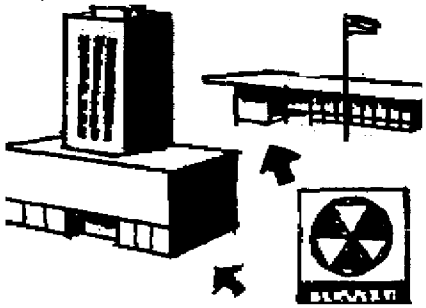
Chapter 3

FALLOUT SHELTERS, PUBLIC AND PRIVATE

After a nuclear attack, fallout particles would drift down on most areas of this country. To protect themselves from the radiation given off by these particles, people in affected areas would have to stay in fallout shelters for 2 or 3 days to as long as 2 weeks. Many people would go to public fallout shelters, while others—through choice or necessity—would take refuge in private or home fallout shelters.

Identifying Public Shelters

Most communities now have public fallout shelters that would protect many of their residents against fallout radiation. Where there are still not enough public shelters to accommodate all citizens, efforts are being made to locate more. In the meantime, local governments plan to make use of the best available shelter.



Most of the existing public shelters are located in larger buildings and are marked with this standard yellow-and-black fallout shelter sign. Other public shelters are in smaller buildings, subways, tunnels, mines and other facilities. These also are marked with shelter signs, or would be marked in a time of emergency.

Learn the Locations of Public Shelters

An attack might come at any hour of the day or night. Therefore you should find out *now* the locations of those public fallout shelters designated by your local government for your use. If no designations have yet been made, learn the locations of public shelters that are nearest to you when you are at home, work, school, or any other place where you spend considerable time.

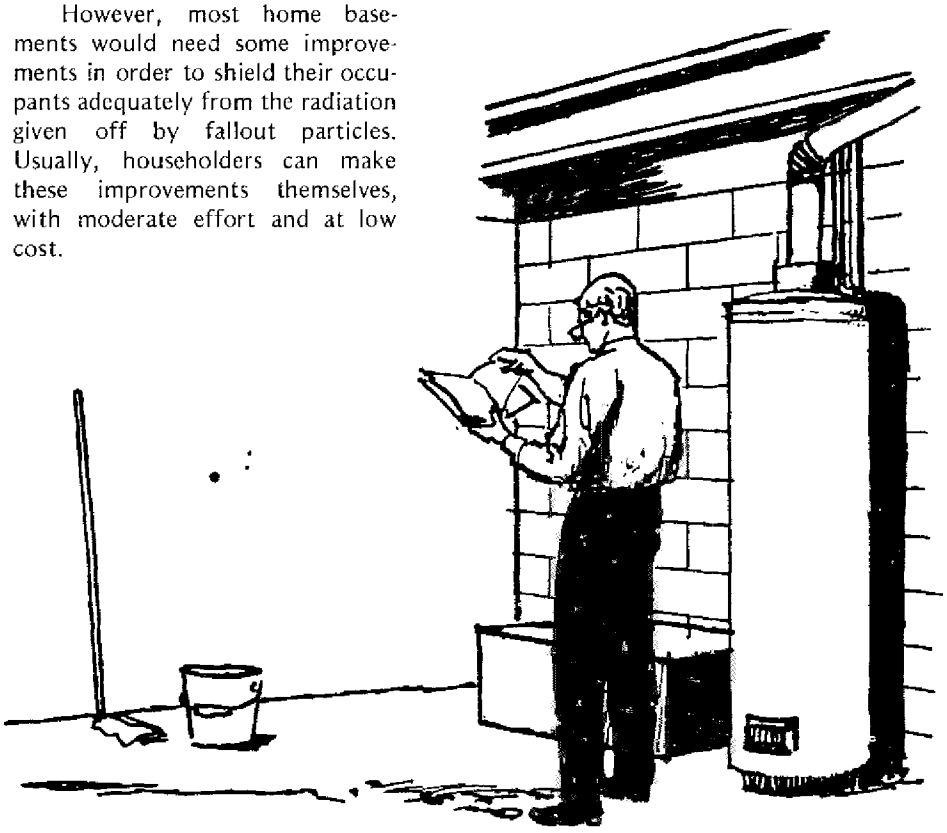
This advice applies to all members of the family. Your children especially should be given clear instructions *now* on where to find a fallout shelter at all times of the day, and told what other actions they should take in case an attack should occur.

A Home Shelter May Save Your Life

Public fallout shelters usually offer some advantages over home shelters. However, in many places—especially suburban and rural areas—there are few public shelters. If there is none near you, a home fallout shelter may save your life.

The basements of some homes are usable as family fallout shelters as they now stand, without any alterations or changes—especially if the house has two or more stories, and its basement is below ground level.

However, most home basements would need some improvements in order to shield their occupants adequately from the radiation given off by fallout particles. Usually, householders can make these improvements themselves, with moderate effort and at low cost.



How to Make Your Own Home Survey

If you do not have information about the fallout protection of your basement, you may obtain it quickly as follows:

Select the answer in each multiple choice question which most nearly applies to your home. Write the number of points selected in the blank space provided opposite each question. Add the numbers written

in the blanks. Write the sum in the blank opposite "TOTAL POINTS" and compare your total with the "Shelter Potential" table.

1. How many stories are above the ground level in this house?
   ( ) One story — 11 points _____
   ( ) One and one-half stories — 9 points _____
   ( ) Two stories — 6 points _____
   ( ) Three stories or more — 3 points _____

2. What is the maximum exposure of any basement wall above the ground? (Exclude exterior entrance of 3 feet width or less.)
   ( ) No basement (skip question 3) — 15 points _____
   ( ) 3 feet or more — 8 points _____
   ( ) 2 to 3 feet — 3 points _____
   ( ) 1 to 2 feet — 1 point _____
   ( ) less than 1 foot — 0 points _____

3. What is the principal material of the basement walls?
   ( ) Cinder block or concrete block — 2 points _____
   ( ) Stone, brick, or poured concrete — 0 points _____

4. What is the principal material of the first story walls?
   ( ) Solid brick, stone and concrete — 3 points _____
   ( ) Other — 5 points _____

5. Is the home attached to or closer than 10 feet to another home or homes of similar size and construction?
   ( ) No — 2 points _____
   ( ) Yes, 1 side — 1 point _____
   ( ) Yes, 2 sides — 0 points _____

TOTAL POINTS _____

Shelter Potential:
Up to 13 points—adequate
14 – 19 points—improvable at low cost
20 or more points—low

Remember, in this type of survey, the *lowest* number of points means *highest* degree of fallout shielding.

Shielding Material is Required

In setting up any home fallout shelter, the basic aim is to place enough "shielding material" between the people in the shelter and the fallout particles outside.

Shielding material is any substance that would absorb and deflect the invisible rays given off by the fallout particles outside the house, and thus reduce the amount of radiation reaching the occupants of the shelter. The thicker, heavier, or denser the shielding material is, the more it would protect the shelter occupants.

Some radiation protection is provided by the existing, standard walls and ceiling of a basement. But if they are not thick or dense enough, other shielding material will have to be added.

Concrete, bricks, earth and sand are some of the materials that are dense or heavy enough to provide fallout protection. For comparative purposes, 4 inches of concrete would provide the same shielding density as:

— 5 to 6 inches of bricks.
— 6 inches of sand or gravel } May be packed into bags, cartons, boxes,
— 7 inches of earth . . . . . } or other containers for easier handling.
— 8 inches of hollow concrete blocks (6 inches if filled with sand).
— 10 inches of water.
— 14 inches of books or magazines.
— 18 inches of wood.

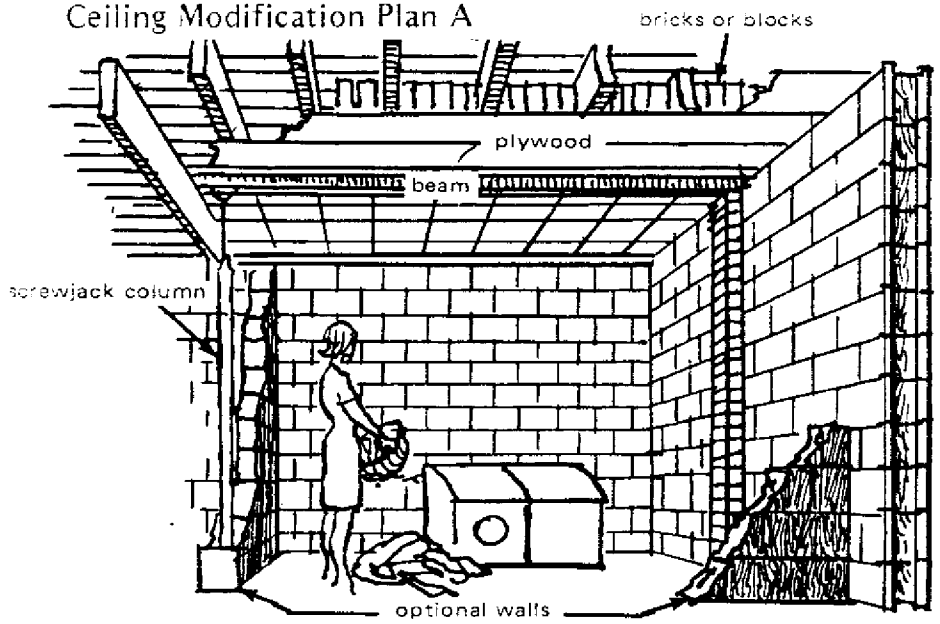
How to Prepare a Home Shelter

If there is no public fallout shelter near your home, or if you would prefer to use a family-type shelter in a time of attack, you should prepare a home fallout shelter. Here is how to do it:

● A PERMANENT BASEMENT SHELTER. If your home basement -or one corner of it--is below ground level, your best and easiest action would be to prepare a permanent-type family shelter there. If you have basic carpentry or masonry skills, you probably could buy the necessary shielding material and do the work yourself in a short time.

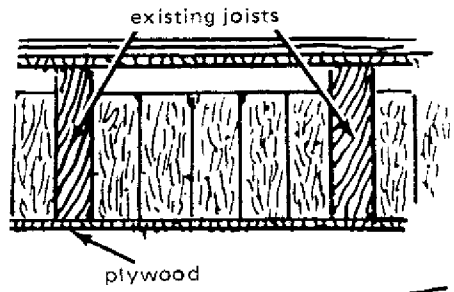
Here are three methods of providing a permanent family shelter in the "best" corner of your home basement—that is, the corner which is most below ground level. If you decide to set up one of these shelters, ***first*** *get the free plan for it* by writing to the U.S. Army AG Publications Center, Civil Preparedness Section, 2800 Eastern Blvd., (Middle River), Baltimore, Maryland 21220. In ordering a plan, use the full name shown for it.

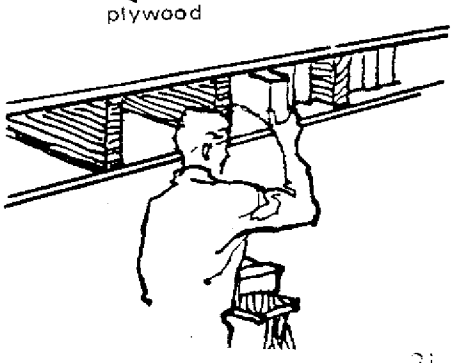
Ceiling Modification Plan A



If nearly all your basement is below ground level, you can use this plan to build a fallout shelter area in one corner of it, without changing the appearance of it or interfering with its normal peacetime use.

However, if 12 inches or more of the basement wall is above ground level, this plan should not be used unless yoy add the "optional walts" shown in the sketch.

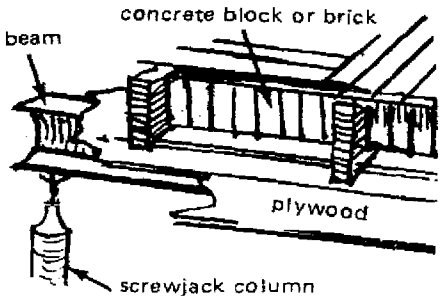




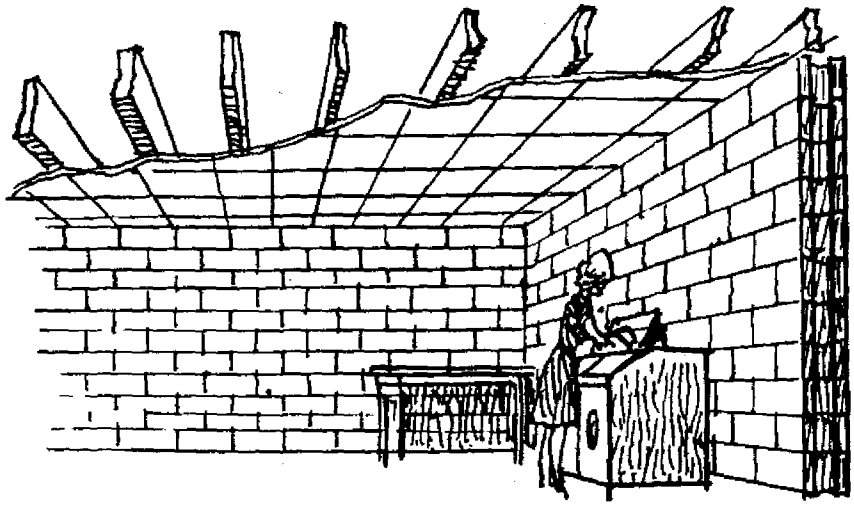
Overhead protection is obtained by screwing plywood sheets securely to the joists, and then filling the spaces between the joists with bricks or concrete blocks. An

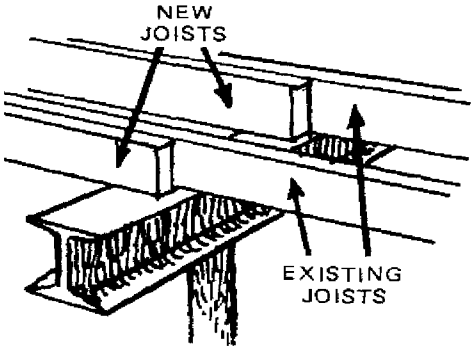
extra beam and a screwjack column may be needed to support the extra weight.

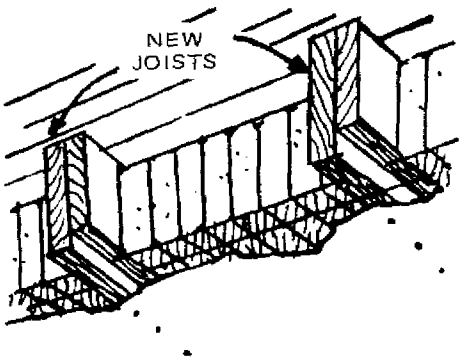
Building this shelter requires some basic woodworking skills and shielding materials. It can be set up while the house is being built, or afterward.



Alternate Ceiling Modification Plan B





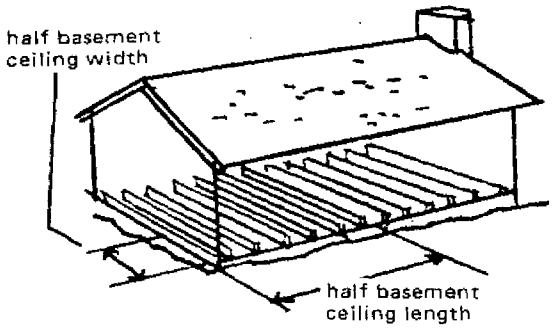


This is similar to Plan A, except that new extra joists are fitted into part of the basement ceiling to support the added weight of the shielding (instead of using a beam and a screwjack column).

The new wooden joists are cut to length and notched at the ends, then installed between the existing joists.

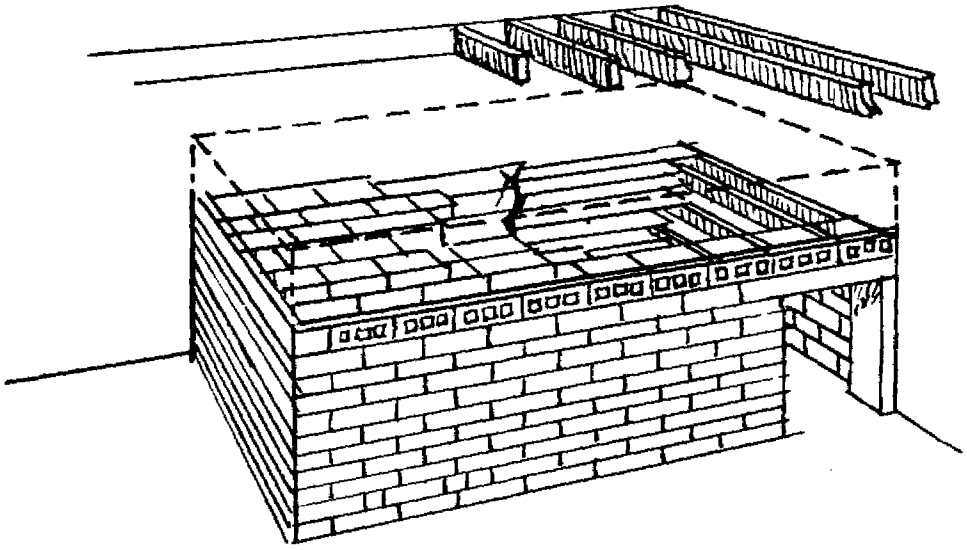
After plywood panels are screwed securely to the joists, bricks or concrete blocks are then packed tightly into the spaces between the joists. The bricks or blocks, as well as the joists themselves, will reduce the amount of fallout radiation penetrating downward into the basement.

Approximately one-quarter of the total basement ceiling should be reinforced with extra joists and shielding material.



Important: This plan (like Plan A) should *not* be used if 12 inches or more of your basement wall is above ground level, unless you add the "optional walls" inside your basement that are shown in the Plan A sketch.

Permanent Concrete Block or Brick Shelter Plan C.

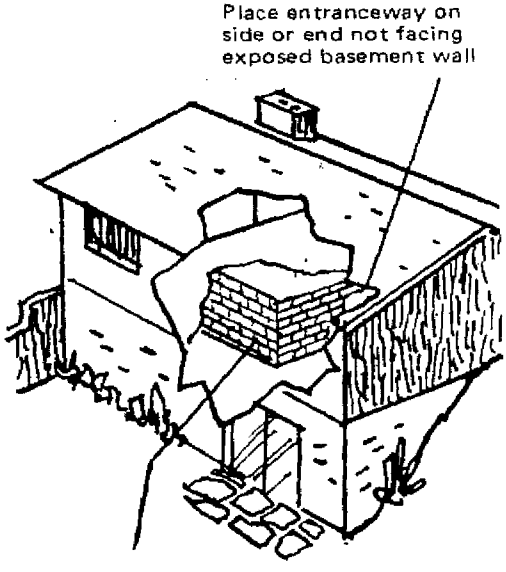


This shelter will provide excellent protection, and can be constructed easily in most parts of the country.

Made of concrete blocks or bricks, the shelter should be located in the corner of your basement that is most below ground level. It can be built low, to serve as a "sit-down" shelter; or by making it higher you can have a shelter in which people can stand erect.

The shelter ceiling, however, should *not* be higher than the outside ground level of the basement corner where the shelter is located.

The higher your basement is above ground level, the thicker you should make the walls and roof of this shelter, since your regular basement walls will provide only limited shielding against outside radiation.



Natural ventilation is provided by the shelter entrance, and by the air vents shown in the shelter wall.

This shelter can be used as a storage room or for other useful purposes in non-emergency periods.

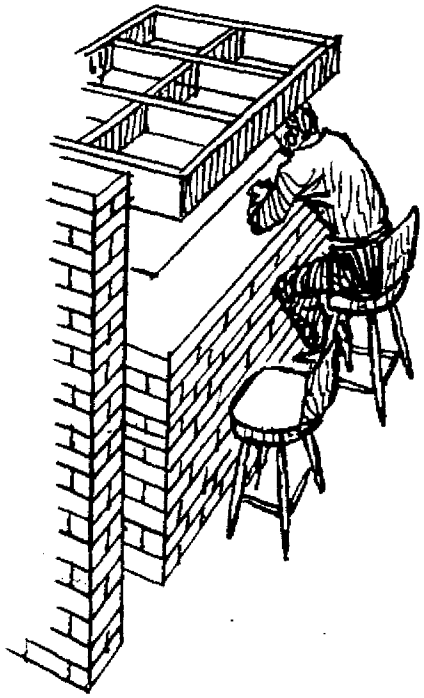
A PREPLANNED BASEMENT SHELTER. If your home has a basement but you do not wish to set up a permanent-type basement shelter, the next best thing would be to arrange to assemble a "preplanned" home shelter. This simply means gathering together, in advance, the shielding material you would need to make your basement (or one part of it) resistant to fallout radiation. This material could be stored in or around your home, ready for use whenever you decide to set up your basement shelter.

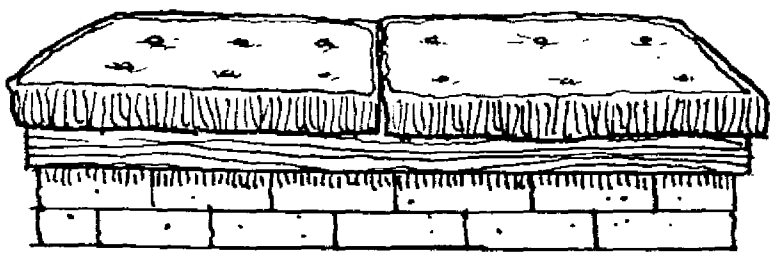
Here are two kinds of preplanned basement shelters. If you want to set up one of these, be sure to *get the free plan for it first* by writing to the U.S. Army AG Publications Center, Civil Preparedness Section, 2800 Eastern Blvd. (Middle River), Baltimore, Maryland 21220. Mention the full name of the plan you want.

Preplanned Snack Bar Shelter Plan D

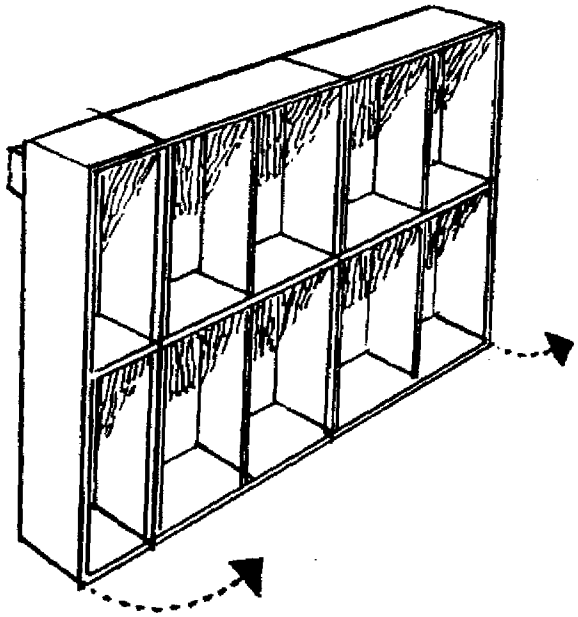
This is a snack bar built of bricks or concrete blocks, set in mortar, in the "best" corner of your basement (the corner that is most below ground level). It can be converted quickly into a fallout shelter by lowering a strong, hinged "false ceiling" so that it rests on the snack bar.

When the false ceiling is lowered into place in a time of emergency, the hollow sections of it can be filled with bricks or concrete blocks. These can be stored conveniently nearby, or can be used as room dividers or recreation room furniture (see bench in sketch).





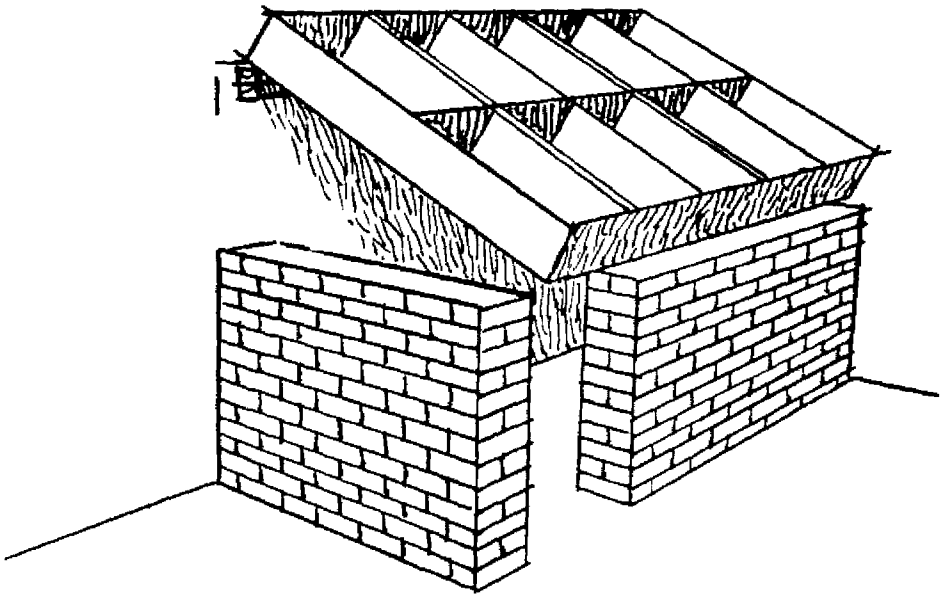
Preplanned Tilt-up Storage Unit Plan E



A tilt-up storage unit in the best corner of your basement is another method of setting up a "preplanned" family fallout shelter.

The top of the storage unit should be hinged to the wall. In peacetime, the unit can be used as a bookcase, pantry, or storage facility.

In a time of emergency the storage unit can be tilted so that the bottom of it rests on a wall of bricks or concrete blocks that you have stored nearby.



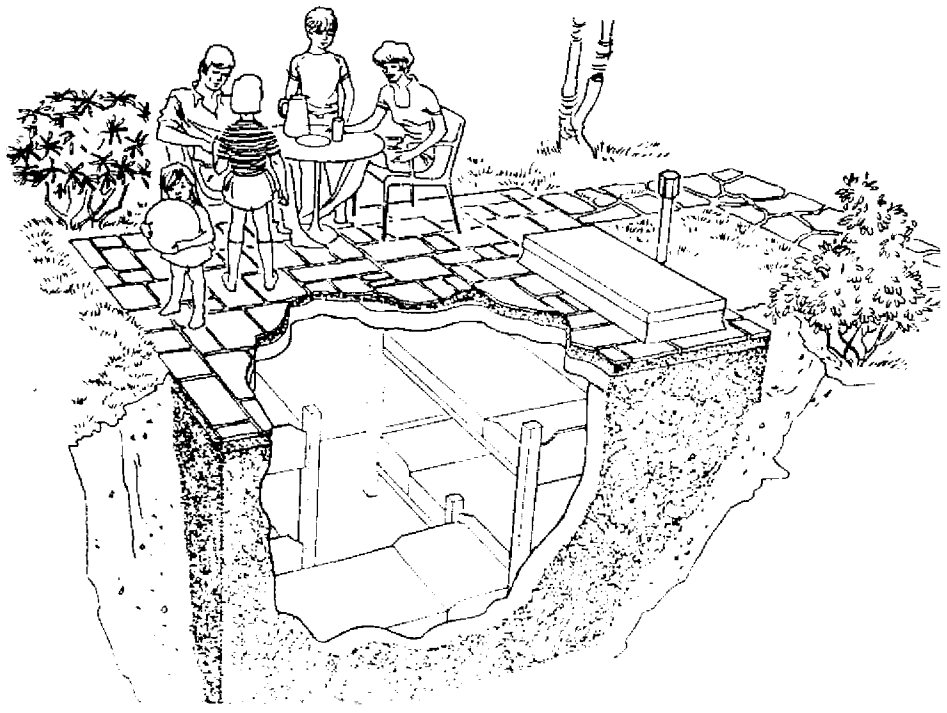
Other bricks or blocks should then be placed in the storage unit's compartments, to provide an overhead shield against fallout radiation.

The fallout protection offered by your home basement also can be increased by adding shielding material to the outside, exposed portion of your basement walls, and by covering your basement windows with shielding material.

You can cover the aboveground portion of the basement walls with earth, sand, bricks, concrete blocks, stones from your patio, or other material.

You also can use any of these substances to block basement windows and thus prevent outside fallout radiation from entering your basement in that manner.

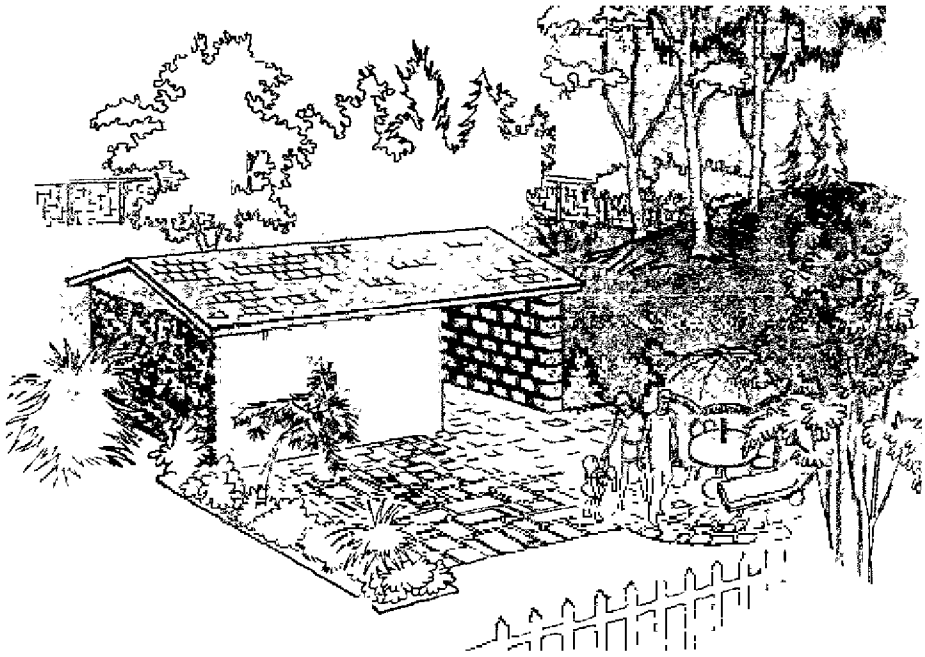
● A PERMANENT OUTSIDE SHELTER. If your home has no basement, or if you prefer to have a permanent-type home shelter in your yard, you can obtain free construction plans by writing to the U.S. Army AG Publications Center, Civil Preparedness Section, 2800 Eastern Blvd. (Middle River), Baltimore, Md. 21220. In ordering a plan, use the full title and code shown for it.



Outside Concrete Shelter, Plan H-12-1

In addition to providing protection against radioactive fallout, this shelter will withstand blast overpressures up to 5 pounds per square inch. It can be built of concrete or a combination of concrete blocks and poured concrete. If built as shown, the roof slab can be used as a patio. The shelter can be reached through a hatch door and wood stairway. Fresh air is provided by a hand-operated blower and two pipes extended above-ground level.

Modifications can be made to permit dual-use of the shelter space. If topography permits, the shelter can be modified to increase protection against radioactive fallout by addition of an earth mound over the shelter. Such a mound can also be used to advantage where drainage is poor or where the watertable is close to the surface.



Aboveground Fallout Shelter, Plan H-12-2

This shelter is for persons who prefer shelter aboveground or for locations where underground shelters are impractical. It can be built of two rows of concrete blocks filled with sand or grout, or of poured, reinforced concrete. If other materials, such as concrete block faced with brick are used, care should be taken to provide the same weight of materials per square foot.

This structure has been designated for areas where frost does not penetrate the ground more than 20 inches. Where frost goes deeper, layers of concrete blocks may be used to lower the footings below the frost line. Dual-use includes storage of lawn equipment, such as wheelbarrows and lawnmowers.

Chapter 4

IMPROVISING FALLOUT PROTECTION

If an enemy attack should occur when you are at home, and you have made no advance shelter preparations, you still might be able to improvise a shelter either inside or outside your house. In a time of emergency, the radio broadcasts may tell you whether you have time to improvise a shelter or should take cover immediately.

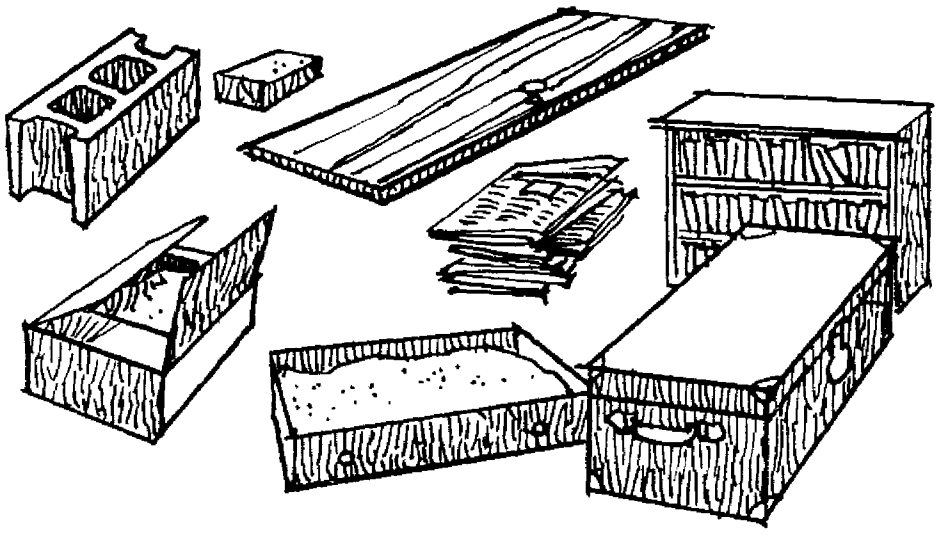
An improvised shelter probably would not give you as much protection as a permanent or a preplanned family shelter, but any protection is better than none, and might save your life.

The best place to improvise a shelter would be the basement or storm cellar, if your home has one.

Shielding Material Needed

To improvise a shelter you would need shielding materials such as those mentioned on page 20—concrete blocks, bricks, sand, etc. Other things could also be used as shielding material, or to support shielding material, such as:

- House doors that have been taken off their hinges (especially heavy outside doors)



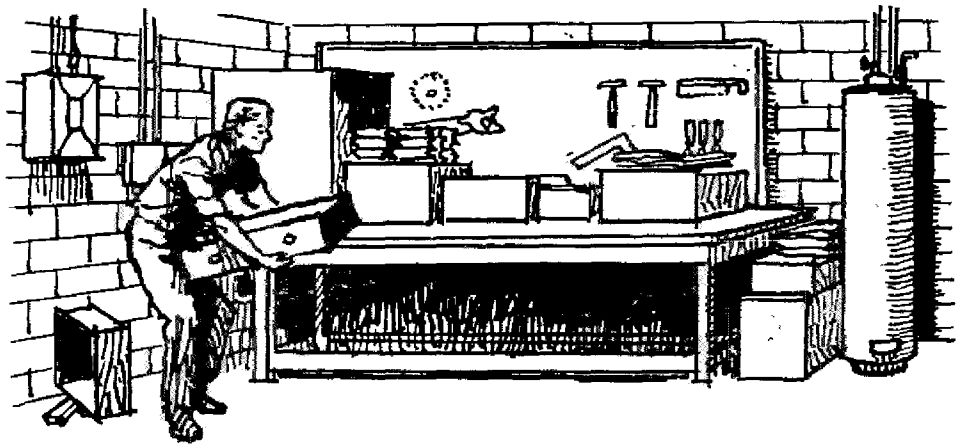
- Dressers and chests (fill the drawers with sand or earth after they are placed in position, so they won't be too heavy to carry and won't collapse while being carried).
- Trunks, boxes and cartons (fill them with sand or earth after they are placed in position)
- Tables and bookcases.
- Books, magazines, and stacks of firewood or lumber.
- Flagstones from outside walks and patios.

Improvising a Basement Shelter

Here are two ways of improvising fallout protection in the basement of a home:

Set up a large, sturdy table or workbench in the corner of your basement that is most below ground level.

On the table, pile as much shielding material as it will hold without collapsing. Around the table, place as much shielding material as possible.



When family members are "inside the shelter"—that is, under the table—block the opening with other shielding material.

If you don't have a large table or workbench available—or if more shelter space is needed—place furniture or large appliances in the corner of the basement so they will serve as the "walls" of your shelter.

As a "ceiling" for it, use doors from the house that have been taken off their hinges. On top of the doors, pile as much shielding material as they will support. Stack other shielding material around the "walls" of your shelter.

When all persons are inside the shelter space, block the opening with shielding material.

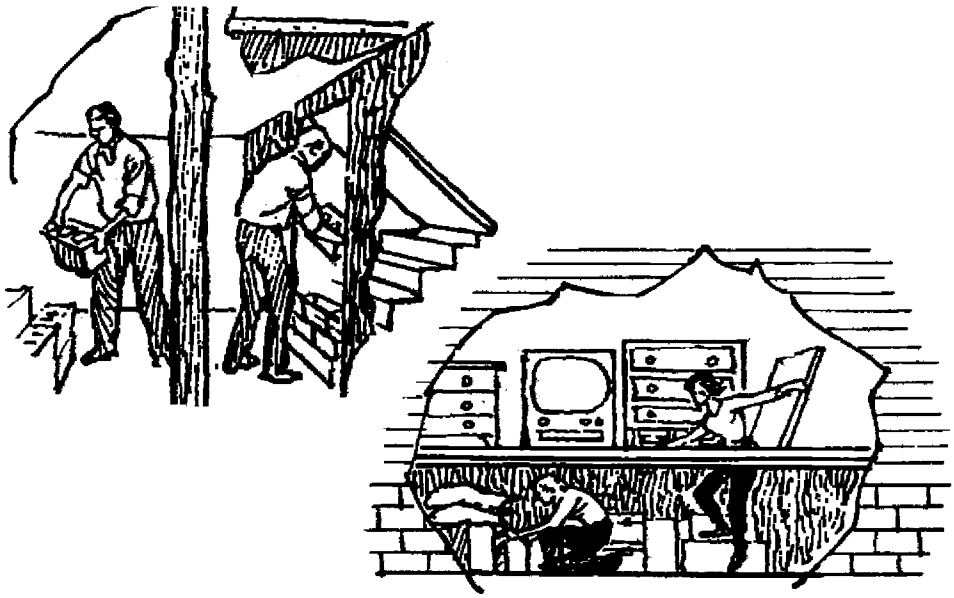
Using a Storm Cellar for Fallout Protection

A below-ground storm cellar can be used as an improvised fallout shelter, but additional shielding material may be needed to provide adequate protection from fallout radiation.

If the existing roof of the storm cellar is made of wood or other light material, it should be covered with one foot of earth or an equivalent thickness of other shielding material (see pages 21 and 22) for overhead shielding from fallout. More posts or braces may be needed to support the extra weight.

After the roof has been shielded, better protection can be provided by blocking the entrance way with 8-inch concrete blocks or an equivalent thickness of sandbags, bricks, earth or other shielding material, after all occupants are inside the shelter. After particles have stopped falling, the outside door may be left open to provide better ventilation.

If shielding material is not available for the entrance way, shelter occupants should stay as far away from it as possible. They also should raise the outside door of the storm cellar now and then to knock off any fallout particles they may have collected on it.



Using the Crawl Space Under Your House

Some homes without basement have "crawl space", between the first floor and the ground underneath the house. If you have this space under your house--and if the house is set on foundation walls, rather than on pillars--you can improvise fallout protection for your family there.

First, get access to the crawl space through the floor or through the outside foundation wall (A trapdoor or other entry could be made now, before an emergency occurs.)

As the location for your shelter, select a crawl-space area that is under the center of the house, as far away from the outside foundation walls as possible.

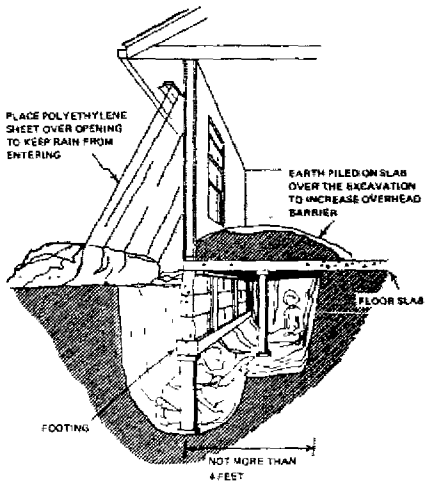
Around the selected shelter area, place shielding material—preferably bricks or blocks, or containers filled with sand or earth—from the ground level up to the first floor of the house, so that the shielding material forms the "walls" of your shelter area. On the floor above, place other shielding material to form a "roof" for the shelter area.

If time permits, dig out more earth and make the shelter area deeper, so you can stand erect or at least sit up in it.

Improvising an Outside Shelter

If your home has no basement, no storm cellar and no protected crawl space, here are three ways of improvising fallout protection in your yard

Shelter Under a House Slab



An excellent fallout shelter can be built by excavating under a small portion of the house slab.

First, dig a trench alongside the house, preferably under an eave to help keep out rainwater. Once the bottom of the slab foundation wall is reached, dig out a space under the slab. The area can vary in size, but it should not extend back more than 4 feet from the outside edge of the foundation wall.

Place support shoring under the slab, and pile dirt on top of the slab (inside the house) over the shelter area to improve overhead shielding from fallout radiation.

You can add to the protection by making a lean-to over the entrance trench, using boards or house doors, covering them with soil, and covering this with a polyethylene sheet to keep out rainwater.

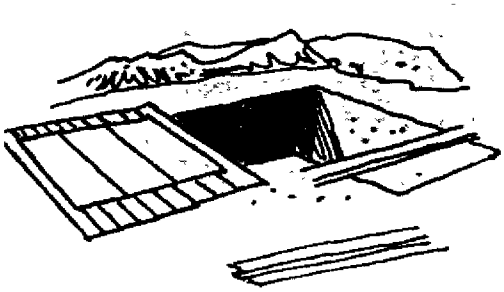
Outside Trench Shelter

Dig an L-shaped trench, about 4 feet deep and 3 feet wide. One side of the L, which will be the shelter area, should be long enough to accommodate all family members The other side of the L can be shorter, since its purpose is to serve as an entrance-way and to reduce the amount of radiation getting into the shelter area.

Cover the entire trench with lumber (or with house doors that have been taken off their hinges), except for about 2 feet on the short side of the L, to provide access and ventilation.

On top of the lumber or doors, pile earth 1 to 2 feet high, or cover them with other shielding material.

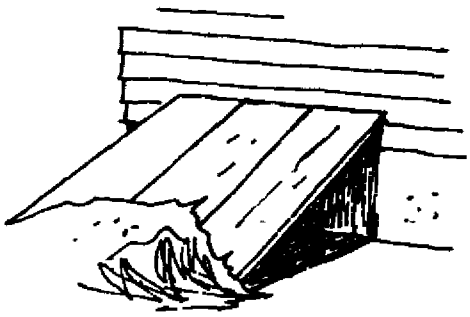
If necessary, support or "shore up" the walls of the trench, as well as the lumber or doors, so they will not collapse.



Outside Lean-To Shelter

Dig a shallow ditch, 6 inches deep and 6 inches wide, parallel to and 4 feet from the outside wall of your house.

Remove the heaviest doors from the house. Place the bottoms of the doors in the ditch (so they won't slip), and lean the doors against the wall of the house.



On the doors, pile 12 to 18 inches of earth or sand. Stack or pile other shielding material at the sides of the doors, and also on the other side of the house wall (to protect you against radiation coming from that direction).

If possible, make the shelter area deeper by digging out more earth inside it. Also dig some other shallow ditches, to allow rain water to drain away.

Boats as Improvised Shelters

If no better fallout protection is available, a boat with an enclosed cabin could be used. However, in addition to emergency supplies such as food, drinking water and battery-powered radio, you should have aboard the items you would need (a broom, bucket, or pump-and-hose) to sweep off or flush off any fallout particles that might collect on the boat.

The boat should be anchored or cruised slowly at least 200 feet offshore, where the water is at least 5 feet deep. This distance from shore would protect you from radioactive fallout particles that had fallen on the nearby land. A 5-foot depth would absorb the radiation from particles falling into the water and settling on the bottom.

If particles drift down on the boat, stay inside the cabin most of the time. Go outside now and then, and sweep or flush off any particles that have collected on the boat.