KITCHEN STORAGE PLANNING

A THESIS
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I recommend this thesis for acceptance by the Honors Program of Ball State University for graduation with honors.

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INTRODUCTION

"Work works from sun to sun ... but woman's work is never done!" (50, p. 14) Since most of a woman's work is composed of cooking, cleaning and laundry, this paper is concerned with making the work sequence and storage in the production center of a home more efficient. It also includes detailed plans of the core, or work center, I hope to have in my own home.

Research shows that "few parts of the home have been subjected to more detailed investigation than the kitchen, and few show less evidence of the application of research findings." (22, p. 2) When all of this research began in the 1930s, women changed their kitchens into white laboratories. These were so dull that the homemaker found no interest in cooking. Today, the kitchen has once again become the "heart of the home!" (50, p. 14)

The object of kitchen planning is "providing a convenient and attractive place in which to prepare meals." (22, p. 55) In order to do this for a family, the following information is essential:

1. Write down your existing and hoped for equipment and appliances.
2. Plan the floors, walls, lighting and ventilation.
3. Have a clear picture of how the family lives.
4. Decide on the best arrangement of the equipment and counters.
5. Pick a style for the kitchen. (22, p. 93)

The majority of this paper deals with storage. Ruth Kitcheson, Extension Housing Specialist, lists five goals for good storage:

Storage is closely related to the important work centers in the kitchen, and is planned to meet the following:
a. Articles and materials can be kept close to where used first or most often.
b. Each item can be seen easily; for example, store articles just one row deep.
c. Items used most often can be reached without stooping or stretching.
d. Each item can be grasped and removed easily.
e. Each item can be removed from its place without first moving something else out of the way; unlike items are not stacked one on top of another. (20, p. 3)

To realize the maximum benefit from a well planned storage area, its location and arrangement must be considered. This is discussed in this paper in the section on general specifications and needs for kitchens.

The home work core has been broken down into its fourteen component centers. Five of these centers, the refrigerator, mix, sink, range and serve center, should be found in every kitchen, in the sequence mentioned. The other nine could be found in various areas in the home, but it is most convenient to have them located together.

These fourteen centers seem to be the major ones in most kitchens, although there could be others. Depending on the family's needs, some centers may be added and others deleted. For instance, some women would find a sewing center useless to their family and would omit it. A half bath, near the kitchen, might be desirable in other cases.

The last, major chapter deals with the needs of my family and the way I intend to apply the principles outlined in this paper. It is mainly drawings of the storage my family will need for the equipment we now possess, and that we hope to own in the future.
CHAPTER II
GENERAL BACKGROUND

One author stated that "a kitchen should be planned for you and your family first of all and not for the equipment." (43, p. 22) While another says, "A kitchen today is a place where food is stored and meals assembled." (22, p. 55) This shows that different people have different values and each family must decide what they value most in a kitchen. For example, a family who values beauty would have a totally different outlook on a kitchen they were planning, than a family that placed more value on convenience.

Therefore, to achieve a perfect kitchen, you must know yourself and your working habits. (7, p. 5)

There seem to be nine basic patterns for a kitchen, each governed by the designer's values and preferences. These are:

1. Family-room in a house with plenty of space.
2. Open kitchens in a home with limited space.
3. Indoor-outdoor kitchens for those who have taken to this way of life.
4. Pre-school kitchens, with teenage variations, for families with small children.
5. Gourmet's kitchens for the growing cult of practicing epicures.
6. Good housekeeper's kitchens for the modern home executives who manage their households on an efficient, business basis.
7. Two-cook kitchens for the couples who enjoy cooking together.
8. Cooking machines for the women who hate to cook and need kitchens geared to make quick work of a difficult job.
9. Lay-help kitchens for the many families who depend on the service of a part-time worker. (43, p. 26)

When planning a kitchen, the family needs to decide which pattern, or combination of patterns, fits into their way of living. This will
greatly influence the kitchen furnishings. A gourmet's kitchen would need two ovens, lots of spices, and probably, open cabinets of equipment. Yet, a good housekeeper would want the equipment behind closed doors and to be able to perform more than just the task of cooking in her kitchen.

If a person is planning to build or remodel his kitchen, he must decide which factors are important to him.

One basic procedure for deciding how to use time, energy, purchasing power, abilities, and material goods, includes the following steps:

1. Define the end, goal, value or standard sought.
2. Determine or discover different existing ways this end can be obtained.
3. Evaluate costs of alternative ways in time, energy, money and other resources and of the quantity and quality of the output resulting.
4. Select the alternative filling most economically the resources on hand and the satisfactions desired.
5. Study and, when possible, improve the procedure selected from the alternative considered.
6. Standardize the selected procedure and use it whenever the task is done, exercising care to avoid waste by unnecessarily exceeding the standards defined in Step 1. (12, p. 5)

The first step in this procedure has been discussed, already.

Next, some of the alternatives in kitchen planning need to be discovered so a family can evaluate them in terms of their resources.

One limiting factor in kitchen planning is the space available and the location of the space. It is most desirable to have a kitchen located close to the garage (for bringing in groceries), near the front door (so that it can be easily answered), and near the play yard and outdoor living area. (43, pp. 178-80) It is also important to have it located near the dining area, for obvious reasons.

Not only does the placement of the kitchen in the home affect the plans, but they are also influenced by the location of the home.
A farm homemaker must keep in mind the following:

1. The kitchen door is used most often and has heavy traffic.
2. A place is needed to put coats, and to wash up.
3. Three, hearty meals are served each day, sometimes to large numbers.
4. There needs to be room for canning and freezing.
5. More storage space is needed to save long drives into town. (25, p. 182)

Another point to consider with location, is the local codes on wiring and plumbing. These will influence the plans, as will the cost of wiring and plumbing. If the kitchen, bath and laundry are located in three distant areas of the house, plumbing costs increase. Similarly, wiring cost can be reduced by concentrating all the appliances requiring 220 Volts.

The size of the kitchen and the placement of doors affect the shape of the counters and equipment. The four basic shapes are the "L", "U", one-wall (or strip), and two-wall (or corridor). (See figure 1) Of course there are several variations of each of these, and a doorway may break any of them.

![Figure 1](image)

The more cross traffic in a kitchen, the less efficient it becomes. It is easy to see the problems caused by children as they run through the corridor kitchen. If one door in this kitchen didn't exist, there would be fewer problems caused by traffic.

All the research indicates that the "U" shaped kitchen is the best in most cases. The unbroken "U" forms a compact dead-end
work center through which household traffic cannot pass." (25, p. 3)

Also, the three major pieces of equipment, sink, range, and refrigerator, are brought close together to save walking time and energy, without making the area crowded. A "U" shaped kitchen only eleven feet wide would give ample room for two women to work in. (25, p. 3)

In one research study, comparing the time needed to prepare a meal in a "U" shaped kitchen, with the time needed in a one-wall kitchen, it was found that "it took thirty-five minutes in the "U" shaped kitchen, to fifty-eight minutes in the strip kitchen." (31, p. 194)

Another study compared the number of steps taken in a one-wall, "L", and "U" arrangement. Using identical meals for four, it took 434 steps in the one-wall kitchen, 236 in the "L", and 212 in the "U". (31, p. 194)

One big goal in kitchen planning is to save the homemaker time and energy. The shape and location of the kitchen affect this, as do the locations of the work centers and storage. A full-time homemaker spends fifty-two to sixty hours a week in homemaking activities. (12, p. 4)

A homemaker who works at a full-time job outside the home spends thirty-one hours in homemaking activities. (12, p. 4) Since so much time and energy is spent in these activities, it is to a homemaker's advantage to plan her kitchen so that tasks can be accomplished with a minimum of time and effort.

Recent studies indicate that it takes less energy to stand than sit, for work requiring arm motions. (31, p. 158) It is also better to stand at most household jobs because they are short in duration and are frequently interrupted. Naturally, it requires more energy to get up and down from a seat than it would to stand for a short period.

Another fact that should be utilized in kitchen planning is that
"...bending required more energy than reaching and less energy was used when the working surface was the correct height for the worker." (21, p. 155)

Therefore, wall cabinets are easier for the homemaker to use and should not be eliminated by island storage. Also, counter surfaces should be made to fit her needs, not some imaginary "average" person's needs.

Location of storage units is further influenced by the length of a homemaker's arms. For a person to find his work arc (total area he can comfortably cover with his arm-reach) he needs to stand in one place and raise his left forearm from one side to the other. This is repeated with the right arm. The area covered is his normal work arc.

By extending the whole arm in the above mentioned motions, a person can find his maximum work arc. (22, pp. 14-5) This knowledge can be utilized in many ways. If a housewife thinks about where she'll stand when mixing food, she can locate the equipment used in this operation where it will be most accessible. If pieces used most often in mixing are stored at the intersection of both normal work arcs, they will be easiest to reach. The things used less often can be stored in her easy reach arc for either the right or left hand. Equipment used only occasionally, such as Christmas cookie cutters, should be stored in the maximum work arc. Storage which is above the maximum reach should not be used.

The flow of work for a right-handed person is from right to left, and the opposite for a left-handed person. (22, p. 57) This information can be used in the placement of the sink and dishwasher. A counter is needed first, to stack dishes, then a sink for rinsing. Next comes the dishwasher, and lastly, a cabinet for storing dishes.
sequence should proceed from right to left. The same arrangement should be used in locating areas for mixing, cooking and food preservation.

A person needs to use the correct work flow to set up work centers and, ultimately, storage. These work centers are: the refrigerator, with its counter and cabinet space, the mix center, the sink center, the cooking center, and the serving center. These centers work best in the order they are listed, and from right to left (for a right-handed person). If an oven, or baking center, is desired, it should be at the left of the serving center. (31, p. 199)

Within the work center complex, can be inscribed a work triangle. (see figure 3, page 38) This triangle connects the three major appliances, the sink, range, and refrigerator. Since more trips are made between the sink and range, (31, p. 195) it is desirable to have this distance as the shortest side of the triangle. The total distance of the work triangle should be no less than twelve feet, and no more than twenty-six feet. (19, p. 17) The recommended distances between the center front of each appliance are as follows:

- sink to refrigerator: four to nine feet
- sink to range: four to eight feet
- refrigerator to range: four to eleven feet (19, p. 17)

Other distances which are often traveled are from the sink to dish storage, and from the dish storage to the dining table. (31, p. 195) Of all the centers, the sink is used most, range second most and the mix center, third. The refrigerator, china and dining areas rank equally with one another. (31, p. 196)

It is best if the work triangle is not broken by traffic. Two doors into a kitchen are the maximum, and the traffic lane they cause should be at least three feet wide. (19, p. 17)

Most of the studies which have been conducted in the area of kitchen
planning have dealt with storage and assembly. As a result of these, many things have happened in the kitchen during the last forty years. People used to have a room where the ice box was kept, another to store home canned goods, and still another for cooking. When the refrigerator came along, it was put in the same spot that the ice box had occupied. Finally, people got the idea to put the appliances together with counters between them. The only problem was, there was no standard height for cabinets, sinks, stoves, etc. Today, cabinets and appliances are made for the height of an average size woman (five feet, four inches tall).

For this average woman, the counter height should be thirty-six inches, except for the mix center, which should be thirty-two inches. The mix center is lower because of the downward pressure a woman uses when she rolls dough or kneads bread. A kitchen table could be used for these jobs if desired. An alternative to this would be to install a thirty-two inch high cabinet, or a thirty-six inch cabinet with a pull out shelf at the proper height.

In order to have an adequate amount of storage and work space for an average size kitchen, the following figures are recommended for counter length:

- 36" to the right of the sink
- 20" to the left of the sink (this is not necessary if there is a dishwasher)
- 15" beside the refrigerator
- 34" beside the range
- 36" for mixing  

(23, p. 12)

These counters can fulfill more than one function. For example, if the refrigerator is located next to the mixing area, thirty-six inches of counter space would suffice for both centers (since this would make fifteen inches beside the refrigerator and thirty-six
inches for mixing). This overlapping of areas should not reduce base

cabinets to less than eight linear feet in order to have adequate

storage. This includes dish storage for four people. (11, p. 59)

Under each cabinet should be a four inch toe space. This can be

raised or lowered in standard cabinets if it fails to fit a particular

homemaker's needs. (41, p. 3)

The clearance between the base cabinets and the wall cabinets

should be from thirteen inches to sixteen inches. (19, p. 18) For

safety reasons, there should be a clearance of twenty-four inches

above the sink, range, top opening dishwasher and clothes washer. (19, p. 18)

A refrigerator needs a three to twelve inch clearance above it unless

it has a built in exhaust. (19, p. 18)

Base cabinets are usually twenty-four inches deep, wall cabinets
twelve inches deep, and middle cabinets (between the base and wall

cabinets) are a maximum of six inches deep when obtained commercially.

(31, p. 205) For the average woman, the top shelf in the wall cabinets

should be no more than seventy-two inches high. (31, p. 205) Any

space above seven feet is considered seasonal storage, since it would

take a ladder to reach it.

When purchasing cabinets, these are some desirable features to look

for:

1. Drawer stops (to keep drawers from being inadvertently

   pulled completely out)
2. Adjustable shelves
3. Magnetic or friction catches (22, p. 73)
4. Rounded corners on peninsula counters (for safety) (6, p. 93)
5. Overhead doors, at least one and one-half feet wide,
   which slide (so that your head won't hit them when they
   are open) (25, p. 209)

In "L" and "U" shaped kitchens there are corners which present

special storage problems. These corners can best be utilized by employing
one of the following suggestions:

1. Corner cabinets are available with a swing-out semi-circular shelf that extends back into the inaccessible area.
2. A lazy susan will make corner cabinet contents more easily reached.
3. A cabinet built on a diagonal base may contain a sink or oven. There are also wall cabinets that fit diagonally into a corner. These cabinets have none of the undesirable characteristics of conventional corner cabinets, but are somewhat wasteful of space.
4. Corner space could be used in an adjoining room by having the cabinet door open into this room instead of the kitchen. This eliminates the inconvenience of a corner cabinet.

Besides offering a variety of options in corner cabinets, manufacturers have designed their straight sections to fit in almost any available space. Ranging in size from twelve inches to forty-eight inches wide, on three inch modules, single cabinets can be connected in any order or arrangement necessary. This flexibility offers the homemaker maximum storage.

The quality of this storage is determined by several factors.

Ray and Sarah Faulkner, interior designers, list five qualifications for good storage:

1. Convenience. Time and energy are conserved if items are stored where they are first used rather than putting all similar items - pots and pans or sharp knives, for example - in one place. Drawers in base cabinets are more convenient than fixed shelves, pull-out shelves are intermediate.
2. Visibility. Storing items (except for such identical articles as tumblers) only one row deep facilitates finding them.
3. Accessibility. Logic indicates putting the most frequently used items at the most convenient height, heavy objects below, and those seldom used, above.
4. Flexibility. Adjustable shelves and drawers with removable dividers adapt to changes in needs of families and to the design of kitchen tools.
5. Maintenance. Open shelves are efficient for items used daily, but enclosed storage for those used less often reduces cleaning. (11, p. 56)

To have functional storage, items should be stored where they are used first. Also, things that are used for the same job should
be stored together. (22, p. 79) This might necessitate buying
duplicates of some small items such as measuring cups, wooden spoons,
rubber scrapers, etc.

Since heavy, frequently used items should be stored at or near

counter level, the following are a few suggestions for their storage:

1. Have drawers or pull out shelves in the base cabinets.
2. Store the most frequently used items at the front of the

shelves.
3. For a heavy mixer, a commercial shelf is made which

pulls out and then up, to counter level. This is designed

to require less effort than lifting the mixer alone.
4. Small middle cabinets at the back of the counter, equipped

with sliding or pull up doors, will enclose portable

appliances and still make them readily available.

These middle cabinets can extend into the wall or even

into the next room, if convenient. This arrangement

would take up less counter space. (see figure 2)

![Figure 2](attachment:figure2.png)

FIGURE 2

Some other points to consider when planning storage are:

1. There can be too much storage space.
2. Not all space below a counter should be enclosed. Leave

openings for a wastebasket, stool, dish, etc.
3. The sink does not have to be under a window - especially

if the kitchen has a dishwasher.
4. The top of the cabinets do not have to be boxed into the

ceiling. This eliminates dust, but adds construction costs.

Sliding or pull down doors could be used here for seasonal

storage (such as Christmas decorations).
5. Open shelves for storage, or hanging utensils on the wall is

quite acceptable. (48, pp. 17-20)
6. Store dishwashing supplies above the sink instead of below

it. Middle cabinets are especially nice for this.
7. Have a trash chute or bin for non-grindable refuse.
8. Make sure your storage requires no turning, pulling or heavy

lifting. (32, p. 99)

The University of Illinois Small Homes Council has made several
studies on how to get the best storage in a small home. These are
their recommendations for storage in a liberal and medium size kitchen:

<table>
<thead>
<tr>
<th>Serve</th>
<th>Range</th>
<th>Sink</th>
<th>Mix</th>
<th>Total</th>
<th>Dinnerware for</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIBERAL</td>
<td>(4-6 members)</td>
<td></td>
<td></td>
<td></td>
<td>4 &amp; 8 12 members, add</td>
</tr>
<tr>
<td>wall 27&quot; 21&quot; 15&quot; 30&quot; 7'9&quot; 2' 3' 4' 6'</td>
<td>base 30&quot; 15&quot; 78&quot; 36&quot; 13'6&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEDIUM</td>
<td>(2-4 members)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wall 21&quot; 15&quot; 15&quot; 24&quot; 6'3&quot; 2' 3' 4' 6'</td>
<td>base 24&quot; 15&quot; 60&quot; 33&quot; 11'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The very minimum of base cabinet frontage is eight feet. (19, p. 23)

When figuring the amount of base cabinet that can be included in
this, only the exposed frontage of corner cabinets can be counted.
(23, p. 11) No more than two feet six inches can be counted under the
sink regardless of the sink size.

For the wall cabinets, those located over the refrigerator and
range cannot be counted in the total, because they are nearly
inaccessible. (23, p. 11)

Older, existing cabinets can be renovated to employ some of the
same advantages commonly found in well planned, new work centers.

For nonadjustable shelves spaced too far apart, build or buy these:

1. Step shelves for spices and other small containers, so
   that each row is higher than the one before and can be
   easily seen.
2. Half shelves which fit between two poorly spaced shelves
   and yet are only half as wide. Using a half shelf increases
   both visibility and accessibility.
3. Vertical and horizontal files (see figure 5, p. 43) for
   pan lids, platters, muffin tins, etc.
4. Spice racks built on the back of the door.
5. Adjustable shelves between the fixed shelves. (20, pp. 5-10)

For shelves which are too deep, build or buy these:

1. Pull out or slide out shelves.
2. Vertical files.
3. Lazy susan. (20, pp. 7, 10, and 12)
For drawers that are too deep, build or buy:

2. Vertical files, for baking pans, etc.  

For under the sink, one could build or buy:

1. Stackable vegetable bins.
2. Slide towel racks.
3. Trash container.
4. Door racks for paper bags or cleaning supplies.  

Extra storage can be made by the following means:

1. Pegboard
2. Magnetic utensil holders
3. Suction cup or threaded hooks
4. Cutlery trays
5. Dividers for knives or silver  

When planning a new kitchen, many of the above mentioned features can be found built in. They should be specifically planned for in certain work centers. The next section of this paper deals with each center's equipment and storage requirements.
CHAPTER III
KITCHEN CENTERS

The best way a person can determine where to store articles, is to make a list of all the kitchen equipment, and then decide in which center each item would be used first. This, then, is where it should be stored. The five main centers are broken down here, including ideas on what should be stored in them and ways things may be stored.

REFRIGERATOR CENTER

This center may be located in one of two spots in the kitchen. It may come first in the work sequence, so that it is near the sink, mix area, and outside entrance. This will save time in putting groceries away, making salads and mixing foods that require ingredients from the refrigerator. The refrigerator may also be located last in the work sequence. This will place it near the serving and dining areas. (11, p. 7)

All refrigerators can be ordered with the door hinged on either side. In this way, a right or left handed homemaker may purchase a model that fits her needs. The homemaker should be sure that the door opens beside a counter so that she is not continually walking around the door to put things away.

The counter on the latched side of the refrigerator should be one and one-half feet wide. (11, p. 7) At least sixteen inches of this
should occur before the counter turns a corner. (19, p. 20) This will aid in getting into the refrigerator. If the refrigerator and freezer centers are beside one another, the counter can serve both centers.

The refrigerator, itself, needs to be a certain size to meet the family's storage needs. A family of two, that eats three meals per day at home, would need six cubic feet of storage capacity. For every two people added to the family, add one cubic foot of refrigerator space. (25, p. 196)

A refrigerator operates most efficiently if it is placed away from windows, radiators and ranges. (14, p. 19) The circulation system of the appliance should be investigated before planning, in order to have enough open space around the refrigerator. Some require circulation of air to remove heat from the condenser.

Since lunch packing requires various items from the refrigerator, it is nice to make a sandwich center a part of the refrigerator center. This would include various papers to wrap sandwiches, bread board, plastic containers, lunch boxes, and foodstuffs such as peanut butter and bread.

Part of the refrigerator center should store storage containers, serving dishes for cold foods, bottle openers, trays, empty bottles, ice cream scoop, scissors, scrapers, pitchers, glasses, knives and the salad supplies.

The space above the refrigerator can be used for such seasonal supplies as picnic gear. This will place it close to the drinks and sandwiches. Vertical files can also be installed in this area for storage of trays.

A pull out cutting board is convenient to make sandwiches on. If the
bread board is located in this center, the toaster should be also. It can be located on a pull out shelf in the base cabinet or on an arrangement in the middle cabinet (see figure II, p. 12).

There are several ways paper supplies may be stored. There are cabinets available which are about six inches wide and pull out of the wall. All of the paper rolls are located on spindles inside the cabinet. (3, p. 41) Paper dispensers may be purchased and placed at the back of the counter or mounted on the back of base cabinet doors.

Pockets of various sizes may be made to store sacks or cloths in. These pockets may be made of wood (20, p. 6) or from cloth. Of course, drawers with adjustable plastic or wooden dividers are best for the small tools, such as bottle openers.

MIX CENTER

This center supports any activities in which foods are combined. Thirty-six inches of counter space is needed for these activities, but forty-two inches is more desirable. (41, p. 4)

To determine the correct counter height for an individual using this center, a person should stand erect, drop his shoulders, and then bend the elbow. The measurement from the elbow to the floor, minus six inches, is the proper height for the counter in this area.

Since it is advisable to have the counter lower in this center, it is nice to have it connect with the planning center, which is also low.

It is advisable to have a place to sit in the mix area. A pull out table is one way to accommodate seated work. The table is best if it is twenty-six inches from the floor. (41, p. 3)
Another way to obtain sitting space is to leave a counter open underneath and keep a stool in the knee hole thus created. The waste basket could also be located in this spot. One advantage to having an open counter like this next to a corner, is better use of corner space. A door may open under the counter into the corner cabinet. Although it would not be convenient, it would be useful to store seasonal equipment such as a pan to roast a turkey in, or a picnic basket.

The counter top in this center should be washable and smooth. Two materials, besides plastic, that may be used here are wood and marble. Wood makes a good chopping surface, but mars easily. Marble is excellent for working with pastry and is quite durable.

It is nice to have folding doors which open to expose all of the wall cabinets in this area at once. (11, p. 62) This saves a lot of time and energy which would ordinarily be spent in opening and closing cabinet doors. This could also allow the small electrical appliances needed in this area to be on the counter and yet out of sight when the door is closed.

Many arrangements can be made for the small electrical appliances stored in this area. The nearer they are to the counter, the easier it is for the homemaker. It is possible to get a base cabinet which has a shelf that pulls out and then up for a heavy mixer. This will bring the mixer to the counter level without much trouble. One other arrangement for electrical appliances is to make a corner cupboard between the base and wall cabinets.

Some electrical appliances which should be stored in this center are: the blender, carving knife, coffee grinder, can opener, drink mixer, food slicer, ice cream freezer, ice crusher, mixer and knife
sharpener. To make movement of some of these easier, install wheels on the bottom. (18, p. 2)

It is a good idea to have bins for flour and sugar under the wall cabinets in this area, instead of losing counter space to canisters. A bin that holds forty pounds of flour above a sifter, and feeds into a smaller bin, is very useful. (41, p. 4) However, this would take up some of the wall cabinets in the mix area. Other bins could be provided for meals and other kinds of sugar.

It is desirable to have vertical files in the top shelf of the wall cabinets for cake pans, muffin tins and all the other shallow baking pans. The lower shelf can store casseroles and mixing bowls which should be stored singly, instead of stacked. If a large flour bin is installed, molds and a tube pan can be stored in vertical files above it, since they aren't used often.

The backs of the doors in the mix area can serve various functions. A rack may be built to hold a cook book so the recipe is at eye level. A clip may also be fastened to the door to hold recipe cards. If there is no planning area, the mix center is a good area to store cook books. Another use for the back of the door is spice storage.

There are several ways spices can be stored. One way is in a small cabinet with sliding doors built between the base and wall cabinets. (43, p. 35) They may also be stored in a rack suspended under the counter, much like a towel rack might be. (43, p. 28-9) A board with holes made to fit the spice containers can be located on top of the splash board. (43, p. 28)

Most of the base cabinets should be equipped with drawers. The drawers may contain vertical files for baking pans, if they are deep
enough and pull out far enough for easy removal of the equipment. Several small drawers should be located within easy reach of the counter level for small utensils such as measuring spoons. A person should not have to stoop in order to use these drawers. Any shelves in the base cabinets should slide out like drawers.

Some equipment and supplies which should be stored in the mix center include: flours, meals, sugars, dry milk, mixes, baking powder, soda, chocolate, flavorings, egg beater, wooden spoons, sauce pans, top half of a double boiler (the bottom half goes in the sink center), casseroles, bowls, measuring equipment, sifter, rolling pin, pastry cloth, baking pans, molds, choppers, grater, knives, rubber scrapers and paper towels.

**SINK CENTER**

Dishwashing and preparation of food requiring water occur at this site. There are two electrical appliances which belong here: the dishwasher and the garbage disposal. These are not absolutely necessary, but they are quite a convenience. A three foot counter is needed on the right of the sink in order to stack and rinse dishes. If a dishwasher is present, no specific size counter is needed on the left of the sink. Without a dishwasher, a two and one-half foot counter is necessary. (23, p. 12)

To facilitate loading for a right-handed person, it is best to place the dishwasher to the left of the sink. This order will require fewer arm motions and steps to load or unload the machine. (22, p. 121) Therefore, the sequence in this center for dish washing (for a right-handed person) is from right to left: scraping and rinsing, garbage
disp·)sal, washing and putting clean dishes away.

If no garbage disposal is present, old newspaper could be stored at this center for waste. Garbage could also be placed directly in a trash can or chute.

An adjustable chair may be located at the sink center to help reduce fatigue while scraping dishes. Knee space would need to be provided and the arrangement in figure 12 page 53 would be very acceptable. (18, p. 5) A chute to the right of the person, or a garbage disposal, would be necessary in order to save energy.

There are many good ideas for placement of the trash basket kept in this area. It can be located in a rack on the door of the base cabinet under the sink (2, p. 8), or it can be on a pull out shelf under the sink. (26, p. 75) This type of shelf may either be pulled out by hand, or attached to the door of the cabinet so that it comes out as the door opens. If a garbage disposal is installed, it will take up the remainder of the space under the sink.

When purchasing a garbage disposal, it is best to get one which is insulated and has a rubber cushion mounting. (7, p. 22) This will cause less vibration and make the disposal operate quieter. Before purchasing the unit, the plumbing regulations in a community must be checked. Some cities will not allow garbage disposals, since their sewage system cannot accommodate this additional waste.

After dishes are rinsed, they must be washed. For the safety of children, dish soaps should be stored out of their reach. It is best if the cabinet they are stored in can be locked. For the person washing dishes, it is more convenient if the cleaning supplies are stored at counter level. A middle cabinet can be located behind
the sink with sliding doors. It should be built large enough to contain the homemaker's favorite size of cleaning agent. Another idea is to build a pull out rack to keep the cleaning supplies under the sink. (45, p. VI) No matter what type of storage is decided upon, it should be well ventilated because of wet scouring pads, etc.

If there is no dishwasher in the kitchen, it is best to have a sink five inches deep for washing dishes, and eight inches deep for draining them. (41, p. 8) This type of sink is available commercially. It is wise to buy a dish drainer which fits in the left side and will rest on the rim of the sink. One side should have enough space left so that liquids may be poured down beside it without contaminating the dishes. (41, p. 8) With a drainer that fits over the sink, all the dishes may be rinsed at once and a hotter water temperature may be used. This is because the homemaker doesn't have to be touched by the rinse water.

If a dishwasher is used, a single sink will be adequate. (11, p. 53) A dishwasher with a pre-rinse cycle will save considerable time in scraping. Of course bones and large food particles will need removing. (7, p. 15)

There are two major types of dishwashers. A portable could be stored in any part of the home and rolled to the table to receive the dishes. Then it can be rolled to the sink and connected to the faucet. This will prohibit use of the sink while the dishwasher is operating. It does, however, offer the advantage of being less expensive than the built-in model.

The built-in dishwasher usually requires a space twenty-four inches wide. (22, p. 120) It seems best to have it open from the front
so that counter space is not lost.

Regardless of whether dishes are washed by man or machine, there still will be wet dish cloths and towels from wiping counters and washing equipment that cannot be placed in the dishwasher. A sliding, pull out rack located next to the dishwasher or oven is perfect for these. The heat from the appliances will help dry the towels. (22, p. 8)

This pull out rack may be purchased and installed in a six inch cabinet especially built for the rack. An alternative to this would be to install the rack under the counter. Of course a regular towel rack can be attached to the back of a cabinet door, or to the wall, and serve the same purpose.

A drawer should be near the sink for storing dish towels, cloths and aprons. It would also be helpful to store a few rags near the sink for cleaning up spills.

Dish storage should be to the left of the sink and dishwasher, for a right-handed person. It should also be convenient to the table. This can be accomplished by having wall cabinets that can be opened in both the kitchen and an adjoining dining area. If the dishes cannot be reached in the dining room from the kitchen cabinet, there should be a place to set them when they are taken from the cabinet. A pull out shelf will serve this purpose.

When storing the dishes, it is most important to consider their accessibility and the elimination of breakage. Varying the depth of dish shelves will help meet both of these needs.

Some people like to place their dishes on open shelves. This creates problems with dust. Installing glass doors would be a wiser choice for displaying dishes. If open shelves are decided
upon, one inch of safety space should be allowed between the stored items and the shelf edge. (43, p. 38)

Dishes that are the same kind and size may be stacked. This will make setting the table easier and take less cabinet space. Odd sized dishes can be stored in vertical or horizontal files. They may even be stored in a drawer that has slanting vertical files. (43, p. 39)

Cups should never be stacked. They can either be stored one deep on half shelves, hung from hooks, or placed on a special rack that slides out of the cabinet.

Glasses should not be stored in any type of deep storage. They can either be divided and placed on the front six inches of two shelves or on a half shelf against the back wall of a cabinet, with flat dinnerware stored below. (43, p. 39) One to two inches is all that is necessary above glasses before another shelf begins. (43, p. 38)

One other idea for storing glasses is to recess shelves between the wall studs. These shelves would be four inches wide; quite adequate for glasses.

Silverware should be stored in a shallow drawer. Wooden blocks with grooves will hold the various pieces in place. (43, p. 37)

Plastic dividers can also be purchased for this purpose, or wooden dividers can be made. The chest for good silverware can be placed on a rollout shelf with stops.

Besides the care and storage of dishes, the sink center is used for all food preparation requiring water. Many fruits and vegetables need water in their preparation. It is convenient to store potatoes, onions and other fruits and vegetables, that do not require refrigeration, at the sink. These may be stored in pull out bins of plastic or metal.
The bin and the cabinet door should both be well ventilated. (48, p. 73)

The bins may be located in a base or middle cabinet. It is especially good to have a built-in middle bin to store twenty pounds of potatoes on the right of the sink and one which will hold ten pounds of onions to the far right. Two more bins may be located to the left, in order to store other fruits and vegetables. (41, p. 7)

Since fruits and vegetables will be washed and cleaned at the sink, it is advisable to locate a seat here. An open counter with knee space can be placed to the right of the sink. If this counter has a hole for discarding peelings in it, a chute could take them to a waste can outside of the home. (41, p. 7)

Knives should be stored in this area, also. They can be kept in separate slots in a block fastened to the counter. (25, p. 184)

They could also be stored in a very shallow drawer containing a slotted wooden block across the center. Children's safety should be kept in mind while making the decision on how to store knives.

Some of the other items that should be stored at the sink are:

- cutting board
- sauce pans
- brushes
- dish drainer
- pressure cooker
- dish cloths
- soaps
- salad sup lies
- funnel
- waste basket
- coffee pot
- dishes
- paper towels
- teapot
- colander
- canning jars
- kettle
- strainer
- knives
- bottom of double boiler
- scrap

All the foodstuffs requiring water for their preparation, such as dry beans, should also be stored here.

One decorative touch for the sink center is a planter of fresh herbs to use as garnishes and seasoning. An eighteen inch, single tube, fluorescent light will be adequate to keep this garden growing.
RANGE CENTER

The range center can be one area with a complete stove, or it can be broken into two centers, the range and oven. Travel is increased sixteen per cent in a kitchen with a divided stove. (31, p. 199) Also, a separate oven and surface unit takes up space which could otherwise be used for a counter. (14, p. 8) A separate oven does offer greater comfort, safety and convenience, since the height of the oven is better suited to the homemaker. (14, p. 8)

The range is best located between the sink and serve center. A separate oven has several alternatives for its placement. The best locations for a separate oven are...

opposite the sink and mix centers, at the extreme end of the kitchen sequence next to the serve center, as a part of any center that is isolated from the other centers or in a corner between any two centers. (22, p. 63)

If the oven is not located in one of these areas, it will interrupt the work flow.

To determine the height of a separate oven for a particular homemaker, use the following formula:

A. Measure the distance between the floor and her elbow
B. Measure the distance between her elbow and the top surface of the opened oven door (three to five inches preferred)
C. Measure the distance between the surface of the open oven door and the bottom of the oven unit.
D. Add B and C, and subtract this sum from A to determine the distance from the floor to build the oven support. (14, p. 8)

Both the range and oven need a heat resistant counter surface beside them that is two feet wide. (11, p. 58) A laminated plastic counter will not withstand the high temperatures which pans from these units will retain. Therefore, a stainless steel, Pyroceram, or other such material will be needed in this area.

26
The wall cabinets in the range area would best be used for small cooking utensils and seasonings. The exhaust duct will take up a major portion of the space above the range, and this should be considered in planning the storage. Pan lids are convenient if they are stored in vertical files over the range.

Shelves above the stove could contain bins for rice, oatmeal, spaghetti, and other staples that are cooked in boiling water. Others, such as sugar, flour, cocoa, and salt, should be located here, too.

There are several ways that spices used at this center may be stored. A rack may be constructed along the back splash panel behind the range, or a strip of two inch wide, 20 gauge stainless steel, with the edges bent and fastened to the wall, will work nicely. (17, p. 100) There is room in front of the exhaust duct in the wall cabinet for shallow storage of spices. (17, p. 100) There would have to be some way to protect the spices from heat if they are stored this close to the stove, since spices should be stored away from heat, light, and moisture. (43, p. 22) They might also be stored on a half shelf, step shelves or a turntable.

Base cabinets in the range area are used to store heavy cooking utensils. It is easiest to store these on pull out shelves or in drawers. Another arrangement for pots is to hang them on the wall. This way they are easy to see and reach.

One other way to store pans is to have a pull out base cabinet divided in the center with peg board. Then, the pans are hung on both sides of the peg board, along with the utensils used at the range. (13, p. 104)
There are several small electrical appliances which can be located at the cooking center. They include:

- broiler
- corn popper
- coffee maker
- dutch oven
- fryer
- baker
- bean pot
- fry pan
- griddle
- hot dog cooker
- kettle
- party grill
- pressure cooker
- roaster
- rotisserie
- sandwich grill
- saucepan
- steam cooker
- toaster
- toaster - oven combination
- waffle baker

Nonelectrical equipment and supplies stored at the range might include:

- cutting board
- measuring equipment
- pot holders
- skillets
- saucepans
- stirring spoons
- testing implements
- ladle
- turner
- cooling racks
- canned vegetables
- griddle
- foods prepared with boiling water
- dutch oven
- pressure oven
- tongs
- shears
- shears
- foods prepared with
- boiling water

SERVING CENTER

This is the end of the assembly line in an efficient kitchen. Things are taken from the stove and placed in serving bowls or on platters which are stored in this area. A table that folds into the wall or a breakfast bar may also be located in this area for family meals.

Since foods are garnished in this area, it is nice to store those supplies here. Table condiments that are not refrigerated are located here, too.

A tea cart may be in this center so that the food can be easily moved to the table. Some carts even have fronts which match the base cabinets, and look like a cabinet until they are pulled out for use.

If a cart is not available, trays (stored in vertical files) will save trips for the homemaker.
This is a good center to keep table linens in. Twelve, shallow, open front drawers are ideal for linens because they eliminate stacking. (3, p. 22) Napkins, place mats, and table cloths can easily be stored here.

Some of the small electrical appliances that would be stored in the serving center are:

- baby food warmer
- bottle warmer
- bun warmer
- food warming tray
- plate warmer
- tureen or casserole (22, p. 104)

In the next chapter, several centers which may be located in the kitchen or near it will be briefly discussed. These are the centers that not every work core might include, depending on the needs of the family.
CHAPTER IV
OTHER CENTERS IN A WORK CORE

The centers discussed in this chapter are those that add the finishing touches to a well planned kitchen. Some may not even be considered centers, depending on the needs and views of the kitchen planner. They certainly are not as vitally necessary to a properly functioning work core as those centers previously discussed, but nonetheless, are very important to certain types of families.

PLANNING CENTER

Today the homemaker has increasingly become a manager instead of a laborer. Therefore, the lady of the house has discovered that she needs an organized desk to efficiently carry out her functions.

A planning desk can be as simple as a wide shelf with book shelves above, or as elaborate as an office desk, complete with typewriter and adding machine.

This desk is the best place to store cook books and to plan meals. A blackboard or corkboard could be near here to put messages on. A bulletin board with seven pockets, one for each day of the week, can also be constructed. Then, messages can be placed in the appropriate pocket. (34, p. 61)

The desk is a good place to store instruction manuals for appliances and clothing, so that proper care can be taken of these articles. Receipts of all kinds could be located here, as well as tax records.
Drawers or files should be provided for bills, health records, important letters, trading stamps, etc.

This is the place to put the telephone. The person using the phone could be seated and would have a pencil handy. The chalk or bulletin board would facilitate leaving telephone messages for others in the family.

This desk may be purchased to match the cabinets in the kitchen. Or, it may fold up into the wall, so that it takes up less space in a small room.

PANTRY CENTER

A pantry center is a storage wall or closet for packaged foods. The use of this center might eliminate storage at the place of first use and add to the number of trips necessary for preparing a meal. (31, p. 199) But it does add to the quantity of food which can be stored, allowing the housewife to take advantage of sale prices.

Narrow shelves (six inches deep) that run from floor to ceiling are excellent for canned goods, if the space is available. Commercial cabinets are built which have several doors in front of other doors. These all swing out, making quite a bit of storage available in a small space. (See figure 9, p. 50) There is another type of storage wall with shelves that slant downward in front. It has doors both front and back, one set opening into the kitchen, the other into the garage. It is loaded from the garage, and the cans roll down to the front of the shelf. Then they can be unloaded from the kitchen when needed. (43, p. 22)

Several other plans for storage walls are available. They include
chest type is that the homemaker must reach down into it and move the top layers of food in order to find what she wants.

To get the most efficient storage from a freezer, a list should be kept of the food stored in the freezer and when it was placed one for a corner arrangement (43, p. 50), a walk in closet, and pull out shelves. (33, p. 50)

A family's shopping habits must determine whether a pantry center is desirable. Large families, or those who make infrequent trips to the grocery, would find a pantry more useful than a family using few canned or dry goods.

FREEZING CENTER

This center may be located in the kitchen, or in another part of the work core. It is best to locate it near a sink so fruits and vegetables can be prepared and placed directly in the freezer. Also, food to be thawed could be laid in the sink.

Since frozen food is usually heavy, it is helpful to have a counter beside the freezer to set the food on. The cabinets with this counter could hold storage containers, freezer paper, tape, etc. If a chest type freezer is purchased, three feet of clearance must be allowed above it before any cabinets begin. (19, p. 29) This will allow opening the lid.

A freezer should not be placed in a room which has a high temperature, but neither should the room temperature be below forty degrees Fahrenheit. The room should not be damp, since this will damage the motor. (27, p. 5)

There are two types of freezers, the upright and the chest type.
or shoe polishing. (16, p. 36) A soap dish is nice to place wet sponges in after they have been used in various operations.

Other equipment which should be stored here includes:

- step ladder or stool
- paper bags
- waxes, polishes, etc.
- sponges
- paper towels
- dustpan
- sweeper attachments
- fly swatter
- tools (hammer, pliers, etc.)
- nails, screws, etc.

LAUNDRY

In a laundry, most right handed people prefer working in a sequence from left to right. (19, p. 27) Therefore, the order of work in this center would begin with soiled clothes, followed by the sink, washer, dryer, and clothes storage.

A laundry chute may empty into the laundry room, or the soiled articles may be brought to the center in a cart. The method selected mainly depends on the location of the laundry room in relation to the bath and bedroom. It is nice to have three or four large baskets for sorting the various types of washer loads. It is best if these baskets slide out and the door of the cabinet is perforated for ventilation. (15, p. 170) Ideally, this would be located near a sink to facilitate spot removal. Ten square feet of counter space is needed for sorting, pretreating and folding clothes. (19, p. 27)

It is best to locate a dryer near a window or an outside wall, so that it can be easily vented. Both the washer and dryer need three feet six inches of open space in front of them to provide adequate working area. The appliance doors should be hinged so that neither door is reached over when unloading the washer contents into...
the dryer.

A wall bracket is handy for hanging either ironed clothing or permanent pressed clothes to keep them from wrinkling. An ironing board may be stored in a narrow cabinet at the end of a wall. A shelf above it will hold the iron and spray starch. (47, p. H-17)

One other feature which some home laundries have, is a drip dry closet. These closets have a shower floor with a drain and a rod to hang the wet clothes from. Some are even equipped with an infrared light to hasten drying. (37, p. 80)

SEWING

There are many compact and elaborate sewing rooms which can be built. Since the iron and ironing board are usually in the laundry room, it seems like a good idea to locate the sewing center near the laundry center.

A table big enough for cutting out sixty inch wool should be planned. This table can pull down from the wall, pull out of the wall, or be hinged on another table.

A peg board can be used to hang small equipment where it can be easily seen. Several small drawers are good for storing thread, snaps, etc. A file drawer is useful for patterns and a bin is good for holding scraps of fabric. (16, p. 37) Shelves equipped with dust proof doors are nice for storing extra fabric. A long mirror is helpful here when fitting garments.

A place should be designated for mending. If the sewing room is near the laundry room, repairs can be made as they are noticed while sorting laundry.
The mud closet could be considered another center in the work core. All work clothes are stored here. It is close to the back door and prevents the family from tracking through the house with muddy boots or a wet umbrella. The children must have low hooks to hang their wraps on so that they can take care of this responsibility themselves. It is desirable to have a plastic shoe bag to store gloves or mittens in, so that parts of a pair are not lost. It is convenient to have a bench in the mud center so that it is easier to remove boots and leggings.

Another small center is the gift wrapping center. Tape, cards, wrapping paper and dispensers of ribbon can be stored here. It is desirable to have it all stored together, with sufficient counter space for working. (16, p. 38)

The flower center should be placed close to a sink and a light source. The laundry area seems to be ideal for raising plants because of the availability of water, and the frequently high humidity. Books on flower arrangement, vases, scissors, clay and other equipment can all be stored together. This will make creating a centerpiece easier and more enjoyable.

The next section contains plans that embody most of the ideas presented in this entire paper. They are intended to illustrate the order and arrangements already explained.
CHAPTER V

STORAGE FLOOR PLANS AND ELEVATIONS

The following is an example of planning a work core using the preceding information. Before each major kitchen center there is a list of the probable equipment used in that area. Compiling such a list makes designing the center easier.

The scale used in the following elevations is: one inch equals one foot; in the floor plans, one inch equals four feet.
## Planning Center

<table>
<thead>
<tr>
<th>Bulkhead Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trays</td>
</tr>
<tr>
<td>Picnic Supplies</td>
</tr>
<tr>
<td>Appliance Booklets</td>
</tr>
<tr>
<td>Clothes Care Instructions</td>
</tr>
<tr>
<td>Recipe Mail Mail Mail Addresses</td>
</tr>
<tr>
<td>Cookbooks</td>
</tr>
<tr>
<td>Radio</td>
</tr>
<tr>
<td>Refrigerator</td>
</tr>
<tr>
<td>Bulletin Board</td>
</tr>
<tr>
<td>Blackboard</td>
</tr>
<tr>
<td>Phone</td>
</tr>
<tr>
<td>Desk Supplies</td>
</tr>
<tr>
<td>Stationery</td>
</tr>
<tr>
<td>Receipts File</td>
</tr>
</tbody>
</table>

**Figure 4**

PLANNING CENTER
EQUIPMENT FOR THE REFRIGERATOR CENTER

Glasses:

6 amber old fashions
6 amber ice tea
5 amber juice
5 amber water
6 amber sherbets
6 amber goblets
6 amber parfaits
8 clear water
8 green water
6 green juice
2 aluminum mugs
1 copper mug
1 amber 2 qt. pitcher
1 green 1 qt. pitcher
1 pyrex juicer
1 Tupperware pitcher (2½ qt.)
1 juice squeezer
2 bottle openers
1 salad bowl (10"
1 pr. vinegar and oil bottles
1 plastic lettuce saver
1 cheese slicer
1 rubber lid opener
1 lunch bucket
1 insulated bottle
1 glass salt and pepper set

3 plastic containers (3"
1 butter dish
1 paper dispenser (5 x 12 x 9)
2 ice cube trays

Needed Equipment for the Refrigerator Center

1 rubber scraper
4 trays
2 2½ qt. plastic pitchers
1 ice cream scoop
4 ice cube trays
1 picnic basket

40
# Equipment for the Mixing Center

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyrex mixing bowls (14&quot;, 12&quot;, 10&quot; and 8&quot;)</td>
<td>6</td>
</tr>
<tr>
<td>Stainless steel mixing bowls (10&quot; - 4&quot;)</td>
<td>6</td>
</tr>
<tr>
<td>Pyrex 1 qt. measuring cup</td>
<td>1</td>
</tr>
<tr>
<td>Pyrex 1 c. measuring cup</td>
<td>1</td>
</tr>
<tr>
<td>Set of metal measuring cups (4)</td>
<td>1</td>
</tr>
<tr>
<td>Set of metal measuring spoons (4)</td>
<td>1</td>
</tr>
<tr>
<td>Flour sifter (4&quot;)</td>
<td>1</td>
</tr>
<tr>
<td>Metal salt shaker</td>
<td>1</td>
</tr>
<tr>
<td>Wooden spoons</td>
<td>3</td>
</tr>
<tr>
<td>Small metal spoon</td>
<td>1</td>
</tr>
<tr>
<td>Pastry blender</td>
<td>1</td>
</tr>
<tr>
<td>Wooden rolling pin</td>
<td>1</td>
</tr>
<tr>
<td>Onion chopper</td>
<td>1</td>
</tr>
<tr>
<td>Egg beater</td>
<td>1</td>
</tr>
<tr>
<td>Rubber scrapers</td>
<td>3</td>
</tr>
<tr>
<td>Metal spatula</td>
<td>1</td>
</tr>
<tr>
<td>Funnel (4&quot;)</td>
<td>1</td>
</tr>
<tr>
<td>Egg slicer</td>
<td>1</td>
</tr>
<tr>
<td>Wooden cutting board</td>
<td>1</td>
</tr>
<tr>
<td>Paring knife</td>
<td>1</td>
</tr>
<tr>
<td>Butcher knife</td>
<td>1</td>
</tr>
<tr>
<td>French knife</td>
<td>1</td>
</tr>
<tr>
<td>Meat tenderizing hammer</td>
<td>1</td>
</tr>
<tr>
<td>Grater</td>
<td>1</td>
</tr>
<tr>
<td>Pr. kitchen shears</td>
<td>1</td>
</tr>
<tr>
<td>Can opener</td>
<td>1</td>
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</table>

**Needed Equipment**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blender</td>
<td>1</td>
</tr>
<tr>
<td>Heavy duty mixer</td>
<td>1</td>
</tr>
<tr>
<td>Round cake pans (8&quot;)</td>
<td>2</td>
</tr>
<tr>
<td>Pie pan (9&quot;)</td>
<td>1</td>
</tr>
<tr>
<td>Top of the double boiler</td>
<td>1</td>
</tr>
<tr>
<td>Portable mixer</td>
<td>1</td>
</tr>
<tr>
<td>Corn popper</td>
<td>1</td>
</tr>
<tr>
<td>Electric can opener</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square cake pan (8&quot;)</td>
<td>1</td>
</tr>
<tr>
<td>Square cake pan (9&quot;)</td>
<td>1</td>
</tr>
<tr>
<td>Ring mold (10&quot;)</td>
<td>1</td>
</tr>
<tr>
<td>Individual molds</td>
<td>8</td>
</tr>
<tr>
<td>Large molds</td>
<td>2</td>
</tr>
</tbody>
</table>
1 small sauce pan
1 spring form pan
2 cookie sheets with sides
4 graters with drilled holes
6 custard cups
1 1½ qt. saucepan
1 peeler
1 case fork
1 small spatula
Staples and Foods which need to be mixed

Lazy Susan

Mixing Equipment

Pitchers

Salad Supplies

Trays

Spices on the back of the door

Bins for Staples

Pull up door for Electrical Appliances

Paper Dispenser

Refrigerator

Corner Lazy Susan for Pots

Cutting Board

Lunch

Mixing tools

Packing Supplies

Pull out Table

Vertical Files for

Baking Pans

FIGURE 5

Toe Space

REFRIGERATOR AND MIX CENTERS
# Equipment at the Sink Center

**Stainless Steel Tableware**
- 6 knives
- 6 teaspoons
- 6 dinner forks
- 6 salad forks
- 6 soup spoons
- 4 ice tea spoons

**Melamine dishes**
- 8 10" dinner plates
- 8 6" plates
- 8 bowls
- 8 saucers
- 8 cups
- 4 salad bowls (6")
- 2 ceramic coffee cups

**Storage containers**
- 1 Pyrex 4 x 7 x 3
- 1 Pyrex 6 x 9 x 3
- 2 Pyrex 4 x 3 x 3
- 3 plastic 5 x 4 x 4
- 4 plastic 4 x 4 x 4
- 1 round plastic (6")
- 1 round plastic (5")
- 9 glass jars
- 2 pyroceram petite pans
- 1 1½ qt. saucepan
- 1 bottom of a double boiler
- 1 waste basket
- 1 dish drainer
- 1 rubber sink mat
- 1 colander (10"")
- 1 potato peeler
- 1 vegetable brush
- 1 sieve
- many aprons, dish cloths, dish towels, and rags

**Needed Equipment at the Sink Center**

**Stainless steel tableware**
- 1 pie server:
- 3 serving spoons
- 1 serving fork
- 1 sugar shell
- 2 place settings (5 pieces)
- 4 ice tea spoons
- 1 butter knife
- 1 rubber scraper
- 1 paper towel dispenser
<table>
<thead>
<tr>
<th>Lazy Susan for Foods requiring water</th>
<th>Window</th>
<th>Storage Containers</th>
<th>Lazy Susan for Foods to be mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onion Bin</td>
<td>Dishwashing Supplies</td>
<td>Potato Bin</td>
<td>Apple Bin</td>
</tr>
<tr>
<td>Silver Chest</td>
<td>Dishwasher</td>
<td>Peeler</td>
<td>Brush</td>
</tr>
<tr>
<td>Linens</td>
<td>Slide out Towel bar</td>
<td>Wastebasket Pulls out as the door</td>
<td></td>
</tr>
<tr>
<td>Corner Cabinet</td>
<td>Paper Towels mounted on the door</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opening into the Dining Room</td>
<td>FIGURE 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SINK CENTER</td>
<td></td>
<td>Lazy Susan for storing pans</td>
<td></td>
</tr>
</tbody>
</table>
EQUIPMENT FOR THE RANGE CENTER

1 1 2/3 qt. saucepan
1 10" skillet
1 10" dutch oven
1 8" pan
1 8" iron skillet
1 4 qt. pressure saucepan
1 2 qt. tea kettle
1 13 x 9 1/2 x 2 pan

Lids:
2 6"
2 10"
1 8"
1 6" casserole
1 7" double boiler
1 10" pressure saucepan
1 1/2 c. syrup ladle
1 1/4 c. butter ladle
1 pr. large salt and pepper shakers
1 pr. tongs
2 soup ladles
3 egg turners
1 large stirring spoon
1 slotted spoon
2 large forks
2 spatulas
2 wooden spoons

1 meat thermometer
1 candy thermometer
1 oven thermometer
1 petite pan handle
9 pot holders
2 wire cooling racks
1 waffle-griddle
1 deep fat fryer

Needed Equipment for Range Center
2 rubber scrapers
1 set metal measuring cups (4)
1 set metal measuring spoons (4)
1 pastry brush
1 pair shears
1 slotted plastic spoon
1 large plastic spoon
1 deep fat frying thermometer
1 1 qt. pyrex measuring cup
1 1 c. pyrex measuring cup
1 cooker canner
1 paper towel dispenser

Lids:
1 6"
1 4"
1 canner lid
EQUIPMENT AT THE SERVE CENTER

<table>
<thead>
<tr>
<th>Serving Dishes</th>
<th>Needed Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 plastic meat platter</td>
<td>3 bread baskets</td>
</tr>
<tr>
<td>2 plastic serving bowls</td>
<td>2 condiment servers</td>
</tr>
<tr>
<td>1 plastic cream and sugar set</td>
<td>1 bread board</td>
</tr>
<tr>
<td>1 plastic salt and pepper set</td>
<td>1 paring knife</td>
</tr>
<tr>
<td>1 pr. of clay salt and pepper shakers</td>
<td>4 trays</td>
</tr>
<tr>
<td>1 china soup tureen</td>
<td></td>
</tr>
<tr>
<td>3 china serving bowls</td>
<td></td>
</tr>
<tr>
<td>1 9&quot; china meat platter</td>
<td></td>
</tr>
<tr>
<td>1 china gravy boat</td>
<td></td>
</tr>
<tr>
<td>1 china sugar and cream set</td>
<td></td>
</tr>
<tr>
<td>1 china salt and pepper set</td>
<td></td>
</tr>
<tr>
<td>1 china butter dish</td>
<td></td>
</tr>
<tr>
<td>1 china 1 qt. teapot</td>
<td></td>
</tr>
</tbody>
</table>

Noritake china

| Noritake china                                     |                         |
| 8 dinner plates (10"")                             |                         |
| 8 salad plates (8"")                               |                         |
| 8 bread and butter plates (6"")                    |                         |
| 8 saucers (6"")                                    |                         |
| 8 cups                                              |                         |
| 8 soup bowls                                        |                         |

Knives

| Knives                                             |                         |
| 1 electric knife                                   |                         |
| 1 bread knife                                       |                         |
| 1 butcher knife                                     |                         |

Toaster
<table>
<thead>
<tr>
<th>Good Dishes</th>
<th>Foods which need to be heated</th>
<th>Vertical Pan Lids</th>
<th>Everyday Dishes</th>
<th>Foods Requiring Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving Dishes</td>
<td>Vertical Files for Everyday Dishes</td>
<td>Exhaust Fan</td>
<td>Lazy Susan</td>
<td>Sugar, salt etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pass Through</th>
<th>Easy to clean Wall</th>
<th>Pass Through</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toaster</td>
<td>Heat resistant Counter</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range Tools</th>
<th>Serving Utensils</th>
<th>Drop in Range</th>
<th>Everyday Silverware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread</td>
<td>Vertical Files for Trays, Bread Board, Cooling Racks</td>
<td>Waffle iron, Deep Fat Fryer on sliding shelves</td>
<td>Pots and Pans on Sliding Shelves</td>
</tr>
<tr>
<td></td>
<td>Waffle iron, Deep Fat Fryer on sliding shelves</td>
<td>Pots and Pans on Sliding Shelves</td>
<td>Pots and Pans</td>
</tr>
</tbody>
</table>

**FIGURE 7**

**RANGE AND SERVE CENTERS**
Every day Dishes

Folding Wooden Doors
Each 3\(\frac{3}{8}\)" and hinged in the middle

Good Dishes

Pass Through

Silver Chest   Everyday Silverware
Linens

FIGURE 8
DIMING AREA
<table>
<thead>
<tr>
<th>Gift Wraps</th>
<th>Ironing Equipment</th>
<th>Pegboard for small sewing equipment</th>
<th>Pull down Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lazy Susan</td>
<td>Pegboard for small sewing equipment</td>
<td>Pull down Table</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shelves inside for fabric and pressing equipment</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 10**

**Sewing Center**

- **Water Softner**
  - Pattern Files
  - Thread
  - Fasteners
  - Tapes
  - Scraps

- **Sewing Machine on Wheels**
  - Knitting
  - Interfacing
  - Mending
  - Embroidery and Hand work
  - Ironing
  - Empty boxes to wrap gifts
  - Ironing
  - Scraps

- **Shower base with drain**

- **Clothes rod**

- **Drip Dry Closet**

- **Space for rack to dry hand washables**

- **Shoe rack**
Lazy Susan for Laundry Supplies

Laundry Supplies

Window

Gift Wrap Supplies

Lazy Susan for Gift Wrap Supplies

Water Heater with work counter

Top loading Washer

Front Loading Dryer

Cart and Sorting Counter

Water Softner accessible from garage

FIGURE 11

LAUNDRY AND GIFT WRAP CENTER
Chest Type Freezer

2 slide out Laundry Baskets

Knee Space for a stool
(Door further back conceals the pipes)

Freezer Supplies
Linens
Rags

FIGURE 12

FREEZER, FLOWER ARRANGING AND LAUNDRY CENTERS
FIGURE 13
MUD CLOSET
54
FIGURE 14

CLEANING CENTER

55
It is evident that the key to building a truly efficient kitchen is planning. Each detail must be thought through carefully and integrated into the entire scheme. A haphazard arrangement of centers, appliances, and even utensils, is certain to cause needless waste of time and energy.

Kitchen plans must not be so shallow as to include only the immediate needs of the family. Space must be available to accommodate anticipated equipment or appliance purchases, no matter how far in the future these may be.

Storage in all areas of the home must be easy to see and reach to be functional. Items stored should be carefully arranged so that each is located where it will be used the most. Placing the frequently used articles within easy reach will save arm motions.

For maximum efficiency, the storage must be planned around its respective work center. Though there can be many centers in a home's work area, there are five that every home has. These are the refrigerator, mix, sink, range, and serve centers. For a right-handed person, these centers should be placed in the above sequence from right to left (for a left-handed person, the order is reversed).

The refrigerator center should include a place to prepare sandwiches, salads, and beverages. It is also a good place to keep storage containers and paper supplies.
The mix center has many small electrical appliances. Places to store and connect these should be provided. All products that must be mixed are kept in this center, as well as the equipment for mixing.

The sink center is where dishes are washed and stored, and fresh fruits and vegetables are prepared. The dishwasher and garbage disposal are the electrical appliances which may be included here. Provisions for dish, trash, linen and vegetable storage should be made at this center. Since this is the most used center in the kitchen, it deserves special consideration.

In the right to left sequence, the range center would be found next. All preparations requiring cooking are made here. Several small cooking appliances may accompany the range at this location. The range itself may be split into two parts, creating an independent oven center. A heat resistant counter should be installed next to the range top and oven.

Last in the sequence is usually the serving center. All serving dishes, table linens, and appliances for keeping food warm are kept here. It is important to have the dining center easily accessible from the serving center.

One minor center which should be located in the kitchen is the planning center. It should include a desk, telephone, cook books, receipts and all other items necessary to manage the family's home. Today the homemaker is more of a manager and organizer than the worker she was several years ago. Therefore, this center is increasing in importance.

The pantry center contains the extra food and supplies. This
center allows the family to take advantage of sales.

The freezing center is best located in a cool, dry and well ventilated area of the home. It is most convenient if a sink is near it, for preparation and thawing of frozen foods. An inventory of foods in the freezer should be posted in a convenient spot.

The laundry center may be located in or near the kitchen so that it can be observed easily while other work is being done, or it might be located near the bath and bedrooms where the majority of clothes are soiled and put away.

The laundry center differs from the others in that a right-handed homemaker usually prefers a sequence from left to right. First a table is needed for sorting, then a sink for stain removal, the washer, the dryer, and finally a table for folding. A cart to transport the clean clothes is very helpful.

Other parts of the work core might include the cleaning, sewing, and closet, gift wrapping and flower arranging centers. These can be easily located in the kitchen and utility rooms, making the entire area more efficient for the homemaker.

By employing these suggestions, a homemaker can get the greatest return on his kitchen investment. Many problems can be avoided by applying the principles outlined in this paper to situations not specifically mentioned. Here, again, careful planning is of the utmost importance.
Bibliography


12. Fitzimmons, Cleo, Eva Goble and Elkin Minter, Easy Notes, Extension Circular # 512, Cooperative Extension Service, Purdue University, Lafayette, Indiana, 1966.


