AND CHILDREN'S  
LARGE TOYS

1. Bicycles
2. Lawn Mower
3. Edger
4. Spreader or Cart
5. Small and Large Hand Tools
6. Wagon
7. Tricycle
8. Carriage
9. Camping Equipment, Fishing Equipment, etc., in space over Children's Large Toys

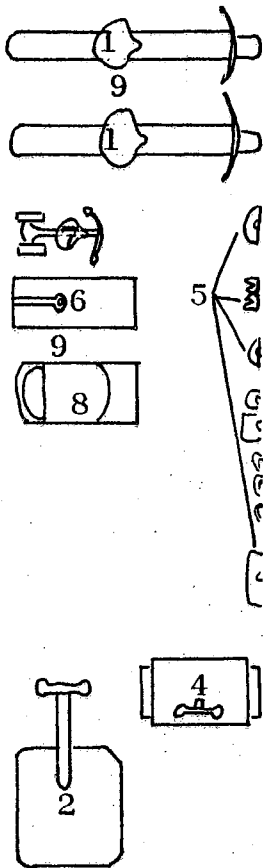
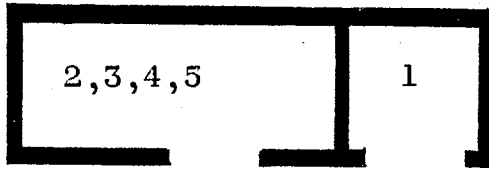


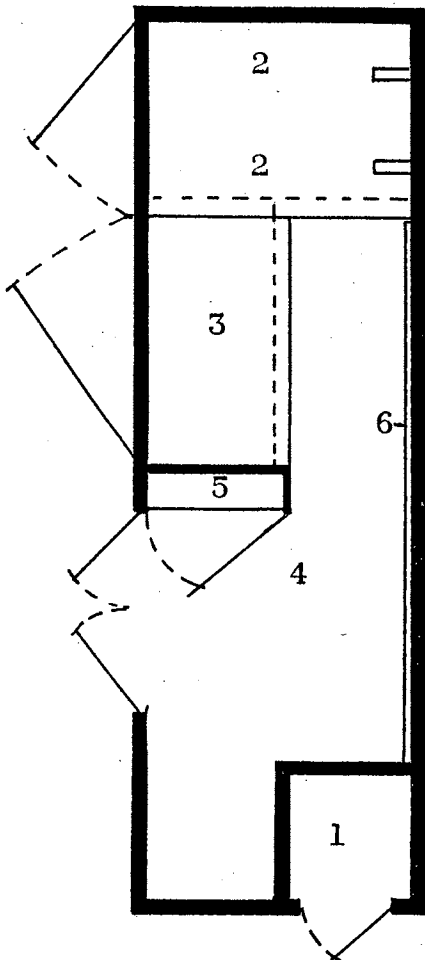
Plate XXIV

OUTDOOR  
STORAGE  
AREA



Current Design

1. Trash
2. Bicycle Storage
3. Children's Large Toys - Storage
4. General Storage Area
5. Storage for Poisonous Materials
6. Pegboard



Revised Design

Scale 1/4" = 1'

## Summary

Implications for design of living and storage areas are drawn from data concerning ownership of furnishings, equipment, and recreational items owned by a significant number of military families. This is done to provide an example for future research workers concerned with families' needs for housing space. Spatial designs of current housing and suggested revisions are made to permit comparisons.

Design considerations incorporated in plans for recreation and entertainment areas are: adequate space for both furniture and the activities implied by the furnishings, organization of space to permit various furniture arrangements, and access to front entry and to outdoor living areas.

Design considerations incorporated in plans for food preparation and service areas are: efficient work patterns, adequate storage of food and utensils, and adequate space for large items of equipment owned by a significant number of families.

Designs of household equipment and storage areas include three spatial areas: utility, cleaning closet, and general storage. Design considerations incorporated in plans for the utility area are: proper sequence for laundry activities, provision of adequate facilities, access to yard, and inclusion of sewing area. Design considerations incorporated in plans for the cleaning closet are: flexible space

for a cannister or upright vacuum cleaner, space for storing cleaning supplies and equipment with high shelves provided for household supplies which may be poisonous. Design considerations incorporated in plans for the general storage area are spaces planned for storing footlockers, suitcases, and out-of-season clothing.

Design considerations incorporated into the plans for the rest and personal care area are: maximum privacy for the parent couple and for at least three other individuals, play areas for children, flexible space for furniture arrangement, and flexible bathroom space to provide simultaneous use by several persons.

Design considerations incorporated into the plan for outdoor living and storage areas are: privacy, flexible space, orientation to take advantage of sun and breeze, and adequate space for use and storage of items owned by a significant number of families.

Designs presented in this chapter are not to be taken as the only solutions to housing for military families. They are presented to illustrate, both visually and verbally, how research data can be used as a basis for achieving greater livability in housing. The writer hopes the ideas set forth herein will serve to interest both research workers and designers in the possibilities which exist for using research findings as a basis for design.

## CHAPTER VI

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary

Data relative to the amount and kinds of spaces required to accommodate possessions is one kind of information necessary to design houses which will meet the needs of military families. Although no two families are expected to be exactly alike, one can anticipate that comparable types of families own similar items of furniture and equipment and that ownership is affected by certain factors about families such as rank, family size and composition, and stage in the family life cycle.

An investigation concerning ownership of furnishings and equipment was undertaken by the writer because of her belief that military housing should be designed with more consideration given to meeting the special needs of military families. The only reliable way to determine these needs is through research.

The study was conceived as a pilot investigation for future research concerning space needs of families; the primary purpose being to provide data which can be used as bases for designing houses that better fit the needs of military families.

A second purpose of the study is to determine the approximate displacement of space by the possessions of military families and subsequent implications for designing and organizing space in houses to be occupied by such families.

The hypothesis of the study is that: Certain items of household equipment and furnishings which, by virtue of size and dimensions of the items affect space requirements of housing, are possessed by a large proportion of military families; and possession or non-possession of these items varies according to military rank, family size and composition, and stage in the family life cycle.

Permission to conduct the study was obtained from the Department of Defense, and local military commanders offered their cooperation.

A questionnaire which could be administered in a group situation or distributed by mail was devised and used in obtaining the data. The instrument was presented to the wives of all military personnel stationed in Stillwater, Oklahoma. Of the 283 questionnaires administered, 166 usable questionnaires were returned for analysis. Data from all questionnaires were analyzed to determine characteristics of the sample. Data from all questionnaires completed by wives of officers were subjected to Chi-square analysis to determine possible relationships between the independent and dependent variables. The limited size of the sample and the resultant low frequency distributions precluded statistical analysis by



all variables except rank, and analysis by rank was possible only for the officer group. Computations were made on an electronic high speed computer in the Computing Center at Oklahoma State University.

Findings relative to ownership of selected items of furniture and household equipment are presented to serve as an example of how data of this nature can be analyzed and used as a basis for drawing design implications. Although it was not possible to conduct a full statistical analysis, as originally planned, the study was useful in determining methods for analyzing data and methods for using the data to draw design implications.

### Conclusions

From analysis of the data, the following conclusions are drawn relative to the hypothesis of the study.

1. Many items of household equipment and furnishings are owned by a large proportion of military families; therefore, the first portion of the hypothesis is supported.
2. Chi-square analyses of the relationship between rank and possession or non-possession of selected items indicate a relationship between rank and ownership of items; therefore, the second portion of the hypothesis is supported.

3. A limited sample precluded statistical analysis of the relationship between the possession or non-possession of items and the variables family size and composition, and stage in the family life cycle; therefore, the final portion of the hypothesis, that ownership varies according to these variables, is not supported.

All three purposes of the study were fulfilled. In addition to determining ownership patterns and the relationship between ownership and selected social characteristics, it was also possible to determine approximate displacement of space effected by possessions and to use the information in drawing implications for the design and organization of space in housing occupied by families having a military officer as household head.

#### Recommendations

Research relative to special housing needs, values, and preferences of military families, as well as other identifiable groups, should be continued so the findings can be used as a bases for designing houses which, it is hoped, will be more livable than those currently designed. The writer recommends that the present study be used as a model for a larger study conducted with a representative sample of military families in order to obtain more valid bases for designing military housing. A study of this scope would make it possible to

include a complete statistical analysis of the relationship between ownership and rank, and further analyses by family size and composition and stage in the family life cycle. The writer recommends that, for design purposes, the data be compiled according to family types (i.e., company grade officer in the expanding stage of the family life cycle, needing three bedrooms) and that design implications be drawn for each type. It is further recommended that findings from such a study be used in designing future military housing and as a basis for remodeling existing housing.

Additions to the instrument which would probably make it more useful are:

1. One or more questions to determine the total number of families who own, or do not own but plan to buy, the following types of furniture:
  - A. formal living room furniture only,
  - B. informal family room furniture only,
  - C. both formal living room and informal family room furniture,
  - D. formal dining room furniture only,
  - E. informal dinette furniture only,
  - F. both formal dining room and informal dinette furniture.
2. One or more questions to determine the total number of bedrooms for which a family owns furniture.

3. One or more questions to determine ownership of the specific items listed below:
  - A. Formal Living Room Furniture: commode or buffet, ottoman or hassock, floor lamps,
  - B. Informal TV room, Family Room or Playroom Furniture: bar stools, ottoman or hassock, floor lamps,
  - C. Music: speaker cabinet, record cabinet, tape recorder,
  - D. Dining Room Furnishings: carpet (all sizes), tea cart,
  - E. Bedroom Furnishings: cedar chest, desk, bookcase,
  - F. Baby Equipment: bassinet, high chair, jumper, swing, play table-chair,
  - G. Household Equipment: portable heater, carpet sweeper, clothes hamper, TV trays.
  - H. Yard Equipment: water hose and sprinkler, ladder, garbage cans,
  - I. Children's Large Toys: table and chairs, toy box or chest, hobby horse, doll beds, etc., kitchen cabinets and equipment, rocking chair, bookcase, car, tractor, fire engine, etc.,
  - J. Outdoor Furniture: chaise lounge,
  - K. Miscellaneous Equipment: typewriter, drawing table, dress form, sewing cabinet, telephone cabinet, clothing stored in cartons, Christmas decorations,

- L. Traveling: 2-wheel trailer,
- M. Special Health or Medical Equipment: weight lifting equipment,
- N. Hobby Equipment: electronic equipment, "handy-man" tools, golf equipment, camera and projector, miniature train layout on a large board, tropical fish equipment, ski and skating equipment.

The writer recommends also that a study be conducted to determine more specifically the amount and types of storage needed by military families for such items as: suitcases, footlockers, hobby equipment, Christmas decorations, etc.

Preference and value studies which furnish information about how people feel in regard to various aspects of a house could be very helpful to designers. One area open for study is that concerning preferences for space organization. A study of this type might encompass relative preferences for divisions of space, such as:

combined living-dining area vs. separate living and dining rooms,

combined kitchen-family room vs. a separate kitchen and a separate family room,

combined children-guest bath vs. combined parent-guest bath.

A second possible area for study concerns style preferences, i.e., contemporary vs. ranch style vs. traditional, and one story vs. split level vs. two story.

Investigation of the housing images held by military families might be another approach to obtaining basic information which will contribute to a better understanding of military families and their feelings and ideas concerning houses. Comparison of the images held within the officer and enlisted ranks could yield insights into how images change with age and improved socio-economic standing.

A comprehensive collection of information regarding research of the various aspects of housing requires a review of numerous professional journals, bulletins, theses, magazines, books, etc. It is a task which would be very difficult on a continuing basis for a practicing designer. The writer recommends, therefore, the publication of a magazine or journal which furnishes abstracts or articles of all current research related to housing in a form convenient for use by interior designers, architects, home builders, home economists, and housing consumers.

Continuing research on military families, as well as other readily identifiable groups, will add to basic knowledge concerning the American family, its needs, values and preferences. It is the writer's contention that such studies can lead to the design and production of houses which afford livability and yield satisfactions for people.

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APPENDIX A



DEPARTMENT OF THE AIR FORCE  
WASHINGTON

OFFICE OF THE SECRETARY

5 November 1963

Mrs. William F. Morris  
606 North Hester Street  
Stillwater, Oklahoma

Dear Mrs. Morris:

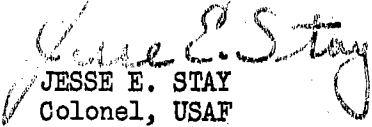
Your recent letter to Mr. Reed, Deputy Assistant Secretary of Defense for Family Housing, has been referred to this office for reply.

I have cleared your request with Department of Defense authorities and there is no objection to the voluntary participation of military personnel in your survey "to determine the implications for the design of military housing as determined through a pilot study of the sizes and spaces displaced by selected possessions of military families."

From your letter I understand that you will survey military families in the Stillwater, Oklahoma area and assume this means those families who are in some way connected with the University, either through ROTC or military student programs. To avoid any unnecessary inconvenience in conducting your survey, I suggest that you advise the commandants of the various services and ROTC units at Oklahoma State University of the contents of this letter.

In coordinating your request through the Department of Defense, I received several requests for a copy of your completed study or an abstract of the findings. If you will provide this office with such a copy (or loan us a copy with permission to reproduce it in all or part), I will see that it is circulated to all interested parties.

Sincerely,

  
JESSE E. STAY  
Colonel, USAF  
Office of Information

Cy to AU (AUOI)  
Maxwell AFB, Ala

Joyce J. Morris  
606 North Hester Street  
Stillwater, Oklahoma  
October 12, 1963

Mr. John J. Reed  
Deputy Assistant Secretary of Defense for Family Housing  
Department of Defense  
Washington 25, D.C.

Dear Mr. Reed:

I am a graduate student at Oklahoma State University, majoring in housing and interior design. In this capacity I will soon begin the research relative to my thesis problem. I am also the wife of an Air Force officer, and consequently am keenly interested in the housing problems faced by military families. The specific aspect of housing I should like to investigate is the amount of housing space (exterior and interior) displaced by certain possessions of military families. The rationale for selecting this particular problem is delineated in the attached proposal.

A number of research studies conducted by the United States Department of Agriculture have resulted in houses designed to fit the special needs of farm families. Similar research currently underway with other specialized groups (e.g. the aged, college students, the disabled, etc.) also should lead to housing designed for special needs. In reviewing research studies relative to housing I have been unable to find reports of any research concerned with the housing of military families; however, I feel that research concerning such families could result in housing design which more nearly meets the special needs of military families than does present day housing. It is my hope that the results of the proposed study will prove beneficial to those who plan military housing projects and to private builders who cater to the military.

It is my understanding that official authorization is required for any survey of military personnel or their families. I would appreciate it if you would furnish the required authorization, or refer my proposal to the appropriate approving authority. Because of limited funds and time military families in the Stillwater, Oklahoma, area will be the subjects for

Mr. John J. Reed

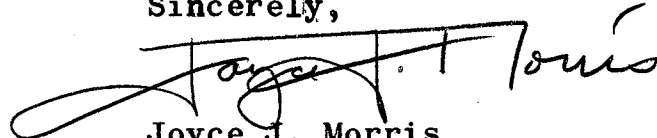
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October 12, 1963

investigation. Time limitations make it imperative that the study be initiated as soon as possible. The only time at which the data can be collected as outlined in the proposal is November 21. Any thing you can do to speed the authorization along will be greatly appreciated.

The study will be conducted under the guidance of Dr. Maie Nygren, Head of the Department of Housing and Interior Design at Oklahoma State University. If you have any questions, I shall be happy to answer them or you may write to Dr. Nygren.

Sincerely,

A handwritten signature in cursive script, appearing to read "Joyce J. Morris". The signature is written in black ink and is positioned above the typed name.

Joyce J. Morris  
(Mrs. William F. Morris)

Joyce J. Morris  
606 North Hester  
Stillwater, Oklahoma  
November 12, 1963

Mr. S. I. Gerber  
Director of Family Housing Standards and Design  
Deputy Assistant Secretary of Defense for Family Housing  
Department of Defense  
Washington 25, D. C.

Dear Mr. Gerber:

I was very pleased to receive your telephone call regarding my proposed study of the possessions of military families and to learn that the Department of Defense might be interested in using the results.

Colonel Jesse E. Stay, USAF Office of Information, has sent a statement to the effect that my study had been cleared by the Department of Defense. I wish to express my appreciation for your assistance in forwarding the proposal to the proper authorities.

A copy of the questionnaire to be used in obtaining the data is attached for your review. As I indicated in our telephone conversation, I would be happy to consider making changes which might yield information useful to you.

In order to allow sufficient time for your office to review the questionnaire and make recommendations, I have arranged to present the questionnaire at the January meeting of the Wives' Club instead of in November as originally planned. I am still considering your suggestion of presenting the questionnaires completely by mail; however, as this method is more costly than presenting them at the luncheon and by mail I must at present consider the least costly method as the one to use.

Your comments concerning the possibility that the Department of Defense might reimburse part of the research expenses in return for use of the results are encouraging. Financial assistance would certainly facilitate the investigation. I am enclosing an estimate of the probable costs for doing the research and producing several copies of the written report.

Mr. S. I. Gerber

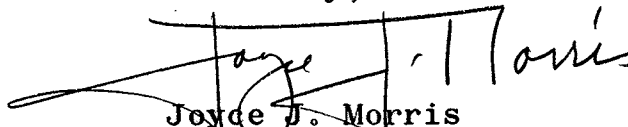
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November 12, 1963

Since I am frequently absent from home for classes and study, you may have difficulty in reaching me by telephone. Should you need to call, I am usually at home in the afternoons, except Mondays from one to three; and I am usually at home on Tuesday and Thursday mornings.

I appreciate the interest you have expressed in my study and look forward to hearing from you again.

Sincerely,



Joyce J. Morris  
(Mrs. Wm. F. Morris)

2 Encl:

1. Estimate
2. Questionnaire

Joyce J. Morris  
606 North Hester  
Stillwater, Oklahoma  
November 14, 1963

Colonel Jesse E. Stay  
Office of Information  
Department of the Air Force  
Office of the Secretary  
SAF-OIXD  
Bolling AFB, D.C. 20332

Dear Colonel Stay,

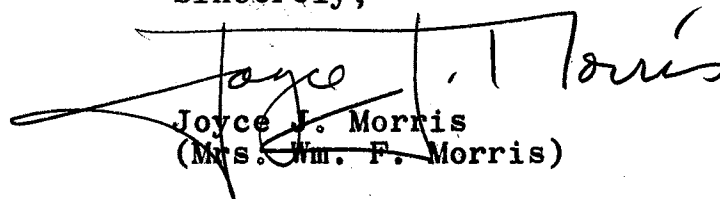
I appreciate very much your letter of 5, November, granting authorization from the Department of Defense for my study concerning the possessions of military families. As you recommended, I have contacted each of the commandants here at OSU to advise them of my study and of your letter.

I shall be happy to furnish your office with a copy of the completed thesis. If the investigation proceeds according to schedule, the thesis should be completed by May, 1964.

I have been very pleased and greatly encouraged by the interest shown in my study. As you probably know, Mr. S. I. Gerber, Director of Family Housing Standards and Design, telephoned me for additional information before referring my proposal to Mr. Reed, Deputy Assistant Secretary of Defense for Family Housing. Mr. Gerber indicated that his office was interested in any findings from this study which can be used in conjunction with those from other current studies in planning military housing. At his request, I have sent a copy of the questionnaire which he has very kindly offered to review. I have asked that he suggest any changes which will make the study more valuable to the Department of Defense.

I appreciate your interest in my proposed research and shall be happy to cooperate with your office in any way possible.

Sincerely,



Joyce J. Morris  
(Mrs. Wm. F. Morris)

**APPENDIX B**

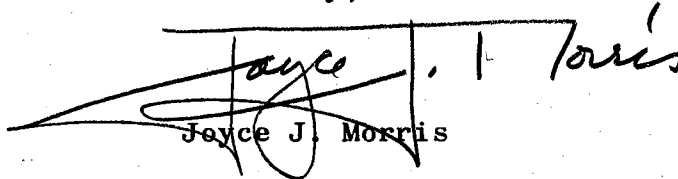
The Department of Defense has recognized housing as one of the major problems faced by military families. Being a military wife, you are probably familiar with some housing problems, for with each change of station your search for suitable housing is launched anew.

It is my feeling that many housing problems can be prevented and many aspects of military housing improved if the people who plan housing have a better understanding of military families and their special needs. For this reason, I have decided to study one aspect of military housing needs, namely, the amount of space needed to house the large equipment, furnishings and other items owned by military families. I have selected this particular problem because of the difficulty military families seem to have in finding houses which satisfactorily accommodate both the family and its possessions.

The attached questionnaire is intended to obtain information about your family and about the major furnishings, equipment, and other items your family owns and/or plans to buy in the near future. The results of this particular survey, which is being conducted under the auspices of the Department of Defense, are intended to be used with the results of other studies in planning future military housing.

Your cooperation in completing and returning this questionnaire will help to provide a more valid basis for the design of military housing.

Sincerely,

  
Joyce J. Morris

Attachment



Schedule No. \_\_\_\_\_

Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Please circle number to the left of the appropriate answer.

1. Husband's rank if he is an officer. (Listed by pay grade and rank)

- 1) 01 - 2nd lieutenant, ensign
- 2) 02 - 1st lieutenant, lieutenant junior grade
- 3) 03 - Captain, lieutenant
- 4) 04 - Major, lieutenant commander
- 5) 05 - Lieutenant colonel, commander
- 6) 06 - Colonel, captain
- 7) 07 - Brigadier general, commodore
- 8) Not an officer

2. Husband's rank if he is a warrant officer. (Listed by pay grade and rank)

- 1) W1 - Warrant officer
- 2) W2 - Chief warrant officer
- 3) W3 - Chief warrant officer
- 4) W4 - Chief warrant officer
- 5) Not a warrant officer

3. Husband's rank if he is enlisted. (Listed by pay grade and rank)

- 1) E1, E2, or E3  
(E1 - Airman basic, recruit, seaman recruit, private)  
(E2 - Airman 3rd class, private, apprentice seaman, private 1st class)  
(E3 - Airman 2nd class, private 1st class, seaman, lance corp.)
- 2) E4, E5, or E6  
(E4 - Airman 1st class, corporal or specl. 4, petty officer 3rd class, corporal)  
(E5 - Staff sgt., sgt. or specl. 5, petty officer 2nd class, sgt.)  
(E6 - Tech sgt., sgt. or specl. 6, petty officer 1st class, sgt.)
- 3) E7, E8, or E9  
(E7 - Master sgt., platoon sgt. or sgt. 1st class or specl. 7, chief petty officer, gunnery sgt.)  
(E8 - Sr. master sgt., 1st sgt. or specl. 8, sr. chief petty officer, 1st sgt.)  
(E9 - Chief master sgt., sgt. major or specl. 9, master chief petty officer, sgt. major)
- 4) Not enlisted.

Schedule No. \_\_\_\_\_

## 4. Husband's branch of service:

- 1) Air Force
- 2) Navy
- 3) Army
- 4) Marine Corps
- 5) Other (specify) \_\_\_\_\_

5. Please list below the age and sex of all children (Natural and adopted), including those who live away at school part of the year (college, boarding school, etc.) and those who live away from home all of the time (married, working, hospital, etc.)

No children \_\_\_\_\_ (check)

Ages of Children	Sex		Lives at Home	Lives away from home	
	Male	Female		School	Married, etc.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
Other (specify)					

6. Please check in the appropriate space or spaces below to indicate your family situation in regard to other individuals who live with you for at least three (3) months each year.

No other individuals \_\_\_\_\_ (check)

Other individuals living with you	1	2	3	4	Other (specify)
1) Other couples					
2) Adult males					
3) Adult females					
4) Teen age males					
5) Teen age females					
6) School age children - male					
7) School age children - female					
8) Pre-school children - male					
9) Pre-school children - female					
10) Other (specify)					

Schedule No. \_\_\_\_\_

Before continuing with this questionnaire please look through the following 12 pages and take note of the headings labeled "A. Living Room - (formal)," "B. TV, Family Room, Playroom, etc.," "C. Music," etc. to avoid giving answers under the wrong heading.

7. Please indicate the number and size of items you "Own" (in use or in storage) or "Plan to Buy" within the next five (5) years.

NOTE: When dimensions are given with no specific instructions they indicate the largest dimensions of the object.

Item	Own							Plan to Buy						
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
<b>A. LIVING ROOM - (formal)</b>														
<b>Sofa</b>														
small (under 5 ft.)														
medium (5 to 7 ft.)														
large (over 7 ft.)														
<b>Lounge chairs (upholstered)</b>														
regular type (with upholstered arms)														
regular type (armless)														
recliner														
contour														
rocker (wood or upholstered)														
<b>Occasional chairs (upholstered or not)</b>														
armless														
with arms														
<b>Rugs or carpeting (approx. sizes)</b>														
12 x 15 ft.														
12 x 12 ft.														
9 x 12 ft.														
8 x 10 ft.														
6 x 9 ft.														
other (specify)														
<b>Card table</b>														
<b>Card table chairs</b>														
<b>Television</b>														
console														
portable														
<b>Coffee table (square or round)</b>														
small (3 to 4 ft.)														
medium (4 to 5 ft.)														
large (over 5 ft.)														

Schedule No. \_\_\_\_\_

Item	Own						Plan to Buy							
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
<b>LIVING ROOM - (formal) cont.</b>														
<b>Coffee table (rectangular)</b>														
small (3 to 4 ft.)														
medium (4 to 5 ft.)														
large (over 5 ft.)														
<b>End table</b>														
small (2 ft. or under)														
medium (2 to 4 ft.)														
large (over 4 ft.)														
<b>Other living room tables</b>														
small (2 ft. or under)														
medium (2 to 4 ft.)														
large (over 4 ft.)														
<b>Desk</b>														
child's size														
adult size														
3 to 4 ft.														
4 to 5 ft.														
5 to 6 ft.														
6 ft. or larger														
<b>Secretary</b>														
<b>Bookcase</b>														
<b>Other living room furniture - (formal) (specify)</b>														
<b>B. TV, FAMILY ROOM, PLAYROOM, ETC. - (casual)</b>														
<b>Sofa</b>														
small (under 5 ft.)														
medium (5 to 7 ft.)														
large (over 7 ft.)														
<b>Lounge chairs (upholstered)</b>														
regular type (with upholstered arms)														
regular type (armless)														
recliner														
contour														
rocker (wood or upholstered)														
<b>Occasional chairs (upholstered or not)</b>														
armless														
with arms														
<b>Rugs (approx. sizes)</b>														
12 x 15 ft.														
12 x 12 ft.														
9 x 12 ft.														
8 x 10 ft.														
6 x 9 ft.														

Schedule No. \_\_\_\_\_

Item	Own							Plan to Buy						
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
TV, FAMILY ROOM, PLAYROOM, ETC. - (casual) - cont.														
Card table and chairs														
Television														
console														
portable														
Coffee table (square or round)														
small (3 to 4 ft.)														
medium (4 to 5 ft.)														
large (over 5 ft.)														
Coffee table (rectangular or oval)														
small (3 to 4 ft.)														
medium (4 to 5 ft.)														
large (over 5 ft.)														
End table														
small (2 ft. or under)														
medium (2 to 4 ft.)														
large (over 4 ft.)														
Other family room tables														
small (2 ft. or under)														
medium (2 to 4 ft.)														
large (over 4 ft.)														
Desk														
child's size														
adult size														
3 to 4 ft.														
4 to 5 ft.														
5 to 6 ft.														
6 ft. or larger														
Secretary														
Bookcase														
Other TV, Family Room, Playroom, etc. furniture - (casual), (specify)														
_____														
_____														
_____														
C. MUSIC														
Piano														
spinet														
grand														
baby grand														
Organ														
small (spinet - 40 to 50 in.)														
medium (console - 50 to 60 in.)														
large (concert - 60 to 65 in.)														

Schedule No. \_\_\_\_\_

Item	Own							Plan to Buy						
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
<b>MUSIC cont.</b>														
Hifi, stereo, combination sets, etc.														
portable														
console														
Other space consuming musical instruments (specify)														
<b>D. DINING ROOM</b>														
Dining table and chairs														
seats 4														
seats 6														
seats 8														
seats 10 or more														
Buffet														
China cabinet														
Sideboard														
Corner cupboard														
Other dining room furniture (specify)														
<b>E. BEDROOMS</b>														
Double bed - regular size														
Double bed - king size														
Double bed - queen size														
3/4 bed														
Single or twin size bed														
Bunk or trundle beds														
Baby bed														
Youth bed														
Single dresser														
Double dresser														
Triple dresser														
Mr. & Mrs. chests														
Chest of drawers														
Bedside tables														
Chairs														
small boudoir														
rocker														
chaise lounge														
Dressing table														
Other bedroom furniture (specify)														

Schedule No. \_\_\_\_\_

Item	Own						Plan to Buy							
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
<b>F. BABY EQUIPMENT</b>														
Baby carriage														
Stroller														
Bathinette														
Play pen														
Other baby equipment (specify)														
<b>G. KITCHEN FURNISHINGS AND EQUIPMENT</b>														
Breakfast set														
seats 2														
seats 4														
seats 6 or more														
Serving cart														
Step stool														
stationary														
folding														
Metal cabinets (storage)														
Stove														
gas														
electric														
Stove														
apartment size, 20 in.														
compact size, 30 in.														
regular size, 40 in.														
other (specify)														
don't know size														
Refrigerator or combination														
one-door freezer-refrig.														
9 cu. ft. or under														
9 to 12 cu. ft.														
12 to 15 cu. ft.														
over 15 cu. ft.														
don't know size														
Two-door freezer-refrig.														
9 to 12 cu. ft.														
12 to 15 cu. ft.														
15 to 20 cu. ft.														
don't know size														
Freezer - type														
upright														
chest														
other (specify)														

Schedule No. \_\_\_\_\_

Item	Own						Plan to Buy							
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
<b>KITCHEN FURNISHINGS AND EQUIPMENT cont.</b>														
Freezer - capacity														
under 10 cu. ft.														
10 to 15 cu. ft.														
15 to 20 cu. ft.														
over 20 cu. ft.														
don't know size														
Other kitchen furnishings and equipment (specify)														
<b>H. HOUSEHOLD EQUIPMENT</b>														
Washer														
Automatic														
front loading														
top loading														
Wringer type														
Washer-dryer combination														
gas														
electric														
Dryer														
gas														
electric														
Dishwasher														
portable														
built-in														
Ironer - Electric														
standard														
portable														
Sewing machine														
portable														
cabinet														
Vacuum cleaner														
upright														
cannister														
other (specify)														
Floor polisher														
Air conditioner														
110 volt														
220 volt														
Air conditioner														
room														
window model														
portable														
central														
Air cooler														
window														
portable														



Schedule No. \_\_\_\_\_

Item	Own							Plan to Buy						
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
<b>HOUSEHOLD EQUIPMENT cont.</b>														
Other household equipment (specify)														
<b>I. YARD EQUIPMENT</b>														
Lawn mower														
gasoline powered (push type)														
gasoline powered (riding type)														
electric powered hand mower														
Edger														
electric														
gasoline														
hand														
Spreader or cart														
Large size hand tools (rake, etc.)														
Small size hand tools (trowel, etc.)														
Other yard equipment (specify)														
<b>J. CHILDREN'S LARGE TOYS</b>														
Bicycle														
Tricycle														
Wagon														
Go-cart														
Swing set														
Climbing apparatus														
Sandbox														
Wading pool														
small (inflatable plastic)														
medium (inflatable or rigid sides)														
large (rigid sides)														
Other children's large toys (specify)														
<b>K. OUTDOOR LIVING</b>														
Patio table														
Patio chairs														
Picnic table														
Picnic benches														

Schedule No. \_\_\_\_\_

Item	Own						Plan to Buy							
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
<b>OUTDOOR LIVING cont.</b>														
Bar-B-Q														
Other outdoor living furnishings (specify)														
<b>L. MISC. EQUIPMENT</b>														
Typewriter table														
Electric fan														
table size														
floor size														
window model														
Foot locker														
Wardrobe trunk														
Steamer trunk														
Suitcases														
small (cosmetic, hat, etc.)														
medium (overnight, etc.)														
large (pullman, 2 or 3 suiter, etc.)														
Standing hair dryer														
File cabinet														
Other misc. equipment (specify)														
<b>M. TRAVELING</b>														
Cars														
Motor cycles														
Boat														
rowboat														
sailboat														
motor boat														
house boat														
Boat trailer														
Camping trailer														
Other traveling (specify)														
<b>N. SPECIAL HEALTH OR MEDICAL EQUIPMENT</b>														
Vibrators														
Exercisors														
Relaxicizers														
Wheel chair														

Schedule No. \_\_\_\_\_

Item	Own							Plan to Buy						
	1	2	3	4	5	6	other	1	2	3	4	5	6	other
<b>SPECIAL HEALTH OR MEDICAL EQUIPMENT cont.</b>														
Iron lung														
Walker														
Other special health or medical equipment (specify)														

8. HOBBY EQUIPMENT that takes floor space (specify items owned after each listing)

- Ham radio equipment (specify) \_\_\_\_\_
- Darkroom equipment (specify) \_\_\_\_\_
- Painting equipment (specify) \_\_\_\_\_
- Fishing equipment (specify) \_\_\_\_\_
- Hunting equipment (specify) \_\_\_\_\_
- Camping equipment (specify) \_\_\_\_\_
- Flower arranging equipment (specify) \_\_\_\_\_
- Gourmet cooking equipment (specify) \_\_\_\_\_
- Model building equipment (specify) \_\_\_\_\_
- Woodworking equipment (specify) \_\_\_\_\_
- Craft equipment (specify) \_\_\_\_\_
- Other hobby equipment (specify) \_\_\_\_\_

9. Please list below any items (such as desks, cars, air conditioners, freezers, etc.) which were purchased or sold because of some special living situation or housing condition in Stillwater.

Item (list)	Purchased (check)	Sold (check)



VITA

Joyce Jackson Morris

Candidate for the Degree of  
Master of Science

**Thesis:** IMPLICATIONS FOR THE DESIGN OF HOUSING FOR MILITARY FAMILIES AS DETERMINED THROUGH A PILOT STUDY OF OWNERSHIP PATTERNS AND THE SPACES DISPLACED BY SELECTED ITEMS OF FURNITURE AND EQUIPMENT.

**Major Field:** Housing and Interior Design

**Biographical:**

**Personal Data:** Born in Atlanta, Georgia, February 20, 1933, the daughter of James R. and Gladys C. Jackson. Married July 20, 1954, to William F. Morris, regular officer, United States Air Force. Mother of two sons William R. Morris, born April 20, 1955, and Michael S. Morris, born August 27, 1956.

**Education:** Attended grade school in Atlanta, Georgia, and in Chicago and Evanston, Illinois; graduated from Evanston Township High School in 1950; received the Bachelor of Science degree in Home Economics from Purdue University, with a major in Applied Design, in May, 1954; studied water color painting under Robert Knight, Chaumont, France, summer of 1956; studied oil painting under Margaret Eastman, Oklahoma City, Oklahoma, 1958; completed requirements for a Master of Science degree, with a major in Housing and Interior Design, January, 1965.

**Professional Experience:** Worked in Jack and June Interior Design Studio, Winnetka, Illinois, Summer, 1953, and as an interior designer at Lord's Department Store, Evanston, Illinois, Summer, 1954. Worked as a free-lance fine and commercial artist and as an interior design consultant, 1954 to present. Taught private art classes in Oklahoma City, Oklahoma, and Blytheville, Arkansas, 1958-62. Taught art classes at the Blytheville Young Men's Christian Association, Blytheville, Arkansas, 1960-62, and for the Stillwater Art Guild, Stillwater, Oklahoma, 1964.